APPENDIX A
INTERIM OPERATIONS PLAN
L-28 CULVERTS
STRUCTURES S-229A, S-229B, AND S-229C
PROVIDED BY SOUTH FLORIDA WATER MANAGEMENT DISTRICT

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INTERIM OPERATIONS PLAN

L-28 CULVERTS

STRUCTURES S-229A, S-229B AND S-229C

[NGVD29 = NAVD88 + 1.47 at S-229A; NGVD29 = NAVD88 + 1.48 at S-229B and S-229C]

DESCRIPTION

The L-28 culverts, S-229A, S-229B and S-229C, are gated culvert structures with multiple barrels, located in the L-28 Canal, near S-343A and S-344 along the L-28 levee, and north of Tamiami Trail in Miami-Dade County (See **Figure 1**). The structures may function with bidirectional flow; however, the flow will most often be east to west; therefore, the upstream side is the east side in Water Conservation Area 3A (WCA-3A), and the downstream side is the west side in the Big Cypress National Preserve (BCNP). The upstream water levels to the east are controlled by a vertical slide gate mounted on a reinforced concrete head structure on each barrel at the east end of each structure. The gates can either be remotely operated from the South Florida Water Management District (SFWMD) Operation Control Center or controlled on-site. Construction of the structures began in early 2024 and will be maintained by Miami Field Station. Plan and Section views are shown in **Exhibit A**.

