

## 《Rock climbers prevent rock slides at the Siq》

The road into Jordan's world-renowned archaeological site, Petra is a winding 1.2-kilometre canyon, known as 'The Siq'. On foot, or by horse carriage or donkey, thousands of tourists visit the UNESCO World Heritage site every year.

But today the road is blocked. Rock climbers are giving the iconic archaeological site a makeover. Using drills and hammers, the climbers -- teamed up with archaeologists -- are hoping to prevent further rock slides at the world famous sandstone attraction, which is prone to earthquakes and flash floods.

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The Nabataeans lived around 2,000 years ago and were ancient Arab nomads who used the spectacular canyon and empty valley as a road to their capital, Petra. From this fortified base -- situated between the trade routes of the Indian Ocean, the Mediterranean and the Red Sea -- the Nabataean civilisation boomed. Along the canyon, they carved out gods, camels, and sophisticated water catchment systems.

"The natural beauty of the Siq is a fact, also its fragility, because this is a natural monument carved on sandstone which is a very fragile kind of rock. Many people might not understand that, therefore might not be able to know how to better protect this site," said Giorgia Cesaro, Siq Stabilization Project Office.

But the arid land along the Dead Sea has suffered repeated flash floods and earthquakes. One such earthquake in 393 AD levelled much of ancient Petra.

The collaborative Siq canyon stability project aims to knock down these rocks before heavy rain or earthquakes trigger a dangerous fall. The removal is part of a \$570 million USD risk management project funded by the Italian Development Cooperation to track flash floods.

The stabilisation team is a mix of climbing professionals from the Amman-based adventure tourism company, Tropical Desert Trips, and local workers from Petra's largest village, Wadi Musa.



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"We've worked there for like almost a month every single day we're climbing and installing equipment in the cracks and in the loose rocks. And all the data we've collected over the two years, we're starting now removing the blocks that might cause a hazard to the people inside the Siq," said Sufian Al Said, Project Rock Climber.

In 2013, al Said and other climbers installed wireless and prism monitoring devices throughout the Siq. These devices were used in combination with satellite topography by the Jordanian authorities and UNESCO to gather data on small movements of rocks. Over two years, they identified risk-prone areas in the heavily-trafficked canyon.

"The use of simple techniques has permitted to reduce greatly the risk of debris and small rock fall during heavy rain fall. And this is one of the most important purposes of the project is to transfer simple knowledge, but effectual knowledge to local system in order to let them capable to do this as a long-term maintenance of the Siq," said Giuseppe Delmonaco, Ispra Geologist & UNESCO consultant.

Work pauses while carriages and tourists continue the walk down the Siq. The work these climbers and

archaeologists are doing may ensure visitors can continue to enjoy this site for decades to come.

