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

Pond Siting Report

Segment 4: State Road 400 (SR 400)/Interstate 4 (I-4) from East of SR 15-600/US 17-92 (Seminole/Volusia County Line) to ½ Mile East of SR 472

Volusia County, Florida (79110)

August 2016

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4 EXPRESS

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 Volusia County, Florida.

This Pond Siting Report (PSR) includes a summary of data collection efforts, calculations, and an overall drainage review prepared for the conceptual analyses for the SR 400 (I-4) widening and extension from east of SR 15/600-US 17/92 (Seminole/Volusia County Line) to ½ mile east of SR 472 in Volusia 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.

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DATE: August 2016

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Executive Summary

The Florida Department of Transportation (FDOT) is conducting an update/reevaluation of the Project Development and Environment (PD&E) studies for the extension of proposed express lanes for State Road 400 (SR 400)/Interstate 4 (I-4). The project limits are within an approximate ten (10) mile segment of I-4 which extends from east of US 17-92 to east of SR 472, from Milepost 0.086 to 10.227 in Volusia County, Florida located within Sections 1, 2, 10, 11, 15, 16, 20, 21 and 29 of Township 19 South, Range 30 East; Sections 13, 24, 25, 35 and 36 of Township 18 South, Range 30 East; and Sections 6, 7 and 18 of Township 18 South, Range 31 East and Rhode Island Avenue, located within Sections 12 & 13, Township 18 South, Range 30 East and extends east approximately 1.3 miles to Section 7 & 18, Township 18 South, Range 31 East. The project datum is NAVD 88.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. The existing typical section for the I-4 mainline consists of three 12-foot travel lanes in each direction. The outside and inside shoulders are 12 feet wide with 10 feet paved. The median width varies from 37 feet to 375 feet and the existing right of way (ROW) varies from 300-feet to 630-feet. The typical section in the proposed condition will have three 12-foot general use travel lanes with a 10-foot inside and 12-foot outside shoulder and two 12-foot express lanes with a 4-foot inside and 10-foot outside shoulder, in each direction. A barrier wall between adjacent 10-foot shoulders will separate the express lanes from the general use lanes. A 44' transit corridor will be provided in the median for the entire length of Segment 4 and auxiliary lanes in both the eastbound and westbound directions will be provided in some areas. It is the intent to have a design exception for the shoulders in the design phase, so for the purpose of our analysis, we used a 36 foot gravel median. Refer to Figure 1.2 of the Preliminary Engineering Report (PER) for the I-4 existing and proposed typical sections.

An extension to Rhode Island Avenue is being proposed as part of the SR 400 (I-4) PD&E reevaluation project. The limits of improvement extend approximately 1 ¼ miles from the east end of Rhode Island Avenue at Veterans Memorial Parkway in Orange City, to Normandy Boulevard in Deltona. The current proposed extension follows the same alignment previously proposed in plans that were completed by Volusia County in 2009. The County has purchased right of way for the previously proposed alignment; any additional parcels will be acquired under the I-4 Beyond the Ultimate project. The proposed typical section consists of a four-lane urban roadway divided by an 18-foot landscape median, with two 12-foot travel lanes and a 4-foot bike lane in each direction. Eight-foot wide sidewalks, which will be separated from the bike lane by a landscape buffer, will be provided on both sides of the roadway. The Rhode Island Avenue extension and interchange improvements are intended to increase connectivity in this region by providing access between I-4 and US 17-92 (S. Volusia Avenue) to the west and Normandy Boulevard to the east.

The project will be divided into twenty-two (22) drainage basins, which requires thirty-one (31) pond sites, one treatment swale and one (1) stormwater vault for the treatment and attenuation of project runoff. Forty (40) alternate pond sites, two (2) treatment swales and one (1) stormwater vault were evaluated. It is the intent of this report to suggest and evaluate, in detail, potential pond sites for this purpose in order to ultimately determine the most advantageous location for each pond. The table below lists the preferred pond alternatives.

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Table 1 - Summary of Recommended Pond Sites

Basin Designation	Recommended Alternative
400	Pond 400
401	Treatment Swale 401-B
402	Ponds 402A, 402B, 402C, 402D, 402E & 402F
403	Pond 403
405	Ponds 405A & 405B
406	Ponds 406A & 406B
407-408	Ponds 407A, 407B, 407C & 408
408A	Stormwater Vault 408
409	Ponds 409-A1 & 409-B1
410	Pond 410
411	Pond 411
412	Pond 412
413	Pond 413
414	Pond 414
415	Pond 415
416	Pond 416
417	Pond 417
418	Pond 418
A (Rhode Island Ave)	Pond A
B (Rhode Island Ave)	Pond B1
C (Rhode Island Ave)	Pond C
D (Rhode Island Ave)	Pond D

Table 2 - Summary of Recommended FPC Pond Sites

Basin Designation	Recommended Alternative
400	400
403	FPC 403
407_407	FPC 407
A (Rhode Island Ave)	FPC Pond A

Table 3 - Summary of Existing Pond Names and Associated Projects

Basin Name	Pond Alternative Name	Existing Stormwater Facilities	Reason For New Alternative
400	Pond 400	Pond RR-3 (I-4 St. Johns River Bridge Replacement and Six-Laning) (Section 2 FEIS-2000)	-
401	Pond 401	Pond RR-2 (I-4 St. Johns River Bridge Replacement and Six-Laning) (Section 2 FEIS-2000)	-

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Basin Name	Pond Alternative Name	Existing Stormwater Facilities	Reason For New Alternative
401	Treatment Swales 401-A	-	Existing permit has treatment swales instead of a pond based on coordination with SJRWMD.
401	Treatment Swale 401-B	-	Existing permit has treatment swales instead of a pond based on coordination with SJRWMD.
402	Pond 402A	Pond SS-2 (I-4 St. Johns River Bridge Replacement and Six-Laning) (Section 2 FEIS-2000)	-
402	Ponds 402B & 402C	Pond SS-3 (I-4 St. Johns River Bridge Replacement and Six-Laning) FPID No. 242702-1-52-01, Pond SS-3 (Section 2 FEIS-2000)	Modified alternative because of the power lines located through the center of the parcel.
402	Ponds 402D, 402E & 402F	-	Added alternative to accommodate for the proposed alignment.
403	Ponds 403	-	Added alternative to accommodate for the proposed alignment.
403	FPC 403	-	Added alternative to provide floodplain compensation.
405	Pond 405A	Pond D (I-4/Saxon Boulevard Interchange) FPID No 79110-3432, Pond TT-3 (Section 2 FEIS-2000)	-
405	Pond 405B	Pond E (I-4/Saxon Boulevard Interchange) FPID No 79110-3432, Pond TT-3 (Section 2-FEIS-2000)	-
406	Pond 406A	Pond F (I-4/Saxon Boulevard Interchange) FPID No 79110-3432, Pond TT-4 (Section 2-FEIS-2000)	-
406	Pond 406B	Pond TT-4 (Section 2-FEIS-2000)	Added alternative to accommodate for the proposed alignment.
407-408	Ponds 407A & 407B	Pond A (I-4/Saxon Boulevard Interchange) FPID No 79110-3432 & Pond 1 (I-4 Widening from south of Saxon Blvd. to North of SR 472), Pond TT-5 (Section 2 FEIS-2000)	-
407-408	Pond 407C	Pond TT-5 (Section 2 FEIS-2000)	-
407-408	FPC 407	-	To accommodate proposed impacts.
407-408	Pond 408	Pond B (I-4/Saxon Boulevard Interchange) & Pond 1A (I-4 Widening from south of Saxon Blvd. to North of SR 472) FPID No. 242716-1-52-01	Existing pond that was added for the I-4/Saxon Boulevard Interchange improvements and is proposed to be expanded to accommodate Saxon Blvd. six-laning.
408A	Vault 408	-	To accommodate for the six-laning on Saxon Boulevard without

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Basin Name	Pond Alternative Name	Existing Stormwater Facilities	Reason For New Alternative
			impacting as much right-of-way.
408B	408B	-	Added alternatives to accommodate for the six-laning on Saxon Boulevard.
408D1	408D1	-	Added alternatives to accommodate for the six-laning on Saxon Boulevard.
409	Pond 409-A1	Pond 2 (I-4 Widening from south of Saxon Blvd. to North of SR 472), Pond TT-8 (Section 2 FEIS-2000)	The existing pond was built slightly north of the area shown in the original PD&E.
409	Pond 409-A2	Pond TT-8 (Section 2 FEIS-2000)	Expanded existing pond to accommodate for the proposed alignment.
409	Pond 409-B1	-	Added alternative to accommodate for the proposed alignment. This new pond alternative is partially located within the FDOT R/W.
410	Pond 410	Pond 3 (I-4 Widening from south of Saxon Blvd. to North of SR 472)	Existing pond that was added for the I-4/SR 472 Interchange improvements.
411	Pond 411	Pond 3 (SR 472 & Howland Blvd. Interchange)	Existing pond that was added for the SR 472 Interchange improvements.
412	Pond 412	-	Added alternative to accommodate for the SR 472 interchange improvements.
413	Pond 413	Pond 6 (SR 472 & Howland Blvd. Interchange)	Existing pond that was added for the SR 472 Interchange improvements.
414	Pond 414	Pond 6 (I-4 Widening from south of Saxon Blvd. to North of SR 472), Pond VV-3 (Section 2 FEIS-2000)	-
415	Pond 415	-	Added alternative to accommodate for the SR 472 interchange improvements.
416	Pond 416	-	Added alternative to accommodate Kentucky Avenue improvements.
417	Pond 417	-	Added alternative to accommodate Kentucky Avenue improvements
418	Pond 418	Pond VB-2 (West Volusia Beltline from SR 472 to Kepler Road)	Existing pond that was added for the MLK Beltway improvements
A	Pond A	Pond A (Rhode Island Ave County Project P-4904)	Added alternative to accommodate for the Rhode Island improvements.
A	FPC A	Pond A (Rhode Island Ave County Project P-4904)	Added alternative to accommodate for the Rhode Island improvements.

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Basin Name	Pond Alternative Name	Existing Stormwater Facilities	Reason For New Alternative
B	Pond B	Pond B (Rhode Island Ave County Project P-4904)	Added alternative to accommodate for the Rhode Island improvements.
B	Pond B1	-	Added alternative to accommodate for the Rhode Island improvements.
C	Pond C	Pond C (Rhode Island Ave County Project P-4904)	Added alternative to accommodate for the Rhode Island improvements.
D	Pond D	Existing Depression designed under Normandy Blvd. Extension County Project 1553	Added alternative to accommodate for the Rhode Island improvements.

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 many cities including Lakeland, 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 and I-75 in the Tampa Bay area, 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) in Central Florida and I-95 on the east coast.

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. Additionally, 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.

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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 PD&E update involves revising the original design concept showing 6 GULs + 2 HOV lanes, as recommended in the FEIS for I-4 from SR 528 to SR 472 (FPN No. 242486, 242592 & 242703, August 2002, Record of Decision Pending), to the current proposed design of 6 GUL + 4 EL. 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 HOV Lanes. The original I-4 PD&E Studies involved physical separation between the general use lanes and the HOV lanes on I -4, with demand management in the HOV lanes. The original demand management strategy was to control the use of the lanes by requiring a minimum number of occupants per vehicle to maintain an acceptable level of service (Level of Service D). This update 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 Central Florida 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.

2.0 Project Description

FDOT is proposing to reconstruct and widen I-4 as part of the I-4 BtU 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 new express lanes in each direction, resulting in a total of ten dedicated lanes. The project limits for the segment analyzed in this report are within an approximate ten (10) mile segment of I-4 which extends from east of US 17-92 to east of SR 472, from Milepost 0.086 to 10.227 in Volusia County (herein referred to as I-4, Segment 4) and as shown in **Error! Reference source not found.**. Although, the interstate is a designated east-west orridor, the alignment follows a southwest to northeast orientation through the limits of Segment 4. The study area in this section from east of US 17-92 to east of SR 472 includes the interchanges at Dirksen Drive/Debary Avenue, Saxon Boulevard and SR 472/Howland Boulevard. A new interchange with I-4 providing direct access only to the express lanes is proposed to be constructed at Rhode Island Avenue, about halfway between Saxon Boulevard and SR 472, with the Rhode

Island Avenue extension. The required stormwater treatment/management along the corridor will be provided with 35 preferred pond sites.

The proposed improvements to I-4 include widening the existing six lane divided urban interstate to a ten lane divided highway. The existing typical section for the I-4 mainline consists of three 12-foot travel lanes in each direction. The outside and inside shoulders are 12 feet wide with 10 feet paved. The median width varies from 37 feet to 375 feet and the existing right of way (ROW) varies from 300-feet to 630-feet. The typical section in the proposed condition will have three 12-foot general use travel lanes with a 10-foot inside and 12-foot outside shoulder and two 12-foot express lanes with a 4-foot inside and 10-foot outside shoulder, in each direction. A barrier wall between adjacent 10-foot shoulders will separate the express lanes from the general use lanes. A 44' transit corridor will be provided in the median for the entire length of Segment 4 and, auxiliary lanes in both the eastbound and westbound directions will be provided in some areas. Refer to the Figure 1.2 of the PER for the I-4 existing and proposed typical sections.

The proposed improvements to Rhode Island Avenue include new construction of Rhode Island Avenue from Veterans Memorial Parkway to Normandy Blvd. The proposed typical section consists of a four-lane urban roadway divided by an 18-foot landscape median, with two 12-foot travel lanes and a 4-foot bike lane in each direction. Eight-foot wide sidewalks, which will be separated from the bike lane by a landscape buffer, will be provided on both sides of the roadway.

The limits of the project are shown on the Project Location Map in Figure 1. The project datum is NAVD 88. A reproduction of the USGS quadrangle map for the project vicinity is shown in Figure 2.

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Figure 1 – Project Location Map

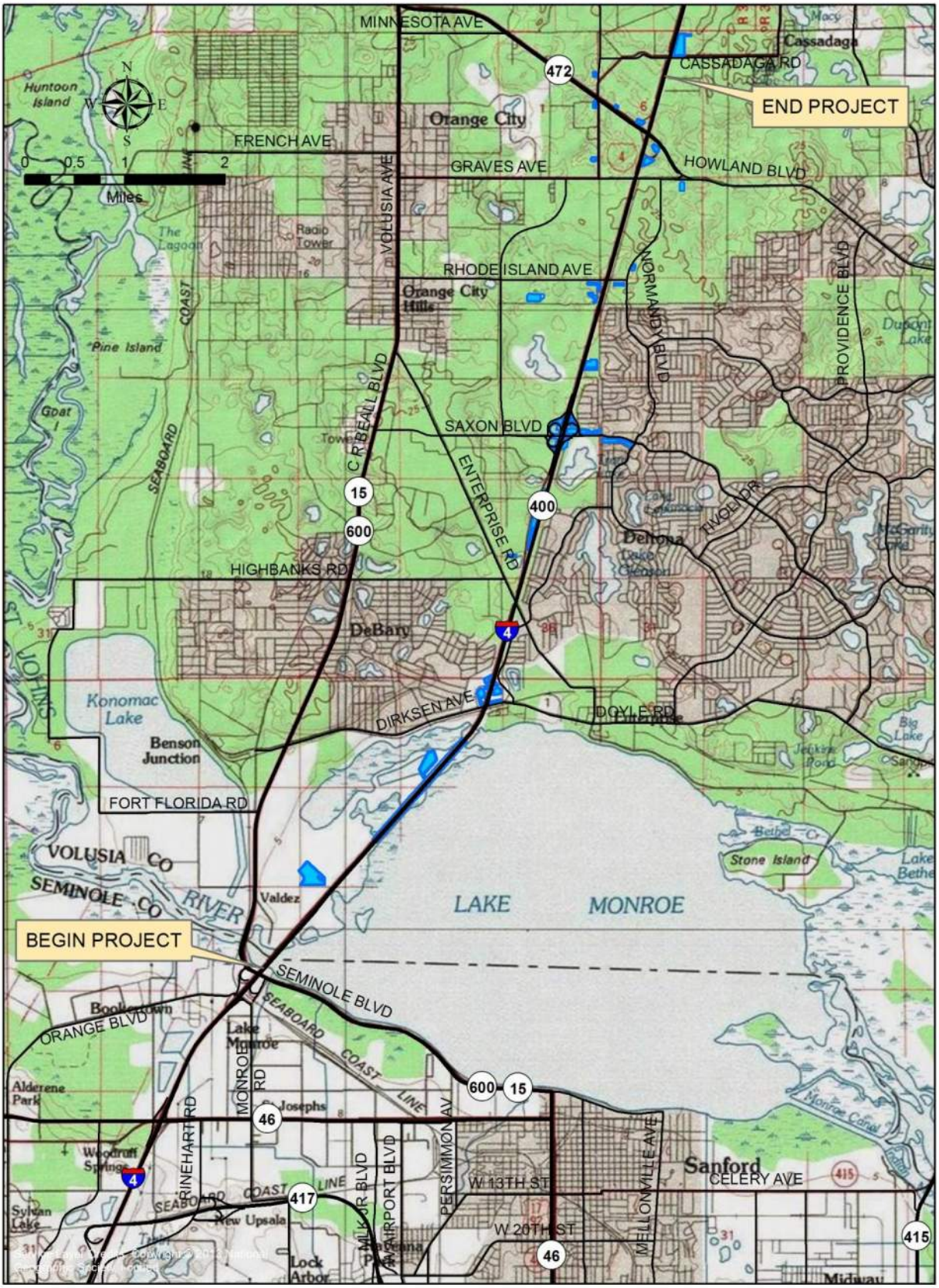

Figure 2 – USGS Quadrangle Map

3.0 Design Criteria

The design of stormwater management facilities for this project is governed by the rules and criteria set forth by the St. Johns River Water Management District (SJRWMD), Florida Department of Environmental Protection (FDEP), Volusia County and the Florida Department of Transportation (FDOT). These criteria were drawn from the 2010 SJRWMD Applicant's Handbook: Management and Storage of Surface Waters (MSSW) and Applicant's Handbook: Regulation of Stormwater Management Systems (RSMS), March 2010 FDEP Stormwater Quality Applicant's Handbook (SQAH) and the 2014 FDOT Drainage Manual.

Water Quality and Pond Recovery

- Wet detention
  - Treatment – Greater of 1" over the basin or 2.5" over impervious area (RSMS, Section 14.2)
  - Recovery – One-half the treatment volume within 24 to 30 hours (RSMS, Section 14.3)
- Dry retention (on-line)
  - Treatment – Greater of 1" over the basin or 1.25" over impervious area +0.5" over total area (RSMS, Section 11.2)
  - Recovery – Treatment volume within 72 hours (RSMS, Section 11.3)
- Outstanding Florida Water (OFW): Treat an additional fifty percent of the runoff volume (RSMS, Sections 14.13 and 11.2)
- Nutrient Load Reduction – The required level of average annual load reduction is whichever is the least: 85% or post=pre (SQAH, Section 3.1)

Water Quantity

- Open Basin – Limits the post-development peak discharge rate to the pre-development peak discharge rate for the 25-year / 24-hour storm event and the mean annual storm events. (RSMS, Section 9.8.2)
- Closed Basin (with an outfall) – Limits the post-development discharge volume to the pre-development discharge volume for the 25-year / 96-hour storm event. (MSSW, Section 10.4.2) The pond must also be sized to limit the post-development discharge volume to the pre-development discharge volume for the 100-year / 10-day storm event. (FDOT, Section 5.3.1.3)
- Closed Basin (without an outfall) – The pond must be sized to hold the entire runoff from the post-development condition for the 100-year / 10-day storm event. (FDOT, Section 5.3.1.3)

Pond Design (FDOT, Section 5.3.4.2)

- Ponds shall be designed to provide a minimum 20-foot of horizontal clearance between the top edge of the normal pool elevation and the right-of-way line. Maintenance berm shall be at least 15-feet with a slope of 1:8 or flatter.
- Corners of ponds shall be rounded to provide an acceptable turning radius for maintenance equipment (30-foot minimum inside radius).
- At least 1-foot of freeboard is required above the maximum design stage of the pond below the front of the maintenance berm.

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4.0 Existing Drainage Conditions

4.1 Land Uses

The existing land uses for the project area and the pond alternatives are agricultural, acreage not zoned for agriculture, residential, retail/office, industrial, public/semi-public, vacant nonresidential and vacant residential. Future land uses include agricultural, commercial, conservation, industrial, high density residential, low density residential, medium density residential and mixed use. The widening of I-4 does not alter the existing or future land uses in the area. The existing land uses are shown in Figure 3 and the future land uses are shown in Figure 4.

4.2 Soil Conditions

The Soil Survey of Volusia County, Florida (1980), published by the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) has been reviewed for the project vicinity. There are twenty-one (21) mapped soil types located within the project vicinity. Table 4 lists these soil types and their hydrologic properties along SR 400 (I-4) corridor and Table 5 lists the soil types and hydrologic properties along Rhode Island Avenue. The soil survey map for the project is illustrated in Figure 5.

Table 4 - NRCS Soil Survey Information – SR 400 (I-4)

Soil Type	Hydrologic Soil Group
Apopka fine sands (1)	A
Astatula fine sands (4,5)	A
Basinger fine sand (8)	A/D
Bluff sandy clay loam (10)	C/D
Cassia fine sand (13)	A/D
Daytona sand (17)	A
EauGallie fine sand (20)	A/D
Electra fine sand (22)	A
Myakka fine sand, depressional (33)	A/D
Immokalee sand (29)	B/D
Orsino fine sand (37)	A
Paola fine sand (42, 43)	A
Pomona fine sand (50)	A/D
Quartzipsamments, gently sloping (54)	A
Tavares fine sand (63)	A
Smyrna fine sand (60)	A/D
St. Johns fine sand (61)	B/D

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Table 5 - NRCS Soil Survey Information – Rhode Island Avenue & Normandy Boulevard

Soil Type	Hydrologic Soil Group
Astatula fine sands (4,5)	A
Cassia fine sand (13)	(A/D)
Electra fine sand (22)	A
Myakka fine sand (33)	A/D
Orsino fine sand (37)	A
Placid (48)	A
Paola fine sand (42)	A
Riviera fine sand (55)	A
Smyrna fine sand (60)	A/D

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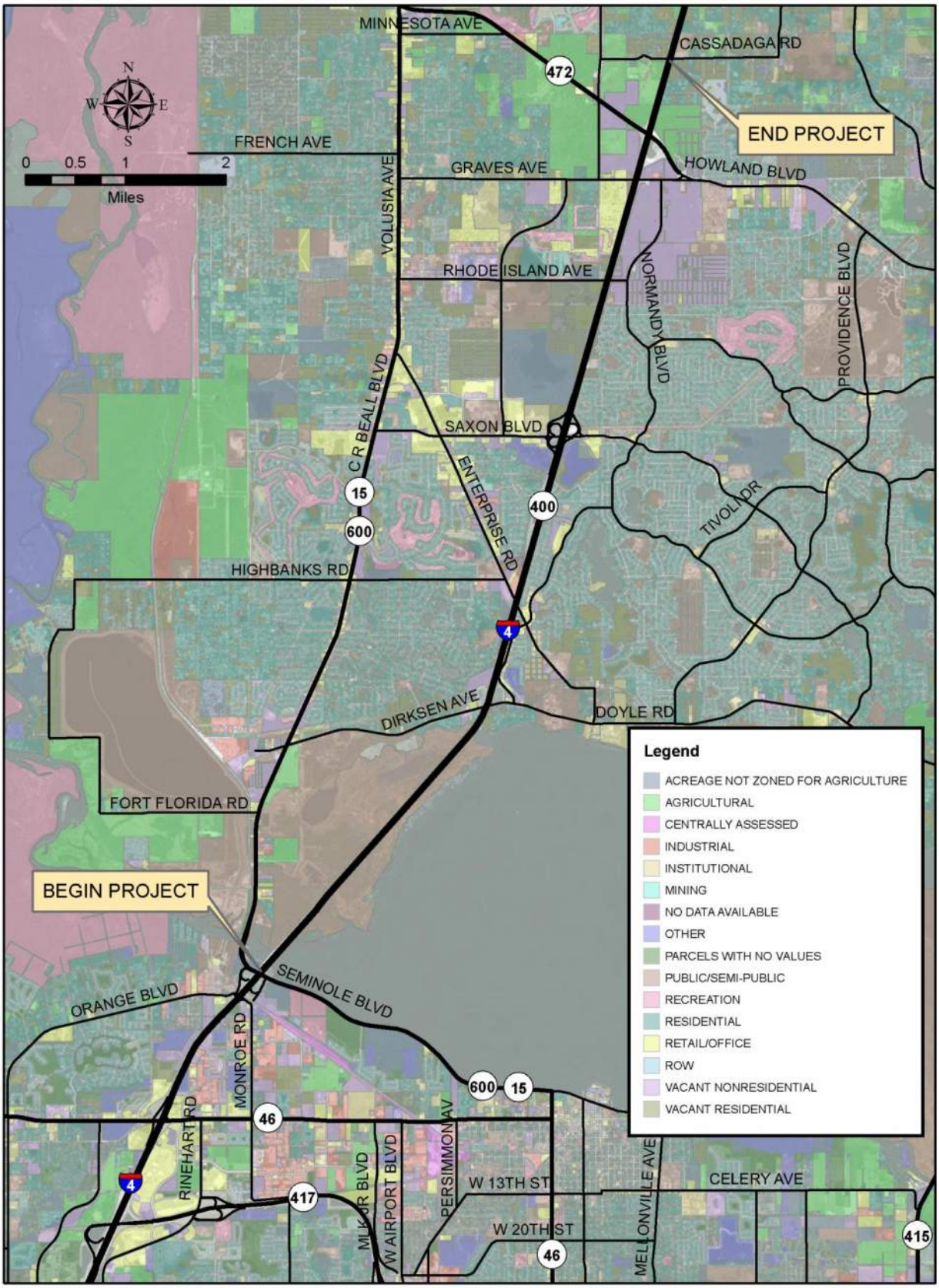

Figure 3 – Existing Land Use Map

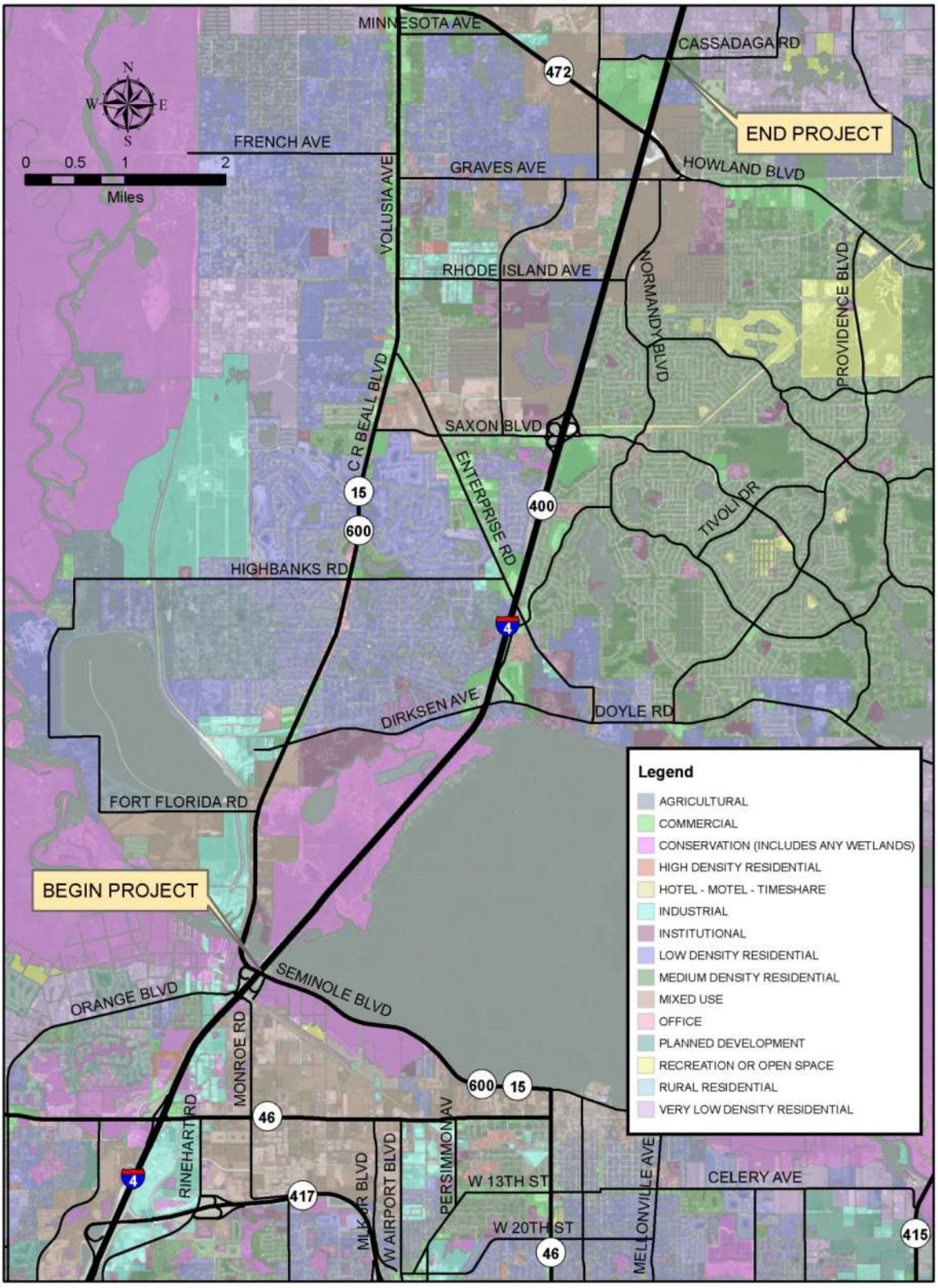

Figure 4 – Future Land Use Map

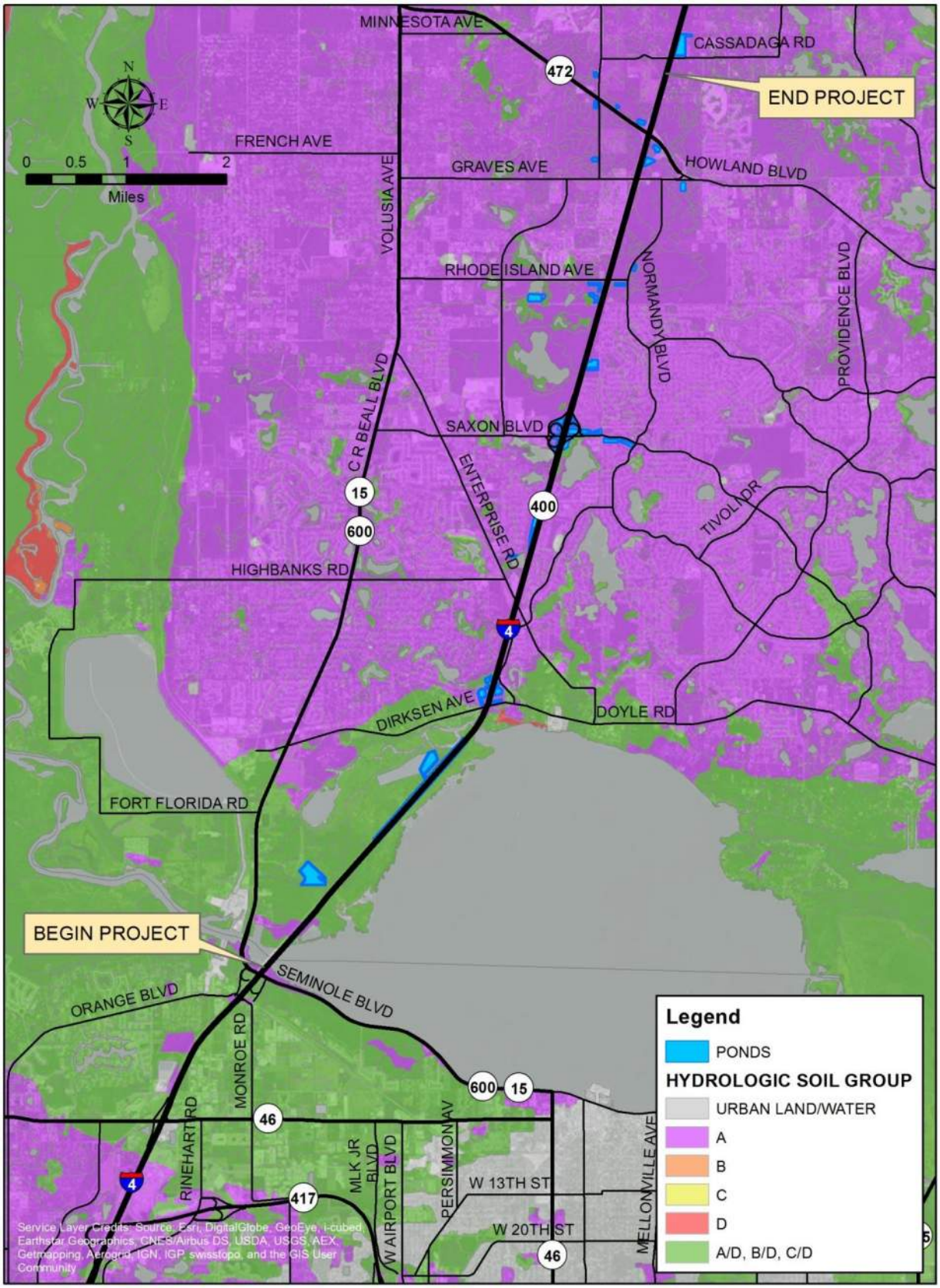

Figure 5 – Soil Survey Map

4.3 Existing Roadway Drainage Systems

The project corridor is located in the St. Johns River Water Management District in Volusia County. The project is separated into twenty-four (24) basins in the existing condition. The basins consist of the pond site and the full right-of-way. A majority of the basins are closed. None of the open basins discharge to an OFW.

4.3.1 Basin 400

Basin 400 begins north of the St. Johns River Bridge at Station 2595+00 and continues north to the high point at Station 2673+00 and is located within the coastal plain of Lake Monroe. Runoff in the basin is predominantly overland flow and open ditches that ultimately drain into Lake Monroe and the St. Johns River. The stormwater runoff is collected by median ditches and inlets that flow into the existing pond (Pond RR-3 in Permit No. 64105-3). The existing pond is located within the 100-year floodplain of Lake Monroe, which is on the west side of I-4 from Station 2630+00 to 2641+00. The existing pond was sized for floodplain compensation, as well. The pond soils are classified in Hydrologic Soil Groups A, A/D and B/D. The existing pond was designed as a wet detention pond and discharges into an existing ditch that eventually flows to the St. Johns River. The existing pond was designed to accommodate the ultimate condition. There are no cross culverts within this basin.

4.3.2 Basin 401

Basin 401 extends from Station 2673+00 to Dirksen Drive at Station 2765+00 and is located within the coastal plain of Lake Monroe. There is an existing borrow pit (Pond RR-2 option in Permit No. 64105-3) within the basin that has an open connection to Padgett Creek. The treatment and attenuation for this basin was initially proposed as a wet detention pond at the borrow pit (FPID No. 242702-1-52-01). After coordinating with SJRWMD staff, it was agreed to provide dry retention adjacent to the westbound lanes of I-4 for a portion of the overall basin. This basin was quantified as an overall basin improvement, since this basin is located within the overall Lake Monroe watershed. A minimum of 80% pollutant removal is achieved by a combination of over-treatment within the existing Pond RR-3, dry retention basin and compensating area. The pond soils are classified in Hydrologic Soil Groups B/D and C/D. There are no cross culverts within this basin.

4.3.3 Basin 402

Basin 402 begins at Dirksen Drive at Station 2765+00 and continues north to Station 2845+00 at the bifurcated area. The stormwater runoff from the roadway widening is collected by a series of ditches and inlets that flow to the existing pond (Pond SS-2 in Permit No. 64105-3). The existing pond is located within the infield area west of I-4, and was sized for the interim improvements only. The pond soils are classified in Hydrologic Soil Group A, B/D and A/D. The existing pond was designed as a wet detention pond and discharges under the ramp, which ultimately flows to Padgett Creek. There is one cross culvert within this basin. For more information on the cross culvert, see the Location Hydraulic Report.

4.3.4 Basin 403

Basin 403 begins at Station 2845+00 and continues north to Station 2864+00. The stormwater runoff from the roadway is collected by a series of ditches and inlets that flow to the existing pond (Pond SS-2 in Permit No. 64105-3). The existing pond is located within the infield area west of I-4, and was sized for the interim

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improvements only. The pond soils are classified in Hydrologic Soil Group A. The existing pond was designed as a wet detention pond and discharges under the ramp, which ultimately flows to Padgett Creek. There is one cross culvert within this basin. For more information on the cross culvert, see the Location Hydraulic Report.

4.3.5 Basin 404

Basin 404 begins at Station 2864+00 and continues north to Station 2891+00. The stormwater runoff from the roadway is collected by roadside ditches and cross drains that flow to existing treatment swales within the median (Permit No. 64105-3) for portions of the existing roadway. The remaining area is discharged directly to the existing cross drain. The pond soils are classified in Hydrologic Soil Group A. The treatment swales discharge east of I-4 to Trout Lake.

4.3.6 Basin 405

Basin 405 begins at Station 2891+00 and continues north to Station 2913+50. The basin includes the ramps at the southwest corner of the intersection. The stormwater runoff from the roadway is collected by roadside ditches and cross drains that flow to the existing ponds (Pond D & E in Permit No. 22931-1). The existing ponds are located within the infield areas at the southwest section of the interchange. Pond D is located from Station 2909+00 to 2912+50 and Pond E is located from Station 2905+00 to 2908+00. The pond soils are classified in Hydrologic Soil Groups A & A/D. The existing ponds were designed as wet detention ponds that also serve as wetland mitigation sites. The ponds discharge east through the cross drain to Trout Lake, which is land-locked.

4.3.7 Basin 406

Basin 406 begins at Station 2913+50 and continues north to Station 2933+50. The basin includes the ramps at the northwest quadrant of the intersection and approximately 1,350 feet of Saxon Boulevard (Station 57+44 to 70+87). The stormwater runoff from the roadway is collected by roadside ditches and cross drains that flow to the existing pond (Pond F in Permit No. 22931-1). The existing pond is located within the infield area at the northwest section of the interchange. The existing pond is located from Station 2915+00 to 2919+00 on the west side of the roadway. The pond soils are classified in Hydrologic Soil Group A. The existing pond was designed as a dry retention pond. The pond discharges south to existing Pond D, which discharges east to the cross drain that flows to Trout Lake, which is land-locked. There is no impact to the 100 year floodplain.

4.3.8 Basin 407

Basin 407 begins at Station 2891+00 and continues north to Station 2915+00. The basin includes the ramps at the northeast corner of the intersection. The stormwater runoff from the roadway is collected by roadside ditches and cross drains that flow to the existing pond (Pond A in Permit No. 22931-1 and Pond 1 in Permit No. 64105-6). The existing pond is located within the infield area at the northeast section of the interchange. The existing pond is located from Station 2916+00 to 2919+00 on the east side of the roadway. The pond soils are classified in Hydrologic Soil Groups A and A/D. The existing pond was originally designed as a dry retention pond, but was later re-permitted as a wet detention pond. The pond discharges south to Trout Lake, which is land-locked. There is no impact to the 100 year floodplain.

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4.3.9 Basin 408

Basin 408 begins at Station 70+88 and continues east to Station 92+60 along Saxon Boulevard. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Pond B in Permit No. 22931-1 and Pond 1A in Permit No. 64105-6). The existing pond is located east of the I-4/Saxon Boulevard Interchange. The existing pond is located from Station 80+50 to 84+50 on the north side of Saxon Boulevard. The pond soils are classified in Hydrologic Soil Groups A and A/D. The existing pond was originally designed as a dry retention pond, but was later re-permitted as a wet detention pond. The pond accounts for an additional four acres of offsite commercial area. The previous design (I-4 Six-Laning Improvements) addressed flooding conditions for this area from a profile standpoint. The pond discharges south to Trout Lake, which is land-locked.

4.3.10 Basin 408B

Basin 408B begins at Station 92+60 and continues east to Station 100+60 along Saxon Boulevard. The stormwater runoff from the roadway is collected by a storm sewer system that flows to Trout Lake untreated. Based on historical aerials, four-laning of Saxon Boulevard was completed in the early 1990's. A permit could not be found for this widening. The basin soils are classified in Hydrologic Soil Group A. Trout Lake is land-locked.

4.3.11 Basin 408D1

Basin 408D begins at Station 100+60 and continues east to Station 120+00 along Saxon Boulevard. The stormwater runoff from the roadway is collected by a storm sewer system that flows to Trout Lake untreated. Based on historical aerials, four-laning of Saxon Boulevard was completed in the early 1990's. A permit could not be found for this widening. The basin soils are classified in Hydrologic Soil Group A. Trout Lake is land-locked. There is no impact to the 100 year floodplain.

4.3.12 Basin 409

Basin 409 begins at the high point north of Saxon Boulevard at Station 2933+50 and continues north to the high point at Station 3038+00. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Pond 2 in Permit No. 64105-6). The existing pond is located adjacent to I-4 from Station 2952+00 to 2957+00 on the east side of the roadway. The pond soils are classified in Hydrologic Soil Group A. The existing pond was designed as a dry retention pond. The pond discharges west through a weir within the roadside ditch that discharges north to a cross drain at Station 2945+00. The cross drain flows west to Lake Mallard, which is land-locked. There are two cross culverts within the basin. For more information on the cross culverts, see the Location Hydraulic Report. There is no impact to the 100 year floodplain.

4.3.13 Basin 410

Basin 410 begins at the high point at Station 3038+00 and continues north to Station 3072+00. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Pond 3 in Permit No. 64105-6). The runoff from the improvements that were completed along Graves Avenue was sent to the existing pond as well. The existing pond is located adjacent to I-4 from Station 3063+00 to 3069+00 on the east side of the roadway. The pond soils are classified in Hydrologic Soil Group A. The existing pond was designed as a dry retention pond. The pond discharges

into a series of depressional areas east of I-4, which are land-locked. There is no impact to the 100 year floodplain.

4.3.14 Basin 411

Basin 411 begins at Station 3072+00 and continues north to the high point at Station 3080+72. The stormwater runoff from the roadway is collected by a roadside ditches and cross drains that flow to the existing pond (Pond 3 in Permit No. 76095-1). The runoff from the improvements that were completed along SR 472 for approximately 2,400 feet was sent to this existing pond as well. The existing pond is located adjacent to I-4 from Station 3073+00 to 3077+30 on the east side of the roadway. The pond soils are classified in Hydrologic Soil Group A. The existing pond was designed as a dry retention pond. The pond discharges into a series of depressional areas east of I-4, which are land-locked. There is no impact to the 100 year floodplain.

