



# CONCRETE SIKA WET PRECAST TECHNOLOGY

MORE THAN ADMIXTURES

BUILDING TRUST



# SIKA WET PRECAST TECHNOLOGY

Will change your construction durability dramatically!







Plan Sonora Proyecto, Mexico



Segment production Weinberg Tunnel, Switzerland



Viaduct de Herve and Battice, Belgium



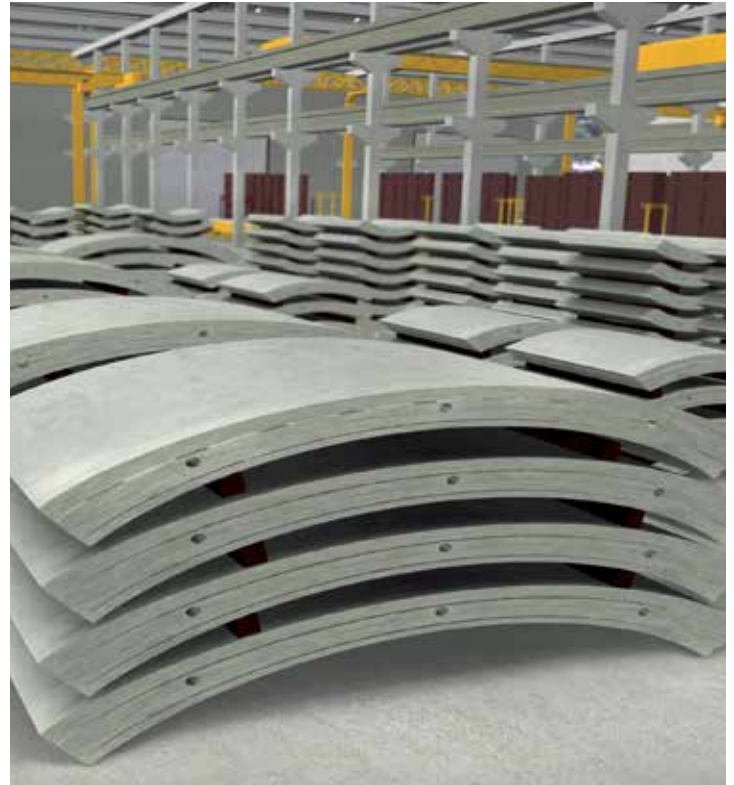
# INTRODUCTION

## Solutions with Sika® Wet Precast Technology

In the precast concrete industry, a concrete element producer sells a finished technical product, though its quality and surface appearance are the producer's calling card. The precast concrete element producer bears responsibility for technical performance, compliance to standards and durability of products. The production process for precast concrete elements is increasingly industrialized, and efficiency is essential.

Because they execute the entire production process, precast concrete element manufacturers encounter a myriad of requirements. In addition to being efficient the production process should be sustainable and environmentally friendly, holding the CO<sub>2</sub> footprint of the product to a minimum. Besides ecological concerns, health and safety of workers also continues to grow in importance.

Structural design and construction with precast concrete elements requires versatile chemical products, from wet precast production to erection on site. Sika, a full range supplier, meets the diverse complexity of the entire precast concrete element production and construction process with solutions for all requirements.



Concrete Production	Surface Appearance	Repair & Protection	Sealing and Bonding
SikaPlast®	Sika® Rugasol®	Antisol®	Sikaflex®
Sika® ViscoCrete®	SikaFilm®	Sikagard®	Sikadur®
SikaRapid®		Sika® MonoTop®	Sika® AnchorFix®
Sika® Stabilizer		SikaGrout®	
SikaFume®			



# FORMWORK PREPARATION

High quality and performance proven form release agent

The use of mold release agents is imperative for production of long-lasting, high quality concrete products. Agent application must be fast and easy. Ease of thin-film application is crucial, because film thickness is decisive for achievement of high quality concrete surfaces.

**Sika Formol** is a chemical release agent designed and formulated to function as a bond breaker between formwork or moulds and freshly placed concrete. It is also used as a general purpose release agent on the construction site and is ideal for application to a wide range of surfaces such as timber, steel or fibreglass.





