

Leica Geosystems **TruStory**

Concrete Dam Monitoring in Montereale Valcellina (IT)



Automatic monitoring system with dual station operation with the Leica TM30 station.

The Ravedis dam is located in the municipality of Montereale Valcellina (PN), in the area where the Cellina torrent, (tributary of the Livenza river) runs from the mountain section to the valley section, spreading out over the Friulian plain in the province of Pordenone. It is a mass gravity concrete dam, measuring 68 m high with a reservoir storage volume of 22.6 million m³. The primary function of the basin is to detain the overflow from the Livenza river, its secondary uses are irrigation and hydroelectricity.

The conditions sheet for operating and maintaining dams show an instruction regarding the periodic control of the structure through a complex integrated monitoring

system formed by meteorological, geotechnical and geodetic sensors.

The topographic monitoring system is formed by two Leica TM30 monitoring total stations, one located upstream and the other downstream of the Ravedis reservoir. Each measuring total station is fed by a 220 VCC cabinet with buffer battery. All the equipment has been suitably housed and protected inside purpose-built structures. The monitoring prisms have been arranged along the crown of the dam, both on the upstream and downstream side, in correspondence with significant structural elements and with other geotechnical sensors. Monitoring prisms have also been placed on the stabilised slopes at the back

■ **Scope/Objective**

Automatic and continuous monitoring of the Ravedis mass gravity concrete dam

■ **Customer/Institution**

Consorzio di Bonifica Cellina Meduna

■ **Challenge**

Continuous automatic monitoring of the behaviour of the structure on a daily basis

■ **Date**

Operational since November 2011

■ **Location**

Montereale Valcellina



■ **Project Summary**

Instruments

Leica TM30 Monitoring Sensor
Leica Geosystems Monitoring prisms
Rover Unit

Software

Leica GeoMoS Monitor
SystemAnywhere (data synchronization & calculations) and Analysis (data view)

Communication

Wireless LAN
GSM/GPRS

Office

Teamviewer

of the reservoir in order to verify the area's stability.

The communication between the total stations and the control centre (Centro di controllo), placed in the guardhouse of the dam, is achieved with a 5 GHz Wireless LAN.

The monitoring system software, Leica GeoMoS, and the local data

analysis software with automatic graphic data representation are installed on the dedicated computer in this dam control centre guardhouse.

Responsible staff can access the monitoring system, consult measurements and amend the parameters thereof remotely through appropriate remote software.

■ Benefits

Acquisition of a homogeneous and comparable database for an indepth study of the dam's behaviour during the filling and emptying phases of the reservoir and correlation with measurements acquired from other sensors



Layout of the Monitoring Stations



Prism points measured by both Total Stations



Total station 1 (Postazione 1)