

AMBITIONS

A DIVE INTO SIKA'S WORLD



© Mau Horng

THE LARGEST ECONOMY

Experience the “land of opportunity”. Come with us to the U.S.

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SMART SOLUTION

An Educational Center in Portugal gets real comfort!

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A CAR WITHOUT DRIVER

A trip into the future: Automated driving will be a restful travel highlight.

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PENANG BRIDGE

Travel with us over the longest bridge of South East Asia.

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GROWTH

Growth normally refers to a positive change in size, often over a period of time. Growth can occur as a stage of maturation or a process toward fullness or fulfillment. As the scientific study of changes that occur in human beings over the course of their life, developmental psychology tells us a lot about growth. Originally concerned with infants and children, the field has expanded to include adolescence, adult development, aging, and the entire lifespan. This field examines change across a broad range of topics including motor skills and cognitive development involving areas such as problem solving, moral understanding, and conceptual understanding. And throughout our lifetime many of us try not only to evolve personally but also change and develop our surroundings. And we need the right resources to build growth with. Construction chemicals are a key resource, but it is important to strive for sustainable, qualitative growth rather than the inferior, quantitative type. Treatments applied to the recently opened Second Penang Bridge in Malaysia (p. 4) will protect it for the next 120 years. It can withstand earthquakes up to a magnitude of 7.5 on the Richter scale. If you want to create more space in your home, but you cannot expand upward or sideways, then why not go underground? Watertight concrete is essential for building a below-ground shell (p.30). But construction is not the only segment to see significant advances with chemicals; considerable headway has been made in the automotive sector too. With driverless cars fast becoming a reality (p.36), everyone might one day enjoy being driven while watching a video. Leaving economics behind, Sika is supporting an Indian school for orphans and disabled children (p.54). They now have a school, a dry and secure place to sleep, as well as a properly functioning water tank. This is major growth indeed.

Yours sincerely,



ASTRID SCHNEIDER



ASTRID SCHNEIDER
Marketing & Product
Communications Manager
Sika Services

CONTRIBUTORS



DANIELA SCHUHMACHER
Assistant Head Automotive,
Sika Switzerland

So fascinating – cars which drive themselves – isn't it crazy?

For 12 years I've have been working in Sika Automotive, it's a great feeling knowing that we contribute to safer and more ecological cars with our products and technologies.



INGERLISE BULLOCH
PR & Communications Manager,
Sika UK

Sika UK is fast-paced and dynamic, with a clear strategic focus. Having only joined in April, I'm still learning about the business but its entrepreneurial spirit is invigorating.



SEBASTIEN GODARD
Marketing, Refurbishment –
Sealing & Bonding,
Sika US

After France, Vietnam, now I joined Sika US, it's a fantastic country, challenging for our marketing team, so many opportunities within this in huge geography. It's an amazing experience.



LUIS DUARTE
Business Development and Target
Market Manager Flooring,
Sika Portugal

Building trust – is our oxygen! We always keep in our mind the commitment between trust and real solutions for design. In this project (p. 12) we were challenged by the architect to define the solution for comfort, no joints and to build trust!

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IMPRINT

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PROTECTION



An effective seismic isolation system enables the bridge to withstand far-field earthquakes up to a magnitude of 7.5 on the Richter scale.





THE BRIDGE TO LAST 120 YEARS

The Second Penang Bridge in Malaysia is a dual carriage-way toll bridge that connects Bandar Cassia in Seberang Prai on mainland Peninsular Malaysia with Batu Maung on Penang Island. It is the second bridge to link the island to the mainland after the first Penang Bridge. The total length of the bridge is 24 km, with the section over water being 16.9 km, making it the longest bridge in South-east Asia. To reduce the cost of construction, its design was modified to resemble the first cable-stayed Penang Bridge. The second bridge was built with loan from the People's Republic of China to mark the excellent economic ties between China and Malaysia.

TEXT: MICHEL DONADIO, ASTRID SCHNEIDER
FOTO: SIKA MALAYSIA

- > Upon completion of the bridge, debilitating traffic jams between the Penang mainland and Penang Island are now a thing of the past. The new bridge is part of the national development plan to boost Malaysia's economy in the northern region that will see the transformation of Penang into a modern, vibrant city and a major logistics and transportation hub.

The Penang International Airport and the Penang Port were upgraded simultaneously to support the Second Penang Bridge as a gateway to the northern corridor so as to enhance and promote the economic growth of the neighboring states. Set to be another architectural wonder of Penang, the bridge acts as a catalyst for the development of the northern corridor. For geological reasons, the Second Penang Bridge is designed based on the double "S" curvy concept. The numerous "S"-like curves along the stretch were a requirement of the road safety audit intended to help motorists keep their attention on the road while driving.

The Penang Second Bridge is the longest bridge in the world to have been installed with a high damping natural rubber (HDNR) bearing, an effective seismic isolation system that enables the bridge to withstand far-field earthquakes up to a magnitude of 7.5 on the Richter scale. The bridge is the first in Malaysia to be installed with seismic expansion joints, which will allow movements during an earthquake.

The bridge has been built to last 120 years without major maintenance. To achieve this goal, the concrete was designed with low chloride permeability and a thick cover. As an additional protection measure, deep penetrating hydrophobic impregnation Sikagard-705 L was used to protect the pile caps and 80 MPa spun piles at a total of 180,000 m² concrete surface area.

>



© Nam Hong

- > Sika supplied Antisol A curing compound, to improve concrete quality.

During construction, there were a number of honeycomb, blow holes, low concrete cover and crack lines at the segmental girders. As a total solution provider, Sika stood tall in providing the right products to rectify the defects and to enhance the durability of the structure.

Cracks were injected with low-viscous epoxy resin Sikadur. Large honeycombs were remedied using pourable Sika micro concrete with rapid chloride permeability lower than 1,000 coulombs at 28 days to ensure long durability in marine environment. All blow holes were repaired using a two component polymer modified re-surfacing mortar SikaTop-121. For small areas, patch repair mortar Sika MonoTop was applied.

At the area of low concrete cover, surface-applied corrosion inhibitor Sika FerroGard-903+ was used to protect the reinforced steel bars. Combine protection on concrete surface with 3 to 4 mm of epoxy cement coating, i.e. Sikagard-720 EpoCem was applied to increase the cover, thus enhance durability.

Sika Malaysia's role in the project was to supply products and, where required, provide the relevant cutting-edge tech-



© Luis Lui

nical advice as well as site product trainings to site personnel on proper use and application of the products.

The bridge is a high impact project (HIP) launched under the Ninth Malaysia Plan. As such, the project is seen as a key catalyst in the socio-economic development of the Northern Corridor Economic Region of Malaysia. The project is being delivered by a special purpose concession company, Jambatan Kedua Sdn Bhd formed by the Government of Malaysia.

The opening ceremony for the Penang Second Bridge was held following the flagship nightly news program on March 1, 2014 by the Malaysian Prime Minister, Datuk Seri Najib Tun Razak. Traffic started traversing the bridge at 0001h local time on March 2, 2014, led by a black Proton Perdana (Proton is Malaysia's national car maker) carrying the national flag and the state flag, both raised simultaneously to the accompaniment of the Malaysian national anthem "Negaraku".

The bridge has been built to last 120 years without major maintenance. To achieve this goal, the concrete was designed with low chloride permeability and a thick cover.





THE WORLD'S FOOTBALL EVENT MADE FROM SAND

A BRAZILIAN ARTIST SURPRISES BY USING SIKA PRODUCTS

We congratulate all teams who participated in the the world's biggest football event and who made a great and exciting match happening for people watching all over the world. The event may be over, but his art will survive up to three months on Copacabana beach: People who pass Copacabana beach in Rio de Janeiro, Brazil, are often surprised by the sand sculptures made by artist Rogean Rodrigues. People's first reaction is amazement at what the artist has created just using the raw material to hand – sand.

