SIKA AT WORK

FAIR-FACED CONCRETE FACADE, ZURICH, SWITZERLAND

SIKA PRECAST CONCRETE

BUILDING TRUST

SIKA SOLUTION FOR CONCRETE PRODUCTION AND PERFORMANCE

PROJECT DESCRIPTION
Sika built a new facility called the "Limmat Building" in the Tueffenwies area of Zurich/Switzerland, where it has had production facilities for over a hundred years. It accommodates up to 300 employees. There are also new laboratories and a product demonstration and application center, plus a restaurant for staff and visitors.

Sika's one-stop approach for integrated solutions 'foundation-to-roof' was applied to Sika's own new building. For new construction, Sika provides products and systems for:
- Concrete production and performance
- Concrete protection
- Waterproofed basement
- Structural strengthening and bonding
- Joint sealing between the construction elements
- Bonding and sealing for structural glazing and curtain walls
- Internal and external facade panel bonding
- Anchoring and grouting
- Roof waterproofing and photovoltaic system integration

For interior finishing, Sika provides:
- Seamless resin flooring
- Wall coatings
- Tile adhesives and grouts
- Wood floor bonding systems
- Various sealants and adhesives

PROJECT REQUIREMENTS
The aesthetic appearance depends on the quality of the fair-faced concrete facade. The architectural facade consists of precast coloured concrete elements with a fine-blasted surface. The concrete must fulfil the requirements of strength class C50/60 and exposure classes XC4, XD1 and XF1.

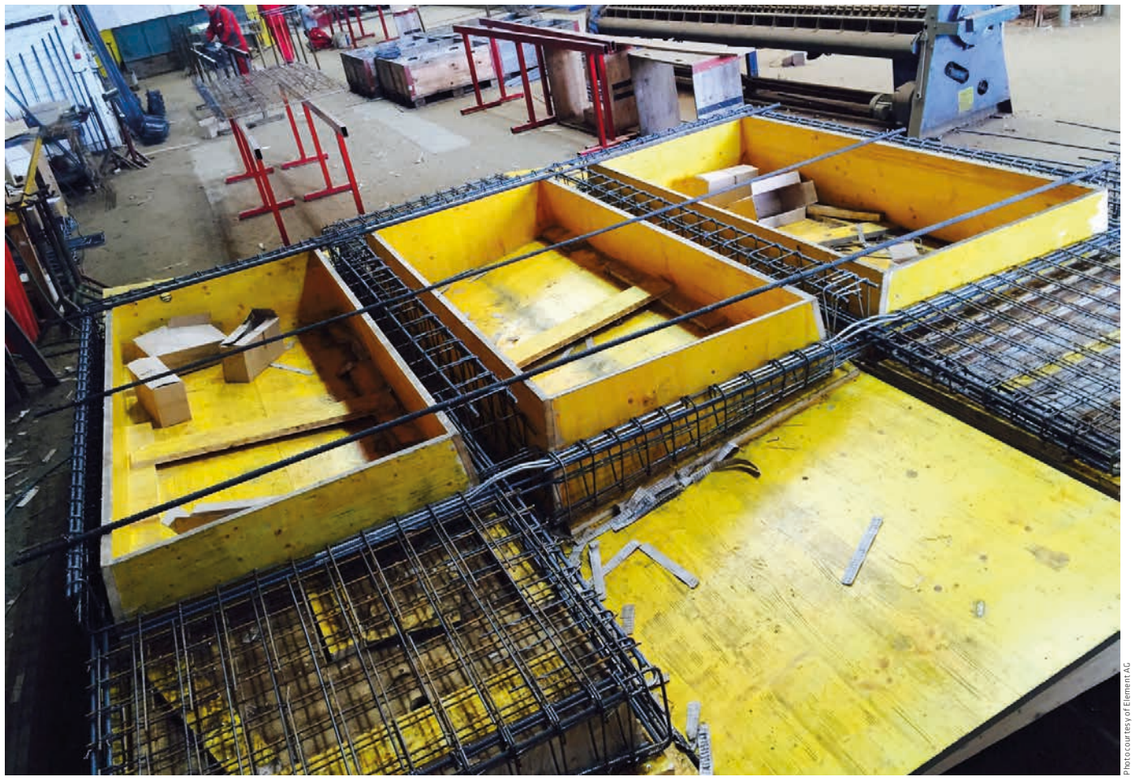

Photo courtesy of Element AG

SIKA SOLUTION
The concrete was produced in a local precast factory using self-compacting concrete. To provide concrete which fulfils the high aesthetical, strength and durability requirements, Sika® ViscoCrete® and SikaFume® were utilized.

A major characteristic of Sika® ViscoCrete® high range water reducing superplasticiser is the capability to substantially reduce the water content in the concrete mix design. Achievement of lower water/cement ratio results in dramatically enhanced strengths and durability, resulting in a remarkably low concrete permeability. Sika® ViscoCrete® furthermore allows the production of flowable concrete. This facilitates the placing of concrete and results in reduced amount of blow holes & surface defects. It makes it possible to produce complex architectural shapes as well as slender, aesthetic concrete elements that include dense steel reinforcement.

