

STRUCTURE S-13

This structure is a pumping station with a gated spillway which can control flows which bypass the pumps. The structure is located in Canal 11 (South New River Canal) about 300 feet west of U.S. Highway 441 and 5½ miles southwest of Fort Lauderdale and is a reinforced concrete structure with concrete block superstructure. The pumping station is equipped with three Fairbanks Morse 60-inch Figure 6310W vertical propeller pumps each having a rated capacity of 180 c.f.s. at a 4-foot static head. Each pumping unit is driven through a Bradfoot Gear Works 2-stage right-angle reducer by a Detroit Diesel V-71 285 horsepower in-line diesel engine. At the south side of the station, there is a 16-foot wide by 11-foot high vertical lift gate which is raised or lowered by means of Baldor 3 Phase stem hoists. Operation of the gate hoist is normally controlled automatically but may be controlled manually during emergencies or for servicing. Other equipment includes a Wright 5-ton manually operated overhead bridge crane for general maintenance and a dual water stage recorder.

PURPOSE

The purpose of the structure is to release flood runoff from, prevent overdrainage of, and saltwater intrusion into the agricultural area served by Canal 11 (South New River Canal) west of the structure.

The purpose of the pumping units in the structure is to pump surplus water through Canal 11 from the agricultural area west of the structure at the rate of 3/4 inch per day from the tributary drainage area, so as to keep water level in the canal west of the structure at optimum elevation of 2.2 feet above mean sea level, insofar as practicable.

The purpose of the gated spillway in the structure is to release runoff from, prevent overdrainage of, and prevent intrusion of salt water into the agricultural area west of the structure.

OPERATION

This structure will be operated to maintain an optimum headwater elevation of 1.6 feet, when sufficient water is available to maintain this level.

Spillway Operation

The automatic controls on the spillway will function as follows:

When the headwater elevation rises to elevation 1.8 feet, the gate will open;

When the headwater elevation falls or rises to elevation 1.6 feet, the gate will become stationary;

When the headwater elevation falls to 1.4 feet, the gates will close.

In addition to maintaining optimum upstream freshwater control as described above, the automatic gate controls on this structure have an overriding control which closes the gates, regardless of the upstream water level in the rare event of a high flood tide, whenever the differential between the head and tailwater pool elevations reaches 0.2 feet.

A special timing device has been installed at this site to protect manatees during automatic gate operation. During this operation when the upstream float sensor indicates that the gate should open, the gate opens a minimum of 2.5 feet. If this opening results in a headwater stage below the gate close level, as it often does, the gate will begin to close and the normal automatic operation will take control.

Pump Operations

The pumps shall be operated whenever water level in Canal 11 westerly of the structure exceeds the optimum elevation of 2 1/2 feet above mean sea level and water level easterly thereof is less than 8 feet above mean sea level. In addition, the pumps will be used when either excessive rainfall and/or high tides are predicted which could compromise gravity operation. The manually controlled pumping units shall be started and stopped slowly, one at a time, so that surges do not occur in the canal.

FLOOD DISCHARGE CHARACTERISTICS

	Pump Design	Gravity Design
Discharge Rate	<u>540</u> cfs * % SPF	<u>540</u> cfs * % SPF
Headwater Elevation	<u>2.2 to 2.5</u> ft.	<u>1.2</u> feet

Tailwater Elevation 6.2 to 6.5 ft. 1.0 feet
 Type Discharge Pumped Submerged, uncontrolled

*Design flow not related to Standard Project Flood

DESCRIPTION OF STRUCTURE

Type Three pumping units and one gated spillway in reinforced concrete and concrete block structure

Spillway

Weir Crest

Net Length 16.0 feet

Elevation -8.0 feet

Service Bridge Elevation 8.0 feet

Water Level which will by-pass structure 8.0 feet

Gates

Number 1

Size 11.3 ft. high by 17.3 ft. wide

Type vertical lift

Bottom elevation of gates, full open 3.0 ft. Normal

9.0 ft. Maximum

Top elevation of gates, full closed 3.5 feet

CONTROL On-site, Automatic and remote by telemetry

Lifting Mechanism

Type Hoist Converted from direct drive electric motor gear connected to stem lifts to cable lifts December 2001.

Date of Transfer: November 1, 1954

ACCESS: Highway 441 to Orange Drive, west of 441 on south bank, in Davie

Pumping station

Number of Pumps 3

Size & Type of Pumps 60" vertical lift propeller type

Design rating 180 c.f.s. each

Propeller speed 191 r.p.m.

Pump Manufacturer Fairbanks Morse

Engine Make and Type General Motors, 6-cylinder in-line diesel

Engine Horsepower 275 each

Engine Speed 1625* r.p.m.

Gates (per bay)

Number 1

Location upstream

Type vertical lift

Size 16 feet wide by 11 feet high (clear opening)

Control manual

Lifting Mechanism direct drive electric motor gear
connected to cable lifts

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water Level On-site, upstream and downstream remote digital recorder.

Gate Position Recorder On-site - remote recorder

Rain Gauge remote digital recorder

Engine Tachometer: On-site remote digital recorder

Electric Power Source

Normal commercial electricity

Emergency diesel engine driven electric generator

SPILLWAY DEWATERING FACILITIES

Upstream and Downstream

Storage West Palm Beach Field Station

Type aluminum needles

Size and Number (per bay)

4 @ 4' wide

PUMP DEWATERING FACILITIES - None

*Engine speed was increased from 1200 to 1625 rpm with change in gear ratio to maintain design pump rpm when engines were replaced 10/94 - 2/95.