

# **DRAINAGE REPORT**

**FOR**

## **MK Park 2 Roadside Site Modifications**

**SUBMITTED TO:**

**REEDY CREEK IMPROVEMENT DISTRICT**

**AND:**

**SOUTH FLORIDA WATER MANAGEMENT DISTRICT**

**June 2021**

**Prepared by:**



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Clermont, Florida, 34711  
352-242-9329

*Engineering Firm Certificate of Authorization No. 29279*

THIS IS TO CERTIFY THAT THE ENCLOSED ENGINEERING CALCULATIONS WERE PERFORMED BY ME OR UNDER MY  
DIRECT SUPERVISION

Christopher M. Germana, PE  
Florida Professional Engineer # 61672  
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SFWMD PERMIT # 160719-4 (BY OTHERS)

**MK Park 2 Roadside Site Modification  
Orange County, Florida**

**Application to South Florida Water Management District (SFWMD)  
for Environmental Resource Permit (ERP) Modification**

**Project Summary**

The MK Park 2 Roadside Site Modification project is located in Section 02 South, Township 24 South, Range 27 East. The project site is generally located adjacent to Floridian Way and World Drive.

The project limits lie within the Reedy Creek Basin and are shown on the aerial photographic maps provided in the exhibit tab of this report. The project area is 43.25 acres and includes approximately 27.57 acres of wetland impacts. The proposed project will consist of the following:

- Fenced gravel yard compound
- Four (4) concrete slabs, measuring 16' x 16'
- Gravel-based porous pavement access drive from existing roads to the concrete slabs
- Selective wetland clearing
- Landscape improvements

**Wetland Impacts**

The proposed improvements associated with this project will impact approximately 27.57 acres of existing South Florida Water Management District wetlands. Other than the direct impacts from the proposed sites, the remaining proposed wetland impacts are to consist of select clearing including undergrowth/underbrush clearing, restoration of trail breaks, and removal of invasive species. No grading, grubbing, or root disturbance will occur in the selective clearing areas. There are no proposed changes to the existing drainage pattern within the selectively cleared areas.

**Water Quality**

As no grading or drainage flow changes are being proposed within the areas of selective clearing, the project sites are the only areas considered for water quality requirements. In considering the multiple small proposed sites and the existing site limitations with the wetlands and floodplain, the project is proposing water quality compensation in lieu of multiple small treatment systems at each site. Water quality will be provided within an existing stormwater management pond that is within the same watershed and currently has excess water quality volume. Pond C was constructed with Floridian Place (SFWMD Application Number 160719-4) and permitted calculations indicate there is 8.97 ac-ft of excess water quality volume. This excess water quality volume will be utilized for the MK Park 2 Roadside Modification project therefore leaving 8.87 ac-ft of excess water quality volume in Pond C. See Appendix D for details.

### **Water Quality Calculations**

Per the Land Development Regulations for RCID, Pollution Abatement volume is to be the greater of 1" over the basin area or 2.5" over the basin area times the impervious percentage.

The total grading area of the project is approximately 0.92 acres with 51% impervious coverage.

$$1'' * 0.92 \text{ Ac} = 0.08 \text{ Ac-Ft}$$

$$51\% * 2.5'' * 0.92 \text{ Ac} = \mathbf{0.10 \text{ Ac-Ft}} < \text{Greater Volume, Controls}$$

### **Flood Plain Calculations**

As RCID does not participate in FEMA, the floodplain for the L-407A Canal was provided by RCID from their Master Drainage Model. The floodplain elevation is 94.55' (upstream section between World Drive and the back of house park entrance) and 94.50' (remaining portion of canal between back of house park entrance and S-407 Amil Gate downstream).

The proposed M1 site impacts the floodplain. Per RCID and SFWMD criteria 1:1 compensation is required and has been provided. Geotechnical information (prepared by Intertek-PSI) was used to verify the SHW at Sites M1 and M5 where impacts and compensation occur. Compensation was only considered between the SHW and the 100-year flood elevation.

The breakdown is as follows:

$$\text{M1 Impact} = 36 \text{ CY}$$

$$\text{M1 Comp \#1} = 23 \text{ CY}$$

$$\text{M1 Comp \#2} = 34 \text{ CY}$$

$$\text{M1 Net} = \mathbf{21 \text{ CY of floodplain compensation}}$$

$$\text{M5 Comp} = 4 \text{ CY}$$

$$\text{M5 Net} = \mathbf{4 \text{ CY of floodplain compensation}}$$

See floodplain exhibit sheets for specific areas of impact and compensation.

### **Conclusion**

The proposed project meets SFWMD and RCID criteria. Additional runoff is not anticipated from the project, and all attenuation is to be handled within the RCID master drainage system.



# **APPENDIX A**

## **VICINITY MAPS**

**Aerial Maps**

**Location Maps**

**SCS Soil Maps**

**Overall USGS Quad Map**



M1 Site Location

## M1 Aerial Map

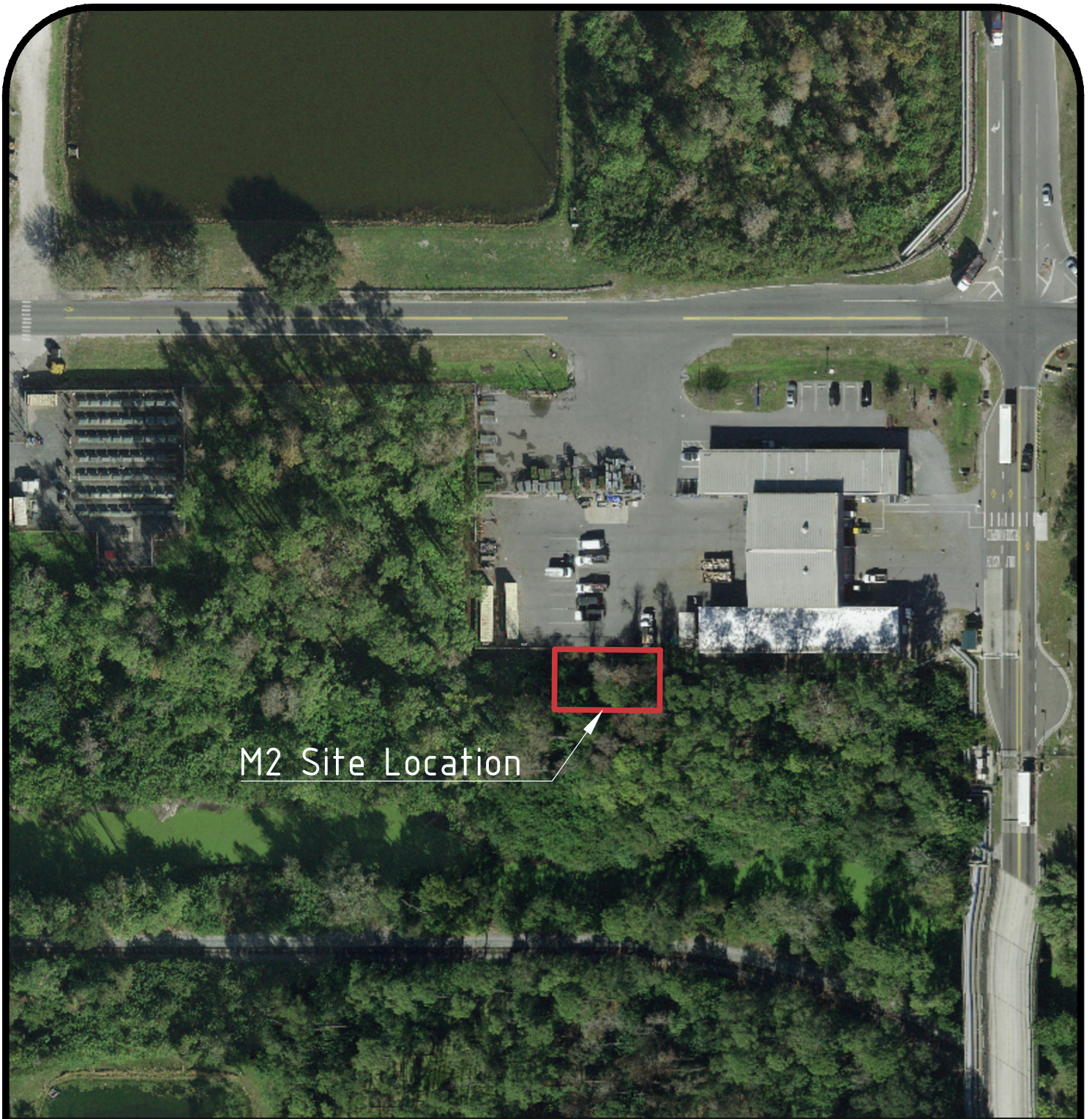
NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