# CONCRETE CONCEPT

Innovations like Self Compacting Concrete offer amazing advantages

The concrete concept drives the precast concrete element production process and has an essential impact on process timing. Concrete production, installation and curing must therefore be kept as short as possible. This has consequences regarding concrete technology.

Requirements influencing precast concrete production are excellence of concrete surface appearance, high compressive strength and high durability. The production steps of batching and mixing, transport, compaction and finishing must also be considered within a concrete concept.

With advanced concrete technology and suitable admixture application, adequate workability, rapid installation and subsequent fast strength development of the concrete can be ensured where fast strength development is critical for swift production. Application of innovative concrete mix designs such as Self Compacting Concrete (SCC) offer further advantages. Besides rapid installation, vibration work can be eliminated, substantially improving the working environment in a precast concrete factory.

The latest concrete admixture technology can improve concrete production and achieve the following advantages:

- Cost efficient concrete mix designs
- Production of high strength, highly durable concrete
- Application of Self Compacting Concrete
- Reduction or elimination of heat or steam curing
- Sustainable and environmentally friendly production
- Reduction in noise by vibration



# SUPERPLASTISER TECHNOLOGY

## LATEST SUPERPLASTICISER TECHNOLOGY OFFERS SOLUTIONS TO ALL PRECAST PRODUCTION CHALLENGES

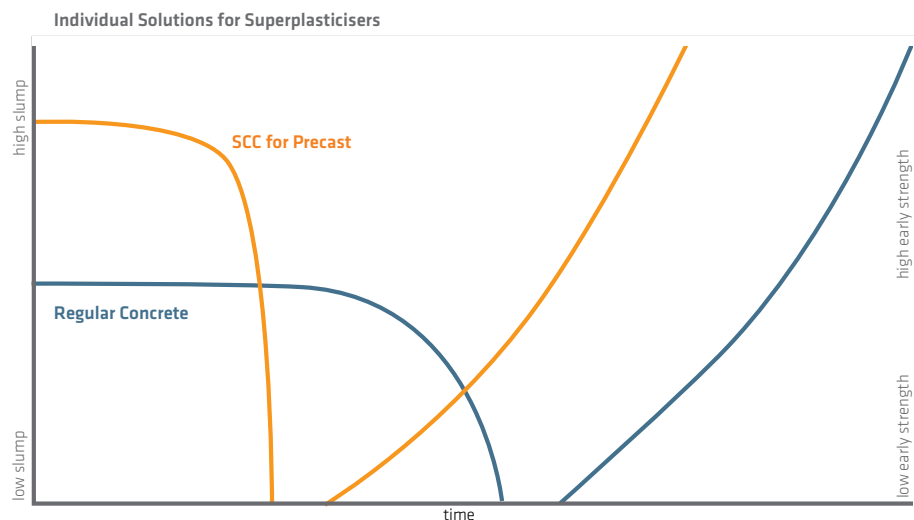
High strength concrete types are used increasingly in the precast concrete business. The quality of the final element, and thus the quality of the concrete, play central roles. Concrete quality and durability are therefore constantly improved. Precast concrete plant processes are evermore industrialized. Timing is more and more important. Concerns regarding factory working environments are rising. Innovative technologies and concrete types such as

Self Compacting Concrete are being utilized, which result in improved working conditions, since vibration work is eliminated and noise thereby significantly reduced. Superplasticizers based on polycarboxylate ether (PCE) technology contribute to these developments and factors. Their application is becoming indispensable.



THE **SIKA® VISCOCRETE®** PRODUCT RANGE IS AN INNOVATIVE POLYCARBOXYLATE BASED ADMIXTURE TECHNOLOGY CAPABLE OF OFFERING SOLUTIONS TO ALL PRECAST CONCRETE PRODUCTION CHALLENGES.

The application of **Sika® ViscoCrete®** can ensure substantial water reduction with adequate workability and slump life in combination with fast early strength development. **Sika® ViscoCrete®** technology enables the design of polymers in direct regard to fresh and hardened concrete performance. Furthermore, technologies can be combined, allowing easy adaptation of solutions to changing production circumstances.





