

AMBITIONS

A dive into Sika's world



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A large volunteer-construction.

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SUSTAINABILITY



If something is sustainable, it has the ability to be maintained at a certain rate or level or the ability to be upheld or defended. In ecology, sustainability is the ability to endure; it is how biological systems remain diverse and productive indefinitely. Long-lived and healthy wetlands and forests are examples of sustainable biological systems. In more general terms, sustainability is the endurance of systems and processes. The organizing principle for sustainability is sustainable development, which includes the four interconnected domains: ecology, economics, politics and culture. Healthy ecosystems and environments are necessary to the survival of humans and other organisms. Moving towards sustainability is also a social challenge that entails international and national law, urban planning and transport, local and individual lifestyles and ethical consumerism. Ways of living more sustainably can take many forms from reorganizing living conditions (for example ecovillages, eco-municipalities or sustainable cities), using science to develop new technologies, to adjustments in individual lifestyles that conserve natural resources. The project Living Lakes of the non-profit organization Global Nature Fund (GNF) is recognized as an "Official Project of the UN Decade of Education for Sustainable Development 2005-2014". GNF also supports many drinking water projects throughout Africa. In the Ivory Coast, more than 24,000 people now have access to clean and fresh water (p. 16). People are taught how to treat the water in order to use it in a sustainable way.

In New Zealand, the Longbush Ecosanctuary Welcome Shelter (p. 5), located near Gisborne on the East Coast, is an innovative environmental education space designed, constructed and operated by a group of passionate volunteers. Access is free of charge and the project aims to promote active stewardship of the natural environment both in conservation areas and in cities.

Celebrating the birthday of a product (p. 30), which findings of long-term studies have shown retains its waterproofing function for at least 25 years, demonstrates sustainability in building and maintaining these buildings. These roofing membranes will continue to fulfill their functions for many more years to come. And with this, the ability to endure is created.

Yours sincerely,

ASTRID SCHNEIDER

CONTRIBUTORS



DUNCAN ROBERTSON
Marketing and Communications
Manager, Sika New Zealand

The Longbush Ecosanctuary is an ambitious environmental project with the goal of turning a remote river valley back into natural wilderness. And in that valley is a bold little structure that has created a big buzz in New Zealand architectural circles.



SARAH JAMES
Marketing Manager Flooring
Sika Limited UK

This project will always stand out for me as being a key installation in our commercial portfolio - a technically challenging specification that was delivered with success and acknowledged by 'Large Project of the Year' award from FeRFA. A great story!



MATTHIAS DICK
Market Field Manager
Sika Services AG Switzerland

The adhesive technology was developed by Sika and the high-quality windows are manufactured in Switzerland by BL windows. Though struggling with high labor costs and a strong Swiss Franc, material optimization and industrial production of bonded windows allow a competitive price.



CHERYL DOUGLAS
Head of Marketing
Sika Limited UK

From perfectly smooth floors for film sets in the Manchester TV Studios, to versatile roofing systems for the Walkie Talkie building, is testament to the trust specifiers and contractors have in Sika.

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IMPRINT

Editors' address: Sika Services AG, Corporate Marketing, Tüffenwies 16, CH-8048 Zurich, Switzerland, e-mail: ambitions.magazine@ch.sika.com

Layout and Design: Sika Services AG, Corporate Marketing, Marketing Services
Visit us on the Internet: www.sika.com

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Rather than simply viewing the landscape, visitors are encouraged to take part in the environmental restoration occurring at the eco-sanctuary through the programs offered at the Welcome Shelter.



PUBLIC ARCHITECTURE ENCOURAGES ENVIRONMENTAL RESTORATION

The Longbush Ecosanctuary Welcome Shelter, located near Gisborne on the East Coast of New Zealand, is an innovative environmental education space designed, constructed and operated by a group of passionate volunteers, with the support of local businesses and charitable organizations. Access to the Welcome Shelter is free of charge for all visitors and the project aims to promote active stewardship of our natural environment both in conservation areas and in our cities.

TEXT: DUNCAN ROBERTSON, ASTRID SCHNEIDER
PHOTO: SIMON DEVITT, SAROSH MULLA, SIKA NEW ZEALAND

> The Longbush Ecosanctuary itself is home to a wide range of New Zealand's native birds. The North Island Black Robin, Titi, Tui, Kereru, Korimako, Fantail, Kingfisher, Ruru, Tomtit, Popokotea, Karearea, Grey Warbler and Pipiwaharoa all call Longbush home. Longbush also supports an increasingly diverse range of plant species, including rare and endangered species. It also holds grey gecko lizards, long-tailed bats and black-headed tree weta. The diversity of the wildlife in the bush continues to grow through the active reintroduction of new species as well as through natural migration.

The project was generated and designed by the award-winning designer Sarosh Mulla. Mr. Mulla's current doctoral research focuses on creating innovative forms of architecture for the New Zealand tourism industry, while continuing to promote the role of the architect as a leader within communities.

The design research looks at how architecture has been used in viewing the New Zealand landscape since colonization and amplifies the techniques drawn from the European Picturesque in defining images of the landscape as imaginative historic constructions. The Welcome Shelter is the central design work of Sarosh Mulla's PhD in Architecture by Creative Practice. It is the largest volunteer-constructed piece of public architecture in New Zealand.

Mulla has led a team of 88 volunteers in the construction of the space that provides facilities for visiting school groups, ecologists and tourists. The design of the structure draws on the framing techniques of the Picturesque, but applies these through contemporary forms, which promote active engagement with the environment. Rather than simply viewing the landscape, visitors are encouraged to take part in the environmental restoration occurring at the ecosanctuary through the programs offered at the Welcome Shelter.

>

OUR GUIDING PRINCIPLE IS THAT GOOD HUMAN-CENTERED DESIGN COMES FROM RIGOROUS DESIGN THINKING

- > “Sarosh Mulla Design focuses on finding the right design solution for each unique situation. We don’t believe that one size fits all, and we know that our clients want a personalized solution. So we emphasize the importance of understanding the needs of each client carefully, before considering what opportunities there are to design a truly creative solution. To achieve this, we practice across several design disciplines and maintain strong relationships with specialists in associated fields. Our guiding principle is that good human-centered design comes from rigorous design thinking. So



Sarosh Mulla has led a team of 88 volunteers in the construction of the space that provides facilities for visiting school groups, ecologists and tourists.

the one thing that is common to all of our projects is a carefully followed process” states Mr. Mulla.