M2 Site Location

## M2 Aerial Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M4 Aerial Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







M5 Site Location

## M5 Aerial Map

NTS

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Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East





## M1 Location Map

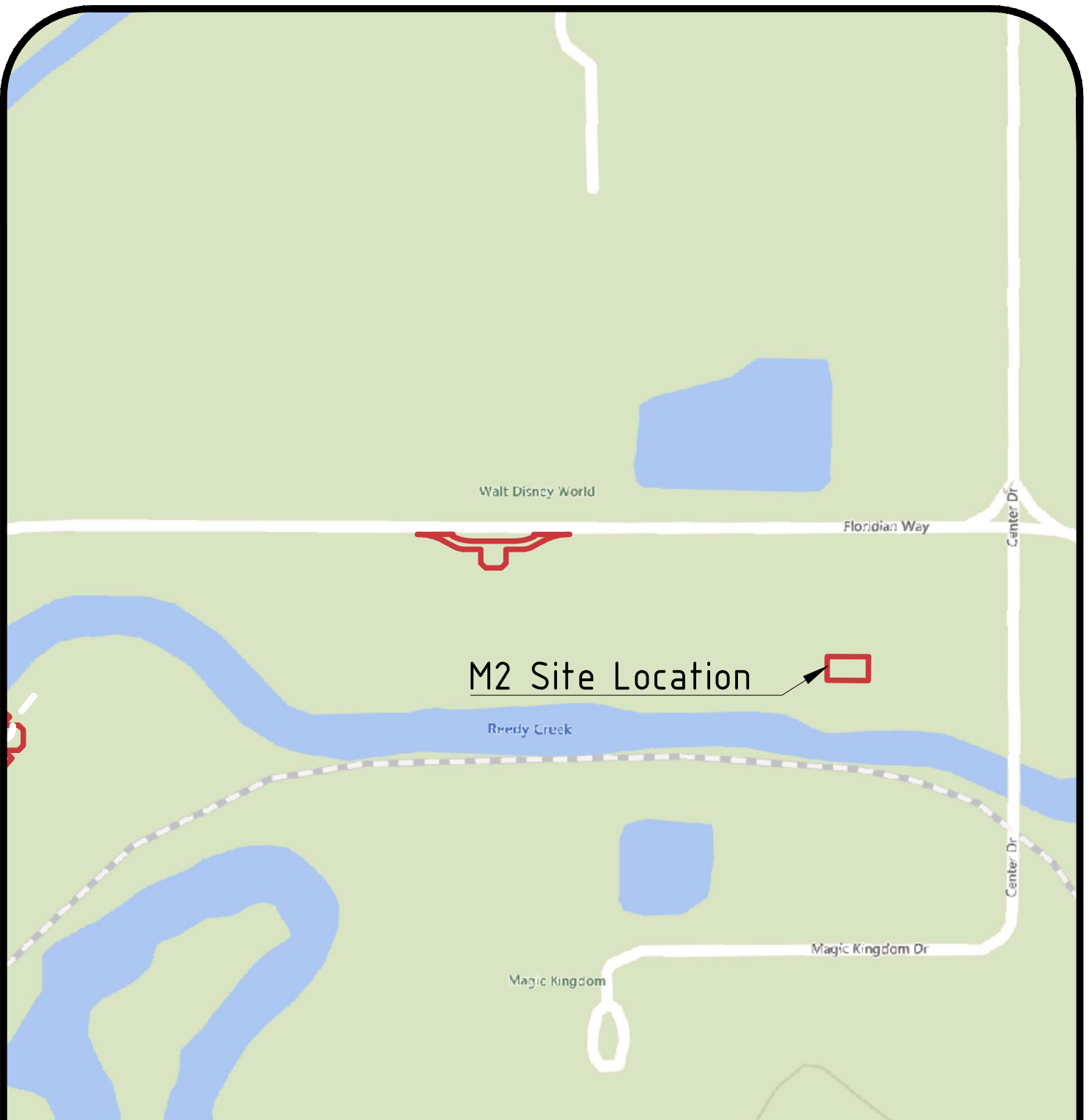
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MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M2 Location Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East