# ACCELERATION

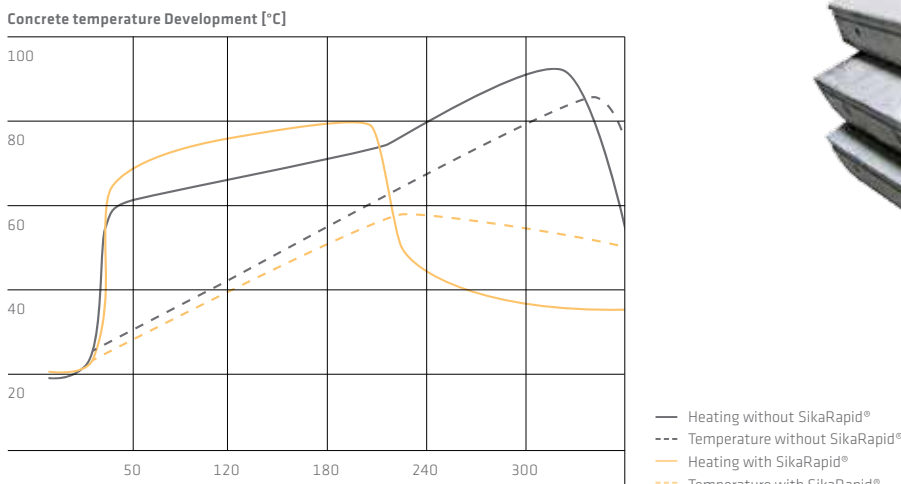
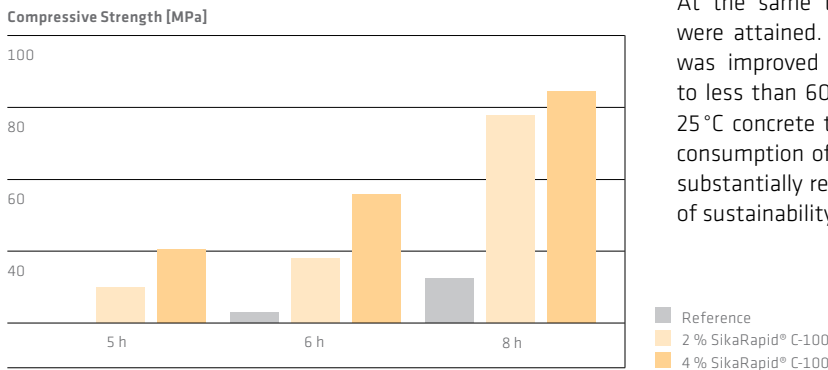
Accelerated Hardening in Combination with resource-friendly Production





The concrete hardening process is a time-consuming step within precast concrete production. On the one hand it is important to reduce the hardening time, which is almost always carried out with the application of heat or steam curing – both highly energy-consuming measures. On the other hand energy efficient and environmentally friendly production processes are gaining importance. Production must be both cost effective and have a small CO<sub>2</sub> footprint. With sound concrete mix design, innovative superplasticizer technology and powerful accelerator technology, the whole production process can be significantly optimized and the energy consumption for heat or steam curing respectively can be either reduced or even eliminated.

## SIKA RAPID® OFFERS ACCELERATED HARDENING WITH NO LOSS OF SLUMP LIFE.



As a result this technology provides solutions for accelerating performance of all concrete types according to different production conditions. Optimized hardening performance of concrete can reduce or eliminate heat or steam curing, speed the turnaround of formwork, making it more efficient and ultimately increasing productivity.

### EXAMPLE TUNNEL SEGMENT PRODUCTION

In tunnel segment production there are two key parameters. It is extremely important on one hand to realize a specified early strength, while on the other tunnels, as complex constructions, must fulfill the highest requirements with regard to durability. The concrete performance regarding these two demands can be enhanced with the **SikaRapid** technology.

The fulfillment of the first target could be achieved by incorporating heat curing in the tunnel segment production concept. In order to reach an early strength of more than 25 MPa it was necessary to apply a heating sequence of more than 5 hours. With the application of **SikaRapid** the hardening process of the concrete was optimized, with the result that approximately 150 minutes of heating could be eliminated.

