

DAM INFORMATION

AC - DAMS

Chelmsford has four dams, which are located at Freeman Lake, Crooked Springs, Swains Pond, and Russell Mill Pond. These dams are a critical component of the Town's stormwater infrastructure, and are used to moderate flow to reduce flooding, to provide for recreational use, or for industrial purposes. Dams, per the Office of Dam Safety, must be inspected at varying intervals depending on their hazard potential. Dams are rated as high, significant, or low hazard potential, and must be inspected every two, five, or ten years, respectively, depending on the rating. A dam inspection is required to be performed by a competent engineer and there is a form on the Office of Dam Safety (ODS) website that must be completed. The inspection report requires the following to be recorded:

- General Background Information
- An Inspection Summary
- Dam Data
- Any Deficiencies
- Surrounding Elevations and Slopes
- Conditions of the:
 - Downstream and Upstream Masonry Walls and Areas
 - Instrumentation
 - Outlet/Inlet Structures
 - Dam Masonry

Based on this information, any deficiencies are investigated and solutions to remediate any issues are identified in a timely manner.

AC.1 Russell Mill Pond Dam

The Russell Mill Pond Dam was built in the mid-1600s by Samuel Adams to power the first grist and sawmill in Chelmsford. Dilapidated by the 1950s, Lloyd C. Green meticulously rebuilt the dam, which is now owned by the Historic Millstream Foundation and the caretaker is Mr. George Ripsom. The dam size, as categorized by the Department of Environmental Management (DEM), is intermediate and the hazard potential rating is significant. The dam is inspected every five years and was last inspected in August 2019. The condition was rated satisfactory. There are pin sized holes along the left sluice (gate of the water channel), which leak approximately one to two gallons per minute (GPM).



Figure 1: The left and right sluice looking upstream at the Russell Mill Dam.

Water also seeps under the intake structure causing another one to two GPM of leakage. The right sluice way has an estimated five GPM of leakage while in the closed position, and the concrete is

deteriorating. There are some areas of stone displacement causing serious stone voids and rotten tree stumps in the left sluice way that should be removed.

If this dam were to fail, Mill Road could be covered in as much as four feet of water and the first floors of surrounding homes would be flooded with a potential loss of life. The surge of water would be constricted at the Mill Street culvert and the relatively flat and heavily overgrown River Meadow Brook. Sediment and overgrowth removal have been recommended for this portion of the brook to increase stream carrying capacity. The Mill Street culvert appears to be in good condition.

AC.2 Crooked Springs Dam

Crooked Springs Dam is owned and maintained by the Town. The dam was originally built in the early 1930s but was breached in 1972. The dam was reconstructed in 1973 to its current configuration. The dam has embankments that stretch approximately 35 feet to the right and left side of the spillway. The spillway is a 15-inch broad crested weir that is 30 feet long. The Crooked Springs



Figure 2: Looking down at the Crooked Springs Dam from the left abutment

Dam is classified as a small dam with a significant hazard potential. The likelihood for overtopping is moderate which could cause roadway flooding at Crooked Spring Road, but it is unlikely that the flood extents would reach any residential properties. Both the downstream culvert under Crooked Spring Road and the stream section were in good condition. The only recommended maintenance related to the culvert was the removal of overgrowth on the headwalls. The adjoining stream segment has some sediment deposition and moderate overgrowth.

AC.3 Swains Pond Dam

Swains Pond Dam is located near the intersection of Deep Brook and Dunstable Road. The dam is maintained by the Town. The stone structure is a nine feet wide by nine feet high with an opening three-feet wide by two and a half feet high. On either side of the stone structure, earth embankments extend 65 feet to the south and 105 feet to the north where the embankments then meet the natural topography. The opening drains water through a stone-lined box culvert under Dunstable Road. From there, water flows down a channel with vertical stone-lined banks. The dam was recommended to be removed from the DEM Dam list as it is believed to be a culvert during the 1998 inspection.

Flow has been known to back up into this area from the Merrimack River during storm events, but no flooding has been recorded. The culvert has partially collapsed wing walls and retaining walls. The culvert and stream have debris and overgrowth.



Figure 3: Looking downstream from the left side of Swains Pond.

AC.4 Freeman Lake

Freeman Lake is in North Chelmsford and is used for recreational purposes. The lake is 83 acres and can store up to 852 acre feet of water. Freeman Lake Dam, located on Shore Drive, is owned and maintained by the Town. The dam has an earth embankment that is 400 feet long, with a structural height of 24 feet. This dam was installed in 1976 and has been classified as a large dam with a significant hazard rating.

A broad crested weir allows water to spill over into a small stream that connects to Stony Brook. The immediate downstream crossing, in the event of an overtopping, would allow a maximum of 4,845 cubic feet per second of flow to run downstream. Approximately 15 properties on Princeton Street, Frontier Drive and Richardson Road. could potentially be impacted by if the dam failed.



Figure 4: The Broad Crested Weir on Freeman Lake.