



SIKA AT WORK

Hydroelectric Power Plant Prellë, Mat, Dibër District, Albania

CONCRETE PRODUCTION: Sika® ViscoCrete®, Sika® Sigunit®, Sika® Stabilizer,
Sika® Antifreeze

WATERPROOFING: Sika®-Waterbars SH

REFURBISHMENT: SikaGrout®

BUILDING TRUST



PROJECT DESCRIPTION

The HEPP is located in the north region of Albania. The power plant produces approximately 49 GWh per year, with the installed power capacity of 14.9 MW (three Pelton turbines with capacity 4.95 MW each).

The project contains two gravity reinforced concrete dams with respective lengths of 38 m and 39.5 m. The respective widths of these dams are 5.5 m and 10.3 m. The closed transmission channel has a length of 220 m until reaching the first tunnel entrance. The project has two tunnels with respective lengths of 950 m and 270 m.

In the design there was foreseen a pipeline of diameters DN 1800 and DN 1600. A part of the DN 1800 pipeline (270 m) was installed inside the second tunnel with the same length. The power house was located in a terrain of a surface approximately 580 m². The new substation occupied an area of 1500 m². The total construction surface was at 36,000.00 m².

The maximum water flow the turbines could elaborate was 10.00 m³/sec while the minimum stood at 0.30 m³/sec. The total water basin included was at 158 km².



PROJECT DEMANDS

The project had various demands for both design and construction phases, involving concrete production, waterproofing, sealing and bonding, injections, flooring, concrete repair, main gates installation, tunnelling works, turbine and electrical installation, substation erection etc.



CONCRETE PRODUCTION

The main concrete classes casted during the project were C20/25, C25/30. A site plant was set up for the concrete production. Following the high importance of the structures which were to be built, different demands had to be met:

- Early & late strength development (7 and 28 days strength) for all the concrete categories
- Concrete with high flowability (Class S3)
- Rapid strength development concrete for special structures
- Sometimes “dry” concrete with a low W/C ratio was needed
- Constant flowability (Class S3) and pumpability for more than 90 minutes
- Spot casting works of semi-dry / semi-wet concrete

The total quantity of concrete produced was ~ 12,000.00 m³.

SIKA SOLUTION

Sigunit® L-22 E was used for the immediate set reaction of the cement paste and a fast development of mechanical strengths of shotcrete mass.

Most of concrete classes demanded rapid strength development and extremely high flowability, the admixture **Sika® ViscoCrete®-400** was selected for these reasons.

Sika® Antifreeze was in used in cases of low temperatures during winter time on the construction site.

Sika® Stabilizer®-4R was used in flowable and high aesthetics concrete mixes, providing resistance to segregation when required.



WATERPROOFING

Some of the project buildings were foreseen to be constructed in a certain depth from the natural level, making it necessary to use injections for crack fillings and PVC waterstops for different casting levels of the same structure. The cracks and holes to be filled were dictated by the high level of water presence, and natural deterioration.

The main part of the project requiring waterproofing works were the power house and the desander area. Construction joints and holes left by the formworks, anchoring of the rebars and reinforcement of steel bolts, required waterproof filling materials.

SIKA SOLUTION

Many needed waterproofing products were required given the specific kind of work processes mentioned in the works area. The main products used for these necessities were **Sika®-Waterbars Yellow SH** for waterproof constructions and expansion joints in concrete structures such as those in water retaining structures. In our case this included the different casting phases of the spillway walls, intake area walls, desander walls and slab and finally all the underground part of the powerhouse area.

SIKA PRODUCTS IN VOLUMES:

- *Concrete & shotcrete production:*

Admixtures:

Sika® Antifreeze

Sika® Stabilizer-4R

Superplasticizers:

Sika® ViscoCrete®-400

Shotcrete accelerator:

Sika® Sigunit® L-22 E

- *Refurbishment:*

Cementitious grout:

SikaGrout®-212 Classic

- *Waterproofing:*

Joint waterproofing system:

Sika®- Waterbars V-24 SH

PROJECT PARTICIPANTS

Owner: PrellEnergy SHPK

Contractor: Trema Engineering 2 SHPK

Consultants: Ovadaprogetti SaS

Start & completion date: May 2015 up to July 2016