A large steel and fabric canopy provides shelter from the sun and rain for an outdoor classroom created on the hillside. Below the roof the form of this classroom is defined by the position of three timber enclosures and small retained gardens. The design plays with the connotations of natural and synthetic materials in the setting of the recovering environment. Each timber enclosure provides a different service, including the storage of teaching material, ablution facilities and an office for the site ecologist. This office opens up to the exterior with a large

drawbridge to create a level platform on teaching and demonstration days. Another enclosure includes a roof deck from which a stunning view of the valley can be appreciated. This deck is accessed via a traditionally made greenwood ladder made from a Manuka tree harvested from the building site.

Constructed from materials donated by 88 sponsors, the Welcome Shelter utilizes very simple construction techniques. The approach adopted aims to produce the maximum environmental program, through minimal architectural resources. The Welcome Shelter is a gateway for visitors to this special environment, which includes several critically endan-

gered native species. The ecosanctuary is approximately 120 hectares and over the past 15 years has been rapidly restored through the efforts of Jeremy and Dame Anne Salmond. With the removal of invasive pests and weeds, alongside the planting of hundreds of thousands of native trees, the diverse ecology at Longbush is beginning to thrive again.

When asked about his projects, Mulla comments: “My architectural practice is research. It is an opportunity to experiment and test ideas and their tectonic resolution. The ways in which architecture can facilitate social sustainability is an ongoing theme in my design re- >



> search. That is not only sustainability in the sense of “green” technology, but as a more holistic approach to how we inhabit the planet and how creating well-functioning communities can have a positive effect on the environments in which they exist.”

Never before in New Zealand’s history has such a large and diverse group of volunteers and sponsors created a piece of public architecture. The Welcome Shelter creates a new benchmark for high quality community-generated architecture that responds to the needs of the local environment. <



Access to the Welcome Shelter is free of charge for all visitors and the project aims to promote active stewardship of our natural environment both in conservation areas and in our cities.



Each timber enclosure provides a different service, including the storage of teaching material, ablution facilities and an office for the site ecologist.





WHAT ABOUT CÔTE D'IVOIRE?

The Republic of Côte d'Ivoire is located in West Africa. Its capital is Yamoussoukro and the biggest city is the port of Abidjan. It has 22 million inhabitants. Through the production of coffee and cocoa, the country was an economic powerhouse in West Africa during the 1960s and 1970s. Ivory Coast went through an economic crisis in the 1980s, contributing to a period of political and social turmoil. The 21st-century Ivorian economy is largely market-based and still relies heavily on agriculture. To see for ourselves, we flew to Abidjan to meet **DIDIER FAURE**, the General Manager of Sika Ivory Coast to have an interview.

TEXT: ASTRID SCHNEIDER

PHOTO: FOTOLIA, SIKA IVORY COAST



The Sanctuaire Marial d'Abidjan is an important Catholic pilgrimage. It is located in Abidjan. The main church was designed by Italian architect Aldo Spirito and was completed and inaugurated in February 1987.



“WITH STABILITY, MORE AND MORE PEOPLE WILL INVEST IN THE IVORY COAST”

DIDIER FAURE
General Manager
Sika Ivory Coast



Didier Faure, General Manager Sika Ivory Coast.

> **What is the first thing that comes to mind when you think about working in Ivory Coast? What makes it exciting?**

It's a challenge. It's really exciting to start from scratch, create a new company, and construct everything (the plant, the team, etc.)

What are your personal secrets for leading a team?

There are no secrets, I just try to set a good example, show motivation and respect the company rules. I listen to the team and have open discussions with them. I want to create an attractive environment (including trainings/team building/bonuses) in order to reach the full potential of each employee.

I explain the rules and the objectives to them and let them do their best in order to reach the goals. For me, autonomy is a key point. Controlling is not my favorite task but it's really important to check that the milestones are being reached on time and as expected.

>



The roof of the Abidjan cathedral needed major refurbishment and Sika was chosen by the government to undertake this.

- > **Ivory Coast's economy is now one of the most developed in Sub-Saharan Africa. It is the world's largest exporter of cocoa and one of the largest exporters of coffee. Is this also reflected in a stronger democratic political basis and certain growth of a stable middle class?**

After the big crisis of 2011, following the presidential election of 2010, Ivory Coast has been one of the more stable countries in the Sub-Saharan area since 2012. This stability and the natural potential of the country (agriculture/mining/oil) have given investors confidence. These investments allow a certain growth of the middle class.

But the unemployment rate is still high and the two civil wars are recent history. What are the biggest opportunities for the economy?

In my opinion, political stability will be the main issue for the development of the country. With stability, more and more people will invest in the Ivory Coast. This country has an abundance of natural resources. Basically, agriculture, mining and oil will be the biggest chances, but buildings, tourism, education and health will be important sectors, too.

How about the construction market? Where exactly does Ivory Coast need Sika?

Technically, the construction market is at a basic level. We have some old buildings here from the 70s. From 2002 (the first big crisis) until 2012, construction halted entirely. Today we have new needs and new and modern constructions (hotels, roads, bridges, hospitals) which are realized in partnership with foreign investors.

Our job today is to inform and train all the economic construction players (contractors, retailers, control office for construction and government) in our technical and innovative solutions for buildings and promote them. We want to drive market transformation.

Can you see any new trends in construction?



Opening of the new pump in the village of Assamoikro. Mr Yao, Sény, Jean-Jacques, National Director, Habitat for Humanity Côte d'Ivoire, is on the left of Didier Faure. Sylvie Senin, Controller of Sika Ivory Coast, on the right.

Most of the architects and designers have undertaken some of their education in Europe, so today the trends are similar to the ones in Europe.

Are there any extraordinary Sika projects in the country you would like to tell us about?

Sika has been involved in the refurbishment of Abidjan cathedral – the first roof was made in 1982 with Sika membrane. After the war, the roof needed major refurbishment and Sika was chosen by the government to undertake this. The job was completed in 2015 with a blue Sarnafil membrane (photo p. 12-13).

