



SR 400 (I-4) Project Development and Environment (PD&E) Study
FM No.: 432100-1-22-01



Location Hydraulic Report

Segment 1: State Road 400 (SR 400)/Interstate 4 (I-4) from West of CR 532 (Osceola/Polk County Line) to West of SR 528 (Beachline Expressway)

Osceola County (92130) and Orange County (75280)

September 2016

HNTB Corporation
610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746



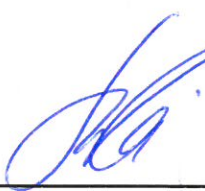
Professional Engineer Certificate

I hereby certify that I am a registered professional engineer in the State of Florida practicing with HNTB Corporation, Inc., a corporation authorized to operate as an engineering business, EB#6500, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for SR 400 (I-4) Project Development and Environment Study for the Florida Department of Transportation in Osceola and Orange County, Florida.

This Location Hydraulic Report (LHR) includes a summary of data collection efforts, floodplain impact estimates, limited cross drain evaluations, and an overall drainage review prepared for the conceptual analyses for the SR 400 (I-4) widening and extension from west of the Polk/Osceola County Line in Polk County to west of SR 528 in Orange County.

I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgments and experience. This document is for planning purposes only and is not to replace any effort required for final design.

SIGNATURE: _____



NAME: Sanam Rai, P.E.

FIRM: HNTB Corporation

P.E. No.: 69089

DATE: September 2016



TABLE OF CONTENTS

- 1.0 Introduction..... 1**
- 2.0 Project Description and Purpose..... 3**
 - 2.1 Proposed Recommended Typical Section 5
- 3.0 Design Criteria 5**
 - 3.1 Culvert Design..... 5
 - 3.2 Floodplains/Floodways..... 6
- 4.0 Site Conditions..... 6**
 - 4.1 Soils..... 6
 - 4.2 Land Use 10
 - 4.2.1 Existing Land Use 10
 - 4.2.2 Future Land Use 10
 - 4.3 Cross Drains 13
 - 4.3.1 Existing Conditions..... 13
 - 4.3.2 Proposed Conditions..... 14
 - 4.4 Bridge Structures 14
 - 4.4.1 Existing Condition 14
 - 4.4.2 Proposed Condition 15
 - 4.5 Floodplain/Floodways 15
- 5.0 Recommendations and Conclusions.....17**
 - 5.1 Cross Drains 17
 - 5.2 Bridge Structures 17
 - 5.3 Project Classification 17
 - 5.4 Project Summary 18

LIST OF TABLES

Table 1: SCS Soil Survey Information 7

Table 2: Existing Cross Drains..... 13

Table 3: Proposed Cross Drains 14

Table 4: Existing Bridges 15

LIST OF FIGURES

Figure 1: Project Location Map 4

Figure 2: Soil Survey Map..... 8

Figure 3: USGS Quadrangle Map..... 9

Figure 4: Existing Land Use Map 11

Figure 5: Future Land Use Map..... 12

Figure 6: FEMA Flood Insurance Rate Map..... 16

APPENDICES

- Appendix A – Straight Line Diagrams
- Appendix B – Cross Drain Calculations
- Appendix C – Correspondence
- Appendix D – Back-up Permit Documentation

1.0 Introduction

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway in order to improve traffic operations, enhance connectivity and improve mobility by providing travel choices to the motoring public. I-4 is an east-west limited access freeway which links the west and east coasts of Florida, from I-275 in Tampa to I-95 in Daytona Beach. I-4 spans across six counties in Central Florida, traversing through many cities including Lakeland, Celebration, Orlando, Altamonte Springs, Sanford and DeLand. I-4 is a critical component of Florida's Strategic Intermodal System (SIS) which links seaports, rail, airports and other intermodal facilities. This aspect of I-4's significance is evidenced through connectivity provided by major junctions with I-275, I-75, SR 429 (Daniel Webster Western Beltway), SR 417 (Southern Connector/Central Florida Greeneway/Seminole Expressway), SR 528 (Martin Andersen Beachline Expressway), SR 91 (Florida's Turnpike), SR 408 (Spessard Lindsay Holland East-West Expressway) and I-95.

I-4 serves as the primary corridor in the movement of people and freight between major population, employment and activity centers in the Central Florida region. When the entire Interstate was fully opened in the early 1960's, it was designed to serve intrastate and interstate travel by providing a critical link between the east and west coasts of Central Florida. Although this role continues to be a crucial transportation function of I-4, the highway also serves large volumes of local and commuter traffic with shorter trip distances. Today, the highway serves as the primary link between hotel/resort complexes and tourist attractions such as Walt Disney World, Universal Studios, Sea World, the International Drive Resort Area and downtown Orlando. Since I-4 is the only north-south limited access facility that is centrally located between the predominant employment centers and the major suburbs to the north, it has become the primary commuting corridor in the Central Florida metropolitan area.

Growth in Central Florida over the past decades has made it difficult for the transportation system to accommodate travel demand. Traffic congestion and crash incidents have resulted in major delays on the Interstate as well as other arterials surrounding the corridor. Increased congestion levels are experienced outside of the typical morning and afternoon rush-hour periods, affecting mobility levels for more hours of the day and impacting other non-commuter/non-weekday travel. The congestion on I-4 is further evidenced by the less than desirable levels of service on the Interstate as well as the crossroads.

Projections of future population and employment in the region indicate that travel demand will continue to increase well into the future. The ability to accommodate the new travel patterns resulting from growth must be provided to sustain the region's economy. Without the improvements, extremely congested conditions are expected to occur for extended periods of time in both the morning and evening peak periods. Due to these congested conditions, user travel times will continue to increase, the movement of goods through the urban area will be slower, and the deliveries of goods within the urban area will be forced to other times throughout the day. The need for improvements to I-4 is illustrated by the important transportation roles I-4 serves to the Central Florida region and the State of Florida. If no improvements are made to the Interstate, a loss in mobility for the area's residents, visitors, and commuters can be expected, resulting in a severe threat to the continued viability of the economy and the quality of life.

This reevaluation involves revising the original design concept showing 6 GUL + 4 SUL from CR 532 to southwest of World Drive , 6 GUL + 2 HOV lanes from southwest of World Drive to northeast of Lake Avenue and 6 GUL + 4 HOV lanes from northeast of Lake Avenue to SR 528, as recommended in the FONSI for SR 400 (I-4) from CR 532 (Polk/Osceola County Line to West of SR 528 (Beachline Expressway) (December 23, 1999), to the current proposed

design of four (4) Express Lanes. The Express Lanes are tolled lanes and will extend the full length of the project. The access to/from the tolled lanes will be evaluated as part of this effort to determine if changes are needed from the previously approved concept for access to/from the SUL/HOV Lanes. The original I-4 PD&E Studies involved physical separation between the general use lanes and the SUL/HOV lanes on I-4, with demand management in the HOV lanes. The original demand management strategy was to control the use of the HOV lanes by requiring a minimum number of occupants per vehicle to maintain an acceptable level of service (Level of Service D).

This reevaluation also addresses revising the demand management tool to convert the HOV lanes to tolled express lanes. The express lanes will be separated from the general use travel lanes by two shoulders with a barrier wall between the shoulders. A variable pricing tolling plan is proposed for the express lanes. The tolls will vary by time of day and day of week to maintain acceptable levels of service in the express lanes. The tolls will be collected electronically through existing E-Pass, SunPass and other systems currently in place in the Orlando metropolitan area. The conversion to Express Lanes will maintain the same right of way limits as documented previously and will not change the impacts to the social, natural or physical environment. An update to the Systems Access Modification Report (SAMR) prepared in January, 2013 is being completed in conjunction with this effort. The primary objective of this Location Hydraulic Report (LHR) is to evaluate the hydraulic conditions along the proposed corridor in the existing and proposed conditions. This evaluation shall be accomplished by assessing and quantifying all floodplain impacts and providing recommendations to offset any impacts. The results of this evaluation will provide FDOT with the information necessary to reach a decision on the type, design, and location of improvements that are required for the widening of SR 400 (I-4).

This report has been prepared in accordance with the requirements set forth in Executive Order 11988, "Floodplain Management", US DOT Order 5650.2, "Floodplain Management and Protection", and Federal-Aid Policy Guide 23 CFR 650A. The intent of these regulations is to avoid or minimize roadway encroachments within the 100-year (base) floodplain, where practicable, and to avoid supporting land use development, which is incompatible with floodplain values. This report provides preliminary information on designated floodplains, cross drains and potential floodplain impacts of the project on these areas.

General information regarding basin delineation, cross drain locations and culvert parameters used in the preparation of this report include the following:

- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) for Osceola County No. 12097C0035F and 12097C20040F and Orange County No. 12095C0395F, 12095C0405F, 12095C0415F and 12095C0585F (Figures 6 & 7).
- US Department of Agriculture (USDA) Soils Conservation Service (SCS) Soils Survey for Polk, Osceola and Orange County (Figure 2)
- US Geological Survey (USGS) Quadrangle Map (Figure 3)
- Florida Department of Transportation (FDOT) PD&E Manual, Part 2, Chapter 24 (revised January 2008)
- FDOT Drainage Manual (2015)
- 2012 SFWMD Basis of Review for Environmental Resource (ERP BOR)
- Existing Construction Plans
- Various Existing Permits
- Site Investigation

2.0 Project Description and Purpose

The Florida Department of Transportation (FDOT) is proposing to reconstruct and widen I-4 as part of the I-4 Ultimate concept. This involves the build-out of I-4 to its ultimate condition through Central Florida, including segments in Polk, Osceola, Orange, Seminole, and Volusia Counties. The concept design proposes the addition of two (2) new express lanes in each direction, resulting in a total of ten (10) dedicated lanes. The study area in this section from the Polk County/Osceola County Line to west of SR 528 includes the following interchanges: CR 532, SR 429, World Drive, SR 417, US 192/SR 530, W. Osceola Parkway, SR 536, SR 535, Daryl Carter Parkway and Central Florida Parkway, and provides for the required stormwater treatment with eighty-nine (89) potential pond sites along the corridor (See Figure 1: Project Location Map). The typical section will ensure that the design will be contained within the existing right-of-way with the exception of the pond sites. This alignment serves as the basis for the development of the proposed improvements outlined in the Location Hydraulic Report.

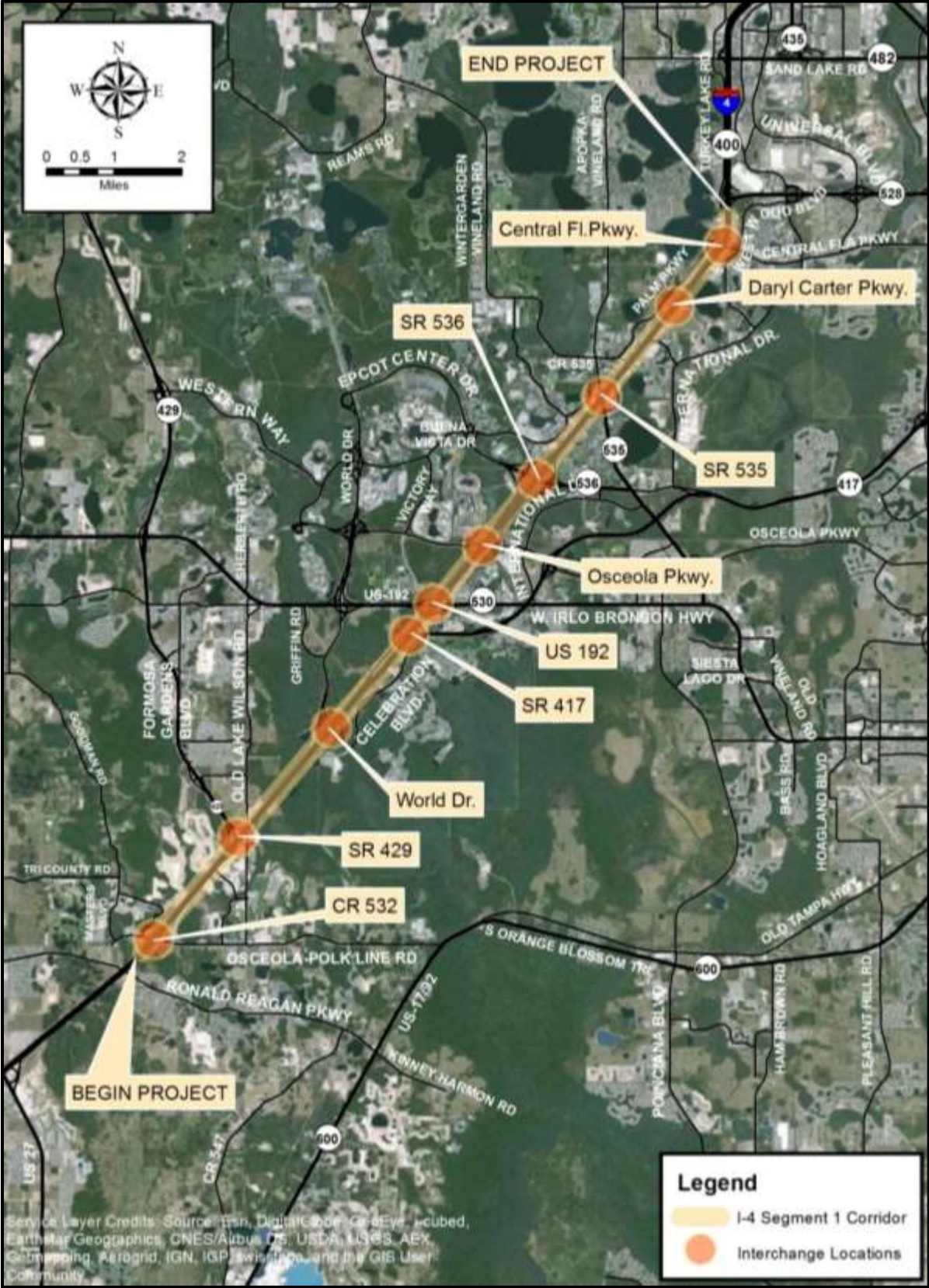


Figure 1: Project Location Map

2.1 Proposed Recommended Typical Section

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. The typical section throughout Segment 1 will have three 12-foot general use travel lanes with 10-foot inside and 12-foot outside shoulders and two 12-foot express lanes with 4-foot inside and 10-foot outside shoulders in each direction. A barrier wall between the adjacent shoulders will separate the express lanes from the general use lanes. Twelve-foot auxiliary lanes will be provided in some areas in both the eastbound and westbound directions. The typical section includes a minimum 44-foot rail envelope in the median within a minimum 300 foot right of way.

While the overall typical section remains consistent throughout Segment 1, there are some areas along the Segment 1 corridor that will have special sections. Special cross sections were developed to meet the needs of the project due to right of way constraints, existing utility easements or other design considerations along the corridor. These special sections may include C-D roads, braided ramp systems, elevated express lanes or elevated general use lanes. Additionally, the median width may vary in certain locations to accommodate changes in the horizontal alignment due to crossroad support structures, water crossings or other features. In the area between World Drive and SR 417, the median is considerably wider than 44 feet to accommodate a future high speed rail station. The special sections along the Segment 1 corridor are identified as follows:

- I-4 Eastbound elevated express lanes between E. of SR 429 and W. of World Drive
- C-D system (Eastbound and Westbound) between World Drive and SR 417
- I-4 Eastbound elevated general use lanes with at grade C-D Road between SR 536 and SR 535
- I-4 Westbound elevated general use lanes between SR 536 and E. of Daryl Carter Parkway with at grade C-D Road between SR 536 and Central Florida Parkway

3.0 Design Criteria

The design of stormwater management facilities for this project is governed by the rules and criteria set forth by the South Florida Water Management District (SFWMD) and the FDOT. These criteria were drawn from the 2012 SFWMD Basis of Review for Environmental Resource (ERP BOR) and the 2015 FDOT Drainage Manual.

3.1 Culvert Design

- All cross drains, if applicable, shall be designed to have sufficient hydraulic capacity to convey the 50-year (Design Frequency) storm event. All culverts shall be analyzed for the base flood (100-year).
- Backwater shall not significantly change land use values unless flood rights are purchased.
- The headwater for design frequency conditions shall be kept at or below the travel lanes in compliance with the FDOT Drainage Manual.
- The highest tailwater elevation, which can be reasonably expected to occur coincident with the design storm event, shall be used (typically, crown of pipe is used).

- The minimum culvert size is 18" or its equivalent size.
- The design of all cross culverts shall comply with the guidelines set forth in the FDOT Drainage Manual, Chapter 4.

3.2 Floodplains/Floodways

- The proposed project may not cause a net reduction in flood storage within the 10-year floodplain.
- Structures shall cause no more than a one-tenth (0.1) of a foot increase in the 100-year flood elevation 500-feet upstream.
- Proposed construction shall not cause a reduction in flood conveyance capabilities.
- Best Management Practices (BMP's) shall be employed to minimize velocity to avoid undue erosion.
- The design of encroachments shall be consistent with standards established by FEMA.

4.0 Site Conditions

This project lies within FDOT District 5, Southwest Florida Water Management District (SWFWMD), South Florida Water Management District (SFWMD) and the Reedy Creek Improvement District (RCID). Wetlands, wildlife, soils conditions, land use, cross drains, and floodplains describe the site conditions present within the limits of this study. Involvement within wetlands and impact of wildlife are specifically addressed in two separate reports, "*Wetlands Evaluation Report*" and "*Endangered Species Biological Assessment*" prepared as part of this PD&E Study.

4.1 Soils

The Soil Survey of Polk, Osceola and Orange County, Florida, published by the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) has been reviewed for the project vicinity. There are forty-one (41) different soil types located in the project area. Table 1 lists these soil types and their hydraulic properties. The Soil Survey Map for the project is illustrated in Figure 2.

Table 1: SCS Soil Survey Information

Soil Type	Hydrologic Soil Group
Adamsville sand (1)	A
Arents (4)	A
Archbold fine sand (2)	A
Basinger fine sands (3, 5, 6, 36)	A/D
Candler sand (4, 7, 8)	A
Hontoon muck (15)	A/D
Immokalee fine sands (16, 20)	A/D
Myakka fine sand (22, 25)	A/D
Ona fine sand (26, 27)	B/D
Placid fine sand (33)	A/D
Placid and Myakka fine sand (25)	A/D
Pits (31, 33)	N/A
Pomello fine sand (34)	A
Pompano fine sand (37)	A/D
Riviera fine sand (38)	C/D
Samsula muck (13, 40)	A/D
Sanibel muck (42)	A/D
Seffner fine sand (43)	A/D
Smyrna fine sand (42, 44)	A/D
Smyrna and Myakka fine sand (17)	A/D
St. Johns fine sand (37)	B/D
St. Lucie fine sand (38)	A
Tavares fine sand (15, 44, 46)	A
Tavares-Millhopper fine sands (47)	A
Urban land (50)	N/A
Vero fine sand (45)	N/A
Wauchula fine sand (46)	A/D
Zolfo fine sand (54)	A

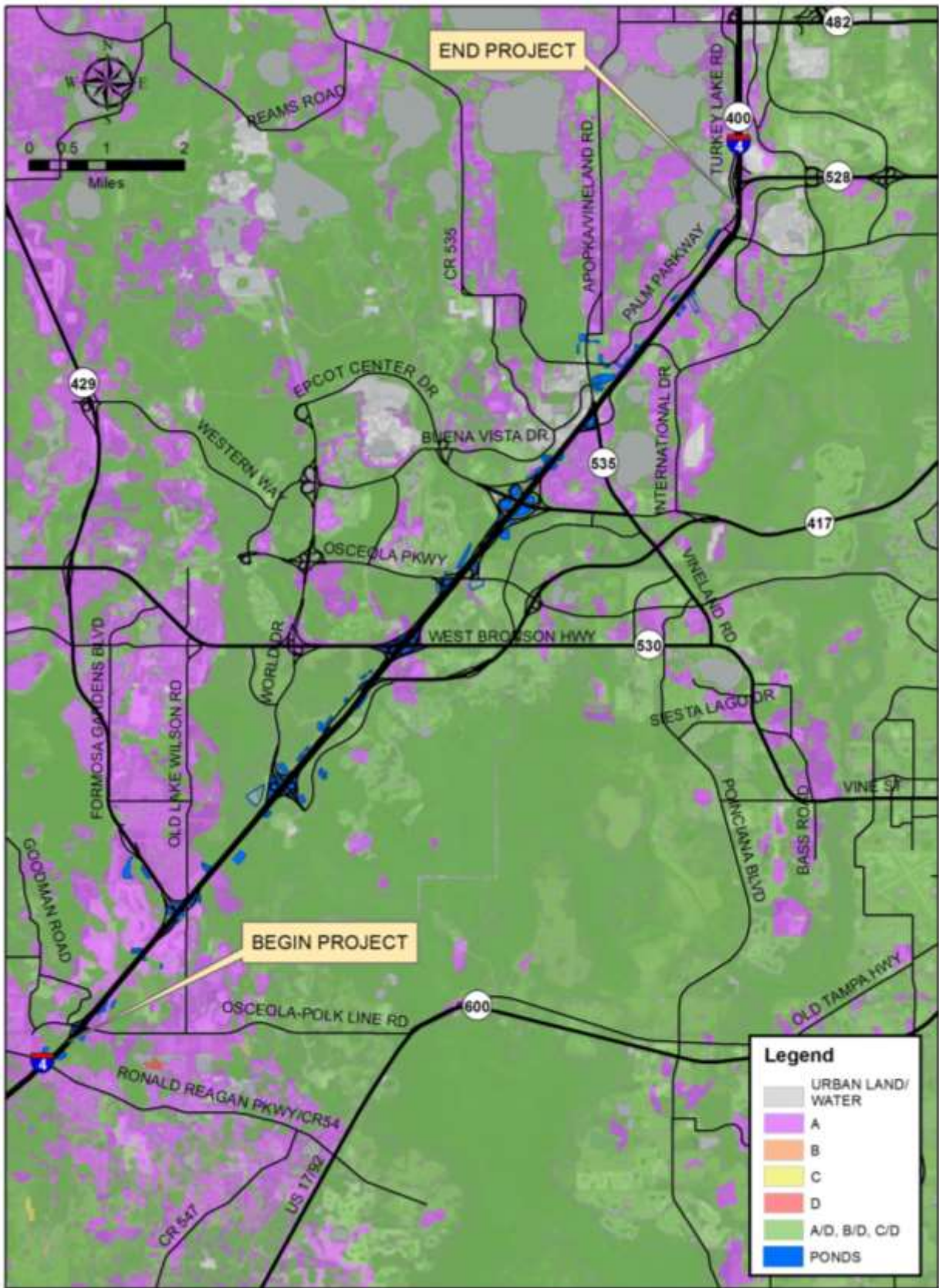


Figure 2: Soil Survey Map

Based on a review of the Polk, Osceola and Orange County Florida United States Geographical Survey (USGS) quadrangle map, the existing ground surface elevations along the project alignment vary approximately from +75 to +125 feet NAVD. A reproduction of the USGS quadrangle map for the project vicinity is shown in Figure 3.



Figure 3: USGS Quadrangle Map

4.2 Land Use

4.2.1 Existing Land Use

Existing land use information within the SR 400 (I-4) PD&E Study is based on the existing land use map. The I-4 corridor varies with a mixture of uses. The southern half of the corridor is characterized by large portions of agricultural and recreational land uses on each side of the interstate. Along the southern end of the corridor, undeveloped parcels are designated for retail/office or non-residential use, non-agriculture acreage and residential land uses. The northern portion of the corridor consists largely of retail/office land uses intermixed with some vacant nonresidential parcels and agricultural use. Figure 4 illustrates the existing land use within the project area.

4.2.2 Future Land Use

Future land use along the I-4 corridor also varies greatly with a mixture of uses. The southern portion of I-4, through Polk County, consists of activity center, medium density residential, preservation and employment center uses. The southern portion of the corridor through Osceola County consists of commercial, planned development and conservation land uses. The northern portion of the I-4, through Orange County, is surrounded predominantly by mixed use parcels with some commercial and office use. The widening of I-4 will not alter the existing or future land uses in the area. Figure 5 illustrates the future land use within the project area.

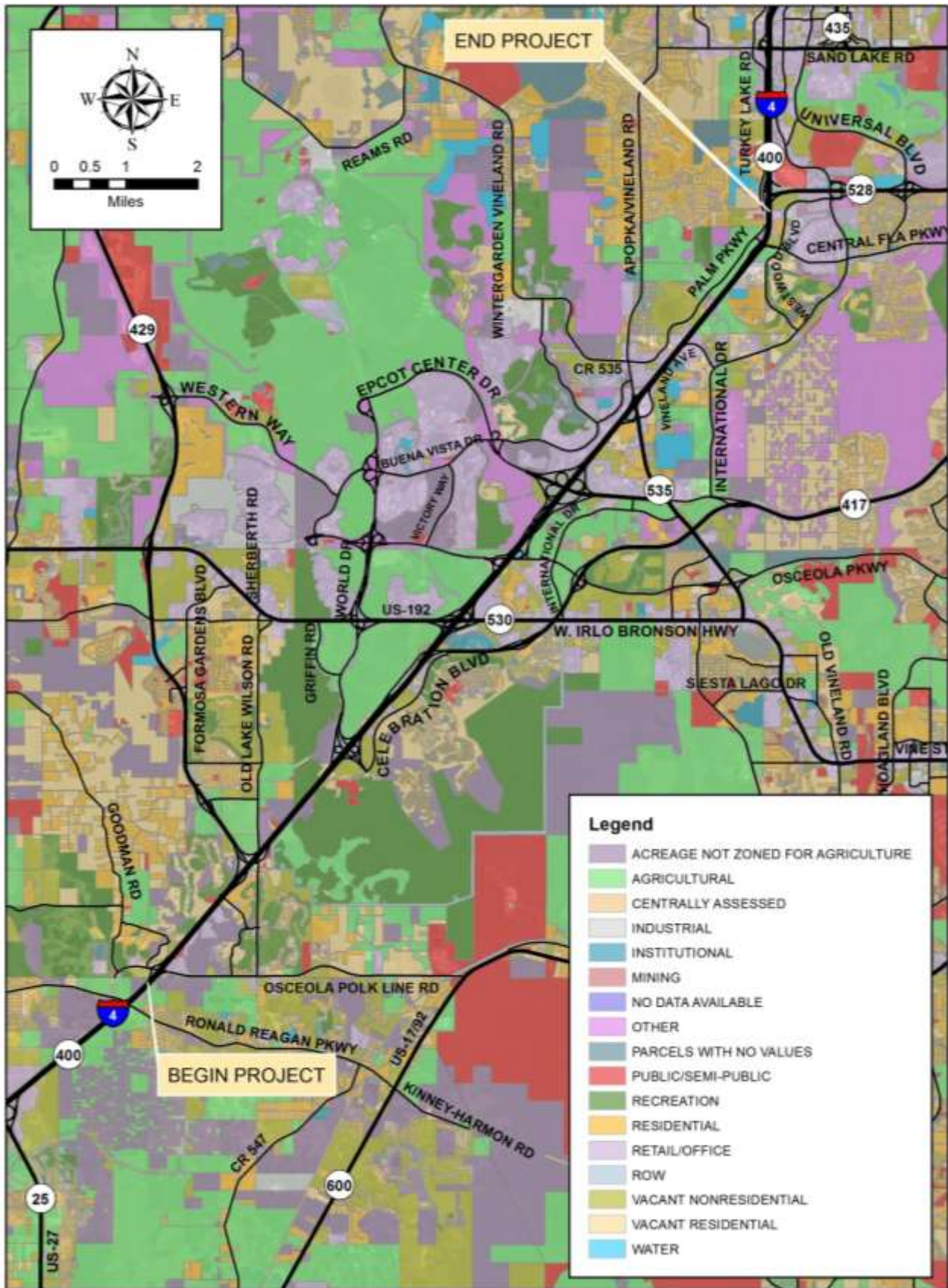


Figure 4: Existing Land Use Map

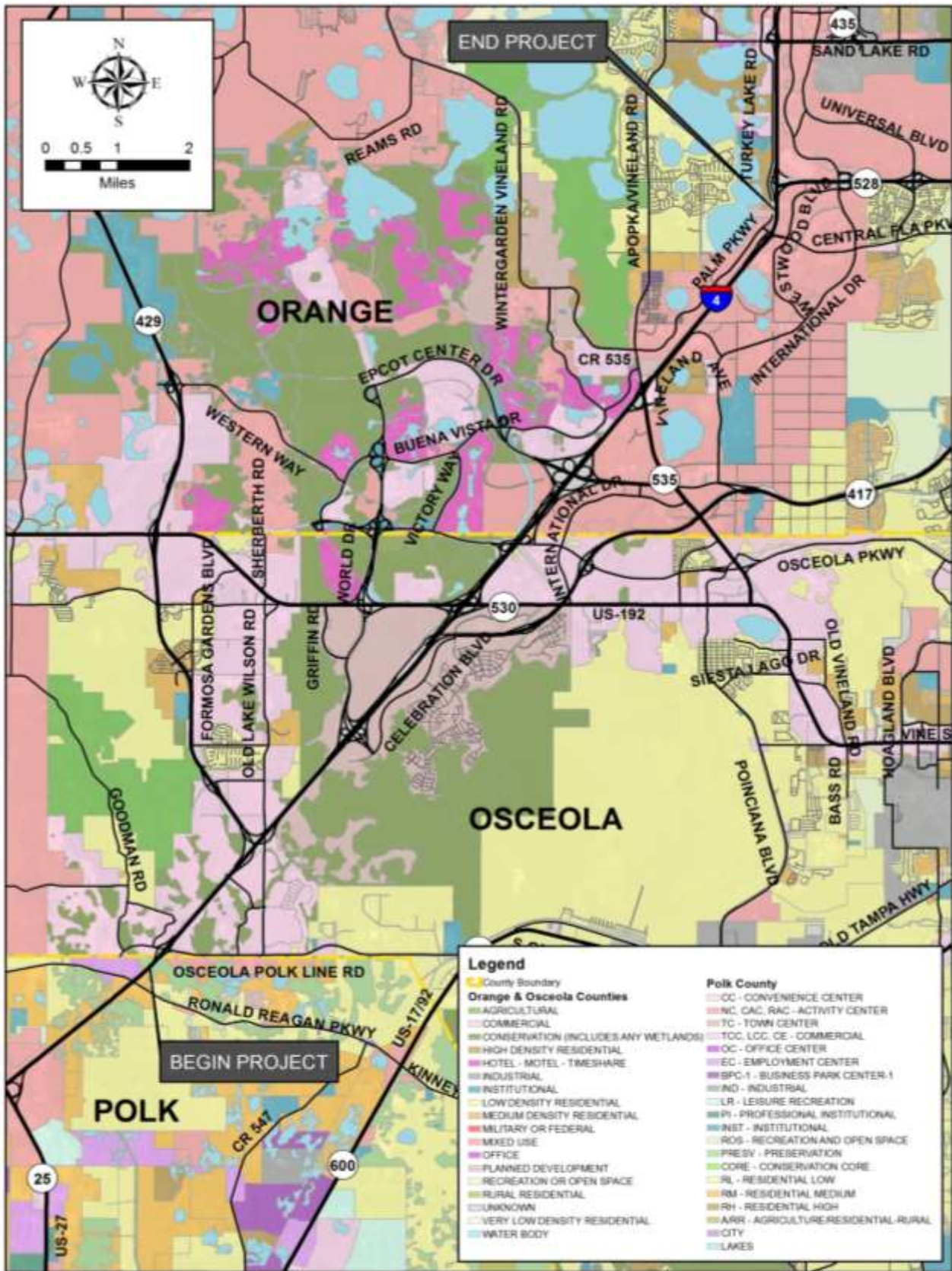


Figure 5: Future Land Use Map

4.3 Cross Drains

4.3.1 Existing Conditions

There are fifteen (15) existing structures which act as cross drains within the study area. Table 2 depicts the existing cross culvert data obtained from the Straight Line Diagram of Road Inventory (Appendix A) pertinent to the project study area, as well as, existing permits and original construction plans. In the case where original construction plans were not found, cross drain invert elevations were obtained from existing permits and the original PD&E study. Some of the existing construction plans were in 1929 NGVD datum. A conversion of (-) 0.85 ft. was used to convert to the NAVD datum. During the design phase, survey and field verification will be necessary to determine the actual pipe lengths and culvert flow lines.

Table 2: Existing Cross Drains

CD No.	Station	Description from Original Construction Plans						
		Count	Span (in)	Rise (in)	Type	*Length (Ft)	*Elevation (Ft NAVD)	
							US	DS
CD-1	614+12.71	2	36	36	RCP	213	111.36	111.25
CD-2	664+22.84	2	48	48	RCP	256	102.58	102.48
CD-3	680+00.00	2	108	84	CBC	262	92.11	91.77
CD-4	692+20.31	1	36	36	RCP	261	90.34	88.25
CD-5	698+00.00	4	144	96	CBC	260	84.27	83.56
CD-6	732+50.00	2	84	48	CBC	310	90.72	90.50
CD-7	761+00.00	1	42	42	RCP	227	84.42	82.97
CD-8	785+16.00	2	42	42	RCP	248	74.18	73.03
CD-9	863+00.00	2	84	48	CBC	583	75.70	75.50
CD-10	914+00.00	2	84	48	CBC	250	79.50	79.25
CD-11	984+00.00	2	84	60	CBC	477	82.45	81.65
CD-12	1083+18.65	2	36	36	RCP	415	83.44	82.45
CD-13	1138+19.00	2	30	30	RCP	247	96.10	94.85
CD-14	1202+15.00	1	48	48	RCP	241	99.57	98.35
**CD-15	1333+10.00							

Abbreviations: RCP – Reinforced Concrete Pipe, CBC – Concrete Box Culvert

*Field Verify.

** Existing information not found.

Based on hydraulic calculations, cross drains CD-9 and CD-11 do not have the sufficient hydraulic capacity to convey the 100-year storm event in the existing condition. The 100 year headwater stage is shown as the critical elevation (roadway elevation) for the purposes of this report. Please refer to Appendix B for additional information.

4.3.2 Proposed Conditions

Due to the proposed roadway widening, all of the cross drains will require total replacement. Through hydraulic analysis, it was determined that four (4) cross drains need to be upsized: CD-7, 8, 12, and 13. The remaining cross drains will require a change in slope to function adequately. All cross drains were analyzed using HY8 (Version 7.3) software. Table 3 depicts the results of the hydraulic analysis.

Table 3: Proposed Cross Drains

CD No.	Station	Description from Original Construction Plans						
		Count	Span (in)	Rise (in)	Type	Length (Ft)	Elevation (Ft NAVD)	
							US	DS
CD-1	614+12.71	2	36	36	RCP	328	111.80	110.80
CD-2	664+22.84	2	48	48	RCP	300	102.58	102.18
CD-3	680+00.00	2	108	84	CBC	353	92.11	91.77
CD-4	692+20.31	1	36	36	RCP	300	90.34	88.25
CD-5	698+00.00	4	144	96	CBC	392	84.27	83.16
CD-6	732+50.00	2	84	48	CBC	460	90.72	90.10
CD-7	761+00.00	1	48	48	RCP	404	84.42	82.97
CD-8	785+16.00	2	48	48	RCP	308	74.18	73.03
CD-9	863+00.00	2	84	48	CBC	583	75.70	75.20
CD-10	914+00.00	2	84	48	CBC	558	79.50	78.70
CD-11	984+00.00	2	84	60	CBC	581	82.00	80.90
CD-12	1083+18.65	2	42	42	RCP	612	83.44	82.45
CD-13	1138+19.00	2	36	36	RCP	356	96.10	94.85
CD-14	1202+15.00	1	48	48	RCP	372	99.57	98.20
**CD-15	1333+10.00							

Abbreviations: RCP – Reinforced Concrete Pipe, CBC – Concrete Box Culvert

** Existing information not found.

4.4 Bridge Structures

4.4.1 Existing Condition

There are twenty nine (29) existing bridges located within the project corridor. Table 4 depicts the location and attributes of the existing bridges. Structure conditions and year of construction was provided in the original I-4 PD&E Study.

Table 4: Existing Bridges

Structure No.	Station	Description
B-1	634+00	I-4 WB over CR 532
B-2	634+00	I-4 EB over CR 532
B-3	706+00	Sinclair Road over I-4
B-4	735+50	SR 429 Ramp from EB I-4
B-5	738+50	SR 429 Ramp to EB I-4
B-6	748+00	Old Lake Wilson Road over I-4
*B-7	813+00	I-4 WB over Reedy Creek
*B-8	813+00	I-4 EB over Reedy Creek
B-9	847+00	World Drive EB over I-4
B-10	851+00	World Drive WB over I-4
B-11	945+00	SR 417 WB Ramp over I-4
B-12	967+00	I-4 EB Ramp from SR 530 over I-4
B-13	973+00	SR 530 SB over I-4
B-14	975+00	SR 530 NB over I-4
B-15	976+50	I-4 WB Ramp from SR 530 over I-4
B-16	978+00	I-4 EB Ramp to SR 530 over I-4
B-17	1034+50	Osceola Parkway SB over I-4
B-18	1036+00	Osceola Parkway NB over I-4
B-19	1060+00	I-4 EB CD Road
B-20	1066+00	I-4 WB CD Road
B-21	1088+00	SR 536 EB Ramp over I-4
B-22	1101+00	SR 536 SB over I-4
B-23	1102+00	SR 536 NB over I-4
B-24	1184+00	I-4 WB over SR 535
B-25	1184+00	I-4 EB over SR 535
B-26	1272+00	Daryl Carter Parkway (Fenton St.) over I-4
B-27	1332+00	Central Florida Parkway WB Ramp over I-4
B-28	1335+00	I-4 EB over Central Florida Parkway
B-29	1335+00	I-4 EB over Central Florida Parkway

* Bridge crossing over Reedy Creek.

4.4.2 Proposed Condition

In the proposed condition, the existing bridges will be either widened or replaced to accommodate the widening of I-4 to its ultimate condition. Please refer to the Preliminary Engineering Report (PER) for additional information.

4.5 Floodplain/Floodways

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) for Polk, Osceola and Orange County. According to FEMA Map Numbers 12105C0125F, 12097C0040F, 12097C0035F, 12095C0585F, 12095C0395F, and 12095C0415F, portions of the roadway are located within the 100-year floodplain. Based on the FEMA floodplain lines, the roadway widening will impact the floodplain on both sides of the roadway. The FEMA Flood Insurance Rate Maps for the project is provided in Figure 6.

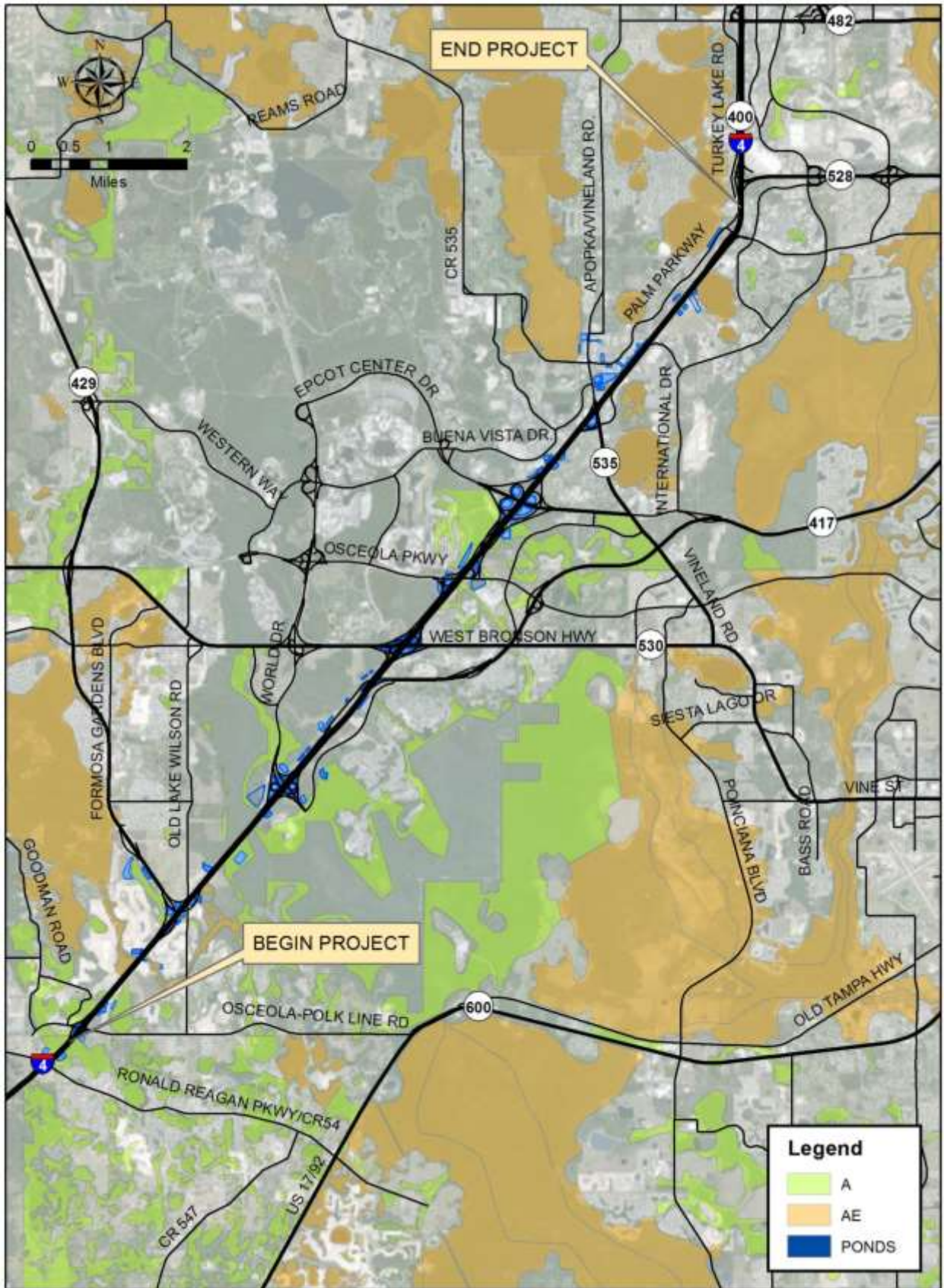


Figure 6: FEMA Flood Insurance Rate Map

5.0 Recommendations and Conclusions

5.1 Cross Drains

There are fifteen (15) cross drains within the study area. Due to the proposed widening, the cross drains will require total replacement. The existing cross drains have been evaluated for headwater impacts to see if replacement is necessary. Through hydraulic analysis, it was determined that four (4) cross drains need to be upsized: CD-7, 8, 12, and 13.

5.2 Bridge Structures

There are twenty nine (29) existing bridges which will require expansion or widening to accommodate the widening of I-4 to its ultimate condition. Additional study will be required during the design and construction phase to determine the resultant scour for the bridges (B-7 & B-8) located at Reedy Creek. Please refer to the Preliminary Engineering Report (PER) for additional information.

5.3 Floodplains and Floodways

Floodplains are present along the project corridor and adjacent to some proposed ponds within the study limits; however, no floodways are located within the project area. Any impacts associated with the roadway widening will be compensated for in existing pond sites and/or proposed floodplain compensation ponds. Please refer to the Pond Siting Report (PSR) for additional information.

5.4 Project Classification

In accordance with FDOT's PD&E Manual, Part 2, Chapter 24, Section 24-2.1, Figure 24.1 "Floodplain" Statements, the proposed corridor has been evaluated to determine the impact of the proposed hydraulic modifications. Hydraulic improvements are grouped into six categories based upon the type of the hydraulic improvements and estimated floodplain impact. The proposed project can be best described in two (2) categories:

Category 3: Projects involving modification to existing drainage structures. The proposed project does not involve the replacement of any existing drainage structures or the construction of any new drainage structures. Projects that affect flood heights and flood limits, even minimally, may require further evaluation to support statements that emphasize the insignificance of the modifications (FDOT PD&E Manual, Part 1, Chapter 24). "The modifications to drainage structures included in this project will result in an insignificant change in their capacity to carry floodwater. This change will cause minimal increases in flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. There will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant."

Category 4: Projects on existing alignment involving replacement of existing drainage structures with no record of drainage problems. The proposed project does not involve replacement activities that would reduce the hydraulic performance of existing facilities. Also, there should be no record of

drainage problems and no unresolved complaints from residents in the area (FDOT PD&E Manual, Part 1, Chapter 24). “The proposed structure will perform hydraulically in a manner equal to or greater than the existing structure, and backwater surface elevations are not expected to increase. As a result, there will be no significant adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant.”

5.5 Project Summary

The proposed reconstruction and widening of SR 400 (I-4) involves adding two new lanes in each direction and providing stormwater management systems. There are fifteen (15) existing cross drains which will necessitate culvert replacement. There are twenty nine (29) bridges within the corridor, which may need to be replaced to meet the proposed geometry. The proposed alignment does impact the 100-year floodplain, as well as several existing pond sites. Any impacts associated with the roadway widening will be compensated for in existing pond sites and/or proposed floodplain compensation ponds. By complying with regulatory criteria, the implementation of this project will not adversely affect the area adjacent to the corridor and meets the expectations of the stakeholders.