4.3.15 Basin 412

Basin 412 begins at Station 57+46 and continues east to Station 70+39 along SR 427. Portions of the stormwater runoff from the roadway along SR 472 and the ramps at the interchange with I-4 are collected by a roadside ditches and cross drains that flow to the existing ponds (Ponds 1 and 2 in Permit No. 76095-1). The existing ponds are located in the northwest and southwest corners of the interchange from Station 66+00 to 70+00 on the south side of the roadway and from Station 67+00 to 69+00 on the north side of the roadway. The pond soils are classified in Hydrologic Soil Group A. The existing ponds were designed as dry retention ponds. The ponds discharge into a series of depressional areas west of I-4, which are land-locked. There is no impact to the 100 year floodplain.

4.3.16 Basin 413

Basin 413 begins at the centerline of I-4 eastbound at Station 3056+00 and continues east along Graves Avenue to the end of the SR 472 access road. Basin 413 includes the eastern side of the bridge over the I-4, Graves Avenue, a portion of SR 472 and the SR 472 Access Road. The stormwater runoff from the roadway is collected by a series of inlets and pipes that discharge directly to the existing pond (Pond 4 in Permit No. 40-127-76095-1). The pond was designed as a dry retention pond and discharges to a depressional area north of the pond, ultimately discharging to Lake Colby which is land-locked. The existing pond is located south of the Graves Avenue and SR 472 intersection. The pond was over-excavated in 2004 to provide emergency fill for a roadway that was demolished due to failure and opening of a sinkhole (permit 40-127-76095-4). As a result, the pond bottom was excavated from elevation 43.5 feet to 30.0 feet. Since the pond was excavated down to an elevation of 30.0 feet, no standing water has been observed (Permit 40-127-76095-2). Several permits are associated with this pond (refer to Appendix E for existing permits). The pond soils are classified in Hydrologic Soil Group A. There is no impact to the 100 year floodplain.

4.3.17 Basin 414

Basin 414 begins at Station 3080+67 and continues north to the high point of the existing roadway profile at Station 3159+02 outside of the project limits. The stormwater runoff from the roadway is collected by roadside ditches and cross drains that flow to the existing pond (Pond 4 in Permit No. 64105-6). The existing pond is located outside of the project limits from Station 3124+00 to 3136+50. The existing pond

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was designed for the ultimate I-4 condition up to Cassadaga Road (Station 3122+00). The pond soils are classified in Hydrologic Soil Group A. The existing pond was designed as a dry retention pond. Although the original basin (before the pond was constructed) discharged to a series of depressional areas east and west of I-4, the existing Pond 4 was designed as a closed basin with no outfall. There is no impact to the 100 year floodplain.

4.3.18 Basin 415

Basin 415 begins at Station 44+12 and continues southeast along SR 472 to Station 54+00. Runoff from the roadway has a southwesterly flow. There is no permit associated with this portion of SR 472. There is no impact to the 100 year floodplain.

4.3.19 Basin 416

Basin 416 begins at the intersection of Kentucky Avenue and Graves Avenue and continues northward along Kentucky Avenue to high point of the existing profile (Permit Application No 42-127-2852ANG). The stormwater runoff from the roadway drains directly into adjacent wetlands without treatment. A permit was issued in 1994 to accommodate for the widening of Kentucky Avenue; however, the permit expired in 1999, of which the pond was never built (Pond 1 in Permit No. 78808-1).

4.3.20 Basin 417

Basin 417 begins at Station 41+87.25 and continues northward to Station 51+59.00 (stationing is from Permit Application No. 42-127-2852ANG). The stormwater runoff from the roadway drains directly into adjacent wetlands without treatment. A permit was issued in 1994 to accommodate for the widening of Kentucky Avenue; however, the permit expired in 1999, of which the pond was never built (Pond 2 in Permit No. 78808-1). On March 11, 2003, a permit was issued for the extension of Veteran's Memorial Parkway (Permit 22827-6) using Pond 2 from the previous permit. On March 11, 2008 the permit expired and the pond was never built.

4.3.21 Basin 418

Basin 418 begins 350 feet north of the Kentucky Avenue and SR 472 intersection and continues north along the Dr. Martin Luther King Jr. Beltway. The basin consists of Dr. Martin Luther King Jr. Beltway, the full right-of-way and a portion of Cassadaga Road. The stormwater runoff from the roadway is conveyed to an existing Volusia County pond (Pond VB-2 under the West Volusia Beltline from SR 472 to Kepler Road project). The existing pond is located just north of the SR 472 and Dr. Martin Luther King Jr Beltway intersection. The pond soils are classified in Hydrologic Soil Group A. The pond was designed as a dry retention pond with no outfall and therefore retains the total post volume for the 100 year/24 hour storm event.

4.3.22 Rhode Island Avenue (Basin A)

Basin A begins at Veterans Memorial Parkway and continues eastward along Rhode Island Avenue to Station 55+27. Runoff from this basin originally flowed to a wetland area and several existing depressional areas, which are land-locked. Runoff from Basin A was permitted to be collected by a closed storm sewer system that discharges to Pond A. In 2007, Pond A (Permit No. 111974-1) was designed and permitted to accommodate the runoff for the full right-of way. Pond A was designed as a dry retention pond to

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accommodate for additional impervious area for future roadway widening (2.89 acres of impervious area); however, the pond was never constructed. The pond soils are classified in Hydrologic Soil Group A and designed for total retention. A portion of Basin A is located within the 100 year floodplain (el. 17.86 NAVD in Permit No. 111974-1). Floodplain compensation is provided in the permitted pond adjacent to Pond A (Refer to Appendix E for Floodplain calculations).

4.3.23 Rhode Island Avenue (Basin B)

Basin B begins at Station 55+27 and continues eastward along Rhode Island Ave to Station 68+28. Runoff from this basin originally flowed to several depressional areas, which are land-locked. Runoff from Basin B was permitted to be collected by a closed storm sewer system that discharges to Pond B. In 2007, Pond B (Permit No. 111974-1) was designed and permitted to accommodate the runoff for the full right-of-way. Pond B was designed as a dry retention pond to accommodate for additional impervious area for future roadway widening (3.52 acres of impervious area), however the pond was never constructed. The pond soils are classified in Hydrologic Soil Group A and was designed for total retention. There is no impact to the 100 year floodplain. There are no cross drains within this basin.

4.3.24 Rhode Island Avenue (Basin C)

Basin C begins at Station 68+28 and continues eastward along Rhode Island Ave to Normandy Blvd. Runoff from this basin originally flowed to depressional areas, which are land-locked. Runoff from Basin C was permitted to be collected by a closed storm sewer system that discharges to Pond C. In 2007, Pond C (Permit No. 111974-1) was designed and permitted to accommodate the runoff for the full right-of-way. Pond C was designed as a dry retention pond to accommodate Rhode Island Ave, the full right-of-way and additional impervious area for future roadway widening (1.93 acres of impervious area). The pond was designed as a dry retention pond for total retention; however the pond was never constructed. The pond soils are classified in Hydrologic Soil Group A. This is no impact to the 100 year floodplain. There are no cross drains within this basin.

4.3.25 Normandy Boulevard (Basin D)

Basin D begins just north of Rhode Island Avenue and continues north along Normandy Boulevard to the existing highpoint. When this portion of Normandy Boulevard was constructed, the basin was divided into two smaller basins. Runoff from this basin is collected by a system of roadside swales, which are actually retention basins that discharge to a land-locked depressional area (Permit No. 42-127-1035NGE). The large, isolated depression was designed as a dry retention pond that accommodates approximately 70.3 acres. The depression was designed with and equalizer culvert placed near the bottom of the depression to allow hydraulic movement between the two basins. The basins were designed for full retention with no outfall. The water surface elevation in this depression must exceed elevation 65 feet NGVD before overland flow to the west will occur. Under the 100 year/24 hour storm event, the water surface elevation does not exceed the overflow of 65 feet NGVD. The pond soils are classified in Hydrologic Soil Group A. There is no impact to the 100 year floodplain. There are no cross drains within this basin.

4.4 Floodplains/Floodways

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) for Volusia County. According to FEMA Map Nos. 12127C0730G, 12127C0735H, 12127C0620H and

12127C0610H, large portions of the roadway and existing ponds within Basins 400 and 401 lie within the 100-year floodplain of Lake Monroe, and are located within Zone AE at an elevation of 9 feet NAVD. The floodplain at Gasline Lake lies within the right-of-way near Station 2845+00 and is classified as Zone A. Based on contours, the elevation for the floodplain is approximately 40 feet NAVD. Just north of the bifurcated area, a portion of the roadway lies within the Goose and Trout Lake Floodplain. An existing culvert hydraulically connects the two lakes. Based on the FEMA FIRM map, Goose Lake lies within Zone A and Trout Lake lies within Zone AE with an elevation of 26 NAVD. The existing ponds in the southwest corner of the Saxon Boulevard Interchange are located with this floodplain. A portion of Rhode Island Avenue lies within the 100-year floodplain from Station 26+83 to Station 31+09 and is classified in Zone A (el. 17.86 NAVD in Permit No. 111974-1). Floodplain compensation is provided within the permitted pond adjacent to Pond A (Refer to Appendix E for floodplain calculations). The FEMA Flood Insurance Rate Maps for the project are shown in Figure 6.

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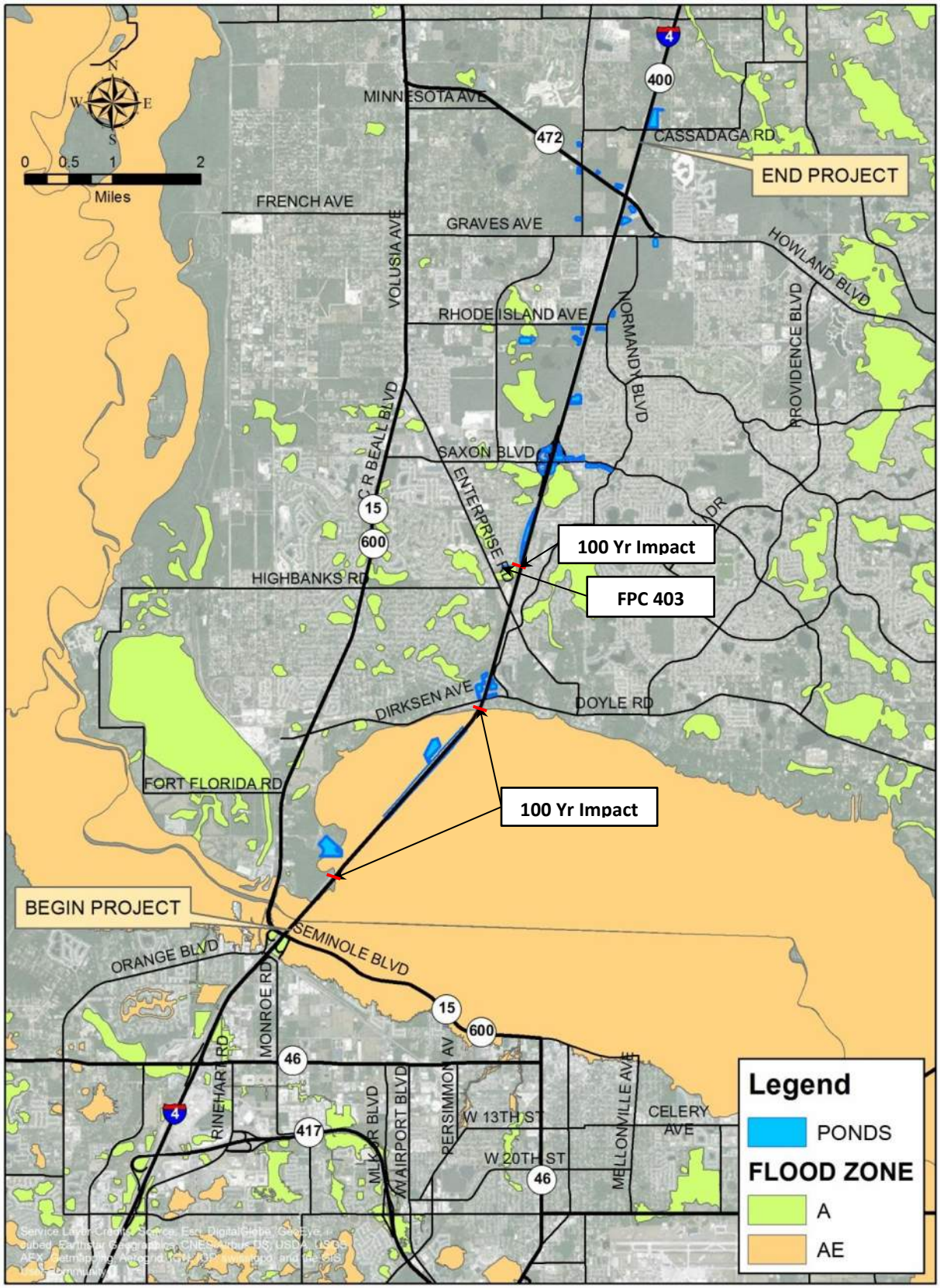

Figure 6 – FEMA Flood Insurance Map

5.0 Proposed Drainage Conditions/Stormwater Ponds

5.1 Overview

This project will make significant improvements to the water quality along the roadway corridor. The stormwater runoff from both the new and existing impervious areas will be treated in existing and proposed stormwater facilities. The stormwater runoff will be collected by storm sewer systems and roadside ditches. The water quality treatment and attenuation will be achieved through the expansion and construction of offsite ponds, some of which will require acquisition of additional right-of-way.

The stormwater will be routed to existing and proposed stormwater ponds. There are a total of twenty-two (22) basins within the project limits. In areas with poor soils and high water table, only wet detention ponds were considered. The ponds were sized based on the assumption that most of the offsite runoff would be drained through separate systems. With the addition of the 44' transit corridor, the 10-foot shoulders will be reduced to 6-foot shoulders, leaving the corridor to 36'. For the purpose of our analysis, the 10-foot shoulders will be accounted for as impervious area and the corridor will be analyzed as a 36-foot gravel corridor. For a majority of the ponds, the location of where the proposed basins begin and end is the same as the existing condition. The location of the outfall in the proposed condition is the same as the existing. None of the basins discharge to an OFW and two of the basins discharge to nutrient impaired waters.

5.2 Methodology of Pond Determinators

Based on the available information, only the hydraulically feasible and environmentally permittable alternative pond sites are considered. Alternative pond sites are analyzed and evaluated for the following parameters:

- Hydrologic and hydraulic factors such as existing ground elevation, soil types, seasonal high water table (SHWT), stormwater conveyance feasibility, allowable hydraulic grade line (HGL), and basin outfalls.
- Cultural resource impacts
- Environmental resource impacts, including wetlands and threatened or endangered species
- Potential for hazardous materials and contamination
- Floodplain impacts
- Potential for impacts to major utilities
- Estimated right-of-way acquisition cost
- Conservation lands
- Property owner input (On properties where the property owner requested a meeting.)

5.3 Pond Alternatives

5.3.1 Basin 400

Basin 400 begins north of the St. Johns River Bridge at Station 2595+00 and continues north to the high point at Station 2673+00. The area between Station 2583+00 and 2595+00 cannot be collected and routed to the pond. Therefore, compensating treatment will be required. Since complete reconstruction of the roadway is expected, compensating treatment by treating roadway that is not currently being treated is

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not an option. In the original permit, the pollutant removal of this basin and basin 401 were quantified as an overall basin improvement within the Lake Monroe watershed. A minimum of 80% pollutant removal is achieved by a combination of over-treatment within Pond 400 and the dry treatment swales (See Basin Calculations in Appendix B for detailed compensation calculations). The basin consists of the pond site and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin, since the existing pond was originally designed for the ultimate condition.

5.3.1.1 Pond 400

Pond 400 is an existing pond (Pond RR-3 in Permit No. 4-127-64105-3) that lies from Station 2630+00 to 2641+00. The pond was built under the I-4 St. Johns River Bridge Replacement and Six–Laning project (FPID No. 242702-1-52-01) and originally evaluated under Section 2 FEIS as the pond alternative. The pond is located within the Lake Monroe coastal plain and the original construction of the pond did impact the Lake Monroe floodplain. Floodplain compensation will continue to be provided within Pond 400, since the area of cut between the original existing ground and the design high water will result in the pond providing compensation for the floodplain impacts. The pond soils are classified in Hydrologic Soil Groups A, A/D, B/D and C/D. The pond was designed as a wet detention pond and will continue to discharge to an existing ditch which is located on the south side of the pond and eventually flows to the St. Johns River. The pond discharges to Class III waters and provides treatment volume equivalent to requirements for discharge into Outstanding Florida Waters (OFW), in order to provide compensating treatment for areas that are not captured and brought to the pond. The pond does not need to be expanded or regraded. The pond will continue to discharge to the wetlands of Lake Monroe, which is nutrient impaired water. There is only one alternative for this basin, since the existing pond is sufficient enough for the proposed improvements. **Pond 400 is the recommended alternative.**

5.3.2 Basin 401

Basin 401 Basin 401 extends from Station 2673+00 to Dirksen Drive at Station 2765+00 and is located within the coastal plain of Lake Monroe. The area from Station 2745+00 to 2765+00 cannot be collected and routed to a pond or treatment swale. Therefore, compensating treatment will be required. Since complete reconstruction of the roadway is expected, compensating treatment by treating roadway that is not currently being treated is not an option. In the original permit, the pollutant removal of this basin and basin 400 were quantified as an overall basin improvement within the Lake Monroe watershed. A minimum of 80% pollutant removal is achieved by a combination of over-treatment within Pond 400 and the dry treatment swales (See Basin Calculations in Appendix B for detailed compensation calculations). The basin consists of the pond site or treatment swales and the full right-of-way. The stormwater runoff from the roadway will either be collected by storm sewer systems that discharge to a pond or treatment swales, or flow directly into treatment swales. The pond or treatment swales will discharge to the wetlands of Lake Monroe, which is nutrient impaired.

5.3.2.1 Pond 401

Pond 401 is within an existing borrow pit (Pond RR-2 option in Permit No. 64105-3) that will need to be bermed up on one side and expanded on another side in order to accommodate the

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roadway widening. The pond was evaluated under Section 2 FEIS as a pond alternative and will be slightly reconfigured. The pond is located from Station 2715+00 to 2730+00. An additional 5.42 ac of right-of-way will be required for the pond expansion. The pond soils are classified in Hydrologic Soil Groups B/D and C/D. The pond will be designed as a wet detention pond. The location of the outfall for this pond will be the existing ditch located on the south side of the pond. The existing ditch flows to Lake Monroe, which then flows to the St. Johns River. The pond discharges to Class III waters and provides treatment volume equivalent to requirements for discharge into Outstanding Florida Waters (OFW), in order to provide compensating treatment for areas that are not captured and brought to the pond. The area that the pond would need to be expanded to was permitted as a mitigation site for FDOT's widening of I-4; therefore, this is not a viable option.

5.3.2.2 Treatment Swales 401-A

In lieu of a wet detention pond, dry treatment swales were sized to accommodate the widening. Treatment Swales 401-A are from Station 2673+00 to 2745+00 on both sides of the road. The treatment swales slope down at a 1:6 from the edge of shoulder to the 4 foot ditch bottom at elevation 5 and then slope back up at a 1:4 to a 5 foot bench at elevation 7.5. The bench slopes down at a 1:3 to existing ground with 10 feet of additional right-of-way for maintenance. The swale soils are classified in Hydrologic Soil Groups B/D and C/D. The treatment swales would outfall directly to the wetlands adjacent to Lake Monroe. Lake Monroe flows to the St. Johns River. The treatment swales discharge to Class III waters and provides treatment volume equivalent to requirements for discharge into Outstanding Florida Waters (OFW), in order to provide compensating treatment for areas that are not captured and brought to the pond.

5.3.2.3 Treatment Swales 401-B

In lieu of a wet detention pond, dry treatment swales were sized to accommodate the widening. Treatment Swales 401-B are from Station 2673+00 to 2745+00 on the eastbound side of the road only. Barrier wall inlets would be used on the westbound side of the roadway to collect the water and discharge to the treatment swales. The treatment swales slope down at a 1:6 from the edge of shoulder to the 17 foot ditch bottom at elevation 5 and then slope back up at a 1:4 to a 5 foot bench at elevation 7.5. The bench slopes down at a 1:3 to existing ground. The FDOT already owns the right-of-way on the eastbound side of the roadway, so no additional right-of-way would be required. The treatment swales would outfall directly to the wetlands adjacent to Lake Monroe. Lake Monroe flows to the St. Johns River. The swale soils are classified in Hydrologic Soil Groups B/D and C/D. The treatment swales discharge to Class III waters and provides treatment volume equivalent to requirements for discharge into Outstanding Florida Waters (OFW), in order to provide compensating treatment for areas that are not captured and brought to the pond. **Treatment Swale 401-B is the recommended alternative.**

5.3.3 Basin 402

Basin 402 begins at Dirksen Drive at Station 2765+00 and continues north to Station 2845+00 at the bifurcated area. The basin consists of the full right-of-way. The stormwater runoff from the roadway will be collected by storm sewer systems that discharge to the ponds. There is only one alternative for this basin.

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5.3.3.1 Ponds 402A, 402B, 402C, 402D, 402E & 402F

Pond 402A is an existing pond (Pond SS-2 in Permit No. 64105-3) that will need to be reduced to accommodate for the widening of I-4 alignment. Pond 402A was built under the I-4 St. Johns River Bridge Replacement and Six–Laning project (FPID No. 242702-1-52-01). Ponds 402B and 402C were evaluated under Section 2 FEIS as Pond SS-3. Due to the power lines through the center of the infield area, the pond needed to be divided into two ponds. Ponds 402D, 402E and 402F are new pond alternatives that were not evaluated under Section 2 FEIS. In order to accommodate the roadway widening with the transit corridor, a total of five ponds will need to be utilized within the infield areas and one pond outside of the right-of-way. Therefore, additional right-of-way will be required for Pond 402F within this basin (Refer to Table 6 for parcel acquisition acreage). Pond 402A is located in the infield area west of I-4 from Station 2765+00 to 2774+50. Pond 402D and Pond 402F are located on the west side of I-4 respectively from Station 2774+50 to 2777+00 and from Station 2777+50 to 2782+50. Ponds 402C and 402B are located on the east of I-4 inside the infield ramp from Station 2767+00 to 2771+00 and Station 2772+00 to 2777+00, respectively. Pond 402E is located just north of Pond 402B. Pond 402F from Station 2777+00 to 2779+50. The pond soils are classified in Hydrologic Soil Group A, with the exception of Pond 402F which consist of soils classified in Hydrologic Soil Groups A/D and B/D. The ponds will be designed as wet detention ponds. The ponds are designed as though they are interconnected. The ponds will continue to discharge west underneath the ramp, which flows to Padgett Creek. Padgett Creek flows to Lake Monroe, which ultimately flows to the St. Johns River. **Ponds 402A, 402B, 402C, 402D, 402D and 402F are the recommended alternatives.**

5.3.4 Basin 403

Basin 403 and Basin 404 are combined in the proposed condition since Pond 402A in the existing conditions was not designed to accommodate for the I-4 Ultimate conditions. The basin begins at Station 2845+00 and continues north to Station 2891+00. The basin consists of the pond site and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.4.1 Pond 403

Pond 403 is a proposed pond in the bifurcated area of I-4 from Station 2852+35 to 2884+00. Additional right-of-way will not be required for this pond. This is a new pond alternative that was not evaluated under Section 2 FEIS. The pond soils are classified in Hydrologic Soil Group A. The pond will be designed as a dry retention pond and will outfall to the cross drain at Station 2904+00. The cross drain discharges to Trout Lake, which is land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 403 is the recommended alterative.**

5.3.5 Basin 405

Basin 405 begins at Station 2891+00 and continues north to Station 2913+50. The basin consists of the pond sites, the westbound travel lanes, auxiliary lanes and ramps to the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin.

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5.3.5.1 Ponds 405A and 405B

Ponds 405A and 405B are existing ponds (Ponds D and E in Permit No. 22931-1). The ponds were built under the I-4/Saxon Boulevard Interchange project (FPID No. 79110-3432). The ponds were evaluated under Section 2 FEIS as Ponds TT-3. The ponds will need to be regraded on the east side to accommodate for the roadway expansion. The ponds are located within the infield areas at the southwest quadrant of the interchange. Pond 405A is located from Station 2908+00 to 2912+50 and Pond 405B is located from Station 2906+00 to 2908+00. The pond soils are classified in Hydrologic Soil Groups A and A/D. The ponds were designed as wet detention ponds that also serve as wetland mitigation sites. The ponds discharge east through the cross drain to Trout Lake, which is land-locked. Since the outfall is land-locked, the ponds were designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 405 is the recommended alternative.**

5.3.6 Basin 406

Basin 406 begins at Station 2913+50 and continues north to Station 2933+50. The basin consists of the pond sites and the full right-of-way. The basin includes the ramps at the northwest corner of the intersection and approximately 1,350 feet of the six-laning of Saxon Boulevard. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin.

5.3.6.1 Ponds 406A and 406B

Pond 406A is an existing pond (Pond F in Permit No. 22931-1). The pond was built under the I-4/Saxon Boulevard Interchange project (FPID No. 79110-3432). The pond will need to be expanded and regraded. Pond 406B is a new pond alternative. The ponds were evaluated under Section 2 FEIS as Ponds TT-4. The ponds are located within the infield areas at the northwest quadrant of the interchange. Pond 406A is located from Station 2915+00 to 2920+00 and Pond 406B is located from Station 2920+00 to 2925+00. A Florida Scrub Jay was observed on this pond site. Relocation prior to site manipulation in the vicinity will be necessary. The pond construction cost located on Table 7, take this cost into account. For additional information on Florida Scrub Jay locations within the project, refer to the Endangered Species Biological Assessment (ESBA) provided by Stantec. The pond soils are classified in Hydrologic Soil Group A. The ponds were designed as dry retention ponds. The ponds discharge south to Pond 405A, which discharges east through the cross drain to Trout Lake, which is land-locked. Since the outfall is land-locked, the ponds were designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Ponds 406A and 406B are the recommended alternatives.**

5.3.7 Basin 407-408

Basin 407 and Basin 408 are combined in the proposed condition to accommodate for the I-4 Ultimate conditions. The basin begins at Station 2891+00 and continues north to Station 2933+50. The basin consists of the eastbound side of I-4, Saxon Boulevard and the ramps in the northeast and southeast quadrants of the intersection. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds or the ponds and a stormwater vault. There are two alternatives for this basin.

5.3.7.1 Ponds 407A, 407B, 407C, Pond 408, Pond 408B & Pond 408D1

Pond 407A is an existing pond (Pond A in Permit No. 22931-1 and Pond 1 in Permit No. 64105-6). The pond was built under the I-4/Saxon Boulevard Interchange project (FPID No. 79110-3432) and later modified under the I-4 Widening from south of Saxon Blvd. to North of SR 472 project (FPID No. 242716-1-52-01). The existing pond was split into two ponds in order to accommodate the power lines that run through the middle of the infield area. The existing pond at the location for Pond 407A will need to be expanded and reconfigured. The existing pond berm north of Pond 407A will need to be regraded outside of the power lines and turned into Pond 407B. Pond 407C is a proposed pond located north of Pond 407B and will be interconnected to Pond 407B via a pipe. Gopher tortoise burrows were observed on this pond site 407C. The burrows will be relocated prior to site manipulation in the vicinity of the burrow. The pond construction cost located on Table 7, take this cost into account. For additional information on gopher tortoise impacts, refer to ESBA provided by Stantec. The ponds were evaluated under Section 2 FEIS as Ponds TT-5. The ponds are located within the infield areas at the northeast section of the interchange. Pond 407A is located from Station 2916+00 to 2919+00, Pond 407B is located from Station 2920+00 to 2922+00 and Pond 407C is located from Station 2922+00 to 2926+00.

Pond 408 includes runoff from Saxon Blvd from Station 70+88 to 92+00 and four acres of non-permitted commercial offsite area. Pond 408 is an existing pond (Pond B in Permit No. 22931-1 and Pond 1A in Permit No. 64105-6). The pond was built under the I-4/Saxon Boulevard Interchange project (FPID No. 79110-3432) and later modified under the I-4 Widening from south of Saxon Blvd. to North of SR 472 project (FPID No. 242716-1-52-01). The pond will need to be expanded and regraded. The berm elevation will be raised by a half foot to match the intersection ponds elevations. Pond 408 was not evaluated under Section 2 FEIS. The pond is located north of Saxon Boulevard from Station 80+50 to 90+00. The ponds soils are classified in Hydrologic Soil Groups A and A/D. The ponds were designed as wet detention ponds. The ponds discharge south to Trout Lake, which is land-locked. Since the outfall is land-locked, the ponds were designed to retain the pre/post volume difference for the 100 year/10 day storm event. Additional right-of-way will be required for the expansion of Pond 408 with an acquisition of three (3) parcels (Refer to Table 6 for parcel acquisition acreage).

This alternative includes Basin 408B and 408D1 as well. Basins 408B and 408D1 include runoff from Saxon Blvd. Basin 408B begins at Station 92+60 and continues east to Station 100+60 along Saxon Boulevard. Basin 408D begins at Station 100+60 and continues east to Station 120+00 along Saxon Boulevard. The basin consists of the pond sites and the full right-of-way. Based on historical aerials, four-laning of Saxon Boulevard was completed in the early 1990's. A permit could not be found for this widening; therefore, existing conditions were assumed to be two lanes for the purpose of computing treatment volumes. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds.

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Pond 408B is a proposed shallow pond that is located south of Saxon Boulevard from Station 94+00 to 100+60. Due to the widening of Saxon Boulevard, multiple property owners will be affected. Additional right-of-way will be required for the proposed pond and will require the acquisition of (20) twenty parcels. The pond soils are classified in Hydrologic Soil Group A. The pond will be designed as a dry retention pond. The pond has been designed without maintenance berms, which is consistent with the existing ponds along the corridor. The pond will discharge to the onsite storm sewer system for Basin 408, which outfalls to Trout Lake. Trout Lake is land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event.

Pond 408D1 is a proposed shallow pond that is located south of Saxon Boulevard from Station 100+60 to 119+20. Due to the widening of Saxon Boulevard, multiple property owners will be affected. Additional right-of-way will be required for the proposed ponds and will require the acquisition of (17) seventeen parcels. The pond soils are classified in Hydrologic Soil Group A. The pond will be designed as a dry retention pond. The pond has been designed without maintenance berms, which is consistent with the existing ponds along the corridor. The pond will discharge to the onsite storm sewer system for Basin 408B. The pond for Basin 408B ultimately discharges to the onsite storm sewer system for Basin 408, which outfalls to Trout Lake. Trout Lake is land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. This alternative requires an excess amount of right-of-way take and therefore is not the most advantageous alternative (Refer to Table 6 for parcel acquisition acreage).

5.3.8 Basin 408A

Basin 408A begins at Station 80+00 and continues east to Station 120+00 along Saxon Boulevard. The basin consists of the pond site and the full right-of-way. Based on historical aerials, four-laning of Saxon Boulevard was completed in the early 1990's. A permit could not be found for this widening; therefore, existing conditions were assumed to be two lanes for the purpose of computing treatment volumes. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.8.1 Pond 408 (Existing) and Stormwater Vault 408

Pond 408 is an existing pond (Pond B in Permit No. 22931-1 and Pond 1A in Permit No. 64105-6). The pond was built under the I-4/Saxon Boulevard Interchange project (FPID No. 79110-3432) and later modified under the I-4 Widening from south of Saxon Blvd. to North of SR 472 project (FPID No. 242716-1-52-01). The pond does not need to be expanded and regraded. Pond 408 was not evaluated under Section 2 FEIS. The pond is located north of Saxon Boulevard from Station 80+50 to 84+50. The pond soils are classified in Hydrologic Soil Groups A and A/D. The pond was designed as a wet detention pond. The pond discharges south to Trout Lake, which is land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event.

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Stormwater Vault 408 is a proposed alternative that is located at the northwest corner of Saxon Boulevard and Finland Drive from Station 90+10 to 90+40 LT. Additional right-of-way will be required with an acquisition of four (4) parcels (Refer to Table 6 for parcel acquisition acreage). The vault will function as a temporary underground storage area for roadway runoff during a rainfall event. The vault has been designed to store the runoff volume from a 10-year, 24-hour design storm. Once the vault reaches its designed capacity, a pump and a force main system will direct the excess runoff to an existing City of Deltona wastewater treatment plant for treatment and reuse (irrigation).

Since the majority of the drainage area contributing to the vault is from Saxon Boulevard, this alternative would be a joint undertaking between FDOT and the City of Deltona. FDOT would construct the vault as part of the Beyond the Ultimate I-4 improvements, but ownership and maintenance would belong to the City. With this alternative, currently untreated runoff will not discharge to Trout Lake.

Additional right-of-way will be required for the Stormwater Vault 408 with an acquisition of four (4) parcels (Refer to Table 6 for parcel acquisition acreage). After consideration from the public involvement meeting, meetings with the property owners and coordination between FDOT, the City of Deltona and SJRWMD, it was determined that existing Pond 408 and the Stormwater Vault 408 alternative has the least amount of impacts. For additional information, please refer to the SJRWMD and City of Deltona coordination meeting minutes in Appendix D. **Pond 407A, 407B, 407C, 408 and the Stormwater Vault 408 is the recommended alternatives.**

5.3.9 Basin 409

Basin 409 begins at Station 2991+00, which is just north of the I-4/Saxon Blvd Interchange and ends at Station 3038+00. The limits have been modified from the original basin limits to accommodate the proposed alignment. The basin consists of the pond sites and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There are two alternatives for this basin. The recommended alternative consists of Ponds 409-A1 and 409-B1 since there is less right-of-way acquisition.

5.3.9.1 Ponds 409-A1 and 409-B1

Pond 409-A1 is an existing pond (Pond 2 in Permit No. 64105-6). The pond was built under the I-4 Widening from south of Saxon Blvd. to North of SR 472 project (FPID No. 242716-1-52-01). The existing pond was built slightly north of the area shown under Section 2 FEIS as Pond TT-8. Pond 409-B1 is a new pond alternative that was not evaluated under Section 2 FEIS. The stormwater runoff that is conveyed to Pond 409-A1 extends from Station 2933+50 to 2991+00 for the eastbound and westbound lanes. From Station 2991+00 to 3038+00 only runoff from the eastbound lanes and right-of-way will be conveyed to the pond. The runoff from the westbound lanes from Station 2991+00 to 3038+00 will discharge to Pond 409-B1. Pond 409-A1 is located from Station 2951+00 to 2958+00 adjacent to the east side of I-4. Additional right-of-way will be required for the expansion of Pond 409-A1 and will require the acquisition of three parcels (Refer to Table 5 for parcel acquisition acreage). Florida Scrub Jays were observed on this pond site. Relocation prior to site manipulation in the vicinity will be necessary. The pond construction cost

located on Table 7, take this cost into account. For additional information on Florida Scrub Jay locations within the project, refer to the ESBA provided by Stantec. Pond 409-B1 is located from Station 2987+00 to 2992+00 adjacent to the west side of I-4. Additional right-of-way will be required for the expansion of Pond 409-B1 and will require the acquisition of seven parcels that share one owner (Refer to Table 6 for parcel acquisition acreage). An offsite ditch around Pond 409-B1 will be required, in order to allow offsite areas to continue to flow to Lake Mallard. The pond soils are classified in Hydrologic Soil Group A. The ponds will be designed as dry retention ponds and will continue to discharge to the cross drain at Station 2945+25. The cross drain flows west to Lake Mallard, which is land-locked. Since the outfall is land-locked, the ponds were designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 409-A1 & 409-B1 is the recommended alternative.**

5.3.9.2 Pond 409-A2

Pond 409-A2 is an existing pond (Pond 2 in Permit No. 64105-6). The pond was built under the I-4 Widening from south of Saxon Blvd. to North of SR 472 project (FPID No. 242716-1-52-01). The existing pond was built slightly north of the area shown under Section 2 FEIS as Pond TT-8. The pond would need to be expanded and regraded. Additional right-of-way will be required for the pond expansion and will require the acquisition of two parcels (Refer to Table 5 for parcel acquisition acreage). Pond 409-A2 is located from Station 2951+00 to 2957+00 on the east side of I-4. The pond soils are classified in Hydrologic Soil Group A. Florida Scrub Jays were observed on this pond site. Relocation prior to site manipulation in the vicinity will be necessary. The pond construction cost located on Table 7, take this cost into account. For additional information on Florida Scrub Jay locations within the project, refer to the ESBA provided by Stantec. The pond will be designed as a dry retention pond and will continue to discharge to the cross drain at Station 2945+25. The cross drain flows west to Lake Mallard, which is land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event.

5.3.10 Basin 410

Basin 410 begins at the high point at Station 3038+00 and continues north to Station 3072+00. The basin consists of the pond site, a small portion of the SR 472 Ramp to I-4 WB GUL ramp and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the ponds. There is only one alternative for this basin.

5.3.10.1 Pond 410

Pond 410 is an existing pond (Pond 3 in Permit No. 64105-6). The pond was built under the I-4 Widening from south of Saxon Boulevard to North of SR 472 project (FPID No. 242716-1-52-01). The pond was not evaluated under Section 2 FEIS. Additional right-of-way will not be required for the pond in this basin. Pond 410 will need to be modified and expanded due to the roadway and ramp alignment. The pond is located adjacent to the I-4 EB GUL Ramp from Station 363+00 to 369+00. The pond soils are classified in Hydrologic Soil Group A. The pond was designed as dry retention pond. The pond discharges south through the cross drain to a series of depressional areas east of I-4, which are land-locked. Since the outfall is land-locked, the pond was designed to

retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 410 is the recommended pond.**

5.3.11 Basin 411

Basin 411 begins at Station 3072+00 and continues north to the high point at Station 3080+72. The basin consists of the pond site, EB GUL ramps, approximately 2,600 feet of SR 472 from Station 70+33 to 99+19 and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.11.1 Pond 411

Pond 411 is an existing pond (Pond 3 in Permit No. 76095-1). The pond was built under SR 472 & Howland Blvd. Interchange project (County No. P-4671). The pond was not evaluated under Section 2 FEIS. The pond will need to be modified and regraded to accommodate the widening. Additional right-of-way will not be required for the modification. The pond is located within the infield area at the southeast section of the interchange. Pond 411 is located from Station 3073+00 to 3077+00. The pond soils are classified in Hydrologic Soil Group A. The pond was designed as a dry retention pond and discharges south through the cross drain to a series of depressional areas east of I-4, which are land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 411 is the recommended alternative.**

5.3.12 Basin 412

Basin 412 begins at Station 54+00 and continues southeast to Station 70+35 along SR 427. The limits have been modified from the original basin limits to accommodate the proposed alignment. The basin consists of the pond site, WB GUL ramps, SR 472 and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.12.1 Pond 412

Pond 412 is a proposed pond located in the northwest quadrant of the I-4/SR 472 Interchange, beginning from Station 63+50 north of SR 472 to 3086+00 west of I-4. The existing ponds will be removed with the proposed improvements. Additional right-of-way will be required for this pond, refer to Table 5 for acquisition acreage. This is a new pond alternative that was not evaluated under Section 2 FEIS. The pond is designed as a dry retention pond. The pond soils are classified in Hydrologic Soil Group A. The pond will discharge into a series of depressional areas west of I-4, which are land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 412 is the recommended alternative.**

5.3.13 Basin 413

Basin 413 begins at the center line of I-4 and continues east until the end of the SR 472 Access Road. The basin consists of the pond site, offsite area, a small portion of the I-4 eastbound bridge, Graves Avenue, SR 472 and the SR 472 Access Road. The stormwater runoff from the roadway will be collected by a series of inlets and pipes that discharge directly to Pond 413. There is only one alternative for this basin.

5.3.13.1 Pond 413

Pond 413 is an existing pond (Pond 4 in Permit No. 76095-1). The pond was originally built under the Howland Boulevard from Kentucky Avenue to Forest Edge Drive project (Project No. 94507). The pond was later changed to Pond 4 (Permit No. 76095-1). The pond was not evaluated under Section 2 FEIS since Howland Boulevard was not included in the previous study. The pond requires expanding and regrading. The existing pond is located south of the intersection of Graves Avenue and the SR 472 intersection from Station 100+00 to 103+00 (SR 472). Pond 413 soils are classified in Hydrologic Soil Group A. The pond was designed as a dry retention pond and discharges into a depressional area north of the pond via a 24" RCP. The pond was designed to retain the pre/post volume difference for the 100 year/ 10 day storm event. **Pond 413 is the recommended alternative.**

5.3.14 Basin 414

Basin 414 begins at Station 3080+72 and continues north to the high point of the existing roadway profile at Station 3159+02 outside of the project limits. The limits have been adjusted from the original basin limits to accommodate the proposed improvements. The basin consists of the pond site, offsite area and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.14.1 Pond 414

Pond 414 is an existing pond (Pond 4 in Permit No. 64105-6) that does not need to be expanded or regraded. The pond was built under the I-4 Widening from south of Saxon Blvd. to North of SR 472 (FPID No. 242716-1-32-01). The pond is located outside of the project limits from Station 3124+00 to 3137+38. The pond was evaluated under Section 2 FEIS as Pond VV-3. Since the existing pond was designed for the ultimate I-4 condition up to Cassadaga Road (Station 3122+00), the pond does not need to be expanded or regraded. The pond soils are classified in Hydrologic Soil Group A. The pond was designed as a dry retention pond. The pond discharges to a series of depressional areas east and west of I-4. These areas are considered land-locked; therefore the pond is designed as a closed basin. **Pond 414 is the recommended alternative.**

5.3.15 Basin 415

Basin 415 begins at Station 44+12 and continues southeast along SR 472 to Station 54+00. The basin consists of the pond site and the full right of way. The stormwater runoff from the roadway will be collected by roadside ditches and storm sewer systems that discharge to Pond 415. There is only one alternative for this basin.

5.3.15.1 Pond 415

Pond 415 is a new pond alternative that was not evaluated under Section 2 FEIS since this portion was not part of the previous study. Pond 415 is located from Station 49+00 to 51+50 adjacent to the north side of SR 472. Additional right-of-way will be required for the construction of Pond 415 and will require a partial acquisition of one parcel (Refer to Table 5 for parcel acquisition acreage). The pond soils are classified in Hydrologic Soil Group A. Pond 415 is designed as a dry retention pond and will outfall to a series of depressional areas to the north of the pond, which are

considered to be land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 415 is the recommended alternative.**

5.3.16 Basin 416

Basin 416 begins at the intersection of Kentucky Avenue and Graves Avenue and continues northward along Kentucky Avenue to high point of the existing profile. The basin consists of the pond site and the full right of way. The stormwater runoff from the roadway will be collected by storm sewer systems that discharge to Pond 416. There is only one alternative for this basin.