TEXT: RODRIGO SILVA
FOTOS: SIKA BRAZIL

- > Now aged 32, Rogean has been working with sand for 20 years. Rogean Rodrigues began his career at the age of 12 as an assistant to Colombian artist Alonso Gomez Díaz, who traveled the world making sand sculptures before settling in Brazil and creating his art on the beaches of Rio de Janeiro. Alonso was Rogean's teacher and main supporter, and it was from him Rogean learned the art of sand sculpture. At the outset, he was inspired by Alonso's work. Nowadays, his main

This way Copacabana keeps its football fever: the artist Rogean, the representative Mario Sergio and Daniele, the artist's wife (from right to left).



themes are castles and events, especially international events such as the Pope's visit to Brazil, World Youth Day and, more recently, the 2014 Football Event.

The artist created several Football-related sculptures on different parts of the beach. One depicted Football mascot Fuleco, another the Cup itself. There were also players from different teams and the huge Maracanã stadium, which he built in a space set aside for crowds to watch the matches. The Maracanã will stay in place for a while longer so that people who were not in Brazil during the Event can take pictures. The sculptures take 5 to 15 days to create and last for up three months.



Even the famous Maracaña stadium the artist created out of sand.

Rogean has already exhibited in several countries, including Colombia, Ecuador, Peru, Venezuela, Mauritius and the Maldives. His first trip abroad was an adventure, but he was made very welcome by everyone who saw the beauty of his work.

Rogean makes his sculptures from all kinds of sand: from beaches, river beds and mountains, and he also uses the washed sand sold in building supply stores. He never uses any other kind of

raw material except water. However, he does use Sika®-2 for waterproofing and durability to ensure that his sculptures remain in perfect condition and are protected from wind and rain.

Sika has been one of Rogean's main partners since 2012. After extensive research, the artist found the right product for his needs: Sika®-2, the "magic liquid", as he calls it, that enables him to make a piece of art that takes several days to create

and that will then last several months despite wind and rain. The liquid additive with the really fast setting time is recommended for plugging infiltrations. Rogean's most remarkable piece of art was the model of the Maracanã stadium that he made in 2007, which was sponsored by SportTV on Panamericano. This sculpture, which was featured by several different media in Brazil and abroad, launched his international solo career.

The flooring system had to provide a solution without joints, which would also provide a high level of comfort underfoot and with sound deadening. As well the floors all had to be easy to clean and keep hygienic.



EDUCATION FOR THE YOUNGEST

Delivering quality education and care for the youngest segment of our population is one of the most important tasks that society and politicians face. Ensuring that children receive an education founded on trust and values is key to giving them a good start in life. Always eager to learn, children are naturally curious. Apart from their family, it is teachers and early friends who shape their first impressions in life. Having a kindergarten and school to go to provides fresh stimuli every day. Let's take a look here at a very special example of such a place.

TEXT: ASTRID SCHNEIDER

FOTOS: LUIS FERREIRA ALVES

- > The architectural award-winning Combatentes Educational Center is in the municipality of Ovar in northwest Portugal, 40 km from Oporto. It was developed as an educational center of excellence for up to 375 elementary schoolchildren aged from 3 to 10. This 3.5 million euro facility was conceived as a total refurbishment of the existing traditional, two-storey street-fronting courtyard building, plus a totally new and uniquely styled curvilinear building behind it, linked together by covered corridors.

While maintaining the pre-existing building's connection with the street, the project adds a new building, whose curvilinear geometry creates conditions for the development of the school program while rebalancing all the lines and angles of the terrain. The different functions are articulated in the two buildings (old and new), characterized by the distinct architectural objectives (rehabilitation and

new construction) and the varying curriculums required to accommodate children from the ages of three to ten. The new building contains the classrooms, the gymnasium, kindergarten, canteen, kitchen and related services, as well as multi-purpose rooms. This is typified by the southwest facade comprising a blade system which controls the light and heat, producing variety in a building associated with games, creativity and rigor. The northeast side features a curved concrete facade, which is insulated and covered with tiles. The use of tiles creates a waterproof barrier and establishes a relationship of continuity using an ancient technique mastered by Ovar's building practitioners.

The project specifications stipulated numerous different multi-purpose rooms and specialist areas such as classrooms, meeting rooms, assembly halls, a library, music rooms, a gymnasium, changing

rooms, a kindergarten, plus a canteen, lunchroom and kitchens. They are all connected by wide and airy central corridors, in addition to the covered corridors in the passageways between the buildings. The architect's requirements for the flooring systems and finishes were an important aspect of their design.

In addition to being available in the striking modern color scheme intended to lift the spirits and ambitions of the students, a totally seamless flooring solution was required throughout the facility. The flooring system had to provide a solution without joints, which would also (and equally importantly) provide a high level of comfort underfoot, with sound deadening and footfall noise reduction capabilities. And of course for this type of facility and healthy environment for children, the floors all had to be easy to clean and keep hygienic.

All rooms are connected by wide and airy central corridors, in addition to the covered corridors in the passageways between the buildings.





THE ARCHITECT'S REQUIREMENTS FOR THE FLOORING SYSTEMS AND FINISHES WERE AN IMPORTANT ASPECT OF THEIR DESIGN



© Luis Ferreira Alves

> The selection criteria defined by the architectural team was virtually a list of the features and performance specifications of the Sika Comfortfloor® systems, so these were the obvious choice. Sika Comfortfloor® systems have high elasticity, with excellent crack-bridging abilities to give a sense of comfort when walking; the elasticity also reduces footfall sound

(impact noise) and so creates less disturbance or distraction all around. These solutions also have low VOC emission and are highly fire-resistant (certified according to EN 13501-1 class B(fl)-S1). For the more aggressively exposed service areas of the kitchens and other utility zones, the highly abrasion-resistant Sikafloor® systems were used, with easily cleanable

profiled anti-slip surfaces where appropriate.

This outstanding complex will be an important place for children as they start out in life. And no one can deny that it meets their needs perfectly.

For exposed service areas of the kitchens and other utility zones, the highly abrasion-resistant Sikafloor® systems were used, with easily cleanable profiled anti-slip surfaces where appropriate.



WORLD VIEWS



WHAT ABOUT UNITED STATES?

The United States of America is the world's largest economy. With a land mass covering 9.83 km² and home to over 300 million people, it is the third largest country by land area and population. The country is diverse in geography, climate and ethnicity. It is often referred to as the "land of opportunity", signified by the Statue of Liberty situated in the middle of New York harbor. The country is propelled forward by the ideals of individual freedom as expressed in the American Dream and rooted in the Declaration of Independence which states that "all men are created equal" and that they are "endowed by their Creator with certain inalienable Rights" including "Life, Liberty and the pursuit of Happiness."

TEXT: SEBASTIEN GODARD

PHOTO: SEBASTIEN GODARD, RICARDO GOMEZ





> US headquarters is located in Lyndhurst, New Jersey, a quiet working-class town of approximately 20,000, nestled in the Meadowlands area just 20 minutes' drive from New York City. Lyndhurst retains its quaint and typical American small-town appeal to many hard-working men and women raising their families and going about normal life while living in the shadow of our big sister New York City. Here on this place we met Christoph Ganz, the Sika President & CEO Region North America.

What comes to your mind thinking about Sika US?

An independent Sika region which develops, produces and sells basically all Sika technologies in both the US and Canada; around \$800 million in sales (North America), 1400 employees and various factories all over the US and Canada. Sika US is the biggest single Sika Company in the Group. The Markets are all significant in size, the largest being Market Roofing with around \$260 million in sales.

What are your personal secrets in leading a big team?

Live the Sika Spirit of doing business. Allow entrepreneurship; be demanding but

respectful to all Sika people on all levels. Do not just talk but deliver and try to be a role model. My leadership style is about motivation and animation! Do not just focus on the first level of managers but include Sika people on all levels. Factory workers want to be motivated as well as sales guys and finance clerks!

I have a management trick which I call management by positive provocation. Provoke your guys with a surprising question and you will get to the true point of an issue much faster! People tend to react more spontaneously and more honestly if they are provoked!

The recovery from the 2008-09 recession remains the most challenging in the past century. The U.S. economy shrank at a 1 percent annual rate in the first quarter, but analysts foresee a strong growth for the coming months. What are your impressions?