APPENDIX A – STRAIGHT LINE DIAGRAMS

DATE	5 YR INV	SLD REV	BMP	EMP	INTERIM REVISIONS	SLD REV
BY	05/18/11	06/14/11			INV	
	URS	URS				

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT ONE MAINTENANCE STATISTICS OFFICE

INT. of US ROUTE NO	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO.
I 4	SR 400	POLK	1	16320000	3
					OF 4

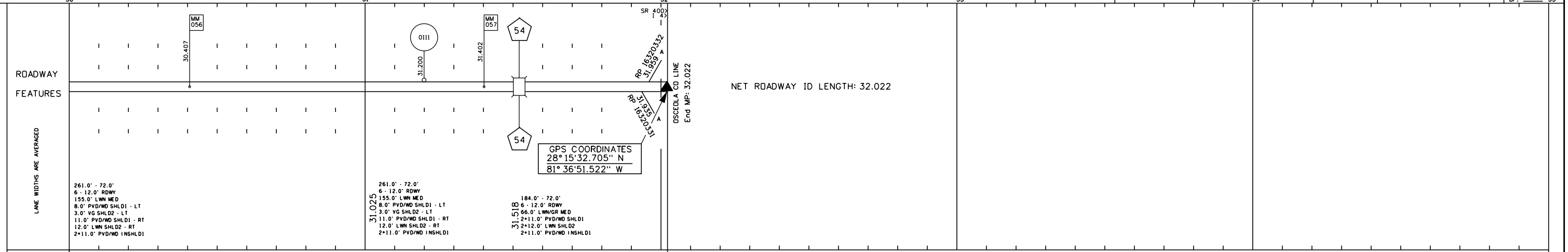
ROADWAY FEATURES		
LANE WIDTHS ARE AVERAGED	<p>329.0' - 72.0' 6 - 12.0' RDWY 222.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 11.0' PVD/WO SHLDI - RT 1.0' LWN SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>173.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 11.0' PVD/WO SHLDI - RT 1.0' LWN SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>21.810 173.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 11.0' PVD/WO SHLDI - RT 1.0' LWN SHLD2 - RT 11.0' PVD/WO INSHLDI - LT 13.0' PVD/WO INSHLDI - RT</p> <p>22.984 173.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 11.0' PVD/WO SHLDI - RT 1.0' LWN SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>172.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 8.0' PVD/WO SHLDI - RT 3.0' VG SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>184.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 2+11.0' PVD/WO SHLDI 2+12.0' LWN SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>184.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 2+11.0' PVD/WO SHLDI 2+12.0' LWN SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>399.0' - 72.0' 6 - 12.0' RDWY 305.0' LWN MED 2+8.0' PVD/WO SHLDI 2+3.0' VG SHLD2 2+11.0' PVD/WO INSHLDI</p>	
ROADWAY COMPOSITION	28/FC-3	
HORIZONTAL ALIGNMENT	<p>PC-20.100 PT-20.877 PT-21.644</p> <p>CURVE DATA IS NOT FIELD VERIFIED</p> <p>D=0°1'00.00" Δ=16°6'30"</p> <p>B=N65°2'00"E</p>	
STRUCTURE DESCRIPTION	<p>20.079 20.087 20.190 20.087 1-24" X 215' CC</p> <p>20.704 20.087 1-24" X 240' CC</p> <p>21.170 21.170 1-24" X 225' CC</p> <p>21.492 21.492 1-24" X 220' CC</p> <p>21.780 21.780 1-36" X 215' CC</p> <p>22.137 22.137 1-30" X 225' CC</p> <p>22.428 22.433 1-30" X 210' CC</p> <p>22.763 22.763 1-30" X 210' CC</p> <p>22.957 22.957 1-6" X 4 X 215' CBC</p> <p>23.130 23.130 1-6" X 4 X 220' CBC</p> <p>23.662 23.662 1-8" X 4 X 220' CBC</p> <p>24.055 24.055 1-42" X 115' CC</p> <p>24.596 24.596 1-30" X 110' CC</p> <p>24.996 24.996 1-36" X 110' CC</p>	
DISTRICT USE		
SIS	SIS HIGHWAY FACILITY	
FUN CLASS	RURAL PRINCIPAL ARTERIAL -- INTERSTATE	

ROADWAY FEATURES		
LANE WIDTHS ARE AVERAGED	<p>184.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 2+11.0' PVD/WO SHLDI 2+12.0' LWN SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>184.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 2+11.0' PVD/WO SHLDI 2+12.0' LWN SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>172.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 8.0' PVD/WO SHLDI - RT 3.0' VG SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>172.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 3.0' VG SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>172.0' - 72.0' 6 - 12.0' RDWY 66.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 2+11.0' PVD/WO INSHLDI</p> <p>321.0' - 72.0' 6 - 12.0' RDWY 203.0' LWN MED 2+11.0' PVD/WO SHLDI 2+12.0' LWN SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>297.0' - 72.0' 6 - 12.0' RDWY 203.0' LWN MED 2+8.0' PVD/WO SHLDI 2+3.0' VG SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>310.0' - 72.0' 6 - 12.0' RDWY 203.0' LWN MED 8.0' PVD/WO SHLDI - LT 3.0' VG SHLD2 - LT 12.0' PVD/WO SHLDI - RT 12.0' LWN SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>322.0' - 72.0' 6 - 12.0' RDWY 203.0' LWN/GR MED 11.0' PVD/WO SHLDI - LT 12.0' LWN SHLD2 - LT 12.0' PVD/WO SHLDI - RT 12.0' LWN SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p> <p>288.0' - 72.0' 6 - 12.0' RDWY 170.0' LWN/GR MED 2+11.0' PVD/WO SHLDI 2+12.0' LWN SHLD2 2+11.0' PVD/WO INSHLDI</p> <p>261.0' - 72.0' 6 - 12.0' RDWY 155.0' LWN MED 8.0' PVD/WO SHLDI - LT 3.0' VG SHLD2 - LT 11.0' PVD/WO SHLDI - RT 12.0' LWN SHLD2 - RT 2+11.0' PVD/WO INSHLDI</p>	
ROADWAY COMPOSITION	28/FC-3	
HORIZONTAL ALIGNMENT	<p>Δ=11°3'00" D=0°0'00.00"</p> <p>PC-26.607 PT-26.617 PT-27.025</p> <p>Δ=6°5'08" D=0°0'00.00"</p> <p>PC-27.696 PT-27.673 PT-28.051</p> <p>PC-28.141 PT-28.264 PT-28.387</p> <p>D=0°0'00.00" Δ=4°0'01"</p> <p>B=N20°1'00"E</p>	
STRUCTURE DESCRIPTION	<p>25.395 25.395 1-36" X 220' CC</p> <p>25.738 25.738 1-12" X 10' X 170' CBC</p> <p>25.985 25.985 1-42" X 220' CC</p> <p>26.476 26.476 1-48" X 220' CC</p> <p>26.900 26.900 1-36" X 210' CC</p> <p>27.226 27.226 3-48" X 115' CC</p> <p>27.592 27.592 1-18" X 120' CC</p> <p>27.702 27.702 2-30" X 115' CC</p> <p>27.826 27.826 1-24" X 125' CC</p> <p>28.292 28.292 1-30" X 215' CC</p> <p>28.331 28.331 2-30" X 215' CC</p> <p>28.446 28.446 1-42" X 105' CI</p> <p>28.466 28.466 1-30" X 95' CC</p> <p>28.942 28.942 1-24" X 135' CI</p> <p>29.168 29.168 1-30" X 115' CC</p> <p>29.193 29.193 1-30" X 115' CC</p> <p>29.471 29.471 1-24" X 190' CI</p> <p>29.940 29.940 1-24" X 70' CI</p>	
DISTRICT USE		
SIS	SIS HIGHWAY FACILITY	
FUN CLASS	RURAL PRINCIPAL ARTERIAL -- INTERSTATE	

DATE BY	5 YR INV	SLD REV	BMP	EMP	INTERIM REVISIONS INV	SLD REV
	05/18/11	06/14/11				
	URS	URS				

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY
 FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT ONE MAINTENANCE STATISTICS OFFICE

INT. or US ROUTE NO	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO.
I 4	SR 400	POLK	1	16320000	4
					OF 4



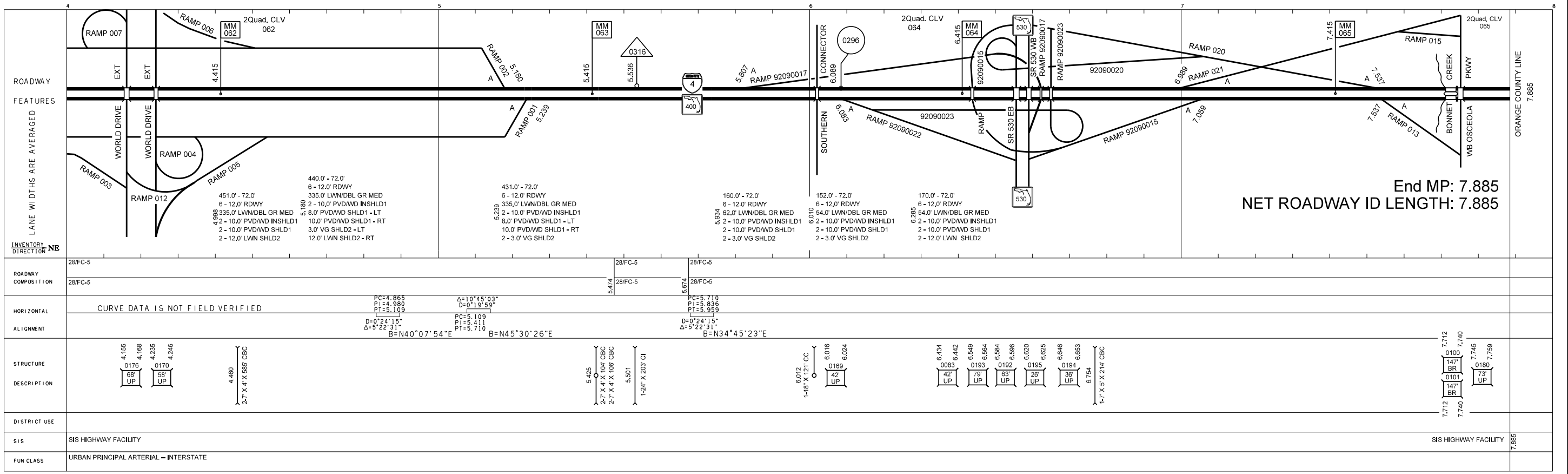
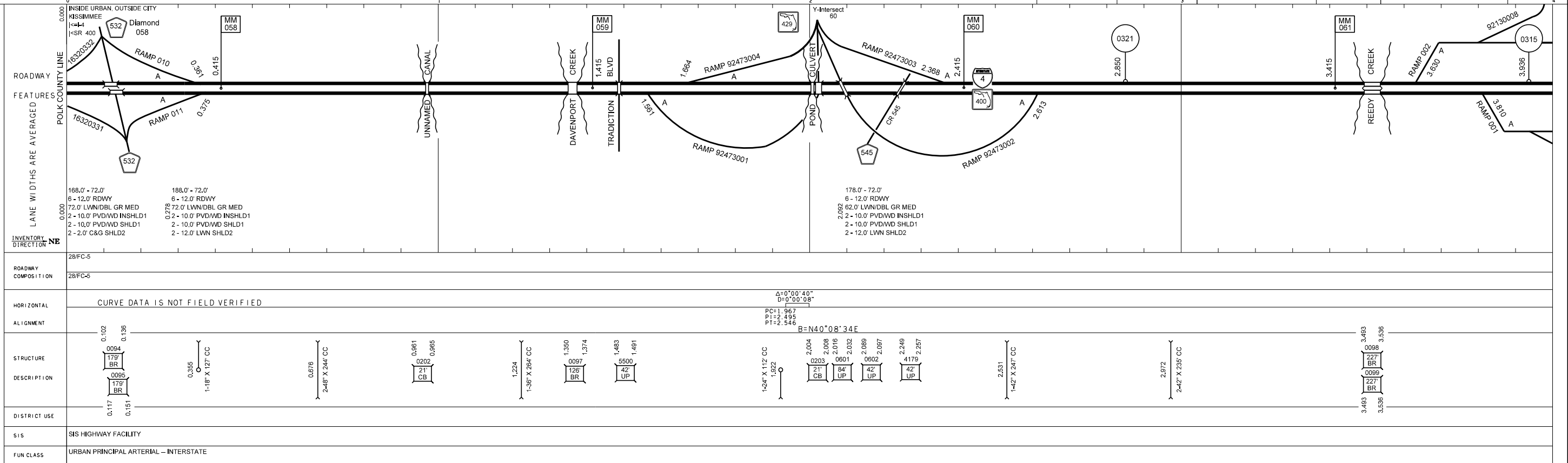
ROADWAY COMPOSITION	28/FC-3 28/FC-3																														
HORIZONTAL ALIGNMENT	CURVE DATA IS NOT FIELD VERIFIED $\Delta=10^{\circ}0'20''$ $D=0^{\circ}0'00.00''$ $PC=31.591$ $PI=31.787$ $PT=31.982$ $B=569^{\circ}7'59''E$																														
STRUCTURE DESCRIPTION	<table border="0"> <tr> <td>30.178</td> <td>1-24" X 110' CC</td> </tr> <tr> <td>30.311</td> <td>1-30" X 115' CC</td> </tr> <tr> <td>30.501</td> <td>1-24" X 95' CC</td> </tr> <tr> <td>30.540</td> <td>1-24" X 110' CC</td> </tr> <tr> <td>30.674</td> <td>1-24" X 105' CC</td> </tr> <tr> <td>30.846</td> <td>1-24" X 105' CC</td> </tr> <tr> <td>30.879</td> <td>2-36" X 105' CC</td> </tr> <tr> <td>30.900</td> <td>2-36" X 105' CC</td> </tr> <tr> <td>31.229</td> <td>1-18" X 105' CC</td> </tr> <tr> <td>31.402</td> <td>1-18" X 140' CM</td> </tr> <tr> <td>31.500</td> <td>0.332</td> </tr> <tr> <td>31.510</td> <td>0.331</td> </tr> <tr> <td>31.518</td> <td>0.331</td> </tr> <tr> <td>31.528</td> <td>0.331</td> </tr> <tr> <td>31.682</td> <td>1-30" X 120' CC</td> </tr> </table>	30.178	1-24" X 110' CC	30.311	1-30" X 115' CC	30.501	1-24" X 95' CC	30.540	1-24" X 110' CC	30.674	1-24" X 105' CC	30.846	1-24" X 105' CC	30.879	2-36" X 105' CC	30.900	2-36" X 105' CC	31.229	1-18" X 105' CC	31.402	1-18" X 140' CM	31.500	0.332	31.510	0.331	31.518	0.331	31.528	0.331	31.682	1-30" X 120' CC
30.178	1-24" X 110' CC																														
30.311	1-30" X 115' CC																														
30.501	1-24" X 95' CC																														
30.540	1-24" X 110' CC																														
30.674	1-24" X 105' CC																														
30.846	1-24" X 105' CC																														
30.879	2-36" X 105' CC																														
30.900	2-36" X 105' CC																														
31.229	1-18" X 105' CC																														
31.402	1-18" X 140' CM																														
31.500	0.332																														
31.510	0.331																														
31.518	0.331																														
31.528	0.331																														
31.682	1-30" X 120' CC																														
DISTRICT USE																															
SIS	SIS HIGHWAY FACILITY SIS HIGHWAY FACILITY																														
FUN CLASS	RURAL PRINCIPAL ARTERIAL -- INTERSTATE																														

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

FLORIDA DEPARTMENT OF TRANSPORTATION

INT. or US ROUTE NO	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO.:
I-4	SR 400	OSCEOLA	5	92 130 000	1 of 1

5 YR INV		SLD REV		BMP		EMP		INTERM REV ISONS		SLD REV	
DATE	BY	EN	EN	000.000	000.000	007.885	007.885	INV	DD	MR	MR
07/15/09		08/06/09						08/24/11	11/12/09	09/14/11	12/01/09

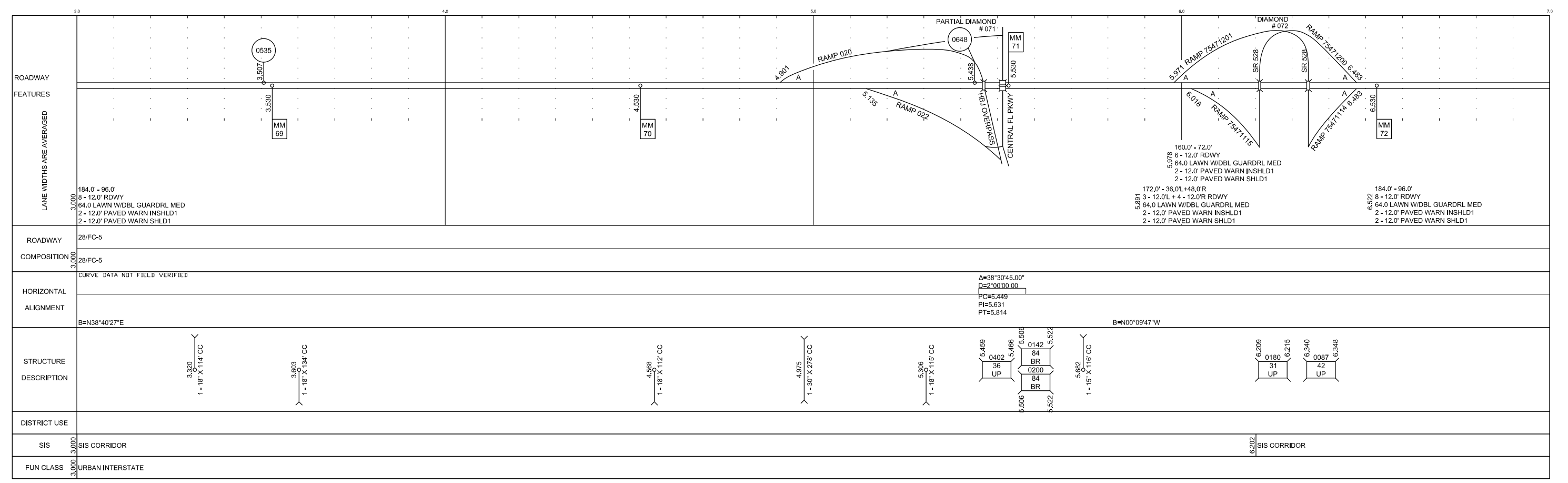
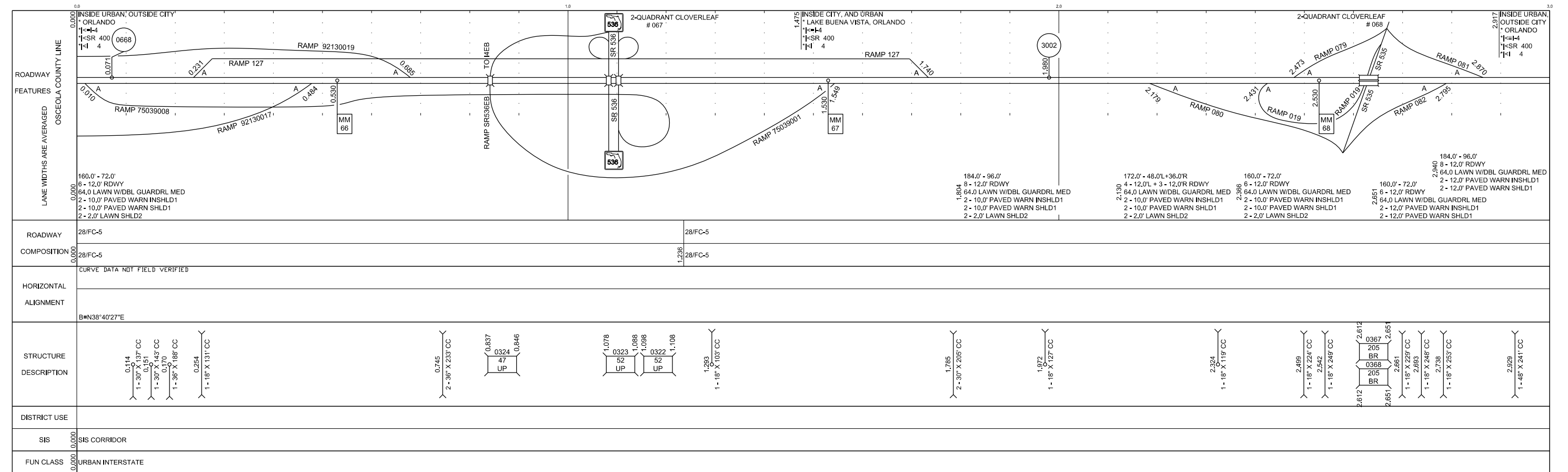


\$FILES PRINTED: \$DATES \$TIMES

5 YR INV	SLD REV	BMP	INTERIM REVISIONS	EN	MR
06/23/2011	08/17/2011	000,000	EMP 024,673	01/17/2013	03/13/2013
BY ENIKA	URS				

FLORIDA DEPARTMENT OF TRANSPORTATION
STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. OR US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02	I 4	SR 400	ORANGE	05	75280000	1 OF 5



APPENDIX B – CROSS DRAIN CALCULATIONS

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO.		CD-1	
		Existing	Proposed
LOCATION	STA.	614+12.71	614+12.71
WIDTH		3.00 FT	3.00 FT
HEIGHT		3.00 FT	3.00 FT
BARRELS		2	2
DIAMETER		3.00 FT	3.00 FT
LENGTH		213.0 FT	328.0 FT
TOTAL CROSS-SECTIONAL AREA		14.14 SF	14.14 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		111.36 FT	111.80 FT
DOWNSTREAM INVERT		111.25 FT	110.80 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		119.00 FT	119.00 FT
TAILWATER (CROWN OF PIPE)		114.25 FT	113.80 FT
<u>DETERMINE FLOWRATES (Q):</u>			
* VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	85 CFS	115.82 FT	115.77 FT
Q (50 YR) = 1.25 * Q (25 YR)	106 CFS	116.70 FT	116.86 FT
Q (100 YR) = 1.40 * Q (25 YR)	119 CFS	117.34 FT	117.66 FT

* *Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-1 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 85 cfs

Design Flow: 106 cfs

Maximum Flow: 119 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-1E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
115.82	85.00	85.00	0.00	1
115.95	88.40	88.40	0.00	1
116.09	91.80	91.80	0.00	1
116.23	95.20	95.20	0.00	1
116.37	98.60	98.60	0.00	1
116.52	102.00	102.00	0.00	1
116.67	105.40	105.40	0.00	1
116.70	106.00	106.00	0.00	1
116.99	112.20	112.20	0.00	1
117.16	115.60	115.60	0.00	1
117.34	119.00	119.00	0.00	1
119.00	147.62	147.62	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
85.00	85.00	115.82	3.464	4.465	4-FFf	3.000	2.121	3.000	3.000	6.013	0.000
88.40	88.40	115.95	3.579	4.593	4-FFf	3.000	2.163	3.000	3.000	6.253	0.000
91.80	91.80	116.09	3.698	4.727	4-FFf	3.000	2.204	3.000	3.000	6.494	0.000
95.20	95.20	116.23	3.820	4.865	4-FFf	3.000	2.244	3.000	3.000	6.734	0.000
98.60	98.60	116.37	3.947	5.009	4-FFf	3.000	2.283	3.000	3.000	6.975	0.000
102.00	102.00	116.52	4.078	5.158	4-FFf	3.000	2.320	3.000	3.000	7.215	0.000
105.40	105.40	116.67	4.214	5.311	4-FFf	3.000	2.357	3.000	3.000	7.456	0.000
106.00	106.00	116.70	4.238	5.339	4-FFf	3.000	2.363	3.000	3.000	7.498	0.000
112.20	112.20	116.99	4.500	5.634	4-FFf	3.000	2.426	3.000	3.000	7.937	0.000
115.60	115.60	117.16	4.650	5.803	4-FFf	3.000	2.459	3.000	3.000	8.177	0.000
119.00	119.00	117.34	4.805	5.977	4-FFf	3.000	2.491	3.000	3.000	8.418	0.000

.....

Straight Culvert

Inlet Elevation (invert): 111.36 ft, Outlet Elevation (invert): 111.25 ft

Culvert Length: 213.00 ft, Culvert Slope: 0.0005

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 111.36 ft

Outlet Station: 213.00 ft

Outlet Elevation: 111.25 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-1E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
85.00	114.25	3.00
88.40	114.25	3.00
91.80	114.25	3.00
95.20	114.25	3.00
98.60	114.25	3.00
102.00	114.25	3.00
105.40	114.25	3.00
106.00	114.25	3.00
112.20	114.25	3.00
115.60	114.25	3.00
119.00	114.25	3.00

Tailwater Channel Data - CD-1E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 114.25 ft

Roadway Data for Crossing: CD-1E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 119.00 ft

Roadway Surface: Paved

Roadway Top Width: 154.00 ft

**CD-1 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 85 cfs

Design Flow: 106 cfs

Maximum Flow: 119 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-1P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
115.77	85.00	85.00	0.00	1
115.93	88.40	88.40	0.00	1
116.10	91.80	91.80	0.00	1
116.27	95.20	95.20	0.00	1
116.45	98.60	98.60	0.00	1
116.64	102.00	102.00	0.00	1
116.83	105.40	105.40	0.00	1
116.86	106.00	106.00	0.00	1
117.23	112.20	112.20	0.00	1
117.44	115.60	115.60	0.00	1
117.66	119.00	119.00	0.00	1
119.00	138.08	138.08	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
85.00	85.00	115.77	3.460	3.970	4-FFf	2.702	2.121	3.000	3.000	6.013	0.000
88.40	88.40	115.93	3.575	4.131	4-FFf	3.000	2.163	3.000	3.000	6.253	0.000
91.80	91.80	116.10	3.694	4.298	4-FFf	3.000	2.204	3.000	3.000	6.494	0.000
95.20	95.20	116.27	3.816	4.472	4-FFf	3.000	2.244	3.000	3.000	6.734	0.000
98.60	98.60	116.45	3.943	4.651	4-FFf	3.000	2.283	3.000	3.000	6.975	0.000
102.00	102.00	116.64	4.074	4.837	4-FFf	3.000	2.320	3.000	3.000	7.215	0.000
105.40	105.40	116.83	4.210	5.030	4-FFf	3.000	2.357	3.000	3.000	7.456	0.000
106.00	106.00	116.86	4.234	5.064	4-FFf	3.000	2.363	3.000	3.000	7.498	0.000
112.20	112.20	117.23	4.496	5.433	4-FFf	3.000	2.426	3.000	3.000	7.937	0.000
115.60	115.60	117.44	4.646	5.644	4-FFf	3.000	2.459	3.000	3.000	8.177	0.000
119.00	119.00	117.66	4.801	5.862	4-FFf	3.000	2.491	3.000	3.000	8.418	0.000

.....

Straight Culvert

Inlet Elevation (invert): 111.80 ft, Outlet Elevation (invert): 110.80 ft

Culvert Length: 328.00 ft, Culvert Slope: 0.0030

.....

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 111.80 ft

Outlet Station: 328.00 ft

Outlet Elevation: 110.80 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-1P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
85.00	113.80	3.00
88.40	113.80	3.00
91.80	113.80	3.00
95.20	113.80	3.00
98.60	113.80	3.00
102.00	113.80	3.00
105.40	113.80	3.00
106.00	113.80	3.00
112.20	113.80	3.00
115.60	113.80	3.00
119.00	113.80	3.00

Tailwater Channel Data - CD-1P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 113.80 ft

Roadway Data for Crossing: CD-1P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 119.00 ft

Roadway Surface: Paved

Roadway Top Width: 280.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

		DATE
made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-2	
LOCATION	STA.	Existing	Proposed
		664+22.84	664+22.84
WIDTH		4.00 FT	4.00 FT
HEIGHT		4.00 FT	4.00 FT
BARRELS		2	2
DIAMETER		4.00 FT	4.00 FT
LENGTH		256.0 FT	300.0 FT
TOTAL CROSS-SECTIONAL AREA		25.13 SF	25.13 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		102.58 FT	102.58 FT
DOWNSTREAM INVERT		102.48 FT	102.18 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		113.00 FT	113.00 FT
TAILWATER (CROWN OF PIPE)		106.48 FT	106.18 FT
<u>DETERMINE FLOWRATES (Q):</u>			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	151 CFS	107.92 FT	107.72 FT
Q (50 YR) = 1.25 * Q (25 YR)	188 CFS	108.71 FT	108.57 FT
Q (100 YR) = 1.40 * Q (25 YR)	211 CFS	109.29 FT	109.19 FT

** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions
 Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-2 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 151 cfs

Design Flow: 188 cfs

Maximum Flow: 211 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-2E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
107.92	151.00	151.00	0.00	1
108.04	157.00	157.00	0.00	1
108.16	163.00	163.00	0.00	1
108.28	169.00	169.00	0.00	1
108.41	175.00	175.00	0.00	1
108.55	181.00	181.00	0.00	1
108.69	187.00	187.00	0.00	1
108.71	188.00	188.00	0.00	1
108.98	199.00	199.00	0.00	1
109.13	205.00	205.00	0.00	1
109.29	211.00	211.00	0.00	1
113.00	321.30	321.30	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
151.00	151.00	107.92	4.135	5.340	4-FFf	4.000	2.628	4.000	4.000	6.008	0.000
157.00	157.00	108.04	4.255	5.457	4-FFf	4.000	2.681	4.000	4.000	6.247	0.000
163.00	163.00	108.16	4.377	5.578	4-FFf	4.000	2.732	4.000	4.000	6.486	0.000
169.00	169.00	108.28	4.502	5.704	4-FFf	4.000	2.783	4.000	4.000	6.724	0.000
175.00	175.00	108.41	4.630	5.834	4-FFf	4.000	2.832	4.000	4.000	6.963	0.000
181.00	181.00	108.55	4.762	5.969	4-FFf	4.000	2.881	4.000	4.000	7.202	0.000
187.00	187.00	108.69	4.897	6.108	4-FFf	4.000	2.928	4.000	4.000	7.440	0.000
188.00	188.00	108.71	4.920	6.132	4-FFf	4.000	2.936	4.000	4.000	7.480	0.000
199.00	199.00	108.98	5.180	6.401	4-FFf	4.000	3.019	4.000	4.000	7.918	0.000
205.00	205.00	109.13	5.327	6.554	4-FFf	4.000	3.063	4.000	4.000	8.157	0.000
211.00	211.00	109.29	5.479	6.712	4-FFf	4.000	3.105	4.000	4.000	8.395	0.000

.....

Straight Culvert

Inlet Elevation (invert): 102.58 ft, Outlet Elevation (invert): 102.48 ft

Culvert Length: 256.00 ft, Culvert Slope: 0.0004

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 102.58 ft

Outlet Station: 256.00 ft

Outlet Elevation: 102.48 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-2E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
151.00	106.48	4.00
157.00	106.48	4.00
163.00	106.48	4.00
169.00	106.48	4.00
175.00	106.48	4.00
181.00	106.48	4.00
187.00	106.48	4.00
188.00	106.48	4.00
199.00	106.48	4.00
205.00	106.48	4.00
211.00	106.48	4.00

Tailwater Channel Data - CD-2E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 106.48 ft

Roadway Data for Crossing: CD-2E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 113.00 ft

Roadway Surface: Paved

Roadway Top Width: 175.00 ft

**CD-2 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 151 cfs

Design Flow: 188 cfs

Maximum Flow: 211 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-2P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
107.72	151.00	151.00	0.00	1
107.85	157.00	157.00	0.00	1
107.98	163.00	163.00	0.00	1
108.11	169.00	169.00	0.00	1
108.25	175.00	175.00	0.00	1
108.40	181.00	181.00	0.00	1
108.55	187.00	187.00	0.00	1
108.57	188.00	188.00	0.00	1
108.86	199.00	199.00	0.00	1
109.02	205.00	205.00	0.00	1
109.19	211.00	211.00	0.00	1
113.00	317.44	317.44	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
151.00	151.00	107.72	4.133	5.143	4-FFf	4.000	2.628	4.000	3.700	6.008	0.000
157.00	157.00	107.85	4.253	5.268	4-FFf	4.000	2.681	4.000	3.700	6.247	0.000
163.00	163.00	107.98	4.375	5.398	4-FFf	4.000	2.732	4.000	3.700	6.486	0.000
169.00	169.00	108.11	4.500	5.533	4-FFf	4.000	2.783	4.000	3.700	6.724	0.000
175.00	175.00	108.25	4.628	5.672	4-FFf	4.000	2.832	4.000	3.700	6.963	0.000
181.00	181.00	108.40	4.760	5.817	4-FFf	4.000	2.881	4.000	3.700	7.202	0.000
187.00	187.00	108.55	4.895	5.966	4-FFf	4.000	2.928	4.000	3.700	7.440	0.000
188.00	188.00	108.57	4.918	5.992	4-FFf	4.000	2.936	4.000	3.700	7.480	0.000
199.00	199.00	108.86	5.178	6.280	4-FFf	4.000	3.019	4.000	3.700	7.918	0.000
205.00	205.00	109.02	5.325	6.444	4-FFf	4.000	3.063	4.000	3.700	8.157	0.000
211.00	211.00	109.19	5.477	6.613	4-FFf	4.000	3.105	4.000	3.700	8.395	0.000

.....

Straight Culvert

Inlet Elevation (invert): 102.58 ft, Outlet Elevation (invert): 102.18 ft

Culvert Length: 300.00 ft, Culvert Slope: 0.0013

.....

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 102.58 ft

Outlet Station: 300.00 ft

Outlet Elevation: 102.18 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-2P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
151.00	106.18	3.70
157.00	106.18	3.70
163.00	106.18	3.70
169.00	106.18	3.70
175.00	106.18	3.70
181.00	106.18	3.70
187.00	106.18	3.70
188.00	106.18	3.70
199.00	106.18	3.70
205.00	106.18	3.70
211.00	106.18	3.70

Tailwater Channel Data - CD-2P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 106.18 ft

Roadway Data for Crossing: CD-2P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 113.00 ft

Roadway Surface: Paved

Roadway Top Width: 272.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-3	
LOCATION	STA.	Existing	Proposed
		680+00.00	680+00.00
WIDTH		9.00 FT	9.00 FT
HEIGHT		7.00 FT	7.00 FT
BARRELS		2	2
DIAMETER		FT	9.00 FT
LENGTH		262.0 FT	353.0 FT
TOTAL CROSS-SECTIONAL AREA		126.00 SF	127.23 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		92.11 FT	92.11 FT
DOWNSTREAM INVERT		91.77 FT	91.77 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		105.50 FT	105.50 FT
TAILWATER (CROWN OF PIPE)		98.77 FT	98.77 FT
<u>DETERMINE FLOWRATES (Q):</u>		Headwater Elevation	Headwater Elevation
ASSUMED VELOCITY (25 YR)	6.00 FT/S		
Q (25 YR) = V (25 YR) * TOTAL AREA	756 CFS	99.86 FT	99.94 FT
Q (50 YR) = 1.25 * Q (25 YR)	945 CFS	100.47 FT	100.60 FT
Q (100 YR) = 1.40 * Q (25 YR)	1058 CFS	100.90 FT	101.07 FT

*** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions
 Analysis done with HY-8 Version 7.3 (April 2014)**

**CD-3 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 756 cfs

Design Flow: 945 cfs

Maximum Flow: 1058 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-3E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
99.86	756.00	756.00	0.00	1
99.94	786.20	786.20	0.00	1
100.04	816.40	816.40	0.00	1
100.13	846.60	846.60	0.00	1
100.23	876.80	876.80	0.00	1
100.33	907.00	907.00	0.00	1
100.44	937.20	937.20	0.00	1
100.47	945.00	945.00	0.00	1
100.66	997.60	997.60	0.00	1
100.78	1027.80	1027.80	0.00	1
100.90	1058.00	1058.00	0.00	1
105.50	1769.00	1769.00	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
756.00	756.00	99.86	6.424	7.746	4-FFf	5.217	3.798	7.000	7.000	6.000	0.000
786.20	786.20	99.94	6.597	7.835	4-FFf	5.375	3.898	7.000	7.000	6.240	0.000
816.40	816.40	100.04	6.771	7.927	4-FFf	5.534	3.998	7.000	7.000	6.479	0.000
846.60	846.60	100.13	6.944	8.022	4-FFf	5.692	4.096	7.000	7.000	6.719	0.000
876.80	876.80	100.23	7.118	8.121	4-FFf	5.848	4.192	7.000	7.000	6.959	0.000
907.00	907.00	100.33	7.292	8.224	4-FFf	6.003	4.288	7.000	7.000	7.198	0.000
937.20	937.20	100.44	7.468	8.330	4-FFf	6.159	4.383	7.000	7.000	7.438	0.000
945.00	945.00	100.47	7.513	8.357	4-FFf	6.199	4.407	7.000	7.000	7.500	0.000
997.60	997.60	100.66	7.821	8.552	4-FFf	7.000	4.569	7.000	7.000	7.917	0.000
1027.80	1027.80	100.78	8.001	8.668	4-FFf	7.000	4.661	7.000	7.000	8.157	0.000
1058.00	1058.00	100.90	8.182	8.788	4-FFf	7.000	4.752	7.000	7.000	8.397	0.000

.....
 Straight Culvert
 Inlet Elevation (invert): 92.11 ft, Outlet Elevation (invert): 91.77 ft
 Culvert Length: 262.00 ft, Culvert Slope: 0.0013

Site Data - EXIST

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 92.11 ft
 Outlet Station: 262.00 ft
 Outlet Elevation: 91.77 ft
 Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Concrete Box
 Barrel Span: 9.00 ft
 Barrel Rise: 7.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge (90°) Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-3E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
756.00	98.77	7.00
786.20	98.77	7.00
816.40	98.77	7.00
846.60	98.77	7.00
876.80	98.77	7.00
907.00	98.77	7.00
937.20	98.77	7.00
945.00	98.77	7.00
997.60	98.77	7.00
1027.80	98.77	7.00
1058.00	98.77	7.00

Tailwater Channel Data - CD-3E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 98.77 ft

Roadway Data for Crossing: CD-3E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 105.50 ft

Roadway Surface: Paved

Roadway Top Width: 170.00 ft

**CD-3 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 756 cfs

Design Flow: 945 cfs

Maximum Flow: 1058 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-3P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
99.94	756.00	756.00	0.00	1
100.04	786.20	786.20	0.00	1
100.14	816.40	816.40	0.00	1
100.24	846.60	846.60	0.00	1
100.35	876.80	876.80	0.00	1
100.46	907.00	907.00	0.00	1
100.57	937.20	937.20	0.00	1
100.60	945.00	945.00	0.00	1
100.81	997.60	997.60	0.00	1
100.94	1027.80	1027.80	0.00	1
101.07	1058.00	1058.00	0.00	1
105.50	1768.86	1768.86	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
756.00	756.00	99.94	6.425	7.832	4-FFf	5.852	3.798	7.000	7.000	6.000	0.000
786.20	786.20	100.04	6.598	7.928	4-FFf	6.032	3.898	7.000	7.000	6.240	0.000
816.40	816.40	100.14	6.772	8.027	4-FFf	6.212	3.998	7.000	7.000	6.479	0.000
846.60	846.60	100.24	6.945	8.130	4-FFf	7.000	4.096	7.000	7.000	6.719	0.000
876.80	876.80	100.35	7.119	8.237	4-FFf	7.000	4.192	7.000	7.000	6.959	0.000
907.00	907.00	100.46	7.294	8.348	4-FFf	7.000	4.288	7.000	7.000	7.198	0.000
937.20	937.20	100.57	7.469	8.462	4-FFf	7.000	4.383	7.000	7.000	7.438	0.000
945.00	945.00	100.60	7.514	8.492	4-FFf	7.000	4.407	7.000	7.000	7.500	0.000
997.60	997.60	100.81	7.823	8.702	4-FFf	7.000	4.569	7.000	7.000	7.917	0.000
1027.80	1027.80	100.94	8.002	8.827	4-FFf	7.000	4.661	7.000	7.000	8.157	0.000
1058.00	1058.00	101.07	8.183	8.956	4-FFf	7.000	4.752	7.000	7.000	8.397	0.000

 Straight Culvert

Inlet Elevation (invert): 92.11 ft, Outlet Elevation (invert): 91.77 ft

Culvert Length: 353.00 ft, Culvert Slope: 0.0010

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 92.11 ft

Outlet Station: 353.00 ft

Outlet Elevation: 91.77 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Concrete Box

Barrel Span: 9.00 ft

Barrel Rise: 7.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-3P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
756.00	98.77	7.00
786.20	98.77	7.00
816.40	98.77	7.00
846.60	98.77	7.00
876.80	98.77	7.00
907.00	98.77	7.00
937.20	98.77	7.00
945.00	98.77	7.00
997.60	98.77	7.00
1027.80	98.77	7.00
1058.00	98.77	7.00

Tailwater Channel Data - CD-3P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 98.77 ft

Roadway Data for Crossing: CD-3P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 105.50 ft

Roadway Surface: Paved

Roadway Top Width: 272.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-4	
		Existing	Proposed
LOCATION	STA.	692+20.31	692+20.31
WIDTH		3.00 FT	3.00 FT
HEIGHT		3.00 FT	3.00 FT
BARRELS		1	1
DIAMETER		3.00 FT	3.00 FT
LENGTH		261.0 FT	300.0 FT
TOTAL CROSS-SECTIONAL AREA		7.07 SF	7.07 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		90.34 FT	90.34 FT
DOWNSTREAM INVERT		88.25 FT	88.25 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		98.00 FT	98.00 FT
TAILWATER (CROWN OF PIPE)		91.25 FT	91.25 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	42 CFS	93.76 FT	93.76 FT
Q (50 YR) = 1.25 * Q (25 YR)	53 CFS	94.57 FT	94.57 FT
Q (100 YR) = 1.40 * Q (25 YR)	59 CFS	95.09 FT	95.09 FT

* *Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-4 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 42 cfs

Design Flow: 53 cfs

Maximum Flow: 59 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-4E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
93.76	42.00	42.00	0.00	1
93.87	43.70	43.70	0.00	1
93.99	45.40	45.40	0.00	1
94.11	47.10	47.10	0.00	1
94.24	48.80	48.80	0.00	1
94.37	50.50	50.50	0.00	1
94.50	52.20	52.20	0.00	1
94.57	53.00	53.00	0.00	1
94.79	55.60	55.60	0.00	1
94.93	57.30	57.30	0.00	1
95.09	59.00	59.00	0.00	1
98.00	83.71	83.71	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
42.00	42.00	93.76	3.420	2.609	5-JS1f	1.760	2.109	3.000	3.000	6.223	0.000
43.70	43.70	93.87	3.534	2.749	5-JS1f	1.806	2.151	3.000	3.000	6.475	0.000
45.40	45.40	93.99	3.651	2.895	5-JS1f	1.851	2.192	3.000	3.000	6.727	0.000
47.10	47.10	94.11	3.772	3.047	5-JS1f	1.897	2.233	3.000	3.000	6.979	0.000
48.80	48.80	94.24	3.898	3.204	5-JS1f	1.946	2.272	3.000	3.000	7.231	0.000
50.50	50.50	94.37	4.028	3.367	5-JS1f	1.995	2.309	3.000	3.000	7.483	0.000
52.20	52.20	94.50	4.162	3.535	5-JS1f	2.044	2.346	3.000	3.000	7.735	0.000
53.00	53.00	94.57	4.227	3.616	5-JS1f	2.068	2.363	3.000	3.000	7.853	0.000
55.60	55.60	94.79	4.445	3.888	5-JS1f	2.143	2.416	3.000	3.000	8.239	0.000
57.30	57.30	94.93	4.594	4.073	5-JS1f	2.194	2.449	3.000	3.000	8.490	0.000
59.00	59.00	95.09	4.748	4.263	5-JS1f	2.254	2.481	3.000	3.000	8.742	0.000

.....