M4 Site Location

## M4 Location Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







M5 Site Location

## M5 Location Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East





M1 Site Location

Soil Name	#
Samsula-Hontoon-Basinger Assoc.	41
Water	99

## M1 Soil Map

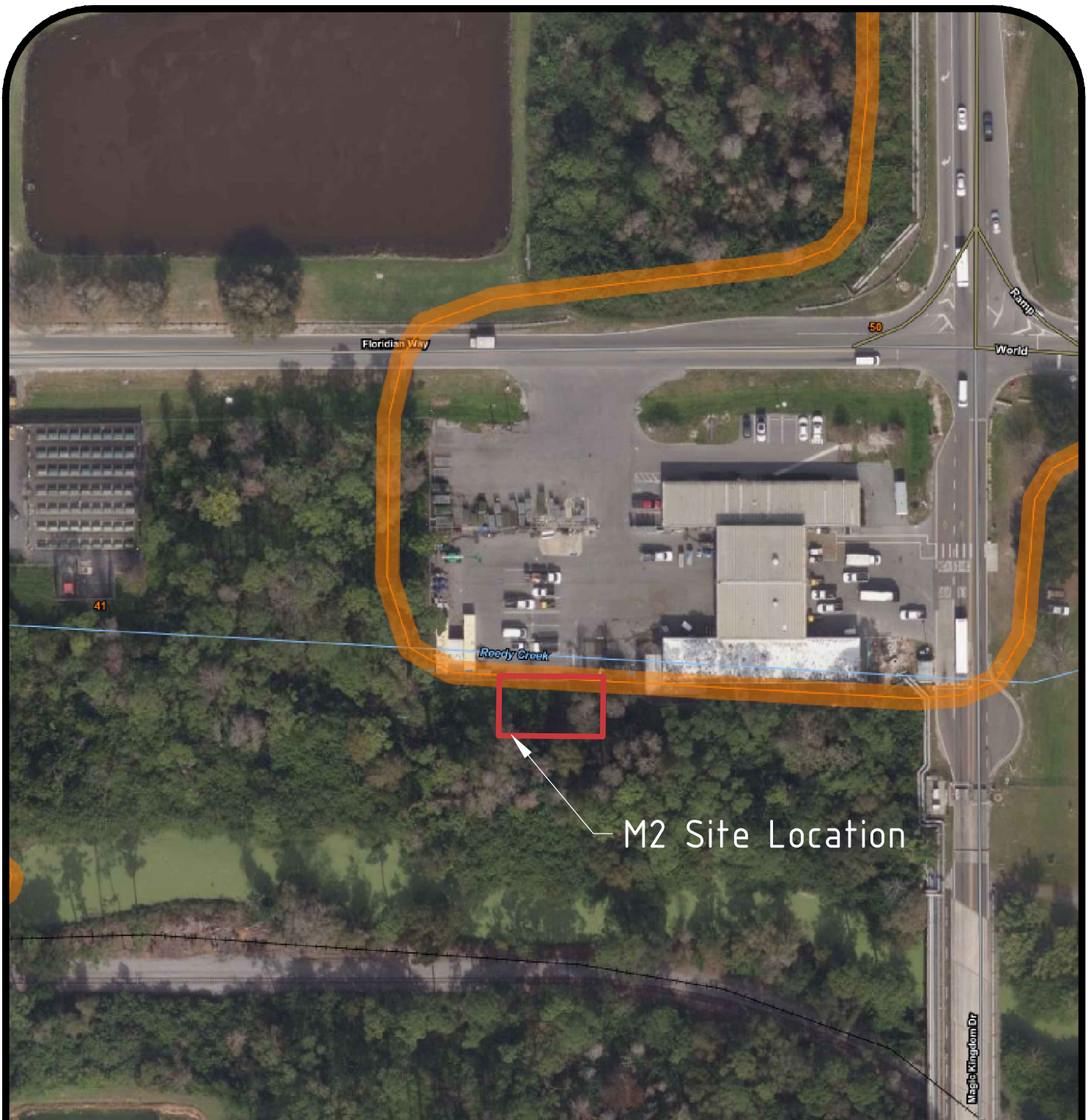
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MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







Soil Name	#
Samsula-Hontoon-Basinger Assoc.	41
Urban Land, 0-2% Slopes	50

## M2 Soil Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







M4 Site Location

Soil Name	#
Samsula-Hontoon-Basinger Assoc.	41
Urban Land, 0-2% Slopes	50
Water	99
Arents, nearly level	1
Smyrna-Smyrna, wet, fine sand, 0-2%	44

## M4 Soil Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







Soil Name	#
Samsula-Hontoon-Basinger Assoc.	41
St. Johns fine sand	37

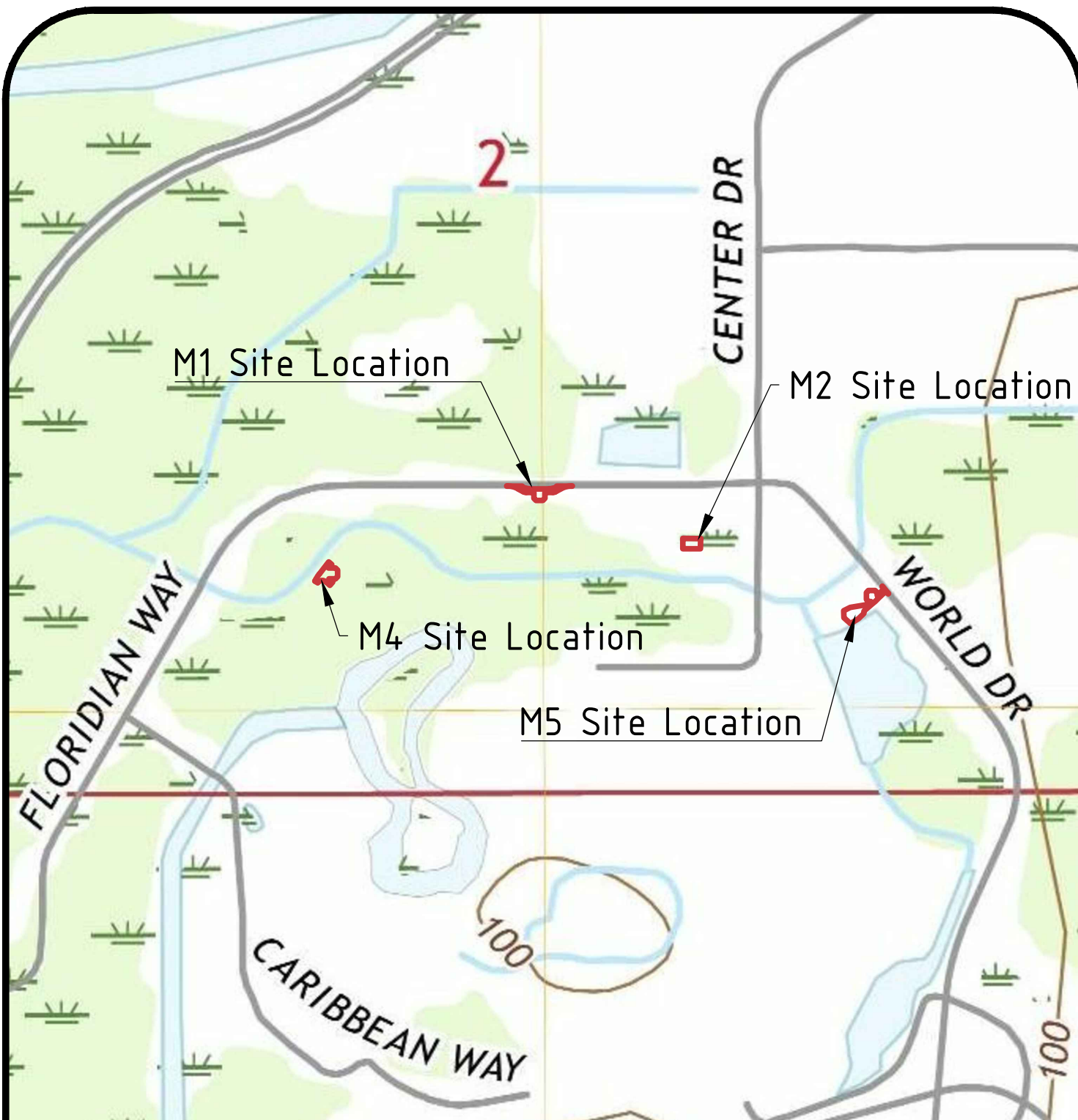
## M5 Soil Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East