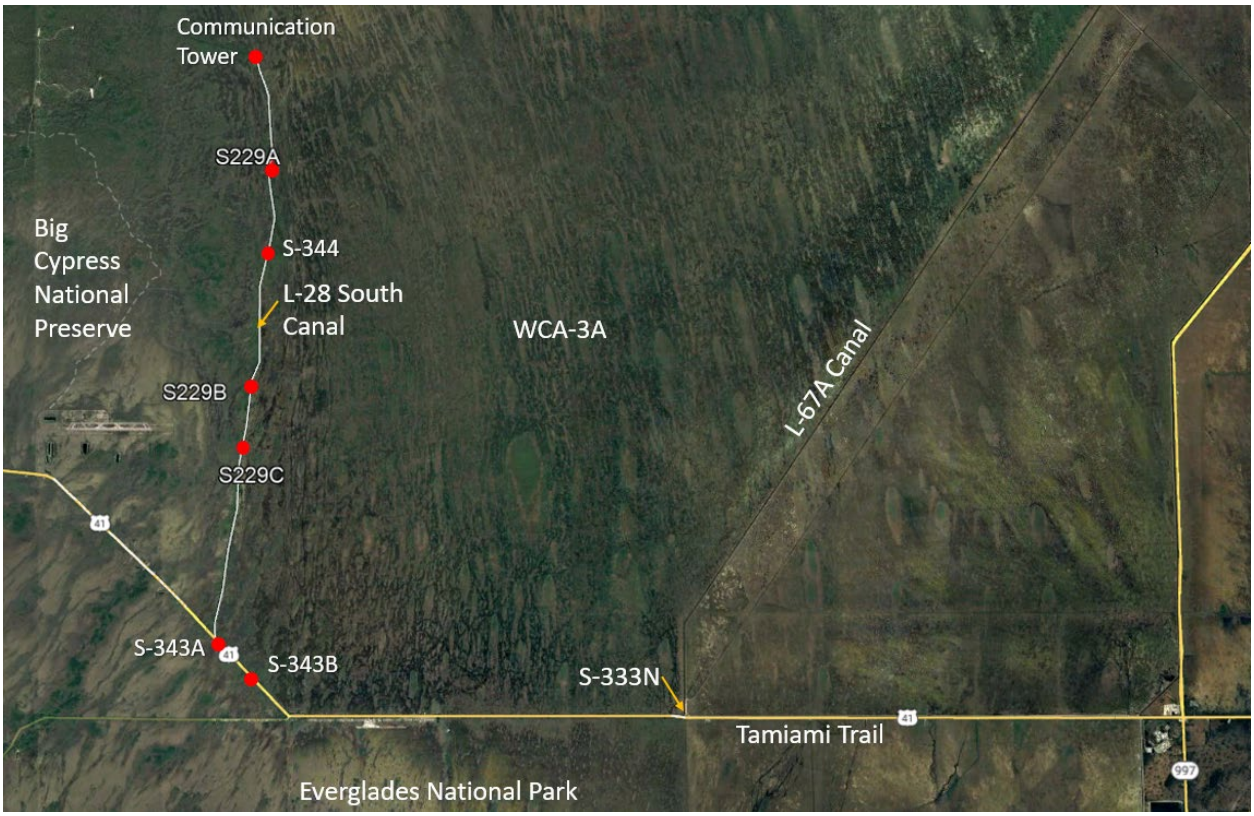

Figure 1: L-28 Culverts Location Map

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PURPOSE

The following objectives were used during development of the Western Everglades Restoration Plan (WERP) Final Project Implementation Report and Environmental Impact Statement (PIR/EIS) and were therefore considered during development of this Interim Operations Plan:

1. Restore freshwater flow paths, flow volumes and timing, seasonal hydroperiods, and historic distributions of sheet flow to re-establish ecological connectivity and ecological resilience of the wetland/upland mosaic.
2. Restore water levels to reduce intense wildfires associated with altered hydrology, which damage the geomorphic and associated ecological conditions of the western Everglades.
3. Restore aquatic low nutrients (oligotrophic) conditions to reestablish and sustain native flora and fauna.

This Interim Operations Plan allows more water to flow west into BCNP, which is an incremental step toward achieving the above listed objectives.

OPERATIONS

The proposed S-229A, S-229B and S-229C gated culvert structures will work in conjunction with additional future modifications to the L-28 Canal, L-28 Tieback and Tamiami Trail Canal and are features of WERP. Once these other elements are designed and approved, a final operations plan will be developed and coordinated with the USACE (including updated NEPA, if required). This Interim Operations Plan is to be used until the final operation plan is available, or until the interim operations are revised through another Section 408 and/or Comprehensive Everglades Restoration Plan (CERP) operational planning study (e.g. Central Everglades Planning Study Increment 1.0 Operational Planning Study).

The proposed gated culvert structures—S-229A, S-229B, and S-229C—will be operated in a manner consistent with the S-344 structure, following the 2020 Combined Operational Plan (COP) Criteria as outlined in the System Operating Manual (SOM) Volume 4 (**Figure 2**) until such time that the eight new monitoring gage(s) described below are installed. Structures S-229A, S-229B, and S-299C will only be opened when the stage in WCA-3A is within Zone A of the regulation schedule. The structures may be operated up to the peak capacities (S-229A: 250 cubic feet per second (CFS); S-229B: 350 cfs; and S-229C: 400 cfs) during this condition. They will remain closed when WCA-3A stage is in Zone B or Zone C and operations will also consider downstream constraints at the Loop Road 1 (LOOP1) gage while in Zone A.

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The culverts will be closed, following S-344 operations under COP, if the water level at LOOP1 exceeds 7.0 feet NAVD88 (8.5 feet NGVD29) to prevent adverse impacts on Loop Road.

Existing monitoring gages in the area include LOOP2, LOOP1 (which requires upgrading), BCA9, and TAMI.40M. Additionally, eight new monitoring gages as depicted in **Figure 3**—currently in the design phase as of September 2025—will be installed along US Highway 41, 11-Mile Road, Loop Road, Jet Port, and at the North and South Environmentally Sensitive Areas (NESA and SESA, tribal lands) to regularly monitor water levels.

Water levels at these eight new gages as well as recently surveyed minimum road top elevations along US Highway 41, Loop Road, 11-Mile Road, Jet Port and ground surface elevations at NESA and SESA, listed in **Table 1**, will be used to inform operations of these culverts once installed. The operational strategies defined at each gage in **Table 1** focus on providing sufficient freeboard (1.5 to 2.0 feet) from the minimum road top elevations or ground surface elevations to avoid adverse impacts on the existing roads within the project area. The culverts may be closed if the water level at any of the eight new gages exceeds any of the operational strategies listed in **Table 1** to prevent adverse impacts to US Highway 41, Loop Road, 11-Mile Road, Jet Port and environmentally sensitive areas subject to the results of field reconnaissance.