Straight Culvert

Inlet Elevation (invert): 90.34 ft, Outlet Elevation (invert): 88.25 ft

Culvert Length: 261.01 ft, Culvert Slope: 0.0080

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 90.34 ft

Outlet Station: 261.00 ft

Outlet Elevation: 88.25 ft

Number of Barrels: 1

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-4E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
42.00	91.25	3.00
43.70	91.25	3.00
45.40	91.25	3.00
47.10	91.25	3.00
48.80	91.25	3.00
50.50	91.25	3.00
52.20	91.25	3.00
53.00	91.25	3.00
55.60	91.25	3.00
57.30	91.25	3.00
59.00	91.25	3.00

Tailwater Channel Data - CD-4E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 91.25 ft

Roadway Data for Crossing: CD-4E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 98.00 ft

Roadway Surface: Paved

Roadway Top Width: 167.00 ft

**CD-4 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 42 cfs

Design Flow: 53 cfs

Maximum Flow: 59 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-4P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
93.76	42.00	42.00	0.00	1
93.88	43.70	43.70	0.00	1
93.99	45.40	45.40	0.00	1
94.11	47.10	47.10	0.00	1
94.24	48.80	48.80	0.00	1
94.37	50.50	50.50	0.00	1
94.50	52.20	52.20	0.00	1
94.57	53.00	53.00	0.00	1
94.79	55.60	55.60	0.00	1
94.94	57.30	57.30	0.00	1
95.09	59.00	59.00	0.00	1
98.00	80.66	80.66	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
42.00	42.00	93.76	3.421	2.740	5-JS1f	1.841	2.109	3.000	3.000	6.223	0.000
43.70	43.70	93.88	3.535	2.891	5-JS1f	1.891	2.151	3.000	3.000	6.475	0.000
45.40	45.40	93.99	3.653	3.049	5-JS1f	1.942	2.192	3.000	3.000	6.727	0.000
47.10	47.10	94.11	3.774	3.212	5-JS1f	1.995	2.233	3.000	3.000	6.979	0.000
48.80	48.80	94.24	3.900	3.381	5-JS1f	2.048	2.272	3.000	3.000	7.231	0.000
50.50	50.50	94.37	4.029	3.556	5-JS1f	2.101	2.309	3.000	3.000	7.483	0.000
52.20	52.20	94.50	4.164	3.737	5-JS1f	2.153	2.346	3.000	3.000	7.735	0.000
53.00	53.00	94.57	4.229	3.824	5-JS1f	2.178	2.363	3.000	3.000	7.853	0.000
55.60	55.60	94.79	4.447	4.117	5-JS1f	2.276	2.416	3.000	3.000	8.239	0.000
57.30	57.30	94.94	4.595	4.317	5-JS1f	2.340	2.449	3.000	3.000	8.490	0.000
59.00	59.00	95.09	4.749	4.522	5-S2n	2.404	2.481	2.404	3.000	9.729	0.000

 Straight Culvert
 Inlet Elevation (invert): 90.34 ft, Outlet Elevation (invert): 88.25 ft
 Culvert Length: 300.01 ft, Culvert Slope: 0.0070

Site Data - PROP

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 90.34 ft
 Outlet Station: 300.00 ft
 Outlet Elevation: 88.25 ft
 Number of Barrels: 1

Culvert Data Summary - PROP

Barrel Shape: Circular
 Barrel Diameter: 3.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge with Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-4P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
42.00	91.25	3.00
43.70	91.25	3.00
45.40	91.25	3.00
47.10	91.25	3.00
48.80	91.25	3.00
50.50	91.25	3.00
52.20	91.25	3.00
53.00	91.25	3.00
55.60	91.25	3.00
57.30	91.25	3.00
59.00	91.25	3.00

Tailwater Channel Data - CD-4P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 91.25 ft

Roadway Data for Crossing: CD-4P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 98.00 ft

Roadway Surface: Paved

Roadway Top Width: 275.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO.		CD-5	
		Existing	Proposed
LOCATION	STA.	698+00.00	698+00.00
WIDTH		12.00 FT	12.00 FT
HEIGHT		8.00 FT	8.00 FT
BARRELS		4	4
DIAMETER		FT	12.00 FT
LENGTH		260.0 FT	392.0 FT
TOTAL CROSS-SECTIONAL AREA		384.00 SF	384.00 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		84.27 FT	84.27 FT
DOWNSTREAM INVERT		83.56 FT	83.16 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		96.00 FT	96.00 FT
TAILWATER (CROWN OF PIPE)		91.56 FT	91.16 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	2304 CFS	92.59 FT	92.31 FT
Q (50 YR) = 1.25 * Q (25 YR)	2880 CFS	93.16 FT	92.95 FT
Q (100 YR) = 1.40 * Q (25 YR)	3226 CFS	93.57 FT	93.40 FT

** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-5 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 2304 cfs

Design Flow: 2880 cfs

Maximum Flow: 3226 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-5E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
92.59	2304.00	2304.00	0.00	1
92.67	2396.20	2396.20	0.00	1
92.76	2488.40	2488.40	0.00	1
92.85	2580.60	2580.60	0.00	1
92.94	2672.80	2672.80	0.00	1
93.04	2765.00	2765.00	0.00	1
93.14	2857.20	2857.20	0.00	1
93.16	2880.00	2880.00	0.00	1
93.35	3041.60	3041.60	0.00	1
93.46	3133.80	3133.80	0.00	1
93.57	3226.00	3226.00	0.00	1
96.00	4492.48	4492.48	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2304.00	2304.00	92.59	7.013	8.319	1-S1f	4.088	4.152	8.000	8.000	6.000	0.000
2396.20	2396.20	92.67	7.200	8.403	1-S1f	4.206	4.262	8.000	8.000	6.240	0.000
2488.40	2488.40	92.76	7.387	8.490	1-S1f	4.324	4.370	8.000	8.000	6.480	0.000
2580.60	2580.60	92.85	7.573	8.580	1-S1f	4.439	4.477	8.000	8.000	6.720	0.000
2672.80	2672.80	92.94	7.758	8.673	1-S1f	4.552	4.584	8.000	8.000	6.960	0.000
2765.00	2765.00	93.04	7.944	8.770	1-S1f	4.665	4.688	8.000	8.000	7.201	0.000
2857.20	2857.20	93.14	8.130	8.870	1-S1f	4.777	4.792	8.000	8.000	7.441	0.000
2880.00	2880.00	93.16	8.176	8.895	1-S1f	4.805	4.817	8.000	8.000	7.500	0.000
3041.60	3041.60	93.35	8.504	9.081	4-FFf	5.003	4.996	8.000	8.000	7.921	0.000
3133.80	3133.80	93.46	8.693	9.191	4-FFf	5.115	5.096	8.000	8.000	8.161	0.000
3226.00	3226.00	93.57	8.883	9.304	4-FFf	5.224	5.196	8.000	8.000	8.401	0.000

.....
 Straight Culvert
 Inlet Elevation (invert): 84.27 ft, Outlet Elevation (invert): 83.56 ft
 Culvert Length: 260.00 ft, Culvert Slope: 0.0027

Site Data - EXIST

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 84.27 ft
 Outlet Station: 260.00 ft
 Outlet Elevation: 83.56 ft
 Number of Barrels: 4

Culvert Data Summary - EXIST

Barrel Shape: Concrete Box
 Barrel Span: 12.00 ft
 Barrel Rise: 8.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge (90°) Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-5E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
2304.00	91.56	8.00
2396.20	91.56	8.00
2488.40	91.56	8.00
2580.60	91.56	8.00
2672.80	91.56	8.00
2765.00	91.56	8.00
2857.20	91.56	8.00
2880.00	91.56	8.00
3041.60	91.56	8.00
3133.80	91.56	8.00
3226.00	91.56	8.00

Tailwater Channel Data - CD-5E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 91.56 ft

Roadway Data for Crossing: CD-5E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 96.00 ft

Roadway Surface: Paved

Roadway Top Width: 170.00 ft

**CD-5 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 2304 cfs

Design Flow: 2880 cfs

Maximum Flow: 3226 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-5P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
92.31	2304.00	2304.00	0.00	1
92.40	2396.20	2396.20	0.00	1
92.50	2488.40	2488.40	0.00	1
92.60	2580.60	2580.60	0.00	1
92.71	2672.80	2672.80	0.00	1
92.81	2765.00	2765.00	0.00	1
92.93	2857.20	2857.20	0.00	1
92.95	2880.00	2880.00	0.00	1
93.16	3041.60	3041.60	0.00	1
93.28	3133.80	3133.80	0.00	1
93.40	3226.00	3226.00	0.00	1
96.00	4492.69	4492.69	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
2304.00	2304.00	92.31	7.012	8.041	1-S1f	4.035	4.152	8.000	8.000	6.000	0.000
2396.20	2396.20	92.40	7.200	8.135	1-S1f	4.151	4.262	8.000	8.000	6.240	0.000
2488.40	2488.40	92.50	7.386	8.232	1-S1f	4.267	4.370	8.000	8.000	6.480	0.000
2580.60	2580.60	92.60	7.572	8.332	1-S1f	4.382	4.477	8.000	8.000	6.720	0.000
2672.80	2672.80	92.71	7.758	8.436	1-S1f	4.493	4.584	8.000	8.000	6.960	0.000
2765.00	2765.00	92.81	7.944	8.544	1-S1f	4.604	4.688	8.000	8.000	7.201	0.000
2857.20	2857.20	92.93	8.130	8.655	1-S1f	4.715	4.792	8.000	8.000	7.441	0.000
2880.00	2880.00	92.95	8.176	8.683	1-S1f	4.742	4.817	8.000	8.000	7.500	0.000
3041.60	3041.60	93.16	8.504	8.888	1-S1f	4.936	4.996	8.000	8.000	7.921	0.000
3133.80	3133.80	93.28	8.693	9.010	1-S1f	5.047	5.096	8.000	8.000	8.161	0.000
3226.00	3226.00	93.40	8.882	9.134	1-S1f	5.156	5.196	8.000	8.000	8.401	0.000

 Straight Culvert
 Inlet Elevation (invert): 84.27 ft, Outlet Elevation (invert): 83.16 ft
 Culvert Length: 392.00 ft, Culvert Slope: 0.0028

Site Data - PROP

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 84.27 ft
 Outlet Station: 392.00 ft
 Outlet Elevation: 83.16 ft
 Number of Barrels: 4

Culvert Data Summary - PROP

Barrel Shape: Concrete Box
 Barrel Span: 12.00 ft
 Barrel Rise: 8.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge (90°) Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-5P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
2304.00	91.16	8.00
2396.20	91.16	8.00
2488.40	91.16	8.00
2580.60	91.16	8.00
2672.80	91.16	8.00
2765.00	91.16	8.00
2857.20	91.16	8.00
2880.00	91.16	8.00
3041.60	91.16	8.00
3133.80	91.16	8.00
3226.00	91.16	8.00

Tailwater Channel Data - CD-5P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 91.16 ft

Roadway Data for Crossing: CD-5P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 96.00 ft

Roadway Surface: Paved

Roadway Top Width: 288.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-6	
		Existing	Proposed
LOCATION	STA.	732+50.00	732+50.00
WIDTH		7.00 FT	7.00 FT
HEIGHT		4.00 FT	4.00 FT
BARRELS		2	2
DIAMETER		FT	7.00 FT
LENGTH		310.0 FT	460.0 FT
TOTAL CROSS-SECTIONAL AREA		56.00 SF	56.00 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		90.72 FT	90.72 FT
DOWNSTREAM INVERT		90.50 FT	90.10 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		97.50 FT	97.50 FT
TAILWATER (CROWN OF PIPE)		94.50 FT	94.10 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	336 CFS	95.86 FT	95.72 FT
Q (50 YR) = 1.25 * Q (25 YR)	420 CFS	96.63 FT	96.63 FT
Q (100 YR) = 1.40 * Q (25 YR)	470 CFS	97.17 FT	97.26 FT

** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions
 Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-6 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 336 cfs

Design Flow: 420 cfs

Maximum Flow: 470 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-6E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
95.86	336.00	336.00	0.00	1
95.97	349.40	349.40	0.00	1
96.09	362.80	362.80	0.00	1
96.21	376.20	376.20	0.00	1
96.33	389.60	389.60	0.00	1
96.46	403.00	403.00	0.00	1
96.59	416.40	416.40	0.00	1
96.63	420.00	420.00	0.00	1
96.87	443.20	443.20	0.00	1
97.02	456.60	456.60	0.00	1
97.17	470.00	470.00	0.00	1
97.50	498.45	498.45	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
336.00	336.00	95.86	4.479	5.143	4-FFf	4.000	2.615	4.000	4.000	6.000	0.000
349.40	349.40	95.97	4.614	5.254	4-FFf	4.000	2.684	4.000	4.000	6.239	0.000
362.80	362.80	96.09	4.752	5.369	4-FFf	4.000	2.753	4.000	4.000	6.479	0.000
376.20	376.20	96.21	4.892	5.489	4-FFf	4.000	2.820	4.000	4.000	6.718	0.000
389.60	389.60	96.33	5.034	5.613	4-FFf	4.000	2.887	4.000	4.000	6.957	0.000
403.00	403.00	96.46	5.178	5.741	4-FFf	4.000	2.952	4.000	4.000	7.196	0.000
416.40	416.40	96.59	5.326	5.874	4-FFf	4.000	3.017	4.000	4.000	7.436	0.000
420.00	420.00	96.63	5.366	5.910	4-FFf	4.000	3.035	4.000	4.000	7.500	0.000
443.20	443.20	96.87	5.631	6.152	4-FFf	4.000	3.146	4.000	4.000	7.914	0.000
456.60	456.60	97.02	5.789	6.297	4-FFf	4.000	3.209	4.000	4.000	8.154	0.000
470.00	470.00	97.17	5.950	6.447	4-FFf	4.000	3.271	4.000	4.000	8.393	0.000

.....

Straight Culvert

Inlet Elevation (invert): 90.72 ft, Outlet Elevation (invert): 90.50 ft

Culvert Length: 310.00 ft, Culvert Slope: 0.0007

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 90.72 ft

Outlet Station: 310.00 ft

Outlet Elevation: 90.50 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-6E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
336.00	94.50	4.00
349.40	94.50	4.00
362.80	94.50	4.00
376.20	94.50	4.00
389.60	94.50	4.00
403.00	94.50	4.00
416.40	94.50	4.00
420.00	94.50	4.00
443.20	94.50	4.00
456.60	94.50	4.00
470.00	94.50	4.00

Tailwater Channel Data - CD-6E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 94.50 ft

Roadway Data for Crossing: CD-6E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 97.50 ft

Roadway Surface: Paved

Roadway Top Width: 170.00 ft

**CD-6 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 336 cfs

Design Flow: 420 cfs

Maximum Flow: 470 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-6P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
95.72	336.00	336.00	0.00	1
95.85	349.40	349.40	0.00	1
95.99	362.80	362.80	0.00	1
96.13	376.20	376.20	0.00	1
96.27	389.60	389.60	0.00	1
96.43	403.00	403.00	0.00	1
96.58	416.40	416.40	0.00	1
96.63	420.00	420.00	0.00	1
96.91	443.20	443.20	0.00	1
97.09	456.60	456.60	0.00	1
97.26	470.00	470.00	0.00	1
97.50	487.20	487.20	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
336.00	336.00	95.72	4.478	4.997	4-FFf	3.595	2.615	4.000	4.000	6.000	0.000
349.40	349.40	95.85	4.613	5.129	4-FFf	4.000	2.684	4.000	4.000	6.239	0.000
362.80	362.80	95.99	4.751	5.265	4-FFf	4.000	2.753	4.000	4.000	6.479	0.000
376.20	376.20	96.13	4.890	5.407	4-FFf	4.000	2.820	4.000	4.000	6.718	0.000
389.60	389.60	96.27	5.032	5.554	4-FFf	4.000	2.887	4.000	4.000	6.957	0.000
403.00	403.00	96.43	5.177	5.706	4-FFf	4.000	2.952	4.000	4.000	7.196	0.000
416.40	416.40	96.58	5.325	5.864	4-FFf	4.000	3.017	4.000	4.000	7.436	0.000
420.00	420.00	96.63	5.365	5.907	4-FFf	4.000	3.035	4.000	4.000	7.500	0.000
443.20	443.20	96.91	5.630	6.194	4-FFf	4.000	3.146	4.000	4.000	7.914	0.000
456.60	456.60	97.09	5.788	6.366	4-FFf	4.000	3.209	4.000	4.000	8.154	0.000
470.00	470.00	97.26	5.949	6.544	4-FFf	4.000	3.271	4.000	4.000	8.393	0.000

.....

Straight Culvert

Inlet Elevation (invert): 90.72 ft, Outlet Elevation (invert): 90.10 ft

Culvert Length: 460.00 ft, Culvert Slope: 0.0013

.....

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 90.72 ft

Outlet Station: 460.00 ft

Outlet Elevation: 90.10 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-6P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
336.00	94.10	4.00
349.40	94.10	4.00
362.80	94.10	4.00
376.20	94.10	4.00
389.60	94.10	4.00
403.00	94.10	4.00
416.40	94.10	4.00
420.00	94.10	4.00
443.20	94.10	4.00
456.60	94.10	4.00
470.00	94.10	4.00

Tailwater Channel Data - CD-6P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 94.10 ft

Roadway Data for Crossing: CD-6P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 97.50 ft

Roadway Surface: Paved

Roadway Top Width: 277.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-7	
		Existing	Proposed
LOCATION	STA.	761+00.00	761+00.00
WIDTH		3.50 FT	4.00 FT
HEIGHT		3.50 FT	4.00 FT
BARRELS		1	1
DIAMETER		3.50 FT	4.00 FT
LENGTH		227.0 FT	404.0 FT
TOTAL CROSS-SECTIONAL AREA		9.62 SF	12.57 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		84.42 FT	84.42 FT
DOWNSTREAM INVERT		82.97 FT	82.97 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		90.50 FT	90.50 FT
TAILWATER (CROWN OF PIPE)		86.47 FT	86.97 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	58 CFS	88.22 FT	88.13 FT
Q (50 YR) = 1.25 * Q (25 YR)	72 CFS	88.99 FT	89.00 FT
Q (100 YR) = 1.40 * Q (25 YR)	81 CFS	89.56 FT	89.03 FT

** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-7 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 58 cfs

Design Flow: 72 cfs

Maximum Flow: 81 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-7E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
88.22	58.00	58.00	0.00	1
88.34	60.30	60.30	0.00	1
88.46	62.60	62.60	0.00	1
88.58	64.90	64.90	0.00	1
88.71	67.20	67.20	0.00	1
88.84	69.50	69.50	0.00	1
88.97	71.80	71.80	0.00	1
88.99	72.00	72.00	0.00	1
89.26	76.40	76.40	0.00	1
89.41	78.70	78.70	0.00	1
89.56	81.00	81.00	0.00	1
90.50	93.79	93.79	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
58.00	58.00	88.22	3.801	3.536	5-JS1f	2.086	2.383	3.500	3.500	6.314	0.000
60.30	60.30	88.34	3.918	3.656	5-JS1f	2.140	2.431	3.500	3.500	6.564	0.000
62.60	62.60	88.46	4.038	3.781	5-JS1f	2.194	2.477	3.500	3.500	6.815	0.000
64.90	64.90	88.58	4.161	3.910	5-JS1f	2.249	2.522	3.500	3.500	7.065	0.000
67.20	67.20	88.71	4.288	4.044	5-JS1f	2.307	2.566	3.500	3.500	7.316	0.000
69.50	69.50	88.84	4.419	4.183	5-JS1f	2.364	2.609	3.500	3.500	7.566	0.000
71.80	71.80	88.97	4.554	4.327	5-JS1f	2.422	2.651	3.500	3.500	7.816	0.000
72.00	72.00	88.99	4.566	4.339	5-JS1f	2.427	2.655	3.500	3.500	7.838	0.000
76.40	76.40	89.26	4.837	4.628	5-JS1f	2.538	2.731	3.500	3.500	8.317	0.000
78.70	78.70	89.41	4.985	4.785	5-JS1f	2.606	2.770	3.500	3.500	8.568	0.000
81.00	81.00	89.56	5.138	4.948	5-JS1f	2.676	2.807	3.500	3.500	8.818	0.000

.....

Straight Culvert

Inlet Elevation (invert): 84.42 ft, Outlet Elevation (invert): 82.97 ft

Culvert Length: 227.00 ft, Culvert Slope: 0.0064

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 84.42 ft

Outlet Station: 227.00 ft

Outlet Elevation: 82.97 ft

Number of Barrels: 1

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-7E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
58.00	86.47	3.50
60.30	86.47	3.50
62.60	86.47	3.50
64.90	86.47	3.50
67.20	86.47	3.50
69.50	86.47	3.50
71.80	86.47	3.50
72.00	86.47	3.50
76.40	86.47	3.50
78.70	86.47	3.50
81.00	86.47	3.50

Tailwater Channel Data - CD-7E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 86.47 ft

Roadway Data for Crossing: CD-7E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 90.50 ft

Roadway Surface: Paved

Roadway Top Width: 170.00 ft

**CD-7 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 58 cfs

Design Flow: 72 cfs

Maximum Flow: 81 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-7P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
88.13	58.00	58.00	0.00	1
88.42	60.30	60.30	0.00	1
88.52	62.60	62.60	0.00	1
88.63	64.90	64.90	0.00	1
88.74	67.20	67.20	0.00	1
88.86	69.50	69.50	0.00	1
88.98	71.80	71.80	0.00	1
89.00	72.00	72.00	0.00	1
89.25	76.40	76.40	0.00	1
88.91	78.70	78.70	0.00	1
89.03	81.00	81.00	0.00	1
90.50	106.12	106.12	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
58.00	58.00	88.13	3.460	3.714	1-S1f	2.282	2.288	4.000	4.000	4.834	0.000
60.30	60.30	88.42	3.546	3.995	3-M1f	2.340	2.334	4.000	4.000	4.799	0.000
62.60	62.60	88.52	3.633	4.099	3-M1f	2.397	2.383	4.000	4.000	4.982	0.000
64.90	64.90	88.63	3.720	4.207	3-M1f	2.455	2.428	4.000	4.000	5.165	0.000
67.20	67.20	88.74	3.807	4.320	3-M1f	2.512	2.472	4.000	4.000	5.348	0.000
69.50	69.50	88.86	3.895	4.438	3-M1f	2.571	2.515	4.000	4.000	5.531	0.000
71.80	71.80	88.98	3.984	4.564	3-M1f	2.633	2.557	4.000	4.000	5.714	0.000
72.00	72.00	89.00	3.991	4.575	3-M1f	2.638	2.561	4.000	4.000	5.730	0.000
76.40	76.40	89.25	4.164	4.831	3-M1f	2.756	2.644	4.000	4.000	6.080	0.000
78.70	78.70	88.91	4.256	4.491	4-FFf	2.818	2.684	4.000	4.000	6.263	0.000
81.00	81.00	89.03	4.350	4.606	4-FFf	2.880	2.724	4.000	4.000	6.446	0.000

 Straight Culvert

Inlet Elevation (invert): 84.42 ft, Outlet Elevation (invert): 82.97 ft

Culvert Length: 404.00 ft, Culvert Slope: 0.0036

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 84.42 ft

Outlet Station: 404.00 ft

Outlet Elevation: 82.97 ft

Number of Barrels: 1

Culvert Data Summary - PROP

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-7P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
58.00	86.97	4.00
60.30	86.97	4.00
62.60	86.97	4.00
64.90	86.97	4.00
67.20	86.97	4.00
69.50	86.97	4.00
71.80	86.97	4.00
72.00	86.97	4.00
76.40	86.97	4.00
78.70	86.97	4.00
81.00	86.97	4.00

Tailwater Channel Data - CD-7P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 86.97 ft

Roadway Data for Crossing: CD-7P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 90.50 ft

Roadway Surface: Paved

Roadway Top Width: 365.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	25-Jun-15
checked by:	BJS	25-Jun-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-8	
		Existing	Proposed
LOCATION	STA.	785+16.00	785+16.00
WIDTH		3.50 FT	4.00 FT
HEIGHT		3.50 FT	4.00 FT
BARRELS		2	2
DIAMETER		3.50 FT	4.00 FT
LENGTH		248.0 FT	308.0 FT
TOTAL CROSS-SECTIONAL AREA		19.24 SF	25.13 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		74.18 FT	74.18 FT
DOWNSTREAM INVERT		73.03 FT	73.03 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		81.00 FT	81.00 FT
TAILWATER (CROWN OF PIPE)		76.53 FT	77.03 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	115 CFS	78.11 FT	78.29 FT
Q (50 YR) = 1.25 * Q (25 YR)	144 CFS	78.91 FT	78.62 FT
Q (100 YR) = 1.40 * Q (25 YR)	162 CFS	79.54 FT	79.04 FT

*** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)**

**CD-8 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 115 cfs

Design Flow: 144 cfs

Maximum Flow: 162 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-8E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
78.11	115.00	115.00	0.00	1
78.21	119.70	119.70	0.00	1
78.32	124.40	124.40	0.00	1
78.44	129.10	129.10	0.00	1
78.59	133.80	133.80	0.00	1
78.73	138.50	138.50	0.00	1
78.88	143.20	143.20	0.00	1
78.91	144.00	144.00	0.00	1
79.20	152.60	152.60	0.00	1
79.37	157.30	157.30	0.00	1
79.54	162.00	162.00	0.00	1
81.00	197.30	197.30	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
115.00	115.00	78.11	3.779	3.925	1-S1f	2.314	2.373	3.500	3.500	6.260	0.000
119.70	119.70	78.21	3.898	4.032	1-S1f	2.383	2.421	3.500	3.500	6.515	0.000
124.40	124.40	78.32	4.020	4.142	1-S1f	2.452	2.469	3.500	3.500	6.771	0.000
129.10	129.10	78.44	4.145	4.263	4-FFf	2.521	2.515	3.500	3.500	6.709	0.000
133.80	133.80	78.59	4.274	4.405	4-FFf	2.600	2.561	3.500	3.500	6.953	0.000
138.50	138.50	78.73	4.407	4.552	4-FFf	2.685	2.605	3.500	3.500	7.198	0.000
143.20	143.20	78.88	4.545	4.704	4-FFf	2.769	2.648	3.500	3.500	7.442	0.000
144.00	144.00	78.91	4.569	4.731	4-FFf	2.783	2.655	3.500	3.500	7.484	0.000
152.60	152.60	79.20	4.834	5.023	4-FFf	2.986	2.730	3.500	3.500	7.930	0.000
157.30	157.30	79.37	4.985	5.191	4-FFf	3.127	2.769	3.500	3.500	8.175	0.000
162.00	162.00	79.54	5.141	5.363	4-FFf	3.500	2.807	3.500	3.500	8.419	0.000

.....

Straight Culvert

Inlet Elevation (invert): 74.18 ft, Outlet Elevation (invert): 73.03 ft

Culvert Length: 248.00 ft, Culvert Slope: 0.0046

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 74.18 ft

Outlet Station: 248.00 ft

Outlet Elevation: 73.03 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-8E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
115.00	76.53	3.50
119.70	76.53	3.50
124.40	76.53	3.50
129.10	76.53	3.50
133.80	76.53	3.50
138.50	76.53	3.50
143.20	76.53	3.50
144.00	76.53	3.50
152.60	76.53	3.50
157.30	76.53	3.50
162.00	76.53	3.50

Tailwater Channel Data - CD-8E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 76.53 ft

Roadway Data for Crossing: CD-8E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 81.00 ft

Roadway Surface: Paved

Roadway Top Width: 160.00 ft

**CD-8 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 115 cfs

Design Flow: 144 cfs

Maximum Flow: 162 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-8P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
77.98	115.00	115.00	0.00	1
78.06	119.70	119.70	0.00	1
78.13	124.40	124.40	0.00	1
78.21	129.10	129.10	0.00	1
78.61	133.80	133.80	0.00	1
78.73	138.50	138.50	0.00	1
78.84	143.20	143.20	0.00	1
78.86	144.00	144.00	0.00	1
78.62	152.60	152.60	0.00	1
78.72	157.30	157.30	0.00	1
78.83	162.00	162.00	0.00	1
81.00	240.75	240.75	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
115.00	115.00	77.98	3.440	3.804	1-S1f	2.242	2.278	4.000	4.000	4.793	0.000
119.70	119.70	78.06	3.529	3.877	1-S1f	2.299	2.325	4.000	4.000	4.988	0.000
124.40	124.40	78.13	3.618	3.952	1-S1f	2.357	2.375	4.000	4.000	5.184	0.000
129.10	129.10	78.21	3.706	4.028	1-S1f	2.414	2.421	4.000	4.000	5.380	0.000
133.80	133.80	78.61	3.795	4.432	3-M1f	2.472	2.466	4.000	4.000	5.324	0.000
138.50	138.50	78.73	3.885	4.545	3-M1f	2.530	2.510	4.000	4.000	5.511	0.000
143.20	143.20	78.84	3.975	4.664	3-M1f	2.590	2.554	4.000	4.000	5.698	0.000
144.00	144.00	78.86	3.991	4.684	3-M1f	2.601	2.561	4.000	4.000	5.730	0.000
152.60	152.60	78.62	4.160	4.445	4-FFf	2.714	2.642	4.000	4.000	6.072	0.000
157.30	157.30	78.72	4.254	4.545	4-FFf	2.775	2.683	4.000	4.000	6.259	0.000
162.00	162.00	78.83	4.350	4.648	4-FFf	2.837	2.724	4.000	4.000	6.446	0.000

Straight Culvert

Inlet Elevation (invert): 74.18 ft, Outlet Elevation (invert): 73.03 ft

Culvert Length: 308.00 ft, Culvert Slope: 0.0037

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 74.18 ft

Outlet Station: 308.00 ft

Outlet Elevation: 73.03 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-8P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
115.00	77.03	4.00
119.70	77.03	4.00
124.40	77.03	4.00
129.10	77.03	4.00
133.80	77.03	4.00
138.50	77.03	4.00
143.20	77.03	4.00
144.00	77.03	4.00
152.60	77.03	4.00
157.30	77.03	4.00
162.00	77.03	4.00

Tailwater Channel Data - CD-8P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 77.03 ft

Roadway Data for Crossing: CD-8P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 81.00 ft

Roadway Surface: Paved

Roadway Top Width: 340.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	25-Jun-14
checked by:	BJS	25-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-9	
		Existing	Proposed
LOCATION	STA.	863+00.00	863+00.00
WIDTH		7.00 FT	7.00 FT
HEIGHT		4.00 FT	4.00 FT
BARRELS		2	2
DIAMETER		FT	7.00 FT
LENGTH		583.0 FT	583.0 FT
TOTAL CROSS-SECTIONAL AREA		56.00 SF	56.00 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		75.70 FT	75.70 FT
DOWNSTREAM INVERT		75.50 FT	75.20 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		83.00 FT	83.00 FT
TAILWATER (CROWN OF PIPE)		79.50 FT	79.20 FT
DETERMINE FLOWRATES (Q):		Headwater Elevation	Headwater Elevation
ASSUMED VELOCITY (25 YR)	6.00 FT/S		
Q (25 YR) = V (25 YR) * TOTAL AREA	336 CFS	81.33 FT	81.03 FT
Q (50 YR) = 1.25 * Q (25 YR)	420 CFS	82.35 FT	82.05 FT
Q (100 YR) = 1.40 * Q (25 YR)	470 CFS	83.00 FT	82.77 FT

100 year headwater elevation exceeds the critical elevation

* *Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-9 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 336 cfs

Design Flow: 420 cfs

Maximum Flow: 470 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-9E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
81.33	336.00	336.00	0.00	1
81.47	349.40	349.40	0.00	1
81.63	362.80	362.80	0.00	1
81.79	376.20	376.20	0.00	1
81.95	389.60	389.60	0.00	1
82.13	403.00	403.00	0.00	1
82.30	416.40	416.40	0.00	1
82.35	420.00	420.00	0.00	1
82.68	443.20	443.20	0.00	1
82.87	456.60	456.60	0.00	1
83.01	470.00	465.59	2.21	36
83.00	465.23	465.23	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
336.00	336.00	81.33	4.480	5.625	4-FFf	4.000	2.615	4.000	4.000	6.000	0.000
349.40	349.40	81.47	4.615	5.774	4-FFf	4.000	2.684	4.000	4.000	6.239	0.000
362.80	362.80	81.63	4.753	5.928	4-FFf	4.000	2.753	4.000	4.000	6.479	0.000
376.20	376.20	81.79	4.892	6.088	4-FFf	4.000	2.820	4.000	4.000	6.718	0.000
389.60	389.60	81.95	5.034	6.254	4-FFf	4.000	2.887	4.000	4.000	6.957	0.000
403.00	403.00	82.13	5.179	6.426	4-FFf	4.000	2.952	4.000	4.000	7.196	0.000
416.40	416.40	82.30	5.327	6.603	4-FFf	4.000	3.017	4.000	4.000	7.436	0.000
420.00	420.00	82.35	5.367	6.652	4-FFf	4.000	3.035	4.000	4.000	7.500	0.000
443.20	443.20	82.68	5.632	6.976	4-FFf	4.000	3.146	4.000	4.000	7.914	0.000
456.60	456.60	82.87	5.790	7.171	4-FFf	4.000	3.209	4.000	4.000	8.154	0.000
470.00	465.59	83.01	5.898	7.305	4-FFf	4.000	3.251	4.000	4.000	8.314	0.000

.....
 Straight Culvert

Inlet Elevation (invert): 75.70 ft, Outlet Elevation (invert): 75.50 ft

Culvert Length: 583.00 ft, Culvert Slope: 0.0003

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 75.70 ft

Outlet Station: 583.00 ft

Outlet Elevation: 75.50 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-9E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
336.00	79.50	4.00
349.40	79.50	4.00
362.80	79.50	4.00
376.20	79.50	4.00
389.60	79.50	4.00
403.00	79.50	4.00
416.40	79.50	4.00
420.00	79.50	4.00
443.20	79.50	4.00
456.60	79.50	4.00
470.00	79.50	4.00

Tailwater Channel Data - CD-9E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 79.50 ft

Roadway Data for Crossing: CD-9E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 83.00 ft

Roadway Surface: Paved

Roadway Top Width: 490.00 ft

**CD-9 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 336 cfs

Design Flow: 420 cfs

Maximum Flow: 470 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-9P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
81.03	336.00	336.00	0.00	1
81.17	349.40	349.40	0.00	1
81.33	362.80	362.80	0.00	1
81.49	376.20	376.20	0.00	1
81.65	389.60	389.60	0.00	1
81.83	403.00	403.00	0.00	1
82.00	416.40	416.40	0.00	1
82.05	420.00	420.00	0.00	1
82.38	443.20	443.20	0.00	1
82.57	456.60	456.60	0.00	1
82.77	470.00	470.00	0.00	1
83.00	484.80	484.80	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
336.00	336.00	81.03	4.479	5.325	4-FFf	4.000	2.615	4.000	4.000	6.000	0.000
349.40	349.40	81.17	4.614	5.474	4-FFf	4.000	2.684	4.000	4.000	6.239	0.000
362.80	362.80	81.33	4.752	5.628	4-FFf	4.000	2.753	4.000	4.000	6.479	0.000
376.20	376.20	81.49	4.891	5.788	4-FFf	4.000	2.820	4.000	4.000	6.718	0.000
389.60	389.60	81.65	5.033	5.954	4-FFf	4.000	2.887	4.000	4.000	6.957	0.000
403.00	403.00	81.83	5.178	6.126	4-FFf	4.000	2.952	4.000	4.000	7.196	0.000
416.40	416.40	82.00	5.326	6.303	4-FFf	4.000	3.017	4.000	4.000	7.436	0.000
420.00	420.00	82.05	5.366	6.352	4-FFf	4.000	3.035	4.000	4.000	7.500	0.000
443.20	443.20	82.38	5.631	6.676	4-FFf	4.000	3.146	4.000	4.000	7.914	0.000
456.60	456.60	82.57	5.789	6.871	4-FFf	4.000	3.209	4.000	4.000	8.154	0.000
470.00	470.00	82.77	5.950	7.071	4-FFf	4.000	3.271	4.000	4.000	8.393	0.000

.....
 Straight Culvert

Inlet Elevation (invert): 75.70 ft, Outlet Elevation (invert): 75.20 ft

Culvert Length: 583.00 ft, Culvert Slope: 0.0009

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 75.70 ft

Outlet Station: 583.00 ft

Outlet Elevation: 75.20 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-9P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
336.00	79.20	4.00
349.40	79.20	4.00
362.80	79.20	4.00
376.20	79.20	4.00
389.60	79.20	4.00
403.00	79.20	4.00
416.40	79.20	4.00
420.00	79.20	4.00
443.20	79.20	4.00
456.60	79.20	4.00
470.00	79.20	4.00

Tailwater Channel Data - CD-9P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 79.20 ft

Roadway Data for Crossing: CD-9P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 83.00 ft

Roadway Surface: Paved

Roadway Top Width: 490.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	25-Jun-15
checked by:	BJS	25-Jun-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-10	
LOCATION	STA.	Existing	Proposed
		914+00.00	914+00.00
WIDTH		7.00 FT	7.00 FT
HEIGHT		4.00 FT	4.00 FT
BARRELS		2	2
DIAMETER		FT	7.00 FT
LENGTH		250.0 FT	558.0 FT
TOTAL CROSS-SECTIONAL AREA		56.00 SF	56.00 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		79.50 FT	79.50 FT
DOWNSTREAM INVERT		79.25 FT	78.70 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		87.50 FT	87.50 FT
TAILWATER (CROWN OF PIPE)		83.25 FT	82.70 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	336 CFS	84.51 FT	84.21 FT
Q (50 YR) = 1.25 * Q (25 YR)	420 CFS	85.22 FT	85.17 FT
Q (100 YR) = 1.40 * Q (25 YR)	470 CFS	85.72 FT	85.85 FT

*** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions
 Analysis done with HY-8 Version 7.3 (April 2014)**

**CD-10 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 336 cfs

Design Flow: 420 cfs

Maximum Flow: 470 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-10E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
84.51	336.00	336.00	0.00	1
84.61	349.40	349.40	0.00	1
84.72	362.80	362.80	0.00	1
84.83	376.20	376.20	0.00	1
84.95	389.60	389.60	0.00	1
85.06	403.00	403.00	0.00	1
85.19	416.40	416.40	0.00	1
85.22	420.00	420.00	0.00	1
85.45	443.20	443.20	0.00	1
85.58	456.60	456.60	0.00	1
85.72	470.00	470.00	0.00	1
87.50	616.62	616.62	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
336.00	336.00	84.51	4.478	5.012	4-FFf	4.000	2.615	4.000	4.000	6.000	0.000
349.40	349.40	84.61	4.614	5.114	4-FFf	4.000	2.684	4.000	4.000	6.239	0.000
362.80	362.80	84.72	4.751	5.221	4-FFf	4.000	2.753	4.000	4.000	6.479	0.000
376.20	376.20	84.83	4.891	5.332	4-FFf	4.000	2.820	4.000	4.000	6.718	0.000
389.60	389.60	84.95	5.033	5.446	4-FFf	4.000	2.887	4.000	4.000	6.957	0.000
403.00	403.00	85.06	5.178	5.565	4-FFf	4.000	2.952	4.000	4.000	7.196	0.000
416.40	416.40	85.19	5.326	5.688	4-FFf	4.000	3.017	4.000	4.000	7.436	0.000
420.00	420.00	85.22	5.366	5.721	4-FFf	4.000	3.035	4.000	4.000	7.500	0.000
443.20	443.20	85.45	5.631	5.945	4-FFf	4.000	3.146	4.000	4.000	7.914	0.000
456.60	456.60	85.58	5.788	6.080	4-FFf	4.000	3.209	4.000	4.000	8.154	0.000
470.00	470.00	85.72	5.950	6.219	4-FFf	4.000	3.271	4.000	4.000	8.393	0.000

 Straight Culvert
 Inlet Elevation (invert): 79.50 ft, Outlet Elevation (invert): 79.25 ft
 Culvert Length: 250.00 ft, Culvert Slope: 0.0010

Site Data - EXIST

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 79.50 ft
 Outlet Station: 250.00 ft
 Outlet Elevation: 79.25 ft
 Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Concrete Box
 Barrel Span: 7.00 ft
 Barrel Rise: 4.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge (90°) Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-10E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
336.00	83.25	4.00
349.40	83.25	4.00
362.80	83.25	4.00
376.20	83.25	4.00
389.60	83.25	4.00
403.00	83.25	4.00
416.40	83.25	4.00
420.00	83.25	4.00
443.20	83.25	4.00
456.60	83.25	4.00
470.00	83.25	4.00

Tailwater Channel Data - CD-10E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 83.25 ft

Roadway Data for Crossing: CD-10E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 87.50 ft

Roadway Surface: Paved

Roadway Top Width: 165.00 ft

**CD-10 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 336 cfs

Design Flow: 420 cfs

Maximum Flow: 470 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-10P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
84.15	336.00	336.00	0.00	1
84.26	349.40	349.40	0.00	1
84.49	362.80	362.80	0.00	1
84.47	376.20	376.20	0.00	1
84.58	389.60	389.60	0.00	1
84.69	403.00	403.00	0.00	1
84.90	416.40	416.40	0.00	1
85.00	420.00	420.00	0.00	1
85.49	443.20	443.20	0.00	1
85.74	456.60	456.60	0.00	1
85.97	470.00	470.00	0.00	1
87.50	555.43	555.43	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
336.00	336.00	84.15	4.477	4.653	7-M1t	3.512	2.615	3.800	4.000	6.316	0.000
349.40	349.40	84.26	4.613	4.759	7-M1t	3.618	2.684	3.800	4.000	6.568	0.000
362.80	362.80	84.49	4.750	4.987	7-M2t	4.000	2.753	3.800	4.000	6.820	0.000
376.20	376.20	84.47	4.890	4.973	3-M2t	4.000	2.820	3.800	4.000	7.071	0.000
389.60	389.60	84.58	5.032	5.080	3-M2t	4.000	2.887	3.800	4.000	7.323	0.000
403.00	403.00	84.69	5.177	5.188	3-M2t	4.000	2.952	3.800	4.000	7.575	0.000
416.40	416.40	84.90	5.325	5.400	7-M2t	4.000	3.017	3.800	4.000	7.827	0.000
420.00	420.00	85.00	5.365	5.499	7-M2t	4.000	3.035	3.800	4.000	7.895	0.000
443.20	443.20	85.49	5.630	5.992	7-M2t	4.000	3.146	3.800	4.000	8.331	0.000
456.60	456.60	85.74	5.787	6.235	7-M2t	4.000	3.209	3.800	4.000	8.583	0.000
470.00	470.00	85.97	5.949	6.470	7-M2t	4.000	3.271	3.800	4.000	8.835	0.000

Straight Culvert

Inlet Elevation (invert): 79.50 ft, Outlet Elevation (invert): 78.70 ft

Culvert Length: 558.00 ft, Culvert Slope: 0.0014

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 79.50 ft

Outlet Station: 558.00 ft

Outlet Elevation: 78.70 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-10P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
336.00	82.50	4.00
349.40	82.50	4.00
362.80	82.50	4.00
376.20	82.50	4.00
389.60	82.50	4.00
403.00	82.50	4.00
416.40	82.50	4.00
420.00	82.50	4.00
443.20	82.50	4.00
456.60	82.50	4.00
470.00	82.50	4.00

Tailwater Channel Data - CD-10P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 82.50 ft

Roadway Data for Crossing: CD-10P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 87.50 ft

Roadway Surface: Paved

Roadway Top Width: 477.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	25-Jun-14
checked by:	BJS	25-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-11	
LOCATION	STA.	Existing	Proposed
		984+00.00	984+00.00
WIDTH		7.00 FT	7.00 FT
HEIGHT		5.00 FT	5.00 FT
BARRELS		2	2
DIAMETER		FT	7.00 FT
LENGTH		477.0 FT	581.0 FT
TOTAL CROSS-SECTIONAL AREA		70.00 SF	70.00 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		82.45 FT	82.00 FT
DOWNSTREAM INVERT		81.65 FT	80.90 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		89.20 FT	89.20 FT
TAILWATER (CROWN OF PIPE)		86.65 FT	85.90 FT
<u>DETERMINE FLOWRATES (Q):</u>		Headwater Elevation	Headwater Elevation
ASSUMED VELOCITY (25 YR)	6.00 FT/S		
Q (25 YR) = V (25 YR) * TOTAL AREA	420 CFS	88.16 FT	87.80 FT
Q (50 YR) = 1.25 * Q (25 YR)	525 CFS	89.01 FT	88.49 FT
Q (100 YR) = 1.40 * Q (25 YR)	588 CFS	89.20 FT	89.15 FT

100 year headwater elevation exceeds the critical elevation

*** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)**

**CD-11 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 420 cfs

Design Flow: 525 cfs

Maximum Flow: 588 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-11E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
88.16	420.00	420.00	0.00	1
88.29	436.80	436.80	0.00	1
88.41	453.60	453.60	0.00	1
88.55	470.40	470.40	0.00	1
88.68	487.20	487.20	0.00	1
88.83	504.00	504.00	0.00	1
88.97	520.80	520.80	0.00	1
89.01	525.00	525.00	0.00	1
89.21	554.40	546.53	5.75	29
89.22	571.20	547.99	21.04	5
89.23	588.00	549.11	36.55	4
89.20	545.47	545.47	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
420.00	420.00	88.16	5.156	5.712	4-FFf	3.918	3.035	5.000	5.000	6.000	0.000
436.80	436.80	88.29	5.304	5.835	4-FFf	4.038	3.115	5.000	5.000	6.240	0.000
453.60	453.60	88.41	5.453	5.963	4-FFf	4.156	3.195	5.000	5.000	6.480	0.000
470.40	470.40	88.55	5.604	6.096	4-FFf	4.273	3.273	5.000	5.000	6.720	0.000
487.20	487.20	88.68	5.756	6.234	4-FFf	4.390	3.350	5.000	5.000	6.960	0.000
504.00	504.00	88.83	5.910	6.377	4-FFf	4.507	3.427	5.000	5.000	7.200	0.000
520.80	520.80	88.97	6.066	6.525	4-FFf	5.000	3.503	5.000	5.000	7.440	0.000
525.00	525.00	89.01	6.105	6.562	4-FFf	5.000	3.522	5.000	5.000	7.500	0.000
554.40	546.53	89.21	6.309	6.760	4-FFf	5.000	3.617	5.000	5.000	7.808	0.000
571.20	547.99	89.22	6.323	6.774	4-FFf	5.000	3.624	5.000	5.000	7.828	0.000
588.00	549.11	89.23	6.334	6.784	4-FFf	5.000	3.629	5.000	5.000	7.844	0.000

.....
 Straight Culvert
 Inlet Elevation (invert): 82.45 ft, Outlet Elevation (invert): 81.65 ft
 Culvert Length: 477.00 ft, Culvert Slope: 0.0017

Site Data - EXIST

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 82.45 ft
 Outlet Station: 477.00 ft
 Outlet Elevation: 81.65 ft
 Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Concrete Box
 Barrel Span: 7.00 ft
 Barrel Rise: 5.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge (90°) Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-11E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
420.00	86.65	5.00
436.80	86.65	5.00
453.60	86.65	5.00
470.40	86.65	5.00
487.20	86.65	5.00
504.00	86.65	5.00
520.80	86.65	5.00
525.00	86.65	5.00
554.40	86.65	5.00
571.20	86.65	5.00
588.00	86.65	5.00

Tailwater Channel Data - CD-11E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 86.65 ft

Roadway Data for Crossing: CD-11E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 89.20 ft

Roadway Surface: Paved

Roadway Top Width: 470.00 ft

**CD-11 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 420 cfs

Design Flow: 525 cfs

Maximum Flow: 588 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-11P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
87.80	420.00	420.00	0.00	1
87.69	436.80	436.80	0.00	1
87.83	453.60	453.60	0.00	1
87.98	470.40	470.40	0.00	1
88.13	487.20	487.20	0.00	1
88.29	504.00	504.00	0.00	1
88.45	520.80	520.80	0.00	1
88.49	525.00	525.00	0.00	1
88.79	554.40	554.40	0.00	1
88.97	571.20	571.20	0.00	1
89.15	588.00	588.00	0.00	1
89.20	592.42	592.42	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
420.00	420.00	87.80	5.156	5.801	3-M1f	3.742	3.035	5.000	5.000	6.000	0.000
436.80	436.80	87.69	5.304	5.694	4-FFf	3.855	3.115	5.000	5.000	6.240	0.000
453.60	453.60	87.83	5.453	5.835	4-FFf	3.967	3.195	5.000	5.000	6.480	0.000
470.40	470.40	87.98	5.603	5.981	4-FFf	4.080	3.273	5.000	5.000	6.720	0.000
487.20	487.20	88.13	5.755	6.132	4-FFf	4.190	3.350	5.000	5.000	6.960	0.000
504.00	504.00	88.29	5.909	6.288	4-FFf	4.301	3.427	5.000	5.000	7.200	0.000
520.80	520.80	88.45	6.065	6.450	4-FFf	4.411	3.503	5.000	5.000	7.440	0.000
525.00	525.00	88.49	6.104	6.492	4-FFf	4.439	3.522	5.000	5.000	7.500	0.000
554.40	554.40	88.79	6.384	6.790	4-FFf	5.000	3.652	5.000	5.000	7.920	0.000
571.20	571.20	88.97	6.548	6.968	4-FFf	5.000	3.725	5.000	5.000	8.160	0.000
588.00	588.00	89.15	6.715	7.151	4-FFf	5.000	3.798	5.000	5.000	8.400	0.000

.....
 Straight Culvert

Inlet Elevation (invert): 82.00 ft, Outlet Elevation (invert): 80.90 ft

Culvert Length: 581.00 ft, Culvert Slope: 0.0019

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 82.00 ft

Outlet Station: 581.00 ft

Outlet Elevation: 80.90 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Concrete Box

Barrel Span: 7.00 ft

Barrel Rise: 5.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge (90°) Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-11P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
420.00	85.90	5.00
436.80	85.90	5.00
453.60	85.90	5.00
470.40	85.90	5.00
487.20	85.90	5.00
504.00	85.90	5.00
520.80	85.90	5.00
525.00	85.90	5.00
554.40	85.90	5.00
571.20	85.90	5.00
588.00	85.90	5.00

Tailwater Channel Data - CD-11P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 85.90 ft

Roadway Data for Crossing: CD-11P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 89.20 ft

Roadway Surface: Paved

Roadway Top Width: 535.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	24-Jun-14
checked by:	BJS	24-Jun-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-12	
LOCATION	STA.	Existing	Proposed
		1083+19.00	1083+19.00
WIDTH		3.00 FT	3.50 FT
HEIGHT		3.00 FT	3.50 FT
BARRELS		2	2
DIAMETER		3.00 FT	3.50 FT
LENGTH		415.0 FT	612.0 FT
TOTAL CROSS-SECTIONAL AREA		14.14 SF	19.24 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		83.44 FT	83.44 FT
DOWNSTREAM INVERT		82.45 FT	82.45 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		91.00 FT	91.00 FT
TAILWATER (CROWN OF PIPE)		85.45 FT	85.95 FT
DETERMINE FLOWRATES (Q):		Headwater Elevation	Headwater Elevation
ASSUMED VELOCITY (25 YR)	6.00 FT/S		
Q (25 YR) = V (25 YR) * TOTAL AREA	85 CFS	87.72 FT	87.33 FT
Q (50 YR) = 1.25 * Q (25 YR)	106 CFS	88.98 FT	88.10 FT
Q (100 YR) = 1.40 * Q (25 YR)	119 CFS	89.90 FT	88.65 FT

** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions
 Analysis done with HY-8 Version 7.3 (April 2014)*

**CD-12 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 85 cfs

Design Flow: 106 cfs

Maximum Flow: 119 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-12E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
87.72	85.00	85.00	0.00	1
87.90	88.40	88.40	0.00	1
88.10	91.80	91.80	0.00	1
88.30	95.20	95.20	0.00	1
88.50	98.60	98.60	0.00	1
88.72	102.00	102.00	0.00	1
88.94	105.40	105.40	0.00	1
88.98	106.00	106.00	0.00	1
89.40	112.20	112.20	0.00	1
89.65	115.60	115.60	0.00	1
89.90	119.00	119.00	0.00	1
91.00	132.91	132.91	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
85.00	85.00	87.72	3.461	4.280	4-FFf	3.000	2.121	3.000	3.000	6.013	0.000
88.40	88.40	87.90	3.576	4.465	4-FFf	3.000	2.163	3.000	3.000	6.253	0.000
91.80	91.80	88.10	3.695	4.657	4-FFf	3.000	2.204	3.000	3.000	6.494	0.000
95.20	95.20	88.30	3.817	4.857	4-FFf	3.000	2.244	3.000	3.000	6.734	0.000
98.60	98.60	88.50	3.944	5.064	4-FFf	3.000	2.283	3.000	3.000	6.975	0.000
102.00	102.00	88.72	4.075	5.278	4-FFf	3.000	2.320	3.000	3.000	7.215	0.000
105.40	105.40	88.94	4.211	5.500	4-FFf	3.000	2.357	3.000	3.000	7.456	0.000
106.00	106.00	88.98	4.235	5.540	4-FFf	3.000	2.363	3.000	3.000	7.498	0.000
112.20	112.20	89.40	4.497	5.965	4-FFf	3.000	2.426	3.000	3.000	7.937	0.000
115.60	115.60	89.65	4.647	6.208	4-FFf	3.000	2.459	3.000	3.000	8.177	0.000
119.00	119.00	89.90	4.802	6.459	4-FFf	3.000	2.491	3.000	3.000	8.418	0.000

.....

