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Trevi reveals Mosul Dam repair strategy

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Trevi reveals Mosul Dam repair strategy

12 May, 2016 By Emily Ashwell

Italian engineering giant Trevi has revealed how it plans to tackle the structural crisis facing the Mosul Dam in Iraq.

Earlier this year, the [US Embassy in Iraq raised concerns](#) that the dam faces a "serious and unprecedented risk of catastrophic failure" with little warning. It said that if the 11.1bn.m³ dam collapses, some areas could be inundated by up to 21m of water within hours. The risk comes after a so-called Islamic State attack on the facility in August 2014 and the subsequent disruption of maintenance operations.

Trevi won the £215M contract for the dam repairs and in the latest [Trevi Group Journal](#), the firm's design, research and development senior technical advisor Raffaella Granata has outlined the job it faces and how it plans to tackle the repairs.

The problems are thought to stem both from the original design of the dam and disruption to maintenance. When it was constructed, on ground consisting of gypsum, anhydrite, marl, dolomite and limestone, the hydraulic seal foundation included installation of a grout curtain, with holes up to 200m deep, as well as blanket grouting to provide a shield at the base of the dam. The grout curtain injections were carried out from a specially built 2,250m-long gallery. The grouting needed to be constantly maintained, which reportedly hasn't happened.

The issue of water in the gypsum and anhydrite ground layers is behind the structural problems of the 1980s built dam. This has been compounded by the development of sinkholes in surrounding areas.

"Said dissolution phenomena result in the formation of fissures and voids which, due to the strong hydraulic gradient, allow considerable water percolation in the foundation soil of the dam," explained Granata. "From upstream to downstream, these flows trigger and favour new and more substantial dissolution phenomena giving rise, in this way, to a vicious circle."

So the task for Trevi is to repair both the grout curtain and the dam's bottom outlet, the latter of which will require specialised divers. Trevi says work on the grout curtain will include the installation of two rows of holes aligned to the dam.

Granata said: "Due both to the stratigraphy and location of the soluble layers, it will be necessary to execute and inject holes up to a depth of 200m."



Source: Soilmec

The Soilmec SM-5E will be used by Trevi in the Mosul Dam repairs. This image shows it in use in Italy.

The grouting used here will be able to intercept and close fissures. Trevi said the final aim is to achieve a grout curtain with a permeability lower than 10 Lugeon units.

Trevi said the repairs will be carried out both from the grouting gallery and dam crest. In the small gallery, 3.7m-high and 3m-wide Soilmec SM-5 rigs will be used. The work will cover three areas, totalling 500m. On the dam crest, surface interventions will be carried out using Soilmec SM-16 rigs with long stroke, for 420m towards the west of the spillway, and from the crest of the dam along the eastern wall of the spillway for 700m.