Sika US has come out of some difficult times caused by the financial crisis. We have to lead the company back from cost saving thinking to profitable business growth and development. Switching from a cost and EBIT mode into a growth mode at a big organization is quite a challenge. The first 3 months of 2014 were

influenced by one of the strongest winters in the history. The winter affected the US economy as well as our sales, nevertheless we still achieved 7.3 % organic sales growth in Region North America after the first 4 months. This result is encouraging for the months ahead of us. We will implement many business initiatives for this year which will trigger growth including opening new factories in Denver, Atlanta and Vancouver (Canada) in the next weeks and months. In addition, we have invested into additional sales staff which the Americans call "boots on the ground."

The United States present an extremely diverse but also challenging economic surrounding. Where do you see special opportunities for the upcoming years?

The US economy basically consists of a few important economic regions like California, Texas, Florida, Chicago and the East coast metropolitans like Boston, NYC and Washington DC. These are the regions where the music plays and this is where we have to invest in factories and people. This is what we are doing and that is what should bring us more growth in the future. Another important challenge is to combine the full potential of all our markets on big pro-



Christoph Ganz, the Sika President & CEO Region North America



THE US CONSTRUCTION MARKET IS HUGE AND ONE OF THE BIGGEST IN THE WORLD

jects. We call this initiative Cross-Selling or SikaSMART® where we specify Concrete, Flooring, Roofing, Waterproofing and Refurbishment products on all the mega projects being built!

How about the construction market? Where does the US need Sika?

The US Construction market is huge and one of the biggest in the world. Projects like high rise buildings, distribution centers, data centers, dams etc. in the magnitude of several billion dollars are being built around the country and are numerous. Such huge projects you rarely see in Europe, only in Asia and the Middle East do these exist! Sika is the problem solver for the construction industry and helps specifiers and contractors to build faster, safer, and more sustainable. We are Building Trust as our slogan says, and that is very much appreciated here in the US! Sika is a reliable partner to the construction industry and this is highly appreciated by our customers!

Any extraordinary Sika projects in you would like to tell us about?

The Hoover dam by pass, once known as Boulder Dam, is a concrete arch gravity dam with a height of 221.4 m and a length of 379 m in the Black Canyon of

the Colorado River. It is on the border between the U.S. states of Arizona and Nevada.

Sika US played a key role in concrete production, protection, structural bonding and ultimately the overall durability of the structure. We supplied a number of products over 5 years, including post tension grout, segmental bridge adhesives, precision grouts and concrete admixtures on this outstanding infrastructure project in the US. These products have helped the contractor meet special production requirements throughout the entire project.

San Francisco Bay bridge

San Francisco Bay bridge (Total length: 7,180 m) Oakland Bay Bridge was constructed at the same time as the Golden Gate Bridge and opened for traffic in 1936. On October 17, 1989 an earthquake measuring 7.1 on the Richter scale severely damaged the double decker truss structure east of Yerba Buena Island knocking down a portion of the upper deck.

The Californian authority completed an investigation and study and concluded it would be far more cost effective and

safer to build a new eastern span rather than retrofit it. The new structure is designed to meet current seismic codes as well as other codes pertaining to roadway shoulders, lane widths, stopping sight distances and other factors to substantially improve public safety. Sika was one of the main suppliers for this project, including grouting, structural bonding, admixtures, joint and sealants.

Empire State Building

Empire State Building is a 103-story skyscraper located in Midtown Manhattan, New York City, at the intersection of Fifth Avenue and West 34th Street. We have helped to carry out ongoing renovation work on the Empire State Building (built in 1930/31), transforming it into the most environmentally-friendly building in the city. Our Sika products have contributed to a 38% reduction in energy consumption through renovation work to windows, cornices, roof terraces, facade elements and elevator shafts. To improve the insulation properties, the windows were sealed with Sikaglaze®, and then used Sikasil® to complete the waterproofing and airtight installation work. All of the products and systems on this prestigious project are from Sika.

Where is Sika US heading? What are the targets?

Market penetration. We have to get back to a good a growth rate and for this we are investing into new people, new products and technologies and we are building new factories around the country. Also, acquisitions are an important topic for us to complete our product offering. For 2014 we want to grow sales organically between 5-10 %.

We want to be the leader in our indus-

The Hoover dam is a concrete arch gravity dam in the Black Canyon of the Colorado River. It is on the border between the U.S. states of Arizona and Nevada.



HOOVER DAM CONNECTING ARIZONA AND NEVADA HIGHWAYS

The central portion of this project is the Colorado River Bridge, a Composite Concrete Deck Arch Bridge connecting the Arizona and Nevada approach highways. The bridge is situated 275 m above the Colorado River, span 610 m. The project was complex as cable collapses occurred for the high winds. Sika's Construction Products played a key role in concrete production, protection and ultimately the overall durability of the structure.



> tries; innovative and reliable to our customers; this includes the production of quality products which we ship on time and in the right quality.

What are the best things about living in New York City and what can you not be without?

I live in iconic Manhattan, in the middle of New York City together with my family. Many people cannot imagine living in such a big and noisy city. We are City people though and enjoy the great oppor-

tunities of culture, art, music, etc. which NYC offers. Of course NYC also has some disadvantages like the traffic and the constant speed; for example car horns before the traffic lights turn green, just to make sure you will move.

What do you wish for your country for the future?

I am Swiss citizen and will always remain a foreigner in this country, although gently welcomed by the Americans. The Americans are very positive think-

ing people and therefore I am sure they will come out of this recession caused by the financial crisis soon and with an even stronger confidence!

The American way of life is "if you make it there, you make it anywhere!"

The new structure of the San Francisco Bay Bridge is designed to meet current seismic codes to substantially improve public safety.



SAN FRANCISCO BAY BRIDGE **270,000 VEHICLES A DAY**

San Francisco's Oakland Bay Bridge was constructed at the same time as the Golden Gate Bridge and opened for traffic in 1936. Although the Golden Gate Bridge gets most of the public's attention, particularly from tourists visiting San Francisco, the Oakland Bay Bridge was the largest and most expensive bridge in the world at the time of its opening. In 1956, it was named one of the seven engineering wonders of the world. Today, it

remains the busiest bridge in the United States, carrying more than 270,000 vehicles a day.

On October 17, 1989, an earthquake measuring 7.1 on the Richter scale severely damaged the double-decker truss structure east of Yerba Buena Island. 61,588 l of Sikadur were 'smeared' to each side of every precast segment prior to final placement and tensioning. 216,000 bags of SikaGrout were supplied to fill the ducts containing the post-tensioned cables. The grout provided additional pro-

tection to the steel cables as well as enhanced bonding of the cables to the duct and precast concrete segments.

In order to service the demand for grout, a local manufacturing facility was established. Every six months, a random sample of material was tested by an independent testing company to ensure that the produced material complied with the strict project specifications.



> EMPIRE STATE BUILDING
**THE HIGHEST SKYSCRAPER
FOR 40 YEARS**

The Empire State Building is an American cultural icon in the largest city in country. It reaches 381 m into the sky above Manhattan and consists of 102 stories. Including the spire, the skyscraper reaches 443 m high. Designed by Shreve, Lamb & Harmon, this art deco super structure was listed by the American Society of Civil Engineers to be one of the Seven Wonders of the Modern World. For 40 years, the Empire State Building was the tallest building in the world, from 1931, when construction was finished to 1972, when the World Trade Center's North Tower was completed. This designated landmark is currently in the process of a \$550 million dollar renovation with an effort to turn the building into a more energy efficient and eco-friendly structure. In 1989, renovations started within the Empire State Building to do major repair work around most of the waterproof seals due to heavy deterioration. A-Best Engineering was the contractor for this phase where every window was replaced and resealed. The copper windows being replaced were very old and were deemed energy in-efficient. The joints around the window frame and flashing were re-caulked as well as many other areas that needed waterproofing. Sikaflex was used for joints between nickel and Indiana limestone, Indiana limestone to Indiana Limestone, and nickel to steel. This phase was finished in 1995. In 2007, a team of restoration engineers, consultants and material producers, all led by the ESB sustainability partners, developed a comprehensive restoration and all-encompassing energy upgrade

THIS DESIGNATED LANDMARK IS CURRENTLY IN THE PROCESS OF A 550 MILLION DOLLAR RENOVATION

to America's most famous landmark. This eight month modeling and analysis project was to save 38% of the buildings energy which translates into \$4.4 million annually. Work started in 2010 and created 252 jobs in the process. Workers verified that the existing perimeter seals and windows from the last cleaning and restoration project were intact. Workers then constructed a window refurbishment processing center onsite which reduced the transportation costs, emission and also created 50 local union positions. With this refurbishment center, workers were able to reuse 95% of the glass. The insulating value for every window went from an R2 to an R7 and reduced the heating and cooling costs drastically. Workers used a fast-cure, high-gas retention urethane, Sikaglaize, to replace the silicone used to reseal glass units due to the slow curing time for silicone. Each window was taken down and the glass was removed then cleaned and resealed to provide a more efficient insulated glass pane. The entire process began to create high labor costs and delayed the delivery of upgraded and restored units. Due to the need to speed up production of insulated glass units and the extra labor intensive process to remove old silicone from glass, project managers called for a silicone digester to expedite the job. This, along with a dip tank method to soak units for cleaning, dramatically improved the work schedule and labor savings. Once the glass was resealed, Sikasil miter joint and seam sealer was used to seal the panes back into the frames. This

leg of the renovation was completed 2010.