Straight Culvert

Inlet Elevation (invert): 83.44 ft, Outlet Elevation (invert): 82.45 ft

Culvert Length: 415.00 ft, Culvert Slope: 0.0024

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 83.44 ft

Outlet Station: 415.00 ft

Outlet Elevation: 82.45 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 3.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-12E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
85.00	85.45	3.00
88.40	85.45	3.00
91.80	85.45	3.00
95.20	85.45	3.00
98.60	85.45	3.00
102.00	85.45	3.00
105.40	85.45	3.00
106.00	85.45	3.00
112.20	85.45	3.00
115.60	85.45	3.00
119.00	85.45	3.00

Tailwater Channel Data - CD-12E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 85.45 ft

Roadway Data for Crossing: CD-12E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 91.00 ft

Roadway Surface: Paved

Roadway Top Width: 374.00 ft

**CD-12 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 85 cfs

Design Flow: 106 cfs

Maximum Flow: 119 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-12P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
87.33	85.00	85.00	0.00	1
87.44	88.40	88.40	0.00	1
87.56	91.80	91.80	0.00	1
87.68	95.20	95.20	0.00	1
87.81	98.60	98.60	0.00	1
87.94	102.00	102.00	0.00	1
88.07	105.40	105.40	0.00	1
88.10	106.00	106.00	0.00	1
88.35	112.20	112.20	0.00	1
88.50	115.60	115.60	0.00	1
88.65	119.00	119.00	0.00	1
91.00	162.61	162.61	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
85.00	85.00	87.33	3.075	3.930	4-FFf	2.835	2.026	3.500	3.500	4.417	0.000
88.40	88.40	87.44	3.153	4.042	4-FFf	2.992	2.066	3.500	3.500	4.594	0.000
91.80	91.80	87.56	3.232	4.159	4-FFf	3.168	2.111	3.500	3.500	4.771	0.000
95.20	95.20	87.68	3.310	4.281	4-FFf	3.500	2.151	3.500	3.500	4.947	0.000
98.60	98.60	87.81	3.389	4.407	4-FFf	3.500	2.190	3.500	3.500	5.124	0.000
102.00	102.00	87.94	3.469	4.537	4-FFf	3.500	2.228	3.500	3.500	5.301	0.000
105.40	105.40	88.07	3.550	4.672	4-FFf	3.500	2.266	3.500	3.500	5.478	0.000
106.00	106.00	88.10	3.564	4.696	4-FFf	3.500	2.273	3.500	3.500	5.509	0.000
112.20	112.20	88.35	3.715	4.954	4-FFf	3.500	2.343	3.500	3.500	5.831	0.000
115.60	115.60	88.50	3.799	5.102	4-FFf	3.500	2.379	3.500	3.500	6.008	0.000
119.00	119.00	88.65	3.885	5.254	4-FFf	3.500	2.414	3.500	3.500	6.184	0.000

 Straight Culvert

Inlet Elevation (invert): 83.40 ft, Outlet Elevation (invert): 82.45 ft

Culvert Length: 612.00 ft, Culvert Slope: 0.0016

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 83.40 ft

Outlet Station: 612.00 ft

Outlet Elevation: 82.45 ft

Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Circular

Barrel Diameter: 3.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-12P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
85.00	85.95	3.50
88.40	85.95	3.50
91.80	85.95	3.50
95.20	85.95	3.50
98.60	85.95	3.50
102.00	85.95	3.50
105.40	85.95	3.50
106.00	85.95	3.50
112.20	85.95	3.50
115.60	85.95	3.50
119.00	85.95	3.50

Tailwater Channel Data - CD-12P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 85.95 ft

Roadway Data for Crossing: CD-12P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 91.00 ft

Roadway Surface: Paved

Roadway Top Width: 564.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	25-Jun-15
checked by:	BJS	25-Jun-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-13	
LOCATION	STA.	Existing	Proposed
		1138+20.00	1138+20.00
WIDTH		2.50 FT	3.00 FT
HEIGHT		2.50 FT	3.00 FT
BARRELS		2	2
DIAMETER		2.50 FT	3.00 FT
LENGTH		247.0 FT	356.0 FT
TOTAL CROSS-SECTIONAL AREA		9.82 SF	14.14 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		96.10 FT	96.10 FT
DOWNSTREAM INVERT		94.85 FT	94.85 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		103.50 FT	103.50 FT
TAILWATER (CROWN OF PIPE)		97.35 FT	97.85 FT
<u>DETERMINE FLOWRATES (Q):</u>			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	59 CFS	99.27 FT	99.10 FT
Q (50 YR) = 1.25 * Q (25 YR)	74 CFS	100.38 FT	99.51 FT
Q (100 YR) = 1.40 * Q (25 YR)	82 CFS	101.07 FT	99.89 FT

*** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions
 Analysis done with HY-8 Version 7.3 (April 2014)**

**CD-13 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 59 cfs

Design Flow: 74 cfs

Maximum Flow: 82 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-13E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
99.27	59.00	59.00	0.00	1
99.43	61.30	61.30	0.00	1
99.59	63.60	63.60	0.00	1
99.75	65.90	65.90	0.00	1
99.92	68.20	68.20	0.00	1
100.10	70.50	70.50	0.00	1
100.28	72.80	72.80	0.00	1
100.38	74.00	74.00	0.00	1
100.66	77.40	77.40	0.00	1
100.86	79.70	79.70	0.00	1
101.07	82.00	82.00	0.00	1
103.50	105.49	105.49	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
59.00	59.00	99.27	3.113	3.174	4-FFf	1.918	1.849	2.500	2.500	6.010	0.000
61.30	61.30	99.43	3.224	3.327	4-FFf	1.987	1.884	2.500	2.500	6.244	0.000
63.60	63.60	99.59	3.338	3.485	4-FFf	2.063	1.918	2.500	2.500	6.478	0.000
65.90	65.90	99.75	3.457	3.650	4-FFf	2.179	1.951	2.500	2.500	6.713	0.000
68.20	68.20	99.92	3.580	3.820	4-FFf	2.500	1.983	2.500	2.500	6.947	0.000
70.50	70.50	100.10	3.708	3.997	4-FFf	2.500	2.014	2.500	2.500	7.181	0.000
72.80	72.80	100.28	3.841	4.179	4-FFf	2.500	2.043	2.500	2.500	7.415	0.000
74.00	74.00	100.38	3.912	4.276	4-FFf	2.500	2.058	2.500	2.500	7.538	0.000
77.40	77.40	100.66	4.120	4.561	4-FFf	2.500	2.099	2.500	2.500	7.884	0.000
79.70	79.70	100.86	4.267	4.760	4-FFf	2.500	2.125	2.500	2.500	8.118	0.000
82.00	82.00	101.07	4.419	4.966	4-FFf	2.500	2.149	2.500	2.500	8.352	0.000

.....

Straight Culvert

Inlet Elevation (invert): 96.10 ft, Outlet Elevation (invert): 94.85 ft

Culvert Length: 247.00 ft, Culvert Slope: 0.0051

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 96.10 ft

Outlet Station: 247.00 ft

Outlet Elevation: 94.85 ft

Number of Barrels: 2

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 2.50 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-13E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
59.00	97.35	2.50
61.30	97.35	2.50
63.60	97.35	2.50
65.90	97.35	2.50
68.20	97.35	2.50
70.50	97.35	2.50
72.80	97.35	2.50
74.00	97.35	2.50
77.40	97.35	2.50
79.70	97.35	2.50
82.00	97.35	2.50

Tailwater Channel Data - CD-13E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 97.35 ft

Roadway Data for Crossing: CD-13E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 103.50 ft

Roadway Surface: Paved

Roadway Top Width: 200.00 ft

**CD-13 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 59 cfs

Design Flow: 74 cfs

Maximum Flow: 82 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-13P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
99.06	59.00	59.00	0.00	1
99.15	61.30	61.30	0.00	1
99.24	63.60	63.60	0.00	1
99.33	65.90	65.90	0.00	1
99.43	68.20	68.20	0.00	1
99.54	70.50	70.50	0.00	1
99.65	72.80	72.80	0.00	1
99.71	74.00	74.00	0.00	1
99.56	77.40	77.40	0.00	1
99.67	79.70	79.70	0.00	1
99.77	82.00	82.00	0.00	1
103.50	140.54	140.54	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
59.00	59.00	99.06	2.667	2.964	3-M1f	1.829	1.754	3.000	3.000	4.173	0.000
61.30	61.30	99.15	2.734	3.049	3-M1f	1.875	1.789	3.000	3.000	4.336	0.000
63.60	63.60	99.24	2.801	3.139	3-M1f	1.923	1.827	3.000	3.000	4.499	0.000
65.90	65.90	99.33	2.868	3.233	3-M1f	1.974	1.860	3.000	3.000	4.661	0.000
68.20	68.20	99.43	2.936	3.333	3-M1f	2.024	1.893	3.000	3.000	4.824	0.000
70.50	70.50	99.54	3.004	3.441	3-M1f	2.074	1.926	3.000	3.000	4.987	0.000
72.80	72.80	99.65	3.073	3.554	3-M1f	2.125	1.958	3.000	3.000	5.150	0.000
74.00	74.00	99.71	3.110	3.614	3-M1f	2.151	1.974	3.000	3.000	5.234	0.000
77.40	77.40	99.56	3.215	3.464	4-FFf	2.235	2.019	3.000	3.000	5.475	0.000
79.70	79.70	99.67	3.287	3.567	4-FFf	2.296	2.053	3.000	3.000	5.638	0.000
82.00	82.00	99.77	3.361	3.673	4-FFf	2.357	2.083	3.000	3.000	5.800	0.000

 Straight Culvert
 Inlet Elevation (invert): 96.10 ft, Outlet Elevation (invert): 94.85 ft
 Culvert Length: 356.00 ft, Culvert Slope: 0.0035

Site Data - PROP

Site Data Option: Culvert Invert Data
 Inlet Station: 0.00 ft
 Inlet Elevation: 96.10 ft
 Outlet Station: 356.00 ft
 Outlet Elevation: 94.85 ft
 Number of Barrels: 2

Culvert Data Summary - PROP

Barrel Shape: Circular
 Barrel Diameter: 3.00 ft
 Barrel Material: Concrete
 Embedment: 0.00 in
 Barrel Manning's n: 0.0120
 Culvert Type: Straight
 Inlet Configuration: Square Edge with Headwall
 Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-13P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
59.00	97.85	3.00
61.30	97.85	3.00
63.60	97.85	3.00
65.90	97.85	3.00
68.20	97.85	3.00
70.50	97.85	3.00
72.80	97.85	3.00
74.00	97.85	3.00
77.40	97.85	3.00
79.70	97.85	3.00
82.00	97.85	3.00

Tailwater Channel Data - CD-13P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 97.85 ft

Roadway Data for Crossing: CD-13P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 103.50 ft

Roadway Surface: Paved

Roadway Top Width: 365.00 ft

HNTB Corporation
 610 Crescent Executive Court, Suite 400
 Lake Mary, FL 32746

DATE

made by:	SR	25-Jun-15
checked by:	BJS	25-Jun-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - Segment 1

CROSS DRAIN NO. _____		CD-14	
		Existing	Proposed
LOCATION	STA.	1202+15.00	1202+15.00
WIDTH		4.00 FT	4.00 FT
HEIGHT		4.00 FT	4.00 FT
BARRELS		1	1
DIAMETER		4.00 FT	4.00 FT
LENGTH		241.0 FT	372.0 FT
TOTAL CROSS-SECTIONAL AREA		12.57 SF	12.57 SF
MANNING'S ROUGHNESS		0.012	0.012
UPSTREAM INVERT		99.57 FT	99.57 FT
DOWNSTREAM INVERT		98.35 FT	98.20 FT
CRITICAL ELEVATION (ROADWAY SHOULDER EL)		108.00 FT	108.00 FT
TAILWATER (CROWN OF PIPE)		102.35 FT	102.20 FT
DETERMINE FLOWRATES (Q):			
ASSUMED VELOCITY (25 YR)	6.00 FT/S	Headwater Elevation	Headwater Elevation
Q (25 YR) = V (25 YR) * TOTAL AREA	75 CFS	103.86 FT	103.86 FT
Q (50 YR) = 1.25 * Q (25 YR)	94 CFS	104.55 FT	104.54 FT
Q (100 YR) = 1.40 * Q (25 YR)	106 CFS	105.12 FT	105.24 FT

*** Culvert Design Drainage Handbook (2004), Chapter 8, Section 8.1. Culvert Extensions Analysis done with HY-8 Version 7.3 (April 2014)**

**CD-14 EXISTING
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 75 cfs

Design Flow: 94 cfs

Maximum Flow: 106 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-14E

Headwater Elevation (ft)	Total Discharge (cfs)	EXIST Discharge (cfs)	Roadway Discharge (cfs)	Iterations
103.86	75.00	75.00	0.00	1
103.97	78.10	78.10	0.00	1
104.08	81.20	81.20	0.00	1
104.19	84.30	84.30	0.00	1
104.30	87.40	87.40	0.00	1
104.42	90.50	90.50	0.00	1
104.54	93.60	93.60	0.00	1
104.55	94.00	94.00	0.00	1
104.78	99.80	99.80	0.00	1
104.91	102.90	102.90	0.00	1
105.12	106.00	106.00	0.00	1
108.00	151.40	151.40	0.00	Overtopping

Table 2 - Culvert Summary Table: EXIST

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
75.00	75.00	103.86	4.106	4.285	1-S1f	2.411	2.619	4.000	4.000	6.251	0.000
78.10	78.10	103.97	4.229	4.396	1-S1f	2.476	2.674	4.000	4.000	6.510	0.000
81.20	81.20	104.08	4.355	4.507	1-S1f	2.541	2.727	4.000	4.000	6.768	0.000
84.30	84.30	104.19	4.484	4.620	1-S1f	2.611	2.780	4.000	4.000	7.026	0.000
87.40	87.40	104.30	4.617	4.734	1-S1f	2.681	2.831	4.000	4.000	7.285	0.000
90.50	90.50	104.42	4.753	4.849	1-S1f	2.751	2.881	4.000	4.000	7.543	0.000
93.60	93.60	104.54	4.892	4.966	1-S1f	2.821	2.929	4.000	4.000	7.801	0.000
94.00	94.00	104.55	4.911	4.981	1-S1f	2.830	2.936	4.000	4.000	7.835	0.000
99.80	99.80	104.78	5.185	5.210	1-S1f	2.972	3.023	4.000	4.000	8.318	0.000
102.90	102.90	104.91	5.338	5.340	1-S1f	3.057	3.068	4.000	4.000	8.577	0.000
106.00	106.00	105.12	5.495	5.549	4-FFf	3.142	3.112	4.000	4.000	8.435	0.000

.....

Straight Culvert

Inlet Elevation (invert): 99.57 ft, Outlet Elevation (invert): 98.35 ft

Culvert Length: 241.00 ft, Culvert Slope: 0.0051

.....

Site Data - EXIST

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 99.57 ft

Outlet Station: 241.00 ft

Outlet Elevation: 98.35 ft

Number of Barrels: 1

Culvert Data Summary - EXIST

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-14E)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
75.00	102.35	4.00
78.10	102.35	4.00
81.20	102.35	4.00
84.30	102.35	4.00
87.40	102.35	4.00
90.50	102.35	4.00
93.60	102.35	4.00
94.00	102.35	4.00
99.80	102.35	4.00
102.90	102.35	4.00
106.00	102.35	4.00

Tailwater Channel Data - CD-14E

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 102.35 ft

Roadway Data for Crossing: CD-14E

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 108.00 ft

Roadway Surface: Paved

Roadway Top Width: 182.00 ft

**CD-14 PROPOSED
HY-8 Culvert Analysis Report**

Crossing Discharge Data

Discharge Selection Method: Specify Minimum, Design, and Maximum Flow

Minimum Flow: 75 cfs

Design Flow: 94 cfs

Maximum Flow: 106 cfs

Table 1 - Summary of Culvert Flows at Crossing: CD-14P

Headwater Elevation (ft)	Total Discharge (cfs)	PROP Discharge (cfs)	Roadway Discharge (cfs)	Iterations
103.85	75.00	75.00	0.00	1
103.97	78.10	78.10	0.00	1
104.08	81.20	81.20	0.00	1
104.20	84.30	84.30	0.00	1
104.32	87.40	87.40	0.00	1
104.44	90.50	90.50	0.00	1
104.57	93.60	93.60	0.00	1
104.59	94.00	94.00	0.00	1
104.86	99.80	99.80	0.00	1
105.03	102.90	102.90	0.00	1
105.25	106.00	106.00	0.00	1
108.00	140.78	140.78	0.00	Overtopping

Table 2 - Culvert Summary Table: PROP

Total Discharge (cfs)	Culvert Discharge (cfs)	Headwater Elevation (ft)	Inlet Control Depth (ft)	Outlet Control Depth (ft)	Flow Type	Normal Depth (ft)	Critical Depth (ft)	Outlet Depth (ft)	Tailwater Depth (ft)	Outlet Velocity (ft/s)	Tailwater Velocity (ft/s)
75.00	75.00	103.85	4.108	4.281	7-M1t	2.693	2.619	3.800	4.000	6.082	0.000
78.10	78.10	103.97	4.232	4.396	7-M1t	2.775	2.674	3.800	4.000	6.333	0.000
81.20	81.20	104.08	4.358	4.512	7-M1t	2.857	2.727	3.800	4.000	6.585	0.000
84.30	84.30	104.20	4.487	4.629	7-M1t	2.946	2.780	3.800	4.000	6.836	0.000
87.40	87.40	104.32	4.619	4.750	7-M1t	3.045	2.831	3.800	4.000	7.088	0.000
90.50	90.50	104.44	4.755	4.874	7-M1t	3.145	2.881	3.800	4.000	7.339	0.000
93.60	93.60	104.57	4.895	5.004	7-M1t	3.245	2.929	3.800	4.000	7.590	0.000
94.00	94.00	104.59	4.914	5.021	7-M1t	3.257	2.936	3.800	4.000	7.623	0.000
99.80	99.80	104.86	5.188	5.291	7-M1t	3.559	3.023	3.800	4.000	8.093	0.000
102.90	102.90	105.03	5.341	5.460	3-M2t	4.000	3.068	3.800	4.000	8.345	0.000
106.00	106.00	105.25	5.498	5.684	7-M2t	4.000	3.112	3.800	4.000	8.596	0.000

Straight Culvert

Inlet Elevation (invert): 99.57 ft, Outlet Elevation (invert): 98.20 ft

Culvert Length: 372.00 ft, Culvert Slope: 0.0037

Site Data - PROP

Site Data Option: Culvert Invert Data

Inlet Station: 0.00 ft

Inlet Elevation: 99.57 ft

Outlet Station: 372.00 ft

Outlet Elevation: 98.20 ft

Number of Barrels: 1

Culvert Data Summary - PROP

Barrel Shape: Circular

Barrel Diameter: 4.00 ft

Barrel Material: Concrete

Embedment: 0.00 in

Barrel Manning's n: 0.0120

Culvert Type: Straight

Inlet Configuration: Square Edge with Headwall

Inlet Depression: NONE

Table 3 - Downstream Channel Rating Curve (Crossing: CD-14P)

Flow (cfs)	Water Surface Elev (ft)	Depth (ft)
75.00	102.00	4.00
78.10	102.00	4.00
81.20	102.00	4.00
84.30	102.00	4.00
87.40	102.00	4.00
90.50	102.00	4.00
93.60	102.00	4.00
94.00	102.00	4.00
99.80	102.00	4.00
102.90	102.00	4.00
106.00	102.00	4.00

Tailwater Channel Data - CD-14P

Tailwater Channel Option: Enter Constant Tailwater Elevation

Constant Tailwater Elevation: 102.00 ft

Roadway Data for Crossing: CD-14P

Roadway Profile Shape: Constant Roadway Elevation

Crest Length: 2000.00 ft

Crest Elevation: 108.00 ft

Roadway Surface: Paved

Roadway Top Width: 342.00 ft

APPENDIX C – CORRESPONDENCE

Sanam Rai

From: Sanam Rai
Sent: Tuesday, August 05, 2014 8:35 AM
To: 'Ortiz, Jose'
Cc: Rivera, Efren
Subject: RE: I-4 Segment 1 CrossDrain Information

Jose, thank you for the Straight Line Diagram. We do have them included in the Location Hydraulics Report.

Sanam

From: Ortiz, Jose [<mailto:Jose.Ortiz@dot.state.fl.us>]
Sent: Monday, August 04, 2014 5:22 PM
To: Sanam Rai
Cc: Rivera, Efren
Subject: RE: I-4 Segment 1 CrossDrain Information

Hi Sanam,

Please refer to the attached Straight Line Diagram of Road Inventory to identify and verify each of the cross drains within the corridor and locate milepost in your PG&E report.

If you have any questions call me.

Thanks,

Jose M. Ortiz, PE
Permits Manager
D5 - Orlando Operations Center
Office: (407) 384-4600 & 384-4603
Email: jose.ortiz@dot.state.fl.us



From: Sanam Rai [<mailto:sarai@HNTB.com>]
Sent: Monday, August 04, 2014 2:20 PM
To: Ortiz, Jose
Cc: Luz Phillip
Subject: I-4 Segment 1 CrossDrain Information

Jose,

Thanks for taking my call earlier regarding the I-4 segment 1 crossdrains. I understand that TME Enterprises is contracted to maintain the crossdrains along I-4. I will coordinate with them as well.

Do you know of any issues (flooding, scour, sedimentation) with any of the crossdrains along segment 1 of the I-4 PD&E project?

Thank you,

Sanam

Sanam Rai, PE

Project Engineer - Drainage

HNTB Corporation

610 Crescent Executive Court, Suite 400

Lake Mary, FL 32746

Tel (407) 805-0355

Direct (407) 547-3025

Fax (407) 805-0227

www.hntb.com

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

Sanam Rai

From: Sanam Rai
Sent: Tuesday, August 05, 2014 8:44 AM
To: 'Jeremy Golloway'
Cc: jose.ortiz@dot.state.fl.us; Luz Phillip; Efren.Rivera@dot.state.fl.us; Barry Switzer; 'Dave Jackson'
Subject: RE: I-4 Segment 1 CrossDrain Information

Jeremy,

Thank you for your prompt feedback.

The project is currently in a Project Development and Environmental (PD&E) Study phase. I am not aware of the schedule for the design phase of the project.

Please visit the following website for more information regarding all segments of the I-4 PD&E project:
<http://i4express.com/>

Thanks,

Sanam

From: Jeremy Golloway [<mailto:jeremy.golloway@tmeenterprises.com>]
Sent: Monday, August 04, 2014 10:10 PM
To: Sanam Rai
Cc: jose.ortiz@dot.state.fl.us; Luz Phillip; Efren.Rivera@dot.state.fl.us; Barry Switzer; 'Dave Jackson'
Subject: RE: I-4 Segment 1 CrossDrain Information

Sanam,

Thank you for the information you provided. To the best of my knowledge, I am not aware of any issues concerning the cross drains you referenced. When is this project slated to start ? Please let me know if you need any additional information. Thanks.

Jeremy Golloway
Regional Operations Manager - Florida
Office – (407) 730-2232
Cell – (407) 625-8812
Fax – (407) 704-7642
Email – Jeremy.golloway@tmeenterprises.com

TME ENTERPRISES
INCORPORATED
RIGHT OF WAY MAINTENANCE

From: Sanam Rai [<mailto:sarai@HNTB.com>]
Sent: Monday, August 04, 2014 2:53 PM
To: 'jeremy.golloway@tmeenterprises.com'
Cc: jose.ortiz@dot.state.fl.us; Luz Phillip; Efren.Rivera@dot.state.fl.us; Barry Switzer
Subject: I-4 Segment 1 CrossDrain Information

Jeremy,

I am sending you this email regarding the I-4 PD&E segment 1 (from west of CR 532 to west of SR 528) cross drains. I have included a project location map for reference.

I contacted Jose Ortiz at the FDOT maintenance office. He mentioned that TME Enterprises is contracted to maintain the cross drains along I-4 and you are the person of contact.

I am coordinating with you to find out any issues (flooding, scour, sedimentation) with the cross drains along segment 1 of the I-4 PD&E project. There are a total of 15 cross drains we have identified within the segment. I have included the draft Location Hydraulics Report (LHR) for your reference. It includes the existing cross drain information (culvert size, culvert type, culvert length).

Please feel free to call me if you like.

Thank you,

Sanam

Sanam Rai, PE
Project Engineer - Drainage

HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

Tel (407) 805-0355
Direct (407) 547-3025
Fax (407) 805-0227
www.hntb.com

This e-mail and any files transmitted with it are confidential and are intended solely for the use of the individual or entity to whom they are addressed. If you are NOT the intended recipient and receive this communication, please delete this message and any attachments. Thank you.

APPENDIX D –
BACK-UP PERMIT DOCUMENTATION

CO-1

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
CONTRACT PLANS

FINANCIAL PROJECT ID 201204-1-52-01
(FEDERAL FUNDS)
POLK COUNTY (16180)
STATE ROAD NO. 400 (1-4)
SEGMENT 7
COMPONENT PLAN SET NO. 13

LATENT
DEFICIENCY
CORRECTIONS

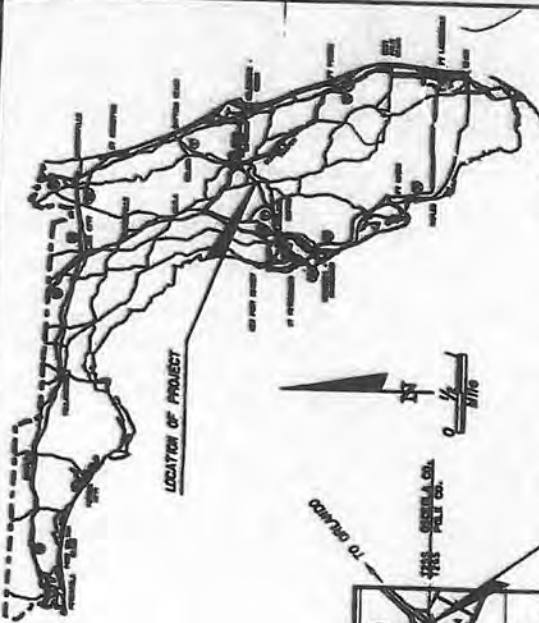
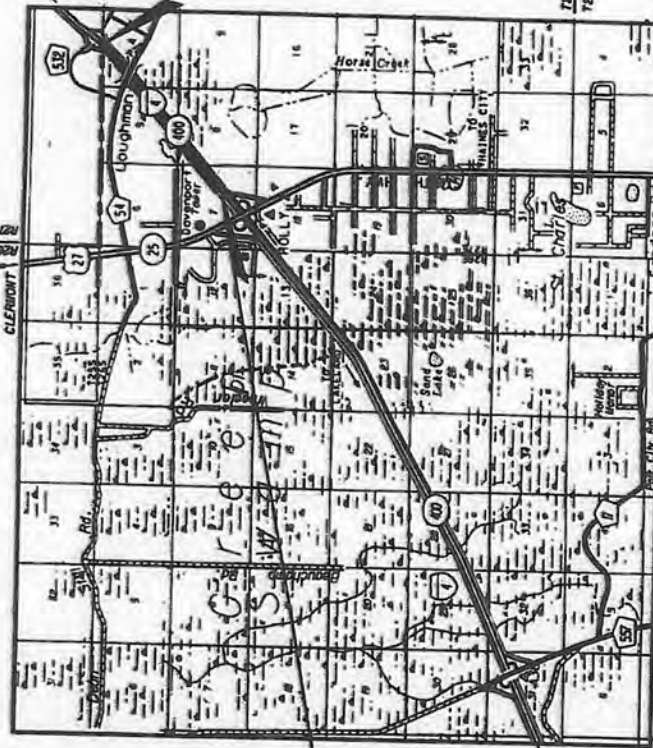
COMPONENTS OF CONTRACT PLANS SET
ROADWAY PLANS
STRUCTURE PLANS
SIGNING AND PAVEMENT MARKING PLANS

INDEX OF ROADWAY PLANS

- SHEET NO. SHEET DESCRIPTION
- 1 KEY SHEET
- 2-4 TYPICAL SECTIONS
- 5 GENERAL NOTES
- 6-16 ROADWAY PLAN SHEETS
- 17-22 ROADWAY PROFILE SHEETS
- 23-35 DRAINAGE STRUCTURES
- 36-37 GRAVITY WALL
- 38-39 FLOOD DETAIL SHEETS
- 40-49 CROSS SECTION PATTERN SHEET
- 121 ROADWAY SOILS SURVEY
- 122-129 TRAFFIC CONTROL PLANS
- 130-132 UTILITY ADJUSTMENTS

RECEIVED
JAN 2 2004

Per.....



END SEGMENT 7
PROJECT FPI 201204-1
SURVEY SR 400 (1-4)
STA. 250+00.00
MP 31.581

DESIGNED BY RECORD
J Jacobs Civil Inc.
10000 N. W. 11th Ave.
Miami, FL 33150
TEL: 305-555-1234
FAX: 305-555-1234

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO MODIFICATION.

INSPECTION CONDUCTED BY DISTRICT

INSPECTION NOT CONDUCTED BY DISTRICT
MIGHT BE REQUIRED FOR FUTURE INSPECTION

ASBUILT FILE OF RECORD
4301896-027

DATE	REVISIONS

ROADWAY	LINEAR FEET	MILES
ROADWAY	10,500.00	2.066
BRIDGES	0.00	0.000
NET LENGTH OF PROJECT	10,500.00	2.066
EXCEPTIONS	0.00	0.000
GROSS LENGTH OF PROJECT	10,500.00	2.066

FOR THIS PLAN BY DISTRICT 4 PROJECT PLAN NO. 1381
DATE 1/21/04
BY: [Signature]
TITLE: PROJECT MANAGER
FISCAL YEAR: 02
SHEET NO.: 02
TOTAL SHEETS: 214

FOR THIS PLAN BY DISTRICT 4 PROJECT PLAN NO. 1381
DATE 1/21/04
BY: [Signature]
TITLE: PROJECT MANAGER
FISCAL YEAR: 02
SHEET NO.: 02
TOTAL SHEETS: 214

PROJECT MANAGER: AMY SHAFER, P.E.

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

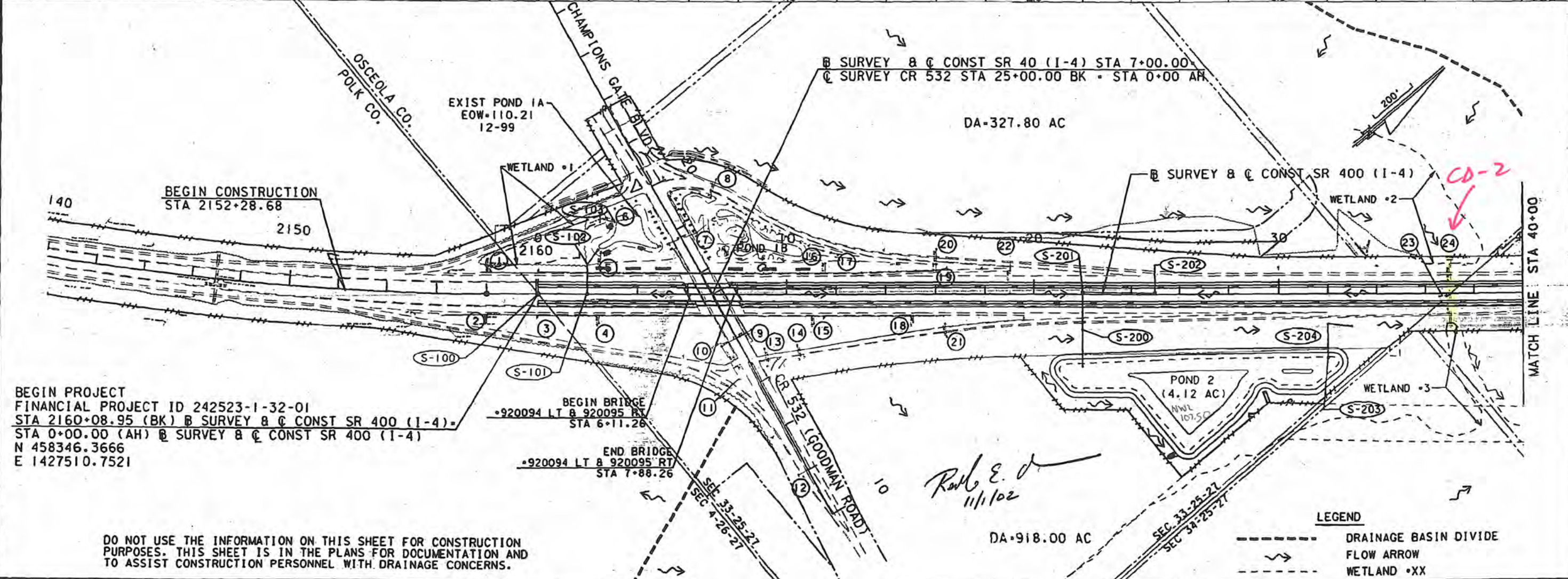
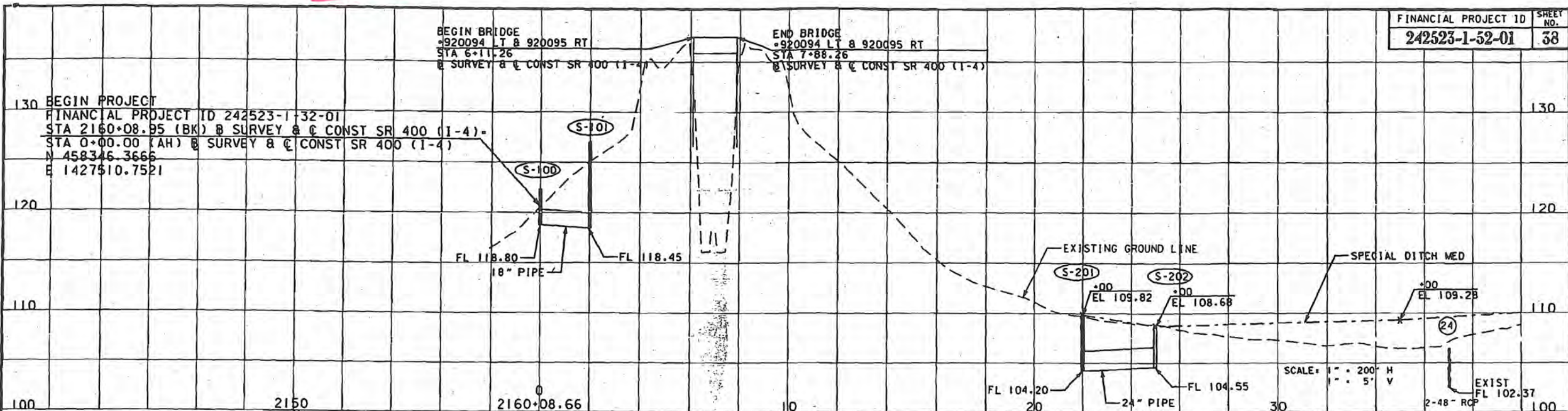
DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

DATE: 1/22-04
BY: [Signature]

CD-2

FINANCIAL PROJECT ID 242523-1-52-01 SHEET NO. 38



BEGIN PROJECT
 FINANCIAL PROJECT ID 242523-1-32-01
 STA 2160+08.95 (BK) @ SURVEY B @ CONST SR 400 (1-4)
 STA 0+00.00 (AH) @ SURVEY B @ CONST SR 400 (1-4)
 N 458346.3666
 E 1427510.7521

BEGIN CONSTRUCTION
 STA 2152+28.68

BEGIN PROJECT
 FINANCIAL PROJECT ID 242523-1-32-01
 STA 2160+08.95 (BK) @ SURVEY B @ CONST SR 400 (1-4)
 STA 0+00.00 (AH) @ SURVEY B @ CONST SR 400 (1-4)
 N 458346.3666
 E 1427510.7521

BEGIN BRIDGE
 +920094 LT @ 920095 RT
 STA 6+11.26

END BRIDGE
 +920094 LT @ 920095 RT
 STA 7+88.26

DO NOT USE THE INFORMATION ON THIS SHEET FOR CONSTRUCTION PURPOSES. THIS SHEET IS IN THE PLANS FOR DOCUMENTATION AND TO ASSIST CONSTRUCTION PERSONNEL WITH DRAINAGE CONCERNS.

LEGEND
 - - - DRAINAGE BASIN DIVIDE
 -> FLOW ARROW
 -XX WETLAND

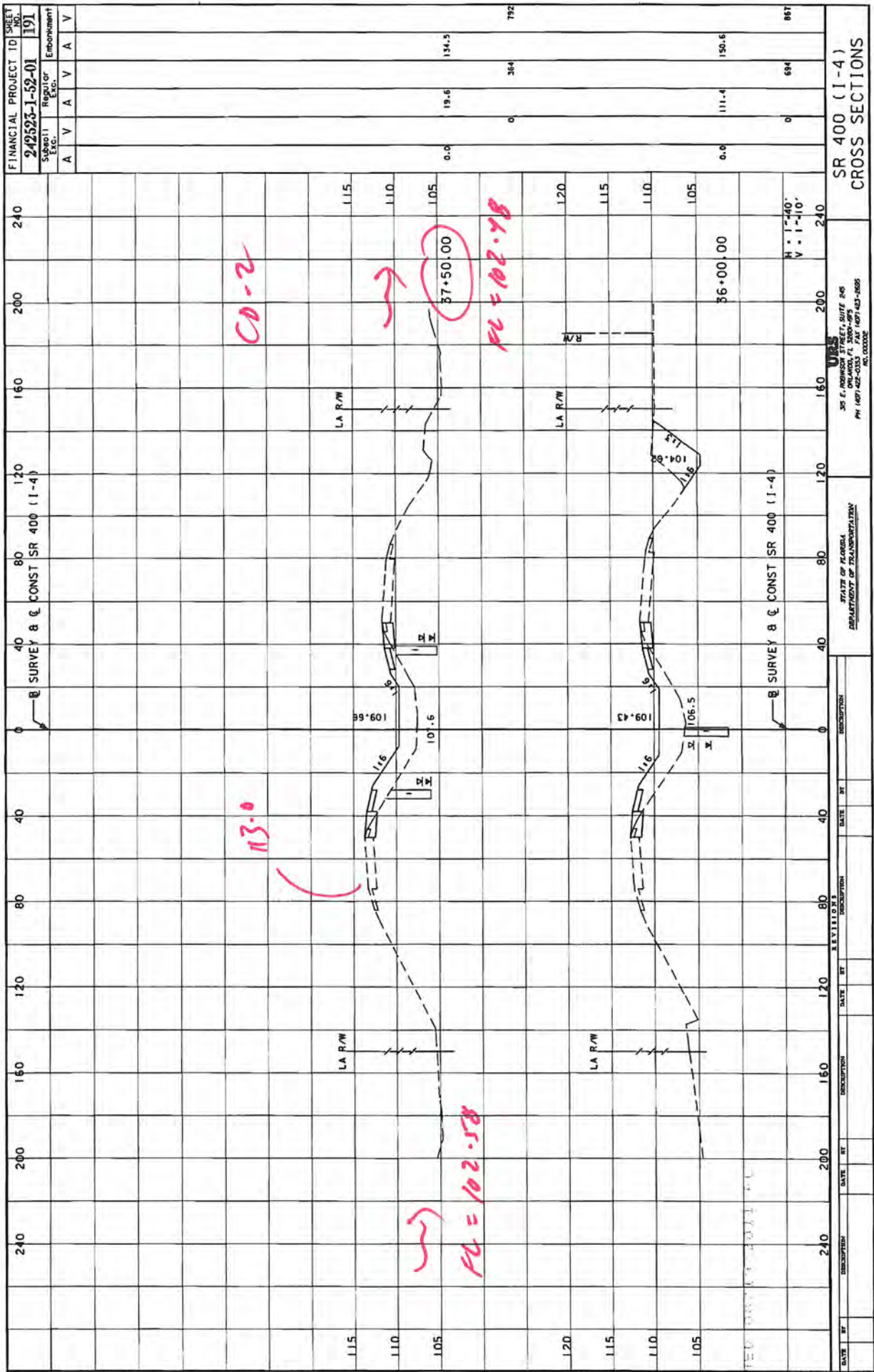
JULY 29, 1999
 H:\V1026403\DRAIN\DRMAPR1...JCN

DATE		BY		DESCRIPTION		DATE		BY		DESCRIPTION	

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION

URS
 315 E. ROBINSON STREET, SUITE 245
 ORLANDO, FL 32801-1975
 PH (407) 422-0353 - FAX (407) 423-2695
 NO. 000002

DRAINAGE MAP



DATE	DESCRIPTION	DATE	DESCRIPTION	DATE	DESCRIPTION	DATE	DESCRIPTION

SR 400 (I-4)
CROSS SECTIONS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

305 E. ROBINSON STREET, SUITE 245
TALLAHASSEE, FL 32304-3000
PH 904-437-2400 FAX 904-437-2408
WC 000000

UNIVERSITY OF FLORIDA

SR 400 (I-4)

36+00.00

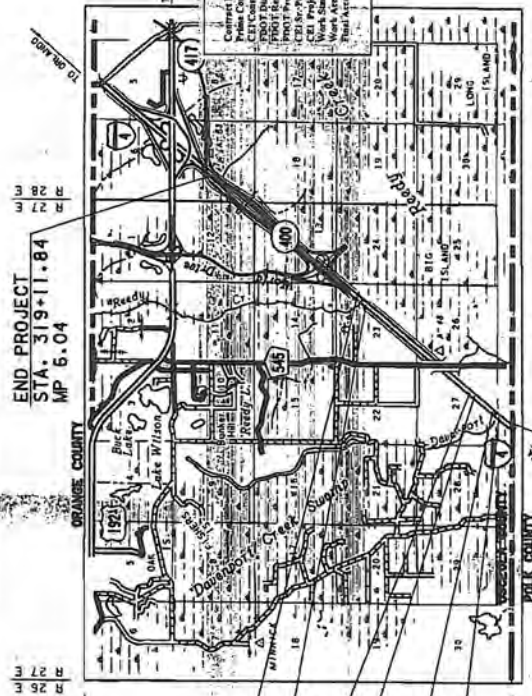
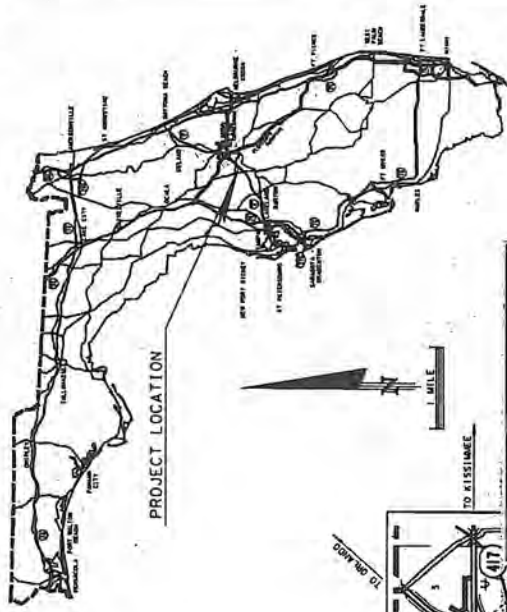
H = 1'-40"
V = 1'-10"

PLAN DATE: 02-28-10
DRAWN BY: JMM
CHECKED BY: JMM
SCALE: 1"=40'
PROJECT: SR 400 (I-4) CROSS SECTIONS

W.P.1. NO. 5147325

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
FINAL "AS-BUILT" PLANS
CONTRACT PLANS

FINANCIAL PROJECT ID 242523-1-52-01
 (FEDERAL FUNDS)
 OSCEOLA COUNTY (92130)
 STATE ROAD NO. 400



THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE FEDERAL AID ROAD ACT, 23 U.S.C. § 103, AND THE FEDERAL AID HIGHWAY ACT, 23 U.S.C. § 104, AS AMENDED BY CONTRACT DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS FROM THE APPROPRIATE AGENCIES AND LOCAL GOVERNMENTS.

