

# AMBITIONS

A dive into Sika's world



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And how to differentiate  
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## COLORED ARCHITECTURE

30,000 ceramic panels and  
a green roof

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AMBITIONS ISSUE #24

BUILDING TRUST



# STRENGTH



ASTRID SCHNEIDER  
Marketing & Product  
Communications Manager  
Sika Services

The word "strength" can mean many different things. An individual's physical strength is determined by two factors: the cross-sectional area of the muscle fibers recruited to generate force and the intensity of the recruitment. In the field of positive psychology the VIA Inventory of Strengths has been developed. This is a psychological assessment tool by which people can identify their character strengths and learn how to capitalize on them. Positive psychology is a relatively new field of academic study, and the first International Conference on Positive Psychology took place as recently as 2003. Its primary aim is to identify people's strengths and help them to grow, rather than looking at any illness. Its classification of strengths includes social intelligence, curiosity, bravery, creativity, honesty and humor to name just a few. The strength of a material is its ability to resist deformation. The strength of a component is usually based on the maximum load it can bear before failure becomes apparent. In this edition, however, we will see how walls or bridges can be strengthened to protect them against graffiti or illegal posters (p. 18).

Furthermore, the Mandira dam in India, which was designed and built between 1957 and 1959, has suffered severe structural damage due to natural wear and tear, requiring intensive repair and retrofitting (p. 46). The products used to restore the dam's strength underwent a number of quality tests at the site, such as pot life, compressive strength, bond strength, shrinkage strength, abrasion testing, and tensile strength. In addition to looking at the all-important area of materia strength, we explore another crucial kind of strength – sustainability (p. 32) and how industries and companies learn to grown stronger from it.

Yours sincerely,

ASTRID SCHNEIDER

# CONTRIBUTORS



CHRISTIAN DIEFENBACHER  
PR Manager, Sika Germany

It is impressive to see, how Sika flat roof sealing provide a great architectural scope. This is verified by taking the 1st place of the BDA Architecture Prize competition and by receiving a DGNB Gold certificate.



SHREEMOYEE BANERJEE  
Deputy Manager, Marketing  
Communications, Sika India

Over nearly the past three decades Sika India has been at the forefront of introducing technology lead interventions across diverse challenging infrastructure projects which form the backbone of our nation's growth.



SARAH JAMES  
Marketing Manager, Flooring,  
Sika UK

We show another example of how Sika ComfortFloor is a great fit for education facilities. It is a sustainably produced product which also delivers in terms of maintenance and flexibility.



ROSARIO LISTE  
Marketing Chief, Sika Uruguay

At Sika Uruguay, morals and respect amongst people are crucial in an atmosphere where trust and appreciation of individual initiatives are fostered.

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## IMPRINT

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The new undulating, multicolor BSU building in Hamburg is the largest building project of the International Building Exhibition IBA Hamburg (2006-2013).



## ROOFING

# MULTI-COLORED GREEN ARCHITECTURE

What is the future of urban design in the 21st century? This was the key question addressed by the International Building Exhibition IBA Hamburg in Northern Germany, which ran until 2013 and delivered a wide variety of projects and other innovative contributions to the contemporary urban development debate.

TEXT: CHRISTIAN DIEFENBACHER  
PHOTO: SIKA GERMANY

> The 60-plus building, social and cultural schemes were implemented in the IBA project area on Hamburg's Wilhelmsburg river island, the neighboring Veddel district and at the Harburg Inland Port.

The project set out to demonstrate how a major urban center can achieve ecologically and socially balanced growth in the 21st century and thereby serve as an example of sustainable, forward-looking urban development.

Hamburg's new State Ministry for Urban Development and the Environment (BSU) building, developed by the city's property management company Sprinkenhof GmbH, stands as the urban center-piece in the refashioned Wilhelmsburg district. The BSU, when it moved to one of Hamburg's most modern buildings on the island of Wilhelmsburg between the northern and southern arms of the river in May 2013, became the first ministry to implement the long-agreed initiative of making the "leap across the Elbe". This policy has cleared the way for growth of the city state at a central location. A 54 m tall central high-rise housing the main entrance is adjoined by two meandering blocks running to the north and west.

One particular highlight – and a signature element in the work of Berlin-based architectural practice Sauerbruch Hutton – is the variegated facade design of the 13-story tower and the two attached five-story blocks, featuring some 30,000 ceramic panels in 20 different colors. A further particularity of the scheme is its ambitious sustainability and energy concept. This was designed to meet the requirements of the DGBN (German Sustainable Building Council) certificate in gold, which it duly received.

### RELIABLE ROOF WATERPROOFING DESPITE UNCONVENTIONAL GEOMETRY

Aside from the striking facade composition, the unorthodox architectural concept also had implications for the

>



- 1 The entire roof assembly had to be adapted to the curvaceous architecture.
- 2 One particular highlight of this project was the waterproofing solution, featuring the Sarnafil TG 76-18 Felt polymer-sheet roof membrane, for a concrete dome located in the green spaces around the building.
- 3 Detailed plan of the first level.



#### SIGNBOARD

**Owner:**  
Sprinkenhof GmbH, Steinstrasse 7, D-20095 Hamburg

**Architect:**  
Sauerbruch Hutton, Berlin

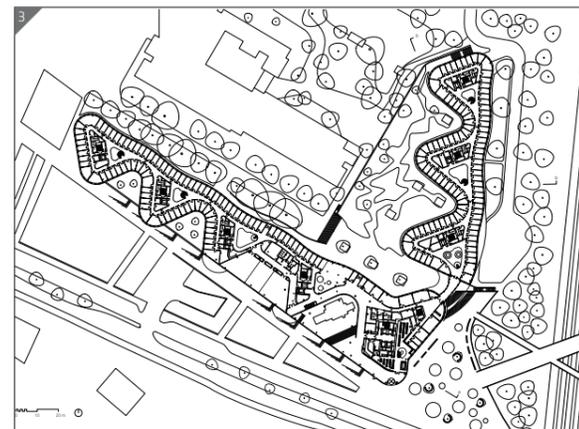
**General planner:**  
Obermeyer Planen + Beraten GmbH, Hamburg (from HOAI Workstage 5)

**Construction period:**  
December 2010 to May 2013

**Applicator:**  
Flat roofing:  
Werder Bedachungen GmbH, Leutersdorf

**Parking lot roof:**  
Carstens Bedachungsgeschäft GmbH, Rotenburg/Wümme

**Awards:**  
DGNB (German Sustainable Building Council) certificate in gold, IBA Excellence, BDA (Association of German Architects) Architecture Prize, 1<sup>st</sup> place



The building's comprehensive sustainability and energy concept earned it a DGNB certificate in gold.