5.3.16.1 Pond 416

Pond 416 is a new pond alternative that was not evaluated under Section 2 FEIS, since Kentucky Avenue was not part of the previous study. Pond 416 is located from permitted Station 19+50 to 21+50 on the west side of Kentucky Avenue. Additional right-of-way will be required for the construction of Pond 416 and will require a partial acquisition of one parcel (Refer to Table 5 for parcel acquisition acreage). The pond soils are classified in Hydrologic Soil Group A. The pond is designed as a dry retention pond and will outfall to a depressional area to the west of the pond, which is considered to be land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 416 is the recommended alternative.**

5.3.17 Basin 417

Basin 417 begins at permitted Station 41+87.25 and continues northward to SR 472 at Station 51+59.00. The basin consists of the pond site, the full right of way and 300 feet of SR 472. The stormwater runoff from the roadway will be collected by storm sewer systems that discharge to Pond 417. There is only one alternative for this basin.

5.3.17.1 Pond 417

Pond 417 is a new pond alternative that was originally permitted for the Kentucky Avenue (C.R. # 4139) from Graves Avenue to SR 472 Project (Project No. 4055). Pond 417 was not evaluated under Section 2 FEIS, since Kentucky Avenue was not part of the previous study. Pond 417 is located from permitted Station 50+00 to 52+00 on the west side of Kentucky Avenue. Additional right-of-way will be required for the construction of Pond 417 and will require a partial acquisition of one parcel and the full acquisition of three parcels (Refer to Table 5 for parcel acquisition acreage). The pond soils are classified in Hydrologic Soil Group A. The pond is designed as a dry retention pond and will outfall to a depression area to the west of the pond, which are land-locked. Since the outfall is land-locked, the pond was designed to retain the pre/post volume difference for the 100 year/10 day storm event. **Pond 417 is the recommended alternative.**

5.3.18 Basin 418

Basin 418 begins just north of the SR 472 and Kentucky Avenue intersection and continues northward along Dr. Martin Luther King Jr. Beltway to Cassadaga Road. The basin consists of the pond site, the full right of way and 1350 feet of Cassadaga Road. The stormwater runoff from the roadway will be collected by roadside ditches that are conveyed to Pond 418. There is only one alternative for this basin.

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5.3.18.1 Pond 418

Pond 418 is a new pond alternative that was constructed on the West Volusia Beltline from SR 472 to Kepler Road project, as Pond VB-2. The pond was not evaluated under Section 2 FEIS, since the Dr. Martin Luther King Jr. Beltway was not part of the previous study. The pond is located just north of the SR 472 and Dr. Martin Luther King Jr Beltway intersection. The pond soils are classified in Hydrologic Soil Group A. The pond is designed as a dry retention pond with no outfall and therefore was designed to retain the total post volume for the 100 year/24 hour storm event. **Pond 418 is the recommended alternative.**

5.3.19 Basin A (Rhode Island Avenue)

Basin A begins at Station 10+18 and continues east along Rhode Island Avenue to Station 55+27. The basin consists of the pond site, offsite area and the full right-of-way. The stormwater runoff from the roadway will be collected by roadside ditches and closed storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.19.1 Pond A

Pond A is a permitted pond (Pond A in Permit No. 111974-1) that expired on September 9th 2013. The pond was designed under the Rhode Island Avenue Volusia County Project (P-4904). Pond A was never built and will require new construction. The pond is located outside of the project limits from Station 23+78 to 31+00. The pond was not evaluated under Section 2 FEIS since Rhode Island was not included in the previous study. Pond A is designed as a dry retention pond with no outfall. Consequently, the pond is designed to retain the post volume for the 100 year/ 24 hour storm event. The pond soils are classified in Hydrologic Soil Group A. The parcel that Pond A lies on is owned by Volusia County, and therefore a joint use agreement will need to be made with Volusia County for use of the parcel. **Pond A is the recommended alternative.**

5.3.20 Basin B (Rhode Island Avenue)

Basin B begins at Station 55+27 and continues east along Rhode Island Avenue to Station 68+28. The basin consists of the pond site, offsite area from the adjacent existing basin, the bridge crossing of SR 400 (I-4) and the full right-of-way. The stormwater runoff from the roadway will be collected by closed storm sewer systems that discharge to the pond. There are two alternatives for this basin.

5.3.20.1 Pond B

Pond B is a permitted pond (Pond B in Permit No. 111974-1) that expired on September 9th 2013. The pond was designed under the Rhode Island Avenue Volusia County Project (P-4904). Pond B was never built and will require new construction. The pond is located in the southwest quadrant of SR 400 (I-4) and Rhode Island Avenue from Station 55+50 to 61+50. The pond was not evaluated under Section 2 FEIS since Rhode Island was not included in the previous study. Pond B was designed to accommodate the additional impervious area for future roadway widening, and therefore does not need to be modified. The pond soils are classified in Hydrologic Soil Group A. The pond was designed as a dry retention pond with no outfall. Consequently, the pond is designed to retain the post volume for the 100 year/ 24 hour storm event. Although the pond was permitted, the right-of-way has not been acquired. Additional right-of-way will be required for the

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construction of Pond B and will require the partial acquisition of two parcels (Refer to Table 5 for parcel acquisition acreage).

5.3.20.2 Pond B1

Pond B1 is a new pond alternative that will acquire partial parcel acquisition from a private owner and a total parcel take of a Volusia County owned property (Refer to Table 6 for parcel acquisition acreage). Pond B1 is located in the southwest quadrant of SR 400 (I-4) and Rhode Island Avenue from Station 60+50 to 63+50. The pond was not evaluated under Section 2 FEIS since Rhode Island was not previously included in the study. The pond soils are classified in Hydrologic Soil Group A. The pond is designed as a dry retention pond with no outfall. Consequently, the pond is designed to retain the post volume for the 100 year/24 hour storm event. **Pond B1 is the recommended alternative.**

5.3.21 Basin C (Rhode Island Avenue)

Basin C begins at Station 68+28 and continues east along Rhode Island Avenue to Normandy Blvd. The basin consists of the pond site and the full right-of-way, approximately 1500 feet of Normandy Blvd and the Park and Ride Parking lot. Historically, the portion of Normandy Blvd was being treated by roadside swales. The stormwater runoff from Basin C will be collected by closed storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.21.1 Pond C

Pond C is a permitted pond (Permit No. 111974-1) that expired on September 9th 2013. The pond was designed under the Rhode Island Avenue Volusia County Project (P-4904). The pond was never built and will require new construction. Although Pond C was designed for future impervious area, the pond will need to be expanded and regraded from the original design to accommodate for the park and ride and widening of Normandy Boulevard. The pond is located in the southeast quadrant of SR 400 (I-4) and Rhode Island Avenue from Station 69+75 to 76+00. The pond was not evaluated under Section 2 FEIS since Rhode Island Avenue was not previously included in the study. The pond soils are classified in Hydrologic Soil Group A. The pond is designed as a dry retention pond with no outfall. Consequently, the pond is designed to retain the post volume for the 100 year/24 hour storm event. **Pond C is the recommended alternative.**

5.3.22 Basin D (Normandy Boulevard)

Basin D begins just north of Rhode Island Avenue and continues north along Normandy Boulevard. The basin consists of the Normandy Boulevard, the pond site and offsite area. The stormwater runoff from Basin D will be collected by closed storm sewer systems that discharge to the pond. There is only one alternative for this basin.

5.3.22.1 Pond D

Pond D is an existing depressional area (Permit No. 111974-1) that will need to be re-graded. The pond was designed under the Normandy Boulevard Extension, Volusia County Project (1553). Pond D is located adjacent to the eastbound side of Normandy Boulevard from Station 30+65 to 34+70. The pond is designed as a dry retention pond and will continue to discharge to the culvert

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connected to the bottom of the pond. Pond D was not evaluated under Section 2 FEIS since Normandy Boulevard was not previously included in the study. The pond soils are classified in Hydrologic Soil Group A. The pond was designed to retain the pre/post volume difference for the 100yr/ 24 hour storm event. **Pond D is the recommended alternative.**

5.4 Floodplains/Floodways

5.4.1 Basin 400

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRM) for Volusia County. According to FEMA Map Nos. 12127C0730G, 12127C0735H, 12127C0620H and 12127C0610H, large portions of the roadway and several ponds lie within the 100-year floodplain. Based on the FEMA floodplain lines, the roadway widening within Lake Monroe Floodplain will impact the floodplain on both sides of the roadway and are located in Zone AE of the floodplain with an elevation of 9 feet NAVD. The roadway impacts the floodplain for a total of 55.75 acre-feet. The westbound impacts occur from Station 2634+00 to Station 2752+00 and the eastbound impacts occur from 2640+00 to Station 2752+00. Compensation for the two basins will be provided in Pond 400 for this impact for a total of 64.58 acre-feet of compensation.

5.4.2 Basin 403

Based on FEMA floodplain lines, a small portion of the widening will impact the Gasline Lake Floodplain. The floodplain at Gasline Lake is classified as Zone A. Based on available contours the elevation for the floodplain is approximately 40 feet NAVD. The westbound portion of the shoulder will impact the Lake Gasline floodplain from Station 2842+20 to Station 2848+20 for a total of 2.41 acre-feet of impacts. A floodplain compensation pond (FPC 403) has been added adjacent to Lake Gasline to compensate for the fill to the floodplain from Station 2847+00 to 2849+00. Additional right-of-way will be required for floodplain compensation pond FPC 403 with an acquisition of one parcel (Refer to Table 5 for parcel acquisition acreage).

5.4.3 Basin 405

Based on the FEMA FIRM map, the roadway right-of-way is located within the 100-year floodplain of Goose Lake and Trout Lake at Station 2905+00. An existing culvert hydraulically connects the two lakes. According to the FEMA FIRM map, Goose Lake lies within Zone A and Trout Lake lies within Zone AE with an elevation of 26 NAVD. The ramps and ponds within the southwest quadrant of the Saxon Boulevard Interchange are located within this floodplain. Previously, SR 400 (I-4) was widened from four lanes to six lanes and compensation was provided in the existing ponds. Additional pavement and fill is not proposed within this area; therefore, no floodplain impacts are anticipated.

5.4.4 Basin 407- 408

Based on FEMA floodplain lines, a small portion of the widening will impact the Trout Lake Floodplain. The floodplain at Trout Lake is classified as Zone A. Based on permit application number 42-127-3037-AN, the elevation for the floodplain is approximately 24.3 feet NAVD. The I-4 eastbound off-ramp to Saxon Blvd. will impact the Lake Trout floodplain for approximately 645 ft. for a total of 6.85 acre-feet of impacts. A floodplain compensation pond (FPC 407) has been added adjacent to Lake Trout to compensate for the fill to the floodplain from Station 2908+00 to 2912+00. Additional right-of-way will be required for the

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proposed ramp alignment. Refer to the Alternative Evaluation Matrix on Table 5.7 of the Preliminary Engineering Report for more detailed information on right-of-way takes.

5.4.5 Basin A (Rhode Island Avenue)

A portion of proposed right-of-way along Rhode Island Avenue lies within the 100-year floodplain from Station 26+82 to Station 32+18. The floodplain is classified as Zone A and has a determined elevation of 17.86 NAVD (Permit No. 111974-1). Compensation for Rhode Island Avenue is provided in a compensation pond that is adjacent to Pond A (Refer to Appendix E for permitted floodplain calculations). The floodplain pond lies within the existing Volusia County right-of-way. Refer to Appendix E in Existing Permits for floodplain calculations. The FEMA Flood Insurance Rate Maps for the project is provided in Figure 6.

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Table 5 – Pond Engineering Data & Analysis

Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
400	Station 2630+00 to 2641+00 FDOT Property	Electra (A), Eau Gallie (A/D), Bluff (C/D) & Wabasso (B/D)	5.50	10.00	Existing ditch south of pond	53.80	Wet Detention	22.53	60.43	N/A	N/A
401	Station 2715+00 to 2730+00 FDOT Property & Parcel No. 02-19-30-00-00-0220	Bluff (C/D) & Wabasso (B/D)	5.50	12.00	Wetlands adjacent to Padgett Creek	73.77	Wet Detention	19.16	36.07	5.42	75.00
Treatment Swales 401-A	Station 2673+00 to 2745+00 FDOT Property & Parcel No. 10-19-30-00-00-0010	Bluff (C/D) & Wabasso (B/D)	1.20	12.00	Wetlands adjacent to Padgett Creek and Lake Monroe	49.59	Dry Retention	5.80	8.70	0.06	343.77
	Parcel No. 11-19-30-00-00-0010									2.27	431.91
	Parcel No. 10-19-30-00-00-0010									1.36	10.65
	Parcel No. 02-19-30-00-00-0002									3.50	75.00
Treatment Swales 401-B	Station 2673+00 to 2745+00 FDOT Property	Bluff (C/D) & Wabasso (B/D)	1.20	12.00	Wetlands adjacent to Lake Monroe	49.59	Dry Retention	5.80	8.70	N/A	N/A
	Parcel No. 02-19-30-00-00-0220									12.64	343.77
402A – 402F	Station 2765+00 to 2782+50 FDOT Property &	Astatula, Orsino, Paola, & Quartzipsamments (A)	14.10	25.00	Padgett Creek	68.91	Wet Detention	28.15	30.26	N/A	N/A
	Parcel No. 02-19-30-00-00-0042	Immokalee (B/D), Pomona (A/D) & Quartzipsamments (A)								3.12	7.5
403	Station 2852+35 to 2884+00 FDOT Property	Orsino & Paola (A)	35.00	42.00	Trout Lake	41.02	Dry Retention	24.55	26.49	N/A	N/A
405A & 405B	Station 2906+00 to 2912+50 FDOT Property	Paola & Daytona (A) Myakka (A/D)	21.20	26.80	Trout Lake	13.17	Wet Detention	7.42	8.44	N/A	N/A
406A & 406B	Station 2915+00 to 2925+00 FDOT Property	Paola (A)	30.00	40.00	Trout Lake	25.06	Dry Retention	12.07	16.27	N/A	N/A
407A, 407B & 407C	Station 2915 to 2926+00 FDOT Property	Myakka (A/D) & Orsino (A)	23.75	28.00	Trout Lake	39.35	Wet Detention	17.89	18.45	N/A	N/A
408 (Alternative)	Station 80+80 to 90+00 FDOT Property &	Orsino & Paola (A) & Myakka (A/D)	23.75	28.00	Trout Lake	39.35	Wet Detention	17.89	18.45	N/A	N/A
	Parcel No. 23-18-30-01-12-0080									0.94	0.94
	Parcel No. 23-18-30-01-12-0091									0.65	0.65
	Parcel No. 23-18-30-01-12-0090									2.33	2.33

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Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
408B	Station 94+00 to 100+00 Parcel No. 30-18-31-03-36-0200	Paola (A)	30.00	38.00	Trout Lake	2.87	Dry Retention	3.03	4.16	0.28	0.47
	Parcel No. 30-18-31-03-36-0190									0.15	0.22
	Parcel No. 30-18-31-03-36-0180									0.16	0.23
	Parcel No. 30-18-31-03-36-0170									0.17	0.21
	Parcel No. 30-18-31-03-36-0160									0.16	0.21
	Parcel No. 30-18-31-03-36-0150									0.15	0.21
	Parcel No. 30-18-31-03-36-0140									0.13	0.21
	Parcel No. 30-18-31-03-36-0130									0.16	0.25
	Parcel No. 30-18-31-03-36-0120									0.06	0.27
	Parcel No. 30-18-31-03-36-0110									0.24	0.24
	Parcel No. 30-18-31-03-36-0100									0.23	0.23
	Parcel No. 30-18-31-03-36-0090									0.26	0.26
	Parcel No. 30-18-31-03-36-0080									0.29	0.29
	Parcel No. 30-18-31-03-36-0070									0.28	0.28
	Parcel No. 30-18-31-03-36-0060									0.25	0.25
	Parcel No. 30-18-31-03-36-0050									0.24	0.24
	Parcel No. 30-18-31-03-36-0040									0.20	0.20
	Parcel No. 30-18-31-03-36-0030									0.22	0.22
	Parcel No. 30-18-31-03-36-0020									0.23	0.23
	Parcel No. 30-18-31-03-36-0010									0.29	0.29
408D1	Parcel No. 30-18-31-03-37-0170	Paola (A)	30.00	38.00	Trout Lake	5.50	Dry Retention	3.57	4.02	0.18	0.24
	Parcel No. 30-18-31-03-37-0160									0.17	0.20
	Parcel No. 30-18-31-03-37-0150									0.22	0.24
	Parcel No. 30-18-31-03-37-0140									0.18	0.24
	Parcel No. 30-18-31-03-37-0130									0.16	0.23
	Parcel No. 30-18-31-03-37-0120									0.14	0.23
	Parcel No. 30-18-31-03-37-0110									0.15	0.23
	Parcel No. 30-18-31-03-37-0100									0.13	0.23
	Parcel No. 30-18-31-03-37-0090									0.15	0.30
	Parcel No. 30-18-31-03-37-0080									0.30	0.30
	Parcel No. 30-18-31-03-37-0070									0.23	0.23

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Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
	Parcel No. 30-18-31-03-37-0060									0.23	0.23
	Parcel No. 30-18-31-03-37-0050									0.25	0.25
	Parcel No. 30-18-31-03-37-0040									0.22	0.22
	Parcel No. 30-18-31-03-37-0030									0.24	0.24
	Parcel No. 30-18-31-03-37-0020									0.28	0.28
	Parcel No. 30-18-31-03-37-0010									0.37	0.37
408 Recommended	Station 80+80 to 90+00 FDOT Property	Orsino & Poala (A) & Myakka (A/D)	23.75	28.00	Trout Lake	33.09	Wet Detention	14.58	15.20	N/A	N/A
408 Vault	Station 90+47 to 94+71 Parcel No. 30-18-31-03-66-0160	Paola & Apopka (A)	23.80	30.00	No Outfall	11.02	Vault	5.28	5.28	0.22	0.22
	Parcel No. 30-18-31-03-66-0150									0.23	0.23
	Parcel No. 30-18-31-03-66-0140									0.23	0.23
	Parcel No. 30-18-31-03-66-0130									0.23	0.23
409-A1	Station 2951+00 to 2958+00 FDOT Property &	Apopka, Astatula, Electra, Orsino & Paola (A)	22.20	35.00	Lake Mallard	51.11	Dry Retention	27.16	30.78	N/A	N/A
	Parcel No. 13-18-30-03-19-0210									0.23	0.23
	Parcel No. 13-18-30-03-09-0190									0.20	0.20
	Parcel No. 13-18-30-03-17-0210									0.05	0.15
	Volusia County									0.36	N/A
409-B1	Station 2987+00 to 2992+00 FDOT Property &	Cassia (A/D), Orsino(A), Paola (A) & Smyrna (A/D)	16.00	35.00	Lake Mallard	13.58	Dry Retention	6.94	9.24	N/A	N/A
	Parcel No. 13-18-30-02-25-0010									0.80	0.80
	Volusia County									0.22	N/A
409-A2	Station 2951+00 to 2957+00 FDOT Property &	Apopka, Astatula, Electra, Orsino & Paola (A)	22.20	35.00	Lake Mallard	75.74	Dry Retention	40.56	40.71	N/A	N/A
	Parcel No. 13-18-30-03-19-0010									1.00	1.00
	Parcel No. 13-18-30-03-19-0190									0.10	0.10
	Parcel No. 13-18-30-03-19-0210									0.23	0.23
	Parcel No. 13-18-30-03-09-0190									0.20	0.20
	Parcel No. 13-18-30-03-17-0210									0.05	1.03
	Volusia County									0.70	N/A
410	Station 363+00 to 369+00 FDOT Property	Astatula, Tavares & Poala (A)	51.00	68.00	Depressional Area East of I-4	28.62	Dry Retention	12.25	14.85	N/A	N/A
411	Station 3073+00 to 3077+00 FDOT Property	Orsino, Paola & Astatula (A)	45.50	65.00	Depressional Area East of I-4	35.80	Dry Retention	8.69	8.93	N/A	N/A

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Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
412	Station 63+50 (SR 472) to 3086+00 (SR400) Parcel No. 06-18-31-00-00-0130	Astatula & Tavares (A)	49.00	65.00	Depressional Area East of I-4	39.41	Dry Retention	9.50	9.67	4.20	28.62
413	Station 100+00 to 103+00 (Saxon Blv.) Volusia County Property Parcel No. 07-18-31-01-04-0010	Orsino & Paola (A)	22.00	52.50	Depressional Area East of I-4	26.13	Dry Retention	6.04	20.49	N/A	N/A
414	Station 3124+00 to 3137+38 FDOT Property	Astatula & Tavares (A)	31.70	55.00	Depressional Area	188.46	Dry Retention	28.11	138.50	N/A	N/A
415	Station 49+00 to 51+50 (Saxon Blvd) Parcel No. 06-18-31-04-00-0170	Astatula & Tavares (A)	40.00	55.00	Depressional Area	4.62	Dry Retention	1.69	1.66	1.59	41.03
416	Station 19+50 to 21+50 (Kentucky Avenue) Parcel No. 01-18-30-00-00-0030	Apopka, Astatula & Tavares (A)	25.00	41.00	Depressional Area	27.60	Dry Retention	4.53	5.91	2.75	215.17
417	Station 50+00 to 52+00 (Kentucky Avenue) Parcel No. 01-18-30-00-00-0250	Astatula & Tavares (A)	30.00	47.50	Depressional Area	8.79	Dry Retention	4.29	4.39	1.333	37.06
	Parcel No. 01-18-30-02-10-0130									0.71	0.08
	Parcel No. 01-18-30-02-10-0180									0.06	0.09
	Parcel No. 01-18-30-02-10-0200									0.06	0.11
418	Volusia County Parcel (Dr. Martin Luther King Jr. Beltway)	Astatula & Tavares (A)	25.0	26.80	No Outfall	15.32	Dry Retention	8.99	8.99	N/A	N/A
A	Station 23+78 to 33+50 Volusia County Property Parcel No. 13-18-30-00-00-0082	Paola (A) & Satellite (A/D)	16.8	26.8	No Outfall	13.29	Dry Retention	13.90	19.73	N/A	N/A
	Parcel No. 13-18-30-00-00-0080									N/A	N/A
B	Station 55+50 to 61+50 Volusia County Property Parcel No. 18-18-31-00-00-0060	Astatula & Orsino (A)	32.6	41.3	No Outfall	9.23	Dry Retention	4.36	6.93	0.17	N/A
	Parcel No. 13-18-30-00-00-0010									2.56	10.0
B1	Station 60+50 to 63+50 Volusia County Property Parcel No. 18-18-31-00-00-0060	Astatula , Orsino & Paola (A)	32.6	41.3	No Outfall	9.23	Dry Retention	4.18	5.64	0.50	10.00
	Parcel No. 13-18-30-00-00-0010									2.33	10.00
	Volusia County Parcel									0.09	0.00
C	Station 69+75 to 76+00 Parcel No. 18-18-31-00-00-0033	Astatula (A)	56.95	73.0	No Outfall	12.88	Dry Retention	7.34	8.5	3.33	10.22

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Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	Lowest Edge of Roadway (ft)	Outfall Location	Roadway Drainage Area (ac)	Method of Treatment	Required Treatment & Attenuation Volume (ac-ft)	Provided Treatment & Attenuation Volume (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
D	Station 30+65 to 34+70 Volusia County Parcel No. Unknown	Astatula (A)	43.5	66.2	No Outfall	70.30	Dry Retention	8.04	37.33	N/A	N/A

Table 6 – Floodplain Compensation Pond Engineering Data & Analysis

FPC Pond	Location	Soil Names & Hydrologic Groups	Estimated SHWT El. (ft)	100 YR Floodplain Elevation (ft)	Required Compensation (ac-ft)	Storage Provided (ac-ft)	Required Add. Pond Area Including Access (ac)	Total Parcel Available (ac)
400	Station 2630+00 to 2641+00 FDOT Property	Electra (A), Eau Gallie (A/D), Bluff (C/D) & Wabasso (B/D)	5.50	9.00	55.75	64.58	N/A	N/A
403	Station 2844+53 to 2847+60 Parcel No. 25-18-30-00-00-0055	Orsino & Paola (A)	35.00	40.00	2.41	2.77	3.88	5.10
A	Station 31+00 to 33+50 Volusia County Property	Cassia (A/D), Paola (A) & Smyrna-Smyrna (A/D)	16.88	16.75	5.99	6.20	1.5	10.49
407	Station 2907+00 to 2914+00 FDOT Property	Myakka (A/D) & Orsino (A)	22.00	24.30	6.85	7.04	N/A	N/A

Table 7 – Pond and Floodplain Compensation Pond Impact & Cost Analysis

Pond	Existing Land Use	**Threatened or Endangered Species Impacts	***Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Floodplain Impacts (ac-ft)	Wetland & Surface Water Impacts (ac)		Total Pond Cost*	Rankings
400	Public / Semi-Public	High	Low	N	55.75	0.00	0.00	$0.00*	1
401	Vacant Government - Drainage	High	Low	N		0.00	19.37	$4,005,911	3
Treatment Swales 401-A	Public / Semi-Public	High	Low	N		23.94	0.00	$3,255,512	2
Treatment Swales 401-B	Public / Semi-Public	High	Low	N		14.50	0.00	$2,136,769	1
402A	Public / Semi-Public	High	Low	Y	0.00	0.00		$1,619	1

Pond	Existing Land Use	**Threatened or Endangered Species Impacts	***Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Floodplain Impacts (ac-ft)	Wetland & Surface Water Impacts (ac)		Total Pond Cost*	Rankings
402B	Public / Semi-Public	High	Low	Y	0.00	5.17	0.00	$997,430	1
402C	Public / Semi-Public	High	Low	Y	0.00	3.67	0.00	$609,810	1
402D	Public / Semi-Public	Moderate	Low	Y	0.00	0.00		$105,002	1
402E	Public / Semi-Public	Moderate	Low	N	0.00	0.00		$126,126	1
402F	Public / Semi-Public	Moderate	Low	N	0.00	1.76	0.00	$1,198,747	1
403	Public / Semi-Public	Moderate	Low	N	2.41	0.00	16.84	$4,188,643	1
405A	Public / Semi-Public	High	Low	N	0.00	0.00		$38,726	1
405B								$55,563	
406A	Public / Semi-Public	High	Low	Y	0.00	0.00		$200,346	1
406B								$341,648	
407A	Public / Semi-Public	High	Low	Y	0.00	0.00		$217,219	1
407B	Public / Semi-Public	Moderate	Low	N	0.00	0.00		$191,486	
407C								$474,966	
408 (Recommended)	Public / Semi-Public	Moderate	Medium	N	0.00	0.00		$82,219	1
408 (Alternative)	Mixed, Store and Office	Low	Medium	N	0.00	0.00		$10,463,936	2
408B	Mixed, Commercial & Medium Density Residential	Low	Medium	Y	0.00	0.00		$5,032,499	2
408-Vault	Mixed, Store and Office	Low	Medium	Y	0.00	0.00		$6,190,965	1
408D1	Medium Density Residential	Low	Medium	N	0.00	0.00		$3,875,693	2
409-A1	Public / Semi-Public	High	Low	N	0.00	0.00		$621,048	1
409-B1	Public / Semi-Public	High	Low	N	0.00	0.00		$398,642	1
409-A2	Public / Semi-Public	High	Low	N	0.00	0.00		$1,008,231	2
410	Public / Semi-Public	Moderate	Low	N	0.00	0.00		$220,079	1
411	Public / Semi-Public	High	Low	N	0.00	0.00		$29,142	1
412	Agricultural	High	Low	N	0.00	0.00		$741,015	1

DRAFT

Pond	Existing Land Use	**Threatened or Endangered Species Impacts	***Hazardous Materials & Contamination Potential	Major Utility Conflict Potential (Y/N)	Floodplain Impacts (ac-ft)	Wetland & Surface Water Impacts (ac)		Total Pond Cost*	Rankings
413	No Data Available	High	Low	N	0.00	0.00		$0.00*	1
414	No Data Available	Moderate	Low	N	0.00	0.00		$3,929	1
415	No Data Available	High	Low	N	0.00	0.00		$785,609	1
416	Parcels with no value	High	Low	N	0.00	0.00		$357,325	1
417	Parcels with no value	High	Medium	N	0.00	0.00		$650,058	1
418	No Data Available	High	Low	N	0.00	0.00		$43,316	1
A & FPC A	Public/Semi-Public	High	Low	N	5.99	0.00		$883,205	1
B	Parcels with no Value	High	Low	N	0.00	0.00		$301,323	2
B1	Parcels with no Value	High	Low	N	0.00	0.00		$292,865	1
C	Acreage not zoned for agriculture	High	Low	N	0.00	0.00		$1,092,464	1
D	No Data Available	High	Low	N	0.00	0.00		$0.00*	1
FPC 403	Commercial	High	Low	N	0.00	0.00	0.05	$1,652,932	1
FPC 407	Commercial	Low	Low	N	6.85	0.00	1.02	$446,265	1

*Since there are no proposed changes to this pond, the total pond cost is $0.
**Refer to the Endangered Species Biological Assessment (ESBA) for more detailed information.
***Refer to the Contamination Screening Evaluation Report (CSER) for more detailed information.

DRAFT

6.0 Conclusion

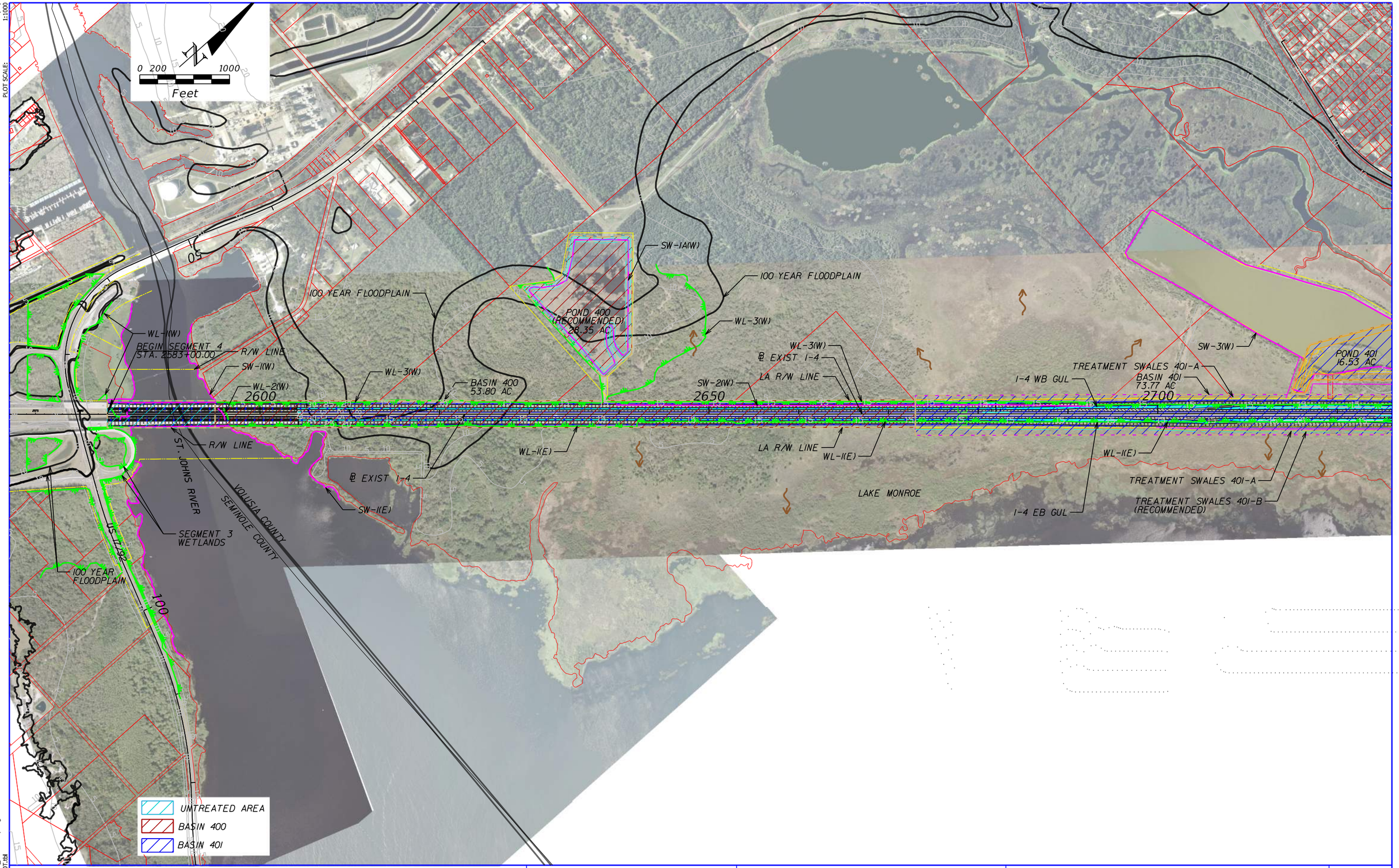
The Pond Alternative Matrices (Tables 5-7) show a summary of the engineering data and analysis, as well as, the impact and cost analysis. *The cost evaluation for the stormwater management facility alternatives in this report includes stormwater management facility construction costs, costs associated with wetland impacts, and parcel acquisition costs. The stormwater management facility construction costs include cost of installed drainage structures, drainage pipes and outfalls, clearing & grubbing, earthwork excavation and grading, berm construction, erosion protection, fencing, access accommodations, and sodding as well as the cost associated with mitigating for endangered species. The associated parcel acquisition costs for each alternative evaluated include the estimated cost of land and any impacted improvements, administrative costs and legal fees*. The recommended pond sites are shown in Tables 1 and 2.

DRAFT

APPENDIX A –

DRAINAGE MAPS

MODEL:
SHEET SIZE: drmprd420 16.5x10.6 (in.)
PLOT SCALE: 1:1000



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	432100-1-22-01

I-4 PD&E STUDY
OVERALL DRAINAGE MAP
SEGMENT 4

SHEET NO. A-1

Color_FDOTPDF.pltcfg
FDOT.tbl
PRINT DRIVER:
PEN TABLE:

lphillip 8/16/2016 2:02:09 PM \\Lkmw00\pmwork3\Jobs\59219 - I4 SAMR\TECHPROD\432100122O1\Segment 4\drainage\drmprd402.dgn

MODEL: drmprd421
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:1000

0 200 1000
Feet

100 YEAR FLOODPLAIN

POND 401
16.53 AC

PADGETT CREEK

SW-3A(W)
WL-3(W)

BASIN 401
73.77 AC

TREATMENT
SWALES 401-A

WL-3(W)

2750

TREATMENT
SWALES 401-A

TREATMENT
SWALES 401-B
(RECOMMENDED)

SW-3A(W)
SW-1A(E)
WL-1(E)

LAKE MONROE

SW-5(W)
SW-2(E)
WL-2(E)
SW-3(E)

100 YEAR FLOODPLAIN

POND 402A (RECOMMENDED)
6.84 AC

LA R/W LINE

SW-6(W)

DIRKSEN DR GUL RAMP
TO I-4 WB GUL

DIRKSEN DR

POND 402D (RECOMMENDED)
0.82 AC

WL-3B(W)

POND 402F (RECOMMENDED)
2.40 AC

LA R/W LINE

2800

WL-4(W)

℄ EXIST I-4

I-4 WB GUL

WL-3(E)

LA R/W LINE

POND 402E (RECOMMENDED)
0.64 AC

SW-4(E)

DIRKSEN DR GUL RAMP
TO I-4 EB GUL

POND 402B (RECOMMENDED)
3.72 AC

BASIN 402 (RECOMMENDED)
68.91 AC

POND 402C (RECOMMENDED)
2.09 AC

100

100 YEAR FLOODPLAIN

SW-8(W)

ENTERPRISE RD.

GASLINE
LAKE

2850

FPC 403 (RECOMMENDED)
1.32 AC

100 YEAR FLOODPLAIN

POND 403
(RECOMMENDED)
14.12 AC

WL-5(W)

SW-10(W)

SW-13(W)

SW-11(W)

WL-4(E)

SW-12(W)

SW-14(W)

SW-15(W)

SW-9(W)

ENTERPRISE RD.