ROADWAY SHOP DRAWINGS TO BE SUBMITTED TO:

URS

STEPHEN N. HOPPINGER, P.E.
 315 E. ROBINSON STREET, SUITE 245
 ORLANDO, FL. 32801-1949
 (407)422-0353
 (407)423-2895 (FAX)

PLANS PREPARED BY:

URS

315 E. ROBINSON STREET, SUITE 245
 ORLANDO, FL. 32801-1949
 (407)422-0353
 VENDOR NO. 53-2087895

NOTE: THIS PROJECT TO BE LET TO CONTRACT WITH FINANCIAL PROJECT ID 403497-5-52-01. THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

Stephen N. Hoppinger
 8/19/05
 APPROVED BY: STEPHEN N. HOPPINGER, P.E.
 P.E. NO. 33020

CO-3

- COMPONENTS OF CONTRACT PLANS SET:
- ROADWAY PLANS
 - SCHEMATIC AND PAVEMENT MARKING PLANS
 - ALIGNMENT PLANS
 - STRUCTURE PLANS
 - GRADE PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2-20	SUMMARY OF PLAN ITEMS
21-29	BOX-CULVERT DATA SHEETS
30-32	RECORD OF BORINGS FOR STRUCTURES
33-44	DRAINAGE MAP
45-46	EXISTING DRAINAGE STRUCTURES
47-51	TYPICAL SECTIONS
52	GENERAL NOTES AND PAY-ITEM NOTES
53-54	SUMMARY OF DRAINAGE STRUCTURES
55-63	OPTIONAL PIPE MATERIAL TABULATIONS
64-66	REFERENCE TABLES
67-89	ROADWAY PLANS
90-106	ROADWAY PROFILES
107-108	SPECIAL GUTTER PROFILES
109-116	RAMP TYPICAL DETAILS
117-130	POND DETAILS
131-132	TYPICAL DRAINAGE STRUCTURES
133	DRAINAGE DETAILS
134-180	DRAINAGE STRUCTURE CROSS SECTIONS
181-183	POND OUT-ALL PLAN / PROFILE
184	ROADWAY EARTH SURVEY
185-326	CROSS SECTIONS
327-372	POND CROSS SECTIONS
373	GENERAL PAVING NOTES
374-325	PAVING ROUGHENING
326-335	STANDARD SPECIFICATION DRAWING NOTES
336-413	STRUCTURE CONSTRUCTION NOTES
414-430	UTILITY APPROPRIATION DETAILS

GOVERNING STANDARDS AND SPECIFICATIONS: FLORIDA DEPARTMENT OF TRANSPORTATION, DESIGN STANDARDS DATED JANUARY 2002 AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE AS AMENDED BY CONTRACT DOCUMENTS.

REVISIONS

- FINANCIAL PROJECT ID 242523-1-52-01
- ROADWAY SHEETS 1, 2, 2A, 8, 2B (REVISED 12-16-02)
- ROADWAY SHEETS 8, 2A (REVISED 3-1-03)
- SCHEMATIC AND PAVEMENT MARKING SHEETS 3-3-3 (REVISED 4-23-04)
- PAVEMENT AND PAVEMENT MARKING SHEETS 3-3-3 (REVISED 4-23-04)
- STRUCTURE SHEETS 61-64, 65, 66, 67, 68, 69 (REVISED 6-06-05)
- STRUCTURE SHEETS 61-64, 65, 66, 67, 68, 69 (REVISED 6-06-05)
- ROADWAY SHEETS 1-47, 48, 49, 51, 54, 57, 67, 73, 79, 80, 83, 84 (REVISED 4-28-05)
- THRU 326 AND 372 (REVISED 2-12-04)
- ROADWAY SHEETS 54A, 68, 69, 70, 71, 72, 73, 79, 80, 83, 84 (REVISED 4-28-05)
- ROADWAY SHEETS 54A, 68, 69, 70, 71, 72, 73, 79, 80, 83, 84 (REVISED 4-28-05)
- SCHEMATIC AND PAVEMENT MARKING SHEETS 3-3-3 (REVISED 4-23-04)
- PAVEMENT AND PAVEMENT MARKING SHEETS 3-3-3 (REVISED 4-23-04)
- ROADWAY SHEETS 1, 2, 2A, 8, 2B (REVISED 12-16-02)
- SCHEMATIC AND PAVEMENT MARKING SHEETS 3-3-3 (REVISED 4-23-04)
- PAVEMENT AND PAVEMENT MARKING SHEETS 3-3-3 (REVISED 4-23-04)
- STRUCTURE SHEETS 61-64, 65, 66, 67, 68, 69 (REVISED 6-06-05)
- STRUCTURE SHEETS 61-64, 65, 66, 67, 68, 69 (REVISED 6-06-05)

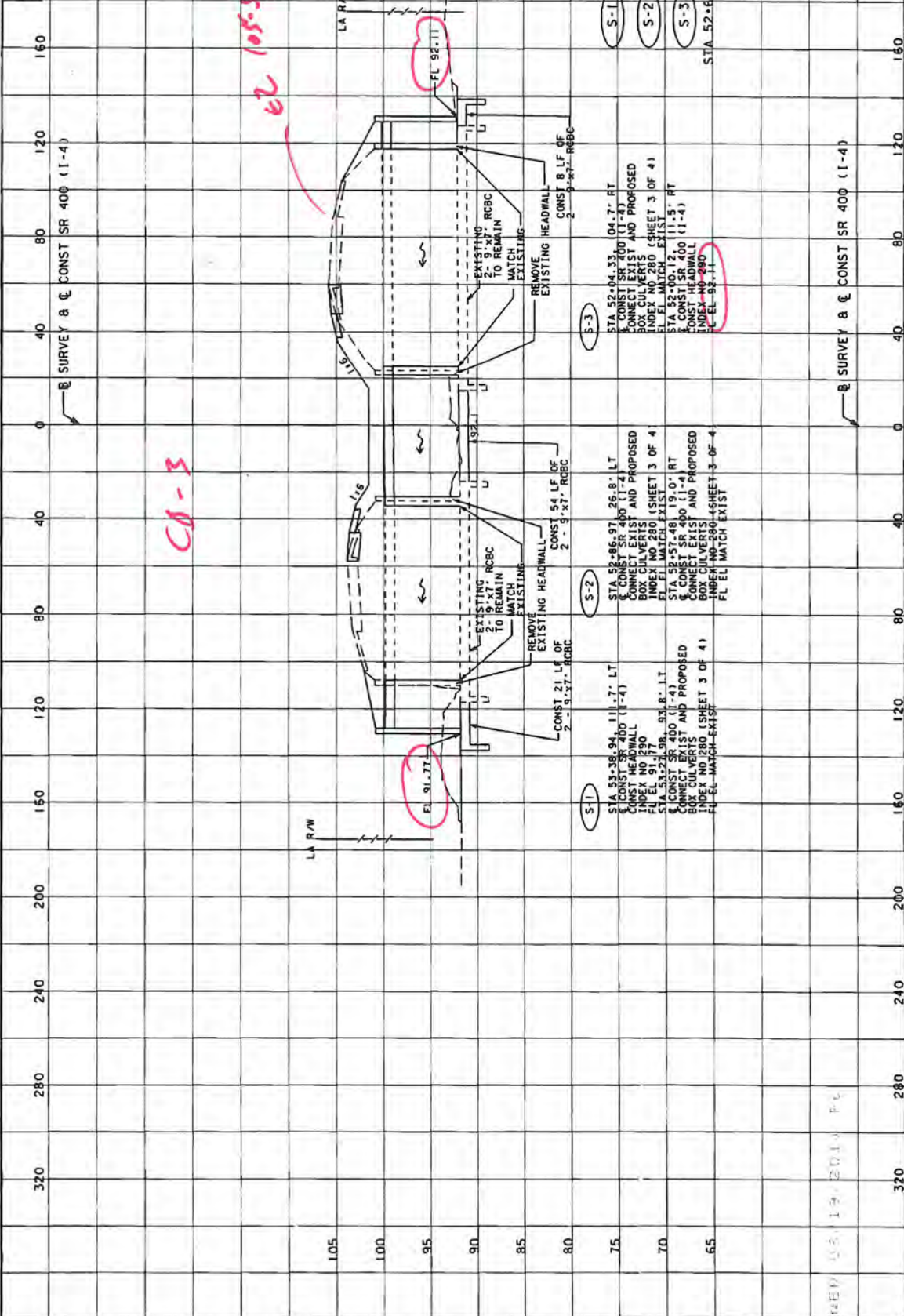
BEGIN PROJECT: STA. 2160+08.95 (BK) B. SURVEY 8 C. CONST. SR. 400 (I-4)
 END PROJECT: STA. 611+26 (AH) B. SURVEY 8 C. CONST. SR. 400 (I-4)

LINEAR FT.	MILES
311,506.84	5.967
405.08	0.017
311,911.84	6.034
6,034.00	0.112
311,917.84	6.041

LENGTH OF PROJECT

LINEAR FT.	MILES
311,506.84	5.967
405.08	0.017
311,911.84	6.034
6,034.00	0.112
311,917.84	6.041

FDOT PROJECT MANAGER: MR. ALAN LEDGERWOOD



CA-3

22 105.5

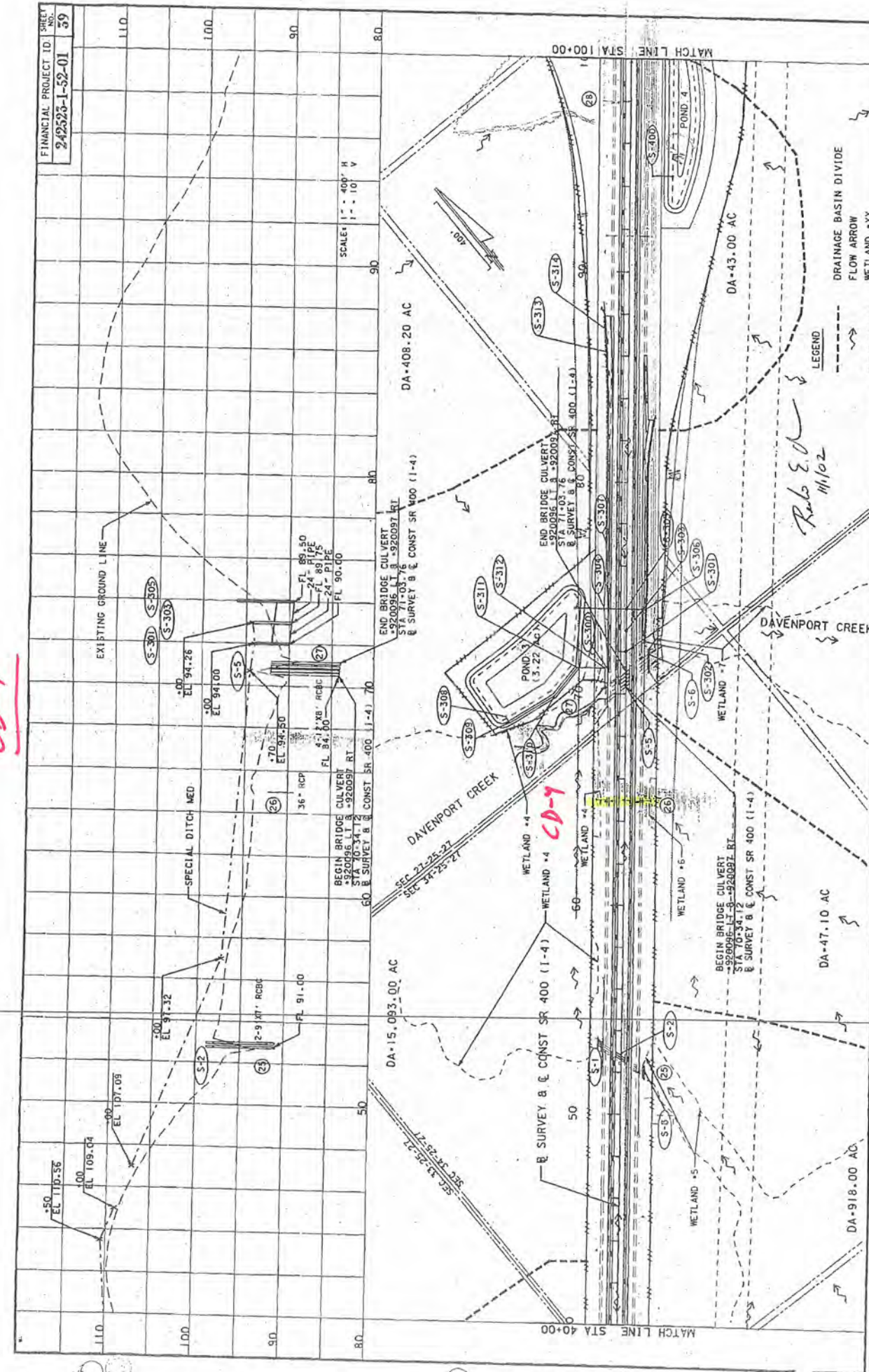
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

SR 400 (1-4)
DRAINAGE STRUCTURE
CROSS SECTIONS

URS
35 E. PALM BLVD, SUITE 240
OKLAHOOKE, FL 33067-2071
PH (904) 422-0353 FAX (904) 422-0685
REL 000026

FINANCIAL PROJECT ID SHEET NO.
 242523-1-52-01 59



CD-4

*Rob E. O'Neil
11/10/02*

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

LEGEND
 DRAINAGE BASIN DIVIDE
 FLOW ARROW
 WETLAND +XX

STATES OF FLORIDA
 DEPARTMENT OF TRANSPORTATION

35 S. HENRY STREET, SUITE 245
 ORLANDO, FL 32801-2905
 PH: (407) 457-6500 FAX: (407) 457-3066

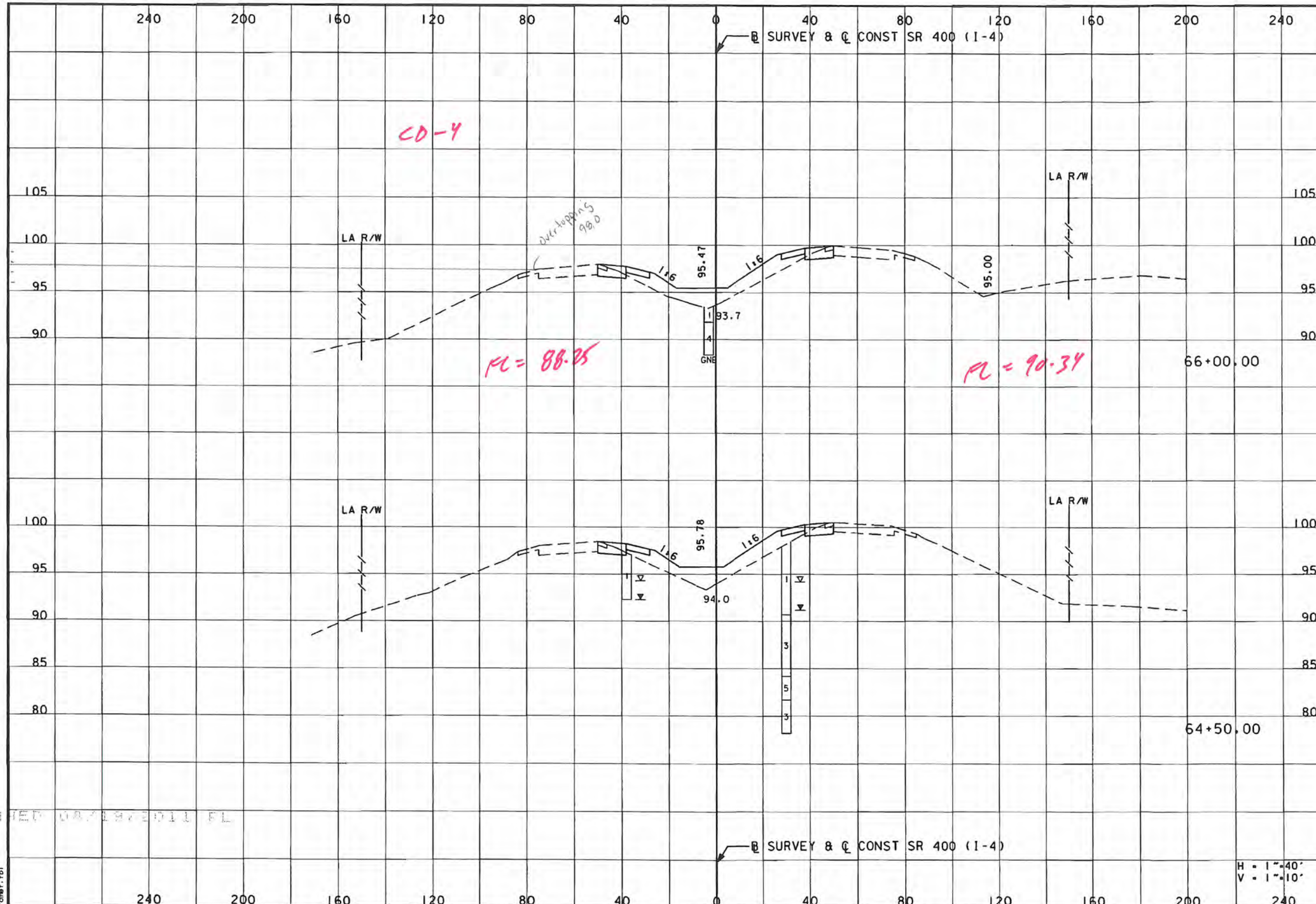
SCALE: 1" = 400' H
 1" = 10' V

MATCH LINE STA 100+00

MATCH LINE STA 40+00

DRAINAGE MAP

Subsoil Exc.		Regular Exc.		Embankment	
A	V	A	V	A	V



0.0	0	21.0	0	103.1	0
0.0	0	20.9	0	107.7	0
			116		585
			118		625

H = 1"=40'
V = 1"=10'

REVISIONS							
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY

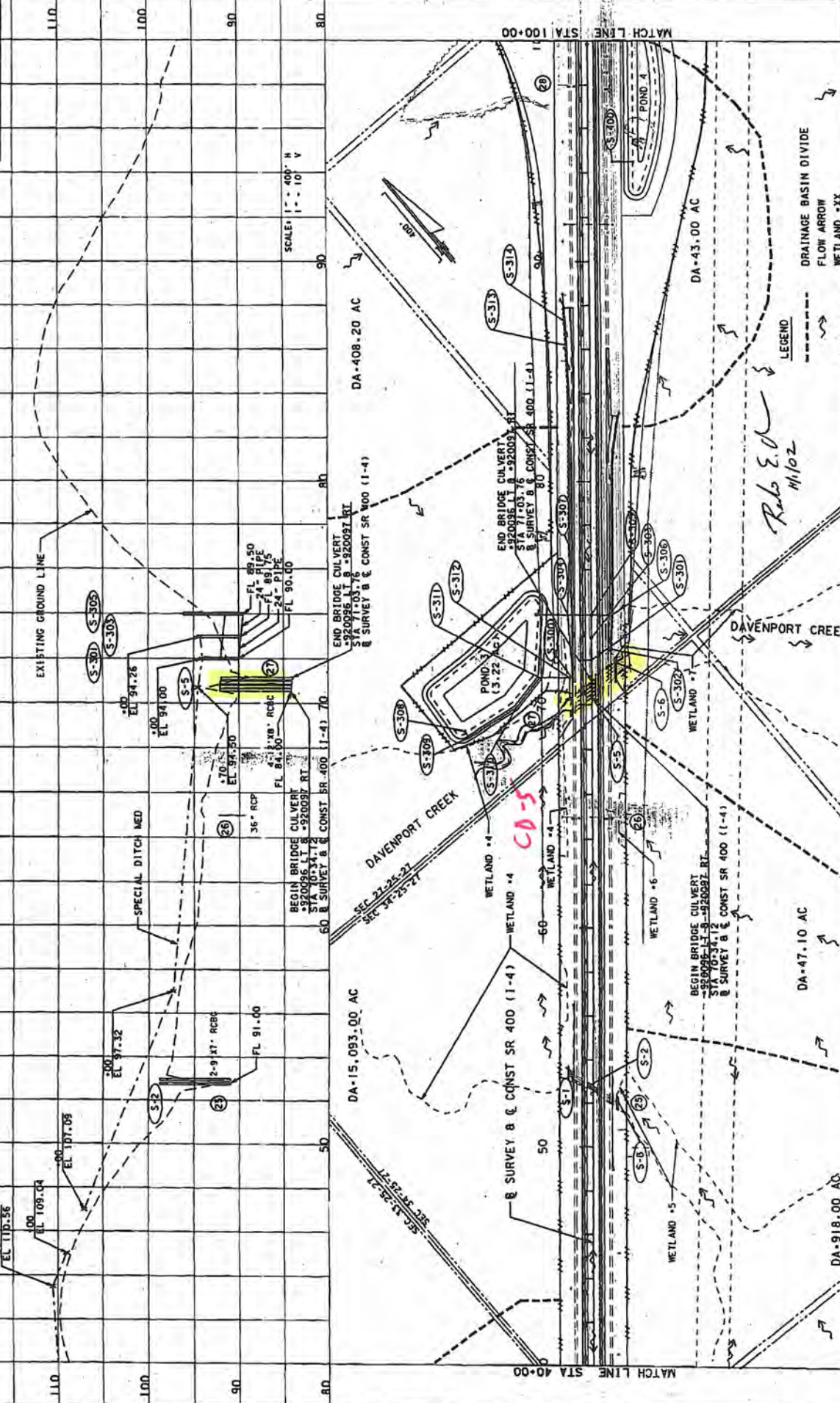
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

URS
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1975
PH (407) 422-0353 FAX (407) 423-2695
NO. 000002

SR 400 (1-4)
CROSS SECTIONS

Mon Oct 29 10:30:33
H:\1026403\XSECT\01\01.dgn
SAWD_NTI_SPOOL_VL012_Vracer027.prf
F:\TABLE\1\rdmet.tbl

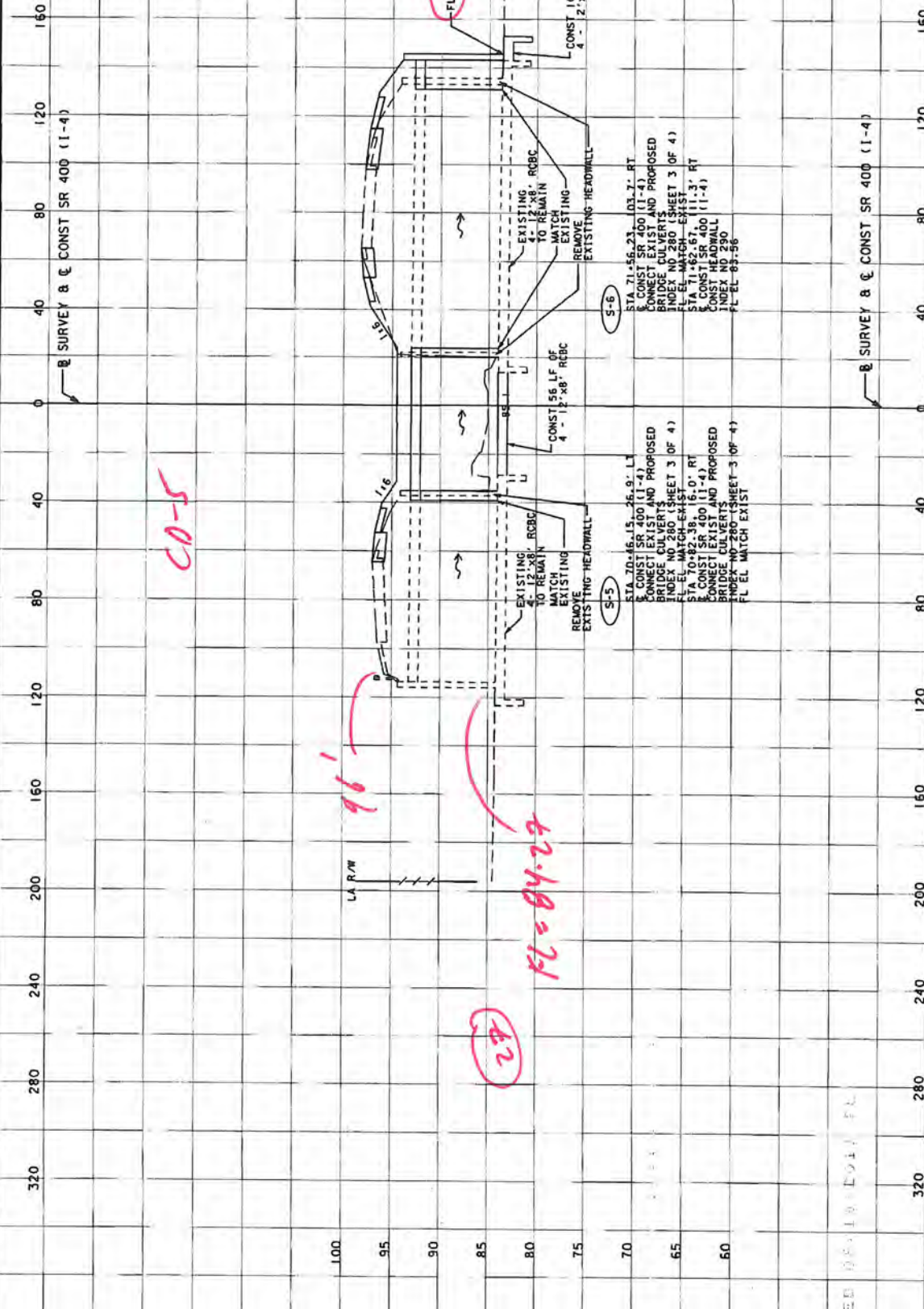
FINANCIAL PROJECT ID: 242523-1-52-01
 SHEET NO. 59



CD-5

DATE	DESCRIPTION	DATE	DESCRIPTION	DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
 34 S. RAYBOLD STREET, SUITE 800
 TAMPA, FL 33604-8899
 PH: (813) 944-1000
 FAX: (813) 944-1000
 DRAINAGE MAP



CO-5

27

FL = 84.27

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

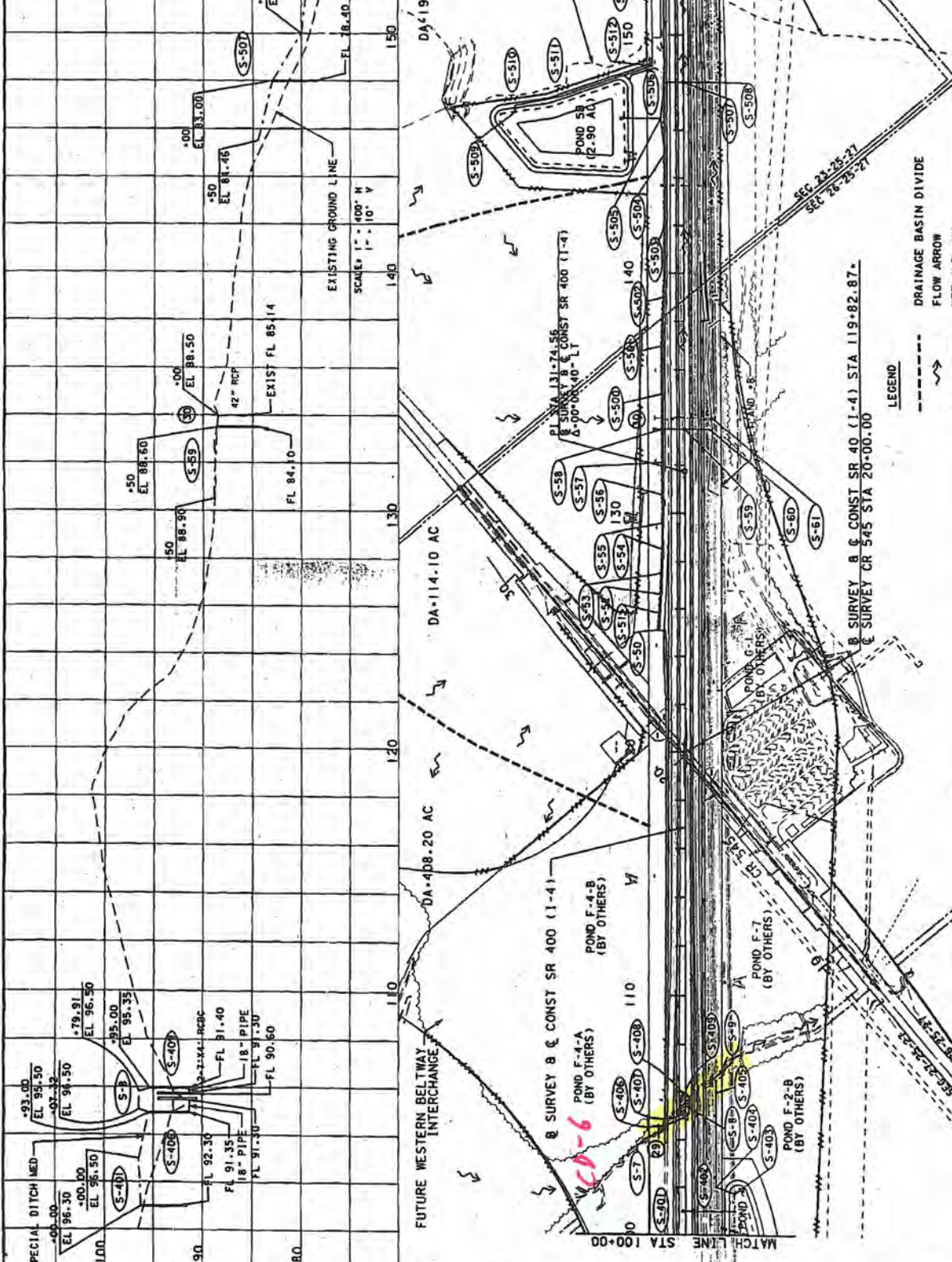
SR 400 (1-4)
 DRAINAGE STRUCTURE
 CROSS SECTIONS

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
 305 F. ROBINSON STREET, SUITE 840
 PALM BEACH, FLORIDA 33401-1000
 PH: (407) 421-3000 FAX: (407) 421-3005
 WWW.FDOT.COM

CO-6

FINANCIAL PROJECT ID
24253-1-52-01

SHEET NO.
40



B SURVEY B & CONST SR 40 (1-4) STA 119+82.87-
 & SURVEY CR 545 STA 20+00.00

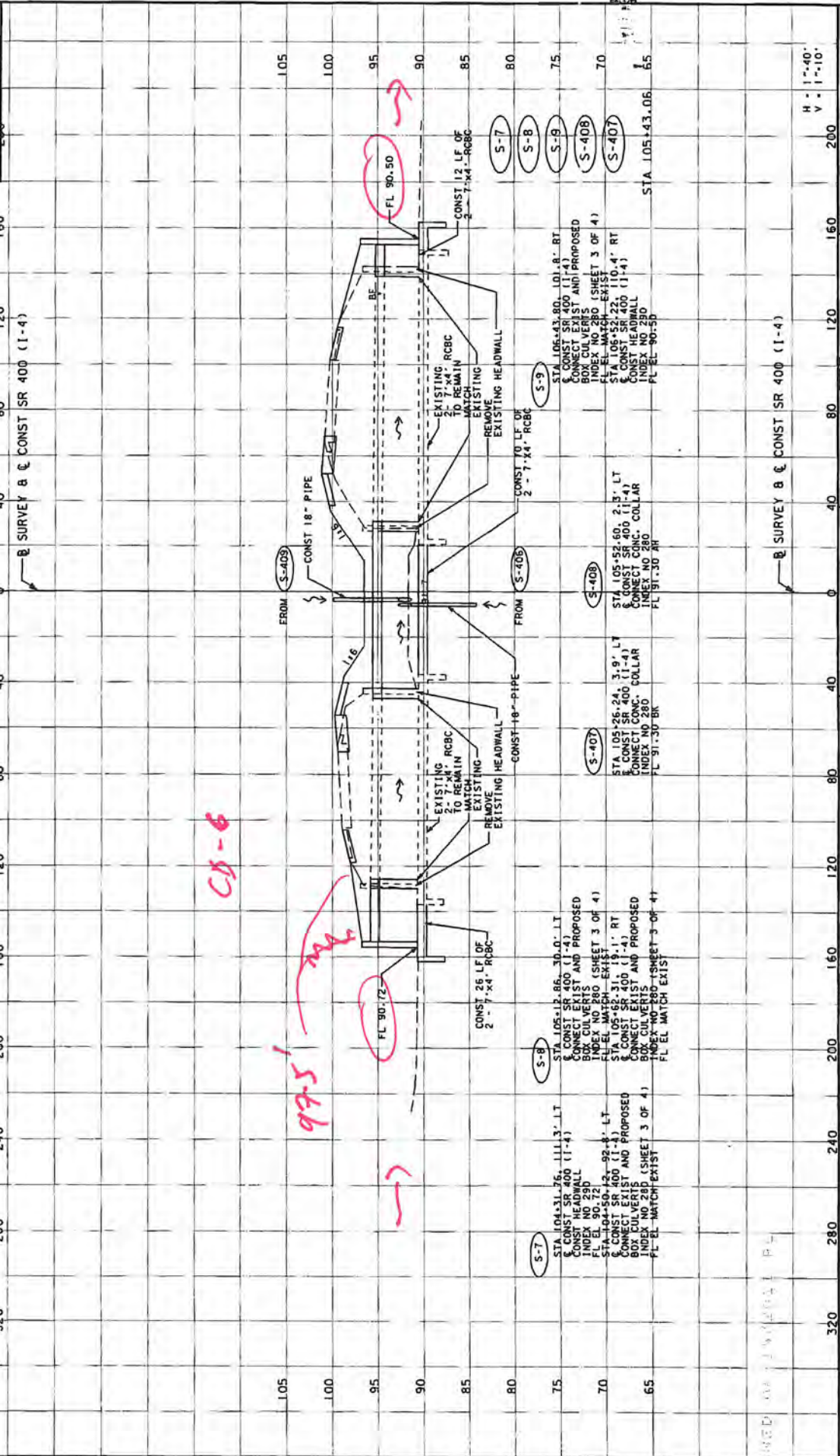
LEGEND
 --- DRAINAGE BASIN DIVIDE
 --- FLOW ARROW
 --- WETLAND -XX

DRAINAGE MAP

UNIVERSITY OF FLORIDA
 30 S. GARDNER BLVD
 GAINESVILLE, FL 32611-8700
 PH: 352-392-0000 FAX: 352-392-0000

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION



DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

SR 400 (1-4)
DRAINAGE STRUCTURE
CROSS SECTIONS

H - 1'-40"
V - 1'-10"

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
30 E. ADAM STREET, SUITE 849
PALM BEACH, FL 33481
PH (407) 424-3333 FAX (407) 423-8885
65, 000000

CD-7

FINANCIAL PROJECT ID NO.
24253-1-52-01
40



Rab Ed
11/1/02

DRAINAGE MAP

UNIVERSITY OF FLORIDA
STATE ROAD 110
GAINESVILLE, FL 32611-8000
PH 352-392-3000 FAX 352-392-3005
35-000000

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

- LEGEND
- DRAINAGE BASIN DIVIDE
 - FLOW ARROW
 - WETLAND -XX

B SURVEY 8 & CONST SR 40 (1-4) STA 119+82.87+
& SURVEY CR 545 STA 20+00.00

B SURVEY 8 & CONST SR 400 (1-4)
POND F-4-A (BY OTHERS)
POND F-4-B (BY OTHERS)

POND F-7 (BY OTHERS)

POND F-2-B (BY OTHERS)

POND C-1 (BY OTHERS)

POND C-2 (BY OTHERS)

POND C-3 (BY OTHERS)

POND C-4 (BY OTHERS)

POND C-5 (BY OTHERS)

POND C-6 (BY OTHERS)

POND C-7 (BY OTHERS)

POND C-8 (BY OTHERS)

POND C-9 (BY OTHERS)

POND C-10 (BY OTHERS)

POND C-11 (BY OTHERS)

POND C-12 (BY OTHERS)

POND C-13 (BY OTHERS)

POND C-14 (BY OTHERS)

POND C-15 (BY OTHERS)

POND C-16 (BY OTHERS)

POND C-17 (BY OTHERS)

POND C-18 (BY OTHERS)

POND C-19 (BY OTHERS)

POND C-20 (BY OTHERS)

POND C-21 (BY OTHERS)

POND C-22 (BY OTHERS)

POND C-23 (BY OTHERS)

POND C-24 (BY OTHERS)

POND C-25 (BY OTHERS)

POND C-26 (BY OTHERS)

POND C-27 (BY OTHERS)

POND C-28 (BY OTHERS)

POND C-29 (BY OTHERS)

POND C-30 (BY OTHERS)

POND C-31 (BY OTHERS)

POND C-32 (BY OTHERS)

POND C-33 (BY OTHERS)

POND C-34 (BY OTHERS)

POND C-35 (BY OTHERS)

POND C-36 (BY OTHERS)

POND C-37 (BY OTHERS)

POND C-38 (BY OTHERS)

POND C-39 (BY OTHERS)

POND C-40 (BY OTHERS)

POND C-41 (BY OTHERS)

POND C-42 (BY OTHERS)

POND C-43 (BY OTHERS)

POND C-44 (BY OTHERS)

POND C-45 (BY OTHERS)

POND C-46 (BY OTHERS)

POND C-47 (BY OTHERS)

POND C-48 (BY OTHERS)

POND C-49 (BY OTHERS)

POND C-50 (BY OTHERS)

POND C-51 (BY OTHERS)

POND C-52 (BY OTHERS)

POND C-53 (BY OTHERS)

POND C-54 (BY OTHERS)

POND C-55 (BY OTHERS)

POND C-56 (BY OTHERS)

POND C-57 (BY OTHERS)

POND C-58 (BY OTHERS)

POND C-59 (BY OTHERS)

POND C-60 (BY OTHERS)

POND C-61 (BY OTHERS)

POND C-62 (BY OTHERS)

POND C-63 (BY OTHERS)

POND C-64 (BY OTHERS)

POND C-65 (BY OTHERS)

POND C-66 (BY OTHERS)

POND C-67 (BY OTHERS)

POND C-68 (BY OTHERS)

POND C-69 (BY OTHERS)

POND C-70 (BY OTHERS)

POND C-71 (BY OTHERS)

POND C-72 (BY OTHERS)

POND C-73 (BY OTHERS)

POND C-74 (BY OTHERS)

POND C-75 (BY OTHERS)

POND C-76 (BY OTHERS)

POND C-77 (BY OTHERS)

POND C-78 (BY OTHERS)

POND C-79 (BY OTHERS)

POND C-80 (BY OTHERS)

POND C-81 (BY OTHERS)

POND C-82 (BY OTHERS)

POND C-83 (BY OTHERS)

POND C-84 (BY OTHERS)

POND C-85 (BY OTHERS)

POND C-86 (BY OTHERS)

POND C-87 (BY OTHERS)

POND C-88 (BY OTHERS)

POND C-89 (BY OTHERS)

POND C-90 (BY OTHERS)

POND C-91 (BY OTHERS)

POND C-92 (BY OTHERS)

POND C-93 (BY OTHERS)

POND C-94 (BY OTHERS)

POND C-95 (BY OTHERS)

POND C-96 (BY OTHERS)

POND C-97 (BY OTHERS)

POND C-98 (BY OTHERS)

POND C-99 (BY OTHERS)

POND C-100 (BY OTHERS)

1	18" RCP N FL 114.75 S FL 117.19 INLET GRATE EL 121.05	17	18" RCP N FL 110.13 S FL 112.27 INLET GRATE EL 121.05	34	18" RCP N FL 109.86 S FL 112.91 INLET GRATE EL 132.10	51	24" RCP STRUCTURE GRATE EL 77.12 LAS BUILT DRAWINGS N FL 74.08 S FL 74.08	68	18" RCP N FL 75.76 S FL 75.76 INLET GRATE EL 80.20	85	18" RCP N FL 77.91 S FL 77.91 INLET GRATE EL 84.89
2	18" RCP N FL 114.84 S FL 116.84 INLET GRATE EL 121.37	18	18" RCP N FL 119.61 S FL 117.87 INLET GRATE EL 123.59	35	18" RCP N FL 112.91 S FL 112.70 INLET GRATE EL 132.05	52	18" RCP N FL 74.25 S FL 74.25 INLET GRATE EL 80.20	69	18" RCP N FL 77.94 S FL 77.94 INLET GRATE EL 85.72	86	18" RCP N FL 77.34 S FL 77.34 INLET GRATE EL 84.47
3	18" RCP N FL 112.15 S FL 112.55 INLET GRATE EL 121.37	19	18" RCP N FL 116.10 S FL 120.68 INLET GRATE EL 123.59	36	18" RCP N FL 109.86 S FL 112.91 INLET GRATE EL 132.10	53	18" RCP N FL 75.41 S FL 75.41 INLET GRATE EL 80.20	70	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	87	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
4	18" RCP N FL 119.32 S FL 117.32 INLET GRATE EL 121.37	20	24" RCP N FL 109.86 S FL 112.91 INLET GRATE EL 132.05	37	18" RCP N FL 112.91 S FL 112.70 INLET GRATE EL 132.05	54	18" RCP N FL 74.18 S FL 74.18 INLET GRATE EL 80.20	71	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	88	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
5	18" RCP N FL 110.28 S FL 120.24 INLET GRATE EL 132.10	21	15" RCP N FL 112.91 S FL 112.70 INLET GRATE EL 132.05	38	18" RCP N FL 114.74 S FL 114.74 INLET GRATE EL 132.10	55	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	72	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	89	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
6	24" RCP N FL 109.86 S FL 112.91 INLET GRATE EL 132.05	22	18" RCP N FL 109.86 S FL 112.91 INLET GRATE EL 132.05	39	18" RCP N FL 114.74 S FL 114.74 INLET GRATE EL 132.10	56	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	73	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	90	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
7	18" RCP N FL 109.86 S FL 109.68 INLET GRATE EL 111.99	23	30" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	40	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	57	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	74	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	91	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
8	18" RCP N FL 112.85 S FL 112.61 INLET GRATE EL 112.95	24	DOUBLE 48" RCP N FL 102.38 S FL 102.38 INLET GRATE EL 102.38	41	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	58	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	75	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	92	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
9	24" RCP N FL 110.95 S FL 110.95 INLET GRATE EL 113.45	25	18" RCP N FL 102.38 S FL 102.38 INLET GRATE EL 102.38	42	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	59	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	76	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	93	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
10	18" RCP N FL 110.95 S FL 110.95 INLET GRATE EL 113.45	26	DOUBLE 9" X 1' RCBC N FL 91.64 S FL 91.64 INLET GRATE EL 91.64	43	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	60	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	77	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	94	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
11	18" RCP N FL 111.20 S FL 111.20 INLET GRATE EL 112.89	27	18" RCP N FL 91.64 S FL 91.64 INLET GRATE EL 91.64	44	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	61	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	78	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	95	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
12	18" RCP N FL 127.77 S FL 127.45 INLET GRATE EL 131.22	28	36" RCP N FL 86.25 S FL 80.34 INLET GRATE EL 93.23	45	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	62	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	79	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	96	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
13	18" RCP N FL 114.33 S FL 114.59 INLET GRATE EL 118.12	29	QUADRUPLE 12" X 8" RCBC N FL 84.24 S FL 84.24 INLET GRATE EL 84.24	46	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	63	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	80	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	97	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
14	18" RCP N FL 114.72 S FL 114.85 INLET GRATE EL 118.12	30	18" RCP N FL 84.24 S FL 84.24 INLET GRATE EL 84.24	47	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	64	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	81	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	98	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
15	18" RCP N FL 129.18 S FL 119.22 INLET GRATE EL 133.07	31	18" RCP N FL 84.24 S FL 84.24 INLET GRATE EL 84.24	48	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	65	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	82	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	99	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89
16	18" RCP N FL 113.59 S FL 128.25 INLET GRATE EL 132.00	32	18" RCP N FL 84.24 S FL 84.24 INLET GRATE EL 84.24	49	18" RCP N FL 109.86 S FL 105.05 INLET GRATE EL 111.78	66	18" RCP N FL 73.05 S FL 73.05 INLET GRATE EL 80.20	83	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89	100	18" RCP N FL 77.48 S FL 77.48 INLET GRATE EL 84.89

CD-7

Rob E. H
4/1/02

EXISTING DRAINAGE STRUCTURES

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DATE: 4/1/02
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]

DATE: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]

