

Presentation

City Dam Maintenance: Best Practices

Anthony Rome, City of Overland Park; Clinton McNeemee, City of Atchison; and Tom Jacobs, City of Lenexa. Kansas Dam Safety Conference, 15 February 2012, Topeka, KS

In Anthony Rome's overview of dam maintenance, he said 1977 rains in Overland Park caused South Lake Dam, one of Lenexa's dams, to almost breach, which forced the city to renovate the 17' high structure. Constructed in the early 1900s for livestock watering, the tree-covered dam had undersized spillways and lacked an emergency spillway. Subsequent reconstruction raised the top of dam 3', supplied a principal and emergency spillway, removed about 30 trees, and added riprap to the upstream slope.

"We inspect it every three years as well as do annual inspections, do the clearing and grubbing to not let trees grow, and install riprap every three to four years," Rome said. "We drew it down to dredge in the early 2000s and plan to do that every 10 years. Luckily, because it is a city park, the Parks Department does the maintenance, making sure there are no rodents and keep it well mowed. We don't let trees grow on the dams because you can't take the trees out without damaging the dam."

Flooding, too, prompted the city of Atchison to develop flood control measures, said Clinton McNeemee, park superintendent. "It's been a group effort with the U.S. Army Corps of Engineers, USDA, and, at the time they were called the Soil Conservation Service, and the City of Atchison.

Of Atchison's 25 earthen dams to upkeep, 19 are high hazard and six, significant hazard. "Size



class, they are mostly 2's and 3's, and we have one size four," McNeemee said. "The city owns half of these dams. The rest are located on private properties. The watershed district is responsible for all of them and contracts with the city to maintain them."

Two city employees maintain the dams, including mowing 300 acres, the equivalent of 120 city blocks. "We try to hit it every week and the ones on private properties one or two times a year. Since our mowing is so intense, I feel that is our best defense against the weeds. We like the grass thick and tall, between 6" and 8."

They also spray and cut brush that mowing or limited livestock grazing doesn't get. He said the challenge is getting those tasks and fence repair accomplished before mowing needs to be done again.

"We're very lucky on pest management. We don't have to be too high tech. We have guards on the toe drains and are diligent on rodent holes. We fill in the holes, they come back. We fill in the holes, they get discouraged and find another place. Beavers don't like the pool level of our dams so they try to plug up our intakes. The guys go out in a backhoe, and after a couple of times beavers get the message and move on. Inspections are a regular part of our maintenance. We have to submit about eight each year to Division of Water Resources and spend about \$7,000 to \$8,000 a year on inspections. Natural Resources Conservation

Service does its inspections, and we have in-house inspections that we do.”

McNeemee said aging dams with spalling concrete, eroded outflow pipes, and other problems built in early 1960s and given 50-year life spans will be his upcoming challenges.”



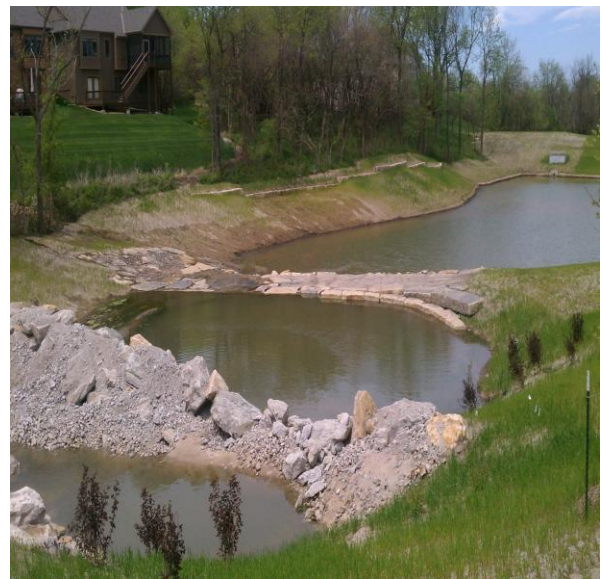
As for the city of Lenexa’s maintenance issues, Tom Jacobs said Lenexa has been focusing on decade-old

ponds that have tell-tale signs of excessive sedimentation: excess plant and algae growth from excessive nutrients, higher water temperatures and lower dissolved oxygen content, stunted fish populations, and potentially contaminated sediments.

In response, Lenexa has used a device to vacuum the algae but didn’t find this a sustainable practice. They have used mechanical dredging, which can take several days, creates a “big soupy mess,” smells, requires several permits and restorations, has incidental costs, and other drawbacks. “What we are trying to do is avoid getting sediment in the pond in the first place,” Jacobs said.

One way to reduce sedimentation is to use rock checks, triangular dikes, and other common devices on construction sites to avoid erosion. In rural areas, terraces, grass waterways, and buffer strips keep sediment on site.

They also started used forebays (see above photograph) that allow sediment to settle out in



an area before reaching the main reservoir.

Jacobs suggests forebays be of the size to contain about five years of sediment and accessible from all sides.