In 2011, there was a need for repairs to the setbacks and roof terraces from floor 87 and higher. All of these setbacks above the observation deck required waterproofing, which ended up being about 10,000 square feet. The Sikalastic system was installed directly over the concrete deck with the addition of an anti-skid finish as these areas are subject to occasional pedestrian traffic by workers. The exterior walls are clad in stainless steel panels which were allowing leaks into the building through anchor/bolt holes at the seam between panels. These panels were previously waterproofed but since the system has failed and is no longer watertight, it must be replaced. The previous system was removed and the panels were mechanically prepared back to a bright metal finish. The fully reinforced Sikalastic system was installed over the metal panel facade. One of the main reasons this system was chosen was for the ability of the fiberglass reinforcement to conform to various irregular shapes while maintaining a seamless appearance.

Also in 2011, the decision was made to perform some major repairs within the elevator shafts. There is a lot of vertical spalling within all of the shafts that needs to be repaired before the falling concrete causes damage to the elevators and surrounding machinery. Currently, SikaTop has been used so far and the job is only 35% complete.

Sika US has helped to carry out ongoing renovation work on the Empire State Building, transforming it into the most environmentally-friendly building in the city.



SIKA INVESTS CHF 60 MILLION IN EXPANDING ITS ZÜRICH-ALTSTETTEN SITE

As a global company with Swiss roots, Sika is demonstrating its commitment to Zurich by investing CHF 60 million in a state-of-the-art laboratory and office building as well as the necessary infrastructure to accommodate further employees.

TEXT: HARRIET SIHN

PHOTO: ITTEN UND BRECHBÜHL, ALEXANDRA PAULI







The new "Limmat" building will be a state-of-the-art laboratory and office building with capacity for a total of 300 employees.

> At a ceremony held end of June at its location in Zurich-Altstetten, Sika launched construction work on a further building on its existing site. The new "Limmat" building will be a state-of-the-art laboratory and office building with capacity for a total of 300 employees. Work is scheduled for completion by fall 2016. Sika plans to bring together 200 existing employees from other Sika branches in Zurich-Altstetten as well as create new jobs. This means that some 830 people will be working at Sika in Zurich by 2016. Within the company, the branch holds a leading position in research and development as well as the production of adhesives and sealants for automotive applications. Furthermore, Zurich is also home to key corporate functions and the marketing organization. Sika is one of the largest remaining industrial employers with production activities in Zurich.

"Ever since Sika was founded in Zurich in 1910, we have continuously expanded our Zurich site and have invested around CHF 120 million in the last ten years alone," commented CEO Jan Jenisch. "Sika Zurich leads the global company in basic and applied research into new adhesives and sealants and the manufacture of

these products, which are used by the automotive industry among others. Each year, over 60 million windshields – that's one in every four world-wide – are bonded using systems made by Sika."

André Odermatt, City Counselor and Head of the Structural Engineering Department of the City of Zurich: "A successful business location needs successful businesses. This is why, going forward, we must continue to ensure that big and small enterprises alike find the best possible operating conditions in our city. The decision taken by successful global industrial company Sika to further expand its Zurich site shows once again that we are on the right track."

NEW LIMMAT BUILDING – SUSTAINABLE CONSTRUCTION

Sustainability is Sika's number one priority not only in terms of its corporate strategy agenda, but also for the new Limmat building: Thermoactive components in the ceiling structure enable energy-efficient operation of the building's cooling and heating systems. The green roof with integrated photovoltaic system generates a large part of the energy consumed by the building.

The plans for the new building were developed by Swiss architects Itten+Brechbühl, whose reference projects include the Geneva-Cornavin train station, the Skylink extension at Vienna Airport and the refurbishment of the Swiss parliament building in Berne. The exterior of the new Limmat building is testimony to Sika's competence: The facade is made of stained concrete elements with different surface structures. Sika system solutions were used from top to bottom, including the flooring, waterproofing of the building envelope and foundation, as well as window bonding adhesives.

The new building offers around 9,000 m² of usable floor space. Its six storeys will contain open plan and single-occupant offices, laboratories, training rooms and a staff canteen.

THE FUTURE OF THE AUTOMOBILE BEGINS IN ZURICH-ALTSTETTEN

A total of 225 of Sika's 800-strong R&D workforce worldwide are based at the company's Zurich-Altstetten site. The focus of R&D activity is on basic research, the development of polymers for high performance concrete additives, ad-



The new building in progress.

hesives for the automotive industry and sealants for construction applications.

The site also has production facilities with 200 employees working in three-shift cycles to manufacture adhesives that are destined primarily for the automotive industry and are crucial to trends in automobile construction, such as light-weight assemblies, a reduction in weight and energy consumption, lower CO₂ emissions and increased safety. One in every four windshields produced worldwide is bonded using Sika products, as are four of the five car bodies voted the most innovative in 2013, i.e. the Mercedes S-Class, the BMW i3, the Lexus IS and the Range Rover Sport (source: Automotive Circle International, EuroCar Body Awards 2013).



Sika CEO Jan Jenisch launches work on Sika's CHF 60 million new-build project at the company's Zurich site.

SUSTAINABILITY IS SIKA'S NUMBER ONE PRIORITY NOT ONLY IN TERMS OF ITS CORPORATE STRATEGY



UNDERGROUND LIVING

Walking around the stuccoed streets of Kensington today, you might be in for a surreal sight. The marching rows of Doric columns, pedimented porticoes and dentilled cornices that define these imposing ranks of wedding-cake mansions have been joined by an unlikely addition to the classical architectural vocabulary.

TEXT: INGERLISE BULLOCH, ASTRID SCHNEIDER
PHOTO: BRIAN GOUGH





© Brian Cough

Close to 1,000 m³ of Sika® Watertight Concrete were supplied to create a watertight structure that conforms for habitable space.



© Brian Cough

The reason for all this quarrying is not the discovery of a coal-rich seam beneath the renaissance streets, but the local enthusiasm for subterranean development. Over the past four years, this local authority alone has granted planning applications for more than 800 basement extensions, refused 90, and has a further 20 outstanding. It is the most densely populated borough in the country, with no room to build outwards, and no permission to build upwards – so the only way is down.

The past five years have seen sprawling underground leisure lairs excavated across west London. They contain playrooms and cinemas, bowling alleys and spas, wine cellars and gun rooms – and even a two-storey climbing wall. It is leading to a kind of iceberg architecture, a humble mansion on the surface just the visible peak of a gargantuan underworld, with subterranean possibilities only limited by the client's imagination.

This is about a project in Kensington, which is now complete. It has a two-car garage and three main bedrooms with en-suite facilities above ground, together with living areas, guest bedroom, swimming pool, cinema and various other rooms below.

The use of Sika® Watertight Concrete has enabled A P Arcon Construction Ltd to construct an exciting new, partly subterranean mansion, on a strip of previously vacant land between two existing buildings in Kensington. The main bedrooms, entrance and garage space are built above ground, but the main living, entertainment and swimming pool areas are underground, so total water tightness was an essential requirement on the project.