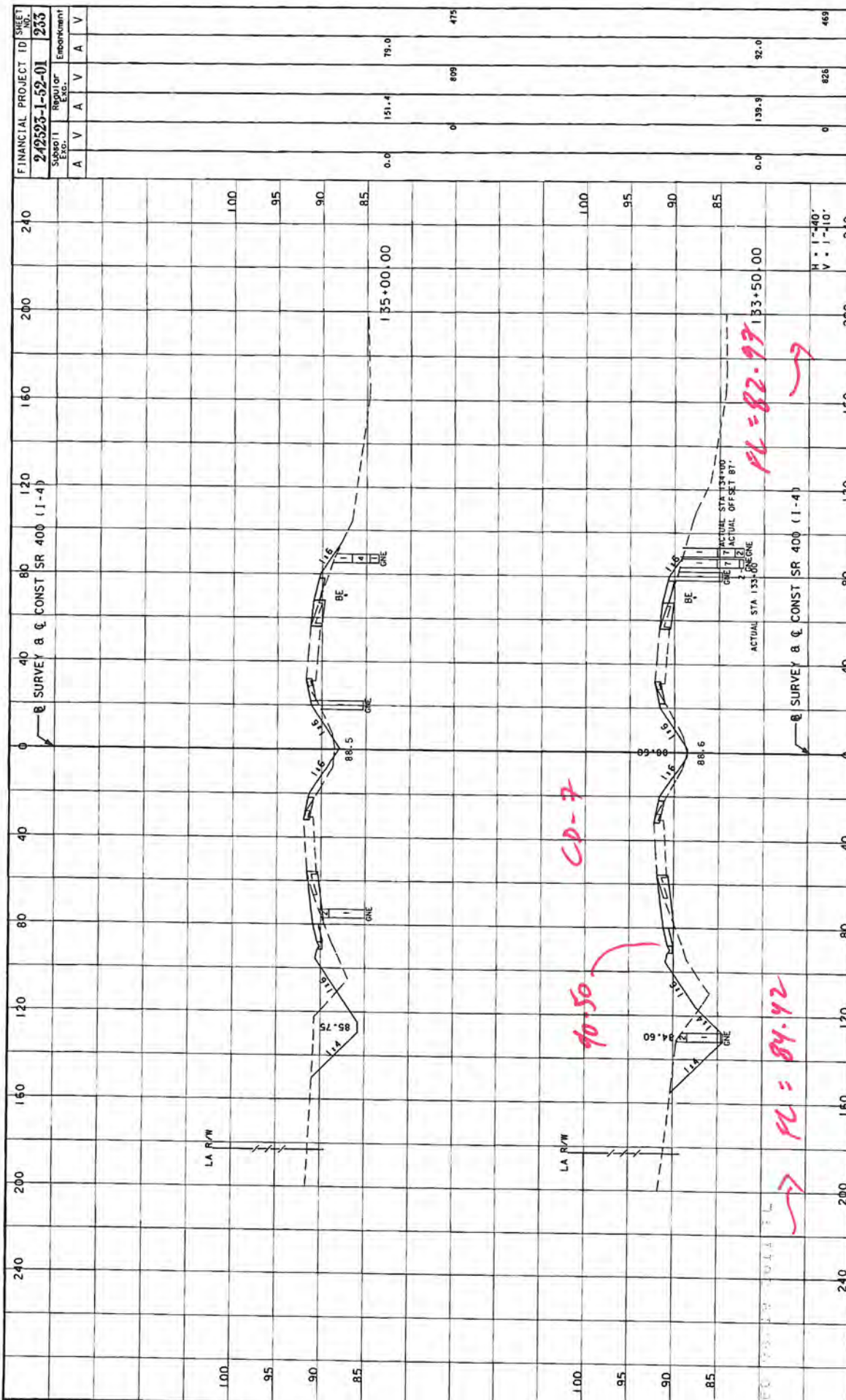
DATE: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]

DATE: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]

DATE: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]

DATE: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]

DATE: [blank]
DRAWN BY: [blank]
CHECKED BY: [blank]
APPROVED BY: [blank]



FINANCIAL PROJECT ID		SHEET NO.	
242523-1-52-01		233	
EXC.	CONV.	EMB.	EMB.
A	V	A	V
A	V	A	V
A	V	A	V
0.0	151.4	79.0	475
0.0	0	809	475
0.0	138.9	92.0	469
0	0	826	469

STATE OF FLORIDA
 DEPARTMENT OF TRANSPORTATION
 SR 400 (I-4)
 CROSS SECTIONS

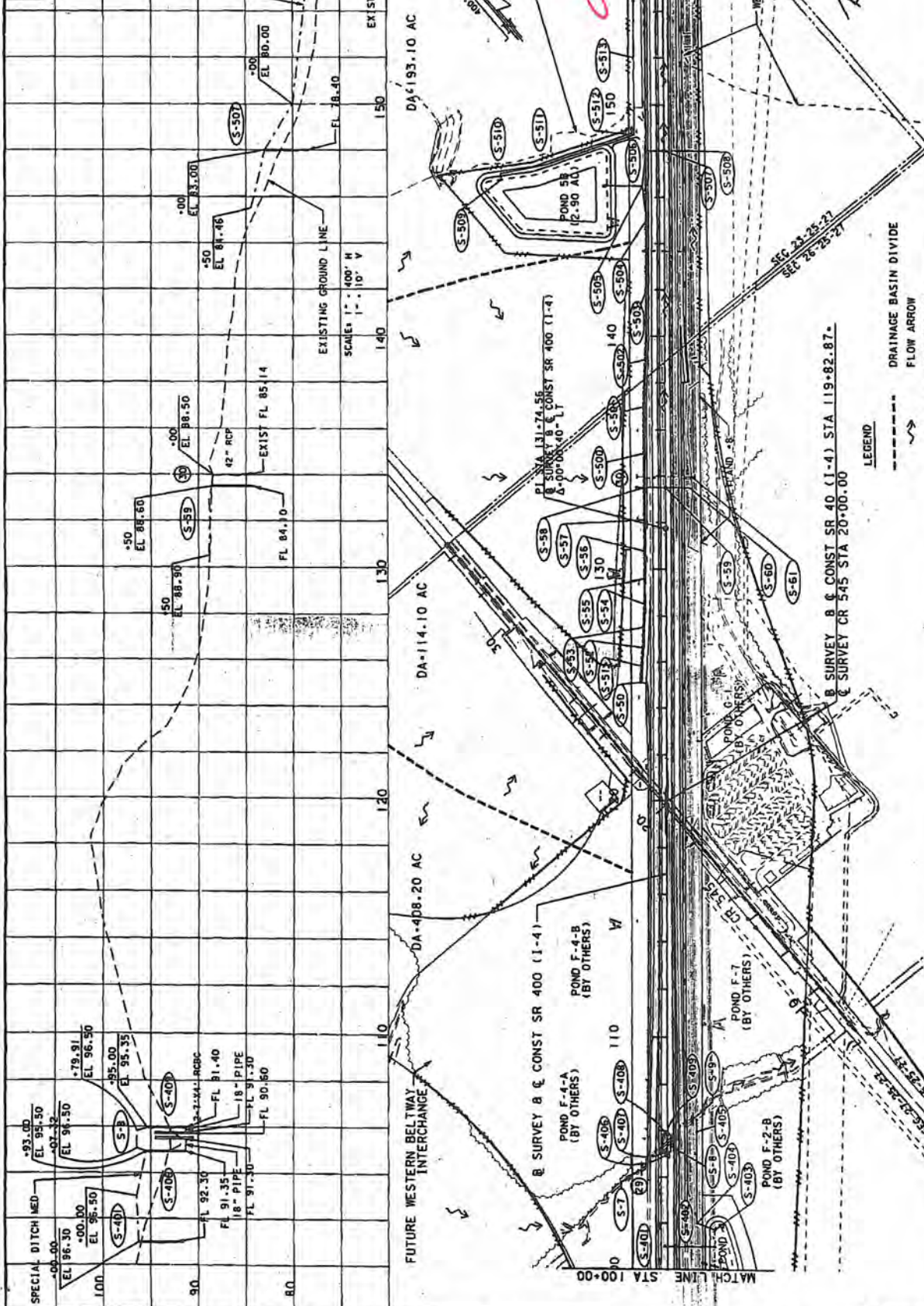
305 E. ROBINSON STREET, SUITE 245
 ORLANDO, FL 32801-9955
 PH 407-421-3000 FAX 407-421-3000

DATE BY DESCRIPTION DATE BY DESCRIPTION DATE BY DESCRIPTION DATE BY DESCRIPTION

DATE BY DESCRIPTION DATE BY DESCRIPTION DATE BY DESCRIPTION DATE BY DESCRIPTION

CD-8

FINANCIAL PROJECT ID
242523-1-52-01
SHEET NO.
40



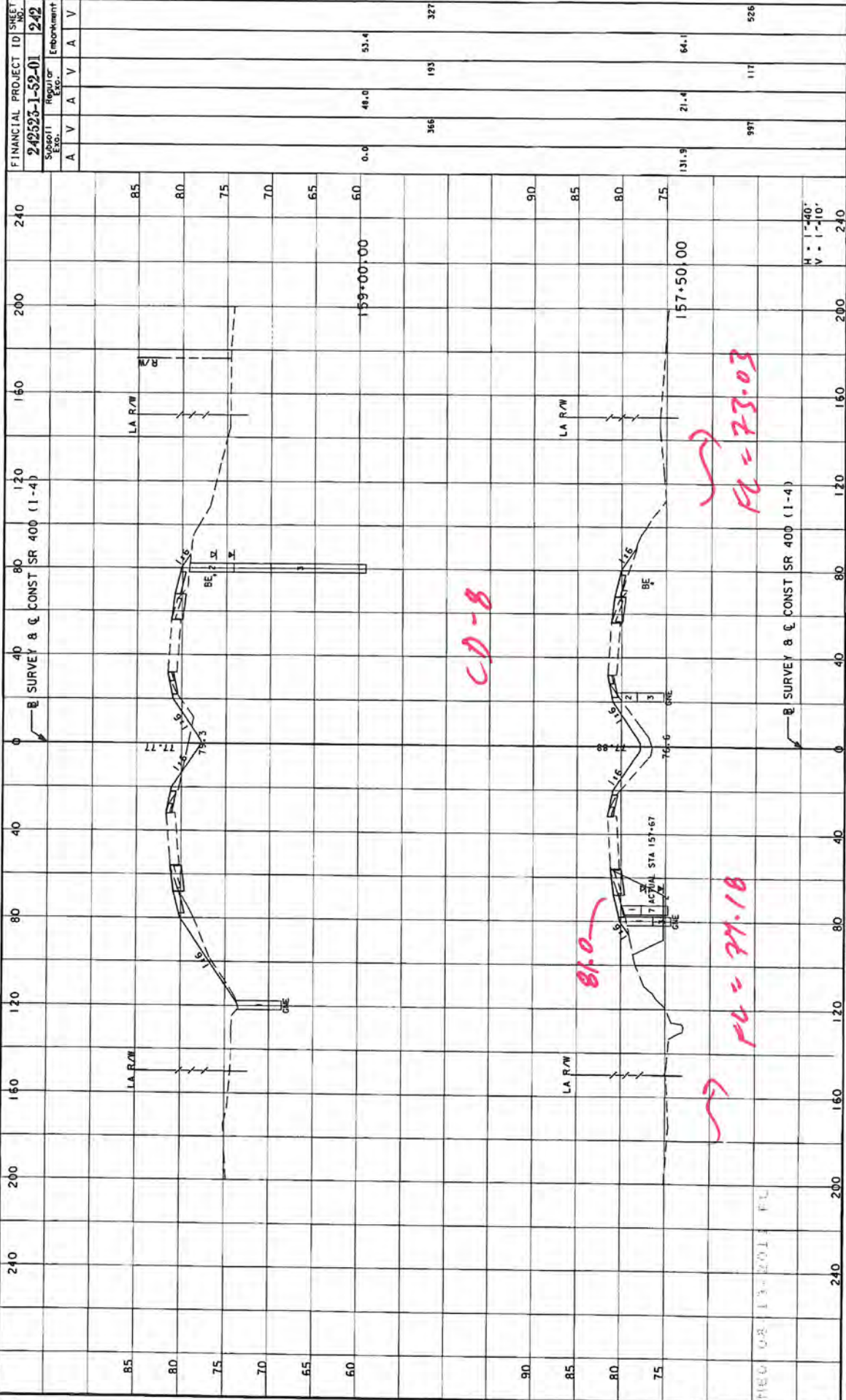
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

LEGEND

- DRAINAGE BASIN DIVIDE
- FLOW ARROW
- WETLAND -XX

UNIT INFORMATION

UNIVERSITY SURVEY AND MAPPING
 56 E. BROADWAY, 11th FLOOR, SUITE 1100
 PH: 407-622-2222 FAX: 407-622-2229
 WWW.UMS.USF.EDU



FINANCIAL PROJECT ID		SHEET NO.	
242523-1-52-01		242	
Subsoil		Regulator	Embarkment
A	V	A	V

STATION	DATE	DESCRIPTION	DATE	BY	DATE	BY
240						
200						
160						
120						
80						
40						
0						

SR 400 (I-4)
CROSS SECTIONS

STATE OF ALABAMA
DEPARTMENT OF TRANSPORTATION

305 E. ARNOLD STREET, SUITE 205
DUNALOO, FL 32009-0797
PH (904) 487-6200 FAX (904) 487-6205

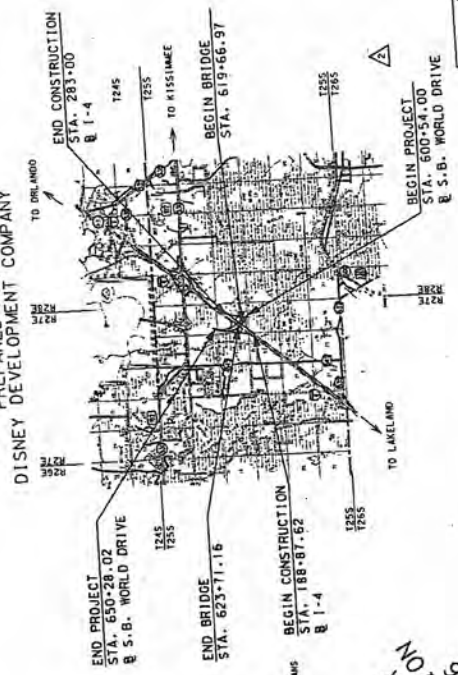
CD-9

1734
96
1



PLANS OF PROPOSED
WORLD DRIVE EXTENSION / I-4 INTERCHANGE
 STATE PROJECT NO. 92130-1426
 CONSTRUCTION PACKAGE NO. 3
 PROJECT NUMBER 3A
 OSCEOLA COUNTY, FLORIDA

PREPARED FOR:
 DISNEY DEVELOPMENT COMPANY



THIS CONTRACT PLAN SET INCLUDES:
 ROADWAY PLANS
 GRADING & MARKING PLANS
 LIGHTING PLANS
 STRUCTURAL PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET
 OF EACH COMPONENT SET OF PLANS

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	SUMMARY OF PAY ITEMS
3	BOX CULVERT DATA SHEETS
4	SUPPLEMENTAL INDEX MAP
5	SECTIONAL DETAILS
6	SUMMARY OF QUANTITIES
7	SUMMARY OF STRUCTURES
8	PROJECT LAYOUT
9	REFERENCE TIES
10	PROFILES
11	INTERCHANGE LAYOUT
12	CURVE GEOMETRIC DETAILS
13	TYPICAL ORNAMENTAL STRUCTURES
14	POND PLANS
15	SOIL BORING LOCATION PLAN
16	SOIL BORING LOGS
17	SWAMPY AREA
18	CROSS SECTIONS
19	TRAFFIC SIGNAL PLANS
20	STANDARD SPECIFICATIONS
21	FLOODPLAIN PROTECTION PRELIMINARY PLANS
22	FLOODPLAIN PROTECTION DETAILS
23	INTEREST STANDARD
24	241 - 248

ISSUED FOR
 CONSTRUCTION
 3/11/96

ROADWAY PLANS
 ENGINEER OF RECORD
 FROW, YASSI M. MYERS, P.E.
 CORRAL, CHRIS LYNCH, P.E.

PLANS PREPARED BY
 HOWARD J. YASSI & BERGENHOFF
 ORLANDO, FL 32822
 (407) 859-8380

ATTENTION IS DIRECTED TO THE FACT THAT
 THESE PLANS HAVE BEEN REDUCED IN
 SIZE BY REPRODUCING UNLESS SCALED DATA.
 CONGRESSIONAL REPRESENTATIVE, STATE OF FLORIDA,
 DEPARTMENT OF TRANSPORTATION, SUPPLEMENTARY
 SPECIAL PROVISIONS APPLICABLE TO THIS PROJECT,
 CONTRACT # 92130-1426-3A

DATE: 12/11/95
 PROJECT NO. 92130-1426-3A
 DRAWN BY: J. MYERS

REVISIONS

NO.	DATE	DESCRIPTION
1	8/15/95	ADDED SBT 113A, NOTES, REVISION 2
2	8/16/95	ADDED INTERIM STAKE LIMITS
3	11/17/95	ADDED STATE PROJ. NUMBER & RFI NO.

LENGTH OF PROJECT

LINEAR FT.	MILES
4,865.13	9.365
804.19	0.017
5,669.32	0.842
5,674.00	0.000
5,974.00	0.000
5,974.00	0.000

PROJECT MANAGER: KAREN SNYDER, P.E.
 DISNEY DEVELOPMENT COMPANY PROJECT MANAGER: DAVID R. LEWIS

* LENGTH MEASURED ALONG
 SB PD EXT.

THESE PLANS HAVE BEEN PREPARED
 IN ACCORDANCE WITH THE STANDARD
 SPECIFICATIONS FOR ROADWAY DESIGN
 PREPARED BY THE FLORIDA DEPARTMENT OF
 TRANSPORTATION, TALLAHASSEE, FLORIDA,
 REVISION DATED JANUARY, 1991.

3 FUA

CO-9

FLORIDA DEPARTMENT OF TRANSPORTATION
 BOX CULVERT AND VIRTUAL SECTION
 LOCATION DESCRIPTION: STA 236+40 I-4 STR. NO. S-132
 ENVIRONMENT: EXTREMELY AGGRESSIVE, USE CLASS IV CONCRETE

PROJECT NUMBER: 1-3 FUA
 DATE: 10/11/88
 DRAWN BY: [blank]
 CHECKED BY: [blank]
 SCALE: [blank]

FLORIDA DEPARTMENT OF TRANSPORTATION
 BOX CULVERT AND VIRTUAL SECTION
 LOCATION DESCRIPTION: STA 236+40 I-4 STR. NO. S-132
 ENVIRONMENT: EXTREMELY AGGRESSIVE, USE CLASS IV CONCRETE

CONCRETE COVER FOR REINFORCING BARS
 3 IN. BOT. SL. +
 3 IN. WALL =
 3 IN. TOP SL. +

PROPERTIES OF ELEMENTS
 STEEL YIELD STRENGTH = 60,000 PSI
 CONCRETE 28 DAY STRENGTH = 5,000 PSI
 SECTION TYPE = 3 IN. WALL

PROPERTIES OF ELEMENTS
 STEEL YIELD STRENGTH = 60,000 PSI
 CONCRETE 28 DAY STRENGTH = 5,000 PSI
 SECTION TYPE = 3 IN. WALL

PROPERTIES OF ELEMENTS
 STEEL YIELD STRENGTH = 60,000 PSI
 CONCRETE 28 DAY STRENGTH = 5,000 PSI
 SECTION TYPE = 3 IN. WALL

PROPERTIES OF ELEMENTS
 STEEL YIELD STRENGTH = 60,000 PSI
 CONCRETE 28 DAY STRENGTH = 5,000 PSI
 SECTION TYPE = 3 IN. WALL

PROPERTIES OF ELEMENTS
 STEEL YIELD STRENGTH = 60,000 PSI
 CONCRETE 28 DAY STRENGTH = 5,000 PSI
 SECTION TYPE = 3 IN. WALL

BAR	NUMBER	BAR SIZE	SPACING	TYPE	LENGTH	WEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT
(#)		(#)	(FT-IN)		(FT-IN)	(LBS)	(FT-IN)	(LBS)	(FT-IN)	(LBS)
A10	302	#4	4	---	16-3	6945	16-3	6945	16-3	6945
A11	2	#4	4	---	9	36	9	36	9	36
A12	2	#4	4	---	10	40	10	40	10	40
A13	4032	#4	4	---	16-0	6945	16-0	6945	16-0	6945
A14	2	#4	4	---	11	44	11	44	11	44
A15	2	#4	4	---	11	44	11	44	11	44
A16	2	#4	4	---	11	44	11	44	11	44
A17	2	#4	4	---	11	44	11	44	11	44
A18	2	#4	4	---	11	44	11	44	11	44
A19	2	#4	4	---	11	44	11	44	11	44
A20	2	#4	4	---	11	44	11	44	11	44
A21	2	#4	4	---	11	44	11	44	11	44
A22	2	#4	4	---	11	44	11	44	11	44
A23	2	#4	4	---	11	44	11	44	11	44
A24	2	#4	4	---	11	44	11	44	11	44
A25	2	#4	4	---	11	44	11	44	11	44
A26	2	#4	4	---	11	44	11	44	11	44
A27	2	#4	4	---	11	44	11	44	11	44
A28	2	#4	4	---	11	44	11	44	11	44
A29	2	#4	4	---	11	44	11	44	11	44
A30	2	#4	4	---	11	44	11	44	11	44
A31	2	#4	4	---	11	44	11	44	11	44
A32	2	#4	4	---	11	44	11	44	11	44
A33	2	#4	4	---	11	44	11	44	11	44
A34	2	#4	4	---	11	44	11	44	11	44
A35	2	#4	4	---	11	44	11	44	11	44
A36	2	#4	4	---	11	44	11	44	11	44
A37	2	#4	4	---	11	44	11	44	11	44
A38	2	#4	4	---	11	44	11	44	11	44
A39	2	#4	4	---	11	44	11	44	11	44
A40	2	#4	4	---	11	44	11	44	11	44
A41	2	#4	4	---	11	44	11	44	11	44
A42	2	#4	4	---	11	44	11	44	11	44
A43	2	#4	4	---	11	44	11	44	11	44
A44	2	#4	4	---	11	44	11	44	11	44
A45	2	#4	4	---	11	44	11	44	11	44
A46	2	#4	4	---	11	44	11	44	11	44
A47	2	#4	4	---	11	44	11	44	11	44
A48	2	#4	4	---	11	44	11	44	11	44
A49	2	#4	4	---	11	44	11	44	11	44
A50	2	#4	4	---	11	44	11	44	11	44
A51	2	#4	4	---	11	44	11	44	11	44
A52	2	#4	4	---	11	44	11	44	11	44
A53	2	#4	4	---	11	44	11	44	11	44
A54	2	#4	4	---	11	44	11	44	11	44
A55	2	#4	4	---	11	44	11	44	11	44
A56	2	#4	4	---	11	44	11	44	11	44
A57	2	#4	4	---	11	44	11	44	11	44
A58	2	#4	4	---	11	44	11	44	11	44
A59	2	#4	4	---	11	44	11	44	11	44
A60	2	#4	4	---	11	44	11	44	11	44
A61	2	#4	4	---	11	44	11	44	11	44
A62	2	#4	4	---	11	44	11	44	11	44
A63	2	#4	4	---	11	44	11	44	11	44
A64	2	#4	4	---	11	44	11	44	11	44
A65	2	#4	4	---	11	44	11	44	11	44
A66	2	#4	4	---	11	44	11	44	11	44
A67	2	#4	4	---	11	44	11	44	11	44
A68	2	#4	4	---	11	44	11	44	11	44
A69	2	#4	4	---	11	44	11	44	11	44
A70	2	#4	4	---	11	44	11	44	11	44
A71	2	#4	4	---	11	44	11	44	11	44
A72	2	#4	4	---	11	44	11	44	11	44
A73	2	#4	4	---	11	44	11	44	11	44
A74	2	#4	4	---	11	44	11	44	11	44
A75	2	#4	4	---	11	44	11	44	11	44
A76	2	#4	4	---	11	44	11	44	11	44
A77	2	#4	4	---	11	44	11	44	11	44
A78	2	#4	4	---	11	44	11	44	11	44
A79	2	#4	4	---	11	44	11	44	11	44
A80	2	#4	4	---	11	44	11	44	11	44
A81	2	#4	4	---	11	44	11	44	11	44
A82	2	#4	4	---	11	44	11	44	11	44
A83	2	#4	4	---	11	44	11	44	11	44
A84	2	#4	4	---	11	44	11	44	11	44
A85	2	#4	4	---	11	44	11	44	11	44
A86	2	#4	4	---	11	44	11	44	11	44
A87	2	#4	4	---	11	44	11	44	11	44
A88	2	#4	4	---	11	44	11	44	11	44
A89	2	#4	4	---	11	44	11	44	11	44
A90	2	#4	4	---	11	44	11	44	11	44
A91	2	#4	4	---	11	44	11	44	11	44
A92	2	#4	4	---	11	44	11	44	11	44
A93	2	#4	4	---	11	44	11	44	11	44
A94	2	#4	4	---	11	44	11	44	11	44
A95	2	#4	4	---	11	44	11	44	11	44
A96	2	#4	4	---	11	44	11	44	11	44
A97	2	#4	4	---	11	44	11	44	11	44
A98	2	#4	4	---	11	44	11	44	11	44
A99	2	#4	4	---	11	44	11	44	11	44
A100	2	#4	4	---	11	44	11	44	11	44
A101	2	#4	4	---	11	44	11	44	11	44
A102	2	#4	4	---	11	44	11	44	11	44
A103	2	#4	4	---	11	44	11	44	11	44
A104	2	#4	4	---	11	44	11	44	11	44
A105	2	#4	4	---	11	44	11	44	11	44
A106	2	#4	4	---	11	44	11	44	11	44
A107	2	#4	4	---	11	44	11	44	11	44
A108	2	#4	4	---	11	44	11	44	11	44
A109	2	#4	4	---	11	44	11	44	11	44
A110	2	#4	4	---	11	44	11	44	11	44
A111	2	#4	4	---	11	44	11	44	11	44
A112	2	#4	4	---	11	44	11	44	11	44
A113	2	#4	4	---	11	44	11	44	11	44
A114	2	#4	4	---	11	44	11	44	11	44
A115	2	#4	4	---	11	44	11	44	11	44
A116	2	#4	4	---	11	44	11	44	11	44
A117	2	#4	4	---	11	44	11	44	11	44
A118	2	#4	4	---	11	44	11	44	11	44
A119	2	#4	4	---	11	44	11	44	11	44
A120	2	#4	4	---	11	44	11	44	11	44

BAR #300 300 C.Y., VIRTUAL = 7.528 C.Y.
 BAR #200 200 C.Y., VIRTUAL = 3.659 C.Y.
 BAR #100 100 C.Y., VIRTUAL = 1.829 C.Y.
 TOTAL CONCRETE QUANTITIES = 12.016 C.Y.

BAR #300 300 C.Y., VIRTUAL = 7.528 C.Y.
 BAR #200 200 C.Y., VIRTUAL = 3.659 C.Y.
 BAR #100 100 C.Y., VIRTUAL = 1.829 C.Y.
 TOTAL CONCRETE QUANTITIES = 12.016 C.Y.

BAR #300 300 C.Y., VIRTUAL = 7.528 C.Y.
 BAR #200 200 C.Y., VIRTUAL = 3.659 C.Y.
 BAR #100 100 C.Y., VIRTUAL = 1.829 C.Y.
 TOTAL CONCRETE QUANTITIES = 12.016 C.Y.

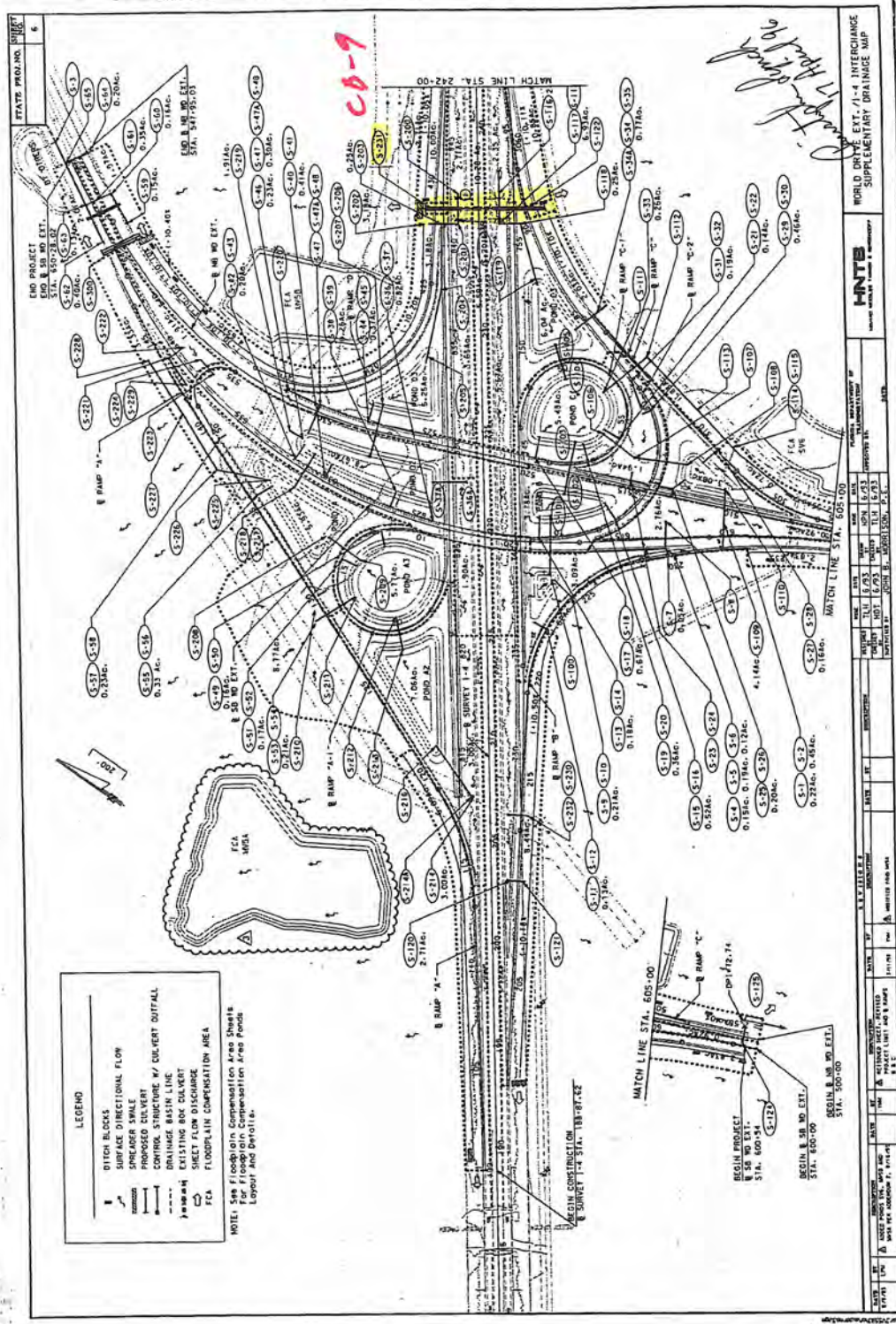
BAR #300 300 C.Y., VIRTUAL = 7.528 C.Y.
 BAR #200 200 C.Y., VIRTUAL = 3.659 C.Y.
 BAR #100 100 C.Y., VIRTUAL = 1.829 C.Y.
 TOTAL CONCRETE QUANTITIES = 12.016 C.Y.

BAR #300 300 C.Y., VIRTUAL = 7.528 C.Y.
 BAR #200 200 C.Y., VIRTUAL = 3.659 C.Y.
 BAR #100 100 C.Y., VIRTUAL = 1.829 C.Y.
 TOTAL CONCRETE QUANTITIES = 12.016 C.Y.

BAR #300 300 C.Y., VIRTUAL = 7.528 C.Y.
 BAR #200 200 C.Y., VIRTUAL = 3.659 C.Y.
 BAR #100 100 C.Y., VIRTUAL = 1.829 C.Y.
 TOTAL CONCRETE QUANTITIES = 12.016 C.Y.

NO.	DATE	BY	DESCRIPTION
1	10/11/88	[blank]	INITIAL DRAWING

FLORIDA DEPARTMENT OF TRANSPORTATION
 STRUCTURE DESIGN OFFICE
 PROJECT NO. 1-3 FUA
 DATE 10/11/88
 DRAWN BY [blank]
 CHECKED BY [blank]
 SCALE [blank]



LEGEND

- DITCH BLOCKS
- DITCH WITH FUNCTIONAL FLOW
- PROPOSED DITCH
- PROPOSED CULVERT
- CONTROL STRUCTURE W/ CULVERT OUTFALL
- DRAINAGE BASIN LINE
- EXISTING BOX CULVERT
- SHEET FLOW DISCHARGE
- FLOODPLAIN COMPENSATION AREA

NOTE: See Floodplain Compensation Area Sheets
 For Floodplain Compensation Area Ponds
 Layout And Details.

STATE PROJECT NO. 1111		SHEET NO. 6	
WORLD INTERCH. AT INTERCHANGE SUPPLEMENTARY DRAINAGE MAP			
HNTE <small>Hydro-Engineering & Surveying, Inc.</small>		<small>DESIGNED BY: JOHN H. HARRISON, P.E.</small> <small>CHECKED BY: JOHN H. HARRISON, P.E.</small> <small>DATE: 11/1/73</small>	
<small>SCALE: AS SHOWN</small> <small>DATE: 11/1/73</small>	<small>PROJECT NO. 1111</small> <small>DATE: 11/1/73</small>	<small>CONTRACT NO. 1111</small> <small>DATE: 11/1/73</small>	<small>CONTRACT NO. 1111</small> <small>DATE: 11/1/73</small>

John H. Harrison

CD-9

STATE PROJ. NO. 58



WORLD DRIVE EXT. 1/4 LONG
 WORLD DRIVE - RAMP C-2
 STA. 79+00 TO 93+00
 SCALE: 1" = 2' H.

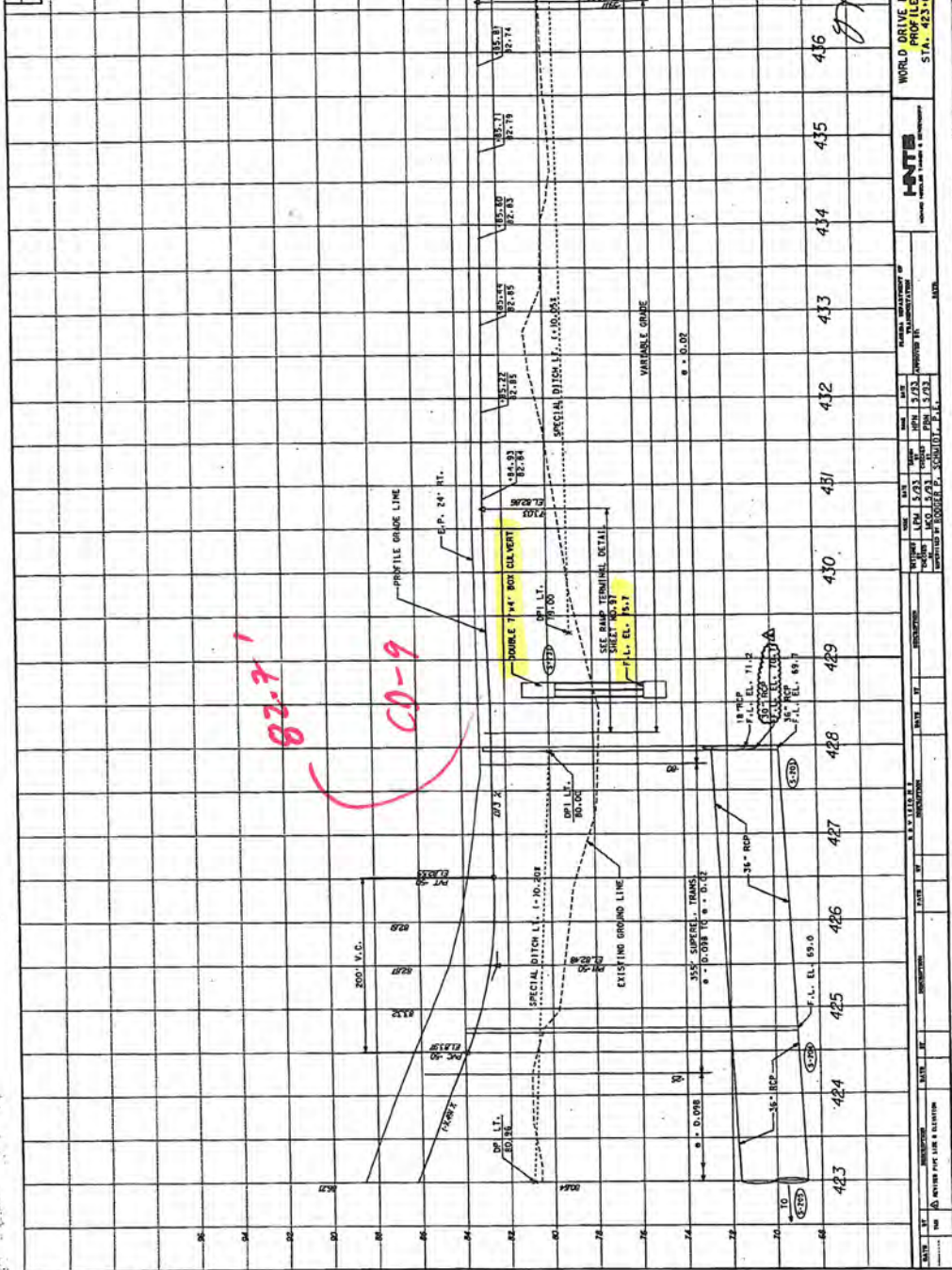
HNTB
 HEADQUARTERS: 1000 G STREET, N.W., WASHINGTON, D.C. 20004
 BRANCH OFFICES: ALBANY, N.Y.; ANNE ARBOR, MICH.; BOSTON, MASS.; CHICAGO, ILL.; CINCINNATI, OHIO; COLUMBIA, S.C.; DALLAS, TEXAS; DENVER, COLO.; DETROIT, MICH.; HOUSTON, TEXAS; KANSAS CITY, MO.; LOS ANGELES, CALIF.; MEMPHIS, TENN.; MINNEAPOLIS, MINN.; NEW YORK, N.Y.; PHOENIX, ARIZ.; PORTLAND, ORE.; RICHMOND, VA.; SAN ANTONIO, TEXAS; SAN FRANCISCO, CALIF.; SEATTLE, WASH.; TAMPA, FLA.; WASHINGTON, D.C.

NO.	DATE	BY	CHKD.	DESCRIPTION
1	5/23	JPH	JPH	PRELIMINARY
2	5/23	JPH	JPH	REVISED
3	5/23	JPH	JPH	REVISED
4	5/23	JPH	JPH	REVISED

DESIGNED BY: ROBERT P. SCHUBERT, P.E.
 CHECKED BY: J. H. H. H.
 DATE: 5/23/93

DATE: 5/23/93
 DRAWN BY: J. H. H. H.
 CHECKED BY: J. H. H. H.
 DATE: 5/23/93

STATE PROJECT NO. 71



DATE	BY	DESCRIPTION	SCALE	DATE	BY	DESCRIPTION
10/10/00	J. J. [unclear]	DESIGN	1" = 40'			
10/10/00	J. J. [unclear]	CHECK	1" = 40'			
10/10/00	J. J. [unclear]	APPROVE	1" = 40'			

WORLD DRIVE EXT. / I-4 ICHG
 PROFILE - RAMP D
 STA. 423+00 TO 437+00
 SCALE: 1" = 40' H.
 1" = 100' V.

82-7'
 CO-9
 8/22/00
 J. J. [unclear]

STATE PROJ. NO. 112

DATE: 11/1/73

SCALE: 1" = 20' H.

WORLD DRIVE EXT. / I-4 ICHG

CROSS SECTIONS

DATE: 11/1/73

SCALE: 1" = 20' H.

WORLD DRIVE EXT. / I-4 ICHG

CROSS SECTIONS

DATE: 11/1/73

SCALE: 1" = 20' H.

WORLD DRIVE EXT. / I-4 ICHG

CROSS SECTIONS

DATE: 11/1/73

SCALE: 1" = 20' H.

WORLD DRIVE EXT. / I-4 ICHG

CROSS SECTIONS

DATE: 11/1/73

SCALE: 1" = 20' H.

WORLD DRIVE EXT. / I-4 ICHG

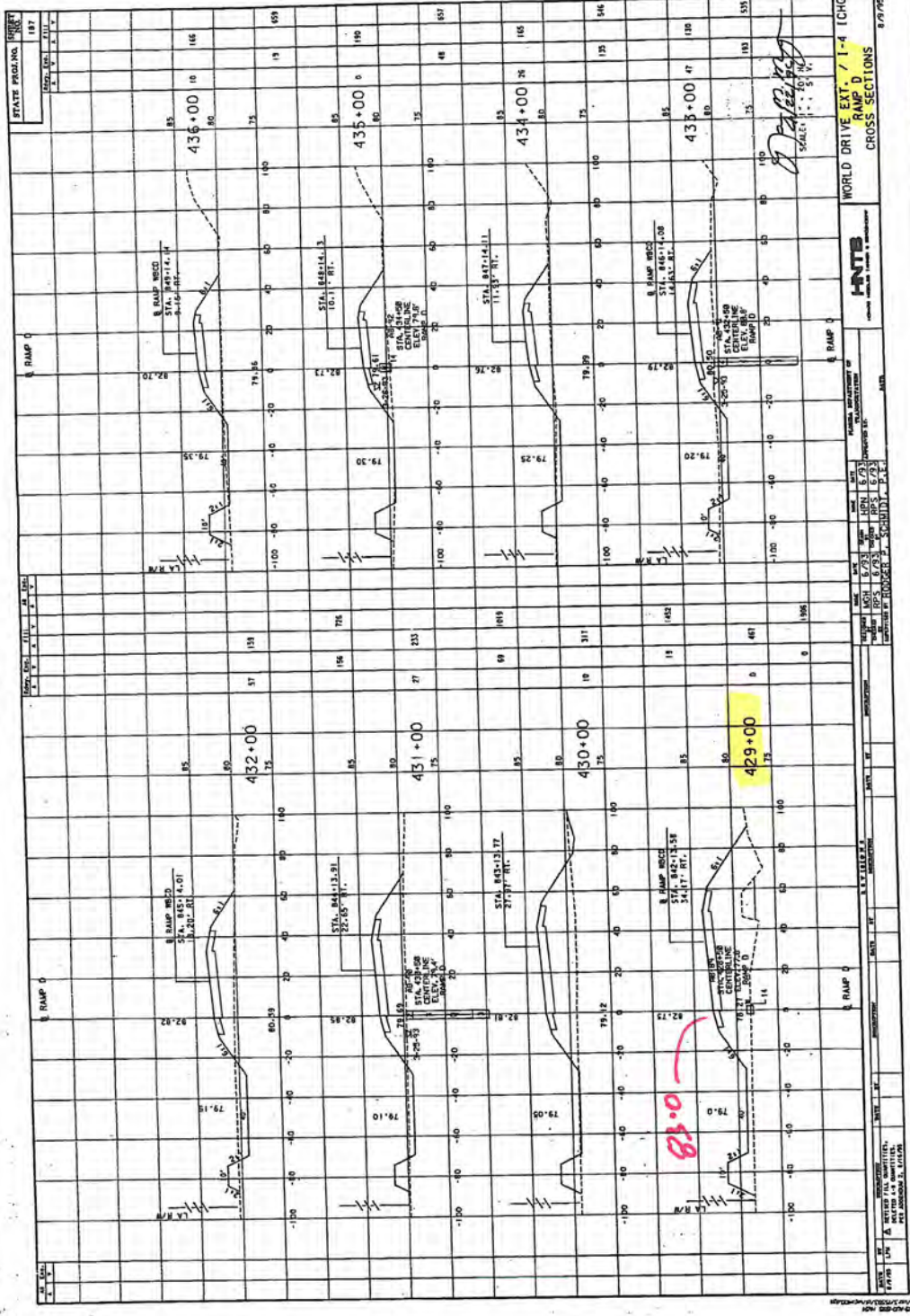
CROSS SECTIONS

DATE: 11/1/73

SCALE: 1" = 20' H.

WORLD DRIVE EXT. / I-4 ICHG





STATE PLANNING DEPARTMENT
 DIVISION OF HIGHWAYS
 PROJECT NO. 111
 SHEET NO. 111
 DATE 8/19/76

WORLD DRIVE EXT. / 1-4 (CHG)
 RAMP D
 CROSS SECTIONS

SCALE: 1" = 20'

8/19/76

J. J. [Signature]

CP-10

State Project No.

