

Supplemental Info 2006 - Dam Fill
21 June 2012

From: Jim Forsythe **Sent:** Sunday, September 10, 2006 10:22 AM **To:** Gary Croskey

Gary,

Two additional questions on the recommendation to change the slope of the downstream side of the dam embankment. You quoted the following:

"Previous reports discussed flattening the downstream slope to either 2.5:1 or 3:1 and to cover the slope with grass. The recommended flatter slopes would provide additional stability and access for maintenance equipment."

What material would be acceptable to use for this purpose.. clay, broken concrete, gravel, aggregate, topsoil, dredging spoils, combination of ..., etc? I would assume a clay, but would appreciate your input.

Also, how far out from the road should this be attempted before we reach the point of diminishing returns as changing the entire dam to a slope of 2.5 would likely push the toe of the dam beyond the Association's property line and would seem to require "hundreds" of yards of material to be brought down our newly paved roads....

Thank you. Jim Forsythe

From: Gary Croskey
Sent: Sunday, September 10, 2006 10:46 PM
To: Jim Forsythe

Jim,

I made that original recommendation for flattening the slopes within the text of the 1991 Report. Not a final recommendation for the report. The observations or concern was to monitor the THEN observed settlement and be able to monitor for seepage by clearing the downstream slope. The 30 foot wide "shelf" halfway down the slope, along with the 25 foot crest width, provides sufficient mass and stability for the existing earth embankment. Further the existing condition at that time would indicate the embankment stable, I just did not know "when" the apparent "settlement" had occurred. Note in the that report not much information was available on the initial construction and that the dam had previous failures or

induced failures. Flattening of the downstream slope was added to the text for discussion purposes. It would only provide easier access for maintenance equipment, i.e. mowing of a grass slope.

Attached is my 1996 Report which discusses this on again on page 5. Again at that time no further settlement at that time, flattening of the slope would be again for maintenance. Also this is not a final recommendation of the report only an observation for consideration.

To answer your question about type of fill, note in my 1991 Report that I discuss the "outer shell" of the embankment for a dam. Please be advised dams, earth embankment dams are best designed and constructed as "zoned embankments". Outer shells are usually pervious material, like gravel sands to allow for drainage on slopes, the interior shell is the "impervious" material like "clay". Therefore, an outside shell for the downstream slope would be a pervious material like sand or a sandy loam. The fill is not dumped, but placed in engineered lifts not exceeding 9-12 inches and compacted to 95% maximum density. So you do not put clay, nor do you put mixed material, broken concrete or other junk. Final surface treatment would be to seed and mulch.

For your dam, the most immediate concerns I have is to keep the slope free of trees and brush and mowed (monthly). This facilitates not only my inspections but your Association members inspection to see any early indicators of problems. Problems would be slides, slumps, cracks, and especially seepage before this leads to boils.

Your other question, deals where to start the slope. If you project from the existing crest of the dam, the proposed slope may well hit the existing "shelf". Check my earlier reports... there may be a sketch in the 1991 Report that would help you determine that.

I believe you should read the Dam Safety Guidebook that the then DNR (DEQ) provided for Dam Owners. I actually wrote it.

Sounds like your doing a great job of educating yourself about the dam etc.. Please feel free to call me anytime to discuss. My personal cell is on the letterhead.