After waterproofing, all roof areas were extensively planted.

> roof in that the entire assembly had to be adapted to the undulating geometry of the building elements. The first step was to install bituminous vapor barriers and thermal insulation on the reinforced-concrete slab. This was then covered by a Sarnafil TG 76-18 Felt polymer-sheet roof membrane supplied by Sika Germany. When fully bonded, this product is also suitable for gravel-ballasted and green roofs thanks to its certified root and rhizome resistance under the FLL (German Research Society for Landscape Development and Landscaping) testing scheme. Given that the plasticizer-free, recyclable and extremely durable membrane also enhances the sustainability performance of the roof system, it contributed to the achievement of DGBN gold certification.

The waterproof sheet membrane comprises a glass-nonwoven interlayer with a nonwoven backing that serves as a bonding and levelling layer for full-surface adhesion. The entire roof assembly was bonded with Sikaplan C 300 adhesive. Due to the building height, certain sections incorporated Sarnafil TS 77-18 membranes mechanically fastened with the Sarnabar system. All roof areas were then extensively planted. The Sarnafil

TS 77-18 membrane likewise meets the stringent FLL requirements.

#### OTHER WATERPROOFING WORKS

In addition to the standard roofing applications, Sika Germany also used its system solutions to waterproof other parts of the building: one of the tasks was to waterproof an approx. 5 m high concrete "lid", with an approx. 10 m radius, that sits on a concrete base. This design feature, which forms a dome above the urban model of Hamburg in the building foyer, was also subsequently planted.

The Sarnafil TG 76-18 Felt polymer-sheet membrane laid on the roof was also used for the 5,000-plus m<sup>2</sup> underground parking lot roof slab, which is now likewise covered over by green spaces. Parts of this area were compartmentalized, fitted with Sarnafil control pipes and then intensively planted. The landscaping concept included the planting of trees in a one-meter-deep basin with a permanent 9.9 cm head of retained water. Given the high hydrostatic pressures, a fail-safe roof membrane was an absolute must.

A waterproofing solution was also needed for the outdoor stairways

around the building. Here, however, the SikaRoof MTC 18 liquid-polymer membrane system was specified. It develops very early rain resistance and, due to the short drying times between coats, allows fast and easy application, even in poor weather. The high-grade liquid-polymer system was primarily chosen because of the complicated junctions and detailing of the stairways. Moreover, with Sika products also used at the interfaces between roof sheet and liquid-polymer membranes, the customer now enjoys the full, unconditional benefits of Sika Germany's extensive warranty package.



# WHAT ABOUT URUGUAY?

The capital Montevideo, founded by the Spanish in 1726 as a military stronghold, soon took advantage of its natural harbor to become an important commercial center. Claimed by Argentina but annexed by Brazil in 1821, Uruguay declared its independence four years later and secured its freedom in 1828. Uruguay is a small country, located at the south of South America, between Argentina and Brazil.

TEXT: ROSARIO LISTE, ASTRID SCHNEIDER  
PHOTO: SIKA URUGUAY, SIKA AG





People walking on the street, looking for spots to watch the Parade during Carnival in Montevideo along Avenida 18 de Julio.



Oscar Baccaro, General Manager of Sika Uruguay.

> It has a population of about three million people scattered over a flat surface of 176,220 km<sup>2</sup>, which means Uruguay would fit almost four times into France. It is a Spanish-speaking country, and most of the population is of Spanish or Italian descent. Uruguay's political and labor conditions are among the most liberal on the continent.

We went to Montevideo and visited Oscar Baccaro, the General Manager of Sika Uruguay.

**What are your personal secrets for leading a team?**

I don't think that they are personal secrets. Motivation is generally a key factor for maintaining a spirit of proactivity, innovation and commitment. Team cohesiveness is also very important, especially because the different roles could create conflicts of interest. Part of my job is to reconcile differing opinions and put the focus on our common goals, underpinning the notion that we are one team. And I also try to encourage the whole organization to permanently live up to the Sika culture, as clearly expressed in our values and principles: Customer First, Courage for Innovation, Managing for Results, Sustainability and Integrity, Empowerment and Respect.

**What is the first thing that springs to mind when someone asks you how it is to work in Uruguay? What makes this little country special?**

When you consider that Uruguay is inside Latin America, the country has

some clear advantages in terms of political stability, institutions, investor protection, education standards, and social awareness of sustainability. On the other hand, as we are a small country with only 3.3 million inhabitants, the domestic market is quite small and foreign investment is not so high as it should be given the country's political and business landscape. Thanks to these favorable conditions, the country has achieved a reasonable level of education and social development which, on the whole, is higher compared to the majority of Latin America.

**Uruguay is characterized by an export-oriented agricultural sector and a well-educated work force, along with high levels of social spending, although the economy is very dependent on Brazil and Argentina, neither of which can boast a stable economic track record. Do you think Uruguay can keep up these great achievements going forward?**

Like all Latin America, clearly the economic situation in Uruguay is currently not as favorable as in the past ten years, mainly because of the fall in the prices of raw materials. And also, as you pointed out, because our two neighboring countries are not as financially stable. In gen-

>



Grilled meat and sausages traditionally prepared. They're presented in a metal pan with condiments on the side. In the background the meat is grilled on large metal racks over coals that are heated by open wood burning flames.

View of Mercado del Puerto in the left, the famous place in Montevideo to eat local meat cuts.





Team of Sika Uruguay.

> eral terms, Uruguay has tried in the last few years to diversify its exports, reducing its dependence on Argentina in particular. So while the short-term view shows a scenario of market slowdown, in the middle and long term, we expect Uruguay to continue growing.

**How about the construction market? Where exactly does the country need Sika?**

Public investment in infrastructure is normally not high, with government spending frequently directed at social housing. Renewable energy sources are a clear priority and part of long-term government policy, particularly wind energy. As for private investment, the real estate business is concentrated in Montevideo and Punta del Este. The rest of the market is composed of small building projects, recycling schemes and the DIY market. For this reason, the distribution channel is very important for us, covering almost 2/3 of our total sales through builder's merchants, hardware stores, paint dealers, etc. That is also the reason why refurbishment and roofing are Sika Uruguay's biggest markets. We are leading the market for interior finishing, mainly with tile adhesives, renderings, coatings and waterproofing products.

**Any new trends in construction?**

Uruguay still has a very "traditional" way of construction, based on the Italian influence, with the emphasis on manual labor. However, the last few years have witnessed some new trends, spelling an increase in precast and industrialized methods, in particular in the social housing and industrial building segments. The concrete sector has seen further integration of the ready-mix industry, which accounts for the major part of the concrete currently manufactured in Uruguay. And this widescale industrialization of processes is being accompanied by increased use of pre-packed dry mortars, a new trend that is growing slowly but surely.