During the operation of these culverts, specifically inclusive of events which resulted in stages exceeding elevations indicated in the operational strategies as listed in Table 1, SFWMD field personnel will be deployed to key locations to collect on-the-ground data—such as photographs, videos, and manual staff gage readings—to support operational decision-making. Based on the results of assessments of field observations data, and in coordination with USACE water managers, operational adjustments at these culverts will be made as necessary to avoid negative impacts to US Highway 41, 11-Mile Road, Jet Port and environmentally sensitive areas. Culverts will be operated at full or reduced capacities as informed by field reconnaissance. These operational targets are subject to change based on field conditions and lessons learned from impactful storm events, and revisions to the operational targets will be documented through administrative updates to the interim operations plan, with NEPA updated as appropriate.

In addition, data and tools relevant to monitoring the Cape Sable seaside sparrow (CSSS) subpopulation Ax—such as water level readings from the NP205 and SPARO gages, along with the USGS CSSS Viewer tool—will be considered to inform operational decisions regarding the three culverts.

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Structures S-229A, S-229B, and S-229C collectively provide an additional 1,000 cfs of discharge capacity for WCA-3A when operating within Zone A of its regulation schedule. Consequently, USACE and SFWMD water managers will consider the operational status of S-229A, S-229B, and S-229C during their weekly operational decision-making, particularly when the WCA-3A three-station average is within six inches of the bottom of Zone A. This is especially critical towards the end of the wet season, due to the following factors:

- Fish and Wildlife Conservation Commission (FWCC) Action Line: Maintaining a two-station average at Sites 62 and 63 below 11.6 feet, National Geodetic Vertical Datum of 1929 (NGVD29), between October 1 and December 1 to meet FWCC targets.

- Wading Bird Habitat: Managing recession rates at Site 63 (Alley North wading bird colony) between 0.05 and 0.12 feet per week, targeting a stage of 11.5 ft NGVD29 by October 1 and above 9.4 ft NGVD29 by March 15.

- CSSS Ax Habitat: Potential impacts to CSSS sub-population Ax habitat related to water levels and recession rates.

- Potential Shift in Operational Focus: A potential need to transition from flood control operations to water supply or water conservation operations, based on forecasts indicating a possible La Niña condition during the upcoming dry season.

The 2020 WCA-3A Regulation Schedule (**Figure 2**) has three (3) zones: Zone A, Zone B, and Zone C. An Extreme High-Water Line (EHWL) is located above the Zone A bottom line. Zone A is above Zone B and delineated by a seasonally varying line that ranges from a maximum of 9.0 feet NAVD88 (10.5 feet NGVD29) (1 November) to a minimum of 8.0 feet NAVD88 (9.5 feet NGVD29) (1 June). In Zone A, maximum releases at S-333, S-333N, S-12D, S-12C, S-12B, S-12A, S-343A, S-343B, S-344, and S-151 are subject to the seasonal closure periods and/or downstream constraints consistent with the COP as described in SOM Volume 4. A Florida Department of Environmental Protection (FDEP) permit (issued to SFWMD) regulates operations of S-333N.

