Lessons Learned from Design and Construction of an Earthen Auxiliary Spillway

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Long Pond Dam, a water and wildlife management dam owned and operated by the New York State Department of Environmental Conservation (NYSDEC), had insufficient spillway capacity to safely convey the Spillway Design Flood (SDF) due to a recent reclassification of the dam to High hazard. A new 125 ft. wide, trapazoidal earthen auxiliary spillway was provided to the left of the existing dam within a native hillside currently used as a parking area for fishing access. The conventional earthen spillway included many constraints that limited the geometry of the spillway. This provided many design challenges to allow safe discharge of the SDF. Specific site challenges included localized high velocities and shear stresses that are known to occur on earthen auxiliary spillways; archeological resources within the proposed footprint; a high groundwater table that provided drainage challenges; an abandoned waterline; prior known experiences with failures of TRM products; and the need to construct the project over portions of two construction seasons. Design of the earthen auxiliary spillway was facilitated through the use of 2D HEC-RAS that identified zones where shear stresses and velocities required stone linings and other locations where Turf Reinforcement Matting (TRM) was sufficient for the predicted shear stresses and velocities. Other project features include: a fishing platform, lakeside earthen embankment protection, buttressing of the concrete service spillway, access drives and downstream channel bank protection.