

# SOUTH DAM IMPROVEMENTS PROJECT



## CREDITS

<b>PROJECT OWNER</b>	Lake Asbury Municipal Services Benefit District
<b>TRUSTEE-IN-CHARGE</b>	Tom Pettruci, Treasurer LAMSBD
<b>PROJECT DESIGN &amp; MANAGEMENT</b>	Mike Kelter, PE Legacy Civil Engineers
<b>PROJECT CONSTRUCTION</b>	Besch & Smith Civil Group St. Augustine, Florida
<b>PROJECT FINANCE</b>	Ameris Bank Orange Park, Florida
<b>PROJECT PERMITTING AGENCY</b>	St. Johns River Water Management District

## TOPPING-OFF CELEBRATION

APRIL 13, 2013



## SUMMARY OF DAM IMPROVEMENTS

The South Dam Improvements Project was designed, permitted, and constructed to reduce the probability of dam failure while protecting downstream properties from flooding due to large releases of stormwater from the South Dam. The Project increases the elevation of the dam and adds a spillway to help prevent “over-topping” failure of the earthen structure, and dramatically improves the remaining service life of the dam by controlling seepage and reducing slope-failure probabilities.

The improved dam capabilities are listed below:

### SOUTH DAM CAPABILITIES

CAPABILITY	BEFORE	AFTER
SOUTH LAKE DRAINAGE BASIN	1001 ACRES	1001 ACRES
SOUTH LAKE VOLUME AT OVERFLOW	1461 ACRE-FEET	1626 ACRE-FEET
CREST ELEVATION (FT, NAVD88)	48.57	50.60
OVERTOPPING FLOW (16-INCH RAIN, 24-HRS)	1025 Cubic Ft/Sec	0 Cubic Ft/Sec
MAX CONTROLLED FLOW (16-INCH RAIN, 24-HRS)	127 Cubic Ft/Sec	582 Cubic Ft/Sec
DAM BREACH FAILURE (INCHES RAIN, 24-HRS)	10.2 Inches	16.0 Inches
DAM FACTOR OF SAFETY	1.06	1.87

The South Dam Improvements have been recommended for more than 30 years by the US Army Corps of Engineers, the Department of Environmental Protection, St. Johns Rive Water Management District, and numerous engineers working on behalf of the Lake Asbury Municipal Services Benefit District.

**SHEET PILE CUTOFF WALL:** Sheet piles were driven deep into the south face of the dam along 746 linear feet of the dam length to cutoff water flow through dam. This strengthens the dam from internal failures and helps prevent erosion.

**BOX CULVERTS AND SPILLWAY:** Two aluminum box culverts were added to increase controlled flows through the dam and 7350 square feet of concrete articulating block was installed to control the flow of water from the South Lake to the North Lake. The articulating block slows spillway velocities by 30% and allows internal water to “weep” safely. The Keystone Block headwalls around the culverts also allow “weepage” around the culverts. The color of the Keystone Block closely matches the color of the clay inside the dam core.

**DAM CREST IMPROVEMENTS:** The crest of the dam was elevated an average of 1.8 feet to remove low points in the dam crest due to years of settling. The original roadway was scarified and mixed into the soils on the top of the dam to create a very hard, and erosion-resistant subgrade. Eight-inches of limerock were compacted into the roadway base and two inches of asphalt was installed for the roadway. Asphalt millings were used on the edges of the roadway for the guardrail pads, which reduce the cost of mowing and weed-eating, while providing a wider shoulder for pedestrians.

**SLOPE AND TOE DRAINAGE IMPROVEMENTS:** An earthen buttress was constructed on the toe of the dam’s north face to arrest sliding of soils down the steep face of the dam. Additional toe underdrains (french drains) were installed to remove excess water from the bottom of the dam, and new cleanout ports were installed in the old underdrain to improve maintenance.

**SURFACE DRAINAGE IMPROVEMENTS:** Concrete flumes were constructed on both flanks of the dam to control surface runoff from the county roads.

**TOTAL PROJECT CONSTRUCTION COST:** \$684,750