I-4 EB GUL

100 YEAR FLOODPLAIN

BASIN 403
41.02 AC

BASIN 401

UNTREATED AREA

BASIN 402

BASIN 403

PRINT DRIVER: Cdot_FDOTPDF.pltcfg
PEN TABLE: FDOT.tbl

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	432100-1-22-01

I-4 PD&E STUDY
OVERALL DRAINAGE MAP
SEGMENT 4

SHEET NO. A-2

lphillip 8/16/2016 2:02:56 PM \\Lkmw00\pmwork3\Jobs\59219 - I4 SAMR\TECHPROD\43210012201\Segment 4\drainage\drmprd402.dgn

MODEL: drmprd422
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:1000

0 200 1000
Feet

BASIN A
13.29 AC
WL-6A(W)
POND A (RECOMMENDED)
6.56 AC
POND FPC A
PROPOSED R/W LINE
WL-6B(W)
100 YEAR FLOODPLAIN
SW-16(W)
SAXON BLVD
BASIN 405
13.17 AC
100 YEAR FLOODPLAIN
POND 405A (RECOMMENDED)
3.66 AC
SW-16(W)
POND 406A (RECOMMENDED)
4.91 AC
LAKE MALLARD
BASIN 406
25.06 AC
POND 405B (RECOMMENDED)
0.74 AC
GOOSE LAKE
POND 406B (RECOMMENDED)
2.93 AC
SAXON BLVD GUL RAMP TO I-4 WB GUL
EXIST 36" RCP
I-4 WB GUL RAMP TO SAXON BLVD WB GUL
BASIN 409
75.74 AC
LA R/W LINE
I-4 WB GUL
POND B
1.90 AC
BASIN B
9.23 AC
WL-6W)
POND 409-B1 (RECOMMENDED)
3.02 AC
PROPOSED LA R/W LINE
B EXIST I-4
PROPOSED LA R/W LINE
BASIN 410
24.52 AC
LA R/W LINE
2900
2950
3000
SW-15(W)
BASIN 403
41.02 AC
SW-6(E)
SW-5(E)
FPC 407
3.43 AC
(RECOMMENDED)
SW-7(E)
POND 407A
(RECOMMENDED)
4.50 AC
30' DRAINAGE EASEMENT
TROUT LAKE
BASIN 407_408
33.09 AC
POND 408
(RECOMMENDED)
2.35 AC
EXIST. 36" RCP
SAXON BLVD GUL RAMP TO I-4 EB GUL
POND 407C
1.67 AC
I-4 EB GUL RAMP TO SAXON BLVD WB GUL
TAYLORVILLE ST
POND 409-A2
8.17 AC
GALVESTON AVE
LA R/W LINE
I-4 EB GUL
EXIST 36" RCP
W. FIRWOOD DR.
POND B1(RECOMMENDED)
0.75 AC
DELTONA WATER TREATMENT
N. GLORIA DR
ANTOINETTE ST
ANNAPOLIS DR
FLAGLER ST
GERANIUM ST
PROPOSED LA R/W LINE
PROPOSED LA R/W LINE
POND 409-A1
(RECOMMENDED)
6.73 AC
POND 407B (RECOMMENDED)
0.70 AC
BASIN 408
(ALTERNATIVE)
39.35 AC
POND 408 (ALTERNATIVE)
4.39 AC
VAULT 408 (RECOMMENDED)
BASIN C
12.88 AC
POND C
(RECOMMENDED)
2.20 AC
100 YEAR FLOODPLAIN
POND 408B (ALTERNATIVE)
3.73 AC
BASIN 408B (ALTERNATIVE)
2.87 AC
POND 408D1(ALTERNATIVE)
3.22 AC
BASIN 408D1
5.50 AC
POND D
(RECOMMENDED)
6.34 AC
BASIN D
70.30 AC

BASIN 403
BASIN 405
BASIN 406
BASIN 407_408
BASIN 408B
BASIN 408 D1
BASIN 409
BASIN 410

BASIN A
BASIN B
BASIN C
BASIN D

Color_FDOTPDF.pltcfg
FDOT.tbl
PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

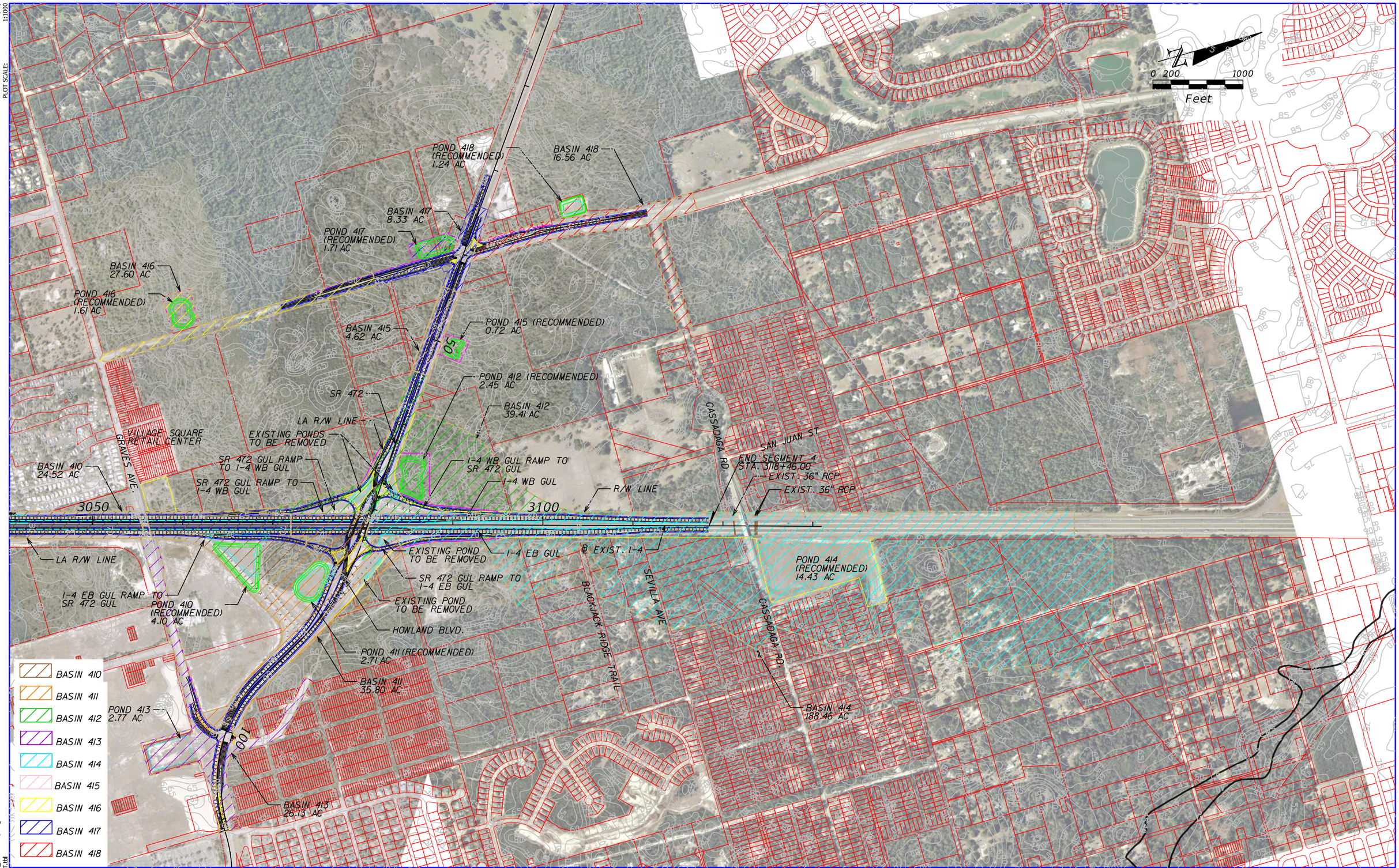
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	432100-1-22-01

I-4 PD&E STUDY
OVERALL DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-3

MODEL: drmprd423
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:1000



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FDOT.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	432100-1-22-01

I-4 PD&E STUDY
OVERALL DRAINAGE MAP
SEGMENT 4

SHEET NO. A-4

drmprd17
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2566+00.00

MATCHLINE STA. 2596+00.00

SEGMENT 3 WETLAND

100 YEAR FLOODPLAIN

100 YEAR FLOODPLAIN

SEGMENT 3 WETLAND

℄ EXIST I-4

US 17/92

LA R/W LINE

WL-I(W)

BEGIN SEGMENT 4
STA. 2583+00.00

WL-I(W)

PERPETUAL R/W EASEMENT

ST. JOHNS RIVER

VOLUSIA COUNTY
SEMINOLE COUNTY

0 50 200
Feet

SW-I(W)

WL-3(W)

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

SW-I(E)

BASIN 400
53.80 AC

SEGMENT 3 WETLAND

SEGMENT 3 WETLANDS

100 YEAR FLOODPLAIN

100 YEAR FLOODPLAIN

PERPETUAL R/W EASEMENT

SW-I(E)

UNTREATED AREA

BASIN 400

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

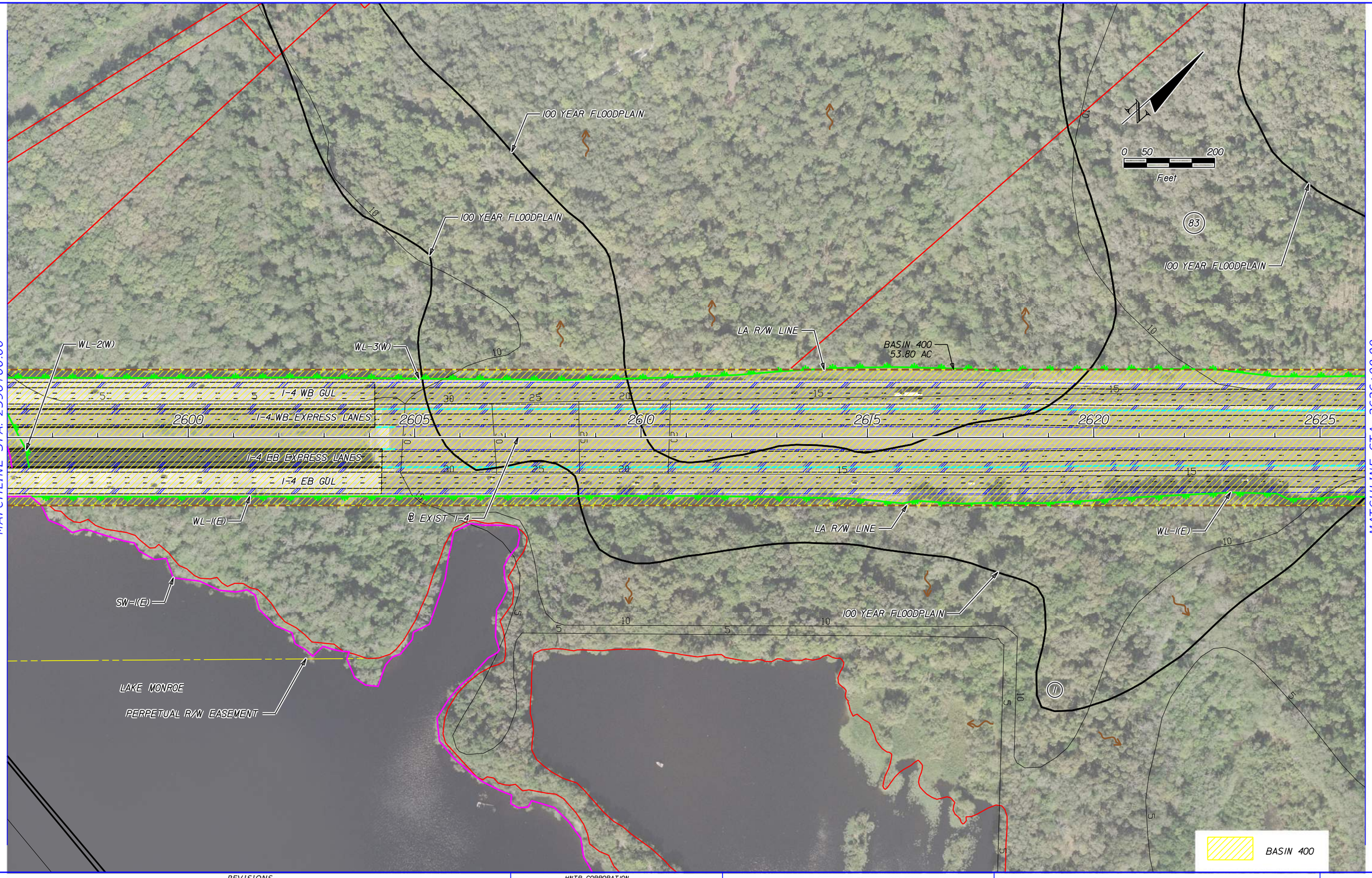
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	SEMINOLE VOLUSIA	432100-1-22-01

I-4 PD&E STUDY DRAINAGE MAP SEGMENT 4

SHEET NO. A-5

drmprd18
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:



MATCHLINE STA. 2596+00.00

MATCHLINE STA. 2626+00.00

Color_FDOTPDF.pltcfg
FDOT_text-qbow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-6

lphillip 8/16/2016 2:04:26 PM \\LKMw00\pmwork3\Jobs\59219 - I4 SAMR\TECHPROD\43210012201\Segment 4\drainage\drmprd401.dgn

drmprd19
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2626+00.00

MATCHLINE STA. 2656+00.00

100 YEAR FLOODPLAIN

POND 400
(RECOMMENDED)
28.35 AC

SW-1A(W)

WL-3(W)

100 YEAR FLOODPLAIN

83

84

85

WL-3(W)

WL-3(W)

BASIN 400
53.80 AC

LA R/W LINE

SW-2(W)

WL-3(W)

I-4 WB-GUL

I-4 WB EXPRESS LANES

2630 2635 2640 2645 2650 2655

I-4 EB EXPRESS LANES

I-4 EB-GUL

℄ EXIST I-4

LA R/W LINE

WL-1(E)

WL-1(E)

1

0 50 200
Feet

BASIN 400

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407)805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-7

drmprd20
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2656+00.00

293

85

0 50 200
Feet

SW-2(W)

BASIN 400
53.80 AC

BASIN 401
73.77 AC

WL-3(W)

LA R/W LINE

TREATMENT SWALES ALTERNATE 401-A

PROPOSED LA R/W LINE

PARCEL ID: 10-19-30-00-00-0010
AREA TAKEN: 98,758 SF

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

2660 2665 2670 2675 2680 2685

WL-1(E)

℄ EXIST I-4

LA R/W LINE

PARCEL ID: 02-19-30-00-00-0220
AREA TAKEN: 550,606 SF
(FDOT OWNED)

TREATMENT SWALES ALTERNATE 401-A

TREATMENT SWALES 401-B
(RECOMMENDED)

1

LAKE MONROE

BASIN 400

BASIN 401

MATCHLINE STA. 2686+00.00

Color_FDOTPDF.pltcfg
FDOT_text-qbkw.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-8

dmprd21
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

STA. 2686+00.00

MATCHLINE STA. 2686+00.00

STA. 2716+00.00

MATCHLINE STA. 2716+00.00

0 50 200
Feet

SW-3(W)

MITIGATION SITE FOR
I-4 SIX-LANING PROJECT

85

86

87

PARCEL ID: 02-19-30-00-00-0002
AREA TAKEN: 236,027 SF

PARCEL ID: 10-19-30-00-00-0010
AREA TAKEN: 98,758 SF

PARCEL ID: 11-19-30-00-00-0010
AREA TAKEN: 59,037 SF

PARCEL ID: 02-19-30-00-00-0002
AREA TAKEN: 152,326 SF

POND
401
16.53 AC

WL-3(W)

SW-2(W)

LA R/W LINE

BASIN 401
73.77 AC

PROPOSED LA R/W LINE

TREATMENT SWALES ALTERNATE 401-A

I-4 WB GUL

2690 2695 2700 2705 2710 2715

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

PARCEL ID: 02-19-30-00-00-0220
AREA TAKEN: 550,606 SF
(FDOT OWNED)

WL-1(E)

@ EXIST I-4

LA R/W LINE

TREATMENT SWALES
ALTERNATE 401-A

TREATMENT SWALES 401-B
(RECOMMENDED)

1

PARCEL ID: 02-19-30-00-00-0220
AREA TAKEN: 75,792 SF

LAKE MONROE

BASIN 401

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-9

drmprd22
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2716+00.00

MATCHLINE STA. 2746+00.00

POND 401
(ALTERNATE)
16.53 AC

SW-3(W)

PARCEL ID: 02-19-30-00-00-0002
AREA TAKEN: 152,326 SF

MITIGATION SITE FOR
I-4 SIX-LANING PROJECT

PARCEL ID: 02-19-30-00-00-0220
AREA TAKEN: 2,421 SF

LA R/W LINE

WL-3(W)

PROPOSED LA R/W LINE

TREATMENT SWALES ALTERNATE 401-A

PARCEL ID: 02-19-30-00-00-0002
AREA TAKEN: 152,326 SF

BASIN 401
73.77 AC

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

EXIST I-4

WL-1(E)

LA R/W LINE

PARCEL ID: 02-19-30-00-00-0220
AREA TAKEN: 75,792 SF

PARCEL ID: 02-19-30-00-00-0220
AREA TAKEN: 550,606 SF
(FDOT OWNED)

TREATMENT SWALES ALTERNATE 401-A

TREATMENT SWALES 401-B
(RECOMMENDED)

SW-3A(W)

PADGET CREEK

WL-3(W)

0 50 200
Feet

LAKE MONROE

BASIN 401

UNTREATED AREA

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-10

drmprd23
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2746+00.00

MATCHLINE STA. 2776+00.00

RIVER OAKS

100 YEAR FLOODPLAIN

PARCEL ID: 02-19-30-00-00-0260
AREA TAKEN: 86,041 SF

SW-3A(W)

BURGER KING

PROPOSED PARK AND RIDE

WL-3A(W)

WL-3(W)

PADGETT CREEK

LA R/W LINE

KANGAROO GAS STATION

HAMPTON INN

SW-6(W)

LA R/W LINE

DIRKSEN DR

IHOP

PARCEL ID: 34-18-30-52-00-0001
AREA TAKEN: 2,926 SF

END SHOULDER CONCRETE BARRIER WALL,
F SHAPED, WITH 14' NOISE WALL
STA. 2763+31.20

POND 402A
(RECOMMENDED)
6.84 AC

PARCEL ID: 34-18-30-52-00-0001
AREA TAKEN: 13,044 SF

BEGIN SHOULDER CONCRETE BARRIER WALL,
F SHAPED, WITH 14' NOISE WALL
STA. 2754+09.09

PARCELS 90-1 TO 90-18
AREA TAKEN: 1,584 SF

PARCEL ID: PADGETT CREEK
AREA TAKEN: 478 SF

PARCEL ID: 02-19-30-00-00-0002
AREA TAKEN: 10 SF

90-15 TO 90-18

90-13 TO 90-14

90-1 TO 90-12

RIVERSIDE

90-19

DIRKSEN DR RAMP
TO I-4 WB GUL

POND 402D
(RECOMMENDED)
0.82 AC

SW-5(W)

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

℄ EXIST I-4

WL-1(E)

LA R/W LINE

SW-1A(E)

100 YEAR FLOODPLAIN

LAKE MONROE

PARCEL ID: 20-19-30-01-00-0010
AREA TAKEN: 529 SF

PARCEL ID: 02-19-30-01-00-0020
AREA TAKEN: 1,248 SF

PARCEL ID: 02-19-30-01-00-0030
AREA TAKEN: 3,221 SF

PARCEL ID: 02-19-30-01-00-0040
AREA TAKEN: 4,411 SF

SPRING TO SPRING TRAIL
(CURRENTLY UNDER CONSTRUCTION)

WL-2(E)

I-4 EB GUL RAMP
TO DIRKSEN DRIVE

POND 402B
(RECOMMENDED)
3.72 AC

POND 402C
(RECOMMENDED)
2.09 AC

BASIN 402
68.91 AC

260 FT. DUKE
ENERGY EASEMENT

LA R/W LINE

SW-3(E)

(ALTERNATE 2 SHOWN)

0 50 200
Feet

UNTREATED AREA

BASIN 402

Cdot_FDOTPDF.pltcfg
FDOT_text-qkw.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-11

MODEL: drmprd24
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:200

MATCHLINE STA. 2776+00.00

MATCHLINE STA. 2806+00.00

WL-3B(W)
PARCEL ID: 02-19-30-00-00-0042
AREA TAKEN: 136,948 SF
POND 402D
0.82 AC
I-4 WB GUL RAMP TO
DIRKSEN DRIVE
POND 402F
(RECOMMENDED)
2.40 AC
GARDENIA AVE
ALEMANDER AVE
RIVIERA DR
COLOMBA RD
CARDINAL DR
BILL KELLER PARK
0 50 200
Feet
100 YEAR FLOODPLAIN
WL-4(W)
LA R/W LINE
PARCEL ID: 02-19-30-00-00-0042
AREA TAKEN: 1,979 SF
SW-6(W)
BASIN 402
68.91 AC
I-4 WB GUL
I-4 WB EXPRESS LANES
I-4 EB EXPRESS LANES
I-4 EB GUL
WL-3(E)
POND 402E
(RECOMMENDED)
0.64 AC
DIRKSEN RD RAMP
TO I-4 EB GUL
B EXIST I-4
LA R/W LINE
DELTONA BLVD
NATIONWIDE CENTER
DELTONA SQUARE
SW-4(E)
EAGLES LANDING
WL-2(E)
I-4 EB GUL RAMP
TO DIRKSEN DRIVE
POND 402B
3.72 AC
DELTONA BLVD
BEST WESTERN
CARIBBEAN ST
LANDMARK ST
HAZELCREST ST
LULLWATER ST
BASIN 402

Color: FDOTPDP.pltctg
FDOT_text-xglow.tbl
PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-12

drmprd25
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2806+00.00

MATCHLINE STA. 2836+00.00

100 YEAR FLOODPLAIN

LA R/W LINE

WL-4(W)

BASIN 402
68.91 AC

0 50 200
Feet

VOLUSIA RENTAL

UNCLE BOB'S SELF STORAGE

ENTERPRISE RD.

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

EXIST I-4

LA PETITE ACADEMY

DELTONA FOUNTAINS MEDICAL CLINIC

MUFFLER MAN

JUSTIN SQUARE

SUNTRUST

FIRST SOUTHERN BANK

W. EMBASSY DR

S. EMBASSY DR

DARTMOUTH ST

SUNOCO GAS STATION

HERITAGE GOLD & DIAMOND EXCHANGE

SPACE COAST CREDIT UNION

US POST OFFICE

DELTONA BLVD

BASIN 402

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407)805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-13

Color_FDOTPDF.pltcfg
FDOT_text-xglow.tbl

PRINT DRIVER:
PEN TABLE:

drmprd26
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2836+00.00

MATCHLINE STA. 2866+00.00

100 YEAR FLOODPLAIN

PARCEL ID: 25-18-30-00-00-0055
AREA TAKEN: 187,267 SF

FPC 403
(RECOMMENDED)
1.32 AC

SW-8(W)

GASLINE LAKE

PARCEL ID: 25-18-30-00-00-0052
AREA TAKEN: 69 SF

HUFFORD DR

BROKENSHIRE DR

DONALDSON DR

MERHAVEN DR

0 50 200
Feet

LA R/W LINE

SW-9(W)

SW-10(W)

SW-11(W)

I-4 WB GUL

I-4 WB EXPRESS LANES

BASIN 403
41.02 AC

POND 403
(RECOMMENDED)
14.12 AC

BASIN 402
68.91 AC

I-4 EB EXPRESS LANES

EXIST I-4

I-4 EB GUL

LA R/W LINE

W. EMBASSY DR

DARTMOUTH ST

QUAIL ROOST ST

EAGLES NEST AVE

ARAB ST

ABBEYVILLE ST

BUCCANEER AVE

BASIN 402

BASIN 403

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-14

drmprd27
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2866+00.00

MATCHLINE STA. 2896+00.00

BERNASEK DR
HAYMAN CT
DOLPHIN COVE CT
MOSS POINT COVE CT
LANYARD LN
100 YEAR FLOODPLAIN
LAKE EMERALD
0 50 200
Feet
PARCEL ID: 23-18-30-05-00-0140
AREA TAKEN: 26 SF
PARCEL ID: EMERALD AVENUE
AREA TAKEN: 4,584 SF
PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 345 SF
PARCEL ID: 23-18-30-01-14-0017
AREA TAKEN: 1,215 SF
FLORIDA AVE
WL-5(W)
SW-10(W)
SW-13(W)
LA R/W LINE
I-4 WB GUL
I-4 WB EXPRESS LANES
SW-14(W)
EMERALD AVE
SW-15(W)
SW-16(W)
SW-11(W)
BASIN 403
41.02 AC
POND 403
(RECOMMENDED)
14.12 AC
SW-12(W)
℄ EXIST I-4
BASIN 405
13.17 AC
I-4 EB EXPRESS LANES
I-4 EB GUL
WL-4(E)
KETTERING RD
TIE-IN TO EXISTING NOISE WALL
BEGIN 16' CONCRETE NOISE WALL
STA. 2877+73.64
LA R/W LINE
BASIN 407_408
33.09 AC
END 16' CONCRETE NOISE WALL
STA. 2890+39.11
COUNTY R/W LINE
W. EVANS CIR
ASHBOURNE WAY
HAVERSHAM RD
SW-5(E)
BUCCANEER AVE
KETTERING RD
TROUT LAKE
100 YEAR FLOODPLAIN
BASIN 403
BASIN 405
BASIN 407_408

Color_FDOTPDF.pltcfg
FDOT_text-cglow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-15

drmprd28
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2896+00.00

MATCHLINE STA. 2926+00.00

GOOSE LAKE

HOLIDAY INN EXPRESS

189

100 YEAR FLOODPLAIN

BASIN 405
13.17 AC

POND 405A
(RECOMMENDED)
3.66 AC

POND 405B
(RECOMMENDED)
0.74 AC

LA R/W LINE

PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 345 SF

PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 21 SF

SW-16(W)

283

319

SAXON BLVD RAMP
TO I-4 WB GUL

EXIST. 36" RCP

I-4 WB GUL RAMP
TO SAXON BLVD EB

SAXON BLVD

145 FT. FPL EASEMENT

BASIN 406
25.06 AC

R/W LINE

POND 406A
(RECOMMENDED)
4.91 AC

LA R/W LINE

14

SAXON BLVD WB RAMP
TO I-4 WB GUL

POND 406B
(RECOMMENDED)
2.93 AC

I-4 WB GUL RAMP
TO WB SAXON BLVD

0 50 200
Feet

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

2900 2905 2910 2915 2920 2925

EXIST I-4

SW-6(E)

285

BASIN 407-408
33.09 AC

COUNTY R/W LINE

SW-7(E)

FPC 407
(RECOMMENDED)
3.43 AC

SW-5(E)

30 FT. DRAINAGE EASEMENT

100 YEAR FLOODPLAIN

I-4 EB GUL RAMP
TO SAXON BLVD EB

I-4 EB GUL RAMP
TO SAXON BLVD WB

POND 407C
(RECOMMENDED)
1.67 AC

POND 407A
(REGOMMENDED)
4.50 AC

POND 407B
(RECOMMENDED)
0.70 AC

410

LA R/W LINE

SAXON BLVD RAMP
TO I-4 EB GUL

TROUT LAKE

BASIN 405

BASIN 406

BASIN 407-408

BASIN 407-408
33.09 AC

PARCEL ID: 23-18-30-01-20-0010
AREA TAKEN: 181,894 SF

PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 79,454 SF

LA R/W LINE

POND 408
(RECOMMENDED)
2.35 AC

(ALTERNATE 5 SHOWN)

Color_FDOTPDF.ctb
FDOT_text-sjkw.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-16

drmprd29
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

STA. 2926+00.00

MATCHLINE STA.

STA. 2956+00.00

MATCHLINE STA.

LAKE MALLARD

100 YEAR FLOODPLAIN

0 50 200
Feet

I-4 WB GUL RAMP TO SAXON BLVD

BASIN 409
75.74 AC

BASIN 406
25.06 AC

LA R/W LINE

EXIST. 36" RCP

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

@ EXIST I-4

LA R/W LINE

SAXON BLVD RAMP TO I-4 EB GUL

BASIN 407-408
33.09 AC

POND 407C
1.67 AC

W. PARKTON DR

E. PARKTON DR

N. PARKTON DR

SULLIVAN ST

ROCKFORD ST

PALMTREE DR

JEFFERS ST

TAYLORVILLE ST

GALVESTON AVE

PARCEL ID: 13-18-30-03-09-0190
AREA TAKEN: 8,653 SF

PARCEL ID: 13-18-30-03-19-0210
AREA TAKEN: 10,089 SF

PARCEL ID: UNKNOWN (CITY OF DELTONA)
AREA TAKEN: 15,780 SF

PARCEL ID: 13-18-30-03-19-0190
AREA TAKEN: 4,541 SF

PARCEL ID: 13-18-30-03-19-0010
AREA TAKEN: 44,966 SF

PARCEL ID: UNKNOWN (CITY OF DELTONA)
AREA TAKEN: 30,328 SF

POND 409-A1
(RECOMMENDED)
6.73 AC

POND 409-A2
(ALTERNATE)
8.17 AC

BASIN 406

BASIN 407_408

BASIN 409

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-17

drmprd30
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2956+00.00

MATCHLINE STA. 2986+00.00

0 50 200
Feet

BASIN 409
75.74 AC

LA R/W LINE

PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 337 SF

PARCEL ID: 13-18-30-01-00-0630
AREA TAKEN: 254 SF

PARCEL ID: 13-18-30-01-00-0002
AREA TAKEN: 62 SF

PARCEL ID: 13-18-30-01-00-0950
AREA TAKEN: 5 SF

WL-6(W)

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

B EXIST I-4

LA R/W LINE

COUNTY R/W LINE

PARCEL ID: 13-18-30-03-17-0210
AREA TAKEN: 2,340 SF

POND 409-A1
(RECOMMENDED)
6.73 AC

GALVESTON AVE

ANTELOPE DR

ANTOINETTE ST

N. GLORIA DR

GIFFORD CT

S. ANNAPOLIS DR

W. FIRWOOD DR

FLAGLER ST

GERANIUM ST

E. ANNAPOLIS DR

BASIN 409

BASIN C

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-18

drmprd31
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 2986+00.00

MATCHLINE STA. 3016+00.00

PARCEL ID: 13-18-30-02-25-0010
AREA TAKEN: 34,997 SF

PARCEL ID: UNKNOWN (VOLUSIA CO.)
AREA TAKEN: 9,515 SF

PARCEL ID: UNKNOWN (VOLUSIA CO.)
AREA TAKEN: 9,29| SF

BASIN B
9.23 AC

PARCEL ID: 13-18-30-00-00-0010
AREA TAKEN: 107,975 SF

PROPOSED LA R/W LINE

PROPOSED LA R/W LINE

POND B
(ALTERNATE)
1.90 AC

RHODE ISLAND

PARCEL ID: 07-18-31-05-09-0030
AREA TAKEN: 671 SF

PARCEL ID: VOLUSIA COUNTY
AREA TAKEN: 262 SF

PARCEL ID: 07-18-31-05-08-0040
AREA TAKEN: 535 SF

PARCEL ID: 07-18-31-05-07-0040
AREA TAKEN: 306 SF

PARCEL ID: VOLUSIA COUNTY
AREA TAKEN: 262 SF

PARCEL ID: 07-18-31-05-06-0050
AREA TAKEN: 3 SF

PARCEL ID: 13-18-30-00-00-0010
AREA TAKEN: 10,369 SF

PARCEL ID: 18-18-31-00-00-0060
AREA TAKEN: 21,595 SF

WL-6(W)

PARCEL ID: 13-18-30-00-00-0010
AREA TAKEN: 402 SF

PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 4,089 SF

POND 409-B1
(RECOMMENDED)
3.02 AC

POND B1
(RECOMMENDED)
1.75 AC

PARCEL ID: UNKOWN (VOLUSIA COUNTY)
AREA TAKEN: 117 SF

I-4 WB GUL

PARCEL ID: 18-18-31-00-00-0060
AREA TAKEN: 3,033 SF

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

EXIST. 36" RCP

COUNTY R/W LINE

PARCEL ID: UNKNOWN (VOLUSIA COUNTY)
AREA TAKEN: 4,2|| SF

50 FT. FPL EASEMENT

I-4 EB EXPRESS LANES RAMP
TO RHODE ISLAND AVE

RHODE ISLAND AVE RAMP
TO I-4 WB EXPRESS LANES

℄ EXIST I-4

PROPOSED LA R/W LINE

PARCEL ID: 18-18-31-00-00-0033
AREA TAKEN: 298,315 SF

DELTONA WATER TREATMENT

BASIN C
12.88 AC

POND C
(RECOMMENDED)
2.20 AC

PARCEL ID: 18-18-31-00-00-0033
AREA TAKEN: 145,206 SF

NORMANDY BLVD
PARK AND RIDE

COUNTY R/W LINE

LA R/W LINE

PARCEL ID: UNKNOWN (VOLUSIA COUNTY)
AREA TAKEN: 7,558 SF

PROPOSED LA R/W LINE

RHODE ISLAND

ABBOTTWOODS LN

HOLLOWRIDGE DR

S. KENTUCKY AVE

0 50 200
Feet

BASIN 409
75.74 AC

LA R/W LINE

BASIN 409

BASIN B

BASIN C

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-19

Color_FDOTPDF.pltcfg
FDOT_text-qbow.tbl

PRINT DRIVER:
PEN TABLE:

drmprd32
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 3016+00.00

MATCHLINE STA. 3046+00.00

S. KENTUCKY AVE
PINEVIEW DR
EDGEMAR CT
SANDLEWOOD LN
WINDERMERE LN
WEDGEWOOD DR
ALMOND VILLAGE ST
REDWOOD VILLAGE ST
ASH VILLAGE ST
MOSS VILLAGE ST
PALM VILLAGE ST
MAPLE AVE
CROSSRIDGE RD
INVERNESS LN
GREENHEDGE DR
HARCOURT TER
COUNTRYSIDE DR

0 50 200
Feet

BASIN 409
75.74 AC

BASIN 410
24.52 AC

LA R/W LINE

I-4 WB GUL
I-4 WB EXPRESS LANES
I-4 EB EXPRESS LANES
I-4 EB GUL

3020 3025 3030 3035 3040 3045

@ EXIST I-4

COUNTY R/W LINE

LA R/W LINE

242 245 246 247

BASIN 409
BASIN 410

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-20

drmprd33
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

MATCHLINE STA. 3046+00.00

MATCHLINE STA. 3076+00.00

MAPLE AVE
COUNTRYSIDE DR
INVERNESS LN
COUNTRYSIDE DR
RICH AVE
VILLAGE SQUARE RETAIL CENTER
GRAVES AVE.
245
248
249
250
251
253
254
264
COUNTY R/W LINE
LA R/W LINE
COUNTY R/W LINE
LA R/W LINE
COUNTY R/W LINE
PARCEL ID: 06-18-31-04-00-0510
AREA TAKEN: 1,432 SF
PARCEL ID: 06-18-31-04-00-0590
AREA TAKEN: 8,905 SF
PARCEL ID: 06-18-31-04-00-0600
AREA TAKEN: 1,277 SF
BASIN 410
24.52 AC
SR 472 RAMP TO
I-4 WB GUL
BASIN 412
39.41 AC
I-4 WB GUL
3050
I-4 WB EXPRESS LANES
3055
3060
3065
3070
3075
I-4 EB EXPRESS LANES
I-4 EB GUL
B EXIST I-4
I-4 EB GUL RAMP TO
SR 472 GUL
POND 410
(RECOMMENDED)
4.10 AC
BASIN 411
35.80 AC
POND 411
(RECOMMENDED)
2.71 AC
247
252
BASIN 413
26.13 AC
BASIN 410
BASIN 411
BASIN 412
BASIN 413
0 50 200
Feet

Color_FDOTPDF.pltcfg
FDOT_text-glow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-21

drmprd34
16.5x10.6 (in.)
1:200

MODEL:
SHEET SIZE:
PLOT SCALE:

PARCEL ID: 06-18-31-00-00-0132
AREA TAKEN: 10,014 SF

PARCEL ID: VOLUSIA COUNTY
AREA TAKEN: 2,329 SF

PARCEL ID: 06-18-31-04-00-0430
AREA TAKEN: 4,868 SF

LA R/W LINE

EXISTING POND
TO BE REMOVED

SR 472 RAMP TO
I-4 WB GUL

SR 472

POND 412
(RECOMMENDED)
2.45 AC

PARCEL ID: 06-18-31-00-00-0130
AREA TAKEN: 182,982 SF

BASIN 412
39.41 AC

EXISTING POND TO BE REMOVED

PARCEL ID: 06-18-31-00-00-0130
AREA TAKEN: 39,998 SF

I-4 WB GUL RAMP
TO SR 472

I-4 WB GUL

I-4 WB EXPRESS LANES

I-4 EB EXPRESS LANES

I-4 EB GUL

BASIN 411
35.80 AC

POND 411
2.71 AC

HOWLAND BLVD

LA R/W LINE

PARCEL ID: 06-18-31-04-00-0180
AREA TAKEN: 754 SF

EXISTING POND TO BE REMOVED

SR 472 RAMP TO
I-4 EB GUL

EXISTING POND TO BE REMOVED

PARCEL ID: 06-18-31-00-00-0150
AREA TAKEN: 37,195 SF

E EXIST I-4

LA R/W LINE

BASIN 414
188.46 AC

BLACKJACK RIDGE TRAIL

LA R/W LINE

0 50 200
Feet

BASIN 411
BASIN 412
BASIN 414

(ALTERNATE 5 SHOWN)

MATCHLINE STA. 3076+00.00

MATCHLINE STA. 3106+00.00

Color_FDOTPDF.pltcfg
FDOT_text-qlow.tbl

PRINT DRIVER:
PEN TABLE:

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO.
A-22

MODEL: drmprd35
SHEET SIZE: 16.5x10.6 (in.)
PLOT SCALE: 1:200

STA. 3106+00.00

MATCHLINE STA. 3106+00.00

SAN JUAN ST

CASSADAGA RD.

SEVILLA AVE

0 50 200
Feet

END SEGMENT 4
STA. 318+46.00

LA R/W LINE

I-4 WB GUL

I-4 EB GUL

℄ EXIST I-4

LA R/W LINE

EXIST. 36" RCP

EXIST. 36" RCP

BASIN 414
188.46 AC

POND 414
14.43 AC

BASIN 414

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

HNTB CORPORATION
610 CRESCENT EXECUTIVE CT
SUITE 400
LAKE MARY, FL 32746
(407) 805-0355
CERT. OF AUTH. NO. 6500

ENGINEER OF RECORD: SANAM RAI, P.E.
FL. REGISTRATION NO. 69089

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	Volusia	432100-1-22-01

I-4 PD&E STUDY
DRAINAGE MAP
SEGMENT 4

SHEET NO. A-23

PRINT DRIVER: Color_FDOTPDF.pltcfg
PEN TABLE: FDOT_text-qlow.tbl

lphillip 8/16/2016 2:06:33 PM \\LKMw00\pmwork3\Jobs\59219 - I4 SAMR\TECHPROD\432100122O1\Segment 4\drainage\drmprd401.dgn

APPENDIX B –

BASIN CALCULATIONS

I-4 PD and E

Segment 4

20 March 2014

INPUT	OUTPUT
State Plane, NAD83 0901 - Florida East, U.S. Feet Vertical - NGVD29 (Vertcon94), U.S. Feet	State Plane, NAD83 0901 - Florida East, U.S. Feet Vertical - NAVD88, U.S. Feet

1 1/1

Northing/Y:	1649812.086835	**Northing/Y:**	1649812.087
Easting/X:	565204.510154	**Easting/X:**	565204.510
Elevation/Z:	0	**Elevation/Z:**	-1.050
Convergence:	-0 08 14.03134	**Convergence:**	-0 08 14.03134
Scale Factor:	0.999950659	**Scale Factor:**	0.999950659
Combined Factor:	0.999955029	**Combined Factor:**	0.999955079

Grid Shift (U.S. ft.): X/Easting = 0.0, Y/Northing = 0.0

Remark:

HNTB Corporation
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Lake Mary, FL 32746

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400
POND NAME: 400 (Pond RR3 in Permit No. 64105-3)

STATION LIMITS: From: 2595+00
To: 2673+00

Roadway Length: 7800 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 9.07 ac*
Pervious Roadway Area: 44.73 ac
Total Roadway Area: 53.80 ac

Pond Area:

Pervious Pond Area: 28.35 ac
Water Surface Area: 0.00 ac
Total Pond Area: 28.35 ac

* Existing Impervious Area from permit.

Total Area:

Impervious Area: 9.07 ac
Pervious Area: 73.08 ac
Water Surface Area: 0.00 ac
Total Area: 82.15 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.07 ac	888.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	7.16 ac	350.7
Open Land (Grass cover 50% - 75%)	A/D,B/D,C/D	84	65.92 ac	5537.4
		Total:	82.15 ac	6777.0

CN = Total CN * Area / Total Area = **82.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.12 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.40 in**

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Lake Mary, FL 32746

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400
POND NAME: 400 (Pond RR3 in Permit No. 64105-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 0.96 ac
(ramps, turn lanes, etc.)

Pervious Roadway Area: 14.88 ac
Total Roadway Area: 53.80 ac

Pond Area:

Pervious Pond Area: 4.55 ac
Water Surface Area: 23.80 ac
Total Pond Area: 28.35 ac

Total Area:

Impervious Area: 38.92 ac
Pervious Area: 19.43 ac
Water Surface Area: 23.80 ac
Total Area: 82.15 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	38.92 ac	3814.3
Water Area	---	100	23.80 ac	2380.0
Open Land (Grass cover 50% - 75%)	A	49	1.17 ac	57.1
Open Land (Grass cover 50% - 75%)	A/D, B/D & C/D	84	12.04 ac	1011.8
Gravel (Rail Corridor)	A	76	1.17 ac	88.6
Gravel (Rail Corridor)	A/D, B/D & C/D	91	5.05 ac	459.6
		Total:	82.15 ac	7811.4

CN = Total CN * Area / Total Area = **95.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.52 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.91 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400
POND NAME: 400 (Pond RR3 in Permit No. 64105-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SJRWMD

Required Treatment Volume:

2.5" over Impervious Area = 8.11 ac-ft
1" over Total Area = 6.85 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 8.11 ac-ft

Additional 50% Treatment: 4.05 ac-ft (for compensating treatment)

Total Provided Treatment: 12.16 ac-ft

Required Attenuation Volume:

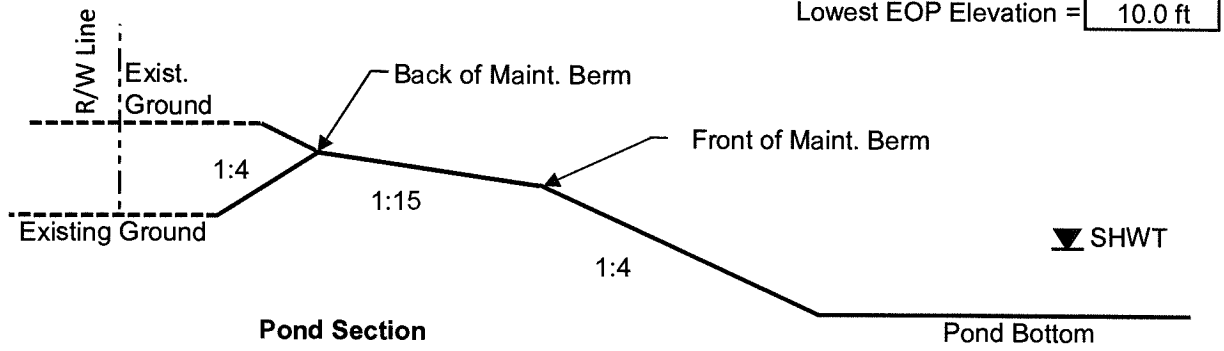
Total Runoff: Q_{pre} = 6.40 in
Q_{post} = 7.91 in
ΔQ = 1.51 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 10.37 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 10.0 ft
Initial Water Elevation = 5.5 ft
Lowest EOP Elevation = 10.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
10.00	Back of Maintenance Berm	28.35 ac			114.14 ac-ft
9.00	Front of Maintenance Berm	25.92 ac			87.01 ac-ft
5.85	---	24.01 ac			8.37 ac-ft
5.50	Initial Water Elevation	23.80 ac			0.00 ac-ft
-2.00	Pond Bottom	12.59 ac			

Required Treatment Volume: 12.16 ac-ft
Required Treat. Vol. + Atten.: 22.53 ac-ft

Top El. Of Treatment Volume: 6.00
Top El. Of Treat. Vol. + Atten.: 6.42

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

STATION LIMITS: From: 2673+00
To: 2745+00

Roadway Length: 7200 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 13.88 ac
Pervious Roadway Area: 35.70 ac
Total Roadway Area: 49.59 ac

Total Area:

Impervious Area: 13.88 ac
Pervious Area: 35.70 ac
Water Surface Area: 0.00 ac
Total Area: 49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	13.88 ac	1360.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	35.70 ac	2999.0
		Total:	49.59 ac	4359.7

CN = Total CN * Area / Total Area = **87.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.37 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.05 in**

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.78 ac
Impervious Roadway Area:	35.82 ac
Pervious Roadway Area:	13.77 ac
Total Roadway Area:	49.59 ac

Total Area:

Impervious Area:	35.82 ac
Pervious Area:	13.77 ac
Water Surface Area:	0.00 ac
Total Area:	49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	35.82 ac	3510.5
Water Area	---	100	0.00 ac	0.0
Gravel (Rail Corridor)	C/D, B/D	91	6.75 ac	613.8
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	7.02 ac	589.7
		Total:	49.59 ac	4714.0

CN = Total CN * Area / Total Area = **95.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.52 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.91 in**

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

POND SIZING : DRY TREATMENT SWALES (OPEN BASIN) - SJRWMD

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 5.80 ac-ft
1" over Total Area = 4.13 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 5.80 ac-ft

Additional 50% Treatment: 2.90 ac-ft (for compensating treatment)

Total Provided Treatment: 8.70 ac-ft

Swale Bottom Sizing:

Treatment Swale Limits: Sta. 2673+20 to Sta. 2745+00

LT side:	
Pond Length:	7180 ft
Front Side Slope:	6
Back Side Slope:	4
Pond Storage Depth:	2.5 ft
Pond Bottom Width:	5 ft

RT side:	
Pond Length:	7180 ft
Front Side Slope:	6
Back Side Slope:	4
Pond Storage Depth:	2.5 ft
Pond Bottom Width:	5 ft

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

LT SIDE

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	4.94 ac	7180 ft	30 ft	7.21 ac-ft
7.00	---	4.12 ac	7180 ft	25 ft	4.94 ac-ft
6.00	---	2.47 ac	7180 ft	15 ft	1.65 ac-ft
5.00	Swale Bottom	0.82 ac	7180 ft	5 ft	0.00 ac-ft

RT SIDE

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	4.94 ac	7180 ft	30 ft	7.21 ac-ft
7.00	---	4.12 ac	7180 ft	25 ft	4.94 ac-ft
6.00	---	2.47 ac	7180 ft	15 ft	1.65 ac-ft
5.00	Swale Bottom	0.82 ac	7180 ft	5 ft	0.00 ac-ft

LT + RT SIDE

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	9.89 ac			14.42 ac-ft
7.00	---	8.24 ac			9.89 ac-ft
6.00	---	4.94 ac			3.30 ac-ft
5.00	Swale Bottom	1.65 ac			0.00 ac-ft

Required Treatment Volume: 8.70 ac-ft

Top El. Of Treatment Volume: 6.82

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-B

STATION LIMITS: From: 2673+00
To: 2745+00

Roadway Length: 7200 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 13.88 ac
Pervious Roadway Area: 35.70 ac
Total Roadway Area: 49.59 ac

Total Area:

Impervious Area: 13.88 ac
Pervious Area: 35.70 ac
Water Surface Area: 0.00 ac
Total Area: 49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	13.88 ac	1360.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	35.70 ac	2999.0
		Total:	49.59 ac	4359.7

CN = Total CN * Area / Total Area = **87.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.37 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.05 in**

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-B

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
		Total Impervious Width:	212 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.78 ac
Impervious Roadway Area:	35.82 ac
Pervious Roadway Area:	13.77 ac
Total Roadway Area:	49.59 ac

Total Area:

Impervious Area:	35.82 ac
Pervious Area:	13.77 ac
Water Surface Area:	0.00 ac
Total Area:	49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	35.82 ac	3510.5
Water Area	---	100	0.00 ac	0.0
Gravel (Rail Corridor)	C/D, B/D	91	6.75 ac	613.8
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	7.02 ac	589.7
		Total:	49.59 ac	4714.0