Furthermore, Sika partnered up with Habitat for Humanity to take part in an assistance program to provide six villages with potable water. You can see the results on You Tube video: <https://youtu.be/WV8npWukEio>.

Where is Sika Ivory Coast headed? What are its targets?

Sika is the leader in the refurbishment market (without tile adhesive), and second in admixtures and sealing and bonding. The other target markets have not been representative until now. The aim is to be the leader in all target markets as soon as we can deliver products from our plant. We want to produce high-quality mortars (tile adhesive, refurbishment and floor hardeners), high-quality admixtures and local silicone.

For the roofing market we want to expand on our success from the cathedral to boost this new technology. In flooring we expect to develop flooring resin (epoxy and polyurethane) in the new factories.

What are the best things about living in Ivory Coast? What do you personally enjoy the most?

Without any doubt the happiness of the



Through the production of coffee and cocoa, the country was an economic powerhouse in West Africa during the 1960s and 1970s.



Located in the tropical zones of the continent, there are a wide spread of flora and fauna.

people, and for those who enjoy the sunshine, we have nine months of summer and no winter.

What do you personally wish Ivory Coast for the future?

I wish for political stability and more education for the young. Education will be the main issue for the success, growth and development of the country. <



NATURE AND HUMANS STRIKE A BALANCE

The Global Nature Fund (GNF) is a non-profit, private, independent, international foundation for the protection of nature and the environment registered in Germany. The organization has offices at Lake Constance, Bonn and Berlin in Germany.

TEXT: KLAUS STRIXNER, ASTRID SCHNEIDER
PHOTO: GLOBAL NATURE FUND, FOTOLIA

- > Founded in 1998, GNF's work and objectives focus on initiating and implementing specific and tangible projects for preserving and protecting nature, the environment and biological diversity, chiefly concerning migrating species, their habitats and their migratory routes. Furthermore, GNF develops model projects aimed at promoting a sustainable economy. In order to achieve this, GNF organizes events dealing with the protection of nature and the environment and promotes international conventions on species protection.
- In 1998, GNF launched the Living Lakes network. Living Lakes is a global partnership of environmental organizations striving to protect lakes and wetlands worldwide. Since its first distinction in 2006, the global Living Lakes network has been permanently recognized as an "Official Project of the UN Decade of Education for Sustainable Development 2005-2014." In November 2013, the National Committee of the UN Decade "Education for Sustainable Development" even awarded Living Lakes the title "Official Measure of the World Decade."



Since 2008, Sika has been supporting drinking water projects in Africa realized by GNF. As a result of these actions, in Burundi more than 5,000 people, especially children, now have access to clean drinking water in the villages of Kagwema and Rukaramu, north-west of Burundi's capital Bujumbura. In Kenya, residents of the village of Kandara, about 30 km north of the town of Thika, have had access to clean water since 2014.

In addition to these activities, four more water projects are currently being realized in Ivory Coast. In 2010, the first water projects were carried out in the regions of Man and N'zi Comoé: the villages in need of pump repairs were selected in close cooperation with the local project partners.

By the end of 2012, a total of 24 wells had been repaired and by the summer of 2013, another 20 wells had been put into operation. With 26 wells in a further 18 villages being fixed in 2014, access to clean and fresh groundwater has now been provided to the residents of 44 vil-



Access to clean and fresh groundwater has now been provided to the residents of 44 villages in total in Ivory Coast.

lages in total. More than 24,000 Ivorians are currently supplied with fresh water as a result of the projects, and can thus hope for a better future.

The residents of all villages have been ac-

tively involved in the projects. They have established water committees involving women and men with specific functions and areas of responsibility and thus manage the water distribution in the commu-

>

SINCE 2008, SIKA HAS BEEN SUPPORTING DRINKING WATER PROJECTS IN AFRICA



Udo Gattenlöhner.

- > nities themselves. Technicians, trained in the technical maintenance of the pumps at the beginning of the project, are responsible for maintaining the wells. Others take care of hygiene education in the village; still others are in charge of financial management. The inhabitants of the villages have agreed that each pump user will pay a small annual fee in order to cover future maintenance costs for the installed facilities.

To learn more about the projects and the people behind them, we jumped into our car and drove to Lake Constance, which is only one hour away from our offices in Zurich, to meet Executive Director Udo Gattenlöhner.

Mr. Gattenlöhner, could you tell us how the idea first came up to create an NGO like GNF?

GNF was founded in 1998 as a kind of international sister organization to the German environmental NGO "Deutsche Umwelthilfe" (Environmental Action Germany). At that time, GNF had the opportunity to launch a global Lake Net-

work with financial support from the private sector, namely from companies such as Unilever, Lufthansa and Daimler.

What was your professional life like before GNF? Have you always worked in the NGO scene? And what drove you to choose this field?

Even while still at school I was fascinated by nature and wanted to work in the environmental sector. I did my compulsory community service with an environmental NGO and chose my degree (Agricultural Sciences) with this goal in mind. After graduating from university, I was lucky enough to be given the opportunity to work for an NGO.

Sadly the world today has many areas, both natural and human, that are in need of improvement. How do you decide which projects you take on?

GNF's main competence lies in the field of water ecosystems and international cooperation. A major orientation is provided by our statutes, defining the will of the founders. However, there is a certain amount of positive opportunism that plays a role in project selection as well, as one can only select and realize projects that are financially feasible.

How many employees do you have who work directly on the projects? Are there also local people on site who support the work or carry it forward after you are gone?

GNF has 14 permanent staff. Networking is in our DNA – so to speak – and it is part of our philosophy to realize all our projects in close collaboration with local partner organizations, building on their experiences and expertise.

Your "Living Lakes" project has a mandate from the United Nations. What does that change for the project?

It is a great honor and "morale booster" for GNF and all Living Lakes partners that the network has been recognized as an "Official Project of the UN Decade of Education for Sustainable Development" from 2005 to 2014. As environmental education plays an important role in almost all our activities, this designation means a lot to us and has helped promote our projects.

What, for you, is special about the drinking water projects in Africa?

