

STRUCTURE 80

This structure is a reinforced concrete, gated spillway with discharge controlled by seven taintor gates and a reinforced concrete lock with two sets of sector gates. The structure is located on the St. Lucie Canal about 8 miles southwest of Stuart.

PURPOSE

This structure, together with S-308, controls the easterly discharge of Lake Okeechobee to tidewater. The structure passes the 100-year and the Standard Project Flood and restricts upstream and downstream flood stages and channel velocities to non-damaging levels. The structure also provides a means for passing boat traffic through the St. Lucie Canal.

SPILLWAY OPERATING CRITERIA

This structure is operated and maintained by the U.S. Corps of Engineers. Lake Okeechobee releases are made, according to the Lake Okeechobee regulation schedule, by S-308 and S-80 via the St. Lucie Canal.

Regulating releases from Lake Okeechobee are made by S-308. When S-308 is closed, S-80 will maintain a headwater stage between 14.0 and 15.0 insofar as possible.

In order to preclude an excessive instantaneous peak discharge however, the following procedure will be followed in changing to a larger gate opening:

1. Under most conditions, the lockmaster will make the change in half-foot increments each half hour until the desired opening is reached.

2. When the rainfall measured at the lock exceeds 2 inches in 24 hours or when the headwater is rising rapidly, the Area Engineer will provide the lockmaster with a table showing the headwater elevations at which each succeeding half-foot increment can be made without exceeding 125% of St. Lucie Canal rating for the 0800 hours lake stage without local inflow. Under conditions of extreme local inflow, this may prolong a gate change over a 2 or 3 day period.

3. No change in the current gate setting (prior to any changes) will be made during a rising headwater until the change can be made without exceeding the 125% rating.

High discharges cause considerable damage because of erosion of the channel banks and subsequent deposition in the St. Lucie estuary. An average channel velocity of 2.5 feet per second has been assumed to be the threshold level above which erosion occurs. Plate 2 (from Design Memorandum for Lake Okeechobee Regulation Facilities, Part IV, Supplement 2, Section 5) gives the discharge, as controlled by S-80, for a channel velocity of 2.5 feet per second as a function of the S-80 headwater stage and the corresponding Lake Okeechobee stage. This relationship is based on the conditions of no inflow between Lake Okeechobee and S-80.

LOCK OPERATING CRITERIA

This structure is operated and maintained by the U.S. Corps of Engineers. It is operated between 6:00 a.m. and 10:00 p.m., seven days a week. Between 10:00 p.m. and 6:00 a.m. the gates are closed.

FLOOD DISCHARGE CHARACTERISTICS

The approximate flood discharge characteristics are given in the Letter Report - St. Lucie Canal dated December 18, 1970, for a Lake regulation schedule of 15.5 to 17.5, as follows:

	Standard Project Flood	100-year Flood
Lake Okeechobee Stage	<u>23.5</u> feet	<u>21.2</u> feet
S-80		
Headwater Stage	<u>12.0</u> feet	<u>12.0</u> feet
Tailwater Stage	<u>6.8</u> feet	<u>6.8</u> feet
Discharge	<u>16,900</u> cfs	<u>16,900</u> feet
Type Discharge	Uncontrolled <u>Submerged</u>	Uncontrolled <u>Submerged</u>

The above relationships obtain prior to the completion of S-308. With the completion of S-308, the conditions at S-80 will be the same for the design storm, but Lake Okeechobee will rise to a maximum stage of 24.5 feet for the Standard Project Flood and 21.6 for the 100-year flood.

DESCRIPTION OF SPILLWAY STRUCTURE

Type reinforced concrete, gated spillway
Weir Crest

Net Length 140 feet

Elevation 0.56 feet

Service Bridge Elevation 20.56 feet

Water Level which will by-pass structure 20.56 feet

Gates

Number 7

Size 20 ft. wide; by 10.5 ft. high

Type Top sealing Taintor gate

Control Manual

Lifting Mechanism

Normal power source On-site generated electricity supplemented by commercial electricity

Emergency power source gasoline engine driven generator

Type Hoist Each gate is equipped with an electric motor operated gear and cable drum which is cable connected to the bottom of the gate.

DESCRIPTION OF LOCK STRUCTURE

Type: reinforced concrete lock, with two pairs of sector gates

Operating Deck Elevation

Lock

Length 250 feet

Width 50 feet

Invert Elevation

Upper Sill: -0.94 feet

Lower Sill: -12.44 feet

Gates

Type: Sector

Size:

Upper: 21.5 feet high

Lower: 32 feet high

Control: Manual

Operating Mechanism

Normal Power Source: On-site generated electricity supplemented by commercial electricity

Emergency Power Source: Gasoline engine drum generator

Type A driving rack is installed around the outside face of each sector gate and movement is effected by rack and pinion drive.

ACCESS: The site is reached from a point on SR 76 about 1/4 mile west of the Turnpike via about one mile of paved access road.

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level On-site, upstream and downstream recorders

Rainfall: On-site recording NOAA raingauge

DEWATERING FACILITIES

Storage U.S. Corps of Engineers

Type Bulkhead gates