

Thorndike Pond

2013 Dam Improvement Project

Peter Russell President and project lead for the TPCA

Jeff Burd of RJB Engineering did the hydrology work

Eric Teal of HTE Northeast is the engineer:

West Rindge Builders was the contractor

Bill Harper, president

Brian Defosses state's Dam Bureau contact, replaced by Jim Webber



Only one board was removed before labor day for this project, in consideration of pond residents, but after that board removal was as aggressive as the downstream culvert could tolerate (about 2-boards per week). Work on the existing dam started after labor day but the abutment extension excavation had to wait for the water to be lowered. Work on the project completed on October 4th. The state inspection was held on October 10th. At the state inspection on October 14th, the engineer suggested we replace the metal brackets that held the boards. West Rindge Builders handled that as well, putting in galvanized brackets. That project was completed on November 4th.

Raising Dam Abutments

We were required to raise the height of the abutments so we had 12 inches of freeboard during a 50 year (we did a 100) storm, which had been redefined upward after the start of the project.



The increased abutment heights can be seen on both sides of the dam in the above picture, they are the lighter color. They were raised about 14 inches. The rebar can be seen in the picture below. The vertical pins with the orange caps (put on only for safety, and later removed) are drilled into the existing abutments and take the sheer force, the U-shaped pieces are to hold the poured cement together under stress.



Extending Abutments

After raising the abutments we had to extend them so water would just go around the sides.



The abutments were extended on both sides from where the yellow arrows indicate. The top picture is of the north side of the dam, the lower picture is of the south side. For these extensions, the lake was lowered, a base was dug about 5 feet below grade, and the whole dug area was filled with concrete with the rebar in place, all the way to the bottom.

In addition to the rebar, a plastic strip (see bottom left picture) was installed to stop water from seeping through the joint. A different but equally effective strip was used for the joint with the existing abutments.



Stabilizing Spillway

There was concern that water going over the broader spillway was dropping some distance and could undermine the dam in that area, the solution was rip-rap to within 1-foot of the spillway to reduce the drop and to create a flow rather than a falls. Grout was added to enhance stability. The result is shown in the top two pictures from two different angles, the previous condition is shown in the bottom picture (with the board out, with the board in the drop is further).



Eliminating stump from structure

There was a stump in one corner of the dam that had been just poured around but has since deteriorated.



The picture below was from 1990 showing thea stump that the dam was poured around. 25 years later the stump is still there but deteriorating with additional organic growth (shown in the picture bottom right after it was cleaned out). This was repaired by removing the stump, installing pins to hold the whole structure together and pouring concrete into the void



Repair Spillway Flaking



Cement on the top of the dam was pitted and flaking. This was repaired with a strong grout material as shown in these two pictures.



Replaced Brackets on Spillway



The brackets holding the spillway boards were rusted and the engineer suggested they be replaced after the project was otherwise completed. The before and after pictures are shown above. A closer view looking down the brackets showing the thickness is below.