Despite UNESCO's 2015 "Water for a Sustainable World" report stating that progress has been good on providing improved access to clean drinking water, 748 million people still lack access to safe and clean water. Especially rural and poor regions in Sub-Saharan Africa face various drinking water and sanitation problems, as they are economically unattractive in terms of government or private water company investment due to low income, poor education and poor infrastructure. As limited access to clean drinking water must be seen as the major cause of health problems and poverty for millions of people in these parts of Africa, GNF tries to focus on these most vulnerable regions and communities. <



GETTING THE SALT OUT OF WATER

About 70% of the earth's surface is covered with water. However 97% of the water on the earth is salt water. Salt water is filled with salt and other minerals, and humans cannot drink it. Less than 1% of all the water on earth is fresh water that we can actually use. We use this small amount of water for drinking, transportation, heating and cooling, industrial, and many other purposes.

TEXT: ASTRID SCHNEIDER
PHOTO: SIKA AG, FOTOLIA

- > Most of the modern interest in desalination is focused on developing cost-effective ways of providing fresh water for human use. Along with recycled wastewater, desalination is one of the few rainfall-independent water sources. Due to the relatively high energy consumption involved, the costs of desalinating sea water are generally higher than the alternatives (fresh water in the form of surface water such as rivers and lakes, groundwater, water recycling and water conservation), but alternatives are not always available and rapid overdraw and depletion of reserves is a critical problem worldwide.

>

To ensure the watertightness of the structure, crack bridging properties are also essential. The waterproofing material has to withstand abrasion caused by sand from the seawater, and has to be chemically resistant against saltwater and every chemical used in the de-mineralization and re-mineralization process.







After the appropriate professional surface preparation by high-pressure water jetting, all surfaces are leveled with Sikagard®-720 EpoCem, followed by an epoxy primer, SikaFloor®-156. Every inch of the surfaces, covering 20,000 m², spray Polyurea, Sikalastic®-841 ST.

> In 2002 there were about 12,500 desalination plants around the world in 120 countries. The most important users of desalinated water are still in the Middle East and North Africa. Among industrialized countries, the United States is one of the most important users of desalinated water, especially in California and parts of Florida. The cost of desalination has kept it from being used more often. Desalination is also used on many sea-going ships and submarines. One of the largest percentages of desalinated water used in any country is in Israel, which produces 40% of its water for domestic use from seawater desalination.

The Ashdod Seawater Desalination Plant is located in Ashdod, Israel, some 40 km along the coast from Tel Aviv. Construction took place between 2012 and 2015, and the final result was a 20,000 m² plant with a production capacity of 100

million m³ per year set up for the seawater reverse osmosis desalination process. Reverse osmosis is a water purification technology that uses a semipermeable membrane. The various areas of the plant, such as intake chambers for the seawater, preparation basins, disinfection areas, the purification section and the outlet section have to be protected with a reliable, robust chemical- and abrasion-resistant lining.

The waterproofing material has to withstand abrasion caused by sand from the seawater, and has to be chemically resistant against saltwater and every chemical used in the de-mineralization and re-mineralization process. To ensure the watertightness of the structure, crack bridging properties are also essential. After the appropriate professional surface preparation by high-pressure water jetting, all surfaces were leveled with

Sikagard®-720 EpoCem, followed by an epoxy primer, SikaFloor®-156. Every inch of the surfaces, covering 20,000 m², spray Polyurea, Sikalastic®-841 ST.

Finally almost all our fresh water takes the form of ice (69% of it, to be exact). If you could melt all that ice, and the earth's surface was perfectly smooth, sea levels would rise to an altitude of 2.7 km. So we do well to take care of this ice. Furthermore take all the water on earth and you would have a blue sphere less than a third the size of the moon. And whether it is saltwater or fresh, the world's water needs to be sustainably taken care of anyhow. <

One of the largest percentages of desalinated water used in any country is in Israel, which produces 40% of its water for domestic use from seawater desalination.





THE WALKIE TALKIE'S CURVED WALKWAYS

Londoners just love to get high. So much so that if you don't want to wait until then to see the vistas from Fenchurch Street – and what is being billed London's newest public park – then your best bet is to do what we did and make a reservation at one of the Sky Garden's three restaurants.

TEXT: FIONA BRIDGFORD, ASTRID SCHNEIDER
 PHOTO: DOUG MCGUIGAN AT FENLAND FLAT ROOFING, SHUTTERSTOCK

- > When you enter the Walkie Talkie, the building's nickname due to its top-heavy form, be prepared for airport-style security before a lift whizzes you up to the 35th floor. A large viewing deck, bar, restaurants and Sky Garden are included on the top three floors. The building opened the doors to its crowning glory – spectacular views of the city amid a stunning park in the sky.
- At this dizzying 160 m tall, London's distinctive Walkie Talkie building required an exceptional roofing solution. Fenland Flat Roofing and Sika Sarnafil single ply were up to the challenge. Designed by architect Rafael Viñoly and costing over £200 million, 20 Fenchurch Street is a commercial skyscraper in central London.
- Awarded the project in February 2014, a lightweight walkable roof area for the access walkways was required and perimeter edges of the glazed roof to the gar-



Offering outstanding resistance to weathering, including permanent UV irradiation: the track gets covered by SarnaTred walkway tiles, allowing durable and slip resistant access for maintenance workers – a vital safety consideration.

den and restaurant. The roofing product had to be carefully selected as it needed to curve in two directions due to the unique design of the building.

Sarnafil G410-12EL single ply provided the perfect solution to this design criteria, thanks to its excellent flexibility and weldability, while offering outstanding resistance to weathering, including permanent UV irradiation. This was installed in Lead Grey to the BMU Track and covered with SarnaTred walkway tiles, allowing durable and slip resistant access for maintenance workers – a vital safety consideration.

The second part of the project was to provide a flexible high performance waterproofing membrane to the bespoke Shoulder areas in white, to match in with the steelwork structure color.

The Walkie Talkie project stands out due to its sheer size and height, creating challenging access issues. As there was no scaffold available, the Fenland team had to work off harnesses and



safety lines on a leading edge and had to traverse the glass roof of the building to access the work area. All tools and equipment had to be properly secured at all times. To maintain the most stringent health and safety standards required diligence and planning, rewarding workers with stunning views across London.

High skill levels were required to overcome the various tricky details on the roof and the team had to interface with multiple trades. Internally the Walkie-Talkie provides a mixture of 1,208 m² of retail space and 63,174 m² of top quality offices with panoramic views of London.