**Where is Sika Uruguay heading to?**

Our main focus is on maintaining our market leadership and brand awareness, which is probably among the highest worldwide, on continuing to bring innovation to the market in the form of new products, systems and solutions, and on giving added value to our customers. We need to reinforce this with strong communication, so we improve our digital strategy and move quickly to find new ways of interacting with customers, institutions and society. And of course, it is very important to remain committed to driving sustainability, both outside and

inside Sika, including our engagement in socially responsible projects.

Internally, we aim to continue developing our people, promoting them or assigning them new responsibilities, and keeping Sika Uruguay as efficient and fit as possible.

**What do you personally enjoy most about living in Uruguay?**

Many things: Montevideo is a very nice city, with very little traffic congestion (a rare and welcome claim for any Latin American capital), it's quite safe, and most importantly, Uruguayans are all very friendly and respectful. They are extremely open-minded, which provides numerous opportunities to suggest new ideas and new projects and to enjoy working on them together.

**What do you wish for your country for the future?**

Primarily, to maintain our key advantages as the country I described above: with respect for institutions, political stability, investment protection, and high standards of education and social responsibility. And we should also improve our productivity and infrastructure in order to be more competitive as a country. <

People enjoy fishing at Montevideo's coastline.



Cellulose Pulp Mill. Colonia – Uruguay. Montes del Plata



## STREET ART OR VANDALISM?

Street art is more a visual art form than random graffiti, contingent to the motive behind the artist's work, as it creates a wide gamut of different reactions among the audience, and thus a relationship between the artist and the community through its expression of self and culture.

TEXT: ASTRID SCHNEIDER  
PHOTO: CHRISTIAN ALBAN, RICARDO GOMEZ



One of Banksy's known performances: a little boy with a water bucket with hearts coming out from it.



New York, United States, 2012: "Silent Scream" is a piece of artwork painted by the French artist JR at the High Line Park in West Chelsea. This performance is part of the "Inside Out" project, which is planet's largest participatory art project. With other artists around the globe JR creates printed façades with large images in different cities of the world.



Berlin, Germany, 2015: Streetart at Berlin Alexanderplatz. A street artist is drawing a portrait with chalk and charcoal on the pavement.



Barcelona, Spain, 2013: Traffic signal with art performance in the District of Gracia.



Lake Worth, United States, 2014: The "Before I Die" chalkboard is exhibited at the 20th Lake Worth Street Art Festival. Everybody can write on it what he wants to do before he dies. All artists compete against each other in this street art festival. Furthermore 400 artists use the pavement as a canvas to transform the city into an outdoor museum.

> The negative status of street art is mainly due to the gang signs and tags that make up nearly 95% of all "street art", or more specifically, graffiti. This in turn raises concerns that urban children will be corrupted by the display of gang culture visible virtually anywhere in the streets, eventually resulting in a dramatic increase in crime and violence in those parts of the city.

But street art has redefined the way that artwork is viewed. The traditional paintings and sculptures housed in art museums have a limited audience that consists

only of those who intend to observe art and have an interest in it. Street art, with its typical vibrant colors and eye-popping

effects, catches the broader public's eye, enticing them to look up from their newspapers and smartphones, showing them



Athens, Greece, 2011: Many large walls of old factories in Peraios street are covered with graffiti art by various artists. These are legally painted graffiti arts in collaboration with Athens' municipality.

that life is about more than work or busy schedules and that they should appreciate the beauty and culture all around.

Popular acclaimed street artists such as British painter and filmmaker Banksy,



> This tree got dressed for fall.

Glasgow, UK – February 22, 2011: A mural showing three swimmers painted on one of the supports of the Kingston Bridge near Springfield Quay in Glasgow, celebrating Glasgow's hosting of the Commonwealth Games in 2014. The Kingston Bridge carries the M8 motorway over the River Clyde.



> who has brought his art to major museums around the world (including the Paris Louvre) and even featured in Time Magazine's list of the world's 100 most influential people in 2010, often travel between countries to spread their designs. Some artists have gained cult followings, attracted media and art world attention, and gone on to work commercially in the styles which made their work known on the streets.

Street art itself combines a wide range of various kinds of art form difficult to describe with a single common definition. Generally, it is free public art that is inspired by the urban environment and encompasses a lot of extraordinary styles such as graffiti, wheat pasting, sticker and guerrilla art, video projection, street posters and installations, art intervention and many others. Though traditional spray-painted graffiti artwork itself is often included in this category, territorial graffiti or pure vandalism is excluded.

Vandalistic graffiti has become a widespread problem, seen in the largest cities



Antigua, Guatemala, 2016: Local man sprays water on dyed sawdust lent carpet decorated with ceramic owls and butterflies for the procession in the colonial town during the most famous Holy Week celebrations in Latin America.

and on highway bridges and trains. What we are talking about here are unprofessional pieces of graffiti by amateurs. Constituting the vast majority of graffiti, they are often just names, tags or offensive slogans.

The bill for cleaning up is presented to the owners and facility managers of public and private buildings, as well as railway companies. The costs typically associated with graffiti erasure and prevention run to billions of dollars annually.



In the UK, graffiti removal costs GBP 1 billion a year, in France the figure is estimated at more than EUR 10 million and in the United States as much as USD 1.3 billion. Moreover, the city of Paris, for instance, spends EUR 3 million every year on removing illegal posters. Sydney City Hall spends AUD 1 million per year.

These numbers drive home how much cost is involved and how much can be saved. This has prompted numerous cities to launch anti-graffiti programs, but preventing vandals from defacing public and private property is still a huge issue for municipalities, private owners and companies all over the world.

Most offenders work quickly, when few people are around. Graffiti and illegal fly-posting predominantly occur late on weekend nights, though there is little systematic evidence for this. Is there an easy way to achieve long-term protection against these acts of vandalism? How can recurrent graffiti be removed just by >



Bridges are one of the most common victims of vandalism. This bridge faces random graffiti tags and illegal posters.



- 1 The owner of this house for sure was not happy seeing this: A graffiti tag defaces the whole entrance to the building.
- 2 It is doubtful that anyone has a comfortable feeling walking up those stairs.
- 3 Trains, trams and metros are as well often the targets of random graffiti vandalism.



> using simple water jetting or even hosing with cold water, rubbing the graffiti with a cloth without the help of any aggressive cleaning agents?

The permanent, transparent coating Sikagard®-850 AG Anti-Graffiti and Anti-Poster can be easily applied by brush, roller and professional spray equipment to mineral substrates, coated substrates, wood and even metal.