At the same time the early and final strength requirements were attained. Moreover the durability of the tunnel segments was improved as the concrete peak temperature was limited to less than 60°C. Thereby a significant reduction of more than 25°C concrete temperature could be realized. Overall the energy consumption of the tunnel segment production process could be substantially reduced. This approach demonstrates a high degree of sustainability.



# DESIGN AND PROTECTION OF CONCRETE SURFACES

Flexible processing of concrete surfaces fulfills innumerable customer requirements

## FAIR-FACED CONCRETE SURFACES ARE LOOKED ON AS AESTHETIC ONLY IF THEIR PLEASING APPEARANCE ENDURES.

Thus the design of a desired surface appearance extends beyond basic design criteria to the curing of concrete surfaces within precast concrete production. During the hardening process, unprotected concrete surfaces dry out prematurely. In order to avoid this effect concrete surfaces can be protected with Sika® Antisol®.



The fulfillment of individual expectations with regard to concrete surface appearance can be attained through the following measures or a combination thereof:

- Finishing of surfaces instantly after concrete installation
- Deliberate selection of formwork surface
- Subsequent treatment of concrete surfaces
- Composition in terms of color

Sika supports diversity with selective application of products and technologies. While Sika admixtures open opportunities for concrete design, it is possible to realize fascinating exposed aggregate concrete surfaces with the application of **Sika® Rugasol®**. Mechanically treated or handcrafted, structured concrete surfaces are often underestimated and characterized by a high degree of surface appearance quality. This appearance can be reached with a broom finish or special trowel treatment on a concrete matrix which is prepared with **SikaFilm®**.

To bring the design of molded concrete surfaces to perfection the interaction of concrete mix design, installation technique, formwork type as well as concrete compaction has to be considered with highest priority. Based on the **Sika® ViscoCrete®** technology it is possible to realize complex architectural shapes as well as slender, aesthetic concrete elements with dense reinforcement.





## REPAIR & PROTECTION

### FAST AND EASY REPAIR OF DEFECTS AND EXTENDED LONGEVITY WITH SIKA PRODUCTS



The precast concrete element surface appearance is the calling card of a precast producer. This places high quality requirements on the precast concrete production process. Nevertheless surface defects and broken or spalled edges are unavoidable in production. The repair of defects requires a repair mortar that is easily and quickly applied as well as being highly durable. Moreover, defects should not be detectable following repair; the mortar must present a crack-free and adequate concrete surface appearance. These requirements can be fulfilled with the **Sika® MonoTop®** repair mortar range.

In order to prolong the durability, ensure the brightness of colored concrete elements and avoid the formation of dirt and moss, a protective system should be applied. The **Sikagard®** range of protective systems, easily and rapidly applied, ensures the longevity of precast concrete elements, and the surface appearance can be significantly improved for an extended period of time.

To protect steel tendon against corrosion, Sika can provide with the cement based grout injection **SikaGrout®-300 PT** a durable, well proven solution to fill post-tensioning ducts.



# SEALING & BONDING

Efficient erection and durable connections

The erection of structures and buildings out of precast concrete elements requires connection joints, which must be sealed to ensure function with respect to water tightness, air tightness and insulation properties. Sealing of joints should be carried out with an elastic sealant that is capable of compensating the movements of the concrete elements that occur due to changes in temperature. In addition, the sealant should be easily applicable on different substrates in changing ambient conditions. The **Sikaflex**® product range fulfills all the challenges of these requirements.

The **Sikadur**® product range offers various technologies for long lasting rigid bonding of precast elements, e.g. segmental bridge elements. **Sikadur**® can furthermore be used to rebuild broken edges and effectively repair defects.





## REQUIREMENTS AND APPLICATIONS

### REQUIREMENTS

The wet precast concrete industry is characterized by the production of high quality concrete elements in an industrialized production process. Quality demands focus on both the technical performance as well as the surface appearance of finished concrete products, including the application of colored concrete. Continuous improvement of the production process leads to innovative solutions in manufacturing, placement and finishing, as well as property advances in strength development or treatment steps such as curing.