>

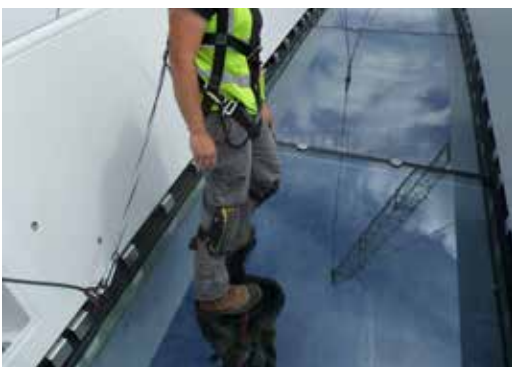
THE WALKIE TALKIE PROJECT STANDS OUT DUE TO ITS SHEER SIZE AND HEIGHT

- > It has been awarded a BREEAM excellence rating together with being named one of London's most sustainable buildings.

But how's it hanging up there as a worker? Fearless construction workers were spotted and they know they are safe. It is not only because of their safety harnesses and the helmet but also the walkway tiles there were installing cover these security aspects like non-slip and long-life: and these facts they not only know but feel on sight working while looking over London's skyline. In the future other workers will use this track for maintenance work.

And is there another way to get into the building than queuing? Climbing? Well, maybe. We asked the reservation teams while we were there and apparently if you try your luck after 6pm on weekdays you're reasonably likely to be able to get up there for a drink. Good luck! <

Tree hoisted to the top of the Walkie Talkie: <http://youtu.be/HFcWD0z1yes>
Sky Garden: <https://vimeo.com/113375223>





DIGITAL FABRICATION

Concrete canoe racing began in Germany in 1986 when the first competition was held in Limburg an der Lahn. Competitions were held every two years until 2002. Then after a three year lag, the competition was reinstated in 2003 in Heidelberg. When the 11th Deutsche Regatta was held in 2007 in Hanover, the top three finishers in both the men's and women's races automatically qualified to paddle against the world champions at WM 2007.

TEXT: HANNES HELLER, BETONKANUVEREIN ETH, ASTRID SCHNEIDER
 PHOTO: HANNES HELLER, BETONKANUVEREIN ETH

> By 2011, over 90 teams were registering for the German nationals, with participants coming from a number of other countries including Switzerland and the Netherlands. In 2014, Dresden reciprocated and fielded the lightest entry in the Netherlands.

As in past years, a group of students from ETH Zurich, Switzerland, competed in the German "Concrete Canoe Regatta", this year taking place in Brandenburg/Havel in Germany. The challenge of

building a boat and surprising the jury with fundamentally new concepts and innovative ideas every two years pushes students to find new ways to convert cement, water and aggregates into a floating structure. This year, two groups of three students in civil engineering built two boats using robotic fabrication. Prof. Robert Flatt of the Institute for Building Materials at ETH invited his students to implement two ongoing research projects in this field: Smart Dynamic Casting and Mesh Mold.

Mesh Mold is a project of the chair for architecture and digital fabrication in collaboration with Sika Technology AG. The technology aims to merge the two conventionally separate, labor and cost-intensive aspects of concrete construction: reinforcement and formwork. This not only allows a more efficient use of material, but also enhances the fabrication of geometrically complex load-bearing concrete structures by using the high spatial coordination of robots. The shape >



Finding ways to efficiently build freely shaped concrete elements using a digital means of fabrication was the target.

- > of the “Queen ElisamEshTH” is the one of a traditional canoe, an already existing 3D model that was downloaded from the Internet. A 3D printer printed the plastic mesh mold for the boat, which was reinforced with carbon fiber due to the poor strength of the material and filled manually with two different types of concrete: one with lightweight foam glass aggregates and another with aerogel aggregates and a white cementitious binder.

Smart Dynamic Casting (SDC) is a project of Gramazio and Kohler Research with similar motivation: finding ways to efficiently build freely shaped concrete elements using a digital means of fabrication. The concept is a sliding formwork with the ability to change its shape during the process. The shape of the canoe was determined first of all, and then a special formwork was designed for it. The building process had to be carefully planned and optimized over the course of many trials. Concrete quality and rheology were crucial. Pressure and friction changes inside the casting on top of the thin wall challenged the team to the last centimeter of production. A structure over four meters high was achieved in



two days, setting a new height record for the young SDC technology. The rear and bow of “S2D2©” were added by using conventional casting.

Sika has been sponsoring the association’s participation in the race since 2011. The concrete for “Queen ElisamEshTH” was inked with Sika ColorCrete to get an even sharper contrast against the white Aerogel concrete. It was a concrete mix with a very low W/C value, so with the aggregates used it resulted in a creamy

consistency. It turned out that the mixture without additives had the best properties for the specific mesh size. Sika Accelerator Superplasticizer ViscoCrete-20 HE was used for the white parts of “S2D2©”.

The teams from ETH Zurich have won several prizes since the competition first took place. Two years ago, they received an award for their on-site canoe that was built the very morning before the race. This year, “Queen ElisamEshTH” won the



The shape of the canoe is traditional, an already existing 3D model that was downloaded from the internet. A 3D printer printed the plastic mesh mold for the boat.



prize for engineering and "S2D2©" (at almost 300 kg) the award for the heaviest boat in the race.

"We weren't so successful in the races, but it's not all about the prizes", says

Pirmin Scherer, President of the Concrete Canoe Club ETH. "The whole project of building the boats, organizing everything with the help of many fellow students, researchers and sponsors and then taking part in the whole event was an in-

credible experience." And as the boats disappear into the cellar, everybody is already thinking about the canoes for the next Regatta. <

A BIRTHDAY TO CELEBRATE PROVEN DURABILITY

Whether you are a building owner, design professional or roofing contractor, choosing the right commercial roofing system for your building or project is one of the most important decisions you will make. The right roofing system will protect your investment for decades, while the wrong roofing system could result in costly repairs, damage to the building and its contents and possibly an early tear-off and re-roof.