## Overall Quad Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East



# **APPENDIX B**

## **BASIN MAPS**





## M1 Pre-Development Basin Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M2 Pre-Development Basin Map

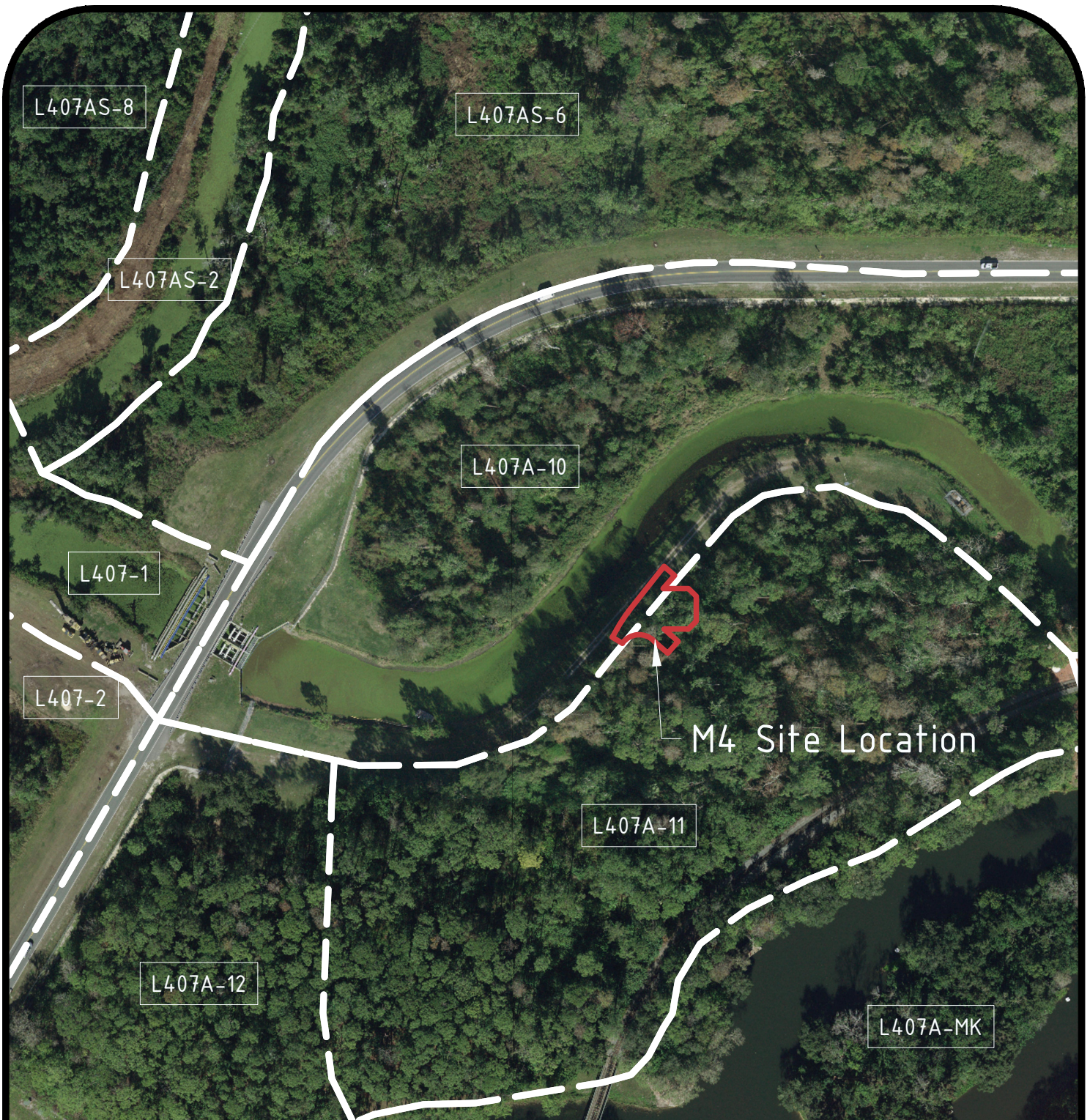
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Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M4 Pre-Development Basin Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M5 Pre-Development Basin Map

NTS

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Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M1 Post-Development Basin Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M2 Post-Development Basin Map

NTS

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Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M4 Post-Development Basin Map

NTS

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Walt Disney World Resorts, Florida 32830

Section 02, Township 24 South, Range 27 East







## M5 Post-Development Basin Map

NTS

MK Park 2 Roadside Site Modifications  
Walt Disney World Resorts, Florida 32830

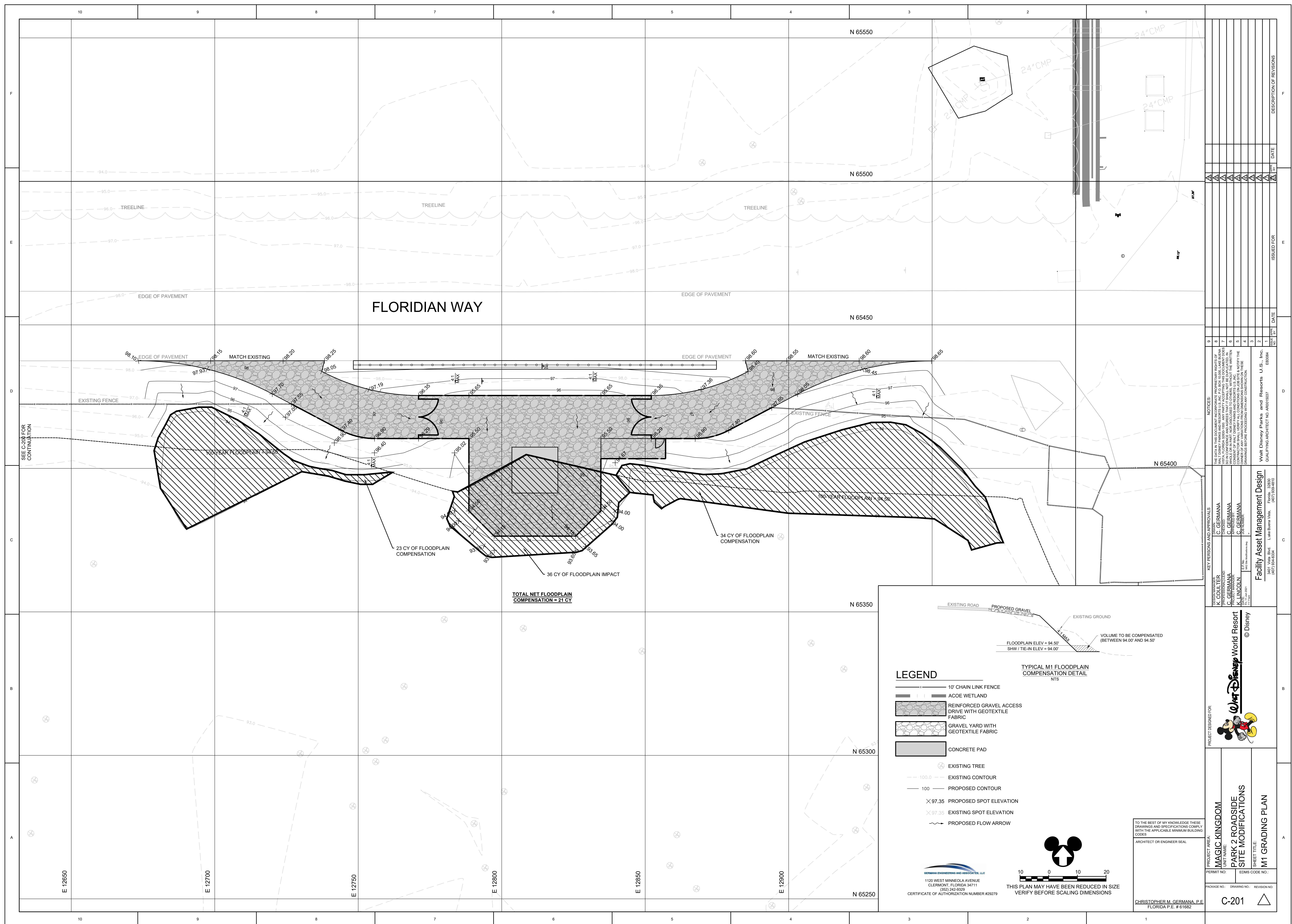
Section 02, Township 24 South, Range 27 East



