

STRUCTURE 191

This structure is a reinforced concrete, gated spillway with discharge controlled by three cable operated, vertical lift gates. Operation of the gates is automatically controlled so that the gate hydraulic operating system opens or closes the gates in accordance with the seasonal operational criteria. The structure is located on Canal 59 at its junction with Levee D4 on the north shore of Lake Okeechobee.

PURPOSE

This structure maintains optimum water control stages in the upstream agricultural area; it passes the design flood (once in ten years frequency) without exceeding the upstream flood design stage, and restricts downstream flood stages and discharge velocities to non-damaging levels; it prevents flooding from hurricane tides on Lake Okeechobee; and it permits backflow up to 330 cfs to the north to meet agricultural water requirements.

OPERATION

This structure will be operated to maintain, insofar as possible, headwater elevation 18.5 foot. The automatic controls function as follows:

When the headwater elevation rises to 19.0 feet, the gates will open at six inches per minute; but the gate opening will be governed by the Differential Head versus Gate Position Curve, and it will not exceed the maximum allowable opening position;

When the headwater elevation rises or falls to elevation 18.6, the gates will become stationary;

When the headwater elevation falls to 18.3 feet, the gate will close at six inches per minute.

Backflow Regulation

In addition to maintaining optimum upstream control, as described above, the automatic controls on this structure have an overriding control which closes the gates, regardless of the upstream water level in the rare event that the tailwater pool elevation reaches or exceeds the headwater elevation.

FLOOD DISCHARGE CHARACTERISTICS

	Design	Standard Project Flood
Discharge Rate	<u>7440</u> cfs	<u>--</u> cfs
	<u>*</u> % SPF	<u>100</u> % SPF
Headwater Elevation	<u>19.2</u> feet	<u>23.0</u> feet
Tailwater Elevation	<u>18.6</u> feet	<u>23.5</u> feet
Type Discharge	Uncontrolled <u>Submerged</u>	<u> </u>

*Design flood based on once in 10 years frequency and not related to the Standard Project Flood.

DESCRIPTION OF STRUCTURE

Type Fixed crest, reinforced concrete gated spillway

Weir Crest

Net Length 81.0 feet

Elevation 7.4 feet

Service Bridge Elevation 42.9 feet

Water Level which will by-pass structure 24.5 feet

Gates

Number 3

Size 17.6 ft. high by 27.8 ft. wide

Type vertical lift gate

Bottom elevation of gates, full open 24.6 feet Normal, 40.9 feet Maximum

Top elevation of gate, full closed 24.9 feet

Bottom of breast wall 24.5 feet

Control Automatic, on-site upstream control with override
differential water surface control sensed by bubbler system

Lifting Mechanism

Normal power source commercial electricity

Emergency power source LP engine driven generator

Type Hoist hydraulic cylinder actuated by electric motor driven pump, with emergency hand pump; connected to gate by steel cables.

ACCESS: from U.S. Highway 441 via access ramp on west side of structure

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level Remote digital headwater and tailwater recorders

Gate Position Recorder Remote digital recorder on all gates

DEWATERING FACILITIES

Storage West Palm Beach Field Station

Type steel needle beams and aluminum needles

Size and number (per bay)

Upstream & Downstream

Needle Beams

Number 1

Size 30 WF 210, 28'-10" long

Needles

Number and width - 5 each @ 5'; 2 each @ 2'