

STRUCTURE S-65

This structure is a reinforced concrete, gated spillway with discharge controlled by three cable operated, vertical lift gates, and a reinforced concrete lock structure with two pairs of sector gates. Operation of the spillway gate is manually controlled in accordance with seasonal operational criteria. The structure is located on Canal 38 at the outlet of Lake Kissimmee. Two new gates were added as part of the Kissimmee River Restoration project.

PURPOSE

This structure maintains optimum upstream water control stages in Lake Kissimmee; it passes the design flood (30% of the Standard Project Flood) without exceeding the upstream flood design stage, and restricts downstream flood stages and channel velocities to non-damaging levels; it prevents overtopping of the structure by wave action from Lake Kissimmee during the design storm and wind tide; it prevents overtopping of the structure during the Standard Project Flood and hurricane wind tide, though it will be overtopped by breaking waves under such conditions and it passes sufficient discharge during low-flow periods to maintain downstream stages and irrigation demands.

SPILLWAY OPERATION

This structure is operated in accordance with the Lake Kissimmee Regulation Schedule. This schedule, which ranges between elevations 48.5 and 52.5 indicates the desirable water level throughout the year. If the level is above the prescribed level, flood operation is followed; if the level is below the prescribed level, low water operation is followed. The operation is also dependent on hydraulic and structural limitations of the structure.

Flood Operation

When the lake level is within 0.5 foot of the prescribed level, a release schedule, based on forecasted inflow, will be established to return the lake to that level within 15 days. When the lake stage is over 0.5 foot from the prescribed level, maximum release, subject to hydraulic and structural limitations, will be made. Maximum release ranges from 3000 cfs. to 11,000 cfs., depending on inflow between S-65 and S-65A in such a way that flow at S-65A does not exceed 11,000 cfs.

When releases have to be terminated from a high discharge rate, the discharge rate should be reduced gradually. The purpose of this operation is to prevent pool level dropping suddenly above S-65B. To minimize the environmental damages, the water, stored on the floodplain in pool B due to a high flow rate in the river, should be released back to the channel slowly after the flow rate in the river decreases. Leave minimum flow (500 c.f.s.) for longer period.

Low-water Operation

Whenever the lake level is below the prescribed level, minimum releases will be made to satisfy downstream irrigation and navigation demands.

Structural Limitations

The maximum water level drop across the structure will be 10 feet.

Hydraulic Limitations

To prevent damage from high velocity discharge, the gate opening will be limited in accordance with the "Maximum Allowable Gate Opening Curve". Moreover, the gate shall be opened gradually to allow tailwater stages to rise before large releases are made.

LOCK OPERATION

The hydraulic system is designed to provide two gate speeds of operation. The normal speed is determined by the hydraulic pump capacity and will result in a peripheral gate speed of approximately 6.75 feet per minute which is equivalent to a full gate travel in three minutes. A manually variable slow speed is achieved by reducing the quantity of oil flowing to the hydraulic motor accomplished by energizing a solenoid valve, thereby connecting in a variable flow bleedoff or bypass system. Slow speed will be considered as effecting a three feet per minute peripheral gate speed.

Starting and stopping of pump power unit and the direction and normal or slow speed of gate travel will be manually controlled by the operator except that the gate speed will automatically shift to slow for the last six inches of gate travel to either the full open or closed position. This six inch limit may be changed in the field as conditions dictate and the slow speed is manually variable by an adjustment of the flow control valve to compensate for seasonal or other extreme variations of differential water levels.

The schedule of lock operation, as established by the U.S. Corps of Engineers in accordance

with the River and Harbor Act of August 8, 1917 (40 Stat. 266; 33 U.S.C. 1) is as follows:

Monday through Friday	All Year	7:00 a.m. to 6:00 p.m.
Saturday and Sunday	Mar. 1 through Oct. 31	5:30 a.m. to 7:30 p.m.
Saturday and Sunday	Nov. 1 through Feb. 28	5:30 a.m. to 6:30 p.m.