High quality concrete element production in an industrialized process demands:

- Excellent fair-faced concrete surface appearance of the finished element
- Fast installation of the fresh concrete
- Early and fast finishing
- Rapid early strength development
- Swift and easy application of any repair mortar and protection agents

The need for efficiency in the production process raises additional requirements:

- Safe and easy application of mold release agents
- Cost efficient concrete mix design with optimized utilization of all constituent materials
- Early strength gain with reduced or eliminated heat and steam curing

The overall sustainability of the entire production and construction process is gaining importance; demands on the process and improvements thereof must respond adequately.

### APPLICATIONS

The innovation and development of superplasticizers based on poly-carboxylate ether (PCE) play a major role in enhancing both – technical performance of the concrete and the production process. The application of PCE-based superplasticizers such as **Sika® ViscoCrete®** technology enables production of high performance concrete types like Self Compacting Concrete, High Strength Concrete and Ultra High Performance Concrete.

Challenging requirements with regard to early strength development of the concrete can be fulfilled with a suitable concrete mix design in conjunction with the powerful superplasticizer and hardening accelerator technologies, **Sika® ViscoCrete®** and **SikaRapid®**.

## THE BUILDING INDUSTRY RECOGNIZES THE GROWING IMPORTANCE OF SUSTAINABILITY FOR THE WHOLE PRODUCTION AND CONSTRUCTION PROCESS.

Within the wet precast concrete industry, several opportunities are at hand to reduce the CO<sub>2</sub> footprint of construction overall and improve the working environment.

Opportunities for sustainable wet precast concrete production include:

- Mix design adaptation regarding optimized binder usage, facilitated by **Sika® ViscoCrete®** technology
- Elimination of steam and heat curing with the application of **Sika® ViscoCrete®** technology and **SikaRapid®** technology
- Elimination of vibration with the application of Self Compacting Concrete
- Sealing and bonding of the precast concrete elements with sustainable, long-lasting sealing and bonding technologies like **Sikaflex®** and **Sikadur®**



# SIKA WET PRECAST SOLUTIONS

## OWNER

### REQUIREMENTS

An owner who engages a designer to develop a structure focuses primarily on the investment and maintenance cost in combination with the speed of construction.

This implies:

- High concrete durability and quality
- Overall sustainable construction
- Slender dimensions of structural members
- Aesthetic appearance with fair-faced or colored concrete
- Application of innovative, efficient construction methods

### SOLUTIONS

In order to reach the above-mentioned aims one technological challenge regarding concrete technology is substantial water reduction in the concrete mix, resulting in increased impermeability and leading to higher quality and durability.

This can be accomplished with the **Sika® ViscoCrete®** technology, which furthermore offers:

- Self Compacting Concrete, High Strength Concrete and Ultra High Strength Concrete for slender structures
- Resource-friendly building materials, i.e. optimized concrete mix, leading to a low CO<sub>2</sub> footprint of the construction

The overall durability of the structure is inevitably connected with the durability of the construction joints. The **Sikadur®** and **Sikaflex®** technologies offer long-lasting, innovative sealing and bonding solutions.

## PRODUCER

### REQUIREMENTS

A concrete construction designer is constantly looking for new construction methods and technological possibilities in order to make full use of diverse material properties, leading to cost efficient and fast construction.

Furthermore importance is attached to:

Design freedom and compliance with standards

- Appearance and aesthetics as the designer's calling card
- Prevention of cracks especially due to shrinkage
- Resource-friendly design methods
- Ecologically sustainable building materials leading to a low CO<sub>2</sub> footprint
- High concrete quality offering high durability with low maintenance

### SOLUTIONS

The ability to resist the ingress of pollutants enhances the durability of concrete; this guarantees a structure's engineered properties for a long period of time.

The **Sika® ViscoCrete®** technology offers solutions to this challenge:

- Highly durable, slender precast elements produced with Self Compacting Concrete, High Strength Concrete or Ultra High Performance Concrete
- Precast products with a high degree of sustainability based on optimized raw material utilization
- Significant shrinkage crack reduction

The overall durability of the structure is inevitably connected with the durability of the construction joints. The **Sikadur®** and **Sikaflex®** technologies offer long-lasting, innovative sealing and bonding solutions.