The substrate does not need to be re-coated after graffiti removal as is the case with alternative sacrificial systems. There is no need for detergents, aggres-

sive cleaners, hot water or high pressure blasting. All that is required is simple water jetting or a cold water hose, and the graffiti can be readily wiped off with a clean cloth. Posters, however, will be prevented from bonding. They will just fall off on their own after a few days. After application, the product leaves a glossy film which can subtly emphasize the colors of a property.

The only thing you might have to reconsider when using Sikagard®-850 AG Anti-Graffiti and Anti-Poster is that if Banksy were to pass by your house at night and embellish it with an artwork, you won't

be able to keep his masterpiece for long, although the wall of your house would be worth a fortune by then. Banksy once said that "some people join the police to make the world a better place, others become a graffiti artist to make the world a better looking place". <

View the best new [street art from around the world](#)  
Street art doesn't need to be painted: look at thousands of [brightly colored origami works](#) at unexpected places  
Get details of street art master [Banksy's life](#)

## TUNNELING

AFTER 17 YEARS OF CONSTRUCTION:

# THE LONGEST RAIL TUNNEL IN THE WORLD GOES LIVE

The Gotthard Tunnel in Switzerland covers 152 km of tunnel systems through the rock and at 57 km long is the world's longest rail tunnel. Its two single-track tunnel tubes are connected every 325 m by cross-cuts and open the way through the Alps. Up to 260 freight trains and 65 passenger trains per day can go through the tunnel. The maximum speed for freight trains will be 160 km per hour and passenger trains can speed up to 250 km per hour.

TEXT: JÜRIG SCHLUMPF, JASMINKA KOCEV, ASTRID SCHNEIDER  
PHOTO: SIKA SWITZERLAND, TRANSALPIN GOTTHARD AG



> When the Base Tunnel is officially opened on 1 June 2016, the Gotthard, the barrier between north and south, will have finally been conquered. Thanks to the tunnel, trains will race through the Alps and scarcely have to climb. This is truly a milestone in transport and for mobility of the future.

The Gotthard Base Tunnel is something new and special in tunneling. It traverses one of the highest massifs in the Alps. Under the highest peaks, the tunnel runs some 2000 m under the rock and is only

about 550 m above sea level at its summit. For heavy freight trains and modern high speed trains, this new line reduces the journey time from Zurich to Milan by about an hour.

The breakthrough on 15 October 2010 was the moment when it was clear that - with the Gotthard Base Tunnel - this 100-year construction project would be successfully completed. Eleven years after the first blasting operations, the 57 km long Gotthard tube was broken through. By the time of commissioning



Challenging demands for the tunneling engineers: high underground temperatures of 30 to 40°C had to be managed.



In 2016 a total of 152 km of tunnel section will have been built and 28 million tonnes of rock excavated from the mountain.



on 1 June 2016, a total of 152 km of tunnel section will have been built and 28 million tonnes of rock excavated from the mountain.

More than 100 years ago, Sika's success story also began in tunneling on the Gotthard. With the waterproofing for the

rail tunnel electrification in 1918, Sika created the conditions for the success of the railway on the north-south axis and also the basis for the company's global success. The Gotthard Base Tunnel posed similar challenges to those of 1918 along with some quite new ones.

It was not just the structural dimensions that placed huge demands on the tunneling engineers; above all it was the high underground temperatures of 30 to 40°C which had to be managed. The high material and engineering specifications, such as the concrete lifespan of 100

>

## SIKA WAS INVOLVED THROUGHOUT THE 14-YEAR CONSTRUCTION PERIOD, INCLUDING THE PRELIMINARY WORKS FROM 1996

> years, were a central issue for this hundred year structure and had to be met. This longest rail tunnel in the world now forms the heart of the new Alptransit rail link (NRLA). Sika was involved throughout the 14-year construction period, in-

cluding the preliminary works from 1996, delivering 40,000 tonnes of materials, including 20,000 tonnes of admixtures. Sika supplied the waterproofing system, the building chemicals know-how and machine solutions on this project. Parts

of the tunnel waterproofing system were also installed by Sika. The tunnel excavation is stabilized by sprayed concrete using high-quality Sika admixtures and sprayed concrete machines.

As of June passengers can now enjoy short trips to Italy. The Gotthard tunnel itself is a contemporary witness to human efforts to build up an infrastructure which connects not only regions and cities, but also countries and even the whole European continent. The Alps should not be an obstacle any more. A project that has taken more than 100 years – and yes, it has been, after all, a considerable success. <



Up to 260 freight trains and 65 passenger trains per day can go through the tunnel. The maximum speed for freight trains will be 160 km per hour and passenger trains can speed up to 250 km/h.

# PIONEERING THE POSSIBILITIES

Despite the decreasing likelihood of worldwide regulation to address climate change, there is evidence to indicate that greenhouse gas reporting and reduction efforts remain strong, and interest in water usage, efficiency and stewardship is on the rise. In this context, green building is also on the increase, as global trends attest. According to a recently published World Green Building Trends survey, 51 percent of respondent firms committed to incorporating sustainability into more than 60 percent of their work by 2015.

TEXT: MARK SCHNEIDER, KLAUS STRIXNER, ASTRID SCHNEIDER  
PHOTO: SIKA AG

## TARGETING AND DELIVERING: SIKA SUSTAINABILITY AT A GLANCE

### ECONOMIC PERFORMANCE

12–14%  
EBIT of net sales

### SUSTAINABLE SOLUTIONS

ALL  
New projects assessed and roadmaps implemented

### ENERGY

–3%  
Energy consumption per ton & year

### WATER/WASTE

–3%  
Water consumption per ton & year

### LOCAL COMMUNITIES/SOCIETY

5%  
More projects per year

### OCCUPATIONAL SAFETY

–5%  
Accidents per year

## SIKA IS COMMITTED TO CONTINUOUSLY MEASURE, IMPROVE, REPORT, AND COMMUNICATE SUSTAINABLE VALUE CREATION.

> Sika's sustainability strategy has proved its worth: With an increase in energy efficiency of approximately 15% during 2014 and 2015 in comparison to 2013, Sika is well on track. For Sika, sustainability has been a central topic ever since, and the efficient use of resources permeates the whole organization. The goal of sustainable development requires the involvement of every participant along the entire value chain and the identification of shared topic areas of significance to all those involved.

Sika is committed to continuously measure, improve, report, and communicate sustainable value creation. Water consumption per ton sold was reduced in the same period by 43% to 0.41 m<sup>3</sup>. Investments in various energy and water efficiency projects at its plants worldwide paid out. And since 2013, the amount of waste has been reduced overall by 3.3%. The number of occupational accidents leading to lost work time of more than one day showed a year-on-year decrease of approximately 10%.

