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MONITORING OF KRIVELJ RIVER COLLECTOR DEFORMATION

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Study of monitoring and analyzing the deformation of the collector Krivelj River has been developed. In the period May - July 2009, the recording of the measurements and the state of the crack deformation in reinforced concrete collectors lining was performed.

Based on analysis of the recording, four characteristic lining deformation of the shape in vulnerable parts of the collector were identified: in calotte, on the sides of calotte, sides themselves, and sides of ducts.

Deformations in calotte zone were in form of tension cracks, reinforcement tears and separation of concrete from the reinforcement created due to high tensile stresses in the inner part of the reinforced concrete lining. The worst damage was observed due to shear stresses in the lateral parts of the calotte, while the cracks in some parts exceeded 10 cm. These are very large and dangerous damages to the collector. Given that there was a fracture of concrete, loads in those areas was taken over by the armature, which was affected by severe corrosion. Due to the large vertical pressures and the tendency for flattening of the collector in internal lateral parts of support, there was erosion of concrete in the form of plates. Small cracks appeared in the side parts of the collector ducts, too.

For collector cross sections recording, in addition to the geodetic procedure, rotating laser beam procedure was applied. Based on these recordings it can be concluded that the profile of the collector, on his damaged sections, is "flattened". The laser process enables easier, faster and more credible measurements of the size and shape of the profile, which may be of particular importance when installing frameworks for future temporary and permanent rehabilitation of vulnerable sections of the collector.

Changes in the deformation of the ten selected places in collectors were observed using embedded devices for measuring deformation cracks in collector reinforced concrete support. Final results of monitoring changes in absolute and relative deformation of reinforced concrete collector of over time show that established shifts are part of the process of reinforced concrete roof supports deformation, which is directed towards the fracture and support breaking.

Key words: collector, deformation, reinforced concrete, corrosion, cracks