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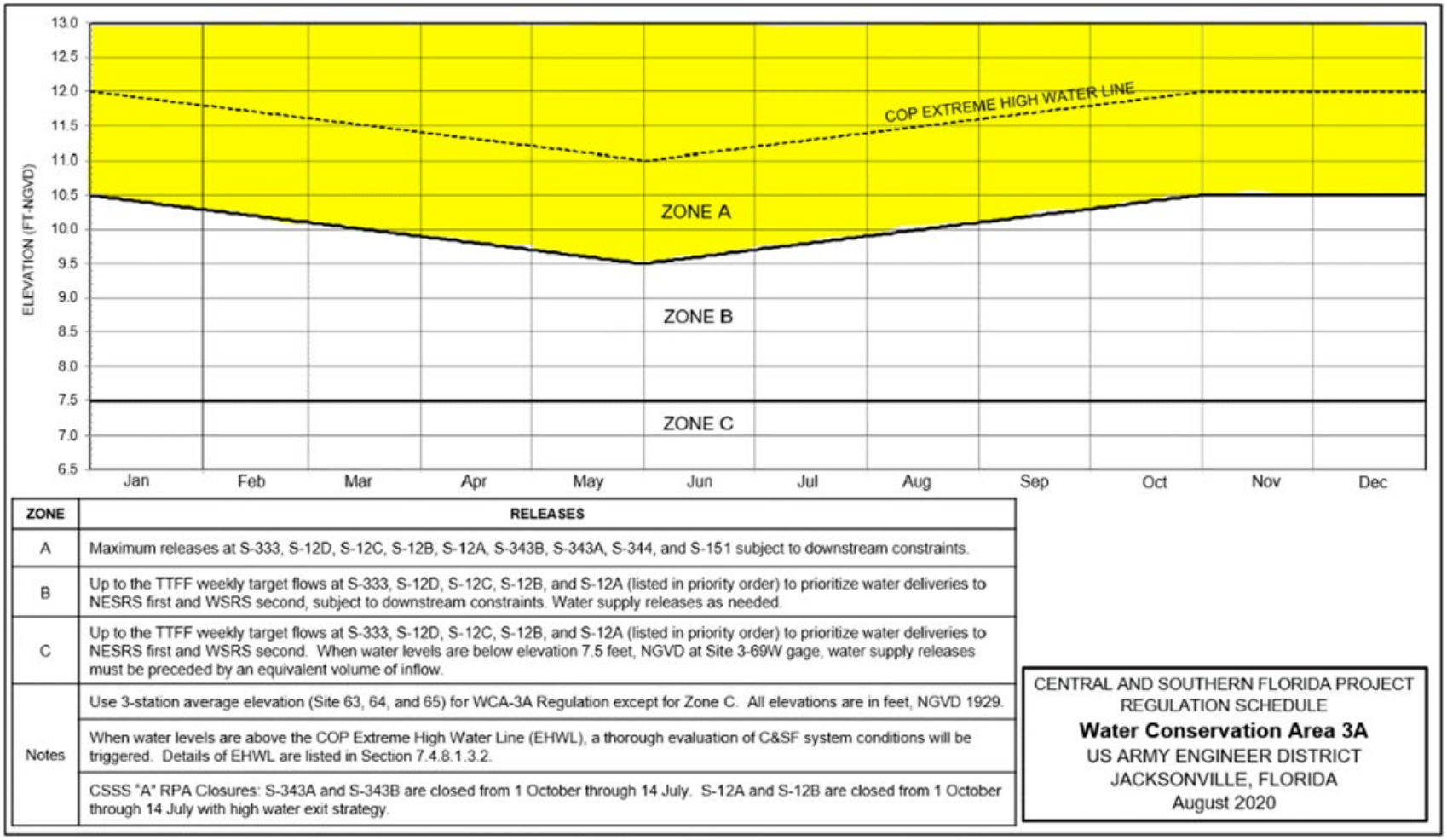

ZONE	RELEASES
A	Maximum releases at S-333, S-12D, S-12C, S-12B, S-12A, S-343B, S-343A, S-344, and S-151 subject to downstream constraints.
B	Up to the TTFF weekly target flows at S-333, S-12D, S-12C, S-12B, and S-12A (listed in priority order) to prioritize water deliveries to NESRS first and WSRS second, subject to downstream constraints. Water supply releases as needed.
C	Up to the TTFF weekly target flows at S-333, S-12D, S-12C, S-12B, and S-12A (listed in priority order) to prioritize water deliveries to NESRS first and WSRS second. When water levels are below elevation 7.5 feet, NGVD at Site 3-69W gage, water supply releases must be preceded by an equivalent volume of inflow.
Notes	Use 3-station average elevation (Site 63, 64, and 65) for WCA-3A Regulation except for Zone C. All elevations are in feet, NGVD 1929.
	When water levels are above the COP Extreme High Water Line (EHWL), a thorough evaluation of C&SF system conditions will be triggered. Details of EHWL are listed in Section 7.4.8.1.3.2.
	CSSS "A" RPA Closures: S-343A and S-343B are closed from 1 October through 14 July. S-12A and S-12B are closed from 1 October through 14 July with high water exit strategy.

CENTRAL AND SOUTHERN FLORIDA PROJECT
REGULATION SCHEDULE
Water Conservation Area 3A
US ARMY ENGINEER DISTRICT
JACKSONVILLE, FLORIDA
August 2020

Figure 2: Water Conservation Area 3A Regulation Schedule (COP 2020)

