

UNESCO AND ITALY COLLABORATE TO PROTECT THE 'SIQ' OF PETRA

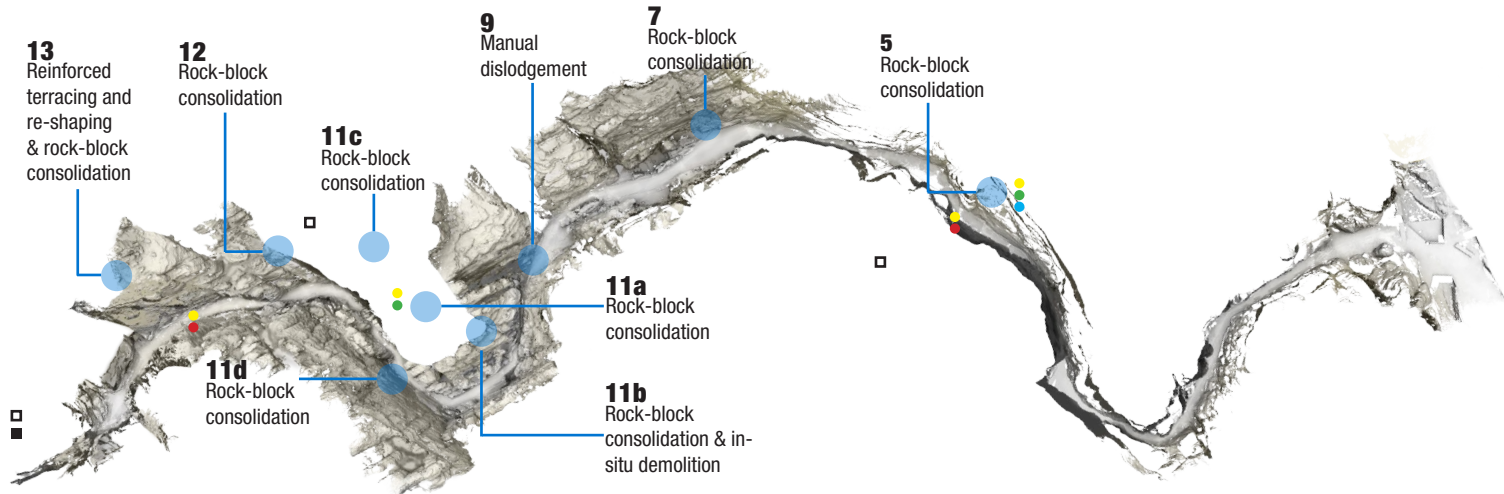
The 'Siq' is a 1.2 km long natural gorge that snakes through the sandstone cliffs, serving as the main entrance to the World Heritage Site of Petra, one of the world's richest archaeological sites. Due to its unique geological and cultural characteristics, the 'Siq' is one of Petra's most endangered areas, impacted by natural and geological hazards.

Thanks to the generous support of the Government of Italy, since 2011 the UNESCO Amman Office has been supporting the national and local authorities in assessing, managing and mitigating natural hazards at the site through the implementation of the "Siq Stability" programme (2011-2018).



As part of Phase I, the project focused on conducting an in-depth assessment of landslide risk in the 'Siq', which led to the installation of an integrated monitoring system using accurate and reliable techniques. A comprehensive documentation of the site through advanced techniques was conducted and a new GIS common platform for storing, analysis and management of data was established.

Within Phases II and III of the "Siq Stability" project, mitigation of landslide risk in the 'Siq' was operationally carried out through the implementation of priority and urgent landslide risk mitigation interventions targeting the most hazardous areas on the upper 'Siq' plateau and along the 'Siq' slopes. Capacity development of the national authorities and awareness raising activities were also carried out. Capitalizing on the achievements of the "Siq Stability" programme, the "Youth for Heritage Conservation and Risk Prevention in Petra" (2018-2020) project has also been generously funded by Italy. It aims at enhancing the capacities of and providing employment opportunities to Jordanian and Syrian youth on cultural heritage conservation and risk prevention by contributing to the implementation of priority interventions in Petra, with primary focus on reducing landslide risks in the 'Siq'. Specialized trainings are being delivered in the areas of geology and engineering geology applied to cultural heritage, safety and security at the work site and cultural heritage conservation and maintenance.



- Net panels**
Double twisted (or enchainned rings) galvanized net, reinforced with galvanized steel wires/ropes and anchored in stable bedrock with steel bars for temporary or permanent consolidation of unstable blocks.
- Dislodgement**
Scaling of small unstable blocks with hand lever or hydraulic jack. In-situ demolition and removal of medium-large unstable blocks with high-expansion cement. For safety reasons, the blocks are reinforced with anchored net panels before the demolition.
- Anchoring**
Steel bars or wire rods placed in drilled boreholes, reaching the stable bedrock, for consolidation of unstable rock blocks. After installation, anchors are injected at low pressure with cement grout.
- Wall / Dam**
Construction of reinforced concrete wall for the consolidation of large unstable blocks. The wall is further reinforced to the stable bedrock with steel bars and then covered with 'Petra rock color' pigments.

- MONITORING SYSTEM**
- Repeater
 - Gateway
 - Air Temperature
 - Humidity
 - Crack meter
 - Tilt meter
 - Deformometer

KEY FIGURES*

People from local community trained and/or employed	Maximum work height
50	80 m
Number of monitoring methods applied	Amount of blocks consolidated
4	30 m³

*These figures refer to the works implemented up to 2018

