



# SIKA AT WORK

## EL ESCOBAL MINE, GUATEMALA

UNDERGROUND AT ONE OF THE WORLDS GREATEST SILVER MINES

BUILDING TRUST



# UNDERGROUND AT ONE OF THE WORLDS GREATEST SILVER MINES

## PROJECT DESCRIPTION

El Escobal Mine is one of the largest and most modern silver mines on the globe. The project is located approximately 40 kilometers southeast of Guatemala City close to the town of San Rafael Las Flores in the department of Santa Rosa. In 2010, Tahoe Resources, a Canadian Mining company, acquired the exploration lease from Goldcorp. Since 2010 the mineral resource of Escobal has grown substantially and the mine was commissioned in 2014 having a mineral base of over 36 Million tons grading over 330 grams per ton silver and interesting by-products such as gold, lead and zinc. The epithermal mineralization is hosted in quartz and carbonate veins and has a lateral extent of more than 2'400 meters and is more than 1'200 meters deep. Vein thicknesses range from 10-30 meters and mining takes place using selective extraction methods such as long-hole and fill mining. Cemented paste backfill is used as a structural fill in order to allow full extraction of the mineralized mass. The Escobal ore is developed using a set of ramps that are accessed through two main portals. Ore is blasted, mucked and transported up to surface by loaders and concentrated at the processing plant on site. The tailings are used again for the underground paste fill.

## RAPID MINE DEVELOPMENT

Since the Escobal project broke ground, Sika was involved as the main supplier for construction and speciality chemicals. In order to achieve the high ore throughput levels of 4'500 tons per day, of which half will be put back underground in form of

cemented paste fill, the mine needs an efficient in-cycle support installation for rapid development rates. From the very beginning, one of the main challenges was to provide enough underground production headings in order to source enough ore feed for the hungry mill on surface. Hence, Multiple ore development headings are driven simultaneously in sometimes difficult ground conditions that requires good shotcrete support designs and a spray application that is fully integrated into the mining cycle. Shotcrete in combination with extensive meshing and structural fibers give good yielding capabilities for the primary shotcrete support and allow fast re-entry times into the secured perimeters. While the underground mine infrastructure grows, longer and longer concrete transport distances also warrant extended workability times and adjusted mix designs when producing the concrete at the ready mix plant on surface.

Sika, together with its partner, Minera San Rafael, a fully owned subsidiary of Tahoe Resources, also work together for the optimization of the backfill mix at the Escobal paste plant where high cement consumption is a major cost component.

## PROJECT REQUIREMENTS

- Rapid early strength development
- High final strength
- A maximum dosage of accelerator of 10%
- A product stability of minimum six months
- Open time > 2h
- High Energy absorption according to ASTM 1550-05



**SIKA SOLUTION**

Sika's world leading Sigunit® and ViscoCrete® technology is among the key elements for the shotcrete and concrete works at Escobal. For the shotcrete, Escobal relies on the proven Sika Sigunit® L50 AFX, alkalifree accelerator that has stable properties and is a high performing product when it comes to rapid early strength development. Sika Guatemala is not only supplying mine consumables but is also present on site to give ongoing support with everything related to underground construction. Together with the dedicated San Rafael team, many challenges have been tackled with good results from the early days of mining at Escobal.