## DESIGNER

### REQUIREMENTS

The industrialized manufacture of high quality precast concrete products presents challenging requirements all along the production process. Sustainability and the CO<sub>2</sub> footprint of the production process is gaining interest, and in addition to ecological concerns, health and safety are considered increasingly important.

Production requirements in detail include:

- Fast and easy application of a thin oil film leading to excellent concrete surface appearance
- Production of high quality concrete with extended durability
- Economic and resource-friendly concrete mix design
- Fast installation and compaction of fresh concrete
- Efficient finishing
- Rapid strength development with shortened curing times
- Reduction of energy cost for steam and heat curing
- Elimination of rejects and overall improved production process
- Fast and easy repair and protection methods

### SOLUTIONS

There are numerous solutions and technologies available with which the complex production process requirements of precast concrete production can be fulfilled. Sika as a full range supplier offers innovative solutions with the following technologies.

**Sika® ViscoCrete®** – the powerful superplasticizer technology offers:

- Significant water reduction with flowable fresh concrete behavior at lowest water/ cement ratios (SCC, HPC and UHPC)
- Ensured, adequate workability and subsequent fast early strength development
- High quality concrete with extended durability performance
- Concrete mix design optimization with regard to economy and ecology

**SikaRapid®** – innovative accelerator technology enables:

- Significantly enhanced early strength development within the first hours
- Reduction or elimination of heat or steam curing
- Ensured workability of the fresh concrete

**Sika Formol®** mould release agent product range leads to:

- Fast and easy application
- Strong release capability, resulting in fair-faced concrete surfaces

Last but not least Sika offers innovative solutions for any repair and protection with the **Sikagard®** and **MonoTop®** product range as well as easily applied, long-lasting sealing and bonding solutions with our **Sikadur®** and **Sikaflex®** technologies.



# SUSTAINABILITY AND COST OPTIMIZATION

Innovative admixture technologies allow the reduction or elimination of heat and steam curing

**SUSTAINABLE PRODUCTION, ENERGY SAVINGS AND REDUCTION OF CO<sub>2</sub> EMISSIONS ARE EVER-PRESENT TOPICS** that are gaining importance in the concrete industry, including the wet precast sector. Several measures are possible in precast concrete plants to save resources, thereby conserving energy and enhancing the sustainability of the production process.

Heat and steam curing are used in concrete element production to attain a required early strength within a short period of time. The implementation of optimized concrete mix designs in combination with innovative admixture technologies enable reduction or elimination of heat and steam curing.



## Example – Energy savings facilitated by Sika® admixtures

A wet precast concrete element manufacturer was producing various wet precast concrete elements such as columns, prestressed beams, precast panels as well as special parts.

The production of several elements required steam curing. The volume of steam cured concrete amounted to 40,000 m<sup>3</sup> per year. Steam curing was necessary for release of formwork after 3 hours and cutting of tendons after 14 hours.

In addition to energy costs for steam curing, the process generated expenses for maintenance of steam distribution, water desalination and maintenance of four steamers.

The cost structure of the production process was as follows:

Total energy cost for steam curing	<b>461,500 NZD</b>	per year
Steam cured concrete	<b>40,000 m<sup>3</sup></b>	per year
Energy cost	<b>11.50 NZD</b>	per m <sup>3</sup>
Raw material cost of concrete	<b>92 NZD</b>	per m <sup>3</sup>
<b>Total concrete cost per m<sup>3</sup></b>	<b>104 NZD</b>	<b>per m<sup>3</sup></b>

The customer sought a solution that offered elimination of the steam curing process. The Sika solution was a concrete curing concept based on **Sika® ViscoCrete®** as well as **SikaRapid®** technology. With the application of **Sika® ViscoCrete®** technology it was possible to reduce the water/cement ratio at ensured workability performance, resulting in a slump of 240 mm. In addition, **SikaRapid®** offered a significant concrete early strength development that eliminated the need for steam curing.

