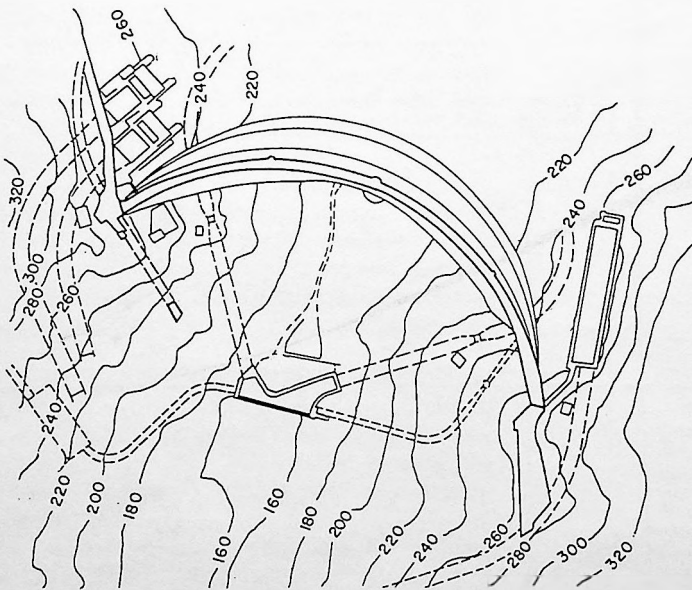


# Flumendosa Arch Dam

## Rehabilitation of the structure by epoxy grouting

Dott. Ing. Francesco Frongia, *Ente Autonomo del Flumendosa*  
Dott. Ing. Giovanni Lombardi, *Lombardi Engineering Ltd*  
Dott. Ing. Marco Foti, *Gruppo Dipenta Costruzioni S.p.A.*  
Geom. Francesco Ciciotti, *Rodio S.p.A.*  
Dott. Ing. Francesco Gallavresi, *Consultant*



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### 1. Introduction

The double curvature Nuraghe Arrubiu arch dam on the Flumendosa river in Sardinia, 115 m high, was completed on 1957. It is founded on sound porphyritic gneiss's rock of quite satisfactory geomechanical properties. The nearly symmetrical dam was cast in 24 approx. 12 m wide blocks. Fig. 1 shows the structure's cross section.

Already at final construction stage and immediately after, a great number of horizontal cracks appeared on the upper part of the upstream face. The phenomenon slowed down progressively and since 1971 no new cracks were detected. Up to date the reservoir was only partially impounded, to about 30 m below the maximum operational water level.

The causes of the cracking, which were clearly identified through a classical structural analysis including a detailed simulation of the construction phases, consist mainly in an unacceptable state of stress due to the temperature fields in the structure during and after construction.

Consequently, as the causes are related only to the construction phase and not acting any longer, the rehabilitation project could consist in restoring a monolithic structure by grouting the cracks in using a suitable well defined technology.

This paper mainly deals with the grouting methodology followed.

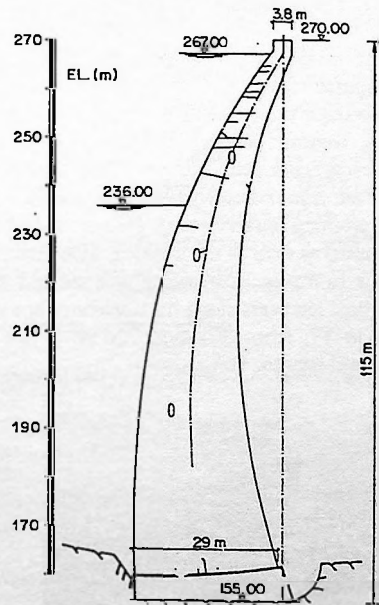


Fig 1. General layout of the dam

maximum dam height	115 m
total crest length	300 m
thickness at crest	3.77 - 6.90 m
thickness at base	29 m
crest elevation	270 m a.s.l.
operative water level	267 m a.s.l.

**Flumendosa Arch Dam  
Rehabilitation of the structure by epoxy grouting**

Owner: Ente Autonomo del Flumendosa  
Designer: Lombardi Engineering Ltd  
Main Contractor: Gruppo Dipenta Costruzioni S.p.A.  
Specialist Contractor: Rodio S.p.A.