Underpinning its engagement, Sika repeats biennially the materiality analysis originally carried out during development of the sustainability strategy. The most important internal and external stakeholder groups are contacted to determine which sustainability issues they consider most important and to review whether relevant changes have taken place. A recent survey in 2015 shows that the priorities chosen are still the right ones and Sika's system of targets remains valid.

### IMPROVING OUR ENVIRONMENTAL AND SAFETY FOOTPRINT

As an example of enhanced safety endeavors, Sika Australia has launched a new country-wide policy of zero toler-

ance for unsafe practices in all plants, with no budget restrictions for safety initiatives and projects. The ongoing activities and measures include awareness campaigns, safety education, monitoring and alerts, site audits and inspections, root cause analysis, safety week activities, bulletins, and notice boards. Creating and increasing value while reducing impacts – that's the goal.

But Sika's internal ambitions cover the management of all in-house resources. At Sika US's facility in Lyndhurst, a large amount of continuous flow cooling water from its own groundwater wells was used in the production process for adhesives and sealants. In 2014, the plant invested into a closed-loop cooling water system, reducing water consumption by 500'000 m<sup>3</sup> and improving cooling capacity.

At its Rio Negro and Tocancipa plants, Sika Colombia treats organic waste from restaurants, gardening work, sludge reactor admixtures and silo cleaning, thereby eliminating disposal costs and reducing environmental impacts. Compost and humus are being used for gardening activities in the plants and at employees' homes.

### INCREASING CUSTOMER BENEFIT AND REDUCING ENVIRONMENTAL IMPACTS

Sustainable construction is a worldwide concern: Singapore, for example, has been at the forefront of this development, strongly encouraging developers, architects, and builders to use resource-efficient products. Reducing Portland cement content in mortars by alternative hydraulic binders is proven to increase resource efficiency. Sika's LCS Optiroc sustainable mortar line includes a range of

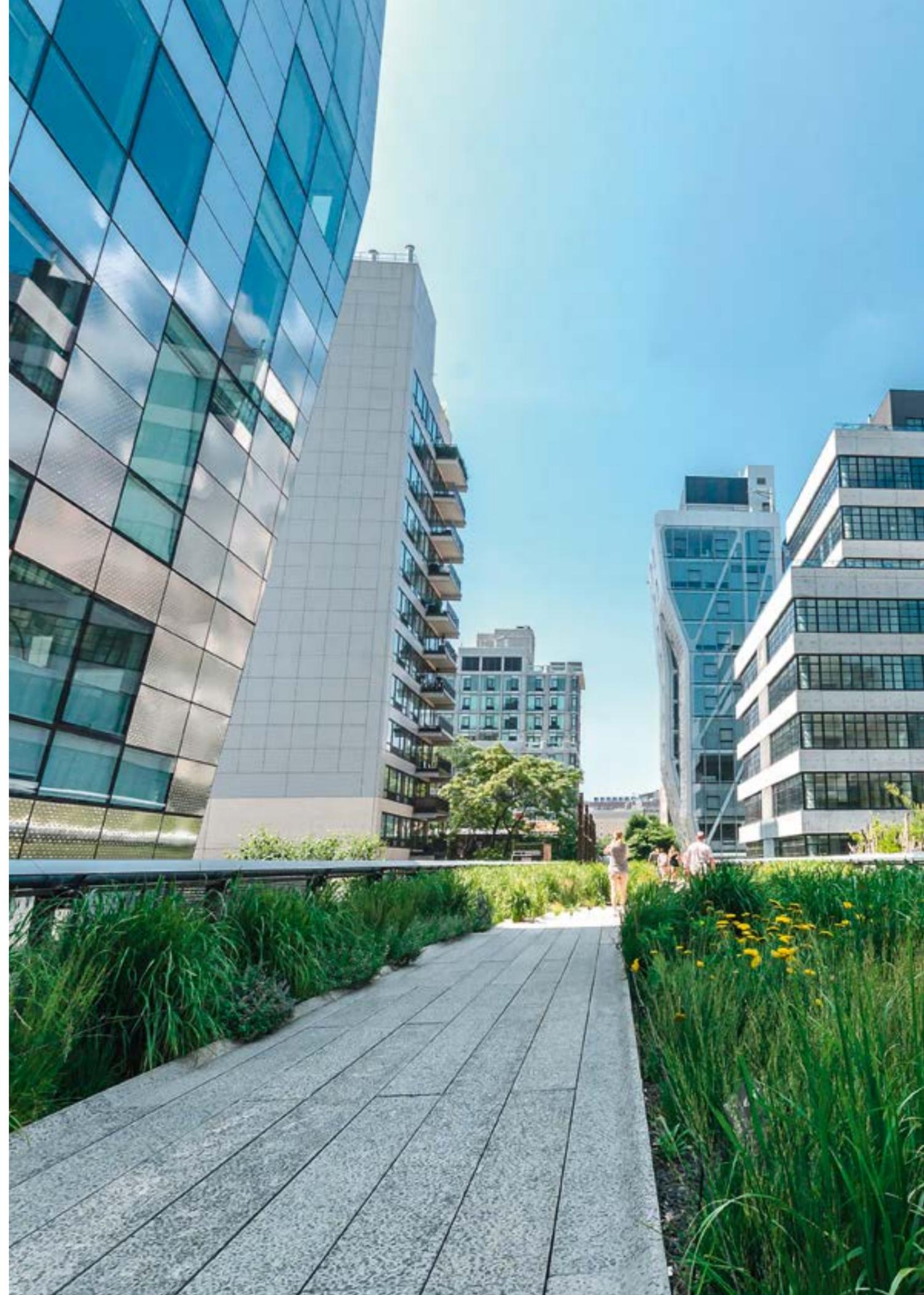
cementitious plaster, tile adhesives, and floor screeds which contain 20% less cement compared to products with a similar performance and reduce the carbon footprint by at least 15%. As a result, the LCS sustainable mortar line meets the Singapore Green Label requirements and supports Singapore's builders in achieving their targets.

And what about packaging? The replacement of aluminum cartridges with customized unipacks for car windshield adhesives will reduce Sika's customer Belron's annual consumption of packaging material and polyurethane adhesives by 164 and 170 tons, respectively, thus helping to fulfill the sustainability targets and save disposal costs. A new packaging line was installed at Sika's US Lyndhurst site to cope with the increased volume of unipacks. The unipack is designed to fit 97% of all automotive glass replacement jobs. The new solution was delivered along with a complete support package including videos and training materials to facilitate the transition for customers.