Characteristics after the introduction of **Sika® ViscoCrete®** and **SikaRapid®** as well as omitted steam curing:

	W/C	Sika ViscoCrete	SikaRapid	Cost per m <sup>3</sup>
<b>Initial Mix</b>	0.4	0.46% b.w.o.c.	–	104.00 NZD
<b>SikaRapid Mix</b>	0.37	0.70% b.w.o.c.	1.0% b.w.o.c.	98.50 NZD
		<b>Net savings per m<sup>3</sup></b>		<b>5.50 NZD</b>

The total savings per year amounted up to **220,000 NZD per year**.



# HIGH EARLY STRENGTH PRECAST TECHNOLOGY FOR THE WALL ST DEVELOPMENT

## PROJECT DESCRIPTION / REQUIREMENTS

Stahlton Engineered Concrete Dunedin is contracted to Naylor Love Dunedin to manufacture the precast panels for the city's Wall Street Development. The 10 metre high by 5.6 metre wide panels were too large (in both size and weight) to be stored in Stahlton's precast yard. Therefore, Stahlton Engineered Concrete and their concrete supplier Allied Concrete Ltd decided to pour the panels in the afternoon, lift them from the precast bed straight onto the truck the next day and take them to site for placing.

## CHALLENGES · SIKA SOLUTION

High early-age strength was required, therefore a mix design which included Sika ViscoCrete-2100 (NZ) was developed. Sika ViscoCrete-2100 (NZ) is a third generation polymer-based ultra high range superplasticiser combined with strength accelerating components, and gives high early strength. Panels were poured in the afternoon and tests carried out early the next morning gave strengths of between 35 and 40 MPa. Because of the early strength achieved, the evening lifting and transportation of the panels was executed without damage to the panels or any delays to the programmed road closure.



*Because of the early strength achieved with Sika ViscoCrete-2100, the evening lifting and transportation of the panels was executed without damage to the panels or any delays to the programmed road closure*

# DUBAI METRO

## PROJECT

The Dubai Metro is a 2.7 billion € infrastructure project, which once in full service is projected to carry approximately 1.2 million passengers per day. It will consist of four lines whereby the red and green lines are under construction and will start operation in September 2009 and March 2010 respectively. The elevated sections will have a total length of 58.7 km and the two lines will provide an underground system of 12.6 km. The tunnels of both lines are constructed with Tunnel Boring Machines (TBM) and subsequently lined with precast concrete segments. The volume of concrete for the precast concrete tunnel segments of the Dubai Metro project amounts to a total of more than 130,000 m<sup>3</sup>, corresponding to an impressive number of more than 53,000 units. The elevated sections of the Metro Dubai are designed as a trough bridge construction consisting of prestressed, precast concrete segments. The required 17,000 viaduct elements representing 700,000 m<sup>3</sup> of concrete have a width of 10.18 meters and can reach a maximum weight of over 80 tons.

## REQUIREMENTS

The production of precast concrete tunnel segments is an automated industrialized process that must meet the highest specifications regarding concrete quality and surface appearance. The precast concrete must gain a compressive strength of more than 10 MPa within 12 hrs. including steam curing. The precast concrete for the viaduct segments must also fulfill

high specifications regarding surface appearance. Within the production of these huge elements the two driving factors sufficient slump life and early strength development play a major role.

## SIKA® SOLUTION

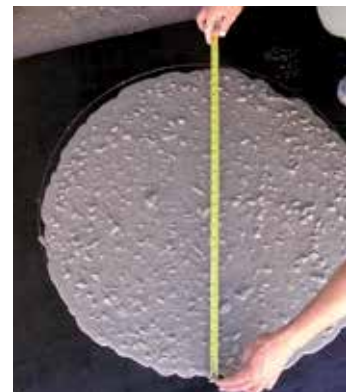
The overall quality of the precast tunnel segments was significantly improved and variations of the fresh concrete properties were minimized by executing an extensive testing programme and adjusting the concrete mix design. Early strength development was enhanced to meet the specified requirements. The Sikament® NN technology facilitated a high slump of approximately 150 mm for over one hour and early strength improvement helped to double the production. Within the production of the prestressed precast bridge elements, the variation in fresh concrete performance was greatly improved. With the application of Sikament® NN and Sikament® NNS during the summer, the slump life as well as the strength requirements could be fulfilled. Test results show that the Sika technologies ensure the required slump life of one hour, maintaining a slump of 215 mm at the very low water/cement ratio of 0.29. Compressive strength tests resulted in cube strength of over 70 MPa, which complies with the specifications. Finally a high quality surface appearance is assured to minimize undesired additional cost for repairs.