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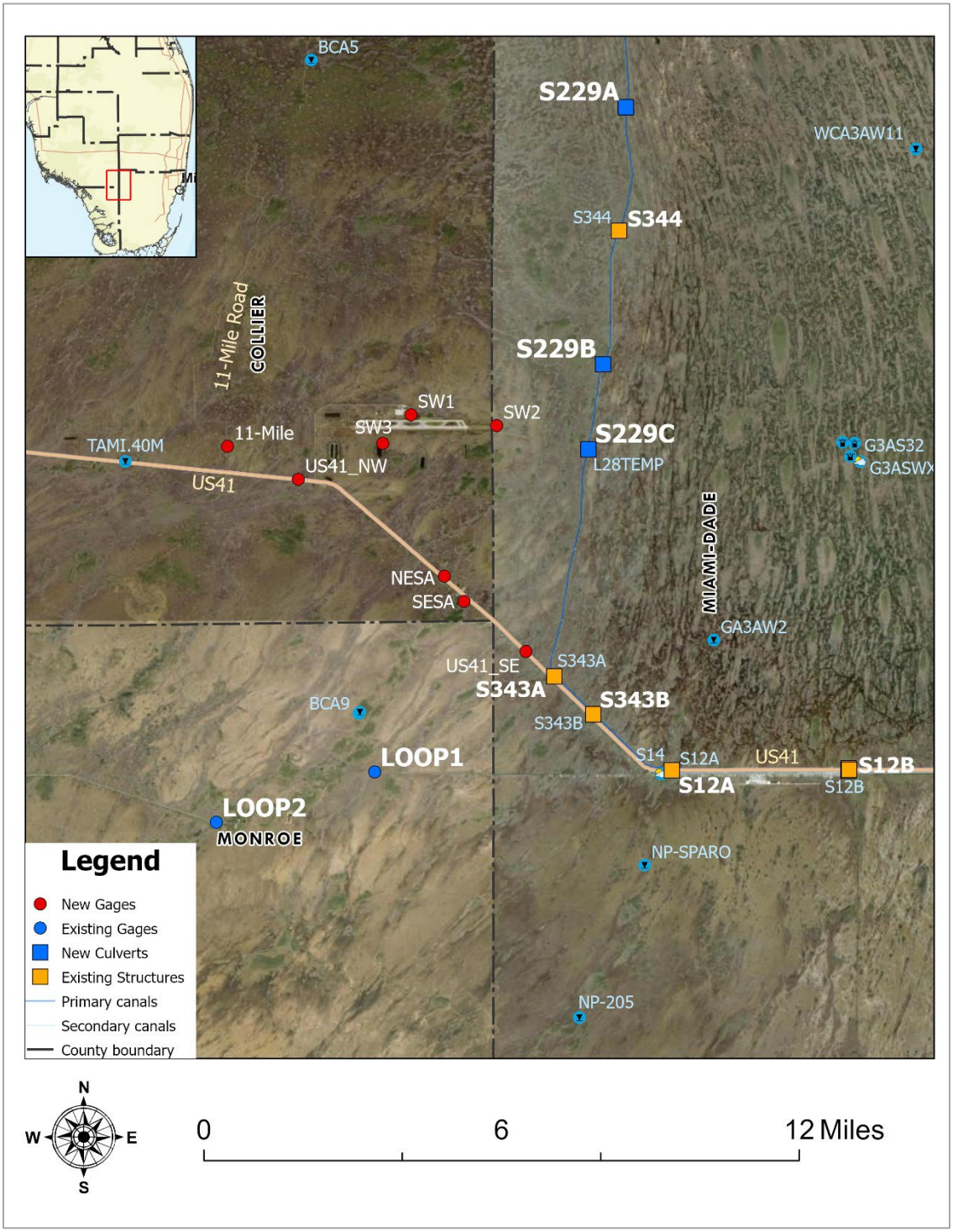

Figure 3: Location of water level monitoring gages

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Table 1. Monitoring gages and associated surveyed road top and environmentally sensitive area elevations

Gage	Stilling Well ID	Road Top/Sensitive Area Elevation (feet NAVD88)	Operational Strategy*
SW1	TAMIJP01	11.2	Target freeboard of 1.5 - 2.0 feet from the top of the Jet Port entrance road
SW2	TAMIJP02	10.5	Target freeboard of 1.5 - 2.0 feet from the top of the Jet Port maintenance road
SW3	TAMIJP03	11.2	Target freeboard of 1.5 - 2.0 feet from Jet Port taxiway
11-Mile	TAMI0011	8.9	Target freeboard of 1.5 - 2.0 feet from top of the 11-mile road
US41_NW	TAMI0012	9.37	Target freeboard of 1.5 - 2.0 feet from top of US41 road
NESA	TAMI0013	9.4	Target freeboard of 1.5 - 2.0 feet from sensitive area and access road top
SESA	TAMI0014	8.8	Target freeboard of 1.5 - 2.0 feet from sensitive area and top of US41 road
US41_SE	TAMI0015	9.6	Target freeboard of 1.5 - 2.0 feet from top of US41 road
LOOP1_H	LOOP1_H	7.8	Existing gage. Based on COP water control plan

*These operational targets subject to change based on field conditions and lessons learned from impactful storm events.