For this reason, A P Arcon chose Sika® Watertight Concrete to construct the below-ground shell of the building. Close to 1,000 m³ of Sika® Watertight Concrete were supplied by Hanson Concrete to create a watertight structure that conforms to BS8102 Grade 3 for habitable space. Around 1,200 skips of soil weighing around 10 tonnes each had to be excavated to create the working space.

With access being extremely limited, virtually the whole site had to be excavated by hand. Main piles up to 30 m with soft piles up to 7 m in length had to be constructed on the project before excavation could begin. Particular care had to be taken to stabilize the adjoining properties as excavation progressed.

- > Poking up at regular intervals, thrusting outwards from their molded openings as if performing a salute to passers-by, are lines of angled conveyor belts. Slowly rumbling away, they reach high above the trees, pouring a continuous stream of rubble into the cradles of awaiting skips. You would be forgiven for thinking that the residents of the royal borough have established a kind of coal-mining cottage industry. Or maybe they're digging for gold?

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© Brian Gough



© Brian Gough



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> Sika® Watertight Concrete is a high performance, cost effective solution, saving time at both the design and construction stages, and it also delivers the maximum usable area to the developer, as the over-dig requirement is much reduced. This is an important feature on projects such as this in cities where space is at a premium. Arek Palka, Director at A P Arcon commented: “We choose Sika® Watertight

Concrete for a number of reasons, including a 50-year track record, a competitive price and warranty. Importantly, Sika supplied good technical backup throughout which gave us added re-assurance on such a complex and difficult project”. Indeed projects like this are very difficult. In other cases, houses began to subside after initial excavations, pulling their neighbors’ property down with them.

Cracks appeared within the adjacent basements, and the facades sunk to such an extent that door frames shifted and people were trapped inside. That is why good construction materials, which guarantee long-term safety and stability, are essential and Sika’s long track record of proven success.

The state of the art bathroom and livingroom makes one to forget being underground.



© Brian Cough



© Brian Cough

Sauna and whirlpool give the underground a special flair.



NOT EVEN FLYING IS NICER

In the near future “autonomous driving” will become a reality Rinspeed unveiled its “XchangE” concept at the 2014 Geneva motor show. While the major automotive manufacturers are fine-tuning the technology, the Swiss dream factory Rinspeed is putting the “people in the car” at the centre of the “XchangE” study. Sika is fully involved in this innovative vision of the future.





- > If cars drive themselves – how should the car interior be designed so that passengers can best use the time saved by not driving?

The “XchangE” seats in this fully electrically powered touring limousine resemble the comfortable adjustable seating in airline business class. The passenger of the future will be able to sit or rest in almost any upright or relaxed prone position, selecting from over 20 different seating configurations.

The XchangE concept offers many different navigation, entertainment, personal assistance and service functions which appear on four displays.

There is a 1.2 metre wide strip in the steering column displays important information in widescreen format. A 32 inch 4K monitor at the rear of the car converts effectively the interior of the XchangE to a comfortable UHD “car cinema” when required. The infotainment system communicates with cloud data via an integral LTE module. Deutsche Telekom’s “Business-2-Car” platform compiles and analyses all of the vehicle and infotainment data.

The futuristic design of the fully-upholstered interior fosters a unique feel-good atmosphere with a maritime charm in different shades of blue and grey. Natural materials like merino wool and silk are used for individual comfort zones.

A revolutionary Plexiglas roof provides a futuristic look and plenty of light and along with the many other Plexiglas components in the front and rear panels, side sills and the rear spoiler, were fixed and sealed using Sikaflex® adhesive.

The XchangE is a Tesla-S development and as well designed to be used as a mobile office or conference room on the move. The time saved by “not driving” yourself, can therefore be spent in many different ways: reading, listening to music, surfing the internet, playing video games, watching high definition films, or holding meetings at 120 km/h or completing paperwork, and whilst brewing a fresh espresso at the same time.



THE TIME SAVED BY "NOT DRIVING" YOURSELF, CAN THEREFORE BE SPENT IN MANY DIFFERENT WAYS

But there is no legal basis for “fully automated driving”. The 1968 Vienna Convention on Road Traffic, which forms the basis for the National Traffic Laws in many countries around the world, only allows partially automated functions. However, the necessary vehicle licensing regulations and product liability issues to amend these are already being discussed in detail by the relevant legislative authorities, governments and the insurance industry.

Driverless cars will be ready for the road in the next 4-6 years. Test vehicles kitted out with an autopilot prove that this is so. Current developments are focused on the following five core areas:

- Sensors for 360° all-round detection -

- Redundant system architecture
 - Functional reliability preventing malfunctions and hacking attacks
 - High-definition precision maps
 - Legal regulations
- Furthermore the following factors are crucial for efficiency on the road:
- Anticipatory driving ability
 - Knowledge of obstacles such as road works, traffic flows and traffic light cycles
 - Adaptable driving behavior and speed.

Many concepts which incorporate these factors in their approach also already exist.

“Automated driving of the future” will include all of above elements and will

therefore make driving a restful travel experience. When automatic control and support systems remove many decisions from us and do operate effectively, errors will become increasingly rare. And as a result the number of road accidents will fall significantly.



THE SINKING CITY

Mexico City, and its metropolitan area, was built over what was once an area of five lakes – Chalco, Texcoco, Xaltocan, Xochimilco and Zumpango. As it has grown, the city has gained ground from the lakes, and consequently faces a major threat of floods. The East Outlet Tunnel (Túnel Emisor Oriente), one of the biggest sewage projects in the world, will help to avert a catastrophe.

TEXT: JEANNINE LEUPPI
PHOTO: SIKA MEXICO

> Over the last 100 years, parts of Mexico City have sunk by nearly 12 meters – the height of a 4-storey house. Huge volumes of groundwater are pumped above ground to serve the needs of nearly 20 million inhabitants, which has led to the city sinking at the rate of 10 centimeters annually.

The bulk of the city is constructed on swampy subsoil, and since more groundwater is extracted from this terrain can

be replaced by precipitation, it becomes even more compact and the city above continues to subside. As a result, various infrastructures in the city, including buildings, roads and sewage systems, have been extensively damaged. To compound matters, the city faces problems of flooding during the rainy season.

The solutions to prevent and control floods have been sought since pre-His-

panic times. The stone levee bridge of Nezahualcoyotl was developed to prevent floods and stop the brackish waters of Texcoco Lake from mixing with fresh water from other areas. In 1607, construction began on the Huehuetoca Channel, including a 7 km tunnel (Gorge of Nochistongo) to discharge water into the Tula River (building work took nearly two centuries). The construction of the so-called Great or Drainage Channel began in 1866, consisting of a 39.5 km con-



crete channel and a tunnel almost 10 km in length (Tequixquiac Tunnel). Building was completed in 1900.

Mexico City thus had two artificial water outlets and a drainage system in operation until 1925, when subsidence caused by the extraction of underground water unleashed a huge flood.

In the 1930s, the metropolis witnessed the start of a massive population explosion, growing from one million inhabitants to two million by 1940, three million by 1950, more than five million in 1960, and more than ten million in the 1970s. During this time, numerous drainage facilities were built, including regulating dams, kilometers of drain lines, pumping plants, west intercepting sewers, and piping for the La Piedad, Churubusco and Consulado rivers.

1967 saw the start of work on a new construction project nicknamed "The Deep Drainage System". It embodied a novel approach, consisting of two intercepting sewers with a diameter of 5 meters

and a combined length of 18 kilometers, at a depth that varied from 30 to 50 meters. The intercepting sewers discharged into the 50 km deep emitter outlet with a diameter of 6.5 meters. Inaugurated in 1975, the system was considered by many to be definitive.

But that proved to be a grave error of judgment. The central emitter outlet continues to sink, presenting serious problems. Its gradient is becoming increasingly more precarious and has in the meantime lost around 30% of its original capacity of 170 m³/s. In some places pumps have to be used to carry the sewage because the gradient has reversed. Year for year, serious floods occur because the wastewater system is no longer able to cope with massive downpours or almost double the population.