TEXT: ASTRID SCHNEIDER
PHOTO: SIKA SERVICES AG

Hahn und Korb Administration and Logistic
Center, Germany

Project year: 2013





Saint Doulchard Medical Center, Cher, France
Project year: 2010



Tempodrome, Cologne, Germany
Project year: 2001

> To help you make an informed decision, Sika describes commercial roofing systems to help you choose one that best fits your needs. One of the greatest challenges and needs is long-lasting and reliable durability when you build a roof. The Sarnafil® T roofing system has proven long-term stability in respect of membranes waterproofing mainly flat roofs. The first Sarnafil® T roofing system was installed in 1988 in Sarnen, Switzerland. According to a sample which was cut out from this roof in November 2013, today in 2015 that roof is still in absolutely perfect condition. But what does “absolutely perfect condition” mean?

After 27 years there is still no moisture in the roof structure and the quality of the product is similar to the newly produced material. The material is still elastic, flexible and has easy and safe weldability at any time.

“We investigated a selection of Sarnafil® projects that are 25 years old. The performance and durability of Sarnafil® membrane are proven through time by hard facts and figures. We don’t know of any other manufacturer who is comparable in the market regarding the quality of the products and the sense of responsibility

towards society,” states Stephan Wehrle Dipl. Ing. (FH) Institute for Construction Protection, Construction Materials and Construction Physics, Germany.

To support the customer in reaching a decision Sika commissioned an expert report in August 2014, which concerns the durability of polymeric roofing membrane types Sarnafil® TS and Sarnafil® TG. It is based on a study of five 17 to 25 year old roofs, plus 158 additional roofs that were investigated and assessed by Sika personnel in a field survey, and also including Sika’s internal production monitoring data and test results. The results of this long-term study and the 25 years of proven, positive experience for the durability of Sarnafil® TG and Sarnafil® TS suggest that, given standard roof conditions and use in compliance with the products’ application and maintenance requirements, the Sarnafil® TG polymeric roofing membranes will continue to fulfil their waterproofing function for many more years.

What was the conclusion of all that? Like every birthday child you are proud of, there was a great cake – the Sika Sarnafil® T cake. Looking forward to many more roofing projects to come! <





Inside of Ronald McDonald Center Only Friends
Amsterdam, The Netherlands



Ronald McDonald Center Only Friends Amsterdam, The Netherlands
Project year: 2010

SWIM WITH THE CURRENT

The swimming facilities in Geiselweid were built more than 100 years ago between 1908 and 1911 in Winterthur, Switzerland. Progress in building with reinforced concrete had made it possible to get away from natural waters and swim also in artificially constructed pools too. This swimming pool has long been one of the largest in the country. However, the eye-catching building with a curved roof and pointed clock tower unfortunately had to be rebuilt.



- > The lawns at the back and on the roof of the neighboring indoor pool gave it a large and airy feel. Behind the pump house is a separate teaching pool and a sunbathing area.

A previously gender-separated, now mixed sun deck is located by the low wooden bunks. Today there are sun loungers on the edge of the basin. On Saturday mornings, early birds welcome the sun with power yoga for inner and outer balance.

The renovation of the pool was delayed by several years. The groundwater had increased greatly through leaks in tanks and pipes. Vines twisted around crumbling concrete, and warped, rough boards surrounded the pool. Lichens had covered the diving tower's scaffold ages ago.

From 2007 to 2009, the outdoor pool was finally renewed and refurbished. It now offers a competition-grade Olympic pool and an adventure pool with a flow channel and wide slides. The special attraction is the largest natural pool in Switzerland.



During works of refurbishment.

land. Expansive lawns, a barbecue area, playing fields, a beach volleyball court, slacklines and much more leave nothing to be desired. Disabled extensions, a cozy restaurant with sun terrace and a store ensures that every guest enjoys added value.

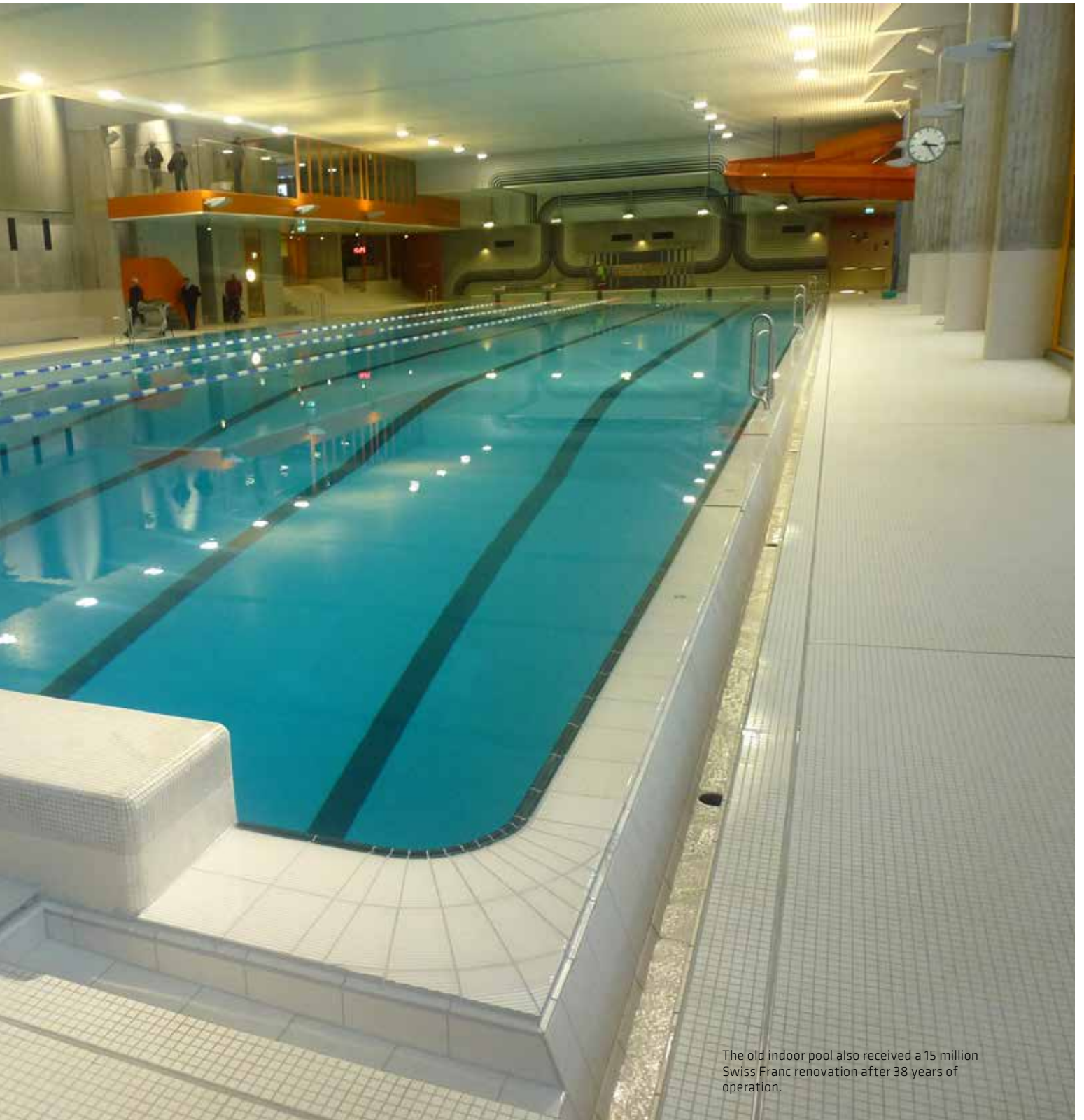
Finally, the old indoor pool also received a 15 million Swiss Franc renovation after 38 years of operation. Besides aesthetic aspects, such as brighter ceilings and a more open entrance area, the swimming pool surround was raised to the water level, making it easier to get into the water. Additionally, the newly installed video surveillance system "Angel Eyes" increases safety for visitors.

