MACCAFERRI

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Solution: ROCKFALL DRAPERY WITH HELLOMAC
EARLY WARNING SYSTEM
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PONZA, ITALY

IoT cutting-edge functionalities applied to a rockfall protection system in Ponza, Italy

Ponza is the largest of the Pontine Islands, a string of tiny islands located in the Tyrrhenian Sea, off the coast of the Lazio region in Italy. The island is a popular destination for tourists mostly thanks to its incredible beaches with amazing sea cliffs. Unfortunately, sea cliff instabilities are increasing and rockfall failures are becoming more recurrent, both for wave action and the presence of fault lines. Several beaches had to be closed to prevent any damage to people and assets. In addition to the loss of natural heritage, these failures are damaging the island's economy, mostly based on tourism and fishing.

Cala Fonte became inaccessible in 2020 because of a rockfall event: a strong rockfall protection was needed and it was supplied by Maccaferri. A geocomposite with reinforced double twist rockfall drapery mesh as placed over the full height of the cliff; the upper part of the rock face was more liable to instabilities and therefore it was reinforced with HEA PLUS panels (300x300 mm panels made of 10 mm dia. GalMac coated rope) and stabilizing nail anchors. However, even the strongest protection system needs confirmation that everything is functioning to design. Detecting deteriorating conditions early is the best way for achieving risk prevention and traditional monitoring can only be done occasionally, with resource-intensive and time-consuming measures.

The civil engineering world is part of a great digital revolution and IoT (Internet of Things) is at the heart of this revolution. The application of IoT in construction can improve both time and resource management of the projects but also it can further enhance safety measures.

Maccaferri has always pursued innovation and has already taken part of this digital transformation developing a new alert system: HELLOMAC. Thanks to the IoT technology, HELLOMAC ensures real-time and accurate monitoring of rockfall protection systems, even in remote areas with limited or no frequency coverage. In Ponza, in addition to the structural protection system, a rockfall monitoring strategy was integrated into the project. The drapery system was equipped with HELLOMAC and 8 different motion sensors. All the data are transferred using radio waves transmission on specific frequency (868 MHz) to the transceiver device HUBIR. In addition, a linear displacement transducer, also connected to HUBIR, was installed for monitoring of fault-line movements. Thanks to the HELLOMAC app, the protection system's status can be checked daily and if any damage occurs, an alert will be received right away.

Why HELLOMAC?

Its 8 different motion sensors are connected through 8 long "legs" that allow to cover the entire rock face area and to monitor every eventual movement. Also, thanks to its functioning mode, it was possible to connect HELLOMAC with an additional device, the linear displacement transducer. Last but not least, HELLOMAC is an active early warning system that immediately send warning information: when it comes to rockfall events, time is precious and this device is able to send a real-time warning when something is wrong. HELLOMAC provides an innovative and effective ally to the risk prevention strategy and the protection of the environment and communities.