The central emitter outlet remains closed for repair and maintenance during low water level months. This means an alternative emitter outlet is needed to maintain operational capacity throughout the year since the current deep drainage

system is insufficient for the present requirements of the Valley of Mexico.

Faced with actual flooding future floods had to be prevented. In mid-2008 CONAGUA, the Mexican National Water Board under the Ministry for the Environment, commissioned construction of the "Túnel Emisor Oriente". With an internal diameter of 7 meters, it will transport up to 150 m³ of sewage per second over a distance of 63 kilometers beneath the capital and the federal district of Mexico to the federal state of Hidalgo. Designed to increase drainage capacity, the tunnel must meet the following objectives:

It should prevent flooding in the Valley of Mexico, reduce the risk of drainage system failure and implement a procedure that allows inspection of the drainage system without interrupting operations. Five Mexican enterprises are involved in the East Outlet Tunnel Project: ICA, CARSO, COTRISA, Constructora Estrella and Lombardo Construcciones. The construction process is essentially divided into three phases:



Key figures for the East Outlet Tunnel:

Length	62 km
Diameter	7 m
Depth	30 to 150 m
Gradient	100 m
Shafts	24
Capacity	150 m ³ /sec
Return period	50 years
Investment	19.5 bn USD
Construction time	4 years
Year of completion	2014



THE SOLUTIONS TO PREVENT AND CONTROL FLOODS HAVE BEEN SOUGHT SINCE PRE-HISPANIC TIMES

- > 1. Construction of shafts.
- 2. Tunnel excavation.
- 3. Final lining.

The concrete will be pumped to a depth of around 95 meters over a maximum distance of 1000 meters. Approximately 230,000 m³ of concrete are required for the segment that ICA is responsible for.

The solution chosen to meet the above specs consists of the two additives Plastiment Liquid and SikaViscoflow. Application of Sika ViscoFlow[®] technology in the form of a combination of Sika ViscoFlow[®] concrete admixtures and Sika[®] Plastiment[®] Liquid produced

high-quality concrete which fulfilled workability retention time requirements. What is more, the compressive strength/ time specifications were more than satisfied by the combination of mix design and Sika admixtures.

Sika Mexico delivers solutions for this project as well as on-site technical support, thus contributing cutting-edge technology to Mexico's development effort. The Mexican Water Board CONAGUA has embarked on a major project in the form of the Túnel Emisor Oriente scheme, which is unparalleled anywhere in the world and absolutely es-

sential for Mexico City itself. Apart from being able to coordinate the groundwater table more effectively in future to prevent the city from subsiding further, the more than 60 km long collector - designed to provide a more effective sewage system and enhance the quality of life in the megacity - is of decisive importance.

The authorities and the population are convinced that the world's biggest sewage project will reintroduce an element of quality to life in the city.

TWO NEW LANDMARKS FOR THE “MAXIMUM CITY”

Who can fail to be fascinated by that city? The capital of England and the United Kingdom, London is the UK's most populous region, urban zone and metropolitan area. Standing on the River Thames, London has been a major settlement for two millennia, its history going back to its founding by the Romans, who named it Londinium. London's ancient core, the City of London, largely retains its 2.9 km² mediaeval boundaries.

TEXT: ASTRID SCHNEIDER
PHOTO: EMPORIS

> A metropolis of superlatives, London is a leading global city with strengths in the arts, commerce, education, entertainment, fashion, finance, healthcare, media, professional services, research and development, tourism and transport all contributing to its prominence. It is one of the world's leading financial centers and has the fifth or sixth-largest metropolitan area GDP in the world depending on measurement. London is a world cultural capital and is the world's most-visited city as measured by international arrival. It has the world's largest city airport system measured by passenger traffic. London's 43 universities form the largest concentration of higher education in Europe. In 2012, London became the first city to host the modern Summer Games three times.

The UK capital has a diverse range of peoples and cultures, and more than 300 languages are spoken within its boundaries. London had an official population of 8,308,369 in 2012, making it the most populous municipality in the European Union, and accounting for 12.5% of the UK population. The London metropoli-

tan area is the largest in the EU with a total population of 13,614,409, while the Greater London Authority puts the population of the London metropolitan region at 21 million. London had the largest population of any city in the world from around 1831 to 1925.

The city contains four World Heritage Sites: the Tower of London; Kew Gardens; the site comprising the Palace of Westminster, Westminster Abbey, and St Margaret's Church; and the historic settlement of Greenwich, where the Royal Observatory is situated, the location of the prime meridian (0° longitude) and Greenwich Mean Time (GMT). Other famous landmarks include Buckingham Palace, the London Eye, Piccadilly Circus, St Paul's Cathedral, Tower Bridge, Trafalgar Square, and The Shard. London is home to numerous museums, galleries, libraries, sporting events and other cultural institutions, including the British Museum, National Gallery, Tate Modern, British Library and 40 West End theatres. The London Underground is the oldest underground railway network in the world.

All in all, it is a city of traditions, with each new century adding its own unique layer to London's character. The result is a city in which castles, royal palaces and centuries' old churches sit comfortably alongside all the necessities of a thriving, modern-day metropolis. For such an enormous and important city, London is relatively low rise, with tall buildings clustered in the City of London and Canary Wharf, and spread sporadically over the rest of the city.

It is not skyscrapers that define London's skyline, but a mix of architectural landmarks that have, over the centuries, come to define a city with a remarkable past. Chief among these are St. Paul's Cathedral, the Palace of Westminster, Tower Bridge and the Tower of London, but these are accompanied by hundreds of church spires and monuments.

The recent interest in high-rise construction has seen these historic landmarks joined by a new breed of stunning modern structures, including City Hall, the BA London Eye and 30 St Mary Axe.



Finished in spring 2014, the 37-storey 20 Fenchurch Street building is 160 m tall, making it the fifth-tallest completed building in the City of London.

> Present-day London is home to some of the tallest and most exciting skyscrapers in Europe such as The Pinnacle, The Shard, One Blackfriars Residential Tower and Salesforce Tower London. Some amazing architectural work is still going on, and in the near future two newcomers will be joining their ranks.

The first is 20 Fenchurch Street, a commercial skyscraper just finalized in London. It takes its name from its address on Fenchurch Street in the City of London financial district and it has been nicknamed The Walkie-Talkie because of its distinctive shape. Finished in spring 2014, the 37-storey building is 160 m tall, making it the fifth-tallest completed building in the City of London.

The architect of 20 Fenchurch Street is Rafael Viñoly, who was born in Montevideo, Uruguay. Educated in Argentina, he received his Diploma in Architecture at the University of Buenos Aires in 1968. He settled permanently in New York in the late 1970s. "Architecture is a dialogue with the forces of life" is part of his philosophy. Anyone standing below the

tower at 20 Fenchurch Street will understand this at once.

The facade was delivered by Permasteelisa UK and Permasteelisa Italy, and the roof was constructed by Josef Gartner. The insulating glass was supplied by Vetrodomus, Italy. For structural glazing, Sika recommended Sikasil®. Another high-performance waterproofing sealant was used for weather sealing as sealant durability under severe weather conditions on the outside of the glass was required.

Furthermore, the Sikasil® range was used as an insulating glass secondary sealant and SikaGlaze IG-5 PIB as insulating glass primary seal, both in grey to match the alu profiles. The most complex challenges arose when the cold bent glass and outwards-sloped facade put the adhesive under permanent stress. That is why very comprehensive planning and joint size calculations were necessary beforehand. Some corners required complicated installation and application of 2-part adhesive on site. In a number of areas with high load concentrations, the only solu-

tion was the new high-strength adhesive Sikasil SG-550 to keep the joint dimension as small as the specifications allow.

The second newcomer is to be found at 122 Leadenhall Street. When completed in 1969, the building was 54 m tall with 14 stories above and three stories below ground. It was originally designed as a pair with the Commercial Union headquarters. The two buildings have a central compressional concrete core and have suspended floors which hang using the steel 'chords' visible on the exterior of the building. These chords are hung from power trusses at the top of the building. It is an example of a tension structure; at the time, it was considered one of the most complex glass-fronted buildings in the United Kingdom. The architect acknowledged the influence of Mies van der Rohe.