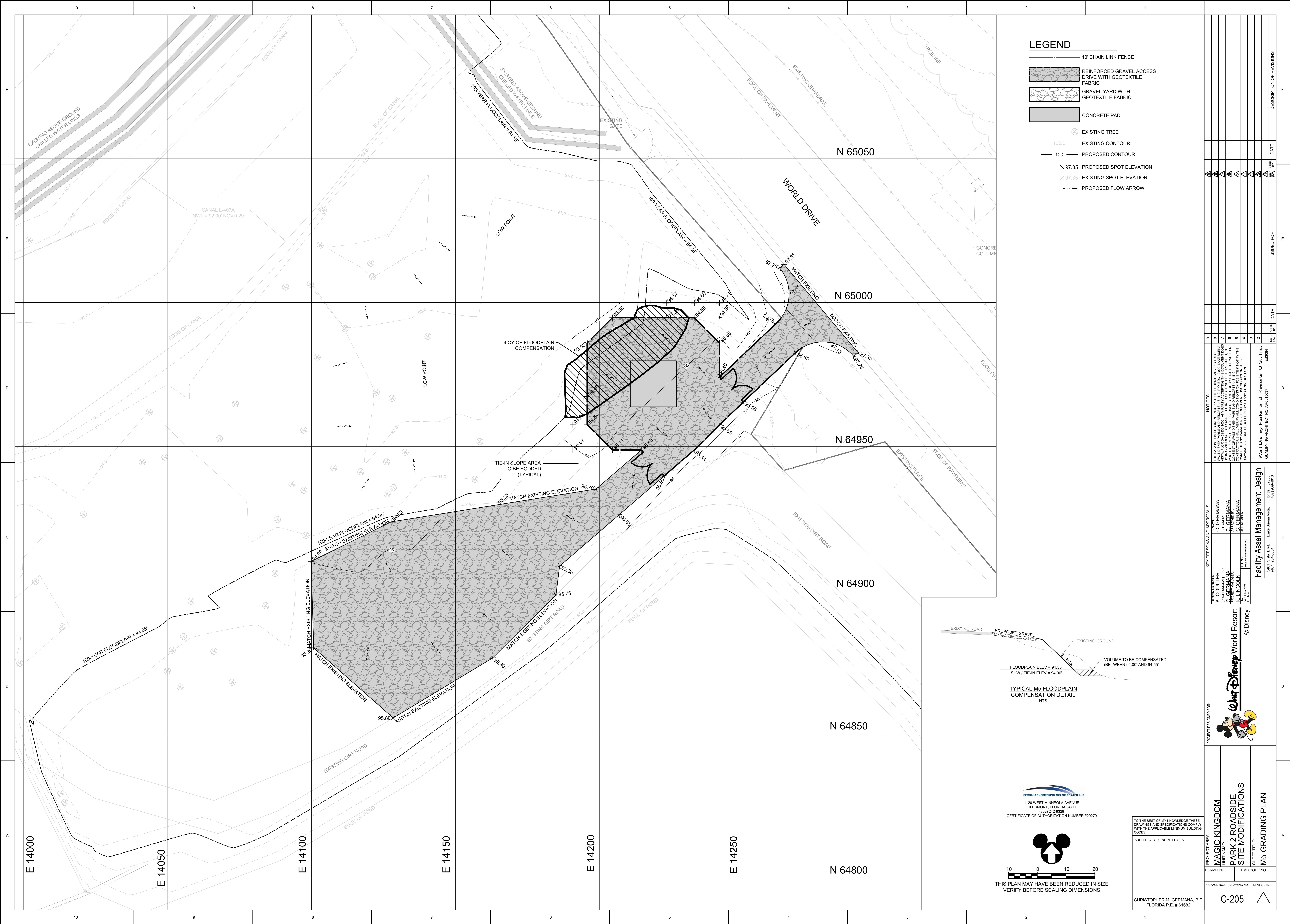
# **APPENDIX C**

## **FLOODPLAIN IMPACT EXHIBITS**



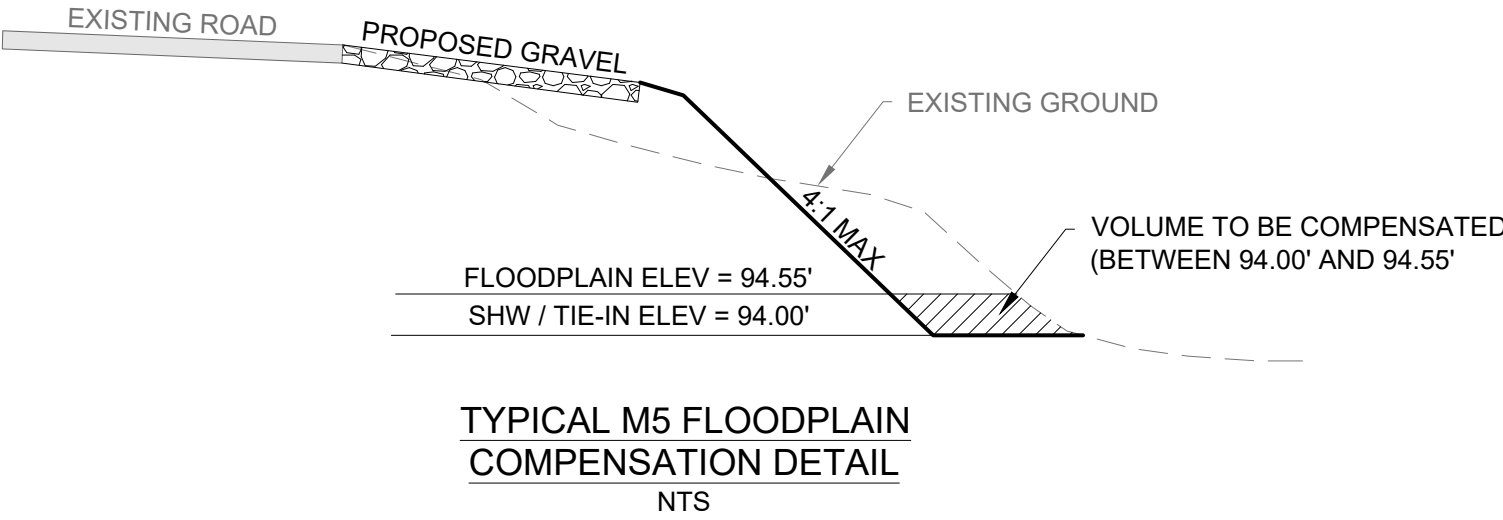




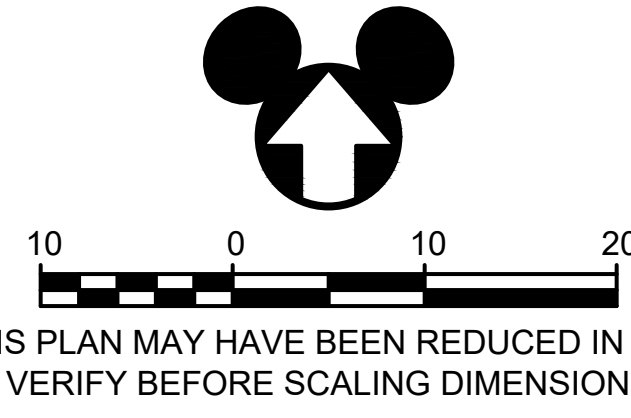


LEGEND

- 10' CHAIN LINK FENCE
- REINFORCED GRAVEL ACCESS DRIVE WITH GEOTEXTILE FABRIC
- GRAVEL YARD WITH GEOTEXTILE FABRIC
- CONCRETE PAD
- EXISTING TREE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED SPOT ELEVATION
- EXISTING SPOT ELEVATION
- PROPOSED FLOW ARROW