For this refurbishment, Sika Switzerland's support was needed in the planning and execution. It had to be a fast construction process with an easily applicable waterproofing solution and an efficient floor structure. The "Angel Eyes" had to be installed and sealed. The floor had to be highly mechanically and chemically resistant in order to withstand chlorine water and aggressive cleaning agents.

Due to the influence on the concrete concept and decoupling and isolation of the pool surrounds with Sika® Permat, the newly concreted subsurface was only covered one month afterwards, instead of the normal waiting time of six months. The concrete joints were waterproofed with the Sikadur®-Combiflex SG System. The extensive sealing of the pool surround was done using Sikalastic®-1K, a flexible fibre reinforced waterproofing mortar.

Now the inhabitants of Winterthur have something to look forward to again: even when it's raining and cool outside, which may well be the case for two thirds of the year, you can go swimming indoors. If you can't swim, take a lesson. And if you are getting bored of swimming, visit the sauna, which goes up to 100°C. Then no one can complain about the cold Mid-European climate of Switzerland. <





The old indoor pool also received a 15 million Swiss Franc renovation after 38 years of operation.



LIGHTS, CAMERA, ACTION!

MediaCityUK is an 81 ha mixed-use property development site on the banks of the Manchester Ship Canal in Salford and Trafford, Greater Manchester, England. The project is being developed by Peel Media, and its principal tenants are media organizations and the University of Salford. The land occupied by the development was part of the Port of Manchester and Manchester Docks. Considered a flagship facility for the UK's biggest commercial program provider, MediaCityUK is home to over 500 staff, including teams.

TEXT: CHERYL DOUGLAS, ASTRID SCHNEIDER

PHOTO: MANCHESTER TV STUDIOS

- > The BBC signaled its intention to move jobs to Manchester in 2004, and the Salford Quays site was chosen in 2006. The Peel Group was granted planning permission to develop the site, and the development was constructed with its own energy generation plant and communications network. Based in Quay House, the principal tenant is the BBC, whose move marks a large-scale decentralization from London. ITV Granada completed the first phase of its move to MediaCityUK on March 25, 2013, followed in two stages by the northern arm of ITV Studios: the second stage involved Coronation Street being moved to a new production facility on Trafford Wharf (next to the Imperial War Museum North) at the end of 2013. The Studios on Broadway houses seven high-definition studios, claimed to be the largest such facility in Europe.

Considered a flagship facility for the UK's biggest commercial program provider, the Orange Tower is home to over 500 staff including teams from CITV, Granada Reports, factual, entertainment, drama, post-production and various business support services.

MediaCityUK is also home to the world's

longest-running drama, Coronation Street, which is produced from a state-of-the-art production center based on a 7.7 acre site. When the first episode was aired on December 9, 1960, it was not initially a critical success, but in 2010, it became the world's longest-running TV soap opera in production.

For the construction of ITV's new Coronation Street studios in Trafford, MediaCityUK required perfectly smooth antistatic floors to facilitate the fluid and safe movement of HD camera equipment. This called for an innovative solution in the form of self-smoothing, epoxy resin floors. A Sika UK flooring system has provided the perfect platform from which to film Britain's longest-running soap.

Designed for use in areas with sensitive electronic equipment, the approved industrial flooring was expertly applied by Sika across four studios totaling 3,800 m². The wealth of experience in delivering TV studio-quality flooring and close collaboration with the main contractor throughout the three month installation in Salford, Manchester both contributed to a successful outcome.

The finished floor was flat to within 1 mm over a 3 m straight edge, which exceeds British Standards. Adrian Bleasdale, Project Leader at ITV, said: "We found the teams at flooring contractor Zircon Flooring and Sika easy to work with and proactive, and the finished floors are absolutely fit for purpose." Richard Kay, Sika Flooring Area Manager for the North West region, said; "ITV Studios may be home to the world's most famous cobblestones, but behind the scenes studio floors are required to be perfectly smooth to ensure the highest standards of filming."

"We were delighted to deliver one of our flooring systems to such an iconic project in conjunction with our highly-skilled approved contractor Zircon Flooring, who delivered a first class project." Stewart Draper, Director at Zircon Flooring, and his team – which included son Keelan Draper, who has recently achieved the NVQ2 in situ resin floor qualification from FeFRA, the resin flooring association, delivered the project to schedule and budget.

Stewart added: "Given the state-of-the-art equipment found in studios it is im-

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Close up of new finished floor.