Note:

S-65 water level reading may be affected by wind speed and direction. S-65 headwater level reading may be affected by the discharge rate due to the channel restriction near the structure.

When S-65 headwater is below 48, navigation may have a problem in Lake Kissimmee. When S-65 headwater is below 49.5, navigation may have a problem in Lake Hatchineha.

FLOOD DISCHARGE CHARACTERISTICS

	Design		Standard Project Flood
	Lower Profile*	Peak Stage*	
Discharge Rate	<u>3000</u> cfs <u>30</u> %SPF	<u>3000</u> cfs <u>30</u> %SPF	<u>3000</u> cfs <u>100</u> %SPF
Headwater Elevation			
Static	<u>51.0</u> feet	<u>52.1</u> feet	<u>58.0</u> feet
Wind Tide	<u> </u> feet	<u>57.5</u> feet	<u>61.7</u> feet
Wind Tide plus Breaking Wave Height	<u> </u> feet	<u>66.6</u> feet	<u>73.9</u> feet
Tailwater Elevation	<u>46.4</u> feet	<u>46.4</u> feet	<u>52.6</u> feet
Type Discharge	Controlled <u>Submerged</u>	Controlled <u>Submerged</u>	Controlled <u>Submerged</u>

*Peak Stage is based on lake operation for design flood which allows 2.0 feet of storage above historic average levels. Lower Profile is based on no rise in lake levels from historic average. Actual operation will probably be close to Lower Profile for the design flood.

DESCRIPTION OF SPILLWAY STRUCTURE

Type reinforced concrete gated spillway

Weir Crest

Net Length: 135.0 feet

Elevation: 39.3 feet

Service Bridge Elevation: 63.0 feet

Water Level which will by-pass structure: 52.5 feet

Gates

Number: 5

Size: 14.2 ft. high by 27.8 ft. wide

Type: Vertical lift gates

Bottom elevation of gates, full open: 53.1 feet Normal

61.0 feet Maximum

Top elevation of gates, full closed: 53.4 feet

Control manual

Lifting Mechanism

Normal power source: Commercial electricity

Emergency power source: LP engine driven generator

Type Hoist: hydraulic cylinder activated by electric motor driven pump with emergency hand pump, connected to gate by steel cables

Date of Transfer: December 14, 1965 (Three-Gate Structure)

August 27, 2001 (Two-gate structure)

ACCESS: structure located on State Road 60

HYDRAULIC AND HYDROLOGIC MEASUREMENTS

Water levels: Remote digital headwater and tailwater recorder

Gate Position Recorder Remote digital recorder

DEWATERING FACILITIESStorage Okeechobee Field StationType steel bulkheads

Size and Number (per bay)

The spillway gate section can be dewatered by using eleven standard bulkheads and one special bulkhead. The bulkheads shall be oriented and placed in the bulkhead recesses of Structure 65 spillway with the skin plate side of the bulkheads facing the spillway gate. The bulkheads can be stacked on top of each other to a maximum of 6 bulkheads on the upstream side and 6 bulkheads on the downstream side in order to dewater the spillway gate section. The one special bulkhead shall be placed first in the upstream bulkhead recess and then up to 5 standard bulkheads may be stacked on top of the special bulkhead. Each bulkhead is 3' -5" high, 1' -9" wide, and 28' -7" long.

DESCRIPTION OF LOCK STRUCTUREType: reinforced concrete lock with two pairs of gatesOperating Deck Elevations: 63.0 feet

Lock

Length: 90.0 feetWidth: 30.0 feetInvert Elevations: 38.0 to 40.5 feet

Gates

Type: SectorSize: Upper: 17.5 feetLower: 20.0 feet high; 18.8 feet radiusControl: manual

Operating Mechanism

Normal Power Source: commercial electricityEmergency Power Source: gasoline engine driven generatorType: double wire rope drum unit with worm type special reducer,

powered by electric motor driven hydraulic motor

DEWATERING FACILITIES

Location: Okeechobee Field Station

Type: steel bulkheads

Size and Number: upstream 5 each, 1' -6" wide, 3' -6" high, 31' - 3" long
downstream - same