

November 20, 2011

Lake Isabella Property Owners Association
1096 Queensway
Lake Isabella, MI 48893

RE: Gate Inlet Trash Rack / Drawdown of Lake Isabella

As requested, we have reviewed the hand sketched and proposed repair description provided by Gerace Construction and have provided a Professional Engineer's seal on these documents. The hand sketch and description are of a trash rack system that is installed on the upstream (west) end of a 60" diameter intake pipe. This pipe is approximately 60 feet in length and connects to a 10' x 4' sluice gate forebay located south of and immediately adjacent to the principal spillway. The north wall of this forebay has a 4' x 4' opening and 1' diameter coldwater draw which are controlled by a 4' x 4' sluice gate and a 1' x 1' sluice gate, respectively. Please refer to attached Gerace Construction sketch and relevant plan sheets from the 1967 construction plans.

These sluice gates and the associated inlet pipe are the only means to draw the lake level below the fixed crest elevation of the principal spillway. The association has a permit to draw the lake down approximately 4' below this fixed crest elevation. Prior to commencing this drawdown it was determined necessary to install a trash screen at the upstream end of the 60" CMP intake pipe. The attached Gerace sketch and proposed repair description summarize this trash screen design.

Trash Screen Drawings Structural/ Design Review

We do not have any specific concerns related to the design or structural integrity of the trash rack system. It has been designed with adequate steel cross section and to allow for relatively easy removal of the trash screen bars by a diver if deemed necessary. The trash screen as shown on the sketch should serve its intended purpose and should not cause any harm provided it is monitored and maintained free of debris while the sluice gate is operated.

Operation of Sluice Gate with Trash Screen in Place

There are operational concerns and risks related with the opening of the sluice gates with the new trash rack in place. A typical trash rack is designed for maximum screen velocities of 2 feet per second in a system where it cannot be easily accessed or maintained and 5 feet per second where access is easier and the screen can be readily cleaned off.

The reason for these maximum screen velocities are to minimize headloss at the screen which reduces the hydraulic capacity of the drawdown system, prevents debris from being drawn to the screen which accelerates the clogging of the screen, and provides a safety factor if parts of the screen become plugged.