CN = Total CN * Area / Total Area = **95.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.52 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.91 in**

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-B

POND SIZING : DRY TREATMENT SWALES (OPEN BASIN) - SJRWMD

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 5.80 ac-ft
1" over Total Area = 4.13 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 5.80 ac-ft

Additional 50% Treatment: **2.90 ac-ft** (for compensating treatment)

Total Provided Treatment: **8.70 ac-ft**

Swale Bottom Sizing:

Treatment Swale Limits: Sta. 2673+20 to Sta. 2745+00

RT side:

Pond Length:	7180 ft
Front Side Slope:	6
Back Side Slope:	4
Pond Storage Depth:	2.5 ft
Pond Bottom Width:	20 ft

RT SIDE ONLY

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	7.42 ac	7180 ft	45 ft	13.39 ac-ft
7.00	---	6.59 ac	7180 ft	40 ft	9.89 ac-ft
6.00	---	4.94 ac	7180 ft	30 ft	4.12 ac-ft
5.00	Swale Bottom	3.30 ac	7180 ft	20 ft	0.00 ac-ft

Required Treatment Volume: 8.70 ac-ft

Top El. Of Treatment Volume: 6.79

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: 401

STATION LIMITS: From: 2673+00
To: 2745+00

Roadway Length: 7200 ft
R/W Width: 446 ft VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 13.88 ac
Pervious Roadway Area: 59.88 ac
Total Roadway Area: 73.77 ac

Pond Area:

Pervious Pond Area: 16.53 ac
Water Surface Area: 0.00 ac
Total Pond Area: 16.53 ac

Total Area:

Impervious Area: 13.88 ac
Pervious Area: 76.41 ac
Water Surface Area: 0.00 ac
Total Area: 90.30 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	13.88 ac	1360.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	76.41 ac	6418.8
		Total:	90.30 ac	7779.5

CN = Total CN * Area / Total Area = **86.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.61 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.84 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: 401

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 4.71 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 39.75 ac
Pervious Roadway Area: 34.02 ac
Total Roadway Area: 73.77 ac

Pond Area:

Pervious Pond Area: 2.82 ac
Water Surface Area: 13.71 ac
Total Pond Area: 16.53 ac

Total Area:

Impervious Area: 39.75 ac
Pervious Area: 36.84 ac
Water Surface Area: 13.71 ac
Total Area: 90.30 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	39.75 ac	3895.6
Water Area	---	100	13.71 ac	1371.0
Gravel (Rail Corridor)	C/D, B/D	91	18.05 ac	1642.6
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	22.47 ac	1887.5
		Total:	93.98 ac	8796.7

CN = Total CN * Area / Total Area = **93.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.68 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.73 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: 401

POND SIZING : WET DETENTION POND (OPEN BASIN) - SJRWMD

Required Treatment Volume:

2.5" over Impervious Area = 8.28 ac-ft
1" over Total Area = 7.52 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 8.28 ac-ft

Additional 50% Treatment: 4.14 ac-ft (for compensating treatment)

Total Provided Treatment: 12.42 ac-ft

Required Attenuation Volume:

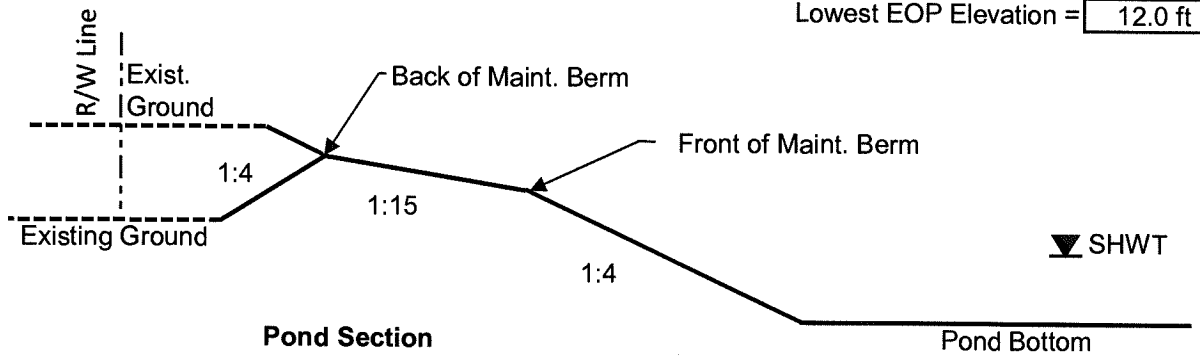
Total Runoff: Q_{pre} = 6.84 in
Q_{post} = 7.73 in
ΔQ = 0.90 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 6.74 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 30.0 ft @ 1:4

Existing Ground Elevation = 15.0 ft
Initial Water Elevation = 5.5 ft
Lowest EOP Elevation = 12.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
10.00	Back of Maintenance Berm	16.53 ac			67.02 ac-ft
9.00	Front of Maintenance Berm	15.23 ac			51.14 ac-ft
6.00	---	14.21 ac			6.98 ac-ft
5.50	Initial Water Elevation	13.71 ac			0.00 ac-ft
-5.00	Pond Bottom	10.36 ac			

Required Treatment Volume: 8.28 ac-ft
Required Treat. Vol. + Atten.: 19.16 ac-ft

Top El. Of Treatment Volume: 6.09
Top El. Of Treat. Vol. + Atten.: 6.83

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

		date:
made by:	LDP	7-Dec-15
checked by:	BJS	7-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400 & 401

PROPOSED CONDITION - UNTREATED AREA

Station Limits: From: 2583+00 To: 2595+00 Roadway Length: 1200 ft R/W Width: 250 ft

Impervious Roadway Area: 5.84 ac
Pervious Roadway Area: 1.06 ac
Total Roadway Area: 6.90 ac

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Station Limits: From: 2745+00 To: 2765+00 Roadway Length: 2000 ft R/W Width: 250 ft

Additional Impervious (Ramps, etc.) 0.79 ac
Impervious Roadway Area: 10.52 ac
Pervious Roadway Area: 0.97 ac
Total Roadway Area: 11.49 ac

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	6 ft	0	0 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Station Limits: From: 43+50 To: 72+22 and From: 85+00 To: 90+50

Roadway Area: Dirksen Drive
Proposed impervious: 2.29 ac (This difference from the pre/post)
(Park and Ride and Widening)

Station Limits: Dirksen Drive to 250 Ft along Deltona Boulevard

Roadway Area: Deltona Boulevard
Proposed impervious: 0.06 ac (This difference from the pre/post)
(Additional turn lane)

Total Area:
Impervious Roadway Area: 18.72 ac
Pervious Roadway Area: 2.02 ac
Total Roadway Area: 20.74 ac

Pond 400 and Treatment Swales 401 provide 95% pollutant removal and the minimum required is 80%.

Pond 400 Area = 82.15 ac
Treatment Swale 401 Area = 49.59 ac
Total Area = 131.74 ac

Overall Efficiency = $\frac{(131.74 * 95) + (20.74 * 0)}{(131.74+20.74)}$ = **82.1 %**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

STATION LIMITS: From: 2765+00 To: 2845+00
Roadway Length: 8000 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond and treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious (ramps, turn lanes, etc.): 5.54 ac

Impervious Roadway Area: 20.97 ac
Pervious Roadway Area: 47.94 ac
Total Roadway Area: 68.91 ac

Pond Area:

Pervious Pond Area: 16.51 ac
Water Surface Area: 0.00 ac
Total Pond Area: 16.51 ac

Total Area:

Impervious Area: 20.97 ac
Pervious Area: 64.45 ac
Water Surface Area: 0.00 ac
Total Area: 85.42 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	20.97 ac	2054.8
Water Area	---	100	0.00 ac	0.0
Wood or Forest Land	A	45	14.57 ac	655.5
Open Land (Grass cover 75% or more)	A/D & B/D	80	2.40 ac	192.0
Open Land (Grass cover 50% - 75%)	A	49	47.49 ac	2326.8
		Total:	85.42 ac	5229.1

CN = Total CN * Area / Total Area = **61.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.34 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **3.86 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 6.58 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 45.51 ac
Pervious Roadway Area: 23.40 ac
Total Roadway Area: 68.91 ac

Pond Area:

Pervious Pond Area: 7.09 ac
Water Surface Area: 9.42 ac
Total Pond Area: 16.51 ac

Total Area:

Impervious Area: 45.51 ac
Pervious Area: 30.49 ac
Water Surface Area: 9.42 ac
Total Area: 85.42 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	45.51 ac	4460.5
Water Area	---	100	9.42 ac	942.0
Gravel (Rail Corridor)	A	76	6.61 ac	502.5
Open Land (Grass cover 75% or greater)	A/D & B/D	80	1.01 ac	80.5
Open Land (Grass cover 50% - 75%)	A	49	22.87 ac	1120.5
		Total:	85.42 ac	7105.9

CN = Total CN * Area / Total Area = **83.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.02 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.48 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SJRWMD

Required Treatment Volume:

2.5" over Impervious Area = 9.48 ac-ft
1" over Total Area = 7.12 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 9.48 ac-ft

Required Attenuation Volume:

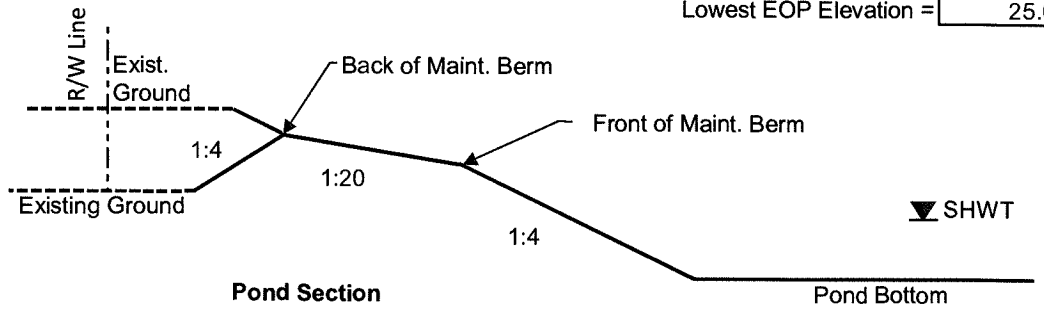
Total Runoff: Q_{pre} = 3.86 in
Q_{post} = 6.48 in
ΔQ = 2.62 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 18.67 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 20.0 ft
Initial Water Elevation = 14.1 ft
Lowest EOP Elevation = 25.0 ft



Pond Section

POND 402A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	6.84 ac			23.33 ac-ft
18.00	Front of Maintenance Berm	5.02 ac			17.40 ac-ft
17.00	---	4.73 ac			12.53 ac-ft
15.00	---	4.16 ac			3.64 ac-ft
14.10	Initial Water Elevation	3.92 ac			0.00 ac-ft
3.50	Pond Bottom	2.07 ac			

POND 402B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	3.72 ac			14.31 ac-ft
18.00	Front of Maintenance Berm	3.05 ac			10.93 ac-ft
17.00	---	2.92 ac			7.94 ac-ft
15.00	---	2.67 ac			2.35 ac-ft
14.10	Initial Water Elevation	2.56 ac			0.00 ac-ft
3.50	Pond Bottom	1.96 ac			

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

POND 402C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	2.09 ac			6.39 ac-ft
18.00	Front of Maintenance Berm	1.43 ac			4.63 ac-ft
17.00	---	1.30 ac			3.26 ac-ft
15.00	---	1.06 ac			0.90 ac-ft
14.10	Initial Water Elevation	0.95 ac			0.00 ac-ft
3.50	Pond Bottom	0.36 ac			

POND 402D

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	0.82 ac			2.29 ac-ft
18.00	Front of Maintenance Berm	0.52 ac			1.62 ac-ft
17.00	---	0.46 ac			1.13 ac-ft
15.00	---	0.36 ac			0.31 ac-ft
14.10	Initial Water Elevation	0.32 ac			0.00 ac-ft
3.50	Pond Bottom	0.11 ac			

POND 402E

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	0.64 ac			1.66 ac-ft
18.00	Front of Maintenance Berm	0.38 ac			1.15 ac-ft
17.00	---	0.33 ac			0.79 ac-ft
15.00	---	0.25 ac			0.21 ac-ft
14.10	Initial Water Elevation	0.22 ac			0.00 ac-ft
3.50	Pond Bottom	0.05 ac			

POND 402F

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	2.40 ac			8.52 ac-ft
18.00	Front of Maintenance Berm	1.84 ac			6.40 ac-ft
17.00	---	1.74 ac			4.61 ac-ft
15.00	---	1.53 ac			1.34 ac-ft
14.10	Initial Water Elevation	1.45 ac			0.00 ac-ft
3.50	Pond Bottom	0.97 ac			

POND 402A + POND 402B + POND 402C + POND 402D + POND 402E + POND 402F

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	16.51 ac			56.50 ac-ft
18.00	Front of Maintenance Berm	12.24 ac			42.12 ac-ft
17.00	---	11.48 ac			30.26 ac-ft
15.00	---	10.03 ac			8.75 ac-ft
14.10	Initial Water Elevation	9.42 ac			0.00 ac-ft
3.50	Pond Bottom	5.52 ac			

Required Treatment Volume: 9.48 ac-ft
Required Treat. Vol. + Atten.: 28.15 ac-ft

Top El. Of Treatment Volume: 15.07
Top El. Of Treat. Vol. + Atten.: 16.82

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 403
POND NAME: 403 (Consisted of four ditch block systems in Permit No. 64105-3)

STATION LIMITS: From: 2845+00 To: 2891+00
Roadway Length: 4600 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.87 ac
Pervious Roadway Area: 32.15 ac
Total Roadway Area: 41.02 ac

Pond Area:

Pervious Pond Area: 14.12 ac
Water Surface Area: 0.00 ac
Total Pond Area: 14.12 ac

Total Area:

Impervious Area: 8.87 ac
Pervious Area: 46.27 ac
Water Surface Area: 0.00 ac
Total Area: 55.14 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.87 ac	869.3
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	46.27 ac	2267.2
		Total:	55.14 ac	3136.5

CN = Total CN * Area / Total Area = **56.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.58 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.74 in**

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

		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 403
POND NAME: 403 (Consisted of four ditch block systems in Permit No. 64105-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 1.43 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 23.82 ac
Pervious Roadway Area: 17.20 ac
Total Roadway Area: 41.02 ac

Pond Area:

Pervious Pond Area: 3.98 ac
Water Surface Area: 10.14 ac (At the Treatment Volume Stage)
Total Pond Area: 14.12 ac

Total Area:

Impervious Area: 23.82 ac
Pervious Area: 21.18 ac
Water Surface Area: 10.14 ac
Total Area: 55.14 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	23.82 ac	2334.1
Water Area	---	100	10.14 ac	1014.0
Open Land (Grass cover 50% - 75%)	A	49	16.96 ac	831.2
Gravel Transit Corridor	A	76	4.22 ac	320.7
		Total:	55.14 ac	4500.0

CN = Total CN * Area / Total Area = **81.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.25 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.05 in**

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 403
POND NAME: 403 (Consisted of four ditch block systems in Permit No. 64105-3)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 4.78 ac-ft
1" over Total Area = 4.60 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 4.78 ac-ft

Required Attenuation Volume:

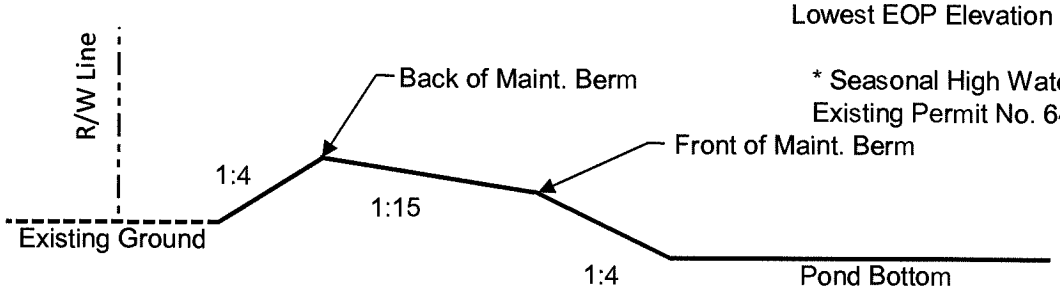
Total Runoff: Q_{pre} = 11.74 in
Q_{post} = 16.05 in
ΔQ = 4.30 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 19.77 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 22.0 ft @ 1:4

Existing Ground Elevation = 45.0 ft
Seasonal High Water Elevation = 35.0 ft
Lowest EOP Elevation = 42.0 ft



* Seasonal High Water El. From Existing Permit No. 64105-3

Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
42.00	Back of Maintenance Berm	14.12 ac			51.13 ac-ft
41.00	Front of Maintenance Berm	11.92 ac			38.11 ac-ft
40.00	---	11.32 ac			26.49 ac-ft
39.00	---	10.74 ac			15.46 ac-ft
37.50	Pond Bottom	9.87 ac			0.00 ac-ft

Required Treatment Volume: 4.78 ac-ft
Required Treat. Vol. + Atten.: 24.55 ac-ft
Top El. Of Treatment Volume: 37.96
Top El. Of Treat. Vol. + Atten.: 39.82

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

STATION LIMITS: From: 2891+00
To: 2913+50

Roadway Length: 2250 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	1	12 ft
Inside Shoulder	10 ft	1	10 ft
Outside Shoulder	8 ft	1	8 ft
	Total Impervious Width:		30 ft

Additional Impervious (ramps, turn lanes, etc.): 1.85 ac

Impervious Roadway Area: 3.40 ac
Pervious Roadway Area: 9.77 ac
Total Roadway Area: 13.17 ac

Pond Area:

Pervious Pond Area: 4.40 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.40 ac

Total Area:

Impervious Area: 3.40 ac
Pervious Area: 14.17 ac
Water Surface Area: 0.00 ac
Total Area: 17.57 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	3.40 ac	333.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	13.07 ac	640.5
Open Land (Grass cover 50% - 75%)	A/D	84	1.10 ac	92.4
		Total:	17.57 ac	1066.0

CN = Total CN * Area / Total Area = **60.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.48 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.50 in**

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

		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	7	84 ft
Wall	2 ft	1	2 ft
Shoulder	6 ft	0	0 ft
Shoulder	10 ft	2	20 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		130 ft

Additional Impervious: 1.61 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.32 ac
Pervious Roadway Area: 4.85 ac
Total Roadway Area: 13.17 ac

Pond Area:

Pervious Pond Area: 1.61 ac
Water Surface Area: 2.79 ac
Total Pond Area: 4.40 ac

Total Area:

Impervious Area: 8.32 ac
Pervious Area: 6.46 ac
Water Surface Area: 2.79 ac
Total Area: 17.57 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.32 ac	815.8
Water Area	---	100	2.79 ac	279.0
Open Land (Grass cover 50% - 75%)	A	49	5.01 ac	245.3
Gravel (Rail Corridor)	A/D	91	0.46 ac	41.9
Gravel (Rail Corridor)	A	76	0.78 ac	59.3
Open Land (Grass cover 50% - 75%)	A/D	84	0.21 ac	17.6
		Total:	17.57 ac	1458.9

CN = Total CN * Area / Total Area = **83.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.04 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.26 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
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		date:
made by:	SR	23-Dec-15
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

POND SIZING : WET DETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

2.5" over Impervious Area = 1.73 ac-ft
1" over Total Area = 1.46 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.73 ac-ft

Required Attenuation Volume:

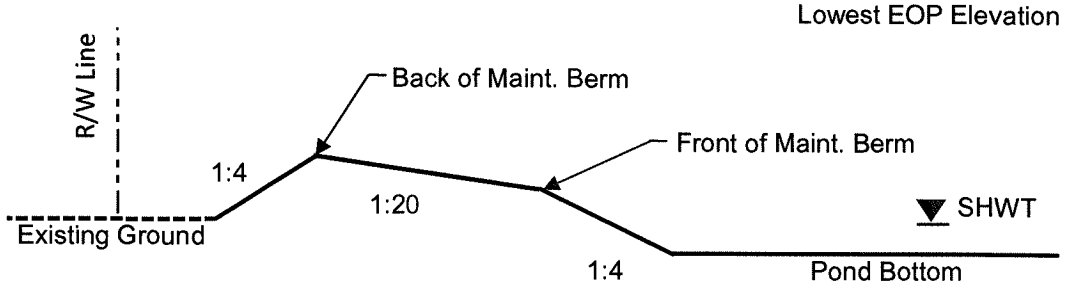
Total Runoff: Q_{pre} = 12.50 in
Q_{post} = 16.26 in
ΔQ = 3.76 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.50 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 25.0 ft
Seasonal High Water Elevation = 21.2 ft
Lowest EOP Elevation = 26.8 ft



Pond Section

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

POND 405A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
26.00	Back of Maintenance Berm	3.66 ac			13.93 ac-ft
25.00	Front of Maintenance Berm	3.01 ac			10.59 ac-ft
24.00	---	2.89 ac			7.64 ac-ft
21.20	---	2.57 ac			0.00 ac-ft
16.20	Pond Bottom	2.29 ac			0.00 ac-ft

POND 405B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
26.00	Back of Maintenance Berm	0.74 ac			1.75 ac-ft
25.00	Front of Maintenance Berm	0.41 ac			1.18 ac-ft
24.00	---	0.35 ac			0.80 ac-ft
21.20	---	0.22 ac			0.00 ac-ft
16.20	Pond Bottom	0.13 ac			0.00 ac-ft

PONDS 405A & 405B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
26.00	Back of Maintenance Berm	4.40 ac			15.68 ac-ft
25.00	Front of Maintenance Berm	3.42 ac			11.77 ac-ft
24.00	---	3.24 ac			8.44 ac-ft
21.20	Initial Water Elevation	2.79 ac			0.00 ac-ft
16.20	Pond Bottom	2.42 ac			0.00 ac-ft

Required Treatment Volume: 1.73 ac-ft
Top El. Of Treatment Volume: 21.78
Required Treat. Vol. + Atten.: 7.24 ac-ft
Top El. Of Treat. Vol. + Atten.: 23.60

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

STATION LIMITS: From: 2913+50
To: 2933+50

Roadway Length: 2000 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 1.45 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 5.31 ac
Pervious Roadway Area: 19.75 ac
Total Roadway Area: 25.06 ac

Pond Area:

Pervious Pond Area: 7.84 ac
Water Surface Area: 0.00 ac
Total Pond Area: 7.84 ac

Total Area:

Impervious Area: 5.31 ac
Pervious Area: 27.59 ac
Water Surface Area: 0.00 ac
Total Area: 32.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	5.31 ac	520.1
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	27.59 ac	1352.1
		Total:	32.90 ac	1872.1

CN = Total CN * Area / Total Area = **56.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.57 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.75 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 1.54 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 11.27 ac
Pervious Roadway Area: 13.79 ac
Total Roadway Area: 25.06 ac

Pond Area:

Pervious Pond Area: 2.20 ac
Water Surface Area: 5.64 ac (At the Treatment Volume Stage)
Total Pond Area: 7.84 ac

Total Area:

Impervious Area: 11.27 ac
Pervious Area: 15.99 ac
Water Surface Area: 5.64 ac
Total Area: 32.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	11.27 ac	1104.8
Water Area	---	100	5.64 ac	564.0
Open Land (Grass cover 50% - 75%)	A	49	14.46 ac	708.4
Gravel (Rail Corridor)	A	76	1.53 ac	116.3
		Total:	32.90 ac	2493.5

CN = Total CN * Area / Total Area = **75.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.19 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **15.15 in**

HNTB Corporation
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.55 ac-ft
1" over Total Area = 2.74 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.74 ac-ft

Required Attenuation Volume:

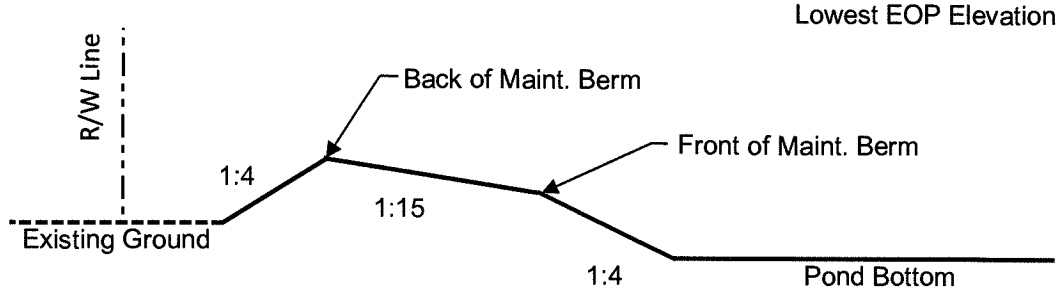
Total Runoff:
Q_{pre} = 11.75 in
Q_{post} = 15.15 in
ΔQ = 3.40 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 9.33 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 30.0 ft
Lowest EOP Elevation = 40.0 ft



Pond Section

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

		date:
made by:	SR	23-Dec-15
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

POND 406A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Back of Maintenance Berm	4.91 ac			19.52 ac-ft
37.00	Front of Maintenance Berm	4.28 ac			14.93 ac-ft
36.00	---	4.12 ac			10.73 ac-ft
35.00	---	3.96 ac			6.69 ac-ft
33.25	Pond Bottom	3.68 ac			0.00 ac-ft

POND 406B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Back of Maintenance Berm	2.93 ac			10.47 ac-ft
37.00	Front of Maintenance Berm	2.36 ac			7.83 ac-ft
36.00	---	2.21 ac			5.54 ac-ft
35.00	---	2.07 ac			3.40 ac-ft
33.25	Pond Bottom	1.82 ac			0.00 ac-ft

PONDS 406A & 406B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Back of Maintenance Berm	7.84 ac			29.99 ac-ft
37.00	Front of Maintenance Berm	6.64 ac			22.75 ac-ft
36.00	---	6.33 ac			16.27 ac-ft
35.00	---	6.03 ac			10.09 ac-ft
33.25	Pond Bottom	5.50 ac			0.00 ac-ft

Required Treatment Volume: 2.74 ac-ft
Required Treat. Vol. + Atten.: 12.07 ac-ft
Top El. Of Treatment Volume: 33.73
Top El. Of Treat. Vol. + Atten.: 35.32

HNTB Corporation
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		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408 (Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

STATION LIMITS: From: 70+88 To: 92+60 Saxon Roadway Length: 2172 ft R/W Width: VARIES

From: 2891+00 To: 2913+50 I-4 Roadway Length: 2250 ft R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area: Saxon Boulevard

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		40 ft

Additional Impervious: 1.86 ac
(I-4 Main line and ramps) 2.16 ac

Impervious Roadway Area: 6.01 ac
Pervious Roadway Area: 33.34 ac
Total Roadway Area: 39.35 ac

Pond Area:

Pervious Pond Area: 11.26 ac
Water Surface Area: 0.00 ac
Total Pond Area: 11.26 ac

Total Area:

Impervious Area: 6.01 ac
Pervious Area: 44.60 ac
Water Surface Area: 0.00 ac
Total Area: 50.61 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.01 ac	589.4
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	34.28 ac	1679.5
Open Land (Grass cover 50% - 75%)	A/D	84	10.32 ac	866.9
		Total:	50.61 ac	3135.8

CN = Total CN * Area / Total Area = **62.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.14 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.74 in**

HNTB Corporation
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408

(Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
	Total Impervious Width:		91 ft

I-4 Additional Impervious: (ramps, turn lanes, etc.)	10.74 ac
Additional Impervious: (Non Permitted commercal)	4.00 ac
Impervious Roadway Area:	19.25 ac
Pervious Roadway Area:	20.10 ac
Total Roadway Area:	39.35 ac

Pond Area:

Pervious Pond Area:	3.61 ac
Water Surface Area:	7.65 ac
Total Pond Area:	11.26 ac

Total Area:

Impervious Area:	19.25 ac
Pervious Area:	23.71 ac
Water Surface Area:	7.65 ac
Total Area:	50.61 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	19.25 ac	1886.8
Water Area	---	100	7.65 ac	765.0
Open Land (Grass cover 50% - 75%)	A	49	15.18 ac	743.7
Open Land (Grass cover 50% - 75%)	A/D	84	7.29 ac	612.4
Gravel (Rail Corridor)	A/D	91	0.46 ac	41.9
Gravel (Rail Corridor)	A	76	0.78 ac	59.3
		Total:	50.61 ac	4109.0

CN = Total CN * Area / Total Area = **81.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.32 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **15.98 in**

HNTB Corporation
610 Crescent Executive Court, Suite 400
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408 (Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND SIZING : WET DETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

2.5" over Impervious Area = 4.01 ac-ft
1" over Total Area = 4.22 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 4.22 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 12.74 in
Q_{post} = 15.98 in
ΔQ = 3.24 in

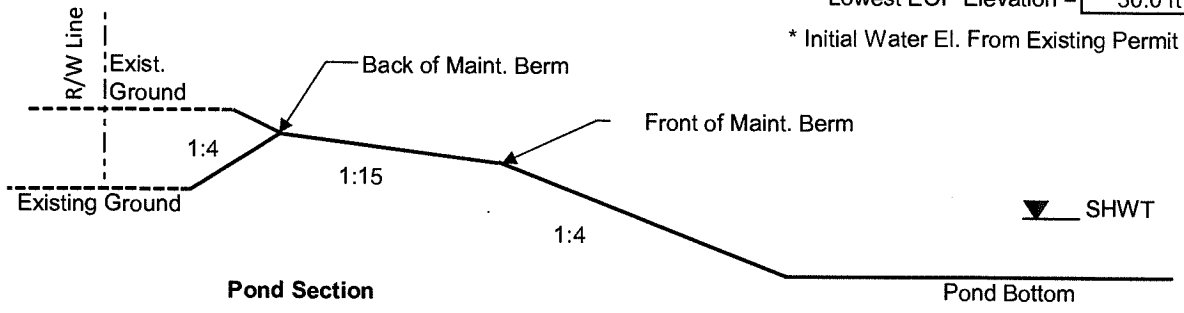
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 13.67 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 30.0 ft
Initial Water Elevation* = 23.75 ft
Lowest EOP Elevation = 30.0 ft

* Initial Water El. From Existing Permit



Pond Section

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

		date:
made by:	SR	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408

(Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND 407A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	4.50 ac			16.05 ac-ft
27.00	Front of Maintenance Berm	3.90 ac			11.85 ac-ft
26.00	---	3.74 ac			8.03 ac-ft
25.00	---	3.59 ac			4.37 ac-ft
23.75	Initial Water Elevation	3.40 ac			0.00 ac-ft
17.00	Pond Bottom	2.91 ac			

POND 407B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	0.70 ac			1.81 ac-ft
27.00	Front of Maintenance Berm	0.47 ac			1.22 ac-ft
26.00	---	0.41 ac			0.78 ac-ft
25.00	---	0.35 ac			0.40 ac-ft
23.75	Initial Water Elevation	0.29 ac			0.00 ac-ft
17.00	Pond Bottom	0.13 ac			

POND 407C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	1.67 ac			5.20 ac-ft
27.00	Front of Maintenance Berm	1.29 ac			3.72 ac-ft
26.00	---	1.20 ac			2.47 ac-ft
25.00	---	1.11 ac			1.32 ac-ft
23.75	Initial Water Elevation	1.00 ac			0.00 ac-ft
17.00	Pond Bottom	0.72 ac			

POND 408 (EXPANDED)

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	4.39 ac			14.68 ac-ft
27.00	Front of Maintenance Berm	3.61 ac			10.68 ac-ft
26.00	---	3.41 ac			7.17 ac-ft
25.00	---	3.21 ac			3.86 ac-ft
23.75	Initial Water Elevation	2.96 ac			0.00 ac-ft
17.00	Pond Bottom	2.31 ac			

PONDS 407A, 407B, 407C & 408

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	11.26 ac			37.73 ac-ft
27.00	Front of Maintenance Berm	9.27 ac			27.47 ac-ft
26.00	---	8.76 ac			18.45 ac-ft
25.00	---	8.26 ac			9.94 ac-ft
23.75	Initial Water Elevation	7.65 ac			0.00 ac-ft
17.00	Pond Bottom	6.07 ac			

Required Treatment Volume: 4.22 ac-ft
Top El. Of Treatment Volume: 24.28
Required Treat. Vol. + Atten.: 17.89 ac-ft
Top El. Of Treat. Vol. + Atten.: 25.93

HNTB Corporation
610 Crescent Executive Court, Suite 400
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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

STATION LIMITS: From: 2891+00 To: 2915+00
Roadway Length: 2400 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	4 ft	1	4 ft
Outside Shoulder	8 ft	1	8 ft
	Total Impervious Width:		36 ft

Saxon Boulevard: 0.85 ac
Additional Impervious: (ramps, turn lanes, etc.) 1.89 ac
Impervious Roadway Area: 4.72 ac
Pervious Roadway Area: 28.37 ac
Total Roadway Area: 33.09 ac

Pond Area:

Pervious Pond Area: 9.22 ac
Water Surface Area: 0.00 ac
Total Pond Area: 9.22 ac

Total Area:

Impervious Area: 4.72 ac
Pervious Area: 37.59 ac
Water Surface Area: 0.00 ac
Total Area: 42.31 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.72 ac	462.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	27.65 ac	1354.7
Open Land (Grass cover 50% - 75%)	A/D	84	9.94 ac	835.0
		Total:	42.31 ac	2652.5

CN = Total CN * Area / Total Area = **62.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 5.95 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.88 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	5	60 ft
Wall	2 ft	1	2 ft
Shoulder	10 ft	2	20 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		106 ft

Additional Impervious: (ramps, turn lanes, etc.)	6.18 ac
	4.00 ac
Impervious Roadway Area:	16.02 ac
Pervious Roadway Area:	17.07 ac
Total Roadway Area:	33.09 ac

Pond Area:

Pervious Pond Area:	2.89 ac
Water Surface Area:	6.32 ac
Total Pond Area:	9.22 ac

Total Area:

Impervious Area:	16.02 ac
Pervious Area:	19.97 ac
Water Surface Area:	6.32 ac
Total Area:	42.31 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	16.02 ac	1570.0
Water Area	---	100	6.32 ac	632.3
Open Land (Grass cover 50% - 75%)	A	49	12.44 ac	609.4
Gravel (Rail Corridor)	A/D	91	0.47 ac	42.8
Gravel (Rail Corridor)	A	76	0.40 ac	30.4
Open Land (Grass cover 50% - 75%)	A/D	84	6.66 ac	559.4
		Total:	42.31 ac	3444.3

CN = Total CN * Area / Total Area = **81.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.28 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.02 in**

HNTB Corporation
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND SIZING : WET DETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

2.5" over Impervious Area = 3.34 ac-ft
1" over Total Area = 3.53 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.53 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 12.88 in
Q_{post} = 16.02 in
ΔQ = 3.13 in

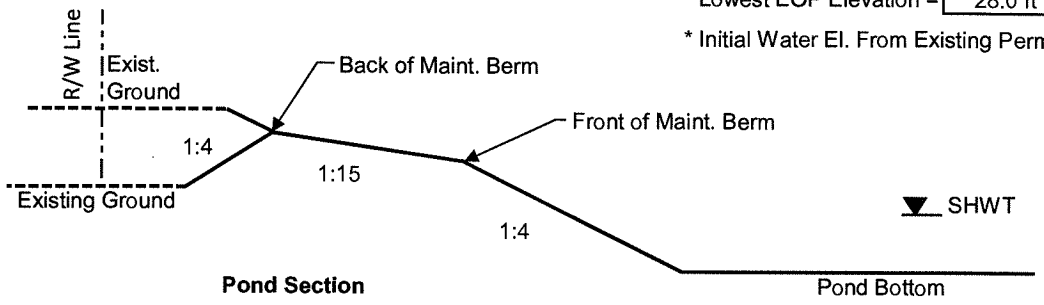
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 11.05 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:20
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 30.0 ft
Initial Water Elevation* = 23.75 ft
Lowest EOP Elevation = 28.0 ft

* Initial Water El. From Existing Permit



Pond Section

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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND 407A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	4.50 ac			16.05 ac-ft
27.00	Front of Maintenance Berm	3.90 ac			11.85 ac-ft
26.00	---	3.74 ac			8.03 ac-ft
25.00	---	3.59 ac			4.37 ac-ft
23.75	Initial Water Elevation	3.40 ac			0.00 ac-ft
17.00	Pond Bottom	2.91 ac			

POND 407B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	0.70 ac			1.81 ac-ft
27.00	Front of Maintenance Berm	0.47 ac			1.22 ac-ft
26.00	---	0.41 ac			0.79 ac-ft
25.00	---	0.35 ac			0.40 ac-ft
23.75	Initial Water Elevation	0.29 ac			0.00 ac-ft
17.00	Pond Bottom	0.13 ac			

POND 407C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	1.67 ac			5.19 ac-ft
27.00	Front of Maintenance Berm	1.29 ac			3.72 ac-ft
26.00	---	1.20 ac			2.47 ac-ft
25.00	---	1.11 ac			1.32 ac-ft
23.75	Initial Water Elevation	1.00 ac			0.00 ac-ft
17.00	Pond Bottom	0.71 ac			

POND 408 (Existing)

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	2.35 ac			7.96 ac-ft
27.00	Front of Maintenance Berm	1.95 ac			5.81 ac-ft
26.00	---	1.85 ac			3.91 ac-ft
25.00	---	1.75 ac			2.11 ac-ft
23.75	Initial Water Elevation	1.63 ac			0.00 ac-ft
17.00	Pond Bottom	1.33 ac			

PONDS 407A, 407B, 407C & 408

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	9.22 ac			31.02 ac-ft
27.00	Front of Maintenance Berm	7.61 ac			22.61 ac-ft
26.00	---	7.20 ac			15.20 ac-ft
25.00	---	6.80 ac			8.20 ac-ft
23.75	Initial Water Elevation	6.32 ac			0.00 ac-ft
17.00	Pond Bottom	5.09 ac			

Required Treatment Volume:	3.53 ac-ft	Required Treat. Vol. + Atten.:	14.58 ac-ft
Top El. Of Treatment Volume:	24.29	Top El. Of Treat. Vol. + Atten.:	25.91

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		date:
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checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408A (408 + 408B + 408D1)
POND NAME: Stormwater Vault 408

STATION LIMITS: From: 80+00 Saxon To: 120+00

Roadway Length: 4000 ft
R/W Width: 120 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
	Total Impervious Width:		91 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.31 ac
Pervious Roadway Area: 2.71 ac
Total Roadway Area: 11.02 ac

Pond Area:

Pervious Pond Area: 0.00 ac
Water Surface Area: 0.00 ac (At the Treatment Volume Stage)
Total Pond Area: 0.00 ac

Total Area:

Impervious Area: 8.31 ac
Pervious Area: 2.71 ac
Water Surface Area: 0.00 ac
Total Area: 11.02 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.31 ac	814.4
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	2.71 ac	132.7
		Total:	11.02 ac	947.2

CN = Total CN * Area / Total Area = **86.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.63 in

Precipitation (P) = **7.4 in (for 100yr/10dy storm event)**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.75 in**

POND SIZING : UNDERGROUND VAULT

Required Attenuation Volume:

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 23.8 ft
Lowest EOP Elevation = 30.0 ft

Total Runoff:
Q_{pre} = 0.00 in
Q_{post} = 5.75 in
ΔQ = 5.75 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = **5.28 ac-ft**

229830	cubic ft
1719127	gal

VAULT DIMENSIONS

DEPTH (FT) = 6 EL. 32' - EL. 26'
WIDTH (FT) = 125 CURBLINE TO CURBLINE
CROSS SECTIONAL AREA = 750
LENGTH (FT) = **306.4**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408B
POND NAME: 408B

STATION LIMITS: From: 94+00 To: 100+60 Saxon

Roadway Length: 660 ft
R/W Width: 120 ft

EXISTING CONDITION

Based on historical aerials, 4-laning of Saxon was completed in the early 90's. Permits could not be found for this widening; therefore, existing conditions were assumed to be 2 lanes.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Shoulder	8 ft	2	16 ft
Sidewalk	5 ft	2	10 ft
		Total Impervious Width:	50 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 0.76 ac
Pervious Roadway Area: 2.11 ac
Total Roadway Area: 2.87 ac

Pond Area:

Pervious Pond Area: 3.73 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.73 ac

Total Area:

Impervious Area: 0.76 ac
Pervious Area: 5.84 ac
Water Surface Area: 0.00 ac
Total Area: 6.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	0.76 ac	74.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	5.84 ac	286.3
		Total:	6.60 ac	360.5

CN = Total CN * Area / Total Area = **54.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.31 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.28 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408B
POND NAME: 408B

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
		Total Impervious Width:	91 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 1.38 ac
Pervious Roadway Area: 1.49 ac
Total Roadway Area: 2.87 ac

Pond Area:

Pervious Pond Area: 1.05 ac
Water Surface Area: 2.68 ac (At the Treatment Volume Stage)
Total Pond Area: 3.73 ac

Total Area:

Impervious Area: 1.38 ac
Pervious Area: 2.54 ac
Water Surface Area: 2.68 ac
Total Area: 6.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	1.38 ac	134.8
Water Area	---	100	2.68 ac	268.0
Open Land (Grass cover 50% - 75%)	A	49	2.54 ac	124.7
		Total:	6.60 ac	527.5

CN = Total CN * Area / Total Area = **79.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.51 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **15.79 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408B
POND NAME: 408B

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.42 ac-ft
1" over Total Area = 0.55 ac-ft

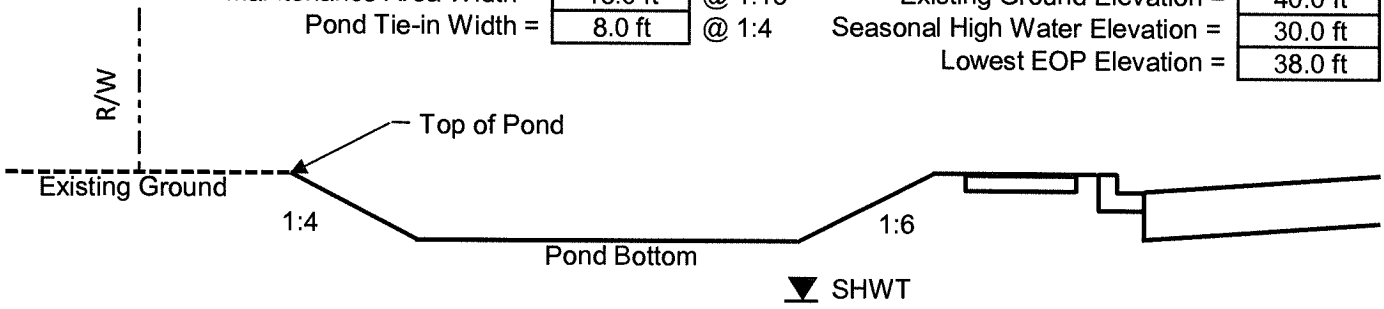
Treatment V_{req} = Largest of Trt. Vol. = 0.55 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 11.28 in
Q_{post} = 15.79 in
ΔQ = 4.52 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.48 ac-ft