**SELECTION OF SIKA PRODUCTS**

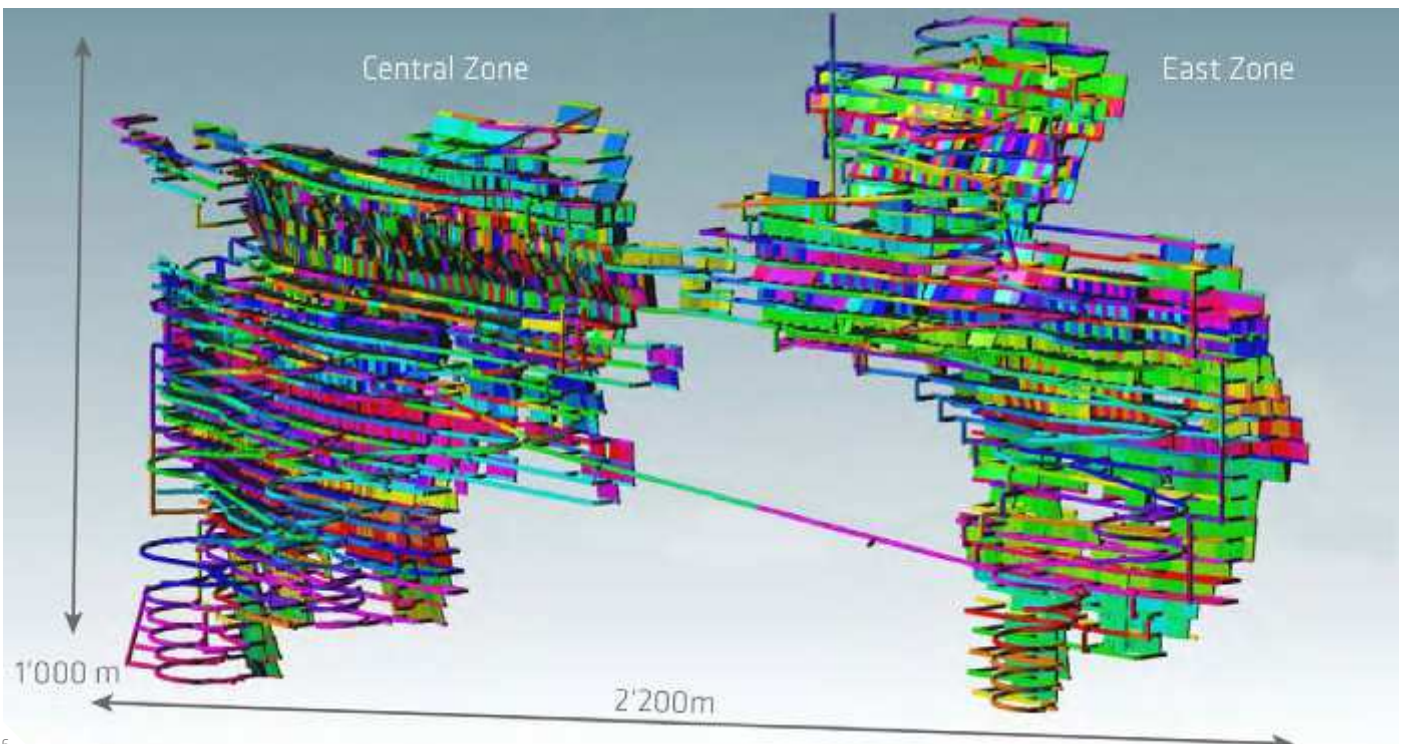
- Sika® ViscoCrete®-2100 Superplasticizer
- Sika ViscoFlow®-50 Slump retainer
- SikaTard®-930 Consistency stabilizer
- Sigunit® L50 AFX Alkali-free, high performance shotcrete accelerator
- SikaPump® Paste backfill admixture

**PROJECT PARTICIPANTS**

Owner: Tahoe Resources, Minera San Rafael  
 Sika Organization: Sika Guatemala



- 1 Front: Spraying process underground using mobile Putzmeister piston pump spray units
- 2 Paste Plant at El Escobal
- 3 Mine Portal for underground access
- 4 Ready mix concrete batch plant on surface loading underground truck mixer
- 5 Shotcrete application underground
- 6 Isoview of the stope layout and the final underground infrastructure of the El Esbobal mine where the different colours represent different mining stages over the life of mine
- 7 Back: Observing the backfill process while filling a mined out underground stope





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Our most current General Sales Conditions shall apply. Please consult the most current local Product Data Sheet prior to any use.



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