This is just a sample selection of measures Sika is taking. Apart from corporate activities such as these, we are all personally called on to adapt our individual lifestyles accordingly and do our bit for the world. This starts with our daily journey to work and ends with which light bulbs we use in our homes at night. Sustainability at Sika is about pioneering the possibilities that technical, scientific and social developments are offering. <

Find out more about Sika's sustainable solutions at:

[www.sika.com/sustainability](http://www.sika.com/sustainability)





## A LIVABLE FLOOR

Everybody is familiar with the feeling of being on your feet all day and although you maybe wearing comfortable shoes, your feet still start to hurt by the end of day. As soon as you get home, all you can think of doing is lying on the sofa and putting your feet up. If only there was a solution to this problem.

TEXT: SARAH JAMES, ASTRID SCHNEIDER  
PHOTO: ZENITH POLA FLOORING SERVICES LTD.

> Visiting the Coleshill Heath Primary School in Birmingham in the UK, we came across a promising concept. Completed in July 2015, the school contains a full day care and school nursery, along with community facilities, including an adult learning center, sports pitches and multi-use games areas. The school was looking for a durable, non-slip floor that offered high comfort, excellent wear and impact resistance, whilst also being aesthetically pleasing.

Initially vinyl flooring was specified on the project, but after a consultation, a seamless, liquid applied resin was found to be more suitable for the requirements of the school. The solution selected was a Sika® ComfortFloor® system, a premium and elastic polyurethane with a high-end reputation in the marketplace.

Sika UK designed and delivered a 1,695 m<sup>2</sup> system throughout the school's class-

rooms, corridors, kitchens and toilet areas, which main contractor Morgan Sindall delivered as part of North Solihull Partnership's continuing investment in the area.

Close partners Zenith Pola Flooring Services, Sika and Morgan Sindall collaborated to create a high quality flooring solution that met the project's requirements exactly. As durability is also key to meet the demands of a busy school building, Sika® ComfortFloor® proved to be the optimum solution. Combining noise suppression and durability with a flawless finish, the system satisfied aesthetic requirements while delivering a hardwearing system that guarantees long term performance.

Ongoing maintenance costs can also be a key factor for schools, and as resin flooring can be applied over existing vinyl and wood surfaces and once laid, there is al-

ways the option to refresh it to extend its lifecycle. Sika® ComfortFloor® boasts a wide range of sustainable benefits for both the end client and installers. Easy to apply and ready to use immediately, this was vital on this project, which had a tight program and several trades on site at the same time.

Sika has developed a range of high performance 'seamless' epoxy and polyurethane resin flooring systems which lend themselves to education projects - with a 'refreshability' option. Sika ComfortFloor is the only resin flooring product to have a A+ BREEAM Green guide rating, which allowed the client to attain maximum sustainable points for the flooring system on the build.

Nicole Fowles, Headteacher, Coleshill Heath School said, "Partnership and collaboration have been at the heart of the entire project. Environmental factors

Sika ComfortFloor is the only resin flooring product to have a A+ BREEAM Green guide rating.

have a huge impact on pupil achievement and their learning experience. The company has listened to our needs from both a functional and aesthetic point of view, which will enable generations of children to be inspired and nurtured."

The school's pupils and teachers might not now be heading straight for the sofa after a stressful day. We bet some might go out for a run, play football or ride around on their bikes. In fact, they won't even be thinking about a sofa. And even high-heels are comfortable on the new flooring... well, in some cases - at least that's what we've heard. <

Get more detailed information about [ComfortFloor](#)  
Listen to Luc Leforestier speaking about [Comfort Flooring](#)



The school was looking for a durable, non-slip floor with high comfort.



## AN ALUMINIUM HONEYCOMB – INDUSTRIAL LAMINATION

Bees are very smart creatures. So why not learn from them? Man-made honeycomb structures have the geometry of a honeycomb to maximize strength and to minimize the amount of material used to reach minimal weight and minimal material cost.

TEXT: STEVE ANSLOW  
PHOTOS: COURTESY OF METALLOCK

> The geometry of honeycomb structures can vary widely, but the common feature of all such structures is an array of hollow cells formed between thin vertical walls. The cells are often columnar and hexago-

nal in shape. A honeycomb-shaped structure provides a material with minimal density and relatively high out-of-plane compression properties and out-of-plane shear properties.

Man-made honeycomb structural materials are commonly made by layering a honeycomb material between two thin layers that provide strength in tension. This forms a laminated plate-like

assembly. Honeycomb materials are widely used where flat or slightly curved surfaces are needed with high specific strength. They are extensively employed in the aerospace industry for this reason, and honeycomb materials in aluminum, fiberglass and advanced composite materials have been featured in aircraft and rockets since the 1950s. But they can also be found in many other fields, from packaging materials in the form of paper-based honeycomb cardboard, to sporting goods such as skis and snowboards – or in façades of buildings.

Kings Avenue Mall is an impressive example. Located in the center of Paphos, it is Greece's most modern shopping mall. It is also home to many leading international brands and retailers and numbers among its leisure facilities a multiplex cinema, children's play areas, restaurant chains and cafes.

Boasting a modern architectural design,

the state-of-the art mall is one of the largest commercial developments on the island. Comprising a total of 103,000 m<sup>2</sup>, it has a covered area of 41,000 m<sup>2</sup> with 120 stores and is celebrating two years since opening.

The impressive exterior façade has the most striking lightweight aluminum honeycomb system, developed and manufactured by Metallock in Greece. Metallock systems, combining aluminum honeycomb core material with various outer substrates, provide diverse design possibilities for designers and architects.

We visited Greece to interview Metallock's owner and CEO **Ilias Koutsourakis** to ask him about the construction of this masterpiece:

### What market applications and countries does Metallock concentrate on?

The focus is on the European market and the Middle East. We are also developing strong activities in Congo and other Central African countries with our honeycomb panel systems.

### What skin materials are used with the aluminum honeycomb core and what value does Metallock bring to its customers with those solutions?

We use stainless steel, aluminum, high pressure laminate, ceramics, plastics, copper and Corian® outer skins. Our key differentiator from our market competitors is certainly that we deliver a complete system to our clients – customized and ready for installation – not just offering a panel.

### How do you see the market for aluminum honeycomb core solutions developing?

>



The impressive exterior façade has the most striking lightweight aluminum honeycomb system, developed and manufactured by Metallock in Greece.



Honeycomb panels can be installed in large dimensions, have excellent rigidity and flatness and reduce the weight of the structure.

> These panels are the next generation of elements which go beyond the traditional ACP (aluminum composite panel). Honeycomb panels can be installed in large dimensions, have excellent rigidity and flatness and reduce the weight of the structure.