92130-3420

W.P.I. NO. 5147339

96 1



STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
PLANS OF PROPOSED
STATE HIGHWAY
INTERSTATE 4
COLLECTOR-DISTRIBUTOR ROADS
FROM REEDY CREEK TO US 192
STATE PROJECT NO. 92130-3420
OSCEOLA COUNTY, FLORIDA



ROADWAY PLANS BOOKLET OF RECORD
ANDRE LAUBER, P.E., REG. NO. 31503
PLANS PREPARED BY
Greiner
Greiner, Inc.
Greiner Building
Knoxville, Tennessee 37904
407-422-0333

ATTENTION: THIS DRAWING IS THE PROPERTY OF THE STATE OF FLORIDA. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFIC TO WHICH IT IS PREPARED. IT 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 THE STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION. SPECIAL SPECIFICATIONS FOR THIS PROJECT ARE TO BE USED IN CONJUNCTION WITH THE STANDARD SPECIFICATIONS FOR ROADWAY PLANS.
DATE BY: JAMES E. LAMBERT
P.E. NO. 2323 2-12-77

ISSUED FOR CONSTRUCTION

NOV. 1, 1996

NO.	DATE	DESCRIPTION
1	01/19/97	ACL PER FOOT COMMENTS

ROADWAY	LENGTH OF PROJ.	PERCENTAGE
ROADWAY	13,868.00 FT.	3.00%
BRIDGE	228.00	0.04%
INTERCHANGE	16,084.72	0.00%
OTHER	15,094.19	3.08%
TOTAL	35,274.91	100.00%

FOOT PROJECT MANAGER: HEATHER BRADSHAW

THIS CONTRACT PLAN SET INCLUDES
ROADWAY PLANS
DRAINAGE AND PREVENTION-ROADWAY PLANS
STRUCTURE PLANS

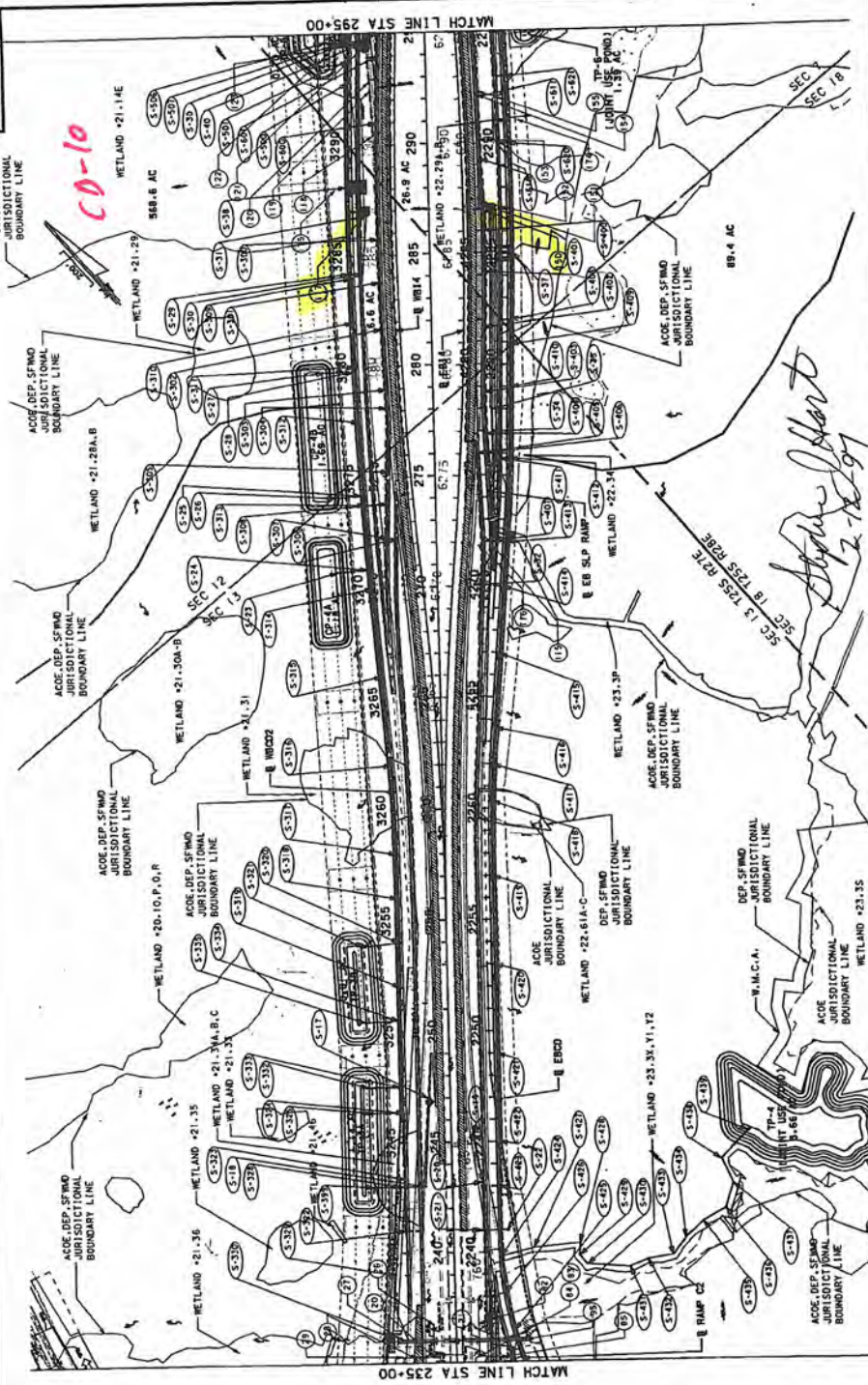
A DETAILED INDEX APPEARS ON THE KEY SHEET
OF EACH COMPONENT SET OF PLANS

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	BOX CULVERT DATA SHEET
3-5	SUPPLEMENTAL DRAINAGE MAP
6-7	EXISTING DRAINAGE STRUCTURE DATA
8-11	EXISTING SECTIONS
12	SUMMARY OF QUANTITIES
13-24	SUMMARY OF DRAINAGE STRUCTURES
25	PROJECT LAYOUT
26	REFERENCE TIES
28-27	ROADWAY PRELIMINARIES
28-28	INTERCHANGE LAYOUT, CURVE & COORD. DATA
29-38	RAMP TERMINAL DETAIL
39-68	DRAINAGE STRUCTURES
69-73	TREATMENT PONDS
74-80	COMPENSATION FOR DETAIL
81-83	CONTROL STRUCTURE DETAILS
84	DRAINAGE DETAILS
85	CON-SPAN DETAILS
87-90	CROSS SECTION PATTERN SHEET
91-93	ROADWAY SECTIONS
94-99	TRAFFIC CONTROL PLAN
100-242	TRAFFIC CONTROL PLANS
243-249	STORMWATER POLLUTION PREVENTION PLANS
250-260	APPROACH SLABS
261-262	UTILITY ADJUSTMENT PLANS
263-271	UTILITY STANDARDS
272-279	

THESE PLANS HAVE BEEN PREPARED IN
ACCORDANCE WITH AND ARE GOVERNED BY
THE STATE OF FLORIDA DEPARTMENT OF
TRANSPORTATION, ROADWAY AND TRAFFIC
DESIGN STANDARDS BOOKLET DATED
JANUARY, 1994.

STATE PROJ. NO. 92130-3-220 4



Greiner SUPPLEMENTARY DRAINAGE MAP
STA 235+00 TO STA 295+00

FLORIDA DEPARTMENT OF TRANSPORTATION

DATE	BY	DESCRIPTION

Stephen Hart
12-18-97

STATE PROJ. NO. 92130-5.220

1	INLET, 18" RCP GRATE EL. 79.20 E FL 74.0 W FL 76.50	16	MES FL 74.0	30	MES, 48" RCP W FL 74.0 E FL 74.0	45	INLET, 18" RCP GRATE EL. 83.77 E FL 76.5	60	MES FL 76.50	75	MES, 48" RCP W FL 74.0 E FL 74.0	90	INLET, 18" RCP GRATE EL. 80.25 W FL 76.5
2	INLET, 24" RCP GRATE EL. 80.00 S FL 75.50 N FL 75.40	17	INLET, 24" RCP S FL 75.50 N FL 76.30	31	MES FL 74.0	46	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	61	INLET, 18" RCP GRATE EL. 82.70 E FL 76.5	76	MES, 48" RCP W FL 74.0 E FL 74.0	91	INLET, 18" RCP GRATE EL. 81.75 W FL 76.5
3	INLET, 24" RCP GRATE EL. 80.00 S FL 75.40 N FL 74.0	17A	MES FL 76.3	32	INLET, 18" RCP GRATE EL. 81.00 W FL 74.0 E FL 74.0	47	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	62	MES FL 82.0	77	MES, 48" RCP W FL 74.0 E FL 74.0	92	MES FL 81.75
4	MES FL 74.0	18	MES FL 68.0	33	MES FL 76.5	48	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	63	INLET, 18" RCP GRATE EL. 82.70 E FL 76.5	78	MES FL 74.0	93	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5
5	MES, 36" RCP S FL 75.0 N FL 75.0	19	MANHOLE, 36" RCP E FL 68.0 W FL 68.0	34	INLET, 18" RCP GRATE EL. 81.00 W FL 74.0 E FL 74.0	49	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	64	INLET, 18" RCP GRATE EL. 82.70 E FL 76.5	79	MANHOLE, 48" RCP S FL 71.47 E FL 71.47	94	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5
6	MES FL 75.0	20	INLET, 30" RCP GRATE EL. 78.0 N FL 70.7 E FL 70.7	35	MANHOLE, 18" RCP TOP EL. 100.00 W FL 76.5	50	MES FL 76.5	65	MES FL 76.5	80	INLET, 48" RCP GRATE EL. 80.20 S FL 74.0 E FL 74.0	95	CONCRETE BOX CULVERT E FL 75.50
7	INLET, 18" RCP GRATE EL. 79.0 W FL 74.0 E FL 74.0	21	INLET, 18" RCP GRATE EL. 79.0 W FL 74.0 E FL 74.0	36	MES FL 76.5	51	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	66	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	81	MES FL 74.0	96	INLET, 18" RCP GRATE EL. 80.00 E FL 77.40 W FL 77.40
8	MES FL 85.4	22	INLET, 18" RCP GRATE EL. 107.39 W FL 102.0 E FL 102.0	37	INLET, 18" RCP GRATE EL. 86.97 W FL 74.5 E FL 74.5	52	U-TYPE ENDWALL W/O AFFLES FL 76.5	67	MES FL 76.5	82	INLET, 18" RCP GRATE EL. 78.20 E FL 72.30 W FL 71.90	97	INLET, 24" RCP TOP EL. 84.76 E FL 76.74 W FL 76.5
9	MES, 24" RCP S FL 76.0 E FL 76.0	23	MES FL 76.5	38	INLET, 18" RCP GRATE EL. 86.97 W FL 74.5 E FL 74.5	53	INLET, 18" RCP GRATE EL. 81.71 E FL 76.5	68	MES, 36" RCP W FL 75.0 E FL 75.0	83	INLET, 18" RCP GRATE EL. 78.50 E FL 71.30 W FL 71.30	98	MES FL 76.5
10	MES FL 76.0	24	INLET, 18" RCP GRATE EL. 105.25 W FL 103.5 E FL 103.5	39	MES FL 76.5	54	INLET, 18" RCP GRATE EL. 80.11 N FL 93.85 E FL 81.75	69	INLET, 18" RCP GRATE EL. 103.50 W FL 93.85 E FL 81.75	84	INLET, 30" RCP GRATE EL. 78.5 S FL 70.80 E FL 70.80	99	INLET, 18" RCP GRATE EL. 87.94 S FL 79.74 N FL 77.24
11	INLET, 18" RCP GRATE EL. 80.95 S FL 75.5 E FL 76.5	25	MES FL 76.5	40	INLET, 18" RCP GRATE EL. 88.33 W FL 82.50 E FL 76.5	55	INLET, 18" RCP GRATE EL. 101.57 W FL 101.00 S FL 101.00	70	MES FL 76.5	85	INLET, 30" RCP GRATE EL. 83.50 S FL 70.80 E FL 70.80	105	INLET, 18" RCP GRATE EL. 83.20 W FL 78.48 E FL 78.38
12	MES FL 76.5	26	INLET, 18" RCP GRATE EL. 75.0 W FL 72.10 E FL 72.10	41	MES FL 76.5	56	INLET, 18" RCP GRATE EL. 106.95 S FL 93.85 E FL 81.75	71	INLET, 18" RCP GRATE EL. 103.50 W FL 93.85 E FL 81.75	86	MANHOLE, 48" RCP TOP EL. 79.00 S FL 77.24 E FL 77.24	106	MES FL 78.38
13	INLET, 18" RCP GRATE EL. 88.88 S FL 93.5 E FL 76.5	27	CONCRETE BOX CULVERT CONV. TO RCP E FL 75.70 W FL 75.50	42	INLET, 18" RCP GRATE EL. 93.33 S FL 81.0 E FL 81.0	57	INLET, 18" RCP GRATE EL. 101.57 W FL 101.00 S FL 101.00	72	MES FL 81.75	87	MANHOLE, 48" RCP TOP EL. 79.00 S FL 77.24 E FL 77.24	107	CONCRETE BOX CULVERT CONV. TO RCP E FL 79.50 W FL 79.50
14	MES FL 76.5	28	MANHOLE, 36" RCP E FL 65.7 W FL 65.0	43	INLET, 18" RCP GRATE EL. 76.1 W FL 74.5 E FL 74.5	58	INLET, 18" RCP GRATE EL. 106.95 S FL 93.85 E FL 81.75	73	MES FL 75.0	88	INLET, 48" RCP GRATE EL. 80.16 W FL 72.50 E FL 72.21	108	INLET, 24" RCP GRATE EL. 85.78 S FL 80.25 E FL 80.25
15	MES, 48" RCP N FL 74.0 S FL 74.0	29	INLET, 18" RCP GRATE EL. 80.0 S FL 71.2 E FL 71.2	44	INLET, 18" RCP GRATE EL. 76.1 W FL 74.5 E FL 74.5	59	INLET, 18" RCP GRATE EL. 106.95 S FL 93.85 E FL 81.75	74	MES, 48" RCP W FL 74.0 E FL 74.0	89	INLET, 18" RCP GRATE EL. 80.19 W FL 73.40 E FL 82.0	109	INLET, 24" RCP GRATE EL. 85.28 S FL 80.25 E FL 80.25

60-10 (05)

Stephen J. Hart
2-2-97

(120)	INLET, 24" RCP GRATE EL. 85.20 N FL 79.50 S FL 80.00 E FL 84.50	(121)	MANHOLE, 24" RCP INLET EL. 85.60 W FL 79.50 E FL 78.75	(122)	INLET, 18" RCP GRATE EL. 86.00 W FL 80.63 E FL 80.45	(123)	INLET, 24" RCP GRATE EL. 85.00 N FL 78.00	(124)	INLET, 24" RCP GRATE EL. 85.54 S FL 79.00 N FL 77.00	(125)	MES, 30" RCP GRATE EL. 86.47 W FL 81.16 E FL 82.25	(126)	INLET, 18" RCP RIM EL. 87.33 S FL 82.76 E FL 82.76	(127)	INLET, 18" RCP GRATE EL. 86.47 S FL 82.70 E FL 82.70	(128)	INLET, 18" RCP GRATE EL. 86.41 W FL 82.70 E FL 81.62	(129)	MANHOLE, 18" RCP RIM EL. 88.0 N FL 81.62 S FL 78.00	(130)	MANHOLE, 30" RCP GRATE EL. 86.50 W FL 80.50 E FL 75.50	(131)	INLET, 18" RCP GRATE EL. 80.83 W FL 79.30 E FL 86.00	(132)	INLET, 18" RCP, MES GRATE EL. 86.79 W FL 86.00 E FL 84.50	(133)	INLET, 18" RCP GRATE EL. 85.00 W FL 81.98 E FL 81.60	(134)	INLET, 18" RCP, MES GRATE EL. 103.03 W FL 80.63 E FL 84.50	(135)	INLET, 24" RCP, MES GRATE EL. 106.87 N FL 102.25 S FL 84.00	(136)	INLET, 18" RCP GRATE EL. 112.25 E FL 106.54 W FL 105.12	(137)	INLET, 18" RCP GRATE EL. 121.98 W FL 108.84 E FL 108.54	(138)	MANHOLE, 24" RCP RIM EL. 91.00 N FL 85.25 E FL 85.25	(139)	MES FL 85.25	(140)	MES FL 84.86	(141)	MANHOLE, 18" RCP GRATE EL. 85.41 W FL 84.86 E FL 85.41	(142)	INLET, 18" RCP GRATE EL. 88.49 W FL 85.41 E FL 85.41	(143)	INLET, 18" RCP, MES GRATE EL. 91.00 W FL 86.27 E FL 86.00	(144)	CONCRETE BOX CULVERT 12.7'x4' CXC1 W FL 79.30 E FL 79.25	(145)	INLET, 18" RCP GRATE EL. 84.57 W FL 75.75 E FL 75.50	(146)	MES FL 75.50	(147)	INLET, 24" RCP GRATE EL. 84.53 S FL 78.90 E FL 79.60	(148)	INLET, 30" RCP GRATE EL. 84.64 S FL 78.90 E FL 78.90	(149)	INLET, 18" RCP, MES GRATE EL. 85.00 W FL 81.06 E FL 81.06	(150)	MES FL 79.50	(151)	INLET, 18" RCP GRATE EL. 85.54 W FL 81.83 E FL 81.81	(152)	INLET, 18" RCP GRATE EL. 85.52 W FL 81.81 E FL 81.39	(153)	INLET, 18" RCP GRATE EL. 85.60 W FL 81.03 E FL 81.03	(154)	INLET, 24" RCP GRATE EL. 85.18 W FL 80.53 E FL 80.50	(155)	INLET, 24" RCP GRATE EL. 85.14 W FL 80.50 E FL 80.08	(156)	INLET, 30" RCP GRATE EL. 85.20 W FL 81.22 E FL 75.50	(157)	MES FL 79.50	(158)	INLET, 18" RCP, MES GRATE EL. 85.00 W FL 81.34 E FL 81.06	(159)	INLET, 30" RCP GRATE EL. 84.64 S FL 78.90 E FL 78.90	(160)	INLET, 30" RCP GRATE EL. 84.53 S FL 78.90 E FL 79.60	(161)	INLET, 42" RCP GRATE EL. 84.57 W FL 75.75 E FL 75.50	(162)	MES FL 75.50	(163)	INLET, 24" RCP GRATE EL. 86.30 W FL 82.59 E FL 80.86	(164)	INLET, 24" RCP GRATE EL. 84.61 W FL 80.15 E FL 80.15	(165)	INLET, 24" RCP GRATE EL. 84.36 W FL 80.15 E FL 80.10	(166)	MANHOLE, 30" RCP RIM EL. 86.05 S FL 79.21 E FL 79.21	(167)	MES, 30" RCP GRATE EL. 83.28 W FL 83.28 E FL 83.28	(168)	INLET, 18" RCP GRATE EL. 82.10 W FL 80.40 E FL 87.81	(169)	INLET, 18" RCP GRATE EL. 86.35 W FL 81.36 E FL 87.36	(170)	INLET, 18" RCP GRATE EL. 101.70 S FL 97.36 E FL 95.75	(171)	MANHOLE, 24" RCP RIM EL. 90.50 W FL 85.75 E FL 85.30	(172)	MANHOLE, 24" RCP GRATE EL. 84.30 W FL 105.00 E FL 85.30	(173)	INLET, 24" RCP GRATE EL. 101.16 W FL 97.43 E FL 105.00	(174)	BLEED-DOWN STRUCTURE *1	(175)	BLEED-DOWN STRUCTURE *2	(176)	BLEED-DOWN STRUCTURE *3	(177)	BLEED-DOWN STRUCTURE *4	(178)	BLEED-DOWN STRUCTURE *5
-------	-----------------------------------------------------------------------------	-------	-----------------------------------------------------------------	-------	---------------------------------------------------------------	-------	-------------------------------------------------	-------	---------------------------------------------------------------	-------	-------------------------------------------------------------	-------	-------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	--------------------------------------------------------------	-------	-----------------------------------------------------------------	-------	---------------------------------------------------------------	-------	--------------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------------	-------	----------------------------------------------------------------------	-------	------------------------------------------------------------------	-------	------------------------------------------------------------------	-------	---------------------------------------------------------------	-------	-----------------	-------	-----------------	-------	-----------------------------------------------------------------	-------	---------------------------------------------------------------	-------	--------------------------------------------------------------------	-------	-------------------------------------------------------------------	-------	---------------------------------------------------------------	-------	-----------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	--------------------------------------------------------------------	-------	-----------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	-----------------	-------	--------------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	-----------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	-------------------------------------------------------------	-------	---------------------------------------------------------------	-------	---------------------------------------------------------------	-------	----------------------------------------------------------------	-------	---------------------------------------------------------------	-------	------------------------------------------------------------------	-------	-----------------------------------------------------------------	-------	-------------------------	-------	-------------------------	-------	-------------------------	-------	-------------------------	-------	-------------------------

Stephen Hart
2-6-97

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

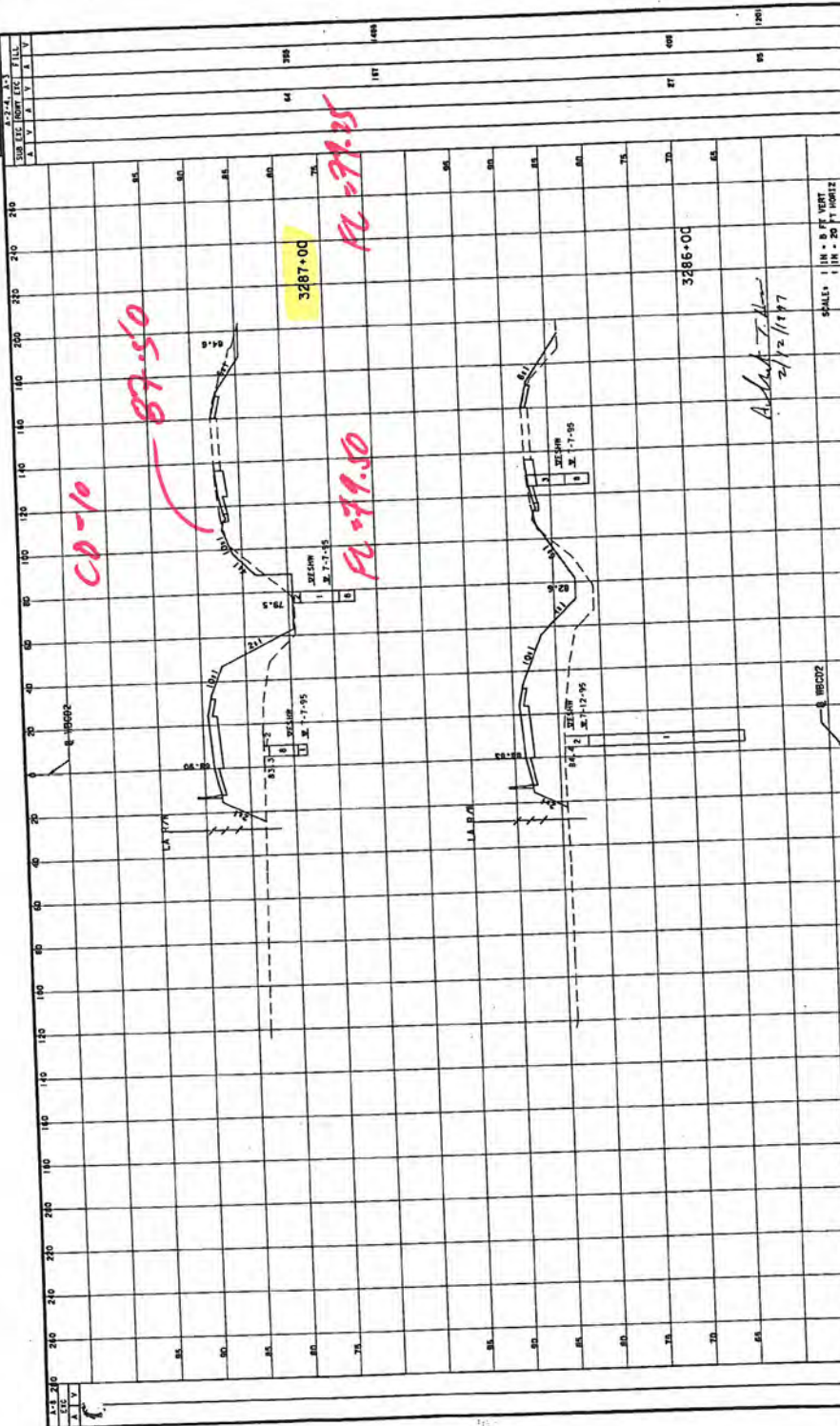
EXISTING DRAINAGE
STRUCTURE DATA

Greiner

FLUORIDA QUALITY OF
TRANSPORTATION

CD-10 (05)

STATE PROJ. NO. 92130-3-20 195
 DATE 10/24/95
 DESIGNED BY JLL
 CHECKED BY JLL
 APPROVED BY JLL



SCALE: 1" = 5' HORIZ
 1" = 2' VERT
 TRANSPORTATION
Greiner
 CROSS SECTIONS
 DATE: 11/13/95
 DATE: 11/13/95
 DATE: 11/13/95
 DATE: 11/13/95

CD-11

SET 1 OF 6
FINAL "AS-BUILT" PLANS
FIN: 242531-1-52-01
FAPN: 00422251
OSCEOLA COUNTY
STATE ROAD NO. 400
Roadway Plans
(Sheets 1 thru 279)

COMPONENTS OF CONTRACT PLANS SET

- ROADWAY PLANS
- SIGNING AND PAVEMENT MARKING PLANS
- SIGNALIZATION PLANS
- LIGHTING PLANS
- STRUCTURE PLANS
- A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

SHEET NO.

- 2A-26 KEY SHEET
- 3-7 SUMMARY OF PAVEMENT ITEMS
- 8-16 DRAINAGE MAP
- 8-16 INTERCHANGE DRAINAGE MAP
- 8-16 FLOOD DATA
- 8-16 EXISTING DRAINAGE STRUCTURES
- 31-39 SUMMARY OF QUANTITIES
- 40-42 BOX CULVERT SPT BORINGS
- 43-54 OPTIONAL PIPE MATERIAL TABULATIONS
- 55 SUMMARY OF DRAINAGE STRUCTURES
- 56-67 PROJECT LAYOUT
- 68 REFERENCE POINTS
- 69-70 COORDINATE AND CURVE DATA
- 71-76 GENERAL NOTES
- 77 PLAN SHEETS
- 100-133 PROFILE SHEETS
- 134-136 SPECIAL CUTTER PROFILES
- 137 INTERCHANGE LAYOUT
- 138-141 RAMP TERMINAL DETAILS
- 142-162 POND DETAIL SHEETS
- 163 DRAINAGE DETAILS
- 164-187 TYPICAL DRAINAGE STRUCTURES
- 188-207 DRAINAGE STRUCTURES
- 208-279 ROADWAY SOIL SURVEY
- 280-308 CROSS SECTIONS
- 309-336 POND CROSS SECTIONS
- 337 STORMWATER POLLUTION PREVENTION PLAN NOTES
- 338 TPC GENERAL NOTES
- 339 TRAFFIC CONTROL PLANS
- 340-380 UTILITY ADJUSTMENT PLANS
- 381-385 STRUCTURES STANDARDS (THREE BEAM RETROFIT)
- 386-392 INTERIM STANDARDS
- 393 GOVERNING STANDARDS AND SPECIFICATIONS:
- 394 FLORIDA LEGISLATION DATED JANUARY 2002 AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 2004,
- 395 AS AMENDED BY CONTRACT DOCUMENTS.

REVISIONS

- 05/11/2004 SHEETS 639, L-5
- 09/03/2004 SHEET L-9
- 09/17/2004 SHEETS 0, 80, 81, 86, 87, 88, 89-94, 91, 121, 123, 128, 153, 154, 173, 186, 201, 203, 204, 207, 259-264, 265, 268, 269, 270, 271, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

Final "As-Built" Plans

FINANCIAL PROJECT ID 242531-1-52-01
(FEDERAL FUNDS)
OSCEOLA COUNTY (92130)
STATE ROAD NO. 400

Name of Contractor:
H.W. Lochner, Inc.
Consultant:
Norlane Downs, P.E.
District Secretary:
Amy Scalen, P.E.
Resident Engineer:
Lynn Chaita, P.E.
Project Manager:
Murray Yates, P.E.
Senior Project Engineer:
Robert Murphy, H.W. Lochner, Inc.
Project Engineer:
01-03-2005
Date Work Final Accepted:
09-20-2007

END PROJECT
FINANCIAL PROJECT ID 242531-1-52-01
STA. 402+6.68 @ SURVEY SR 400 (1-4)
MP 7.617

BEGIN CONSTRUCTION
@ SURVEY US 192 (SR 530)
STA. 490+00.00

@ WB 1-4 (SR 400)
STA. 2319+20.47 =
@ SURVEY 1-4 (SR 400)
STA. 319+11.84

BEGIN CONSTRUCTION
@ WB 1-4 (SR 400)
STA. 2259+00.00

BEGIN CONSTRUCTION
@ EB 1-4 (SR 400)
STA. 1289+50.00

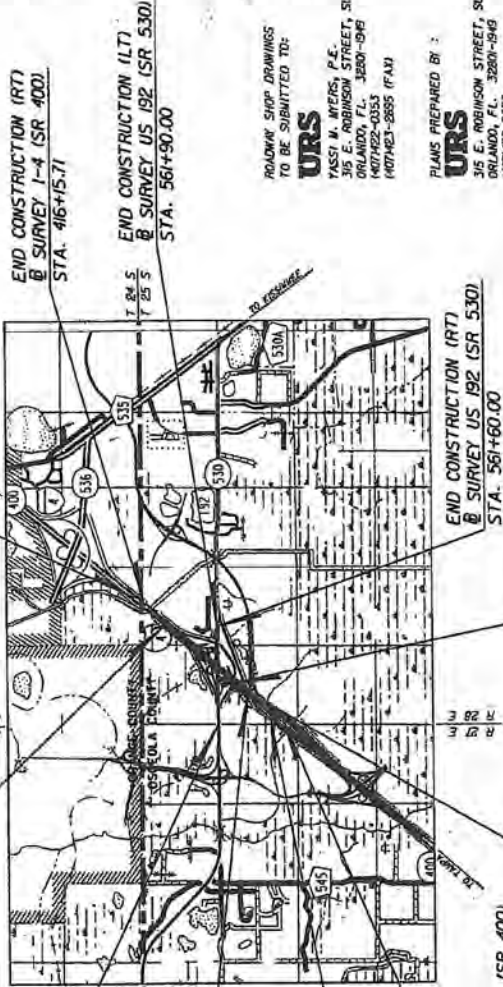
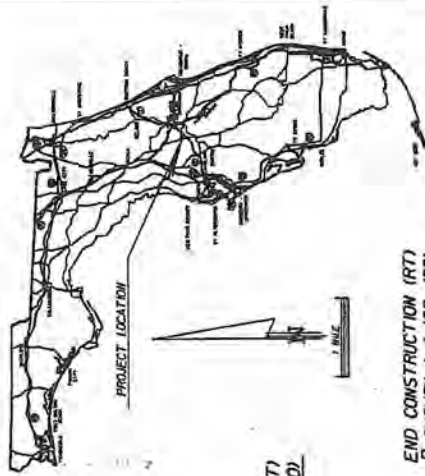
@ EB 1-4 (SR 400)
STA. 1319+20.47 =
@ SURVEY 1-4 (SR 400)
STA. 319+11.84

See sheet 1A for list of new plan sheets

LENGTH OF PROJECT

LINEAR FT.	MILES
ROADWAY	2,306.68
BRIDGES	0.00
NET LENGTH OF PROJ.	2,306.68
EXCEPTIONS	0.00
GROSS LENGTH OF PROJ.	2,306.68

FOOT PROJECT MANAGER : ALAN LEDGERWOOD



BEGIN PROJECT
FINANCIAL PROJECT ID 242531-1-52-01
STA. 329+00.00 @ SURVEY SR 400, (1-4)
MP 6.231

This Project was constructed in substantial compliance with those plans as provided by the engineer of record. These plans reflect "As-Built" conditions where indicated.
Murray Yates
S.E. Project Engineer
Resident Engineer
Date 10/18/07

ROADWAY SHOP DRAWINGS TO BE SUBMITTED TO:

URS
YASSI M. MYERS, P.E.
315 E. ROBINSON STREET, SUITE 205
ORLANDO, FL. 32801-1949
(407)422-0353
(407)423-9855 (FAX)

PLANS PREPARED BY:

URS
315 E. ROBINSON STREET, SUITE 205
ORLANDO, FL. 32801-1949
(407)422-0353
VENDOR NO. 59-2087895

CONTRACT NO. C-9134
CERTIFICATE OF AUTHORIZATION NO. 00000002
NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

ISSUED BY:
CONTRACTOR OF RECORD: YASSI M. MYERS, P.E.
P.E. NO. 32801

Stamp and signature area with handwritten text: #56129 4/24/07

FINANCIAL PROJECT ID 242531-1-52-01
 W.P.I. NO. 5147335
 DATE: 10/24/02

STRUCTURE NO.	STATION	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD		GREATEST FLOOD			
		2% PROB. DISCHARGE	50 YR. FREQ. STAGE	1% PROB. DISCHARGE	100 YR. FREQ. STAGE	DISCHARGE	STAGE	DISCHARGE	STAGE	PROB. %	FREQ. YR.
S-19	121+27.81	50.50	87.40	55.00	87.44			64.00	87.62	0.2	500
S-25A	126+00.26	250.00	89.85	265.14	90.29			300.00	91.29	0.2	500
S-24A	356+96.12	340.00	89.32	355.46	89.72			388.00	90.59	0.2	500
S-24C	849+78.38	340.00	88.56	355.46	88.90			388.00	89.63	0.2	500
S-2322	854+50.16	340.00	87.67	355.46	87.96			388.00	88.58	0.2	500
S-22A	503+36.86	340.00	86.89	355.46	87.09			388.00	87.52	0.2	500
S-21	502+17.40	340.00	86.06	355.46	86.20			388.00	86.49	0.2	500

NOTE: THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY, TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS SENSITIVE TO CHANGES, PARTICULARLY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CAN NOT BE ATTAINED. DISCHARGES ARE IN CUBIC FEET PER SECOND AND STAGES ARE IN FEET, NAVD, 1988.

DEFINITIONS:

- DESIGN FLOOD:** THE FLOOD SELECTED BY F.D.O.T. TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PERFORMANCE.
- BASE FLOOD:** THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY)
- OVERTOPPING FLOOD:** THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THRU EMERGENCY RELIEF STRUCTURES.
- GREATEST FLOOD:** THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT PRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY)

PREPARED BY: REC
 DATE: 10/02/02

PK
 3/1/04

REVISIONS		STATE OF FLORIDA		DEPARTMENT OF TRANSPORTATION		FINANCIAL PROJECT ID		SHEET NO.	
DATE	BY	DESCRIPTION	ROAD NO.	COUNTY	SR NO.	OSCEOLA	242531-1-52-01	FLOOD DATA	
			SR 400	OSCEOLA	SR 400	OSCEOLA	242531-1-52-01	17	

Murray
10/15/10

AREA TO INLET			
STR. NO.	AREA	STR. NO.	AREA
S-700	0.07	S-715	0.08
S-700A	0.11	S-700	1.89
S-701	0.09	S-700	1.89
S-702	0.40	S-700	1.89
S-703	0.80	S-700	1.89
S-704	0.80	S-700	1.89
S-705	0.80	S-700	1.89
S-706	0.80	S-700	1.89
S-707	0.80	S-700	1.89
S-708	0.80	S-700	1.89
S-709	0.80	S-700	1.89
S-710	0.80	S-700	1.89
S-711	0.80	S-700	1.89
S-712	0.80	S-700	1.89
S-713	0.80	S-700	1.89
S-714	0.80	S-700	1.89
S-715	0.80	S-700	1.89
S-716	0.80	S-700	1.89
S-717	0.80	S-700	1.89
S-718	0.80	S-700	1.89
S-719	0.80	S-700	1.89
S-720	0.80	S-700	1.89
S-721	0.80	S-700	1.89
S-722	0.80	S-700	1.89
S-723	0.80	S-700	1.89
S-724	0.80	S-700	1.89
S-725	0.80	S-700	1.89
S-726	0.80	S-700	1.89
S-727	0.80	S-700	1.89
S-728	0.80	S-700	1.89
S-729	0.80	S-700	1.89
S-730	0.80	S-700	1.89
S-731	0.80	S-700	1.89
S-732	0.80	S-700	1.89
S-733	0.80	S-700	1.89
S-734	0.80	S-700	1.89
S-735	0.80	S-700	1.89
S-736	0.80	S-700	1.89
S-737	0.80	S-700	1.89
S-738	0.80	S-700	1.89
S-739	0.80	S-700	1.89
S-740	0.80	S-700	1.89
S-741	0.80	S-700	1.89
S-742	0.80	S-700	1.89
S-743	0.80	S-700	1.89
S-744	0.80	S-700	1.89
S-745	0.80	S-700	1.89
S-746	0.80	S-700	1.89
S-747	0.80	S-700	1.89
S-748	0.80	S-700	1.89
S-749	0.80	S-700	1.89
S-750	0.80	S-700	1.89
S-751	0.80	S-700	1.89
S-752	0.80	S-700	1.89
S-753	0.80	S-700	1.89
S-754	0.80	S-700	1.89
S-755	0.80	S-700	1.89
S-756	0.80	S-700	1.89
S-757	0.80	S-700	1.89
S-758	0.80	S-700	1.89
S-759	0.80	S-700	1.89
S-760	0.80	S-700	1.89
S-761	0.80	S-700	1.89
S-762	0.80	S-700	1.89
S-763	0.80	S-700	1.89
S-764	0.80	S-700	1.89
S-765	0.80	S-700	1.89
S-766	0.80	S-700	1.89
S-767	0.80	S-700	1.89
S-768	0.80	S-700	1.89
S-769	0.80	S-700	1.89
S-770	0.80	S-700	1.89
S-771	0.80	S-700	1.89
S-772	0.80	S-700	1.89
S-773	0.80	S-700	1.89
S-774	0.80	S-700	1.89
S-775	0.80	S-700	1.89
S-776	0.80	S-700	1.89
S-777	0.80	S-700	1.89
S-778	0.80	S-700	1.89
S-779	0.80	S-700	1.89
S-780	0.80	S-700	1.89
S-781	0.80	S-700	1.89
S-782	0.80	S-700	1.89
S-783	0.80	S-700	1.89
S-784	0.80	S-700	1.89
S-785	0.80	S-700	1.89
S-786	0.80	S-700	1.89
S-787	0.80	S-700	1.89
S-788	0.80	S-700	1.89
S-789	0.80	S-700	1.89
S-790	0.80	S-700	1.89
S-791	0.80	S-700	1.89
S-792	0.80	S-700	1.89
S-793	0.80	S-700	1.89
S-794	0.80	S-700	1.89
S-795	0.80	S-700	1.89
S-796	0.80	S-700	1.89
S-797	0.80	S-700	1.89
S-798	0.80	S-700	1.89
S-799	0.80	S-700	1.89
S-800	0.80	S-700	1.89

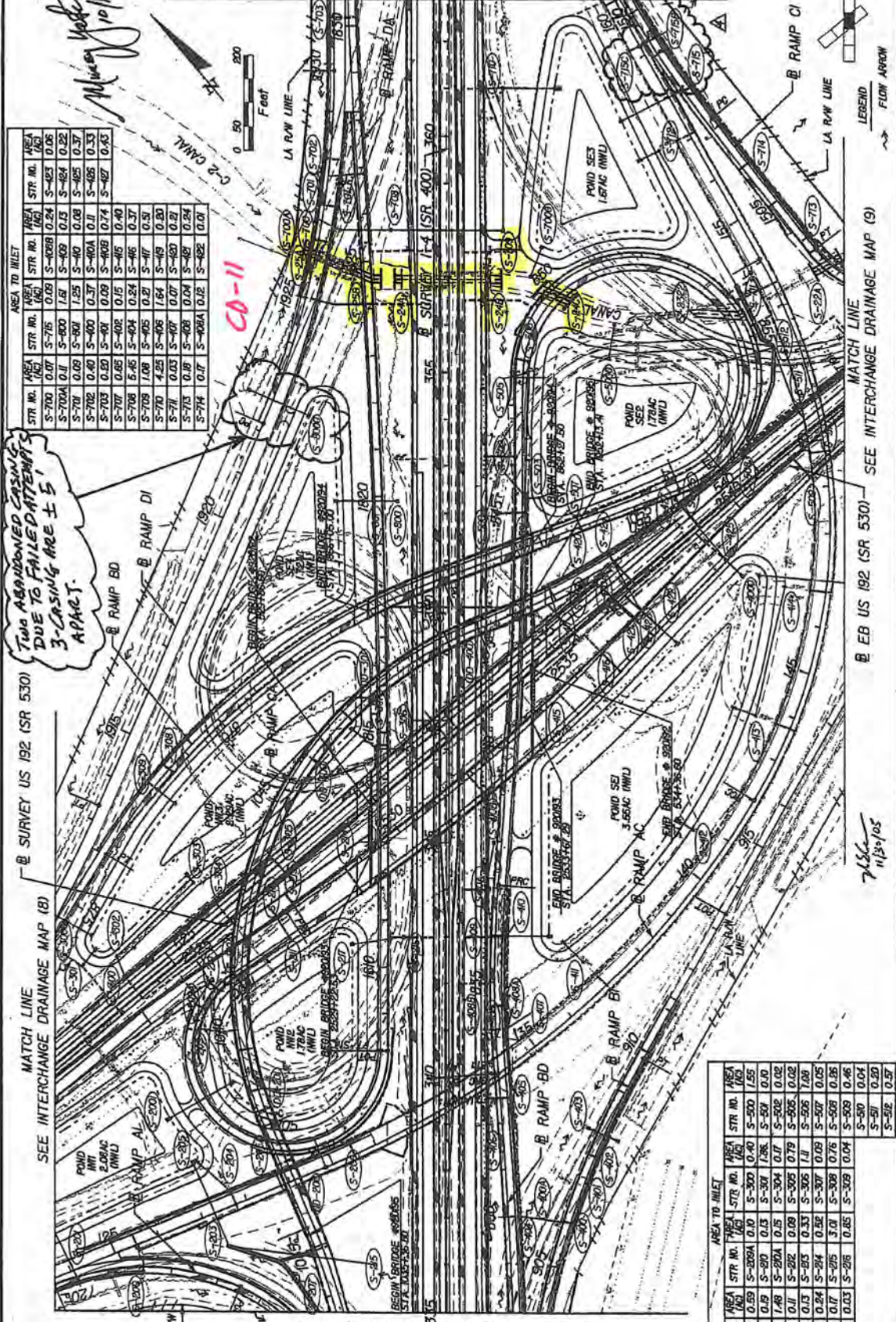
TWO ABANDONED CASING
DUE TO FAILED DATUMS
3-CASING ARE ± 5'
APART.