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	40.0 ft
Pond Tie-in Width =	8.0 ft	@ 1:4	Seasonal High Water Elevation =	30.0 ft
			Lowest EOP Elevation =	38.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Top of Pond	3.73 ac			10.55 ac-ft
37.00	---	3.07 ac			7.15 ac-ft
36.00	---	2.90 ac			4.16 ac-ft
34.50	Pond Bottom	2.65 ac			0.00 ac-ft

Required Treatment Volume:	0.55 ac-ft	Required Treat. Vol. + Atten.:	3.03 ac-ft
Top El. Of Treatment Volume:	34.70	Top El. Of Treat. Vol. + Atten.:	35.62

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408D1
POND NAME: 408D1

STATION LIMITS: From: 100+60 Saxon To: 120+00

Roadway Length: 1940 ft
R/W Width: 120 ft

EXISTING CONDITION

Based on historical aerials, 4-laning of Saxon was completed in the early 90's. Permits could not be found for this widening; therefore, existing conditions were assumed to be 2 lanes.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Shoulder	8 ft	2	16 ft
Sidewalk	5 ft	2	10 ft
	Total Impervious Width:		50 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 2.23 ac
Pervious Roadway Area: 3.27 ac
Total Roadway Area: 5.50 ac

Pond Area:

Pervious Pond Area: 3.20 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.20 ac

Total Area:

Impervious Area: 2.23 ac
Pervious Area: 6.47 ac
Water Surface Area: 0.00 ac
Total Area: 8.70 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.23 ac	218.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	6.47 ac	317.2
		Total:	8.70 ac	535.4

CN = Total CN * Area / Total Area = **61.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.25 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.66 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408D1
POND NAME: 408D1

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
		Total Impervious Width:	91 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 4.03 ac
Pervious Roadway Area: 1.47 ac
Total Roadway Area: 5.50 ac

Pond Area:

Pervious Pond Area: 0.97 ac
Water Surface Area: 2.23 ac (At the Treatment Volume Stage)
Total Pond Area: 3.20 ac

Total Area:

Impervious Area: 4.03 ac
Pervious Area: 2.44 ac
Water Surface Area: 2.23 ac
Total Area: 8.70 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.03 ac	395.0
Water Area	---	100	2.23 ac	223.0
Open Land (Grass cover 50% - 75%)	A	49	2.44 ac	119.5
		Total:	8.70 ac	737.5

CN = Total CN * Area / Total Area = **84.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.80 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.51 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408D1
POND NAME: 408D1

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.78 ac-ft
1" over Total Area = 0.73 ac-ft

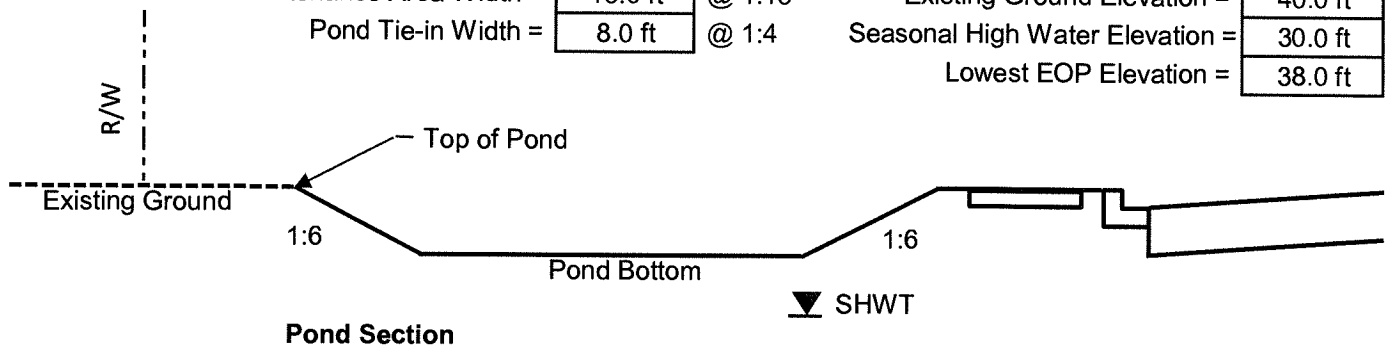
Treatment V_{req} = Largest of Trt. Vol. = 0.78 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 12.66 in
Q_{post} = 16.51 in
ΔQ = 3.84 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.79 ac-ft

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	40.0 ft
Pond Tie-in Width =	8.0 ft	@ 1:4	Seasonal High Water Elevation =	30.0 ft
			Lowest EOP Elevation =	38.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Top of Pond	3.20 ac			9.42 ac-ft
37.00	---	2.60 ac			6.52 ac-ft
36.00	---	2.40 ac			4.02 ac-ft
34.25	Pond Bottom	2.19 ac			0.00 ac-ft

Required Treatment Volume:	0.78 ac-ft	Required Treat. Vol. + Atten.:	3.57 ac-ft
Top El. Of Treatment Volume:	34.59	Top El. Of Treat. Vol. + Atten.:	35.82

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A1 (Pond 2 in Permit No. 64105-6)

STATION LIMITS:
From: 2933+50 To: 2991+00 — East & Westbound — Roadway Length: 5750 ft, R/W Width: 300 ft
From: 2991+00 To: 3038+00 — Eastbound Only — Roadway Length: 4700 ft, R/W Width: 150 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 15.62 ac
Pervious Roadway Area: 35.49 ac
Total Roadway Area: 51.11 ac

Pond Area:

Pervious Pond Area: 6.73 ac
Water Surface Area: 0.00 ac
Total Pond Area: 6.73 ac

Total Area:

Impervious Area: 15.62 ac
Pervious Area: 42.22 ac
Water Surface Area: 0.00 ac
Total Area: 57.84 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	15.62 ac	1530.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	42.22 ac	2068.8
		Total:	57.84 ac	3599.5

CN = Total CN * Area / Total Area = **62.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.07 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.79 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A1 (Pond 2 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 38.03 ac
Pervious Roadway Area: 13.08 ac
Total Roadway Area: 51.11 ac

Pond Area:

Pervious Pond Area: 1.95 ac
Water Surface Area: 4.78 ac (At the Treatment Volume Stage)
Total Pond Area: 6.73 ac

Total Area:

Impervious Area: 38.03 ac
Pervious Area: 15.03 ac
Water Surface Area: 4.78 ac
Total Area: 57.84 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	38.03 ac	3726.9
Water Area	---	100	4.78 ac	478.0
Open Land (Grass cover 50% - 75%)	A	49	7.19 ac	352.3
Gravel (Rail Corridor)	A	76	7.84 ac	595.8
		Total:	57.84 ac	5153.1

CN = Total CN * Area / Total Area = **89.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.22 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **17.11 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A1 (Pond 2 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 6.37 ac-ft
1" over Total Area = 4.82 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 6.37 ac-ft

Required Attenuation Volume:

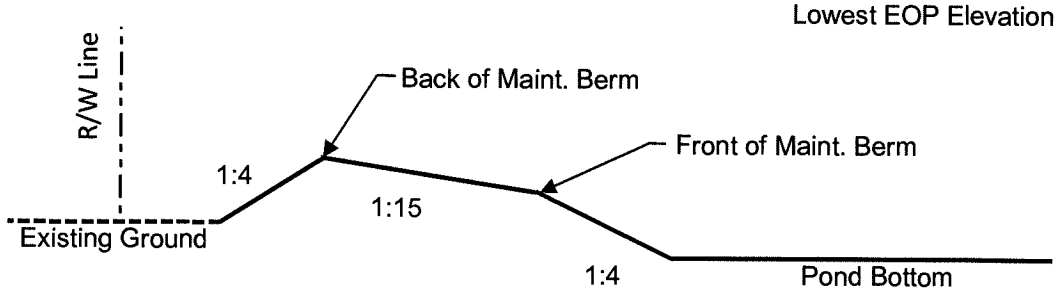
Total Runoff: Q_{pre} = 12.79 in
Q_{post} = 17.11 in
ΔQ = 4.31 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 20.79 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 22.2 ft
Lowest EOP Elevation = 35.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
36.00	Back of Maintenance Berm	6.73 ac			42.95 ac-ft
35.00	Front of Maintenance Berm	5.94 ac			36.62 ac-ft
34.00	---	5.73 ac			30.78 ac-ft
33.00	---	5.53 ac			25.15 ac-ft
28.00	Pond Bottom	4.53 ac			0.00 ac-ft

Required Treatment Volume: 6.37 ac-ft
Required Treat. Vol. + Atten.: 27.16 ac-ft
Top El. Of Treatment Volume: 29.27
Top El. Of Treat. Vol. + Atten.: 33.38

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-B1

STATION LIMITS: From: 2991+00 To: 3038+00 Westbound Only

Roadway Length: 4700 ft
R/W Width: 150 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond (Pond 2 in Permit 64105-6) was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 4.53 ac
Pervious Roadway Area: 9.05 ac
Total Roadway Area: 13.58 ac

Pond Area:

Pervious Pond Area: 3.02 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.02 ac

Total Area:

Impervious Area: 4.53 ac
Pervious Area: 12.07 ac
Water Surface Area: 0.00 ac
Total Area: 16.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.53 ac	444.1
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A/D	84	0.04 ac	3.0
Open Land (Grass cover 50% - 75%)	A	49	12.03 ac	589.6
		Total:	16.60 ac	1036.7

CN = Total CN * Area / Total Area = **62.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ 6.01 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)} =$ **12.84 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-B1

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Wall	2 ft	1	2 ft
Shoulder	12 ft	2	24 ft
Shoulder	6 ft	1	6 ft
Shoulder	4 ft	1	4 ft
	Total Impervious Width:		84 ft

Additional Impervious: 4.92 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 9.45 ac
Pervious Roadway Area: 4.13 ac
Total Roadway Area: 13.58 ac

Pond Area:

Pervious Pond Area: 1.40 ac
Water Surface Area: 1.62 ac (At the Treatment Volume Stage)
Total Pond Area: 3.02 ac

Total Area:

Impervious Area: 9.45 ac
Pervious Area: 5.53 ac
Water Surface Area: 1.62 ac
Total Area: 16.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.45 ac	926.3
Water Area	---	100	1.62 ac	162.0
Open Land (Grass cover 50% - 75%)	A	49	3.18 ac	155.9
Gravel (Rail Corridor)	A	76	2.33 ac	177.1
Open Land (Grass cover 50% - 75%)	A/D	84	0.02 ac	1.4
		Total:	16.60 ac	1422.6

CN = Total CN * Area / Total Area = **85.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.67 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.64 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-B1

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.68 ac-ft
1" over Total Area = 1.38 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.68 ac-ft

Required Attenuation Volume:

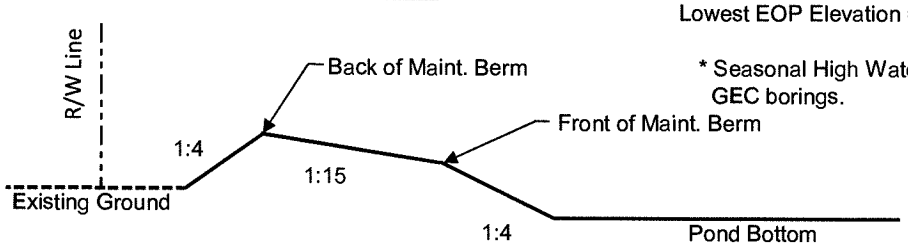
Total Runoff: Q_{pre} = 12.84 in
Q_{post} = 16.64 in
ΔQ = 3.80 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.26 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 25.0 ft
Seasonal High Water Elevation* = 16.0 ft
Lowest EOP Elevation = 35.0 ft



* Seasonal High Water El. From GEC borings.

Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
25.00	Back of Maintenance Berm	3.02 ac			14.27 ac-ft
24.00	Front of Maintenance Berm	2.40 ac			11.56 ac-ft
23.00	---	2.24 ac			9.24 ac-ft
20.00	---	1.77 ac			3.23 ac-ft
18.00	Pond Bottom	1.47 ac			0.00 ac-ft

Required Treatment Volume: 1.68 ac-ft
Required Treat. Vol. + Atten.: 6.94 ac-ft
Top El. Of Treatment Volume: 19.04
Top El. Of Treat. Vol. + Atten.: 22.01

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A2 (Pond 2 in Permit No. 64105-6)

STATION LIMITS: From: 2933+50 To: 3038+00

Roadway Length: 10450 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 20.15 ac
Pervious Roadway Area: 55.59 ac
Total Roadway Area: 75.74 ac

Pond Area:

Pervious Pond Area: 8.17 ac
Water Surface Area: 0.00 ac
Total Pond Area: 8.17 ac

Total Area:

Impervious Area: 20.15 ac
Pervious Area: 63.76 ac
Water Surface Area: 0.00 ac
Total Area: 83.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	20.15 ac	1974.8
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	63.76 ac	3124.2
		Total:	83.91 ac	5099.0

CN = Total CN * Area / Total Area = **60.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.46 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.51 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A2 (Pond 2 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 4.04 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 54.90 ac
Pervious Roadway Area: 20.84 ac
Total Roadway Area: 75.74 ac

Pond Area:

Pervious Pond Area: 2.00 ac
Water Surface Area: 6.17 ac (At the Treatment Volume Stage)
Total Pond Area: 8.17 ac

Total Area:

Impervious Area: 54.90 ac
Pervious Area: 22.84 ac
Water Surface Area: 6.17 ac
Total Area: 83.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	54.90 ac	5380.1
Water Area	---	100	6.17 ac	617.0
Rail Corridor (Gravel)	A	76	10.77 ac	818.5
Open Land (Grass cover 50% - 75%)	A	49	12.07 ac	591.5
		Total:	83.91 ac	7407.1

CN = Total CN * Area / Total Area = **88.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.33 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **17.00 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A2 (Pond 2 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 9.21 ac-ft
1" over Total Area = 6.99 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 9.21 ac-ft

Required Attenuation Volume:

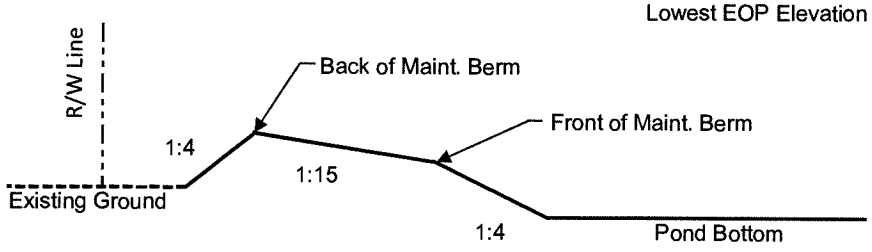
Total Runoff: Q_{pre} = 12.51 in
Q_{post} = 17.00 in
ΔQ = 4.48 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 31.34 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 22.2 ft
Lowest EOP Elevation = 35.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
36.00	Back of Maintenance Berm	8.17 ac			55.73 ac-ft
35.00	Front of Maintenance Berm	7.36 ac			47.97 ac-ft
34.00	---	7.15 ac			40.71 ac-ft
33.00	---	6.94 ac			33.67 ac-ft
27.75	Pond Bottom	5.89 ac			0.00 ac-ft

Required Treatment Volume: 9.21 ac-ft
Required Treat. Vol. + Atten.: 40.56 ac-ft
Top El. Of Treatment Volume: 29.19
Top El. Of Treat. Vol. + Atten.: 33.98

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 410
POND NAME: 410 (Pond 410A is Pond 3 in Permit No. 64105-6)

STATION LIMITS: From: 3038+00 To: 3072+00
Roadway Length: 3400 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 6.56 ac
Pervious Roadway Area: 17.96 ac
Total Roadway Area: 24.52 ac

Pond Area:

Pervious Pond Area: 4.10 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.10 ac

Total Area:

Impervious Area: 6.56 ac
Pervious Area: 22.06 ac
Water Surface Area: 0.00 ac
Total Area: 28.62 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.56 ac	642.5
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	22.06 ac	1081.1
		Total:	28.62 ac	1723.6

CN = Total CN * Area / Total Area = **60.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.60 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.41 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 410
POND NAME: 410 (Pond 410A is Pond 3 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Wall	2 ft	2	4 ft
Shoulder	4 ft	2	8 ft
Shoulder	6 ft	2	12 ft
Shoulder	12 ft	4	48 ft
		Total Impervious Width:	168 ft

Additional Impervious: 2.03 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 15.14 ac
Pervious Roadway Area: 9.38 ac
Total Roadway Area: 24.52 ac

Pond Area:

Pervious Pond Area: 1.33 ac
Water Surface Area: 2.77 ac (At the Treatment Volume Stage)
Total Pond Area: 4.10 ac

Total Area:

Impervious Area: 15.14 ac
Pervious Area: 10.71 ac
Water Surface Area: 2.77 ac
Total Area: 28.62 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	15.14 ac	1484.0
Water Area	---	100	2.77 ac	277.0
Open Land (Grass cover 50% - 75%)	A	49	7.92 ac	387.9
Gravel (Transit Corridor)	A	76	2.79 ac	212.0
		Total:	28.62 ac	2361.0

CN = Total CN * Area / Total Area = **82.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.12 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.18 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 410
POND NAME: 410 (Pond 410A is Pond 3 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.77 ac-ft
1" over Total Area = 2.39 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.77 ac-ft

Required Attenuation Volume:

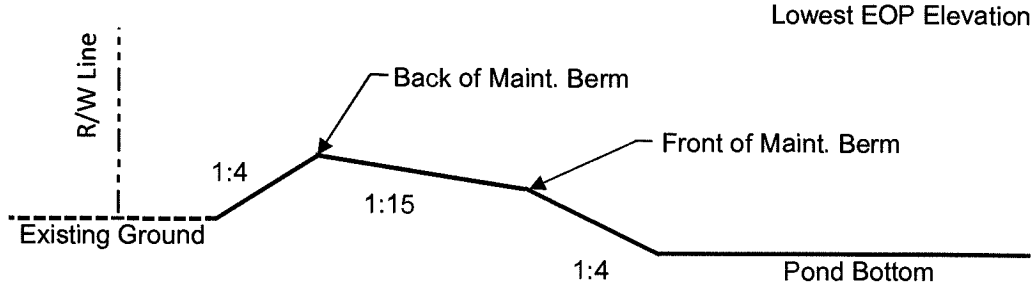
Total Runoff: Q_{pre} = 12.41 in
Q_{post} = 16.18 in
ΔQ = 3.77 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 8.99 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 54.0 ft @ 1:4

Existing Ground Elevation = 75.0 ft
Seasonal High Water Elevation = 51.0 ft
Lowest EOP Elevation = 68.0 ft



Pond Section

POND 410A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
64.00	Back of Maintenance Berm	4.10 ac			22.08 ac-ft
63.00	Front of Maintenance Berm	3.50 ac			18.28 ac-ft
62.00	---	3.35 ac			14.85 ac-ft
60.00	---	3.04 ac			8.46 ac-ft
57.00	Pond Bottom	2.60 ac			0.00 ac-ft

Required Treatment Volume: 2.77 ac-ft
Required Treat Vol. + Atten.: 11.76 ac-ft
Top El. Of Treatment Volume: 57.98
Top El. Of Treat. Vol. + Atten.: 61.03

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 411
POND NAME: 411 (Pond 3 in Permit No. 76095-1)

STATION LIMITS: From: 3072+00 To: 3080+72

Roadway Length: 872 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 5.70 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 7.38 ac
Pervious Roadway Area: 28.42 ac
Total Roadway Area: 35.80 ac

Pond Area:

Pervious Pond Area: 2.71 ac
Water Surface Area: 0.00 ac
Total Pond Area: 2.71 ac

Total Area:

Impervious Area: 7.38 ac
Pervious Area: 31.13 ac
Water Surface Area: 0.00 ac
Total Area: 38.51 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	7.38 ac	723.4
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	31.13 ac	1525.3
		Total:	38.51 ac	2248.7

CN = Total CN * Area / Total Area = **58.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.13 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.05 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 411
POND NAME: 411 (Pond 3 in Permit No. 76095-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 8.09 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 12.33 ac
Pervious Roadway Area: 23.47 ac
Total Roadway Area: 35.80 ac

Pond Area:

Pervious Pond Area: 0.98 ac
Water Surface Area: 1.73 ac (At the Treatment Volume Stage)
Total Pond Area: 2.71 ac

Total Area:

Impervious Area: 12.33 ac
Pervious Area: 24.45 ac
Water Surface Area: 1.73 ac
Total Area: 38.51 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	12.33 ac	1208.7
Water Area	---	100	1.73 ac	173.0
Open Land (Grass cover 50% - 75%)	A	49	23.74 ac	1163.1
Gravel Transit Corridor	A	76	0.71 ac	54.0
		Total:	38.51 ac	2598.8

CN = Total CN * Area / Total Area = **67.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 4.82 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **13.76 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 411
POND NAME: 411 (Pond 3 in Permit No. 76095-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.89 ac-ft
1" over Total Area = 3.21 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.21 ac-ft

Required Attenuation Volume:

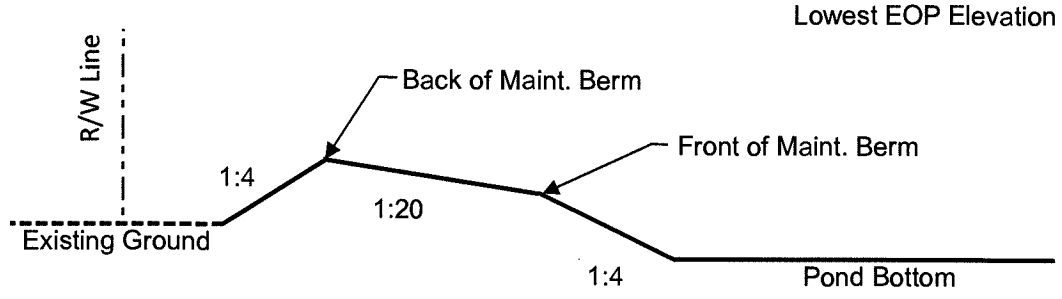
Total Runoff: Q_{pre} = 12.05 in
Q_{post} = 13.76 in
ΔQ = 1.71 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.48 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 57.0 ft
Seasonal High Water Elevation = 45.5 ft
Lowest EOP Elevation = 65.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
55.00	Back of Maintenance Berm	2.71 ac			13.44 ac-ft
54.00	Front of Maintenance Berm	2.14 ac			11.02 ac-ft
53.00	---	2.04 ac			8.93 ac-ft
50.00	---	1.73 ac			3.27 ac-ft
48.00	Pond Bottom	1.54 ac			0.00 ac-ft

Required Treatment Volume: 3.21 ac-ft
Required Treat. Vol. + Atten.: 8.69 ac-ft
Top El. Of Treatment Volume: 49.96
Top El. Of Treat. Vol. + Atten.: 52.88

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 412
POND NAME: 412

STATION LIMITS: From: 54+00 SR 427 Roadway Length: 1635 ft
To: 70+35 R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	10 ft	0	0 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		40 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 1.50 ac
Pervious Roadway Area: 37.91 ac
Total Roadway Area: 39.41 ac

Pond Area:

Pervious Pond Area: 2.45 ac
Water Surface Area: 0.00 ac
Total Pond Area: 2.45 ac

Total Area:

Impervious Area: 1.50 ac
Pervious Area: 40.36 ac
Water Surface Area: 0.00 ac
Total Area: 41.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	1.50 ac	147.1
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	40.36 ac	1977.7
		Total:	41.86 ac	2124.9

CN = Total CN * Area / Total Area = **50.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 9.70 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **10.44 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 412
POND NAME: 412

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Shoulder	8 ft	2	16 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		88 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.68 ac
Impervious Roadway Area:	6.98 ac
Pervious Roadway Area:	32.43 ac
Total Roadway Area:	39.41 ac

Pond Area:

Pervious Pond Area:	0.96 ac	
Water Surface Area:	1.49 ac	(At the Treatment Volume Stage)
Total Pond Area:	2.45 ac	

Total Area:

Impervious Area:	6.98 ac
Pervious Area:	33.39 ac
Water Surface Area:	1.49 ac
Total Area:	41.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.98 ac	684.3
Water Area	---	100	1.49 ac	149.0
Open Land (Grass cover 50% - 75%)	A	49	33.39 ac	1636.1
		Total:	41.86 ac	2469.4

CN = Total CN * Area / Total Area = **59.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.95 in Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.17 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 412
POND NAME: 412

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.47 ac-ft
1" over Total Area = 3.49 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.49 ac-ft

Required Attenuation Volume:

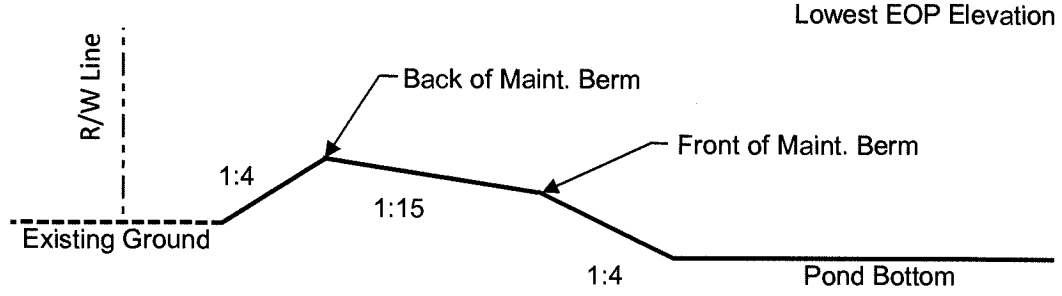
Total Runoff: Q_{pre} = 10.44 in
Q_{post} = 12.17 in
ΔQ = 1.72 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 6.01 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 60.0 ft
Seasonal High Water Elevation = 49.0 ft
Lowest EOP Elevation = 65.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
60.00	Back of Maintenance Berm	2.45 ac			13.84 ac-ft
59.00	Front of Maintenance Berm	2.00 ac			11.62 ac-ft
58.00	---	1.89 ac			9.67 ac-ft
56.00	---	1.67 ac			6.11 ac-ft
51.80	Pond Bottom	1.24 ac			0.00 ac-ft

Required Treatment Volume: 3.49 ac-ft
Required Treat. Vol. + Atten.: 9.50 ac-ft
Top El. Of Treatment Volume: 54.20
Top El. Of Treat. Vol. + Atten.: 57.91

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 413
POND NAME: 413 Pond 4 in Permit Application No. 40-127-76095,-1,-2,-3,-4,-5)

STATION LIMITS: From: 076+18 To: 110+00 Roadway Length: 3382 ft R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built. * Pre Impervious area from Permit No. 40-76095-4-P

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24
Turn Lane	12 ft	1	12 ft
Curb and Gutter	5 ft	1	5 ft
Outside Shoulder	5 ft	1	5 ft
	Total Impervious Width:		46 ft

Additional Impervious: 3.31 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area:* 6.88 ac
Pervious Roadway Area: 19.25 ac
Total Roadway Area:* 26.13 ac

Pond Area:

Pervious Pond Area: 2.77 ac
Water Surface Area: 0.00 ac
Total Pond Area: 2.77 ac

Total Area:

Impervious Area: 6.88 ac
Pervious Area: 22.02 ac
Water Surface Area: 0.00 ac
Total Area: 28.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.88 ac	674.4
Water Area	---	100	0.00 ac	0.0
Meadow (Good Condition)	A	39	14.22 ac	554.5
County Pond Area & Contributing Area	A	30	7.80 ac	234.0
		Total:	28.90 ac	1462.9

CN = Total CN * Area / Total Area = **50.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 9.76 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **10.41 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 413
POND NAME: 413 Pond 4 in Permit Application No. 40-127-76095,-1,-2,-3,-4,-5)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	12 ft	1	12 ft
Outside Shoulder	12 ft	1	12 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.97 ac
Impervious Roadway Area:	9.56 ac
Pervious Roadway Area:	16.57 ac
Total Roadway Area:	26.13 ac

Pond Area:

Pervious Pond Area:	1.98 ac	
Water Surface Area:	0.79 ac	(At the Treatment Volume Stage)
Total Pond Area:	2.77 ac	

Total Area:

Impervious Area:	9.56 ac
Pervious Area:	18.55 ac
Water Surface Area:	0.79 ac
Total Area:	28.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.56 ac	936.9
Water Area	---	100	0.79 ac	79.2
Meadow (Good Condition)	A	39	10.75 ac	419.2
*County Pond and Contributing Area	A	30	7.80 ac	234.0
		Total:	28.90 ac	1669.3

CN = Total CN * Area / Total Area = **57.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.31 in Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.92 in**

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		date:
made by:	LDP	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 413
POND NAME: 413 Pond 4 in Permit Application No. 40-127-76095,-1,-2,-3,-4,-5)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.20 ac-ft
1" over Total Area = 2.41 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.41 ac-ft

Required Attenuation Volume:

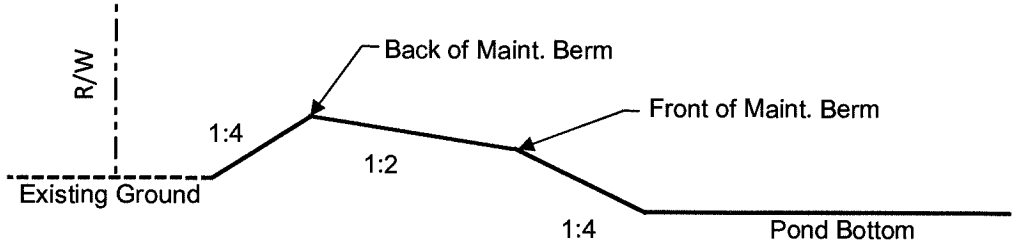
Total Runoff: Q_{pre} = 10.41 in
Q_{post} = 11.92 in
ΔQ = 1.51 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 3.63 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:2
Pond Tie-In Width = 34.2 ft @ 1:4

Existing Ground Elevation = 55.0 ft
Seasonal High Water Elevation = 22.0 ft (NAVD)
Lowest EOP Elevation = 52.5 ft



Pond Section

POND 413

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
48.95	Back of Maintenance Berm	2.77 ac			25.48 ac-ft
47.95	Front of Maintenance Berm	2.47 ac			22.86 ac-ft
46.95	---	2.27 ac			20.49 ac-ft
40.95	---	1.53 ac			9.09 ac-ft
34.95	---	0.75 ac			2.25 ac-ft
29.95	Pond Bottom	0.15 ac			0.00 ac-ft

Required Treatment Volume: 2.41 ac-ft
Required Treat Vol. + Atten.: 6.04 ac-ft
Top El. Of Treatment Volume: 35.30
Top El. Of Treat. Vol. + Atten.: 38.28

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 414
POND NAME: 414 (Pond 4 in Permit No. 64105-6)

STATION LIMITS: From: 3080+72
To: 3159+02

Roadway Length: 7830 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	4	32 ft
	Total Impervious Width:		124 ft

Additional Impervious: 2.69 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 24.98 ac
Pervious Roadway Area: 163.48 ac
Total Roadway Area: 188.46 ac

Pond Area:

Pervious Pond Area: 14.43 ac
Water Surface Area: 0.00 ac
Total Pond Area: 14.43 ac

Total Area:

Impervious Area: 24.98 ac
Pervious Area: 177.91 ac
Water Surface Area: 0.00 ac
Total Area: 202.89 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	24.98 ac	2447.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	177.91 ac	8717.7
		Total:	202.89 ac	11165.6

CN = Total CN * Area / Total Area = **55.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.17 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.36 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 414
POND NAME: 414 (Pond 4 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Wall	2 ft	2	4 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		124 ft

Additional Impervious: 3.00 ac
(ramps, turn lanes, etc.)
Impervious Roadway Area: 25.29 ac
Pervious Roadway Area: 163.17 ac
Total Roadway Area: 188.46 ac

Pond Area:

Pervious Pond Area: 5.42 ac
Water Surface Area: 9.01 ac (At the Treatment Volume Stage)
Total Pond Area: 14.43 ac

Total Area:

Impervious Area: 25.29 ac
Pervious Area: 168.59 ac
Water Surface Area: 9.01 ac
Total Area: 202.89 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	25.29 ac	2478.3
Water Area	---	100	9.01 ac	901.2
Open Land (Grass cover 50% - 75%)	A	49	161.81 ac	7928.7
Gravel (Transit Corridor)	A	76	6.78 ac	515.3
		Total:	202.89 ac	11823.4

CN = Total CN * Area / Total Area = **58.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.16 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.02 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 414
POND NAME: 414 (Pond 4 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 11.09 ac-ft
1" over Total Area = 16.91 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 16.91 ac-ft

Required Attenuation Volume:

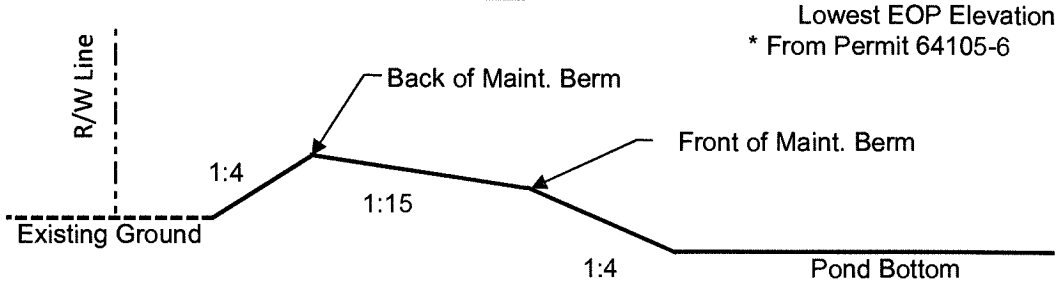
Total Runoff: Q_{pre} = 11.36 in
Q_{post} = 12.02 in
ΔQ = 0.66 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 11.20 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 50.0 ft
Seasonal High Water Elevation* = 31.7 ft
Lowest EOP Elevation = 55.0 ft
* From Permit 64105-6



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
51.00	Back of Maintenance Berm	14.43 ac			165.25 ac-ft
50.00	Front of Maintenance Berm	13.11 ac			151.48 ac-ft
49.00	---	12.85 ac			138.50 ac-ft
48.00	---	12.50 ac			125.82 ac-ft
36.00	Pond Bottom	8.47 ac			0.00 ac-ft

Required Treatment Volume: 16.91 ac-ft
Required Treat. Vol. + Atten.: 28.11 ac-ft
Top El. Of Treatment Volume: 37.61
Top El. Of Treat. Vol. + Atten.: 40.29

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		date:
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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 415
POND NAME: 415

STATION LIMITS: From: 44+12 SR 472 Roadway Length: 988 ft
To: 54+00 R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	10 ft	0	0 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		40 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 0.91 ac
Pervious Roadway Area: 3.71 ac
Total Roadway Area: 4.62 ac

Pond Area:

Pervious Pond Area: 0.72 ac
Water Surface Area: 0.00 ac
Total Pond Area: 0.72 ac

Total Area:

Impervious Area: 0.91 ac
Pervious Area: 4.43 ac
Water Surface Area: 0.00 ac
Total Area: 5.34 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	0.91 ac	88.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	4.43 ac	217.2
		Total:	5.34 ac	306.1

CN = Total CN * Area / Total Area = **57.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.44 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.83 in**

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		date:
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checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 415
POND NAME: 415

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Shoulder	8 ft	2	16 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		88 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.25 ac
Impervious Roadway Area:	2.25 ac
Pervious Roadway Area:	2.37 ac
Total Roadway Area:	4.62 ac

Pond Area:

Pervious Pond Area:	0.43 ac	
Water Surface Area:	0.29 ac	(At the Treatment Volume Stage)
Total Pond Area:	0.72 ac	

Total Area:

Impervious Area:	2.25 ac
Pervious Area:	2.80 ac
Water Surface Area:	0.29 ac
Total Area:	5.34 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.25 ac	220.1
Water Area	---	100	0.29 ac	29.0
Open Land (Grass cover 50% - 75%)	A	49	2.80 ac	137.4
		Total:	5.34 ac	386.5

CN = Total CN * Area / Total Area = **72.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.82 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **14.60 in**

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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 415
POND NAME: 415

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.46 ac-ft
1" over Total Area = 0.45 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.46 ac-ft

Required Attenuation Volume:

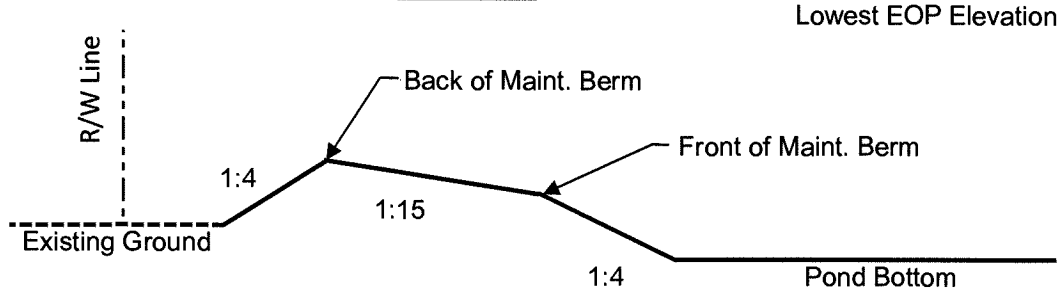
Total Runoff: Q_{pre} = 11.83 in
Q_{post} = 14.60 in
ΔQ = 2.76 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 1.23 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 50.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 40.0 ft
Lowest EOP Elevation = 55.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
50.00	Back of Maintenance Berm	0.72 ac			2.74 ac-ft
49.00	Front of Maintenance Berm	0.50 ac			2.13 ac-ft
48.00	---	0.45 ac			1.66 ac-ft
46.00	---	0.35 ac			0.86 ac-ft
43.00	Pond Bottom	0.22 ac			0.00 ac-ft

Required Treatment Volume: 0.46 ac-ft
Required Treat. Vol. + Atten.: 1.69 ac-ft
Top El. Of Treatment Volume: 44.60
Top El. Of Treat. Vol. + Atten.: 48.07

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		date:
made by:	LDP	23-Dec-15
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 416
POND NAME: 416 (*Pond 1 in Permit No. 42-127-2852ANG, Application No. 78808-1)

STATION LIMITS: From: 10+00 To: 41+87 *N. Kentucky Ave
Roadway Length: 3187 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	2 ft	1	2 ft
Outside Shoulder	2 ft	1	2 ft
	Total Impervious Width:		28 ft

Additional Impervious (ramps, turn lanes, etc.): 0.06 ac

Impervious Roadway Area: 2.11 ac
*Pervious Roadway Area: 25.49 ac
Total Roadway Area: 27.60 ac

* Permitted offsite area, App. No. 42-127-2852ANG

Pond Area:

Pervious Pond Area: 1.61 ac
Water Surface Area: 0.00 ac
Total Pond Area: 1.61 ac

Total Area:

Impervious Area: 2.11 ac
Pervious Area: 27.10 ac
Water Surface Area: 0.00 ac
Total Area: 29.21 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.11 ac	206.7
Water Area	---	100	0.00 ac	0.0
Wood or Forest (Good Cover)	A	25	27.10 ac	677.6
		Total:	29.21 ac	884.3

CN = Total CN * Area / Total Area = **30.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 23.04 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **1.24 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 416
POND NAME: 416 (*Pond 1 in Permit No. 42-127-2852ANG, Application No. 78808-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Wall	2 ft	1	2 ft
Shoulder	2 ft	1	2 ft
	Total Impervious Width:		28 ft

Additional Impervious: (ramps, turn lanes, etc.)	1.33 ac
Impervious Roadway Area:	3.38 ac
Pervious Roadway Area:	24.22 ac
Total Roadway Area:	27.60 ac

Pond Area:

Pervious Pond Area:	0.64 ac	
Water Surface Area:	0.97 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.61 ac	

Total Area:

Impervious Area:	3.38 ac
Pervious Area:	24.86 ac
Water Surface Area:	0.97 ac
Total Area:	29.21 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	3.38 ac	331.1
Water Area	---	100	0.97 ac	97.0
Wood or Forest (Good Cover)	A	25	23.25 ac	581.3
Grass (Good Condition)	A	39	1.61 ac	62.9
		Total:	29.21 ac	1072.3

CN = Total CN * Area / Total Area = **36.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 17.24 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **2.10 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 416
POND NAME: 416 (*Pond 1 in Permit No. 42-127-2852ANG, Application No. 78808-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.57 ac-ft
1" over Total Area = 2.43 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.43 ac-ft

Required Attenuation Volume:

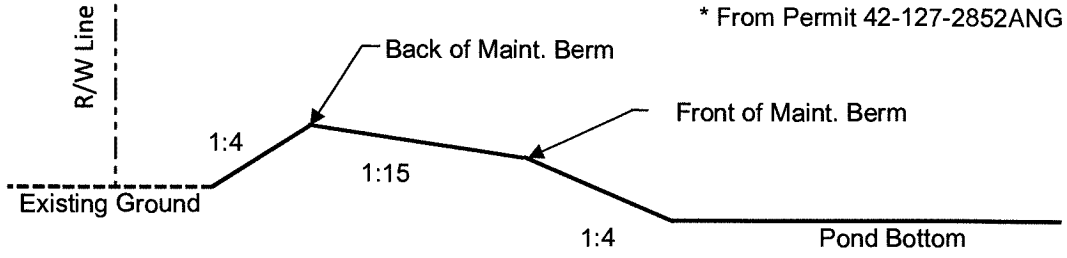
Total Runoff: Q_{pre} = 1.24 in
Q_{post} = 2.10 in
ΔQ = 0.86 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.09 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 17.8 ft @ 1:4

Existing Ground Elevation = 35.0 ft
Seasonal High Water Elevation* = 25.0 ft
Lowest EOP Elevation = 41.0 ft (NAVD)
* From Permit 42-127-2852ANG



Pond Section

POND 416

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
36.95	Back of Maintenance Berm	1.61 ac			8.61 ac-ft
35.95	Front of Maintenance Berm	1.29 ac			7.16 ac-ft
34.95	---	1.21 ac			5.91 ac-ft
31.95	---	0.98 ac			2.63 ac-ft
28.95	Pond Bottom	0.77 ac			0.00 ac-ft

Required Treatment Volume: 2.43 ac-ft
Top El. Of Treatment Volume: 31.73
Required Treat. Vol. + Atten.: 4.53 ac-ft
Top El. Of Treat. Vol. + Atten.: 33.68

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Lake Mary, FL 32746

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 417
POND NAME: 417 (Pond 2 in *Permit Application No. 42-127-2852ANG, 22827-0 & 22827-6)