# SUBSTANTIALLY IMPROVED PRECAST PRODUCTION WITH Sika® ViscoCrete®, BRAZIL

THE CUSTOMER WAS LOOKING FOR A SOLUTION TO CHANGE THE PRODUCTION OF STRUCTURAL ELEMENTS SUCH AS COLUMNS AND BEAMS FROM CONVENTIONALLY VIBRATED CONCRETE TO SELF COMPACTING CONCRETE (SCC).



## CUSTOMER

Munte is a wet precast concrete element producer located in the vicinity of Sao Paulo, Brazil. Munte has been producing beams and columns as well as concrete slabs and tiles in two precast factories for 32 years and is known for high quality concrete products. The plant with column and beam production achieves an output of 30,000 m<sup>3</sup> per year.

## REQUIREMENTS

The customer was looking for a solution to change the production of structural elements such as columns and beams from conventionally vibrated concrete to Self Compacting Concrete (SCC). Due to the fact that these concrete elements are characterized by congested steel reinforcement, the application of Self Compacting Concrete offered a high potential for improvements within the production. The Self Compacting Concrete should reach a slump flow of 660 – 750 mm and 760 – 850 mm respectively with low viscosity of the fresh concrete. Further, a compressive strength of 50 MPa after 28 days was necessary, with early strength development of more than 21 MPa after 10 hours.

## SIKA® VISCOCRETE® SOLUTION

Sika offered a high degree of support for the development of different types of Self Compacting Concrete (SCC) mix designs, which included the selection of suitable superplasticizers and development of new superplasticizer systems. After 6 months of intensive investigation

work the required solutions were developed including beneficial procedures for placement and finishing of the fresh concrete. The range of SCC mix designs used today fulfills the above-mentioned fresh and hardened concrete requirements. The lighter reinforced elements are produced with an SCC at a slump flow of approximately 710 mm using Sika® ViscoCrete® 3535 CB. The heavily reinforced prestressed elements are produced with a Self Compacting Concrete, which reaches a slump flow of approximately 800 mm enabled by the powerful liquefying performance of Sika® ViscoCrete® -20 HE. All mixes are characterized by low viscosity, demonstrated by a t500 time of less than 2 seconds and a V-funnel time of not more than 8 seconds respectively. Dubai Metro Substantially Improved Precast Production with Sika® ViscoCrete®, Brazil

With the application of Self Compacting Concrete several improvements of the production process could be achieved. First of all the SCC solution represents a significant enhancement of the overall quality of the precast elements. The use of this innovative concrete also enabled elimination of vibration of the fresh concrete and minimized labor in finishing, which resulted in a labor cost reduction of 30%. In addition, the production capacity of prestressed beams could be doubled from 500 m<sup>3</sup>/month to 1,000 m<sup>3</sup>/month at constant production time and manpower. Last but not least the application of Sika® ViscoCrete® technology offered the above mentioned improvements and advantages at equal final cost per m<sup>3</sup> of concrete due to the potential labor savings for production.



## BUILDING TRUST FROM BASEMENT TO ROOF



# FOR MORE Sika® PRECAST TECHNOLOGY INFORMATION:



### WHO WE ARE

Sika AG, Switzerland, is a globally active specialty chemicals company. Sika supplies the building and construction industry as well as manufacturing industries (automotive, bus, truck, rail, solar and wind power plants, façades). Sika is a leader in processing materials used in sealing, bonding, damping, reinforcing and protecting loadbearing structures. Sika's product lines feature high quality concrete admixtures, specialty mortars, sealants and adhesives, damping and reinforcing materials, structural strengthening systems, industrial flooring as well as roofing and waterproofing systems.

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