GERMAN ENGINEERING AND ASSOCIATES, LLC  
1120 WEST MINNICOLA AVENUE  
CLERMONT, FLORIDA 34711  
(352) 242-8320  
CERTIFICATE OF AUTHORIZATION NUMBER #29279



THIS PLAN MAY HAVE BEEN REDUCED IN SIZE  
VERIFY BEFORE SCALING DIMENSIONS

TO THE BEST OF MY KNOWLEDGE THESE  
DRAWINGS AND SPECIFICATIONS COMPLY  
WITH THE APPLICABLE MINIMUM BUILDING  
CODES  
ARCHITECT OR ENGINEER SEAL  
CHRISTOPHER M. GERMANA, P.E.  
FLORIDA P.E. # 61682

PROJECT DESIGNED FOR			KEY PERSONS AND APPROVALS			NOTES			ISSUED FOR			DESCRIPTION OF REVISIONS		
MAGIC KINGDOM			DESIGNED BY: C. GERMANA			THE DATA IN THIS DOCUMENT INCORPORATES PROPRIETARY RIGHTS OF WALT DISNEY PARKS AND RESORTS, LTD. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM, WITHOUT THE WRITTEN PERMISSION OF WALT DISNEY PARKS AND RESORTS, LTD. THIS DOCUMENT IS THE PROPERTY OF WALT DISNEY PARKS AND RESORTS, LTD. AND IS NOT TO BE LOANED, REPRODUCED, COPIED, OR IN ANY MANNER DISCLOSED TO ANY OTHER PARTY WITHOUT THE WRITTEN PERMISSION OF WALT DISNEY PARKS AND RESORTS, LTD.			Walt Disney Parks and Resorts U.S., Inc.			DATE		
PARK 2 ROADSIDE			CHECKED BY: C. GERMANA			1			DATE			DATE		
SITE MODIFICATIONS			APPROVED BY: K. LINCOLN			2			DATE			DATE		
M5 GRADING PLAN			DATE: 11/11/2021			3			DATE			DATE		
C-205			Facility Asset Management Design			4			DATE			DATE		
			3801 Vista Blvd (607) 844-8341			5			DATE			DATE		
			Lynn Barnes Viala, P.E. (407) 358-4810			6			DATE			DATE		
			Florida: 33330 (407) 358-4810			7			DATE			DATE		
						8			DATE			DATE		
						9			DATE			DATE		
						10			DATE			DATE		



PROJECT AREA:  
MAGIC KINGDOM  
PARK 2 ROADSIDE  
SITE MODIFICATIONS  
SHEET TITLE:  
M5 GRADING PLAN

PACKAGE NO.:  
DRAWING NO.:  
REVISION NO.:  
C-205



**APPENDIX D**

**HISTORIC PERMIT PLANS AND  
CALCULATIONS**

**SFWMD PERMIT # 160719-4  
(BY OTHERS)**

### **Project Description**

This report documents the drainage design for the proposed Center Drive Phase II Project. The Reedy Creek Improvement District (RCID) is proposing a new Center Drive alignment connecting existing Floridian Way just north of the Grand Floridian Hotel to existing Center Drive to the north, traversing 1.44 miles. The majority of the proposed roadway is a four lane suburban typical section with open swale drainage and raised curb and gutter median. The north portion of the proposed roadway is a four lane urban typical section which will tie into the recently constructed Center Drive at the North Service Area for Walt Disney World. The Center Drive Phase II project includes a proposed bridge to carry the northbound and southbound lanes over the existing L-407 Canal which intersects the proposed Center Drive alignment. Also included with the project is the realignment of a portion of Floridian Way to form a new intersection with proposed Center Drive and Maple Drive just east of the existing RCID Fire Station 3. Please refer to the Location Map included as Figure I-1 and Aerial Map included as Figure I-2. The entire project area is located within the Reedy Creek Improvement District (RCID) and within the jurisdiction of the South Florida Water Management District (SFWMD).

**Note: This project is based on the NGVD '29 Datum. All project design elevations are based on this datum.**

### **Existing (Pre Development) Conditions**

The project area in existing (pre development) conditions mostly consists of undeveloped forested wetlands and bay swamp which are hydraulically connected to the L-407 Canal, a large drainage canal that is part of the RCID Municipal Separate Stormwater System (MS4)/Master Drainage System. The L-407 Canal flows west and is controlled by a downstream control structure at elevation 90.50 through the project area. The topography throughout the wetlands is generally flat with elevations ranging from approximately 93 to 95 south of the L-407 Canal and approximately 91 to 93 north of the L-407 Canal. Please see Land Use Map included as Figure I-4.

A recently constructed section of the new Center Drive that connects to Reams Road is located north of the project area at the Disney North Service Area. This existing four lane urban roadway is adjacent to the Red/SWEC Parking Lots and connects the parking areas for the North Service Area to Reams Road. This existing roadway drains via piped system to the recently constructed NSA Master Pond which is adjacent and just south of the SWEC parking lot. Please see Location Map included as Figure I-1, and Aerial Map included as Figure I-2.

Soil conditions throughout the proposed alignment are generally wet and poor draining. The existing wetland areas south of the L-407 Canal consist of Sanibel Fine Sand (Hydrologic Group D) with seasonal high groundwater levels at or above ground surface. The existing wetland areas north of the L-407 Canal consist of Samsula Fine Sand (Hydrologic Group D) with seasonal high groundwater levels at or above ground surface. The northern portion of the project limits consists of upland area with Smyrna Fine Sand (Hydrologic Group A/D) with seasonal high groundwater levels approximately 2-3 feet below ground surface. Please see Soil Map included as Figure I-3 and Geotechnical Report under separate cover.

Pre development hydrology calculations are included in Section IV of this report. Please see pre development drainage maps included in Section II. It should be noted that since pre/post

attenuation is not required for this project, these calculations are provided for reference to RCID and for permitting purposes.

### **Proposed (Post Development) Conditions**

Proposed (post development) drainage conditions from station 59+19 (Begin Project) to station 113+50 consist of sheet flow off the roadway into roadside conveyance swales which drain to ditch bottom inlets and into the three proposed wet detention ponds. A median ditch is proposed north of the proposed bridge from station 89+00 to station 107+63.75 to drain the southbound lanes in the horizontal curve section due to the cross slope of the lanes being reverse crown. The southbound lanes through the horizontal curve section will drain to median curb flumes into the median ditch, which will flow to a ditch bottom inlet and into the proposed Pond C. The urban section of Center Drive from station 113+50 to 124+79.64 will drain to curb inlets and a closed drainage system and be piped to the existing North Service Area Master Pond. The existing portion of Center Drive from 124+79.64 to 135+25.80 (End Project) drains to existing curb inlets and piped system that outfalls into the existing North Service Area Master Pond.

The South-A basin consists of proposed Center Drive from station 59+51.99 to 67+74.56 and existing Maple Drive/proposed Floridian Way from station 8+06.12 to 17+02.63 totaling 5.46 acres. The basin includes roadway pavement, grassed right of way areas, and proposed Pond A.