- > portant to opt for flooring systems with anti-static features to prevent electrostatic discharges from operatives damaging sensitive electronic components. Having worked closely with Sika over the past decade we have got TV studio flooring off to a fine art and the finished floor in gray looks absolutely superb." The Sikafloor®-262 AS system for normal to medium-heavy wear is available in a wide variety of colors and is suited to a range of applications including computer rooms, car manufacturing plants, power plants, laboratories and hospitals. <



© Manchester TV Studios



© Manchester TV Studios

Breaks are essential: Stewart Draper, Director, contractor Zircon Flooring, serves at the bar.



© Manchester TV Studios



ABOUT THE SUCCESS OF A SWISS WINDOW MANUFACTURER

If the recent addition of a new 6,500 m² PVC windows factory in Brugg, Switzerland, to the existing production site at Veltheim makes one thing clear, it is that the company is growing. Its focus is on the provision of single-source design, production and installation solutions to meet enhanced quality standards. We talk to **MARCEL BEGLINGER** and **SAMUEL LÜSCHER**, Chief Executives of BL Fenster AG, a company with one of the highest growth rates among aluplast's partners.

TEXT: JÖRG PFÄFFINGER

PHOTOS: BL FENSTER AG, FOTOLIA



> **While some of your competitors are shifting production abroad, you are expanding in Switzerland. How have you managed that?**

Marcel Beglinger: We reckon that a strategy of highly automated production by a skilled, committed workforce and within easy reach of our customers will pay dividends in the long run. Many in the industry see the growth in cheap imports from abroad as potentially damaging.

Samuel Lüscher: In Switzerland, for example, a prefabricated single-family house can be erected on site within 48 hours. That's not feasible if you're working from abroad.

How has your company managed to grow despite the proximity to the German border?

Lüscher: I think that enough people will always want to live, work and earn money here in Switzerland. With imports, things don't always run smoothly.

Beglinger: Our local presence close to customers allows us to respond promptly. Production, which accounts for 21 of our 85 employees, is only one part of our start-to-finish services. We cover everything from initial measurement to on-site assembly. Some companies just specialize in fabrication and let other providers handle installation and support. Our mission is to provide a full-range service for customers. If you include the import logistics costs in the equation, then our locally based approach is barely more expensive.

Lüscher: Price comparisons should always be based on the cost of a fully installed window. You can't simply compare a punched window product with an installed, full-height unit complete with structural connections and extension profiles. A further factor is the Ordinance on the Supervision of Private Insurance Companies (AVO), which is mandatory in Switzerland. What ultimately matters is the finished product with warranty. Our best argument, as a Swiss company, is to deliver a quality product with professional support. If we achieve that, then we will more than make up for any small percentage difference in costs. We succeed simply by outperforming the importers.

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The consistently high quality of our products is largely due to the method of bonding the insulating glass in the sash frame – what we call the 'bonding inside' technology.

> **Your customers have obviously rewarded you for the quality standards you have upheld over the years. What sets your windows apart?**

Beglinger: The consistently high quality of our products is largely due to the method of bonding the insulating glass in the sash frame – what we call the 'bonding inside' technology. We have applied this process, with products supplied by Sika, for nearly seven years and have so far bonded some 70,000 units.

Lüscher: A bonded window is not just a cheaper window, it's also a better window. This has been and remains our message. We can deliver consistent quality without steel reinforcement. Our products are no more expensive than steel-reinforced products while offering superior performance.

What features underscore the superior quality of your windows?

Lüscher: Bonded windows offer greater structural stability. That explains the almost complete lack of damage during transportation and assembly. At the same time, the use of more robust components has also enabled us to expand our range of products. Recent orders, for example, have included some 85 large-

format, bonded-sash assemblies of a kind we have never produced before and which would have been unfeasible without this technology. For us, bonding has opened up new markets for this type of product.

How did you implement this technology in your company?

Beglinger: We started off with manual fabrication. In September 2014, after a contract for which we used a semi-automatic system, we proceeded to launch our fully automated production line. This has enabled us to boost production at the new plant by 50% since 2013. We recorded 43% growth in 2014 and expect around 25% this year. We still have ample spare capacity and expect to achieve double the 2013 output in 2017. That is our phased growth model.

You mentioned that bonding technology has significantly reduced the support effort.

Lüscher: We now keep sashes and frames strictly separate in terms of both manufacture and delivery, even on refurbishment projects. That's one of the benefits of our highly automated production system, which allows us to work to the

finest of tolerances. This vastly reduces the need for post-installation works, such as fine adjustment. I always cite the '1-10-100' formula: if something is not working properly during production, the effort needed for rectification is of the order of 1. If a problem is identified during a post-production inspection, this effort is of the order of 10. And if the flaw is detected on site, then the effort is of the order of 100. Remedial works, such as the tightening of a screw, that take a matter of minutes at the plant may easily require one hundred times as long as a support service. A good window should work immediately after installation and one adjustment, and shouldn't need any later fine adjustment. That is the bar we set ourselves. As I see it, the need for fine adjustment is merely a symptom of prior imprecision and is therefore something we can eliminate.

Beglinger: The segregation of sashes and window frames ensures trouble-free production while also facilitating transportation and on-site assembly. It also gives us greater freedom during manufacture, the sashes and frames being produced by separate teams whose work requires no coordination. This minimizes redundancy. It is also possible to manufacture the

A BONDED WINDOW IS NOT JUST A CHEAPER WINDOW, IT'S ALSO A BETTER WINDOW

window frames prior to glass delivery. The glazed sashes are then produced at a later point in time.

Lüscher: The PVC windows of some of our competitors are glazed on site, with all the attendant risks: not just glass breakages, but also when shimming with setting and edge blocks. We don't face those problems.

What are the advantages during manufacture?

Lüscher: Use of the Lemuth gluing station and bonding without hanging the sashes allows cycle times of 70 seconds to be achieved. That includes feeding, bonding and forwarding. The new high-temperature welding system on our sash production line further speeds up operations. The average 1.5 sashes per window needed in Switzerland make it important to minimize cycle times.

Beglinger: Practically all big-name window manufacturers in Switzerland capitalize on the benefits of bonding technology. Bonding also allows us to dispense with steel reinforcement, which is both costly and structurally redundant. Aside from that, all windows made from sections developed for shimming cannot be

handled by glazing robots. And we plan to use these robots on our production line from 2016 onwards. Even today, our plant enables us to achieve industry-grade glazing standards. <



