

The Stabilization of Gilboa Dam, New York, Using High Capacity Rock Anchors: Addressing Service Performance Issues

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Abstract

Prior to the proposed reconstruction of Gilboa Dam in upstate New York, 79 very high capacity rock anchors were installed from the dam crest and downstream face to improve the interim stability of the dam. Given concerns over potentially compromising corrosion protection at the head, and other logistical reasons, it was elected not to install load cells in the permanent anchors. In order to satisfy potential concerns regarding the long-term performance of the anchors, many of which were installed in argillaceous rocks of variable properties, several “defenses” were put in place. These included a conservative design process; preproduction pull-out tests; the concept of off-site “sentinel” anchors (with load cells); stringent installation and testing procedures; and Performance Testing (i.e., progressive cyclic) on every anchor (not just on a limited number). The paper describes each step in the assessment, design, construction and testing/evaluation process and, thereby, provides a comprehensive case history of a contemporary large dam stabilization using high capacity rock anchors. Units are provided in the actual, Imperial style used in the project. A conversion table is provided at the end of the paper.