The South-B basin consists of proposed Center Drive from station 67+74.56 to 86+46.00 totaling 7.96 acres. The basin includes roadway pavement, proposed bridge deck, grassed right of way areas, and proposed Pond B.

The North-C basin consists of proposed Center Drive from station 86+46.00 to 113+28.60 totaling 22.94 acres. The basin includes roadway pavement, proposed bridge deck, grassed right of way areas, and proposed Pond C.

The North-D basin consists of proposed Center Drive from station 111+97.93 to 124+79.64 totaling 3.11 acres. The basin includes roadway pavement and grassed right of way areas. See Table 1 below for a summary of basin information.

Table 1-Proposed (Post Development) Basin Summary

<b>Basin</b>	<b>Area (Ac)</b>	<b>Curve Number</b>	<b>Time of Conc. (min.)</b>	<b>To Pond</b>
South A	5.46	89.0	31.80	A
South B	7.96	89.9	44.34	B
North C	22.94	92.6	40.17	C
North D	3.11	92.1	N/A	Exist. NSA Pond

Due to the proposed Center Drive alignment bifurcating an existing wetland south of the L-407 canal, dual 24" cross drains are proposed at station 73+50 and station 80+00 to provide a hydraulic connection and maintain drainage flows between the eastern portion (18.70 acres) and western portions of the wetland. A single 18" cross drain is also proposed at station 16+00 Floridian Way.

Proposed Floridian Way from station 17+02.63 southward will be treated in proposed Pond A. Proposed Floridian Way from station 17+02.63 northward (0.14 acres of new pavement/widening) will drain into the existing Floridian Way ditches/wetland untreated. Also, 0.02 acres of proposed widening along Center Drive from station 59+19 to station 61+00 (LT) will drain to the existing Floridian Way ditches untreated. To compensate for the 0.16 acres of proposed pavement not being treated in the ponds, a portion of existing Floridian Way (0.83 acres) is being removed with the proposed realignment of Floridian Way, which is currently untreated pavement. This results in a net reduction of 0.67 acres of untreated pavement.

See post development drainage maps included in Section III and post development hydrology, pond, and routing calculations included in Section V.

### **Stormwater Management System**

The proposed stormwater management system includes three wet detention ponds referred to in this report and project construction plans as Pond A, Pond B, and Pond C. See Table 2 below for a summary of pond design information.

Table 2-Pond Design Summary

<b>Pond</b>	<b>Control Elevation (Ft)</b>	<b>Design High Water (Ft) (50Yr, 72Hr)</b>	<b>Type</b>	<b>Outfalls To</b>	<b>Discharge (50Yr, 72Hr) (cfs)</b>
A	93.90	94.98	Wet Det.	Wetland	16.74
B	93.50	94.86	Wet Det.	Wetland	20.73
C	91.50	93.21	Wet Det.	L-407 Canal	37.10

Pond discharges are shown in Table 2 but pre/post discharge attenuation is not required for this project.

Pond control elevations are set based on estimated seasonal high groundwater elevations in the adjacent wetlands and/or control elevations of existing canals. See Geotechnical Report under separate cover for further information.

Pond A will provide water quality treatment for the South-A basin and will outfall to the east via concrete weir into the adjacent wetland. Pond B will provide water quality treatment for the South-B basin and will outfall to the west via concrete weir into the adjacent wetland. Pond C will provide water quality treatment for the North-C basin and will outfall to the south via four Type H structures into the L-407 Canal. Pond C is oversized to provide the required floodplain compensation volume for the project. This results in 8.97 acre-feet of excess water quality (treatment) volume available in Pond C for future development. See Table 3 below for a summary of pond water quality (treatment) volumes.

Table 3-Pond Water Quality Summary

Pond	Basin	Required Water Quality Volume (Ac-Ft)	Provided Water Quality Volume (Ac-Ft)	Excess Water Quality Volume (Ac-Ft)
A	South-A	0.46	0.52	0.06
B	South-B	0.66	0.90	0.24
C	North-C	1.91	10.88	8.97

Required water quality volumes are calculated in Section V using the greater of first inch of runoff from the basin or 2.5 inches times impervious area (SFWMD Applicants Handbook Vol. II).

Pond peak stages for the 10-Year, 72-Hour storm were compared to proposed pavement grades to ensure adequate freeboard to the roadway (see Table 4 below).

Table 4-Pond Peak Stages (10-Year, 72-Hour)

Pond	Pond Peak Stage (Ft) (10Yr, 72Hr)	Proposed Low Pavement Elevation (Ft)	Freeboard (Ft)	Location
A	94.89	97.20	2.31	62+00 (RT EOP)
B	94.76	97.39	2.63	76+00 (RT/LT EOP)
C	93.21	96.12	2.91	101+00 (RT EOP)

See proposed pond calculations and routings included in Section V.

The existing NSA Master Pond is also being utilized for the proposed drainage system for Center Drive. The existing NSA Master Pond was designed to provide treatment for a future 5.66 acre roadway basin for this project. The proposed North-D basin (3.11 acres) will drain to and be treated in the existing NSA Master Pond. See Appendix A for excerpts from *North Service Area Access and Drainage Improvements Modified Drainage Report (June 2014)* for NSA Master Pond calculations.

### **Floodplain Impacts**

The 100-year floodplain within the project area is shown on Figure I-5 Floodplain Map. The 100-year floodplain elevation of 93.80 NGVD shown on map is from the RCID master floodplain model updated May 2016 by RCID. See Appendix B for updated floodplain model output from RCID and correspondence regarding updated floodplain elevation.

Floodplain storage fill impacts from this project total 22.96 acre-feet. Floodplain compensation volume is provided for the project in proposed Pond C of 25.51 acre-feet which exceeds impact volume. See Section VII for floodplain impact calculations and Section V for Pond C calculations.

### **Electrical Substation**

Reedy Creek Electrical Services (RCES) Northwest 69kv Electrical Substation is located just south of the NSA Master Pond, east of the Perimeter Canal, and adjacent to the proposed alignment of Center Drive near station 112+00. The existing drainage system for the substation consists of a series of dry treatment swales that outfall via control structure (dry detention) northward into the Perimeter Canal. Total swale bottom area is 0.80 acres at elevation 97.00 and swales are connected by a 12"x18" cross drain. The proposed Center Drive alignment impacts a portion of the existing treatment swales by filling in approximately 0.05 acres of swale at bottom elevation 97.00. To compensate for this impact the downstream swale will be expanded by 0.12 acres at bottom elevation 97.00 to maintain original storage volume. A cross-drain and bubble up structure is proposed under Center Drive to connect the existing swale on the east side of the alignment with the expanded swale on the west side of alignment. SFWMD General Permit No. 48-00714-S (issued July 16, 2004) will be modified with this project. See Appendix B for original permit documentation and calculations.



## North-C Basin (Post Development)

Basin Area: 22.94 acres

Description: Proposed Center Drive (STA 86+46 to 113+28.60 )

Outfall Waterbody: L-407 Canal

### Weighted CN Calculations

Land Use	Soil Class	Area (Ac)	CN	Product
Impervious (Proposed Pavement)		4.14	98	405.72
Grassed R/W	D	8.09	80	647.20
Pond C (CE)		10.71	100	1071.00
TOTAL		22.94		2123.92

<b>Weighted CN = 92.6</b>
---------------------------

### Time of Concentration

Tc=40.17 min. (From Ditch Calcs/Storm Tabs)

### Water Quality Calculations

Treatment Volume (Wet-Detention): Greater of 1 inch over basin or 2.5 inches over project impervious area (excluding pond).