**In terms of bonding and sealing in the production of your panels, what are your main requirements?**

In addition to the technical characteristics, which include adhesion performance and fire protection, we need fast process times and logistical availability, packaging and delivery quantities, and safety in use- and not forgetting compatibility with the existing application techniques and equipment.

**Which products do you use and for what applications?**

We use various products from Sika, such

as SikaForce® for bonding aluminum honeycomb cores to skin materials, and Sikaflex® and SikaBond® adhesives and sealants for installation work. We also tested Sika materials as finishing on the top sheet layers with very impressive results.

**What values do you look for in your adhesive supplier?**

At the end of the day, you need a partner on whom you can depend for solutions, whether that means the fast delivery of materials or technical assistance, for instance conducting a fire protection test. When dealing with customized solutions, you need to be flexible in every stage of your production process and along the entire value chain. It is an added advantage if the adhesive manufacturer has a local application technology facility capable of performing tests to international standards.

**How would you sum up your relationship with Sika in less than 10 words?**

A reliable partner with solutions for each project.

Now we suggest that you visit the Kings Avenue Mall yourself, do some shopping, grab a coffee and walk around the building and enjoy the impact it will have on you. And then you will agree that, yes, bees are intelligent and, yes, how well we have done by learning from them. <

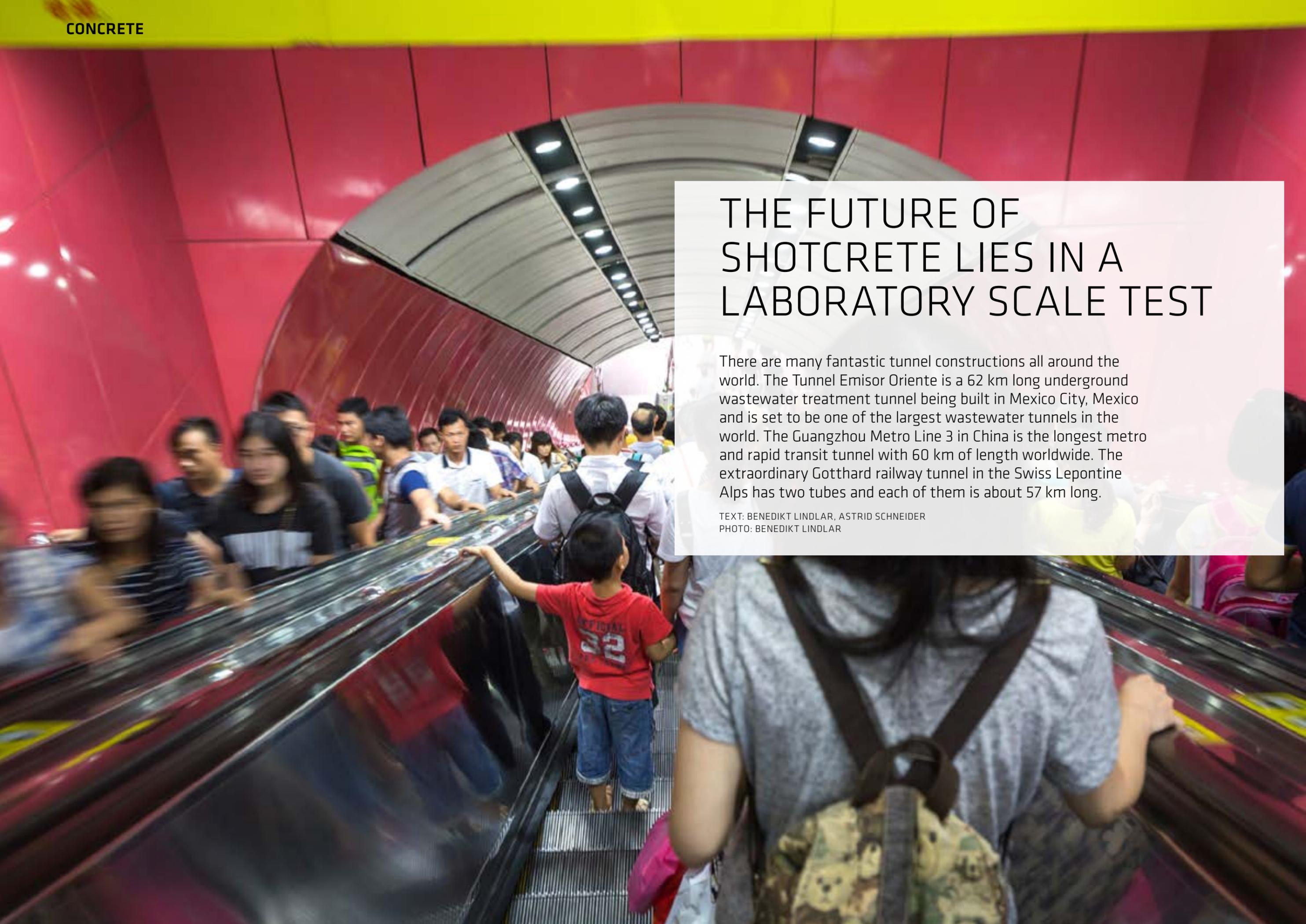
See more photos of [lightweight aluminum honeycomb systems](#) Visit [Metallock](#)



# THE FUTURE OF SHOTCRETE LIES IN A LABORATORY SCALE TEST

There are many fantastic tunnel constructions all around the world. The Tunnel Emisor Oriente is a 62 km long underground wastewater treatment tunnel being built in Mexico City, Mexico and is set to be one of the largest wastewater tunnels in the world. The Guangzhou Metro Line 3 in China is the longest metro and rapid transit tunnel with 60 km of length worldwide. The extraordinary Gotthard railway tunnel in the Swiss Lepontine Alps has two tubes and each of them is about 57 km long.

TEXT: BENEDIKT LINDLAR, ASTRID SCHNEIDER  
PHOTO: BENEDIKT LINDLAR



- 1 MiniShot installation at the lab of Sika Indonesia: cement-slurry- and accelerator-dosage (pumps).
- 2 Demonstration of the new MiniShot in Indonesia.



## THE SIKA MINISHOT RESULTS ALSO GIVE A RELIABLE INDICATION OF THE COMPLEX INTERACTION OF DIFFERENT CEMENTS



- 3 Spraying MiniShot for experiments.
- 4 Test of a MiniShot-installation in Australia.



> One of the most eagerly anticipated tunnels in history was the Channel Tunnel. A dream for centuries envisioned and encouraged by Napoleon, it was begun in 1987.

Completed in 1994, the tunnel connects Great Britain to mainland Europe through three, 50 km long tunnels (two one-way and one service tunnel). The Channel Tunnel is underwater for 37 km.