Designed by Richard Rogers and developed by British Land and Oxford Properties, the new Leadenhall Building will be 225 m tall, with 48 floors, when it is completed in 2014. With its distinctive wedge-shaped profile it has been nick-



Designed by Richard Rogers and developed by British Land and Oxford Properties, the new Leadenhall Building will be 225 m tall, with 48 floors

IT IS THE WORLD'S TALLEST OF ITS KIND

base features a 30 m high atrium. This will be open to the public and will extend the adjacent plaza. Exterior glass lifts will be used on the building, similar to the neighboring Lloyd's building designed by the same architect.

The main drawback of this unusual design is the building's relatively small floor space of 84,424 m² for a building of its height. The facade was created by Shenyang YuanDa and YuanDa Europe and the insulating glass was delivered by two Chinese producers, SYP and North Glass. Sikasil was used for structural glazing and for weather sealing in order to guarantee long-term durability. Sikasil was ideal as a secondary edge seal for air and gas-filled insulating glass in the structural glazing applications. The elevator control boxes were bonded using the fast-curing adhesive system SikaFast®. The triangular glass geometry of the corners and the huge variety of glass dimensions called for intensive planning and joint size calculations.

Next time you visit London, stroll by Fenchurch and Leadenhall Street to take a look at the two London newcomers and admire the amazing architectural delights. Use your imagination! You might come up with new nicknames for the two buildings. But maybe you'll stick to the ones they already have and speak into your Walkie-Talkie while using the Cheesegrater to shred your favorite Parmesan.

named the Cheesegrater, a name originally given to it by the City of London Corporation's chief planning officer, Peter Rees, who upon seeing a model of the concept told Richard Rogers he could imagine his wife using it to grate Parmesan. The name stuck.

The planning application was submitted to the City of London Corporation in February 2004 and was approved in May 2005. Scheme design started in 2006. In a statement made to the London Stock Exchange on August 14, 2008, British Land said it was delaying the project, which was due to start in October 2010. On December 22, 2010, the developer

announced the project was moving forward with contracts being signed for the 50/50 joint venture with Oxford Properties.

The new tower features a tapered glass facade on one side which reveals steel bracings, along with a ladder frame to emphasize the vertical appearance of the building. It also gives the impression of anchoring the tower to the ground, giving a sense of strength. Unlike other tall buildings, which typically use a concrete core to provide stability, the steel megafame, engineered by Arup, provides stability to the entire structure and is the world's tallest of its kind. The

THE IMPORTANCE OF DURABILITY

Professor Tanaka discusses key areas of research in joint sealing materials. Kyoji Tanaka, professor emeritus at Tokyo Institute of Technology, taught materials science for 40 years, mainly focusing on sealing materials and sealing technology. He chaired a working group on the development of Japanese industry standards for sealing materials and is overseeing the group's revision of these standards this year in the same capacity.

TEXT: CHRISTINE KUKAN
PHOTO: MARC EGGIMANN

> **Why is the durability of sealants and adhesives so hugely important in buildings?**

Prof. Tanaka: There are several reasons. Unless high-grade sealants and adhesives are used, it is no longer possible to satisfy the increasingly stringent technical, commercial and ecological requirements that are placed on buildings. As a consequence, the main challenge today is to adapt their durability to the service life of the building as a whole. Subsequent secondary sealing work is difficult and, particularly with high-rise buildings, involves a significant investment of time and money. This alone makes the durability of sealants and adhesives a key economic factor for building contractors and property owners. Another reason is the reduction in environmental pollution. Although joint sealing materials are produced with relatively little raw material and energy compared with other building materials (e.g. concrete or glass), they make a disproportionately high contribution to improving a building's overall energy balance. The more durable the sealants and adhesives, the less frequently they have to be renewed and the lower the material consumptions. Durability reduces maintenance costs and improves the carbon footprint at the same time.

What are the key areas of research?

The critical point is always the joint between the sealing material and the construction component. The priority, therefore, is to develop sealants and primers with good adhesive properties on a variety of surfaces.

Another area is single-component technology. Many Japanese architects and engineers still believe that two-component

sealants are superior to single-component sealants as regards joint expansion capability and weather resistance, but they are gradually beginning to rethink their attitude. The single-component products can be used immediately, require less specialized knowledge and are much easier to handle. This is an important quality criterion not least because the construction industry is employing fewer and fewer fully trained experts.

What is driving this development?

The demand for energy efficiency, cost pressures, technological progress as regards building materials and the life-cycle approach. For some time now, the climate footprint of buildings has been not just an ecological but, above all, an economic management tool.

What are the most important measures in this context?

Enhancing durability, improving long-term adhesion on a variety of surfaces and faster procedures for testing long-term properties. These are "accelerated aging" test procedures which deliver reliable results, not after years but within weeks. This is particularly important because new innovative building materials and building technologies are constantly coming onto the market and sealants and adhesives need to take account of them.

You live in Japan, where the buildings are regularly subjected to earthquakes and typhoons. What role do sealants and adhesives play under such extreme conditions?

The joints between building components are exposed to huge forces. This applies especially to rain-screen cladding. Consequently, the joint sealing materials need to withstand varying



DURING TYPHOONS, THE JOINT SEALS ALSO HAVE TO BE ABLE TO WITHSTAND EXTREME EXTERNAL INFLUENCES SUCH AS STORM-FORCE WINDS AND HEAVY RAIN

movements for the longest-possible time while suffering the least-possible damage.

Earthquakes cause short-term but intense movements. Heat and cold, day and night cause constant alternation between slow expansion and contraction. During typhoons, the joint seals also have to be able to withstand extreme external influences such as storm-force winds and heavy rain. Optimum adhesion, flexibility, tear and weather resistance over a long time are the main criteria which the sealants and adhesives need to satisfy. But there is something else as well: the design of the joint also has a role to play. Architects prefer narrow, inconspicuous joints and this requires sealants with special mechanical properties, i.e. preferably those with a particularly high movement absorption capability, such as +100/-50%.

When investigating joint seals after the Hanshinn-awaji earthquake in 1995, we repeatedly found that although the adhesive

seals had been partly destroyed, they were still able to retain their hold on smaller parts of buildings, such as glass roof panels or ceramic tiles, and prevent them from falling. This revealed a hitherto hidden characteristic of sealants and adhesives: they have a safety function and act as a sort of back up.

You were involved in developing industry standards for tall buildings. How much did your investigations contribute to the new standards for sealants and adhesives?

The results of my investigations into the weather resistance of synthetic polymer-based materials have been incorporated into a number of standards for the test methods for classifying durability. My investigations into the long-term behavior of sealants in moving joints also acted as the basis for discussion about test methods and was of some help in devising Japanese industry standard JIS A 5758 for building seals and glazing. Thank you for taking the time to talk to us.



With 11 branch offices and now six production sites, the company is well represented in the emerging market of India.

INCREASED CUSTOMER PROXIMITY IN INDIA AND BRAZIL

In order to execute major infrastructure projects, Sika India has expanded its supply chain and opened the new Jhagadia plant. Brazil Sika has also opened a new plant, in Aparecida de Goiânia in the mid-western Brazilian state of Goiás.

TEXT: HARRIET SIHN

PHOTO: SIKA BRAZIL, SIKA INDIA

> In order to execute major infrastructure projects, Sika India has expanded its supply chain and opened the new Jhagadia plant. The city of Jhagadia is situated in the State of Gujarat, 350 km north of Indian megacity Mumbai.

Sika continues to strengthen its position in India with the inauguration of its sixth manufacturing facility and R&D center in Jhagadia. The new facility, located in the western part of India, will focus on concrete admixtures, mortars, resin floors and adhesives for the booming construc-

tion market. The new plant will also be home to comprehensive R&D facilities and a technical center.

The opening of the Jhagadia plant marks another milestone in the expansion of Sika's supply chain in major growth markets. With 11 branch offices and now six production sites, the company is well represented in the emerging market of India.

Sika CEO Jan Jenisch comments: "Sika is strongly committed to implementing

the Strategy 2018 targets – one of which is the accelerated expansion of our supply chain in emerging markets in order to seize untapped business opportunities. Following the opening of the Surabaya plant in Indonesia just one month ago and the recent inauguration of the Jhagadia plant with its strong R&D activities in India, Sika has successfully extended its presence in two of the world's most populous countries which are home to major infrastructure and construction projects."



