

Avoiding a Spillway Malfunction – Hydraulic Model at Hickory Log Dam

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The City of Canton, Georgia and the Cobb Marietta Water Authority have elected to build a pump storage dam and reservoir for future water supply. Hickory Log Creek Dam will be a 180- foot high by 950- foot long RCC gravity dam. When completed, it will be the highest non-federal dam in Georgia.

Due to the dam's size and hazard classification, the project design storm is the Probable Maximum Precipitation (PMP) event. For the 8.3 square mile drainage basin, the PMP produces an outflow of over 40,000cfs. Because of restrictions on flood pool elevation and the topography at the valley floor, the auxiliary spillway over the dam will require converging training walls. The ogee crest will be 250 feet long with the stilling basin limited to 140 feet in width. The crest section will have three bays. The two outer bays will each be 70 foot wide consisting of fixed cast-in-place ogee concrete sections. The center 110 foot wide section will have 6 foot high crest gates attached to an ogee section. These gates, when open, will have the geometric shape of an ogee weir so that the efficiency of the spillway will be maximized.

A 1:25 scaled model was constructed so the designers could develop an understanding of converging sidewalls and chute steps on the training wall heights, the dimensions and shape of the stilling basin, and the behavior of the flows with the gates fully open. The model study was warranted because the results of existing model studies could not be extrapolated to adequately address the uniqueness of the Hickory Log Dam spillway. This study evaluated storm events from the 10-year event through the PMP and the effects of tailwater conditions below the dam.

The presentation will discuss the results of this model study and how these results shaped the final design of the spillway and stilling basin in a cost-effective manner and how these results might be used for the design of similar spillways in the future.