SikaFume® silica fume improves properties of the fresh concrete, such as cohesion, bond and water efficiency. In hardened concrete the highly active pozzolanic material reacts with the free lime produced by the hydration of the cement to improve strength, density and durability of the concrete.

The color of the concrete facade desired by the architect was adjusted using Sika® granular integral colors.

Photo courtesy of Element AG

CONCRETE MIX DESIGN:

Binder	CEM I 52,5 White	388 kg/m³
	Calcite	165 kg/m³
Aggregates	0/8 mm	1,800 kg/m³
Water	Water/cement-ratio 0.38	147 l/m³
Admixtures	Sika® ViscoCrete®-20 PLUS (HRWR)	1.29%
	SikaFume® HR	2.0%
	Sika® ColorCrete G-920 Yellow	0.80 kg/m³
	Sika® ColorCrete G-110 Red	0.27 kg/m³

The very delicate mouldings on the elements extend up and over the windows as a feature. Each precast unit covers one floor and one window unit. The design required that each of the different facade elements had to be produced up to a maximum of 25 times. Therefore, the concrete formwork was made in wood.

Photo courtesy of Element AG

Sika® ViscoCrete® MAKES COMPLEX, SLENDER, REINFORCED ARCHITECTURAL SHAPES POSSIBLE

CONCRETE ELEMENT TRANSPORTATION AND ERECTION

For transport of the precast facade elements from the factory to site, a specialist haulage company was commissioned. Special trucks with low-load platforms were used to avoid height restrictions and issues with bridges enroute.

Before installation of the precast facade elements, the scaffolding was removed from around the building. The elements were then hoisted by the crane for the erection team and placed into position in the framework of the facade, one by one and floor by floor.

THE VERY DELICATE MOULDINGS ON THE ELEMENTS EXTEND UP AND OVER THE WINDOWS AS A FEATURE

Photo courtesy of Element AG

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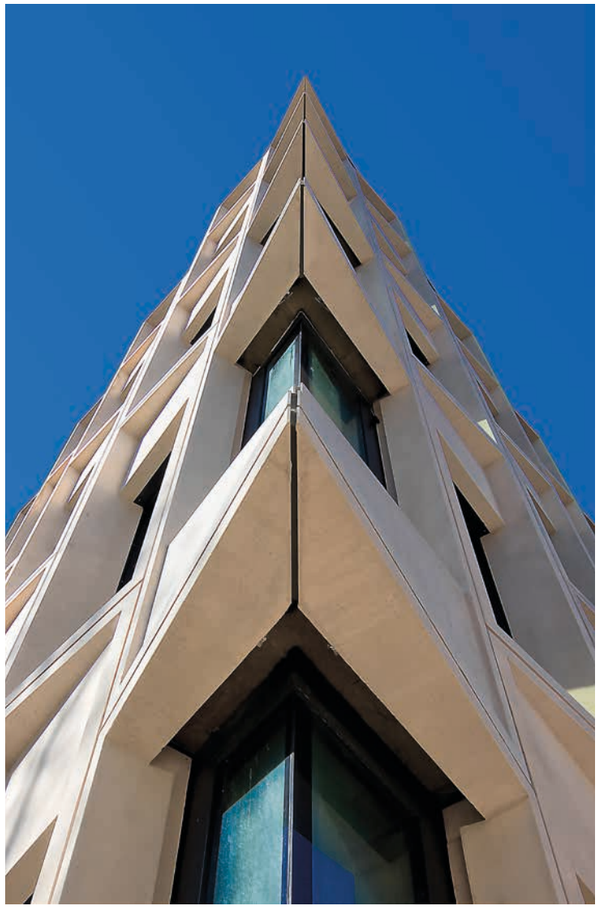
CONCRETE SURFACE PROTECTION

After the installation of the facade elements, the exposed concrete surfaces were given additional protection with a hydrophobic impregnation. Sikagard®-703 W/-705 L was applied by low pressure spray to penetrate into the surfaces and make the blasted concrete surfaces water-repellent, which also provides long-term protection against dirt pickup, green growths and other microorganisms.



FAIR-FACED CONCRETE FACADE, ZURICH, SWITZERLAND

SIKA PRODUCTS

Precast concrete facade elements:

Admixtures	Sika® ViscoCrete®-20 PLUS (HRWR)
	SikaFume® HR
	Sika® ColorCrete G-920 Yellow
	Sika® ColorCrete G-110 Red

Facade protection:

Hydrophobic impregnation	Sikagard®-703 W

PROJECT PARTICIPANTS

Owner:	Sika Schweiz AG, Zurich
General Management/ Architect:	Itten+Brechbühl AG, Bern
Precast concrete producer:	Element AG, Veltheim

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