The new plant in Aparecida de Goiânia meets the needs of customers in the mid-west of Brazil.



Brazil Sika has also opened a new plant, in Aparecida de Goiânia in the mid-western Brazilian state of Goiás. This is the company's seventh plant in the country. Goiás is one of Brazil's fastest growing states, providing an excellent platform to supply the country's central and northern markets.

The new plant meets the needs of customers in the mid-west of Brazil. Increased customer proximity and higher logistics efficiency help meet the growing demand for products in the construc-

tion markets, in particular concrete admixtures, waterproofing systems and grouts.

Sika CEO Jan Jenisch: "The new plant in Aparecida de Goiânia is, in addition to the acquisition of Lwart Química earlier this year, a further step in our strategic expansion in Brazil initiated in 2012. Sika now operates seven factories in the country."

The improved supply chain will bring major benefits to customers in the rail and

road infrastructure segment, the airports sector and the power supply business. Infrastructure projects with an investment volume of over € 65.8 billion are currently under construction, and a combined € 80 billion project volume is either at the tender phase or at the award stage awaiting construction. Most recently, Sika Brazil delivered a range of diverse solutions for the construction, refurbishment and maintenance of the stadiums and related infrastructure at the 2014 Football Event.

ROOFING



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A PERFECT MOUNTAIN VACATION

The Hynčice pod Sušinou Mountain extends on the southeastern edge of the Šniežnik range near the city of Staré Město, 270 km from the capital city of Prague. To the west rises the Velka Šindelná (Schindelberg, 1195 m). The Tetřeví hora (Black Mountain, 1251 m) lies to the northwest of the Sušina (Koppe, 1321 m), and to the north the Štvanice (Black Hunting, 866 m) is situated.

TEXT: ASTRID SCHNEIDER

PHOTO: M. TŮMA / BOYSPLAYNICE

> Being in the mountains is fun, means adventure and over centuries has become one of the most popular ways for families and friends to spend their leisure time. You can be active and go mountaineering, hiking, walking or climbing, enjoy the spectacular natural views and observe animals. In the winter the slopes are all yours and you can race down on your skis or snowboard until you feel like you're surfing in the sea. Or you can enjoy the slower pleasures of life, reading a good book, sleeping in a hammock, breathing in the healthy mountain air and simply contemplating the fact that you are now a bit nearer to the sun than everyone down in the valley.

The newly renovated three-storey mountain guest house Penzion Kraličák, situated in the upper part of the Hynčice pod Sušinou mountain, is such a place, where your soul can take a rest. Above the level of building is a long off-notch driveway with parking spaces. There is also a restaurant terrace, offering an opportunity for a pleasant sit in the sun. The property is located in the meadow, which is intensively used throughout the year for children's activities (ski school, summer games at the stream). One of the attractions is a circular water tank. Plans are in the pipeline for a sauna and playground.

The architectural expression is based on the existing concept of buildings in open

countryside above the village. The idea was to create a contemporary architectural form in open mountainside meadows, a simple compact shape, where the wall merges unchanged into the roof (dark gray hydroisolation). The architectural intent behind the guest house was not to add to the village character of traditionally built recreation facilities. The Penzion Kraličák was designed as a natural object beneath the forest.

The compact shape of the building should bring to mind flat stone, standing on the open plain. The building does not have a main facade and its entire structure is from architecturally molded material. It is a solitary object outside the village,



DURING CONSTRUCTION, SUBSTANTIAL FACADE WATER-PROOFING WAS NECESSARY

> beyond the horizons of the landscape. The area at the rear of the property opens into a dark forest. The landscape character is reflected in the architectural design, achieved by coating the wooden structure with waterproofing. The windows on the facade of sloping surface



es are set in dormers - no more than a slightly distorting compact mass. Water and snow freely run down the roof over the sloped facades to a ditch leading away from the property.

The ground plan is an oblong polygon with converging fronts. The construction technique is reflected in the wooden structure with internal longitudinal load-bearing masonry made of ceramic bricks. The actual building was erected after the workshop-prefabricated floors and walls had been installed. The ceilings are designed as beams with a concrete cover.

During construction, substantial facade waterproofing was necessary. The final work step consisted of waterproofing the roof. The facade with the suction gap around the perimeter and the entire height of the three-storey building were ventilated. The roof has a ridge vent, which also hides all outlets. SikaRoof® MTC, a liquid, cold-applied waterproofing membrane, was used on the wooden substrate of the entire casing

of the building. Modern, highly technologically advanced liquid waterproofing Sikalastic®-based polyurethanes were also applied. Their basic features include design, seamless waterproofing, flexibility and strength of the system, ability to bridge cracks and breathability. The layout of the interior of the building is structured into one operating floor (the ground floor restaurant with kitchen, restrooms for guests and staff, ski rental and service desk) and two floors containing rooms for guests. A top-lit staircase runs through the middle of the building.

The guest house has three double rooms and four four-bed rooms. Groups of up to 28 people can be accommodated. Situated right on the slopes, it is ideal for winter pursuits, with ski and snowboard lessons on offer. And cyclists can enjoy the nearby cycle route in summer. Barbecue evenings and other activities are also organized. Whether you like active vacations or just relaxing with a book in a hammock in the sun, this sounds like a very attractive destination.





A HOME FOR ORPHANS AND DISABLED PEOPLE IN INDIA

India has recently seen impressive economic growth. However, poverty and injustice, often tied to gender and class, are cruel realities for millions of women and children. The framework of the Indian Constitution provides the necessary means for the protection, development and welfare of children.

TEXT: KLAUS STRIXNER, ASTRID SCHNEIDER
PHOTO: BRIGITTE BORN

- > Yet children are a particularly vulnerable group. Notably, almost half of the children in the country suffer from malnutrition. A high number of children do not enjoy the right to an adequate standard of living, such as access to clean drinking water, acceptable housing conditions and latrines. Access to school and health care is limited. Despite a scheme launched four years ago to provide universal education, about 60 million children do not attend primary school. Around 18 million children live and work on India's urban streets. The country has more street children than anywhere else in the world. The problem of harmful child labor is well recognized. More than 12 million Indian children work, many of them in hazardous labor. India is also considered to be a source, destination, and transit country for children who are trafficked for the purposes of forced labor and commercial sexual exploitation.



There are about 500,000 child prostitutes in the country, and concern is expressed that the programs for the physical and psychological recovery and social reintegration of child victims of sexual abuse and exploitation remain insufficient and inadequate.

Only 1% of children with disabilities have access to school and one third of most disabilities are preventable. Providing expecting mothers better pre and post-natal care as well as proper nutrition for infants and mothers would help a lot. Undernutrition is a severe problem with children. In India 80% of children with disabilities will not survive the age of 40. Furthermore, orphans and mentally and physically challenged children are at particular risk to abuse and violence. Many of them live on the streets.

In order to provide assistance for mentally and physically disabled children in India, Sika supports "Samrakshana" (Shelter, give shelter, protect), the home for orphans and disabled people in the state of Telanga, Medak district, in the south-

ern part of west-India. Samrakshana was founded in 2013 by Joseph Vattaparambil and Brigitte Born.

During 9 years (2006-2014) Joseph and Brigitte have established the home for disabled children in Karunalaya and the Akshalashala School. In April 2014 the responsibility for the home and the school was taken over by the congregation Bethany. By that time Brigitte and Joseph started to build up "Samrakshana". The home has already been built and 30 children found a new home.

The projects will be supported by Sika via the Swiss citizen Brigitte Born, who manages her projects in Karunalaya since

2007 and spends every third month on-site working there. Sika supports the following projects: Construction of a water tank - the provision of water is guaranteed by a watertank, a waterpipeline and two pumps. Furthermore the Sika support concentrates on the construction of an orphan's home in the community of Dondhi, Telanga. Street children unfortunately belong to the daily life in India. "Samrakshana" was founded to give complete orphans a home. Here the children experience sympathy, love and warmth. They obtain healthy nutrition, medical care if needed and are schooled properly and get professional training.