SEE SURVEY US 192 (SR 530)

SEE INTERCHANGE DRAINAGE MAP (B)

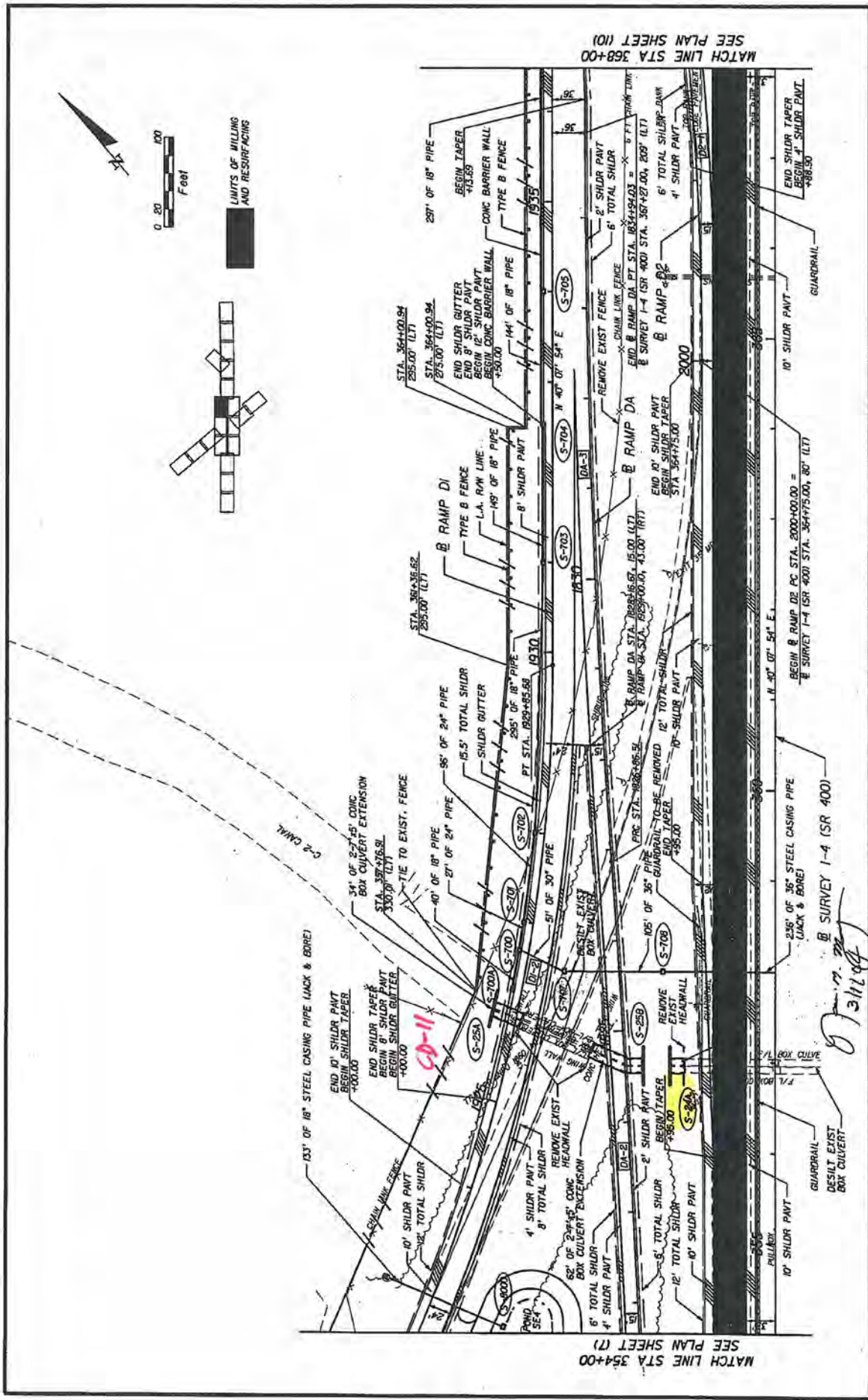
SEE INTERCHANGE DRAINAGE MAP (2)

SEE INTERCHANGE DRAINAGE MAP (4)



AREA TO INLET			
STR. NO.	AREA	STR. NO.	AREA
S-800	0.59	S-800A	0.10
S-801	0.19	S-800	0.40
S-802	0.19	S-801	1.98
S-803	1.48	S-804	0.17
S-804	0.11	S-805	0.09
S-805	0.13	S-805	0.79
S-806	0.24	S-806	0.79
S-807	0.17	S-807	0.09
S-808	0.03	S-808	0.76
S-809	0.03	S-809	0.04
S-810	0.04	S-810	0.04
S-811	0.50	S-811	0.50
S-812	0.57	S-812	0.57

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
9-17-04	REC	DELETION OF S-48			
10-28-04	REC	ADDITION OF S-715B, S-715C AND B1 PIPE			
REVISIONS REVISION NO. 1 DATE 11/30/05 BY [Signature]					
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		ROAD NO. SR 400		COUNTY OSCEOLA	
PROJECT NO. 242531-1-52-01		PROJECT TITLE INTERCHANGE DRAINAGE MAP (B)			
INTERCHANGE DRAINAGE MAP (B) STA 335+00 TO STA 365+00 SHEET NO. 10					

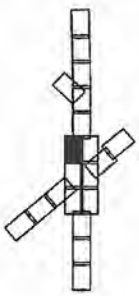


MATCH LINE STA 354+00
SEE PLAN SHEET (7)

MATCH LINE STA 368+00
SEE PLAN SHEET (10)



LIMITS OF MILLING
AND RESURFACING



DATE	BY	DESCRIPTION	REVISIONS	DATE	BY	DESCRIPTION

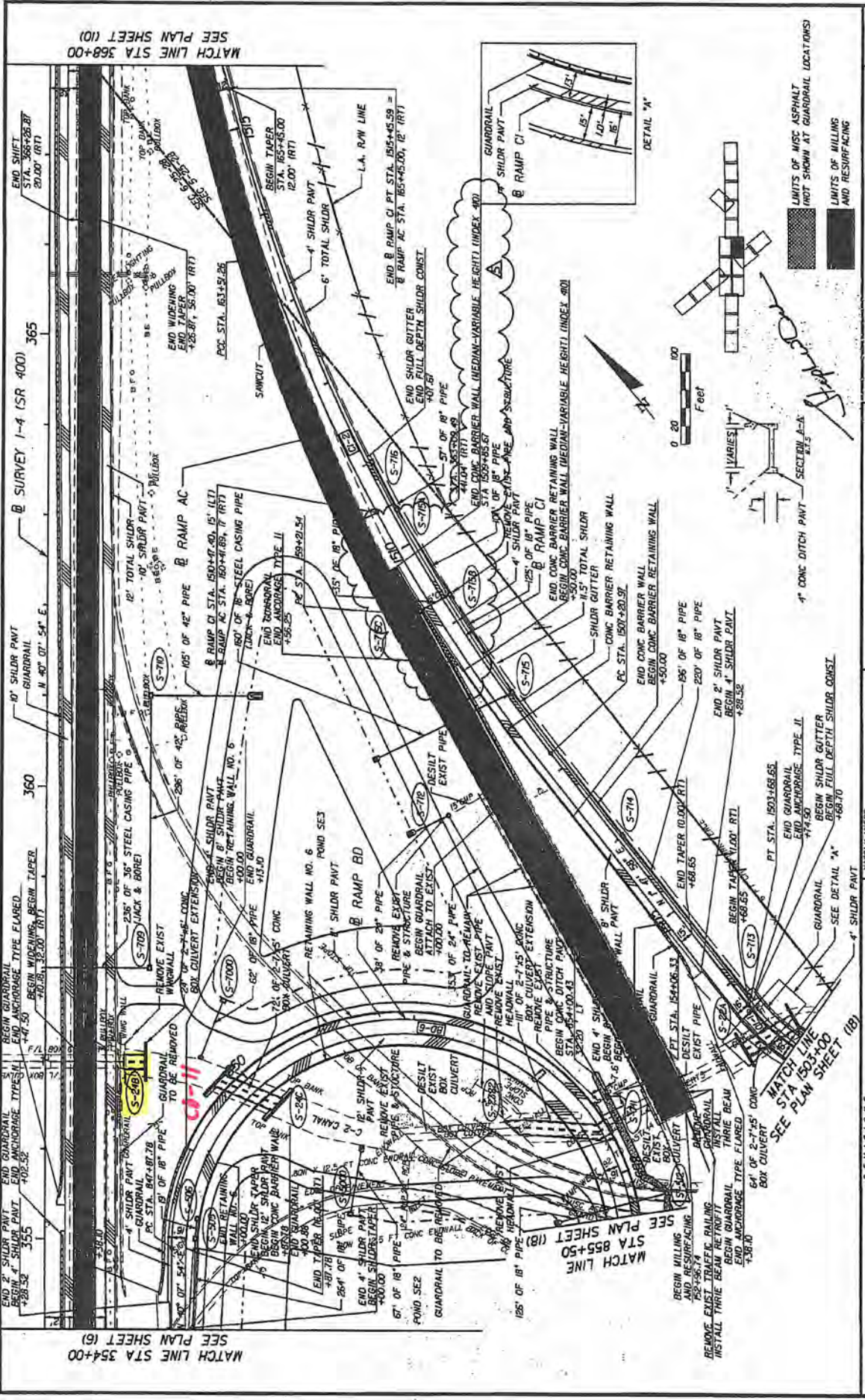
STATE OF FLORIDA		DEPARTMENT OF TRANSPORTATION	
ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
SR 400	OSCEOLA	242531-1-52-01	

YASSI H. WELLS		P.E. LICENSE NO. 3884	
URS CORPORATION		100 UNIVERSITY AVENUE, SUITE 245	
ORLANDO, FL 32801-8715		PH (407) 423-3855	
FAX (407) 423-3855		CERTIFICATE OF AUTHORIZATION NO. 00000002	

PLAN SHEET (9)

SHEET NO. 88

DATE: JUN 21 13:25:50 2006



DATE	BY	DESCRIPTION	REVISIONS
0-28-08	REC	ADDITION OF S-755A, S-755C, S-755D AND S-755E	5
		EXTENDED CONC BARRIER WALL	
		18\"/>	

PLAN SHEET (8)

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO. SR 400
COUNTY OSCEOLA
PROJECT ID 242531-1-52-01

DATE 01/15/08
DRAWN BY J. W. WILSON
CHECKED BY J. W. WILSON
SCALE 1" = 40'

REVISIONS

DESCRIPTION

DATE

BY

REVISIONS

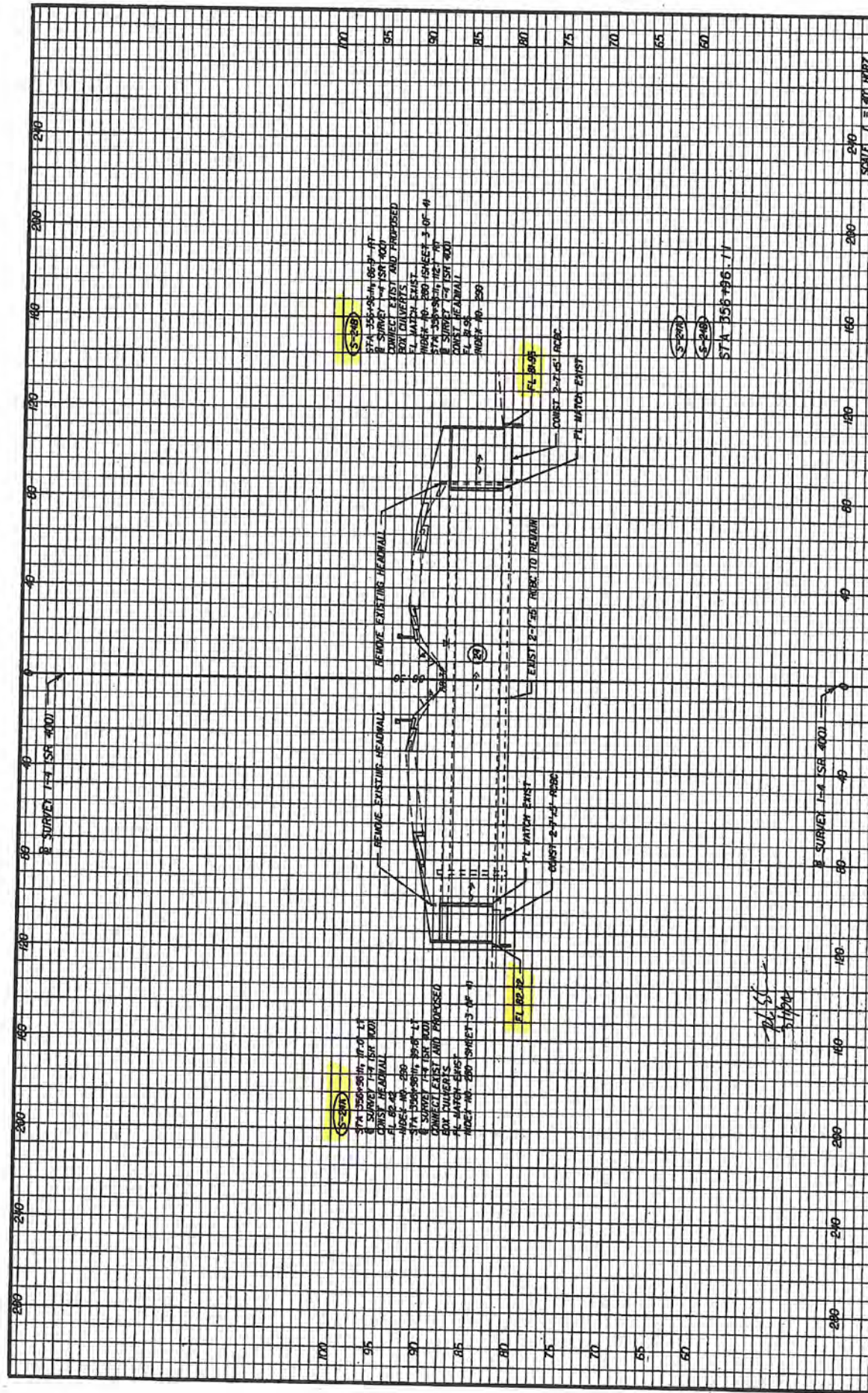
5



DATE	BY	DESCRIPTION	REVISIONS	DATE	BY	DESCRIPTION

PENNYTO E CIVIL P.L.L.C. 315 E. ROBINSON STREET, SUITE 205 ORLANDO, FL 32801-4005 CERTIFICATE OF AUTHORIZATION NO. 00000002	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION ROAD NO. SR 400 COUNTY OSCEOLA PROJECT ID 242531-1-52-01	SHEET NO. 270 SCALE HORIZONTAL = 1" = 40' HORZ. VERTICAL = 1" = 10' VERT.
-----------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------

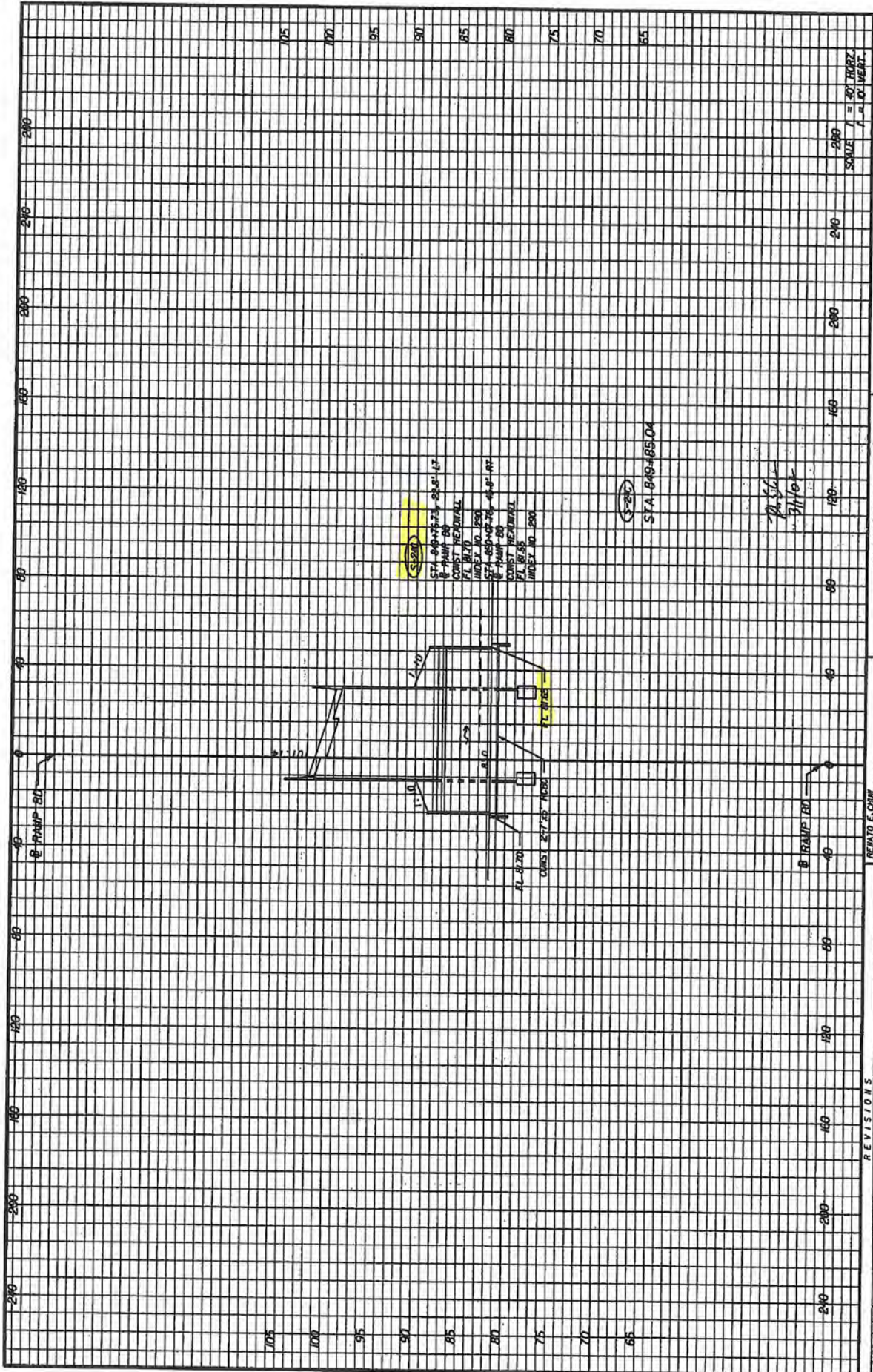
STA 1924+80.00 TO 1924+99.41
 CONST 2'-7" X 5" REIN TO REMAIN
 REMOVE EXIST HEADWALL
 FL MATCH EXIST
 STA 1924+80.00 TO 1924+99.41
 CONST 2'-7" X 5" REIN TO REMAIN
 REMOVE EXIST HEADWALL
 FL MATCH EXIST
 STA 1924+80.00 TO 1924+99.41
 CONST 2'-7" X 5" REIN TO REMAIN
 REMOVE EXIST HEADWALL
 FL MATCH EXIST
 STA 1924+80.00 TO 1924+99.41
 CONST 2'-7" X 5" REIN TO REMAIN
 REMOVE EXIST HEADWALL
 FL MATCH EXIST



DATE	REV.	DESCRIPTION	DATE	REV.	DESCRIPTION

REIATO E. CHOW
 P.E. LICENSE NO. 50000
 315 E. ROBINSON STREET, SUITE 205
 ORLANDO, FL 32801-8975
 PH (407) 422-0553 FAX (407) 423-8895
 CERTIFICATE OF AUTHORIZATION NO. 00000002
 PROJECT: SR 400 Drainage Structure Upgrade @ I-4/US 90 JCT

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION COUNTY OSCEOLA	ROAD NO. SR 400	FINANCIAL PROJECT ID. 242531-1-52-01	SHEET NO. 197
-----------------------------------------------------------------------	--------------------	-----------------------------------------	------------------



DATE	BY	DESCRIPTION	REVISIONS	DATE	BY	DESCRIPTION

REVATO E. CHW P.E. LICENSE NO. 50050 JRS CORPORATION 305 E. ROBINSON STREET, SUITE 2-9 TAMPA, FL 33604 PH (813) 492-3333 FAX (813) 492-9898 CERTIFICATE OF AUTHORIZATION NO. 00000002 HT 9789 STATE 242531 02 21 0000 0000 0000 0000 0000 0000		ROAD NO. SR 400	COUNTY OSCEOLA	FINANCIAL PROJECT ID 242531-1-52-01	DEPARTMENT OF TRANSPORTATION STATES OF FLORIDA
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--------------------	-------------------	----------------------------------------	---------------------------------------------------

SCALE 1" = 80' HORZ. 1" = 10' VERT.	SHEET NO. 249
-------------------------------------------	------------------

RAMP RD
DRAINAGE STRUCTURE SHEET

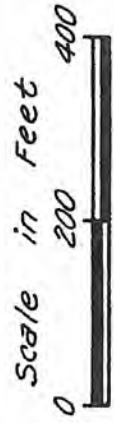
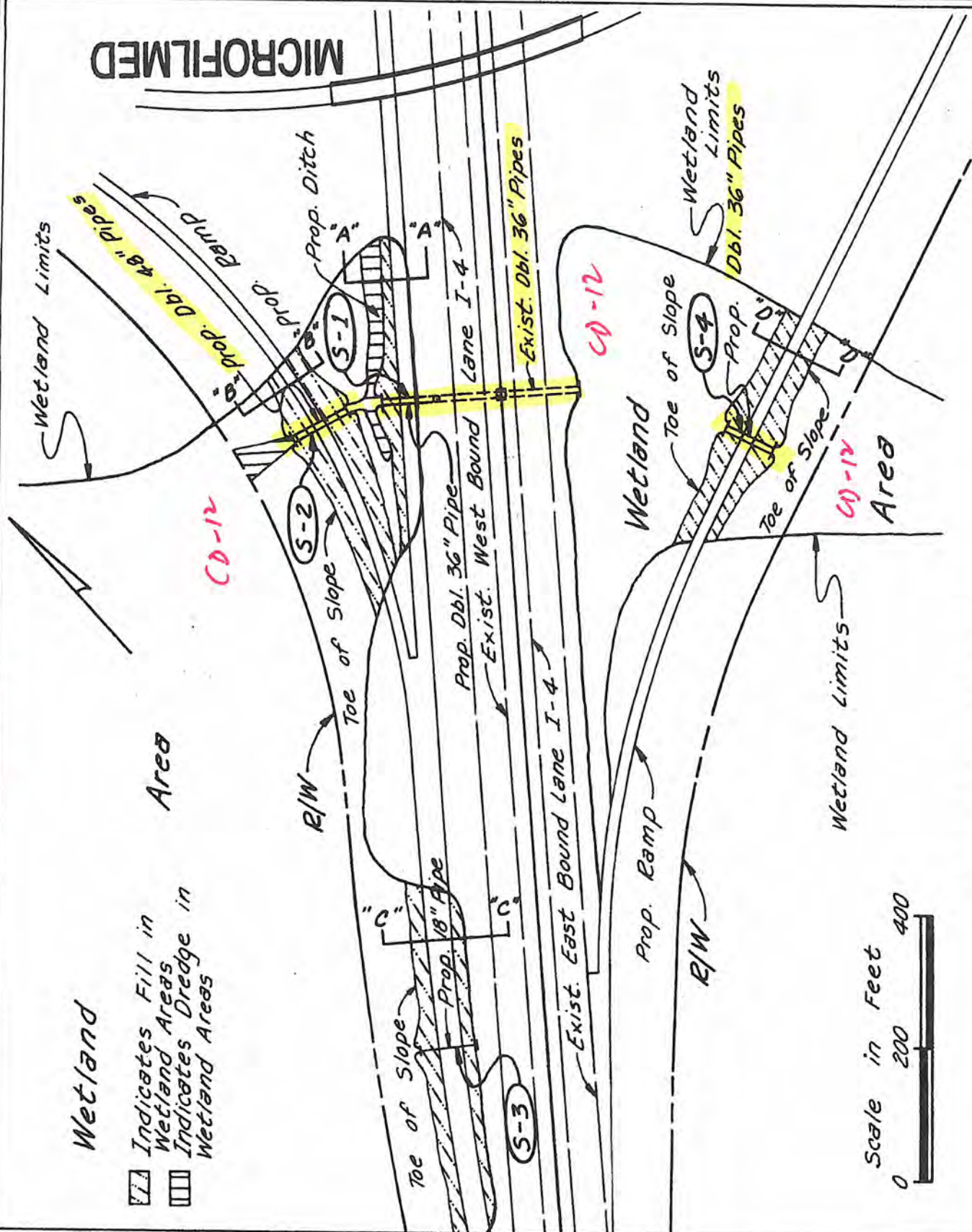
STA. 849+85.04

FF 128 21 1424185 2004

CD 12 & CD 13

MICROFILMED

- Wetland
- Indicates Fill in Wetland Areas
- Indicates Dredge in Wetland Areas



PLAN VIEW

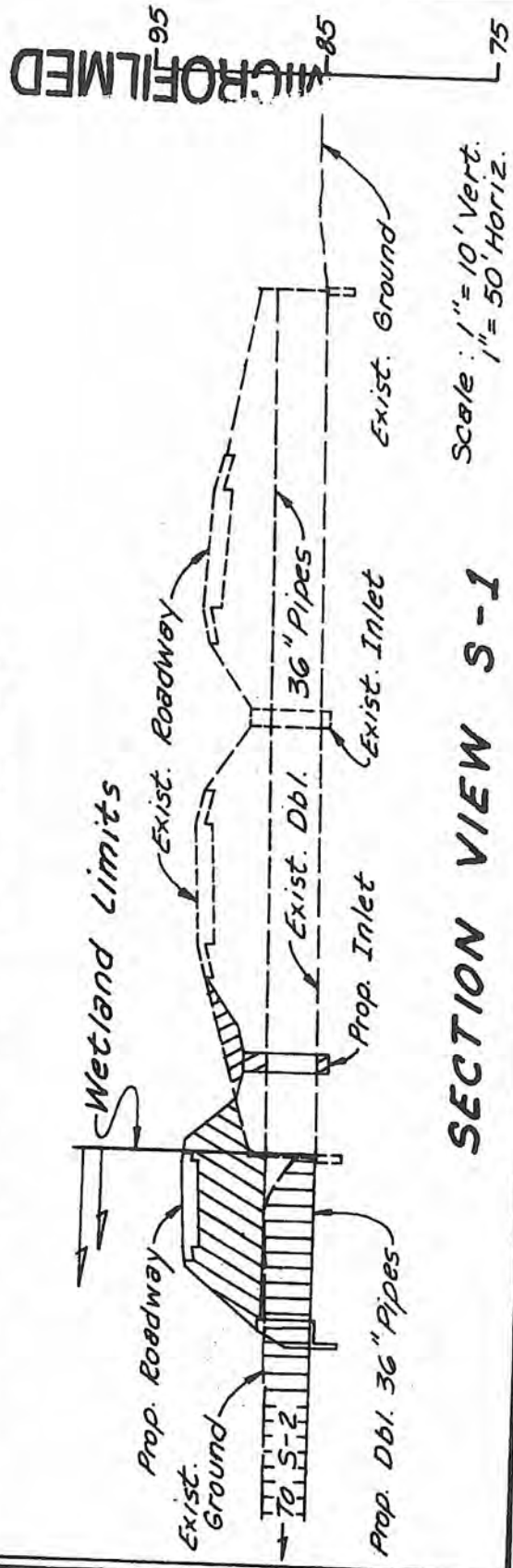
Date: 3/17/81

Sheet 2 of 7

CD-12

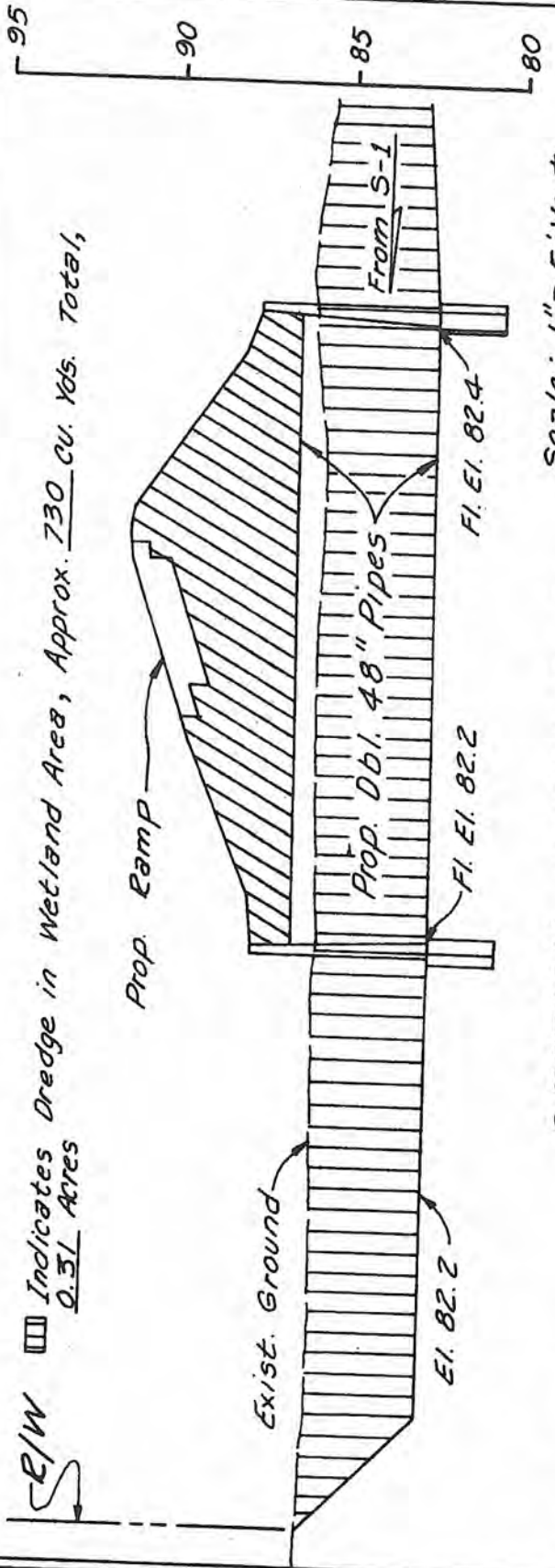
▨ Indicates Deposit, Approx. 120 cu. Yds. Total

▩ Indicates Excavation, Approx. 640 cu. Yds. Total



SECTION VIEW S-1

SE/W ▨ Indicates Dredge in Wetland Area, Approx. 730 cu. Yds. Total, 0.31 Acres



SECTION VIEW S-2

Date: 3/17/81

STATE PROJ. NO.	SHEET NO.
75000 - 3520	4

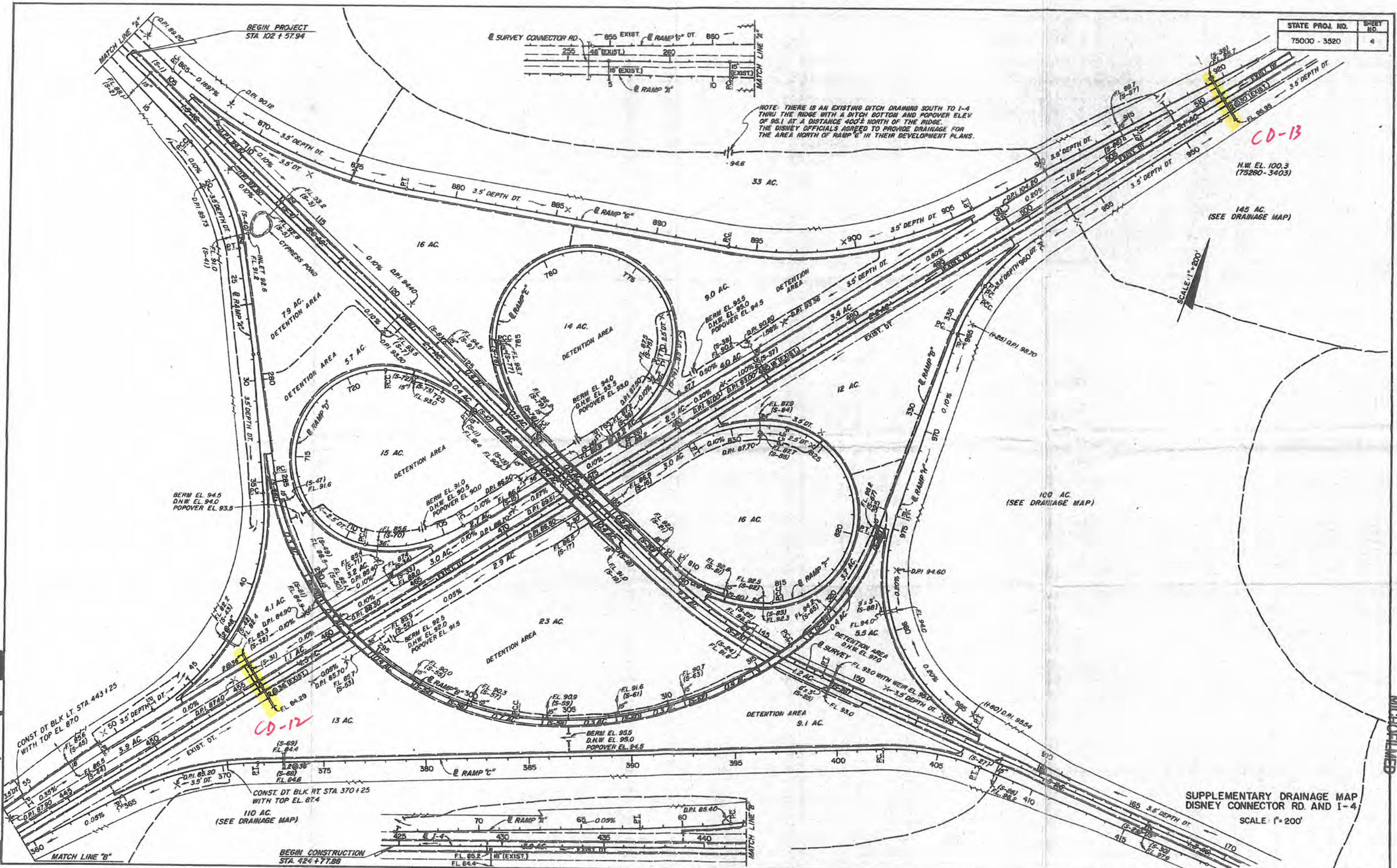
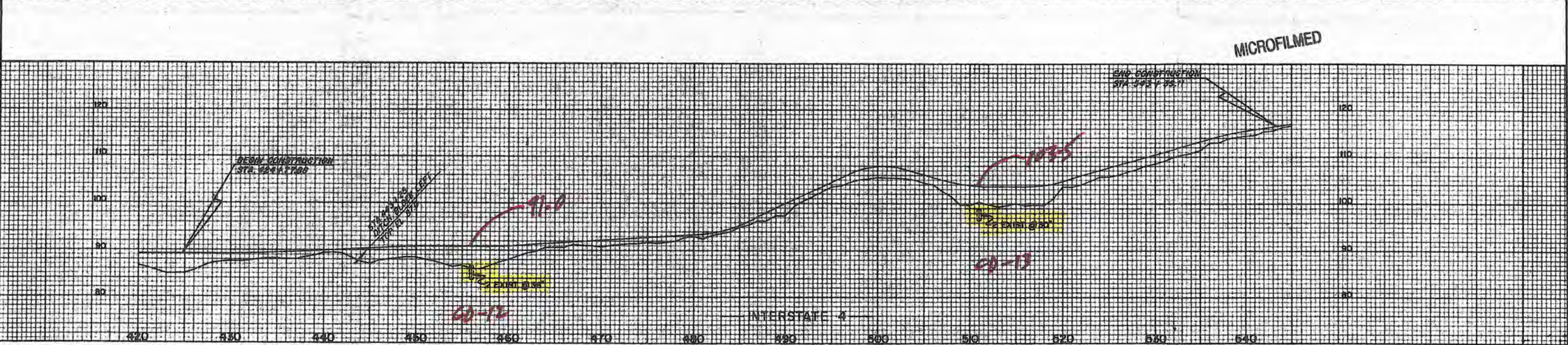
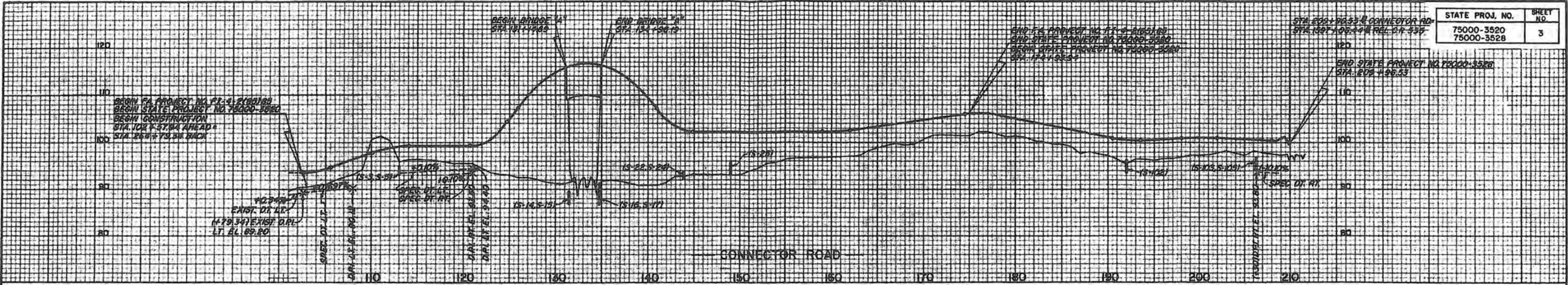
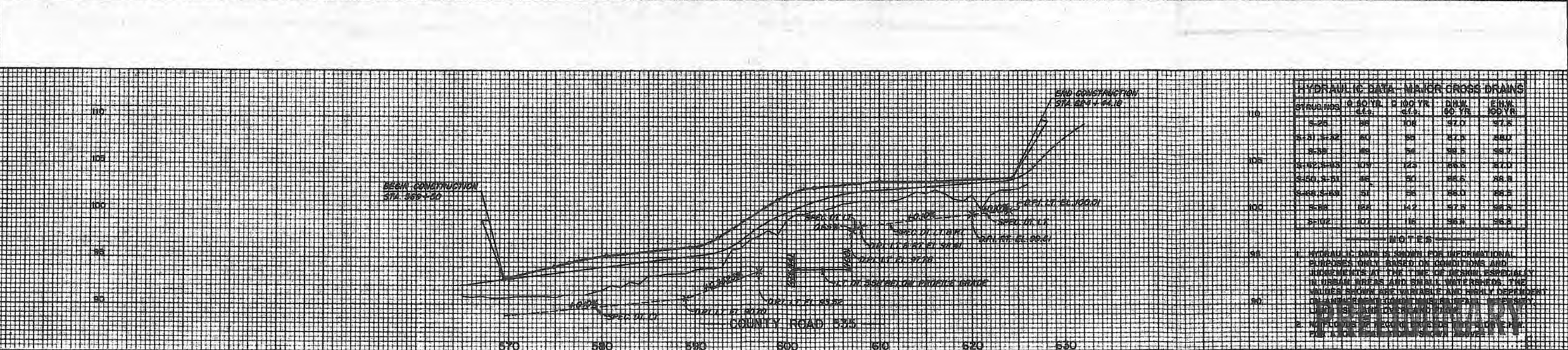


Exhibit 3

SUPPLEMENTARY DRAINAGE MAP
DISNEY CONNECTOR RD. AND I-4
SCALE: 1" = 200'



MICROFILMED

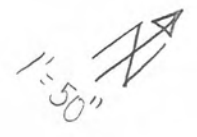


HYDRAULIC DATA - MAJOR CROSS DRAINS

STATIONING	10 YR. C.T.	100 YR. C.T.	DIM. (60 YR.)	ENH. (100 YR.)
S-26	86	108	57.0	57.5
S-51 5+32	50	58	57.5	58.0
S-55	85	94	58.5	59.7
S-42 3+15	109	125	56.5	57.0
S-50 3+51	86	90	56.5	58.8
S-68 3+83	51	56	56.0	56.5
S-88	124	142	57.5	58.5
S-102	107	116	56.8	56.8

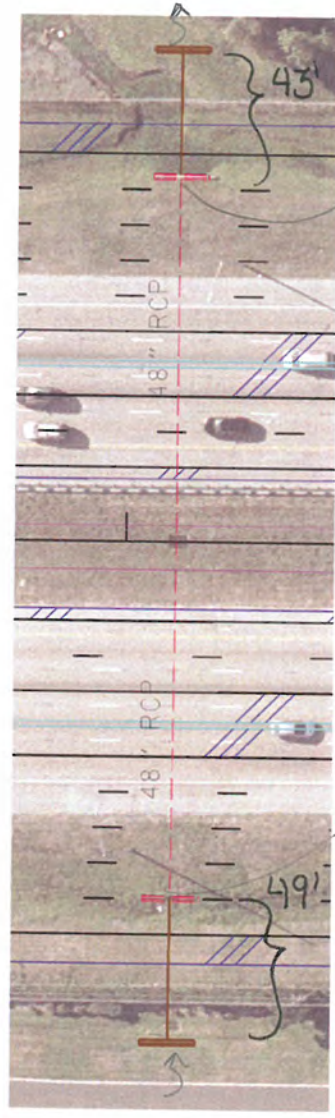
NOTES
1. HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY. BASED ON CONDITIONS AND SURVEILLANCE AT THE TIME OF DESIGN, ESPECIALLY IN URBAN AREAS AND SHADY WATERWAYS. THE VALUES SHOWN ARE VARIABLE AND HIGHLY DEPENDENT ON WATERWAY CHARACTERISTICS AND LOCAL CONDITIONS. LOCAL ENGINEERS SHOULD CONSULT WITH THE STATE ENGINEER FOR FURTHER INFORMATION.

MP 2.929



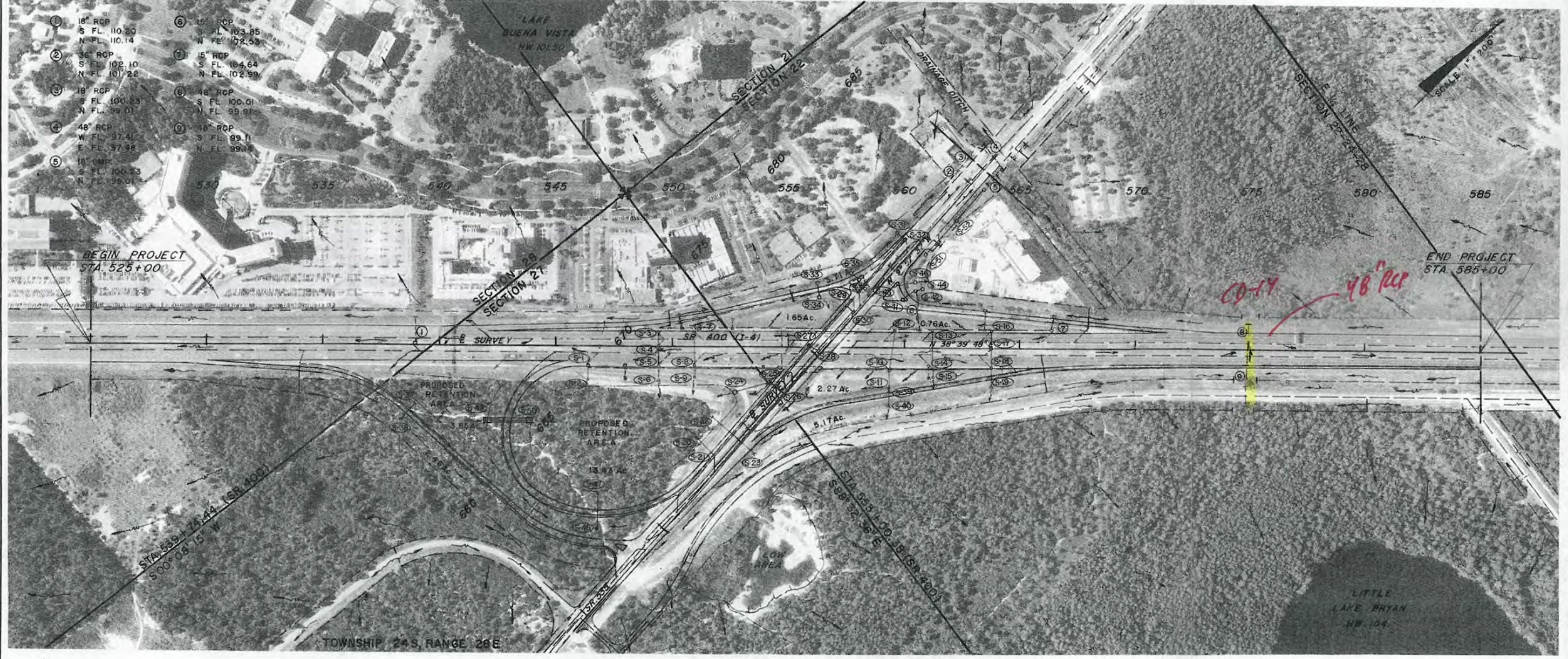
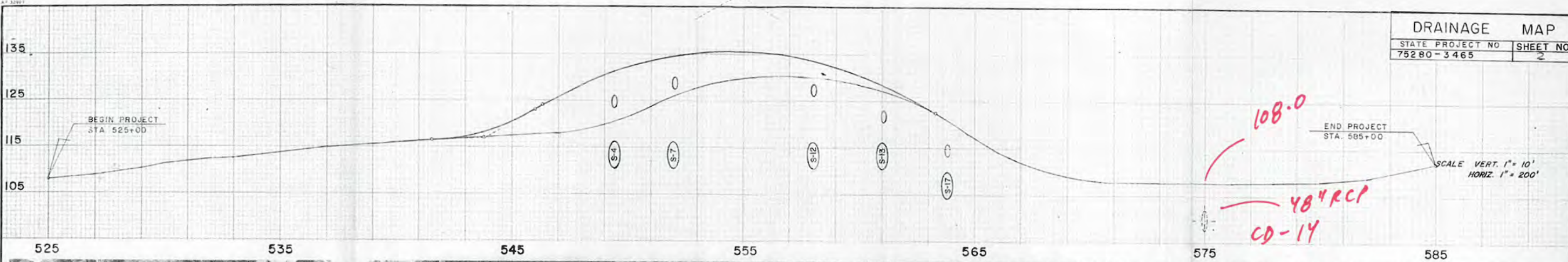
CD-17

S12535



Approx $99.20 - 0.85 = 98.35$

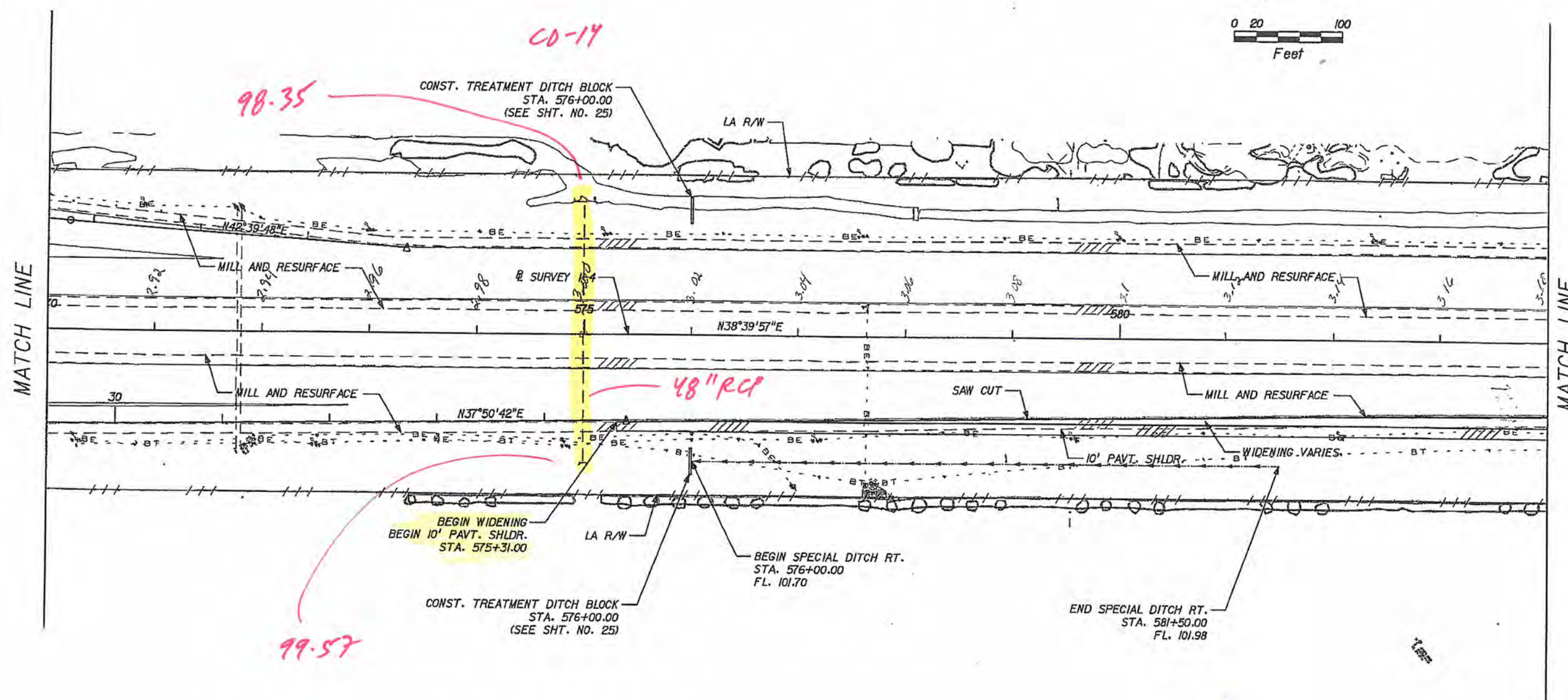
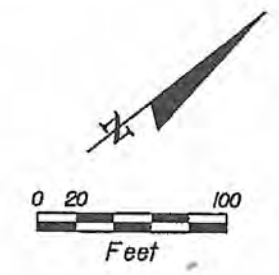
Approx. $100.42 - 0.85 = 99.57$



- ① 18" RCP
S FL 110.20
N FL 110.14
- ② 36" RCP
S FL 102.10
N FL 101.22
- ③ 18" RCP
S FL 100.93
N FL 99.01
- ④ 48" RCP
W FL 97.41
E FL 97.48
- ⑤ 18" CMP
S FL 100.73
N FL 99.01
- ⑥ 15" RCP
S FL 103.85
N FL 102.59
- ⑦ 15" RCP
S FL 104.64
N FL 102.99
- ⑧ 48" RCP
S FL 100.01
N FL 99.91
- ⑨ 18" RCP
S FL 99.11
N FL 99.11

REVISIONS				DESIGNED				DRAWN				APPROVED	
DATE	BY	DESCRIPTION		NAME	DATE	NAME	DATE	NAME	DATE	DATE	DATE	DATE	DATE
				PC	2-86	RR	2-86						
				CHECKED BY		CHECKED BY							
				SUPERVISED BY									

DRAINAGE MAP
 SR 400 (I-4) & SR 535



MATCH LINE

MATCH LINE

98.35

99.57

48" RCP

REVISIONS	
DATE	DESCRIPTION

HNTB CORPORATION
5850 T.G. LEE BLVD., SUITE 600
ORLANDO, FL 32822
PH. 407-859-8380
CA #6500



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	ORANGE	405515-1-52-01

**I-4 AUXILIARY LANES
PLAN 2**

SHEET NO.
31

A.P. Melton
11/01/02
AS-BUILT

TONY L. MELTON, P.E. #40398