1 inch X	22.94 =	1.91 Ac-Ft	
2.5 inches X	4.14 =	0.86 Ac-Ft	(Proposed Pav't)

<b>Required Treatment Volume = 1.91 Ac-Ft</b>
---

### Pond Storage Calculations

Stage/Area/Storage (Pond C)

	Stage (ft)	Area (acres)	Storage (ac-ft)	
	85.50	9.82		Littoral Shelf (< 6')
	89.5	10.06		Littoral Shelf (< 6')
Control Elevation	91.50	10.71	0	8.3% Littoral Shelf
Weir Elevation	92.50	11.04	10.88	Provided Treatment Vol.
	93.00	11.21	16.44	
100 Yr Floodplain Elevation	93.80	11.47	25.51	Provided Floodplain Comp. Volume
	94.00	11.54	27.81	
	95.50	12.04	45.50	
	96.00	13.32	51.84	

Note: Excess treatment volume of 8.97 ac-ft is provided in Pond C for future use

Littoral Shelf Calculations	8.3% > 20%	or
	3.9% > 2.5%	OK

### Orifice Sizing Calculations

Drawdown 1/2 inch of required treatment volume in 24 hours.

$$Q = CA(2gH)^{1/2}$$

where:

Orifice Invert = 91.50      W.S. Elev. = 92.00      (At Required Drawdown)

C = 0.65      Weir Elev. = 92.50

No. of openings = 4

Drawdown Volume = 0.96 ac-ft

Average Stage = 92.25

Avg. depth:      H (ft) = 0.75

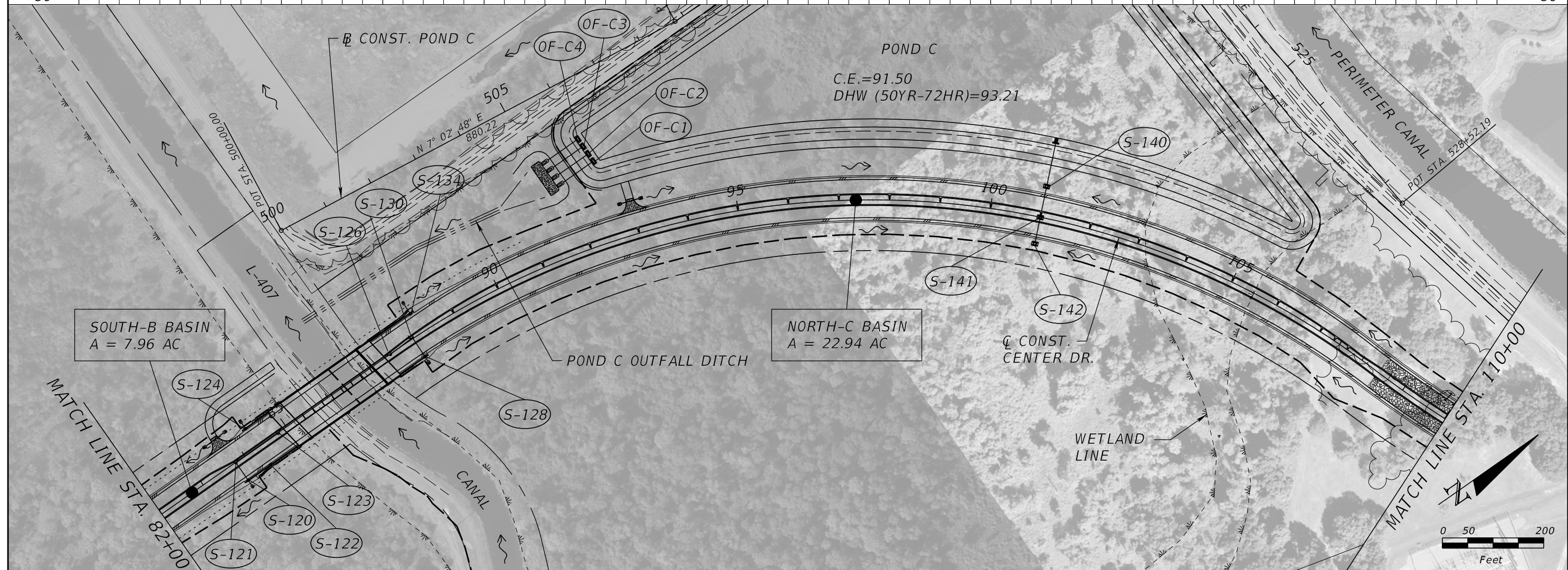
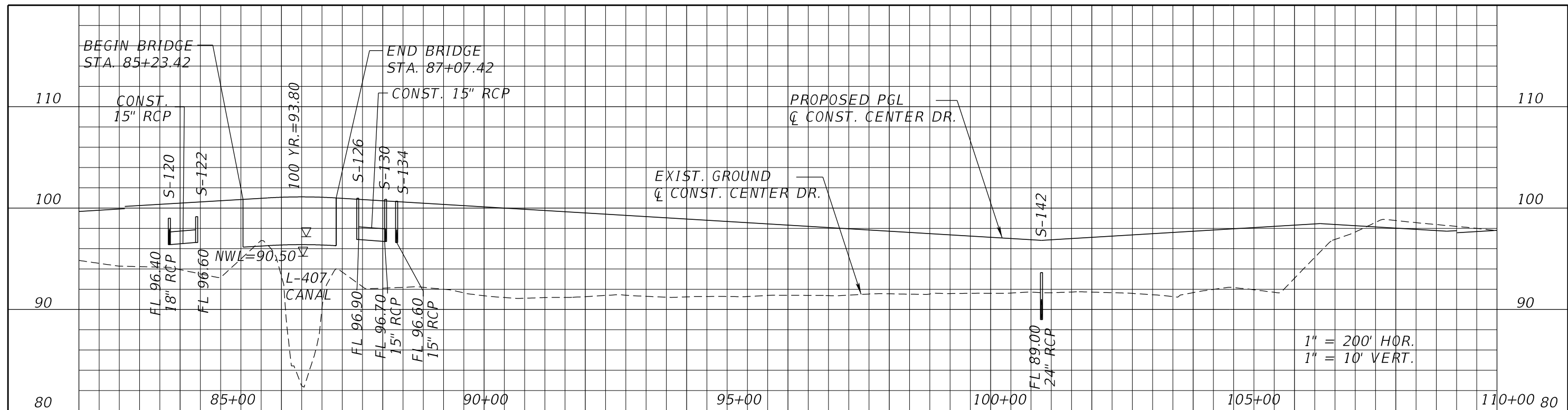
Avg. flow rate to recover in 24 hours:      Q (cfs) = 0.12

Orifice Area:      A(ft<sup>2</sup>) = 0.03

Orifice Diameter:      Dia. (ft) = 0.18

                                 Dia. (in) = 2.22

**Use minimum D=2.80 inches**



REVISIONS	
DATE	DESCRIPTION

**DRMP**  
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**REEDY CREEK IMPROVEMENT DISTRICT**  
LAKE BUENA VISTA, FL  
**CENTER DRIVE PHASE II**

**DRAINAGE MAP (2)**

**SHEET NO.**  
**3**