But as with all these architectural masterpieces, many steps have to be taken during construction works. For underground construction works in tunnels, hydroelectric power plants and also in mining, it is essential for progress and safety reasons to stabilise and secure the working areas at the face as quickly and effectively as possible. This is generally achieved using sprayed concrete, whereby pumpable concrete is mixed

with Sika admixtures and accelerated during the spraying process so that it bonds to the walls and roof, then hardens immediately.

It has not previously been possible to model and pre-analyse this very specific concrete application reliably in the laboratory, because the distinct physical conditions of the spraying process always have a significant effect on the setting

and hardening of the material. With the new Sika MiniShot Laboratory System it is now possible for the first time to simulate both the composition of the concrete components and their mixing process at the nozzle realistically in miniature, as the name Sika MiniShot suggests.

This is effectively a static miniaturized concrete spraying machine, which is designed so that, even on this small scale, as the test materials and mix designs are sprayed, the discharge quantities and the machine dimensions generate mechanical conditions which correspond precisely to those occurring on the construction site. The Sika MiniShot results also give a reliable indication of the complex interaction of different cements, additives and Sika admixtures, which allows us to make targeted product developments, also opening up opportunities that did not previously exist to optimize specifically for major projects.

In addition to the realistic application of sprayed concrete test mixes and materials, the Sika MiniShot system also breaks new ground for subsequent strength measurement of the sprayed concrete samples. An ultrasound spectrometer is included, the Pulsment, which has been developed to automatically carry out non-destructive measurement and recording of strength developments over 24 hours.

Comparison between Sika MiniShot measurements and 'real' sprayed concrete shows very good correlation of the test results. This means that even simple laboratory tests with small samples will give a good idea of the sprayed concrete performance to be expected on site. The Sika MiniShot system has already been successfully used in Sweden, Finland, Portugal, Turkey and Australia, where it has been particularly helpful for large mining customers as well as construction professionals.

The Sika MiniShot Laboratory system is a development made entirely in-house by Sika, i.e. all of the different components of the system such as the spray machine (MiniShot), ultrasound measurement system (Pulsment) and all of the support electronics and software were developed, built and tested to production stage in the Central Research Centre facilities in Zurich. As a result, only Sika is capable of carrying out such realistic laboratory scale tests on sprayed concrete and mortar systems. <

Watch the film for more information <https://youtu.be/JYNWCoyLqi0>

## RETURNING METTLE TO INDIA'S STEEL

This time we are taking a visit to Odisha, one of the 29 states of India, located in the east of the country. Odisha has 485 km of coastline along the Bay of Bengal on its east, from Balasore to Malkangiri. It is the 9th largest state by area, and the 11th largest by population. Odia is the official and most widely-spoken language, with 33.2 million speakers.

TEXT: SACHIN CHUGH, SHREEMOYEE BANERJEE, ASTRID SCHNEIDER  
PHOTO: DIPTISH SATPATHY



To cater for the water needs of this mammoth plant, Mandira dam was conceived and constructed by Hirakud Project Authority during the years 1957-59. But after all these decades it needed refurbishment.



## SIKA PRODUCTS WERE USED FOR THE RENOVATION WORKS FOLLOWING APPROVAL BY THE CENTRAL WATER AND POWER RESEARCH STATION (CWPRS) IN PUNE

> On August 15, 1947, India earned its independence. The baby steps towards achieving modernization and attaining infrastructural development for the young country led to the establishment of several heavy industries. Foremost

among those were Rourkela Steel Plant (RSP), in Sambalpur District, Odisha. It was the first integrated public sector steel plant in the whole of India and was set up in collaboration with the former West Germany.

The RSP, presently controlled by the Steel Authority of India (SAIL), produces a wide variety of special purpose steels, and has many firsts to its credit. In fact, it was the first plant in Asia to adopt the energy-efficient LD steelmaking process.



A steel worker in Odisha.

Diverse RSP products are used in a variety of industrial applications, including the manufacture of LPG cylinders, automobiles, railway wagon chassis, silicon steels for the power sector, high quality pipes for the oil and gas sector, tin plates for the packaging industry and specialty steels for the defense sector among others.

To cater for the water needs of this mammoth plant, Mandira dam was conceived and constructed by Hirakud Project Authority during the years 1957-59. The dam was built across Sankh River, a tributary of Brahmani River. The dam is located at a distance of 32 km from Rourkela, and the RSP plant is about 24 km downstream of it.

It has a 426.72 m zoned embankment and releases a regulated supply of water of 100 cusecs through an 8 x 8 foot outlet sluice. It also has a weir (low dam) built across Brahmani river near Rourkela to pump out water from the pond to the plant area.

Over the past half century, the dam has suffered severe structural damage due to natural wear and tear, requiring intensive repair and retrofitting. Under closer scrutiny, it was found that the dam's aprons, spillway, blocks and buckets had been acutely damaged. There were instances of massive pitting erosion and also cavity formation. While ensuring that opera-



Over the past half century, the dam has suffered severe structural damage due to natural wear and tear, requiring intensive repair and retrofitting.

tions continued running smoothly at RSP, renovation work on the dam began immediately as a matter of utmost priority.

Sika products were used for the renovation works following approval by the Central Water and Power Research Station (CWPRS) in Pune, a renowned research institute under the Indian government's Ministry of Water Resources. The products were subjected to a number of quality tests at the site, such as pot life, compressive strength, bond strength, shrinkage strength, abrasion test, and tensile strength.

The massive cavities created in the spillways were filled up using SikaTop®-122. It was lined with Sikadur®-31 primer and Sikadur®-41 up to 5 mm. Finally, two layers of epoxy coating Sikagard®-63/1 were applied to obtain a smooth surface. Next in line was the treatment for the cavities occurring in the chute, baffle block and weir walls. The walls and blocks were jacketed up to 75 mm using SikaRep® Microcrete-2 and further lined with Sikadur®-31 mortar primer and Sikadur®-41 mortar up to 5 mm. Here as well, two final coats of epoxy coating Sikagard®-63/1 were applied to achieve a smooth surface.

The basin area had already been repaired



with new concrete. However, to enhance the life of the concrete many times over, it was lined with Sikadur®-31 along with two final layers of Sikagard® epoxy coating. The cracks and voids found all over the dam were treated with surface injection using low viscosity injection epoxy resin, i.e. Sikadur®-52, whereas the construction and expansion joints were repaired employing the Sikadur - Combi-flex® SG Tape System.

The Mandira dam has been completely restored to its former glory, preparing the way for RSP to reach new highs. And no wonder that RSP, which came on stream in the 1960s with an installed capacity of only 1 million tonnes per year, is now expected to increase that to an enormous 10.8 MTPA by 2025. <