STATION LIMITS: From: 41+87 To: 51+59 *N. Kentucky Ave. Roadway Length: 972 ft R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	2 ft	1	2 ft
Outside Shoulder	2 ft	1	2 ft
	Total Impervious Width:		28 ft

Additional Impervious: 2.32 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 2.94 ac
*Pervious Roadway Area: 5.85 ac
Total Roadway Area: 8.79 ac

Pond Area:

Pervious Pond Area: 1.71 ac
Water Surface Area: 0.00 ac
Total Pond Area: 1.71 ac

Total Area:

Impervious Area: 2.94 ac
Pervious Area: 7.56 ac
Water Surface Area: 0.00 ac
Total Area: 10.50 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.94 ac	288.6
Water Area	---	100	0.00 ac	0.0
Wood or Forest (Good Cover)	A	25	7.56 ac	188.9
		Total:	10.50 ac	477.5

CN = Total CN * Area / Total Area = **45.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 11.99 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **3.33 in**

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Lake Mary, FL 32746

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 417
POND NAME: 417 (Pond 2 in *Permit Application No. 42-127-2852ANG, 22827-0 & 22827-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	12 ft	1	12 ft
Outside Shoulder	12 ft	1	12 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.93 ac
Impervious Roadway Area:	5.54 ac
Pervious Roadway Area:	3.25 ac
Total Roadway Area:	8.79 ac

Pond Area:

Pervious Pond Area:	0.80 ac	
Water Surface Area:	0.91 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.71 ac	

Total Area:

Impervious Area:	5.54 ac
Pervious Area:	4.05 ac
Water Surface Area:	0.91 ac
Total Area:	10.50 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	5.54 ac	542.5
Water Area	---	100	0.91 ac	91.0
Wood or Forest (Good Cover)	A	25	2.34 ac	58.6
Grass (Good Condition)	A	39	1.71 ac	66.7
		Total:	10.50 ac	758.8

CN = Total CN * Area / Total Area = **72.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.84 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.07 in**

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		date:
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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 417
POND NAME: 417 (Pond 2 in *Permit Application No. 42-127-2852ANG, 22827-0 & 22827-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.01 ac-ft
1" over Total Area = 0.88 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.01 ac-ft

Required Attenuation Volume:

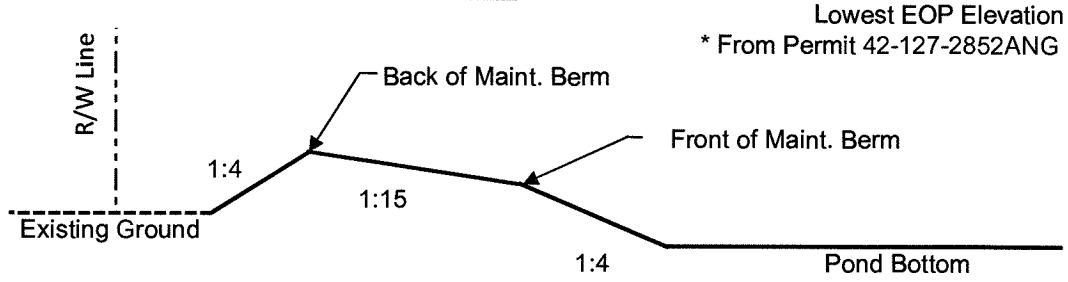
Total Runoff: Q_{pre} = 3.33 in
Q_{post} = 7.07 in
ΔQ = 3.74 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 3.27 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 50.2 ft @ 1:4

Existing Ground Elevation = 50.0 ft
Seasonal High Water Elevation* = 30.0 ft
Lowest EOP Elevation = 47.5 ft (NAVD)
* From Permit 42-127-2852ANG



Pond Section

POND 417

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
39.95	Back of Maintenance Berm	1.71 ac			7.22 ac-ft
38.95	Front of Maintenance Berm	1.35 ac			5.69 ac-ft
37.95	---	1.26 ac			4.39 ac-ft
35.95	---	1.08 ac			2.05 ac-ft
33.70	Pond Bottom	0.74 ac			0.00 ac-ft

Required Treatment Volume: 1.01 ac-ft
Required Treat. Vol. + Atten.: 4.29 ac-ft
Top El. Of Treatment Volume: 34.81
Top El. Of Treat. Vol. + Atten.: 37.86

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 418
POND NAME: 418 (Retention Pond VB-2 in West Volusia Beltline Project)

STATION LIMITS: From: 010+00 To: 035+00

Roadway Length: 2500 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11 ft	2	22 ft
Shoulder	5 ft	1	5 ft
Shoulder	5 ft	1	5 ft
	Total Impervious Width:		32 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.62 ac
Impervious Roadway Area:	5.46 ac
Pervious Roadway Area:	9.86 ac
Total Roadway Area:	15.32 ac

Pond Area:

Pervious Pond Area:	0.57 ac	
Water Surface Area:	0.67 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.24 ac	

Total Area:

Impervious Area:	5.46 ac
Pervious Area:	10.43 ac
Water Surface Area:	0.67 ac
Total Area:	16.56 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	5.46 ac	534.7
Water Area	---	100	0.67 ac	67.0
Open Land (Good)	A	39	10.43 ac	406.9
		Total:	16.56 ac	1008.6

CN = Total CN * Area / Total Area = **60.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.42 in

Precipitation (P) = * 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.52 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 418
POND NAME: 418 (Retention Pond VB-2 in West Volusia Beltline Project)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.26 ac-ft
1" over Total Area = 1.38 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.38 ac-ft

Required Attenuation Volume:

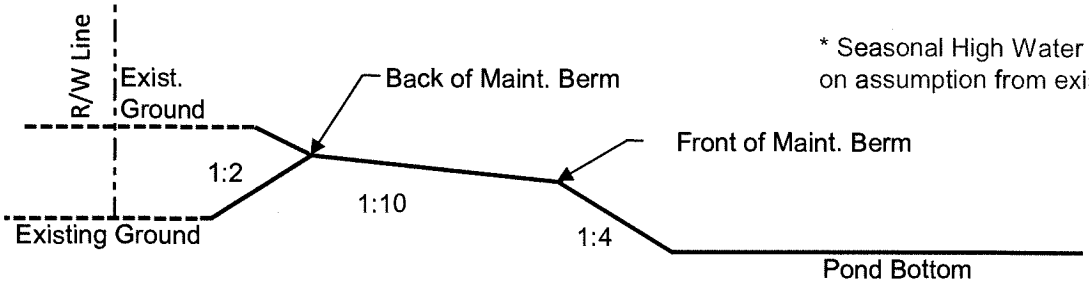
Total Runoff: Q_{post} = 5.52 in

Attenuation V_{req} = ΔQ/12 x Total Area = 7.61 ac-ft

Maintenance Area Width = 10.0 ft @ 1:10
Pond Tie-In Width = 16.0 ft @ 1:2

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation* = 25.0 ft
Lowest EOP Elevation = 26.8 ft

* Seasonal High Water El. based on assumption from exist. permit.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
37.00	Back of Maintenance Berm	1.24 ac			7.88 ac-ft
36.00	Front of Maintenance Berm	1.04 ac			6.74 ac-ft
35.00	---	0.97 ac			5.74 ac-ft
31.00	---	0.76 ac			2.28 ac-ft
27.50	Pond Bottom	0.54 ac			0.00 ac-ft

Required Treatment Volume: 1.38 ac-ft
Top El. Of Treatment Volume: 29.97

Required Treatment Volume: 7.61 ac-ft
Top El. Of Treat. Vol. + Atten.: 36.76

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: A
POND NAME: A (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 010+18 To: 055+27

Roadway Length: 4509 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	1.92 ac
Impervious Roadway Area:	9.37 ac
Pervious Roadway Area:	3.92 ac
Total Roadway Area:	13.29 ac

Pond Area:

Pervious Pond Area:	1.00 ac	
Water Surface Area:	5.56 ac	(At the Treatment Volume Stage)
Total Pond Area:	6.56 ac	

Total Area:

Impervious Area:	9.37 ac
Pervious Area:	4.92 ac
Water Surface Area:	5.56 ac
Total Area:	19.85 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.37 ac	918.5
Water Area	---	100	5.56 ac	556.0
Open Land (Good)	A	39	2.70 ac	105.2
Wood (Good)	A	25	2.22 ac	55.5
		Total:	19.85 ac	1635.2

CN = Total CN * Area / Total Area = **82.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.14 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **8.40 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: A
POND NAME: A (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.80 ac-ft
1" over Total Area = 1.65 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.80 ac-ft

Required Attenuation Volume:

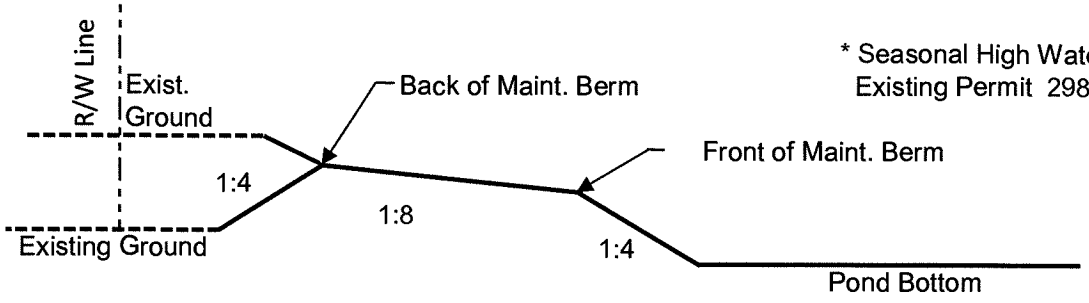
Total Runoff: Q_{post} = 8.40 in

Attenuation V_{req} = ΔQ/12 x Total Area = 13.90 ac-ft

Maintenance Area Width = 16.0 ft @ 1:8
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 25.0 ft
Seasonal High Water Elevation* = 16.8 ft
Lowest EOP Elevation = 26.8 ft

* Seasonal High Water El. From Existing Permit 29810-1.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
21.00	Back of Maintenance Berm	6.56 ac			19.73 ac-ft
20.00	Front of Maintenance Berm	6.17 ac			13.36 ac-ft
19.00	---	5.80 ac			7.38 ac-ft
18.00	---	5.61 ac			1.67 ac-ft
17.70	Pond Bottom	5.55 ac			0.00 ac-ft

Required Treatment Volume: 1.80 ac-ft
Top El. Of Treatment Volume: 18.02

Required Treatment Volume: 13.90 ac-ft
Top El. Of Treat. Vol. + Atten.: 20.08

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 55+27 To: 68+28
Roadway Length: 1301 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.33 ac
Impervious Roadway Area:	2.48 ac
Pervious Roadway Area:	6.75 ac
Total Roadway Area:	9.23 ac

Pond Area:

Pervious Pond Area:	0.77 ac	
Water Surface Area:	1.13 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.90 ac	

Total Area:

Impervious Area:	2.48 ac
Pervious Area:	7.52 ac
Water Surface Area:	1.13 ac
Total Area:	11.13 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.48 ac	243.1
Water Area	---	100	1.13 ac	113.0
Open Land (Good)	A	39	4.95 ac	193.0
Wood (Good)	A	25	2.57 ac	64.3
		Total:	11.13 ac	613.4

CN = Total CN * Area / Total Area = **55.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.15 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **4.70 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.72 ac-ft
1" over Total Area = 0.93 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.93 ac-ft

Required Attenuation Volume:

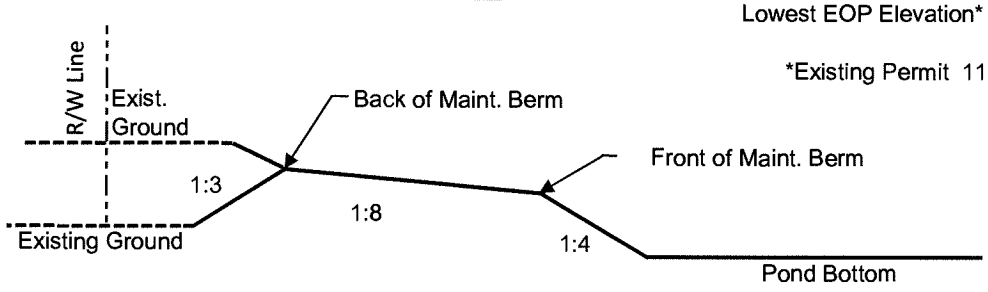
Total Runoff: Q_{post} = 4.70 in

Attenuation V_{req} = ΔQ/12 x Total Area = 4.36 ac-ft

Maintenance Area Width = 16.0 ft @ 1:8
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation* = 32.6 ft
Lowest EOP Elevation* = 41.3 ft

*Existing Permit 111974-1.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
41.00	Back of Maintenance Berm	1.90 ac			6.93 ac-ft
40.00	Front of Maintenance Berm	1.64 ac			5.16 ac-ft
39.00	---	1.39 ac			3.64 ac-ft
38.00	---	1.27 ac			2.31 ac-ft
36.00	Pond Bottom	1.04 ac			0.00 ac-ft

Required Treatment Volume: 0.93 ac-ft
Top El. Of Treatment Volume: 36.80

Required Treatment Volume: 4.36 ac-ft
Top El. Of Treat. Vol. + Atten.: 39.54

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		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B1 (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 55+27 To: 68+28
Roadway Length: 1301 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.33 ac
Impervious Roadway Area:	2.48 ac
Pervious Roadway Area:	6.75 ac
Total Roadway Area:	9.23 ac

Pond Area:

Pervious Pond Area:	0.83 ac	
Water Surface Area:	0.92 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.75 ac	

Total Area:

Impervious Area:	2.48 ac
Pervious Area:	7.58 ac
Water Surface Area:	0.92 ac
Total Area:	10.98 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.48 ac	243.1
Water Area	---	100	0.92 ac	92.0
Open Land (Good)	A	39	5.01 ac	195.4
Wood (Good)	A	25	2.57 ac	64.3
		Total:	10.98 ac	594.7

CN = Total CN * Area / Total Area = **54.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.46 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **4.57 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B1 (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.72 ac-ft
1" over Total Area = 0.92 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.92 ac-ft

Required Attenuation Volume:

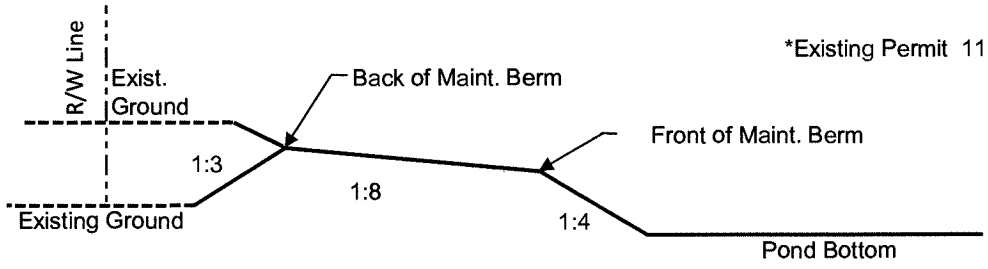
Total Runoff: Q_{post} = 4.57 in

Attenuation V_{req} = ΔQ/12 x Total Area = 4.18 ac-ft

Maintenance Area Width = 16.0 ft @ 1:8
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 45.0 ft
Seasonal High Water Elevation* = 32.6 ft
Lowest EOP Elevation* = 41.3 ft

*Existing Permit 111974-1.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
41.00	Back of Maintenance Berm	1.75 ac			5.64 ac-ft
40.00	Front of Maintenance Berm	1.26 ac			4.14 ac-ft
39.00	---	1.15 ac			2.93 ac-ft
38.00	---	1.03 ac			1.84 ac-ft
36.00	Pond Bottom	0.81 ac			0.00 ac-ft

Required Treatment Volume: 0.92 ac-ft
Top El. Of Treatment Volume: 36.99

Required Treatment Volume: 4.18 ac-ft
Top El. Of Treat. Vol. + Atten.: 40.15

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: C
POND NAME: C (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 68+28
To: 76+04

Roadway Length: 776 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	5 ft	2	10 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		74 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.58 ac
Impervious Roadway Area:	4.90 ac
Pervious Roadway Area:	7.98 ac
Total Roadway Area:	12.88 ac

Pond Area:

Pervious Pond Area:	0.94 ac	
Water Surface Area:	1.26 ac	(At the Treatment Volume Stage)
Total Pond Area:	2.20 ac	

Total Area:

Impervious Area:	4.90 ac
Pervious Area:	8.92 ac
Water Surface Area:	1.26 ac
Total Area:	15.08 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.90 ac	480.1
Water Area	---	100	1.26 ac	126.0
Open Land (Good)	A	39	8.92 ac	347.9
		Total:	15.08 ac	954.0

CN = Total CN * Area / Total Area = **63.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 5.81 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.84 in**

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		date:
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checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: C
POND NAME: C (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.14 ac-ft
1" over Total Area = 1.26 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.26 ac-ft

Required Attenuation Volume:

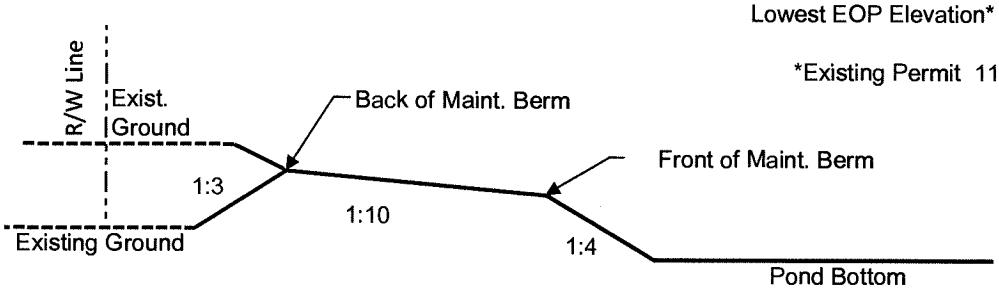
Total Runoff: Q_{post} = 5.84 in

Attenuation V_{req} = ΔQ/12 x Total Area = 7.34 ac-ft

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 43.0 ft @ 1:3

Existing Ground Elevation = 60.0 ft
Seasonal High Water Elevation* = 57.0 ft
Lowest EOP Elevation* = 73.0 ft

*Existing Permit 111974-1



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
71.00	Back of Maintenance Berm	2.20 ac			9.14 ac-ft
70.00	Front of Maintenance Berm	1.73 ac			7.17 ac-ft
69.00	---	1.61 ac			5.50 ac-ft
67.00	---	1.37 ac			2.52 ac-ft
65.00	Pond Bottom	1.15 ac			0.00 ac-ft

Required Treatment Volume: 1.26 ac-ft
Top El. Of Treatment Volume: 66.00
Required Treat. Vol. + Atten.: 7.34 ac-ft
Top El. Of Treat. Vol. + Atten.: 70.11

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

		date:
made by:	LDP	20-Dec-14
checked by:	BJS	20-Dec-14

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: D
POND NAME: D (Normandy Blvd: Depression in Permit No. 42-127-1035ANG)

STATION LIMITS: From:* 26+87 To: 48+00
Roadway Length: 2113 ft
R/W Width: VARIES
* Stationing from Permit No. 42-127-1035ANG

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
		Total Impervious Width:	48 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.00 ac
Impervious Roadway Area:	2.33 ac
Pervious Roadway Area:	67.97 ac
Total Roadway Area:	70.30 ac

Pond Area:

Pervious Pond Area:	4.57 ac	
Water Surface Area:	1.77 ac	(At the Treatment Volume Stage)
Total Pond Area:	6.34 ac	

Total Area:

Impervious Area:	2.33 ac
Pervious Area:	72.54 ac
Water Surface Area:	1.77 ac
Total Area:	76.64 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.33 ac	228.2
Water Area	---	100	1.77 ac	177.0
Open Land (Grass cover 75% or more)	A	25	70.58 ac	1764.5
Wood or Forest Land (Grass cover 75% or more)	A	39	1.96 ac	76.4
		Total:	76.64 ac	2246.2

CN = Total CN * Area / Total Area = **29.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 24.12 in

Precipitation (P) = 11.0 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **1.26 in**

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

		date:
made by:	LDP	20-Dec-14
checked by:	BJS	20-Dec-14

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: D
POND NAME: D (Normandy Blvd: Depression in Permit No. 42-127-1035ANG)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 3.44 ac-ft
1" over Total Area = 6.39 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 6.39 ac-ft

Required Attenuation Volume:

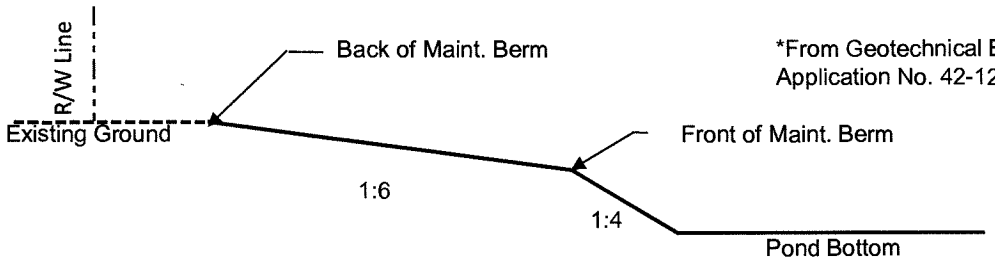
Total Runoff: Q_{post} = 1.26 in

Attenuation V_{req} = ΔQ/12 x Total Area = 8.04 ac-ft

Maintenance Area Width = 6.0 ft @ 1:6
Pond Tie-In Width = 34.2 ft @ 1:4

Existing Ground Elevation = 70.0 ft
Seasonal High Water Elevation* = 43.5 ft
Lowest EOP Elevation = 66.2 ft

*From Geotechnical Borings in Application No. 42-127-1035ANG



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
63.95	Back of Maintenance Berm	6.34 ac			43.10 ac-ft
62.95	Front of Maintenance Berm	5.20 ac			37.33 ac-ft
59.95	---	4.32 ac			23.05 ac-ft
55.95	---	2.53 ac			9.35 ac-ft
48.95	Pond Bottom	0.14 ac			0.00 ac-ft

Required Treatment Volume: 6.39 ac-ft
Top El. Of Treatment Volume: 53.73

Required Treatment Volume: 8.04 ac-ft
Top El. Of Treat. Vol. + Atten.: 55.57

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400
POND NAME: 400 (Pond RR3 in Permit No. 64105-3)

STATION LIMITS: From: 2595+00
To: 2673+00

Roadway Length: 7800 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 9.07 ac*
Pervious Roadway Area: 44.73 ac
Total Roadway Area: 53.80 ac

Pond Area:

Pervious Pond Area: 28.35 ac
Water Surface Area: 0.00 ac
Total Pond Area: 28.35 ac

* Existing Impervious Area from permit.

Total Area:

Impervious Area: 9.07 ac
Pervious Area: 73.08 ac
Water Surface Area: 0.00 ac
Total Area: 82.15 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.07 ac	888.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	7.16 ac	350.7
Open Land (Grass cover 50% - 75%)	A/D,B/D,C/D	84	65.92 ac	5537.4
		Total:	82.15 ac	6777.0

CN = Total CN * Area / Total Area = **82.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.12 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.40 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400
POND NAME: 400 (Pond RR3 in Permit No. 64105-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 0.96 ac
(ramps, turn lanes, etc.)

Pervious Roadway Area: 14.88 ac
Total Roadway Area: 53.80 ac

Pond Area:

Pervious Pond Area: 4.55 ac
Water Surface Area: 23.80 ac
Total Pond Area: 28.35 ac

Total Area:

Impervious Area: 38.92 ac
Pervious Area: 19.43 ac
Water Surface Area: 23.80 ac
Total Area: 82.15 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	38.92 ac	3814.3
Water Area	---	100	23.80 ac	2380.0
Open Land (Grass cover 50% - 75%)	A	49	1.17 ac	57.1
Open Land (Grass cover 50% - 75%)	A/D, B/D & C/D	84	12.04 ac	1011.8
Gravel (Rail Corridor)	A	76	1.17 ac	88.6
Gravel (Rail Corridor)	A/D, B/D & C/D	91	5.05 ac	459.6
		Total:	82.15 ac	7811.4

CN = Total CN * Area / Total Area = **95.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.52 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.91 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400
POND NAME: 400 (Pond RR3 in Permit No. 64105-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SJRWMD

Required Treatment Volume:

2.5" over Impervious Area = 8.11 ac-ft
1" over Total Area = 6.85 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 8.11 ac-ft

Additional 50% Treatment: 4.05 ac-ft (for compensating treatment)

Total Provided Treatment: 12.16 ac-ft

Required Attenuation Volume:

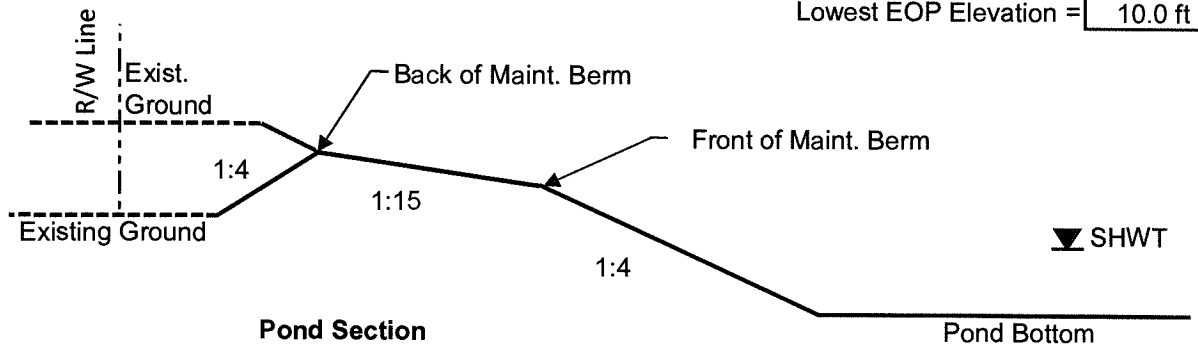
Total Runoff: Q_{pre} = 6.40 in
Q_{post} = 7.91 in
ΔQ = 1.51 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 10.37 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 10.0 ft
Initial Water Elevation = 5.5 ft
Lowest EOP Elevation = 10.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
10.00	Back of Maintenance Berm	28.35 ac			114.14 ac-ft
9.00	Front of Maintenance Berm	25.92 ac			87.01 ac-ft
5.85	---	24.01 ac			8.37 ac-ft
5.50	Initial Water Elevation	23.80 ac			0.00 ac-ft
-2.00	Pond Bottom	12.59 ac			

Required Treatment Volume: 12.16 ac-ft
Required Treat. Vol. + Atten.: 22.53 ac-ft

Top El. Of Treatment Volume: 6.00
Top El. Of Treat. Vol. + Atten.: 6.42

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

STATION LIMITS: From: 2673+00
To: 2745+00

Roadway Length: 7200 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 13.88 ac
Pervious Roadway Area: 35.70 ac
Total Roadway Area: 49.59 ac

Total Area:

Impervious Area: 13.88 ac
Pervious Area: 35.70 ac
Water Surface Area: 0.00 ac
Total Area: 49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	13.88 ac	1360.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	35.70 ac	2999.0
		Total:	49.59 ac	4359.7

CN = Total CN * Area / Total Area = **87.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.37 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.05 in**

HNTB Corporation
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.78 ac
Impervious Roadway Area:	35.82 ac
Pervious Roadway Area:	13.77 ac
Total Roadway Area:	49.59 ac

Total Area:

Impervious Area:	35.82 ac
Pervious Area:	13.77 ac
Water Surface Area:	0.00 ac
Total Area:	49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	35.82 ac	3510.5
Water Area	---	100	0.00 ac	0.0
Gravel (Rail Corridor)	C/D, B/D	91	6.75 ac	613.8
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	7.02 ac	589.7
		Total:	49.59 ac	4714.0

CN = Total CN * Area / Total Area = **95.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.52 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.91 in**

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

		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

POND SIZING : DRY TREATMENT SWALES (OPEN BASIN) - SJRWMD

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 5.80 ac-ft
1" over Total Area = 4.13 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 5.80 ac-ft

Additional 50% Treatment: 2.90 ac-ft (for compensating treatment)

Total Provided Treatment: 8.70 ac-ft

Swale Bottom Sizing:

Treatment Swale Limits: Sta. 2673+20 to Sta. 2745+00

LT side:	
Pond Length:	7180 ft
Front Side Slope:	6
Back Side Slope:	4
Pond Storage Depth:	2.5 ft
Pond Bottom Width:	5 ft

RT side:	
Pond Length:	7180 ft
Front Side Slope:	6
Back Side Slope:	4
Pond Storage Depth:	2.5 ft
Pond Bottom Width:	5 ft

HNTB Corporation
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Lake Mary, FL 32746

		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-A

LT SIDE

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	4.94 ac	7180 ft	30 ft	7.21 ac-ft
7.00	---	4.12 ac	7180 ft	25 ft	4.94 ac-ft
6.00	---	2.47 ac	7180 ft	15 ft	1.65 ac-ft
5.00	Swale Bottom	0.82 ac	7180 ft	5 ft	0.00 ac-ft

RT SIDE

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	4.94 ac	7180 ft	30 ft	7.21 ac-ft
7.00	---	4.12 ac	7180 ft	25 ft	4.94 ac-ft
6.00	---	2.47 ac	7180 ft	15 ft	1.65 ac-ft
5.00	Swale Bottom	0.82 ac	7180 ft	5 ft	0.00 ac-ft

LT + RT SIDE

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	9.89 ac			14.42 ac-ft
7.00	---	8.24 ac			9.89 ac-ft
6.00	---	4.94 ac			3.30 ac-ft
5.00	Swale Bottom	1.65 ac			0.00 ac-ft

Required Treatment Volume: 8.70 ac-ft

Top El. Of Treatment Volume: 6.82

HNTB Corporation
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		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-B

STATION LIMITS: From: 2673+00
To: 2745+00

Roadway Length: 7200 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 13.88 ac
Pervious Roadway Area: 35.70 ac
Total Roadway Area: 49.59 ac

Total Area:

Impervious Area: 13.88 ac
Pervious Area: 35.70 ac
Water Surface Area: 0.00 ac
Total Area: 49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	13.88 ac	1360.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	35.70 ac	2999.0
		Total:	49.59 ac	4359.7

CN = Total CN * Area / Total Area = **87.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.37 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.05 in**

HNTB Corporation
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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-B

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
		Total Impervious Width:	212 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.78 ac
Impervious Roadway Area:	35.82 ac
Pervious Roadway Area:	13.77 ac
Total Roadway Area:	49.59 ac

Total Area:

Impervious Area:	35.82 ac
Pervious Area:	13.77 ac
Water Surface Area:	0.00 ac
Total Area:	49.59 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	35.82 ac	3510.5
Water Area	---	100	0.00 ac	0.0
Gravel (Rail Corridor)	C/D, B/D	91	6.75 ac	613.8
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	7.02 ac	589.7
		Total:	49.59 ac	4714.0

CN = Total CN * Area / Total Area = **95.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.52 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.91 in**

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

		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: TREATMENT SWALES 401-B

POND SIZING : DRY TREATMENT SWALES (OPEN BASIN) - SJRWMD

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 5.80 ac-ft
1" over Total Area = 4.13 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 5.80 ac-ft

Additional 50% Treatment: **2.90 ac-ft** (for compensating treatment)

Total Provided Treatment: **8.70 ac-ft**

Swale Bottom Sizing:

Treatment Swale Limits: Sta. 2673+20 to Sta. 2745+00

RT side:

Pond Length:	7180 ft
Front Side Slope:	6
Back Side Slope:	4
Pond Storage Depth:	2.5 ft
Pond Bottom Width:	20 ft

RT SIDE ONLY

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
7.50	---	7.42 ac	7180 ft	45 ft	13.39 ac-ft
7.00	---	6.59 ac	7180 ft	40 ft	9.89 ac-ft
6.00	---	4.94 ac	7180 ft	30 ft	4.12 ac-ft
5.00	Swale Bottom	3.30 ac	7180 ft	20 ft	0.00 ac-ft

Required Treatment Volume: 8.70 ac-ft

Top El. Of Treatment Volume: 6.79

HNTB Corporation
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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: 401

STATION LIMITS: From: 2673+00
To: 2745+00

Roadway Length: 7200 ft
R/W Width: 446 ft VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 13.88 ac
Pervious Roadway Area: 59.88 ac
Total Roadway Area: 73.77 ac

Pond Area:

Pervious Pond Area: 16.53 ac
Water Surface Area: 0.00 ac
Total Pond Area: 16.53 ac

Total Area:

Impervious Area: 13.88 ac
Pervious Area: 76.41 ac
Water Surface Area: 0.00 ac
Total Area: 90.30 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	13.88 ac	1360.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	76.41 ac	6418.8
		Total:	90.30 ac	7779.5

CN = Total CN * Area / Total Area = **86.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.61 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.84 in**

HNTB Corporation
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		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: 401

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 4.71 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 39.75 ac
Pervious Roadway Area: 34.02 ac
Total Roadway Area: 73.77 ac

Pond Area:

Pervious Pond Area: 2.82 ac
Water Surface Area: 13.71 ac
Total Pond Area: 16.53 ac

Total Area:

Impervious Area: 39.75 ac
Pervious Area: 36.84 ac
Water Surface Area: 13.71 ac
Total Area: 90.30 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	39.75 ac	3895.6
Water Area	---	100	13.71 ac	1371.0
Gravel (Rail Corridor)	C/D, B/D	91	18.05 ac	1642.6
Open Land (Grass cover 50% - 75%)	C/D, B/D	84	22.47 ac	1887.5
		Total:	93.98 ac	8796.7

CN = Total CN * Area / Total Area = **93.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 0.68 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.73 in**

HNTB Corporation
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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 401
POND NAME: 401

POND SIZING : WET DETENTION POND (OPEN BASIN) - SJRWMD

Required Treatment Volume:

2.5" over Impervious Area = 8.28 ac-ft
1" over Total Area = 7.52 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 8.28 ac-ft

Additional 50% Treatment: 4.14 ac-ft (for compensating treatment)

Total Provided Treatment: 12.42 ac-ft

Required Attenuation Volume:

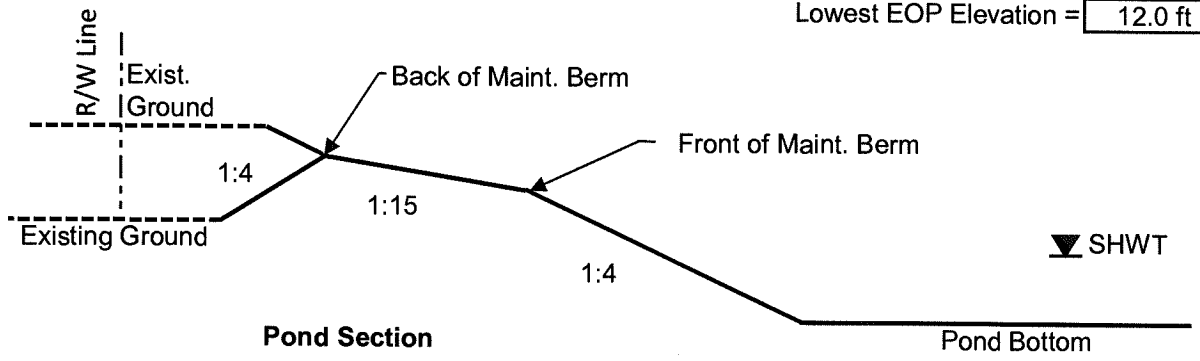
Total Runoff: Q_{pre} = 6.84 in
Q_{post} = 7.73 in
ΔQ = 0.90 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 6.74 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 30.0 ft @ 1:4

Existing Ground Elevation = 15.0 ft
Initial Water Elevation = 5.5 ft
Lowest EOP Elevation = 12.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
10.00	Back of Maintenance Berm	16.53 ac			67.02 ac-ft
9.00	Front of Maintenance Berm	15.23 ac			51.14 ac-ft
6.00	---	14.21 ac			6.98 ac-ft
5.50	Initial Water Elevation	13.71 ac			0.00 ac-ft
-5.00	Pond Bottom	10.36 ac			

Required Treatment Volume: 8.28 ac-ft
Required Treat. Vol. + Atten.: 19.16 ac-ft

Top El. Of Treatment Volume: 6.09
Top El. Of Treat. Vol. + Atten.: 6.83

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

		date:
made by:	LDP	7-Dec-15
checked by:	BJS	7-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 400 & 401

PROPOSED CONDITION - UNTREATED AREA

Station Limits: From: 2583+00 To: 2595+00 Roadway Length: 1200 ft R/W Width: 250 ft

Impervious Roadway Area: 5.84 ac
Pervious Roadway Area: 1.06 ac
Total Roadway Area: 6.90 ac

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Station Limits: From: 2745+00 To: 2765+00 Roadway Length: 2000 ft R/W Width: 250 ft

Additional Impervious (Ramps, etc.) 0.79 ac
Impervious Roadway Area: 10.52 ac
Pervious Roadway Area: 0.97 ac
Total Roadway Area: 11.49 ac

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	6 ft	0	0 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Station Limits: From: 43+50 To: 72+22 and From: 85+00 To: 90+50

Roadway Area: Dirksen Drive
Proposed impervious: **2.29 ac** (This difference from the pre/post)
(Park and Ride and Widening)

Station Limits: Dirksen Drive to 250 Ft along Deltona Boulevard

Roadway Area: Deltona Boulevard
Proposed impervious: **0.06 ac** (This difference from the pre/post)
(Additional turn lane)

Total Area:
Impervious Roadway Area: 18.72 ac
Pervious Roadway Area: 2.02 ac
Total Roadway Area: 20.74 ac

Pond 400 and Treatment Swales 401 provide 95% pollutant removal and the minimum required is 80%.