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Table 2. Discharge Characteristics of the L-28 Culverts

DISCHARGE CHARACTERISTICS	S-229A	S-229B	S-229C
Design Discharge	250 cfs	350 cfs	400 cfs
SPF Discharge	N/A[1]	N/A[1]	N/A[1]
Optimum Headwater (NAVD88)	8.0 – 9.0 feet	8.0 – 9.0 feet	8.0 – 9.0 feet
Design Headwater Elevation (NAVD88)	8.53 feet	8.52 feet	8.52 feet
Design Tailwater Elevation (NAVD88)	8.03 feet	8.02 feet	8.02 feet
Design Discharge Flow Type	Controlled submerged	Controlled submerged	Controlled submerged
Generator Finished Floor Elevation	N/A	N/A	N/A
Storm Surge - MOM Elevation[2]			
Hurricane Category 1	N/A	N/A	N/A
Hurricane Category 2	N/A	N/A	N/A
Hurricane Category 3	N/A	N/A	N/A
Hurricane Category 4	N/A	N/A	N/A
Hurricane Category 5	N/A	N/A	N/A

[1]Design flow not related to Standard Project Flood (SPF).

[2]MOM Elevation is SLOSH (2009-2010) model output corresponding to maximum of MEOW (Maximum Envelope of Water with high tide as initial condition).

Table 3. Description of the L-28 Culverts

DESCRIPTION OF STRUCTURE	S-229A	S-229B	S-229C
Type	Cast-in-place reinforced concrete	Cast-in-place reinforced concrete	Cast-in-place reinforced concrete
Barrels			
Number:	2	2	3
Size (HxW):	6.0 feet x 6.0 feet	6.0 feet x 8.0 feet	6.0 feet x 6.0 feet
Bottom Length[1]:	60.0 feet	60.0 feet	60.0 feet
Top Length[1]:	30.5 feet	30.5 feet	30.5 feet
Invert Elevation:	-0.47 feet NAVD88	-1.48 feet NAVD88	-1.48 feet NAVD88
Grating Elevation:	16.25 feet NAVD88	16.25 feet NAVD88	16.25 feet NAVD88
Headwall Top Elevation:	16.25 feet NAVD88	16.25 feet NAVD88	16.25 feet NAVD88
Gates			
Number:	2	2	3
Size (HxW):	6 feet x 5.25 feet	6 feet x 7.25 feet	6 feet x 5.25 feet

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DESCRIPTION OF STRUCTURE	**S-229A**	**S-229B**	**S-229C**
			(outer gates) 6 feet x 4.5 feet (middle gate)
Type:	Slide gates	Slide gates	Slide gates
Gate Control:	Local and remote control	Local and remote control	Local and remote control
Bottom elevation of gate full open:	5.53 feet NAVD88	4.52 feet NAVD88	4.52 feet NAVD88
Top elevation of gate full closed:	5.53 feet NAVD88	4.52 feet NAVD88	4.52 feet NAVD88
Canal Description – Upstream			
Bottom width:	varies up to 20 feet	20 feet	20 feet
Bottom elevation:	-4.0 feet NAVD88	-4.48 feet NAVD88	-4.48 feet NAVD88
Side Slope (V): (H):	1:2, 1:3	1:3	1:3
Canal Description – Downstream			
Bottom width:	20 feet	7 feet	varies up to 30 feet
Bottom elevation:	-3.47 feet NAVD88	-5.0 feet NAVD88	-6 to -5 feet NAVD88
Side Slope (V): (H):	1:3	1:3	1:3
Lift Mechanism			
Normal Power Source:	Commercial electricity	Commercial electricity	Commercial electricity
Emergency Power Source:	Portable generator	Portable generator	Portable generator
Type:	Vertical lift gate	Vertical lift gate	Vertical lift gate
Hydraulic and Hydrology Measurements			
Water Level:	Upstream and downstream staff gages, telemetered stilling well	Upstream and downstream staff gages, telemetered stilling well	Upstream and downstream staff gages, telemetered stilling well
Gate Position:	Telemetered gate sensor	Telemetered gate sensor	Telemetered gate sensor
Rain Gage:	None	None	None
Date of Transfer:	TBD	TBD	TBD
Dewatering Facilities	Needle beams	Needle beams	Needle beams
Manatee Protection System	None	None	None
Access	From Krome Ave. travel 21.2 miles west on Tamiami Trail (US-41) to S-12A. Turn north at S-12A to access Levee 29 (L-29). Proceed 2.9 miles west and then northwest on L-29 to S-343A. Proceed north on L-28 to S-229C, S-229B, and S-229A.		

