



# ZOLEZZI DAM

## Italy, 1991

### PROJECT CHARACTERISTICS

**Works:** lining of the upstream face of a thin concrete arch dam

**Purpose:** rehabilitation of the headworks of an hydropower system.

#### Dimensions:

- height: 22 m
- thickness of arch at the top: 0.33 m
- thickness of arch at the foundation plug: 1.4 m

**Watertightness:** multilayered PVC geocomposite (geomembrane + geotextile) applied to u/s dam face with special adhesives.

#### Materials:

- foundation: calcareous schist with conglomerate inclusions
- lining support: concrete surface treated with sand-blasting and a full coat of primer.

### PROFESSIONAL SERVICES PERFORMED

Preliminary design of the impervious liner, laboratory and field tests, construction drawings of the lining system, and details of crest and abutments, assistance during placement of the lining.



*Zolezzi dam, located deep in the Ligurian hills, is in operation since 1923. In 1991 the Owner decided to maintain and rewamp this old structure consisting of a thin concrete arch dam and gravity abutments across a steep ravine accessible only by 1.5 km mule path.*

*As the new lining system a 2.5 mm geocomposite, formed by a multilayered PVC geomembrane, reinforced with nonwoven fiberglass scrim, coupled to a polyester nonwoven geotextile, was selected. The proposed adhesive was preliminary tested on-site to measure the adherence that could be developed on the existing concrete face as well as the pull-out strength of the concrete. Key parameters of the geocomposite, of the adhesive and of the sealants were extensively tested in laboratory.*

*A steel tube scaffolding was erected on both faces of the dam for sand-blasting and chipping of deteriorated areas. The rolls of geocomposite were unrolled from the top down and were then pressed against the arch so that the geotextile became embedded in the two component adhesive, previously placed on the dam face, before it polymerised. The vertical weldings were done and tested manually. Three different peripheral attachments were adopted for the upper edge, lower edge and the sides using stainless steel strips and studs embedded with epoxy resin, sealants and mortar.*

*Since the dam is over-topped regularly the dam crest was lined with the composite geomembrane (after meticulous cleaning and patching of the concrete sill) and then protected with stainless steel sheets adhered and fixed to the geomembrane.*