[1] See **Figure 4**.

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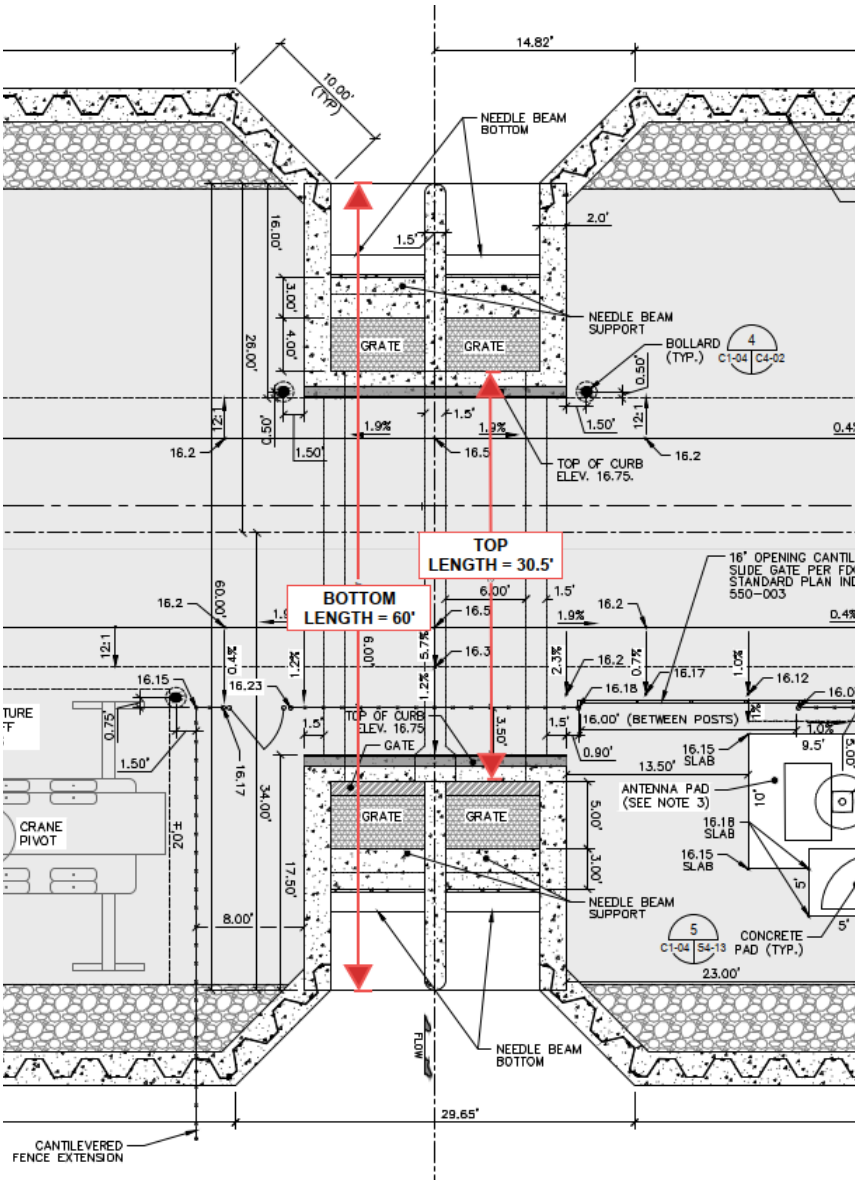

Figure 4: Culvert lengths