Pond 400 Area = 82.15 ac
Treatment Swale 401 Area = 49.59 ac
Total Area = 131.74 ac

Overall Efficiency = $\frac{(131.74 * 95) + (20.74 * 0)}{(131.74+20.74)}$ = **82.1 %**

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

		date:
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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

STATION LIMITS: From: 2765+00 To: 2845+00
Roadway Length: 8000 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond and treatment swales were built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious (ramps, turn lanes, etc.): 5.54 ac

Impervious Roadway Area: 20.97 ac
Pervious Roadway Area: 47.94 ac
Total Roadway Area: 68.91 ac

Pond Area:

Pervious Pond Area: 16.51 ac
Water Surface Area: 0.00 ac
Total Pond Area: 16.51 ac

Total Area:

Impervious Area: 20.97 ac
Pervious Area: 64.45 ac
Water Surface Area: 0.00 ac
Total Area: 85.42 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	20.97 ac	2054.8
Water Area	---	100	0.00 ac	0.0
Wood or Forest Land	A	45	14.57 ac	655.5
Open Land (Grass cover 75% or more)	A/D & B/D	80	2.40 ac	192.0
Open Land (Grass cover 50% - 75%)	A	49	47.49 ac	2326.8
		Total:	85.42 ac	5229.1

CN = Total CN * Area / Total Area = **61.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.34 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **3.86 in**

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

		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 6.58 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 45.51 ac
Pervious Roadway Area: 23.40 ac
Total Roadway Area: 68.91 ac

Pond Area:

Pervious Pond Area: 7.09 ac
Water Surface Area: 9.42 ac
Total Pond Area: 16.51 ac

Total Area:

Impervious Area: 45.51 ac
Pervious Area: 30.49 ac
Water Surface Area: 9.42 ac
Total Area: 85.42 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	45.51 ac	4460.5
Water Area	---	100	9.42 ac	942.0
Gravel (Rail Corridor)	A	76	6.61 ac	502.5
Open Land (Grass cover 75% or greater)	A/D & B/D	80	1.01 ac	80.5
Open Land (Grass cover 50% - 75%)	A	49	22.87 ac	1120.5
		Total:	85.42 ac	7105.9

CN = Total CN * Area / Total Area = **83.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.02 in

Precipitation (P) = 8.5 in (for 25yr/24hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **6.48 in**

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610 Crescent Executive Court, Suite 400
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		date:
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checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

POND SIZING : WET DETENTION POND (OPEN BASIN) - SJRWMD

Required Treatment Volume:

2.5" over Impervious Area = 9.48 ac-ft
1" over Total Area = 7.12 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 9.48 ac-ft

Required Attenuation Volume:

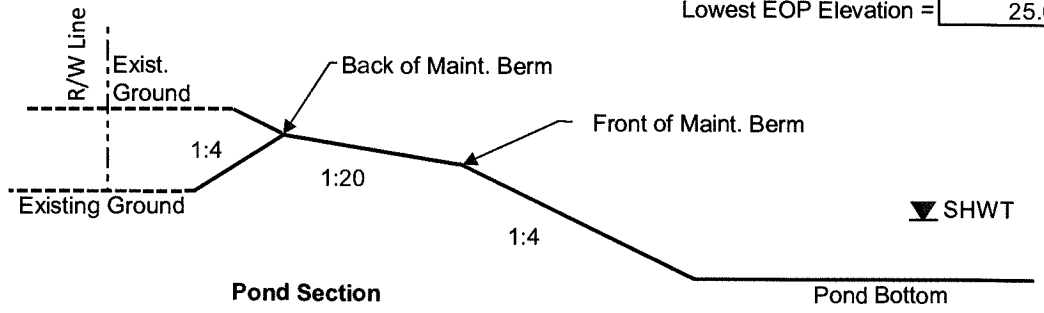
Total Runoff: Q_{pre} = 3.86 in
Q_{post} = 6.48 in
ΔQ = 2.62 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 18.67 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 20.0 ft
Initial Water Elevation = 14.1 ft
Lowest EOP Elevation = 25.0 ft



Pond Section

POND 402A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	6.84 ac			23.33 ac-ft
18.00	Front of Maintenance Berm	5.02 ac			17.40 ac-ft
17.00	---	4.73 ac			12.53 ac-ft
15.00	---	4.16 ac			3.64 ac-ft
14.10	Initial Water Elevation	3.92 ac			0.00 ac-ft
3.50	Pond Bottom	2.07 ac			

POND 402B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	3.72 ac			14.31 ac-ft
18.00	Front of Maintenance Berm	3.05 ac			10.93 ac-ft
17.00	---	2.92 ac			7.94 ac-ft
15.00	---	2.67 ac			2.35 ac-ft
14.10	Initial Water Elevation	2.56 ac			0.00 ac-ft
3.50	Pond Bottom	1.96 ac			

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

		date:
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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 402
POND NAME: 402A, 402B, 402C, 402D, 402E & 402F (Pond SS-2 in Permit No. 64105-3)

POND 402C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	2.09 ac			6.39 ac-ft
18.00	Front of Maintenance Berm	1.43 ac			4.63 ac-ft
17.00	---	1.30 ac			3.26 ac-ft
15.00	---	1.06 ac			0.90 ac-ft
14.10	Initial Water Elevation	0.95 ac			0.00 ac-ft
3.50	Pond Bottom	0.36 ac			

POND 402D

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	0.82 ac			2.29 ac-ft
18.00	Front of Maintenance Berm	0.52 ac			1.62 ac-ft
17.00	---	0.46 ac			1.13 ac-ft
15.00	---	0.36 ac			0.31 ac-ft
14.10	Initial Water Elevation	0.32 ac			0.00 ac-ft
3.50	Pond Bottom	0.11 ac			

POND 402E

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	0.64 ac			1.66 ac-ft
18.00	Front of Maintenance Berm	0.38 ac			1.15 ac-ft
17.00	---	0.33 ac			0.79 ac-ft
15.00	---	0.25 ac			0.21 ac-ft
14.10	Initial Water Elevation	0.22 ac			0.00 ac-ft
3.50	Pond Bottom	0.05 ac			

POND 402F

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	2.40 ac			8.52 ac-ft
18.00	Front of Maintenance Berm	1.84 ac			6.40 ac-ft
17.00	---	1.74 ac			4.61 ac-ft
15.00	---	1.53 ac			1.34 ac-ft
14.10	Initial Water Elevation	1.45 ac			0.00 ac-ft
3.50	Pond Bottom	0.97 ac			

POND 402A + POND 402B + POND 402C + POND 402D + POND 402E + POND 402F

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
19.00	Back of Maintenance Berm	16.51 ac			56.50 ac-ft
18.00	Front of Maintenance Berm	12.24 ac			42.12 ac-ft
17.00	---	11.48 ac			30.26 ac-ft
15.00	---	10.03 ac			8.75 ac-ft
14.10	Initial Water Elevation	9.42 ac			0.00 ac-ft
3.50	Pond Bottom	5.52 ac			

Required Treatment Volume: 9.48 ac-ft
Required Treat. Vol. + Atten.: 28.15 ac-ft

Top El. Of Treatment Volume: 15.07
Top El. Of Treat. Vol. + Atten.: 16.82

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 403
POND NAME: 403 (Consisted of four ditch block systems in Permit No. 64105-3)

STATION LIMITS: From: 2845+00 To: 2891+00
Roadway Length: 4600 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.87 ac
Pervious Roadway Area: 32.15 ac
Total Roadway Area: 41.02 ac

Pond Area:

Pervious Pond Area: 14.12 ac
Water Surface Area: 0.00 ac
Total Pond Area: 14.12 ac

Total Area:

Impervious Area: 8.87 ac
Pervious Area: 46.27 ac
Water Surface Area: 0.00 ac
Total Area: 55.14 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.87 ac	869.3
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	46.27 ac	2267.2
		Total:	55.14 ac	3136.5

CN = Total CN * Area / Total Area = **56.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.58 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.74 in**

HNTB Corporation
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Lake Mary, FL 32746

		date:
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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 403
POND NAME: 403 (Consisted of four ditch block systems in Permit No. 64105-3)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 1.43 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 23.82 ac
Pervious Roadway Area: 17.20 ac
Total Roadway Area: 41.02 ac

Pond Area:

Pervious Pond Area: 3.98 ac
Water Surface Area: 10.14 ac (At the Treatment Volume Stage)
Total Pond Area: 14.12 ac

Total Area:

Impervious Area: 23.82 ac
Pervious Area: 21.18 ac
Water Surface Area: 10.14 ac
Total Area: 55.14 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	23.82 ac	2334.1
Water Area	---	100	10.14 ac	1014.0
Open Land (Grass cover 50% - 75%)	A	49	16.96 ac	831.2
Gravel Transit Corridor	A	76	4.22 ac	320.7
		Total:	55.14 ac	4500.0

CN = Total CN * Area / Total Area = **81.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.25 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.05 in**

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Lake Mary, FL 32746

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 403
POND NAME: 403 (Consisted of four ditch block systems in Permit No. 64105-3)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 4.78 ac-ft
1" over Total Area = 4.60 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 4.78 ac-ft

Required Attenuation Volume:

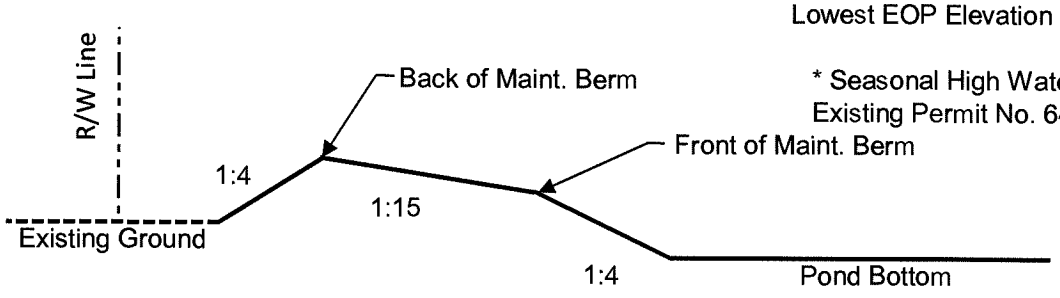
Total Runoff: Q_{pre} = 11.74 in
Q_{post} = 16.05 in
ΔQ = 4.30 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 19.77 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 22.0 ft @ 1:4

Existing Ground Elevation = 45.0 ft
Seasonal High Water Elevation = 35.0 ft
Lowest EOP Elevation = 42.0 ft



* Seasonal High Water El. From Existing Permit No. 64105-3

Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
42.00	Back of Maintenance Berm	14.12 ac			51.13 ac-ft
41.00	Front of Maintenance Berm	11.92 ac			38.11 ac-ft
40.00	---	11.32 ac			26.49 ac-ft
39.00	---	10.74 ac			15.46 ac-ft
37.50	Pond Bottom	9.87 ac			0.00 ac-ft

Required Treatment Volume: 4.78 ac-ft
Required Treat. Vol. + Atten.: 24.55 ac-ft
Top El. Of Treatment Volume: 37.96
Top El. Of Treat. Vol. + Atten.: 39.82

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

		date:
made by:	SR	23-Dec-15
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

STATION LIMITS: From: 2891+00
To: 2913+50

Roadway Length: 2250 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	1	12 ft
Inside Shoulder	10 ft	1	10 ft
Outside Shoulder	8 ft	1	8 ft
	Total Impervious Width:		30 ft

Additional Impervious (ramps, turn lanes, etc.): 1.85 ac

Impervious Roadway Area: 3.40 ac
Pervious Roadway Area: 9.77 ac
Total Roadway Area: 13.17 ac

Pond Area:

Pervious Pond Area: 4.40 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.40 ac

Total Area:

Impervious Area: 3.40 ac
Pervious Area: 14.17 ac
Water Surface Area: 0.00 ac
Total Area: 17.57 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	3.40 ac	333.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	13.07 ac	640.5
Open Land (Grass cover 50% - 75%)	A/D	84	1.10 ac	92.4
		Total:	17.57 ac	1066.0

CN = Total CN * Area / Total Area = **60.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.48 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.50 in**

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

		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	7	84 ft
Wall	2 ft	1	2 ft
Shoulder	6 ft	0	0 ft
Shoulder	10 ft	2	20 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		130 ft

Additional Impervious: 1.61 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.32 ac
Pervious Roadway Area: 4.85 ac
Total Roadway Area: 13.17 ac

Pond Area:

Pervious Pond Area: 1.61 ac
Water Surface Area: 2.79 ac
Total Pond Area: 4.40 ac

Total Area:

Impervious Area: 8.32 ac
Pervious Area: 6.46 ac
Water Surface Area: 2.79 ac
Total Area: 17.57 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.32 ac	815.8
Water Area	---	100	2.79 ac	279.0
Open Land (Grass cover 50% - 75%)	A	49	5.01 ac	245.3
Gravel (Rail Corridor)	A/D	91	0.46 ac	41.9
Gravel (Rail Corridor)	A	76	0.78 ac	59.3
Open Land (Grass cover 50% - 75%)	A/D	84	0.21 ac	17.6
		Total:	17.57 ac	1458.9

CN = Total CN * Area / Total Area = **83.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.04 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.26 in**

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

		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

POND SIZING : WET DETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

2.5" over Impervious Area = 1.73 ac-ft
1" over Total Area = 1.46 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.73 ac-ft

Required Attenuation Volume:

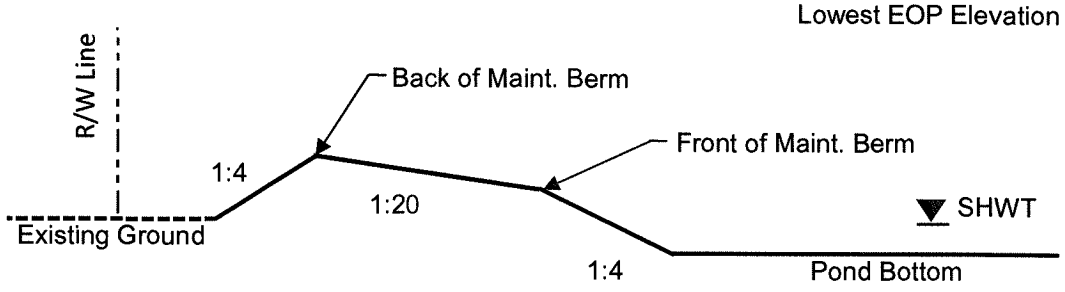
Total Runoff:
Q_{pre} = 12.50 in
Q_{post} = 16.26 in
ΔQ = 3.76 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.50 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 25.0 ft
Seasonal High Water Elevation = 21.2 ft
Lowest EOP Elevation = 26.8 ft



Pond Section

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 405
POND NAME: 405A & 405B (Ponds D & E in Permit No. 22931-1)

POND 405A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
26.00	Back of Maintenance Berm	3.66 ac			13.93 ac-ft
25.00	Front of Maintenance Berm	3.01 ac			10.59 ac-ft
24.00	---	2.89 ac			7.64 ac-ft
21.20	---	2.57 ac			0.00 ac-ft
16.20	Pond Bottom	2.29 ac			0.00 ac-ft

POND 405B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
26.00	Back of Maintenance Berm	0.74 ac			1.75 ac-ft
25.00	Front of Maintenance Berm	0.41 ac			1.18 ac-ft
24.00	---	0.35 ac			0.80 ac-ft
21.20	---	0.22 ac			0.00 ac-ft
16.20	Pond Bottom	0.13 ac			0.00 ac-ft

PONDS 405A & 405B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
26.00	Back of Maintenance Berm	4.40 ac			15.68 ac-ft
25.00	Front of Maintenance Berm	3.42 ac			11.77 ac-ft
24.00	---	3.24 ac			8.44 ac-ft
21.20	Initial Water Elevation	2.79 ac			0.00 ac-ft
16.20	Pond Bottom	2.42 ac			0.00 ac-ft

Required Treatment Volume: 1.73 ac-ft
Top El. Of Treatment Volume: 21.78
Required Treat. Vol. + Atten.: 7.24 ac-ft
Top El. Of Treat. Vol. + Atten.: 23.60

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		date:
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checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

STATION LIMITS: From: 2913+50
To: 2933+50

Roadway Length: 2000 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 1.45 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 5.31 ac
Pervious Roadway Area: 19.75 ac
Total Roadway Area: 25.06 ac

Pond Area:

Pervious Pond Area: 7.84 ac
Water Surface Area: 0.00 ac
Total Pond Area: 7.84 ac

Total Area:

Impervious Area: 5.31 ac
Pervious Area: 27.59 ac
Water Surface Area: 0.00 ac
Total Area: 32.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	5.31 ac	520.1
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	27.59 ac	1352.1
		Total:	32.90 ac	1872.1

CN = Total CN * Area / Total Area = **56.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.57 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.75 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 1.54 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 11.27 ac
Pervious Roadway Area: 13.79 ac
Total Roadway Area: 25.06 ac

Pond Area:

Pervious Pond Area: 2.20 ac
Water Surface Area: 5.64 ac (At the Treatment Volume Stage)
Total Pond Area: 7.84 ac

Total Area:

Impervious Area: 11.27 ac
Pervious Area: 15.99 ac
Water Surface Area: 5.64 ac
Total Area: 32.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	11.27 ac	1104.8
Water Area	---	100	5.64 ac	564.0
Open Land (Grass cover 50% - 75%)	A	49	14.46 ac	708.4
Gravel (Rail Corridor)	A	76	1.53 ac	116.3
		Total:	32.90 ac	2493.5

CN = Total CN * Area / Total Area = **75.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.19 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **15.15 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.55 ac-ft
1" over Total Area = 2.74 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.74 ac-ft

Required Attenuation Volume:

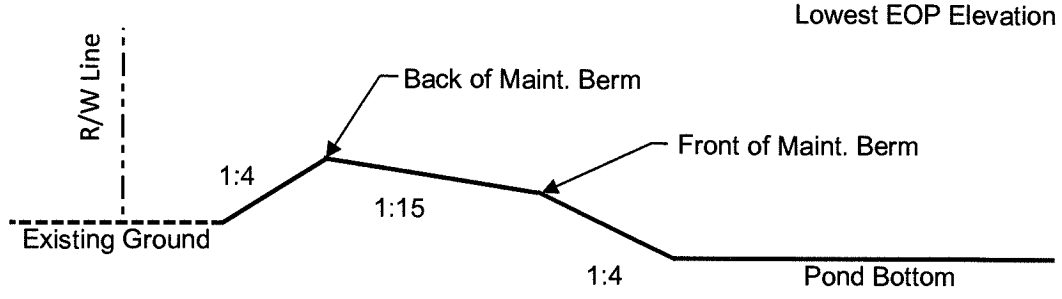
Total Runoff:
Q_{pre} = 11.75 in
Q_{post} = 15.15 in
ΔQ = 3.40 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 9.33 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 30.0 ft
Lowest EOP Elevation = 40.0 ft



Pond Section

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

		date:
made by:	SR	23-Dec-15
checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 406
POND NAME: 406A & 406B (Pond 406A is Pond F in Permit No. 22931-1)

POND 406A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Back of Maintenance Berm	4.91 ac			19.52 ac-ft
37.00	Front of Maintenance Berm	4.28 ac			14.93 ac-ft
36.00	---	4.12 ac			10.73 ac-ft
35.00	---	3.96 ac			6.69 ac-ft
33.25	Pond Bottom	3.68 ac			0.00 ac-ft

POND 406B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Back of Maintenance Berm	2.93 ac			10.47 ac-ft
37.00	Front of Maintenance Berm	2.36 ac			7.83 ac-ft
36.00	---	2.21 ac			5.54 ac-ft
35.00	---	2.07 ac			3.40 ac-ft
33.25	Pond Bottom	1.82 ac			0.00 ac-ft

PONDS 406A & 406B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Back of Maintenance Berm	7.84 ac			29.99 ac-ft
37.00	Front of Maintenance Berm	6.64 ac			22.75 ac-ft
36.00	---	6.33 ac			16.27 ac-ft
35.00	---	6.03 ac			10.09 ac-ft
33.25	Pond Bottom	5.50 ac			0.00 ac-ft

Required Treatment Volume: 2.74 ac-ft
Required Treat. Vol. + Atten.: 12.07 ac-ft

Top El. Of Treatment Volume: 33.73
Top El. Of Treat. Vol. + Atten.: 35.32

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408 (Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

STATION LIMITS: From: 70+88 To: 92+60 Saxon Roadway Length: 2172 ft R/W Width: VARIES

From: 2891+00 To: 2913+50 I-4 Roadway Length: 2250 ft R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area: Saxon Boulevard

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	4 ft	0	0 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		40 ft

Additional Impervious: 1.86 ac
(I-4 Main line and ramps) 2.16 ac

Impervious Roadway Area: 6.01 ac
Pervious Roadway Area: 33.34 ac
Total Roadway Area: 39.35 ac

Pond Area:

Pervious Pond Area: 11.26 ac
Water Surface Area: 0.00 ac
Total Pond Area: 11.26 ac

Total Area:

Impervious Area: 6.01 ac
Pervious Area: 44.60 ac
Water Surface Area: 0.00 ac
Total Area: 50.61 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.01 ac	589.4
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	34.28 ac	1679.5
Open Land (Grass cover 50% - 75%)	A/D	84	10.32 ac	866.9
		Total:	50.61 ac	3135.8

CN = Total CN * Area / Total Area = **62.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.14 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.74 in**

HNTB Corporation
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408

(Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
	Total Impervious Width:		91 ft

I-4 Additional Impervious: (ramps, turn lanes, etc.)	10.74 ac
Additional Impervious: (Non Permitted commercal)	4.00 ac
Impervious Roadway Area:	19.25 ac
Pervious Roadway Area:	20.10 ac
Total Roadway Area:	39.35 ac

Pond Area:

Pervious Pond Area:	3.61 ac
Water Surface Area:	7.65 ac
Total Pond Area:	11.26 ac

Total Area:

Impervious Area:	19.25 ac
Pervious Area:	23.71 ac
Water Surface Area:	7.65 ac
Total Area:	50.61 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	19.25 ac	1886.8
Water Area	---	100	7.65 ac	765.0
Open Land (Grass cover 50% - 75%)	A	49	15.18 ac	743.7
Open Land (Grass cover 50% - 75%)	A/D	84	7.29 ac	612.4
Gravel (Rail Corridor)	A/D	91	0.46 ac	41.9
Gravel (Rail Corridor)	A	76	0.78 ac	59.3
		Total:	50.61 ac	4109.0

CN = Total CN * Area / Total Area = **81.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.32 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **15.98 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408 (Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND SIZING : WET DETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

2.5" over Impervious Area = 4.01 ac-ft
1" over Total Area = 4.22 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 4.22 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 12.74 in
Q_{post} = 15.98 in
ΔQ = 3.24 in

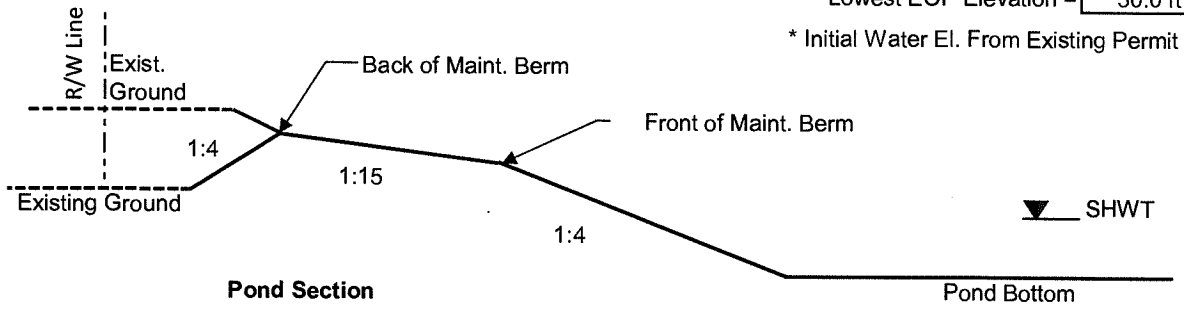
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 13.67 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 30.0 ft
Initial Water Elevation* = 23.75 ft
Lowest EOP Elevation = 30.0 ft

* Initial Water El. From Existing Permit



Pond Section

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

		date:
made by:	SR	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408
POND NAMES: 407A ,B, C & 408

(Pond 407A is Pond 1 in Permit No. 64105-6 and Pond A in Permit No. 22931-1)
(Pond 408 is Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND 407A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	4.50 ac			16.05 ac-ft
27.00	Front of Maintenance Berm	3.90 ac			11.85 ac-ft
26.00	---	3.74 ac			8.03 ac-ft
25.00	---	3.59 ac			4.37 ac-ft
23.75	Initial Water Elevation	3.40 ac			0.00 ac-ft
17.00	Pond Bottom	2.91 ac			

POND 407B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	0.70 ac			1.81 ac-ft
27.00	Front of Maintenance Berm	0.47 ac			1.22 ac-ft
26.00	---	0.41 ac			0.78 ac-ft
25.00	---	0.35 ac			0.40 ac-ft
23.75	Initial Water Elevation	0.29 ac			0.00 ac-ft
17.00	Pond Bottom	0.13 ac			

POND 407C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	1.67 ac			5.20 ac-ft
27.00	Front of Maintenance Berm	1.29 ac			3.72 ac-ft
26.00	---	1.20 ac			2.47 ac-ft
25.00	---	1.11 ac			1.32 ac-ft
23.75	Initial Water Elevation	1.00 ac			0.00 ac-ft
17.00	Pond Bottom	0.72 ac			

POND 408 (EXPANDED)

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	4.39 ac			14.68 ac-ft
27.00	Front of Maintenance Berm	3.61 ac			10.68 ac-ft
26.00	---	3.41 ac			7.17 ac-ft
25.00	---	3.21 ac			3.86 ac-ft
23.75	Initial Water Elevation	2.96 ac			0.00 ac-ft
17.00	Pond Bottom	2.31 ac			

PONDS 407A, 407B, 407C & 408

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	11.26 ac			37.73 ac-ft
27.00	Front of Maintenance Berm	9.27 ac			27.47 ac-ft
26.00	---	8.76 ac			18.45 ac-ft
25.00	---	8.26 ac			9.94 ac-ft
23.75	Initial Water Elevation	7.65 ac			0.00 ac-ft
17.00	Pond Bottom	6.07 ac			

Required Treatment Volume: 4.22 ac-ft
Top El. Of Treatment Volume: 24.28
Required Treat. Vol. + Atten.: 17.89 ac-ft
Top El. Of Treat. Vol. + Atten.: 25.93

HNTB Corporation
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

STATION LIMITS: From: 2891+00 To: 2915+00
Roadway Length: 2400 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	4 ft	1	4 ft
Outside Shoulder	8 ft	1	8 ft
	Total Impervious Width:		36 ft

Saxon Boulevard: 0.85 ac
Additional Impervious: (ramps, turn lanes, etc.) 1.89 ac
Impervious Roadway Area: 4.72 ac
Pervious Roadway Area: 28.37 ac
Total Roadway Area: 33.09 ac

Pond Area:

Pervious Pond Area: 9.22 ac
Water Surface Area: 0.00 ac
Total Pond Area: 9.22 ac

Total Area:

Impervious Area: 4.72 ac
Pervious Area: 37.59 ac
Water Surface Area: 0.00 ac
Total Area: 42.31 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.72 ac	462.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	27.65 ac	1354.7
Open Land (Grass cover 50% - 75%)	A/D	84	9.94 ac	835.0
		Total:	42.31 ac	2652.5

CN = Total CN * Area / Total Area = **62.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 5.95 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.88 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	5	60 ft
Wall	2 ft	1	2 ft
Shoulder	10 ft	2	20 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		106 ft

Additional Impervious: (ramps, turn lanes, etc.)	6.18 ac
	4.00 ac
Impervious Roadway Area:	16.02 ac
Pervious Roadway Area:	17.07 ac
Total Roadway Area:	33.09 ac

Pond Area:

Pervious Pond Area:	2.89 ac
Water Surface Area:	6.32 ac
Total Pond Area:	9.22 ac

Total Area:

Impervious Area:	16.02 ac
Pervious Area:	19.97 ac
Water Surface Area:	6.32 ac
Total Area:	42.31 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	16.02 ac	1570.0
Water Area	---	100	6.32 ac	632.3
Open Land (Grass cover 50% - 75%)	A	49	12.44 ac	609.4
Gravel (Rail Corridor)	A/D	91	0.47 ac	42.8
Gravel (Rail Corridor)	A	76	0.40 ac	30.4
Open Land (Grass cover 50% - 75%)	A/D	84	6.66 ac	559.4
		Total:	42.31 ac	3444.3

CN = Total CN * Area / Total Area = **81.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.28 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.02 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND SIZING : WET DETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

2.5" over Impervious Area = 3.34 ac-ft
1" over Total Area = 3.53 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.53 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 12.88 in
Q_{post} = 16.02 in
ΔQ = 3.13 in

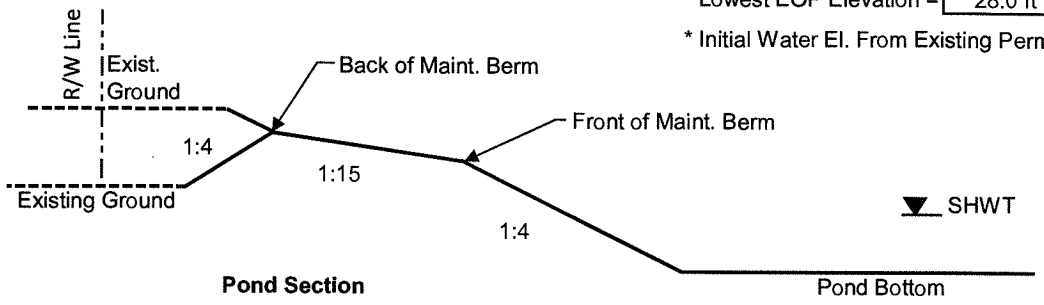
Attenuation V_{req} = $\Delta Q/12$ x Total Area = 11.05 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:20
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 30.0 ft
Initial Water Elevation* = 23.75 ft
Lowest EOP Elevation = 28.0 ft

* Initial Water El. From Existing Permit



Pond Section

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 407_408 (Recommended)
POND NAME: 407A, 407B & 407C
(Pond 407A,Pond 1 in Permit No. 64105-6, Pond A in Permit No. 22931-1)
(Pond 408, Pond 1A in Permit No. 64105-6 and Pond B in Permit No. 22931-1)

POND 407A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	4.50 ac			16.05 ac-ft
27.00	Front of Maintenance Berm	3.90 ac			11.85 ac-ft
26.00	---	3.74 ac			8.03 ac-ft
25.00	---	3.59 ac			4.37 ac-ft
23.75	Initial Water Elevation	3.40 ac			0.00 ac-ft
17.00	Pond Bottom	2.91 ac			

POND 407B

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	0.70 ac			1.81 ac-ft
27.00	Front of Maintenance Berm	0.47 ac			1.22 ac-ft
26.00	---	0.41 ac			0.79 ac-ft
25.00	---	0.35 ac			0.40 ac-ft
23.75	Initial Water Elevation	0.29 ac			0.00 ac-ft
17.00	Pond Bottom	0.13 ac			

POND 407C

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	1.67 ac			5.19 ac-ft
27.00	Front of Maintenance Berm	1.29 ac			3.72 ac-ft
26.00	---	1.20 ac			2.47 ac-ft
25.00	---	1.11 ac			1.32 ac-ft
23.75	Initial Water Elevation	1.00 ac			0.00 ac-ft
17.00	Pond Bottom	0.71 ac			

POND 408 (Existing)

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	2.35 ac			7.96 ac-ft
27.00	Front of Maintenance Berm	1.95 ac			5.81 ac-ft
26.00	---	1.85 ac			3.91 ac-ft
25.00	---	1.75 ac			2.11 ac-ft
23.75	Initial Water Elevation	1.63 ac			0.00 ac-ft
17.00	Pond Bottom	1.33 ac			

PONDS 407A, 407B, 407C & 408

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
28.00	Back of Maintenance Berm	9.22 ac			31.02 ac-ft
27.00	Front of Maintenance Berm	7.61 ac			22.61 ac-ft
26.00	---	7.20 ac			15.20 ac-ft
25.00	---	6.80 ac			8.20 ac-ft
23.75	Initial Water Elevation	6.32 ac			0.00 ac-ft
17.00	Pond Bottom	5.09 ac			

Required Treatment Volume:	3.53 ac-ft	Required Treat. Vol. + Atten.:	14.58 ac-ft
Top El. Of Treatment Volume:	24.29	Top El. Of Treat. Vol. + Atten.:	25.91

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408A (408 + 408B + 408D1)
POND NAME: Stormwater Vault 408

STATION LIMITS: From: 80+00 Saxon To: 120+00

Roadway Length: 4000 ft
R/W Width: 120 ft

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
	Total Impervious Width:		91 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 8.31 ac
Pervious Roadway Area: 2.71 ac
Total Roadway Area: 11.02 ac

Pond Area:

Pervious Pond Area: 0.00 ac
Water Surface Area: 0.00 ac (At the Treatment Volume Stage)
Total Pond Area: 0.00 ac

Total Area:

Impervious Area: 8.31 ac
Pervious Area: 2.71 ac
Water Surface Area: 0.00 ac
Total Area: 11.02 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	8.31 ac	814.4
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	2.71 ac	132.7
		Total:	11.02 ac	947.2

CN = Total CN * Area / Total Area = **86.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.63 in

Precipitation (P) = **7.4 in (for 100yr/10dy storm event)**

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.75 in**

POND SIZING : UNDERGROUND VAULT

Required Attenuation Volume:

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 23.8 ft
Lowest EOP Elevation = 30.0 ft

Total Runoff:
Q_{pre} = 0.00 in
Q_{post} = 5.75 in
ΔQ = 5.75 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = **5.28 ac-ft**

229830	cubic ft
1719127	gal

VAULT DIMENSIONS

DEPTH (FT) = 6 EL. 32' - EL. 26'
WIDTH (FT) = 125 CURBLINE TO CURBLINE
CROSS SECTIONAL AREA = 750
LENGTH (FT) = **306.4**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408B
POND NAME: 408B

STATION LIMITS: From: 94+00 To: 100+60 Saxon

Roadway Length: 660 ft
R/W Width: 120 ft

EXISTING CONDITION

Based on historical aerials, 4-laning of Saxon was completed in the early 90's. Permits could not be found for this widening; therefore, existing conditions were assumed to be 2 lanes.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Shoulder	8 ft	2	16 ft
Sidewalk	5 ft	2	10 ft
		Total Impervious Width:	50 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.00 ac
Impervious Roadway Area:	0.76 ac
Pervious Roadway Area:	2.11 ac
Total Roadway Area:	2.87 ac

Pond Area:

Pervious Pond Area:	3.73 ac
Water Surface Area:	0.00 ac
Total Pond Area:	3.73 ac

Total Area:

Impervious Area:	0.76 ac
Pervious Area:	5.84 ac
Water Surface Area:	0.00 ac
Total Area:	6.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	0.76 ac	74.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	5.84 ac	286.3
		Total:	6.60 ac	360.5

CN = Total CN * Area / Total Area = **54.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.31 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.28 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408B
POND NAME: 408B

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
		Total Impervious Width:	91 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 1.38 ac
Pervious Roadway Area: 1.49 ac
Total Roadway Area: 2.87 ac

Pond Area:

Pervious Pond Area: 1.05 ac
Water Surface Area: 2.68 ac (At the Treatment Volume Stage)
Total Pond Area: 3.73 ac

Total Area:

Impervious Area: 1.38 ac
Pervious Area: 2.54 ac
Water Surface Area: 2.68 ac
Total Area: 6.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	1.38 ac	134.8
Water Area	---	100	2.68 ac	268.0
Open Land (Grass cover 50% - 75%)	A	49	2.54 ac	124.7
		Total:	6.60 ac	527.5

CN = Total CN * Area / Total Area = **79.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.51 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **15.79 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408B
POND NAME: 408B

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.42 ac-ft
1" over Total Area = 0.55 ac-ft

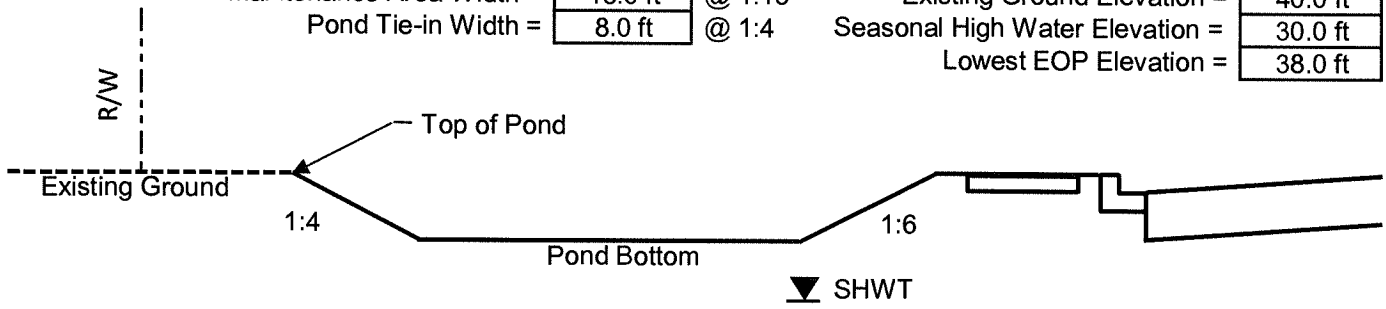
Treatment V_{req} = Largest of Trt. Vol. = 0.55 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 11.28 in
Q_{post} = 15.79 in
ΔQ = 4.52 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.48 ac-ft

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	40.0 ft
Pond Tie-in Width =	8.0 ft	@ 1:4	Seasonal High Water Elevation =	30.0 ft
			Lowest EOP Elevation =	38.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Top of Pond	3.73 ac			10.55 ac-ft
37.00	---	3.07 ac			7.15 ac-ft
36.00	---	2.90 ac			4.16 ac-ft
34.50	Pond Bottom	2.65 ac			0.00 ac-ft

Required Treatment Volume:	0.55 ac-ft	Required Treat. Vol. + Atten.:	3.03 ac-ft
Top El. Of Treatment Volume:	34.70	Top El. Of Treat. Vol. + Atten.:	35.62

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408D1
POND NAME: 408D1

STATION LIMITS: From: 100+60 Saxon Roadway Length: 1940 ft
To: 120+00 R/W Width: 120 ft

EXISTING CONDITION

Based on historical aerials, 4-laning of Saxon was completed in the early 90's. Permits could not be found for this widening; therefore, existing conditions were assumed to be 2 lanes.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Shoulder	8 ft	2	16 ft
Sidewalk	5 ft	2	10 ft
	Total Impervious Width:		50 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 2.23 ac
Pervious Roadway Area: 3.27 ac
Total Roadway Area: 5.50 ac

Pond Area:

Pervious Pond Area: 3.20 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.20 ac

Total Area:

Impervious Area: 2.23 ac
Pervious Area: 6.47 ac
Water Surface Area: 0.00 ac
Total Area: 8.70 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.23 ac	218.2
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	6.47 ac	317.2
		Total:	8.70 ac	535.4

CN = Total CN * Area / Total Area = **61.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.25 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.66 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408D1
POND NAME: 408D1

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Sidewalk	5 ft	2	10 ft
Curb & Gutter	2.25 ft	2	5 ft
Curb & Gutter	2 ft	2	4 ft
Bike Lane	4 ft	0	0 ft
		Total Impervious Width:	91 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 4.03 ac
Pervious Roadway Area: 1.47 ac
Total Roadway Area: 5.50 ac

Pond Area:

Pervious Pond Area: 0.97 ac
Water Surface Area: 2.23 ac (At the Treatment Volume Stage)
Total Pond Area: 3.20 ac

Total Area:

Impervious Area: 4.03 ac
Pervious Area: 2.44 ac
Water Surface Area: 2.23 ac
Total Area: 8.70 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.03 ac	395.0
Water Area	---	100	2.23 ac	223.0
Open Land (Grass cover 50% - 75%)	A	49	2.44 ac	119.5
		Total:	8.70 ac	737.5

CN = Total CN * Area / Total Area = **84.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.80 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.51 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 408D1
POND NAME: 408D1

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.78 ac-ft
1" over Total Area = 0.73 ac-ft

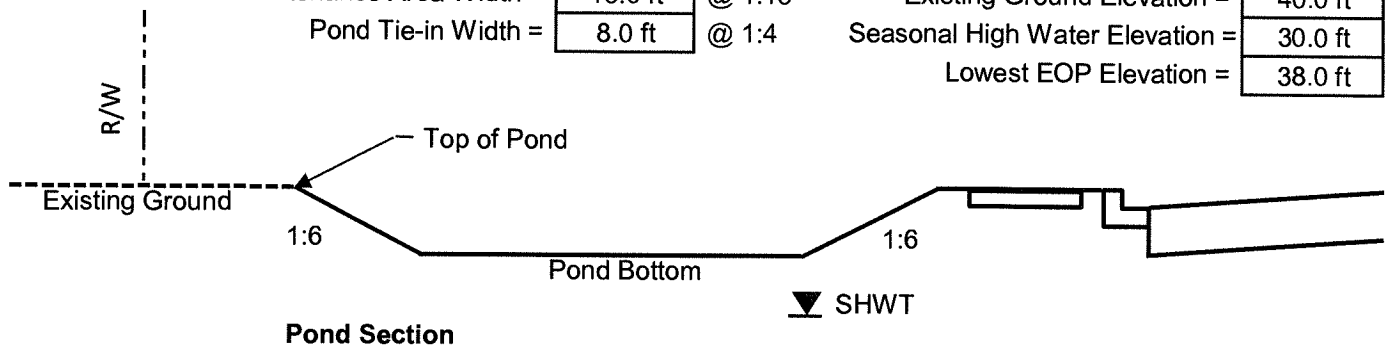
Treatment V_{req} = Largest of Trt. Vol. = 0.78 ac-ft

Required Attenuation Volume:

Total Runoff: Q_{pre} = 12.66 in
Q_{post} = 16.51 in
ΔQ = 3.84 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.79 ac-ft

Maintenance Area Width =	15.0 ft	@ 1:15	Existing Ground Elevation =	40.0 ft
Pond Tie-in Width =	8.0 ft	@ 1:4	Seasonal High Water Elevation =	30.0 ft
			Lowest EOP Elevation =	38.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
38.00	Top of Pond	3.20 ac			9.42 ac-ft
37.00	---	2.60 ac			6.52 ac-ft
36.00	---	2.40 ac			4.02 ac-ft
34.25	Pond Bottom	2.19 ac			0.00 ac-ft

Required Treatment Volume:	0.78 ac-ft	Required Treat. Vol. + Atten.:	3.57 ac-ft
Top El. Of Treatment Volume:	34.59	Top El. Of Treat. Vol. + Atten.:	35.82

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A1 (Pond 2 in Permit No. 64105-6)

STATION LIMITS:
From: 2933+50 To: 2991+00 — East & Westbound — Roadway Length: 5750 ft, R/W Width: 300 ft
From: 2991+00 To: 3038+00 — Eastbound Only — Roadway Length: 4700 ft, R/W Width: 150 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 15.62 ac
Pervious Roadway Area: 35.49 ac
Total Roadway Area: 51.11 ac

Pond Area:

Pervious Pond Area: 6.73 ac
Water Surface Area: 0.00 ac
Total Pond Area: 6.73 ac

Total Area:

Impervious Area: 15.62 ac
Pervious Area: 42.22 ac
Water Surface Area: 0.00 ac
Total Area: 57.84 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	15.62 ac	1530.7
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	42.22 ac	2068.8
		Total:	57.84 ac	3599.5

CN = Total CN * Area / Total Area = **62.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.07 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.79 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A1 (Pond 2 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 38.03 ac
Pervious Roadway Area: 13.08 ac
Total Roadway Area: 51.11 ac

Pond Area:

Pervious Pond Area: 1.95 ac
Water Surface Area: 4.78 ac (At the Treatment Volume Stage)
Total Pond Area: 6.73 ac

Total Area:

Impervious Area: 38.03 ac
Pervious Area: 15.03 ac
Water Surface Area: 4.78 ac
Total Area: 57.84 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	38.03 ac	3726.9
Water Area	---	100	4.78 ac	478.0
Open Land (Grass cover 50% - 75%)	A	49	7.19 ac	352.3
Gravel (Rail Corridor)	A	76	7.84 ac	595.8
		Total:	57.84 ac	5153.1

CN = Total CN * Area / Total Area = **89.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.22 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **17.11 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A1 (Pond 2 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 6.37 ac-ft
1" over Total Area = 4.82 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 6.37 ac-ft

Required Attenuation Volume:

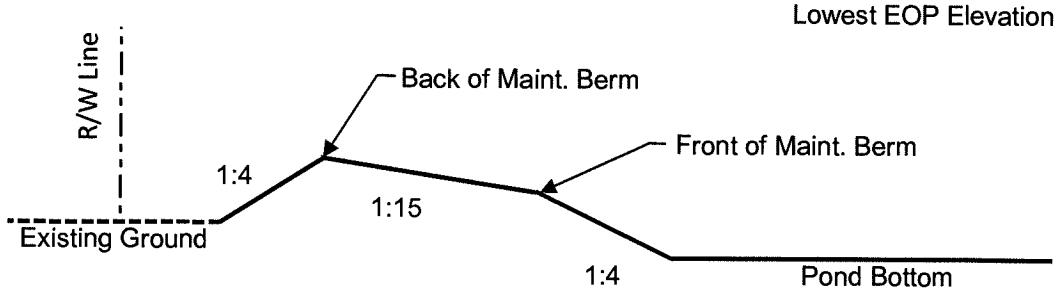
Total Runoff: Q_{pre} = 12.79 in
Q_{post} = 17.11 in
ΔQ = 4.31 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 20.79 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 22.2 ft
Lowest EOP Elevation = 35.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
36.00	Back of Maintenance Berm	6.73 ac			42.95 ac-ft
35.00	Front of Maintenance Berm	5.94 ac			36.62 ac-ft
34.00	---	5.73 ac			30.78 ac-ft
33.00	---	5.53 ac			25.15 ac-ft
28.00	Pond Bottom	4.53 ac			0.00 ac-ft

Required Treatment Volume: 6.37 ac-ft
Required Treat. Vol. + Atten.: 27.16 ac-ft
Top El. Of Treatment Volume: 29.27
Top El. Of Treat. Vol. + Atten.: 33.38

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-B1

STATION LIMITS: From: 2991+00 To: 3038+00 Westbound Only

Roadway Length: 4700 ft
R/W Width: 150 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond (Pond 2 in Permit 64105-6) was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 4.53 ac
Pervious Roadway Area: 9.05 ac
Total Roadway Area: 13.58 ac

Pond Area:

Pervious Pond Area: 3.02 ac
Water Surface Area: 0.00 ac
Total Pond Area: 3.02 ac

Total Area:

Impervious Area: 4.53 ac
Pervious Area: 12.07 ac
Water Surface Area: 0.00 ac
Total Area: 16.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.53 ac	444.1
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A/D	84	0.04 ac	3.0
Open Land (Grass cover 50% - 75%)	A	49	12.03 ac	589.6
		Total:	16.60 ac	1036.7

CN = Total CN * Area / Total Area = **62.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10 =$ 6.01 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)} =$ **12.84 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-B1

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Wall	2 ft	1	2 ft
Shoulder	12 ft	2	24 ft
Shoulder	6 ft	1	6 ft
Shoulder	4 ft	1	4 ft
	Total Impervious Width:		84 ft

Additional Impervious: 4.92 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 9.45 ac
Pervious Roadway Area: 4.13 ac
Total Roadway Area: 13.58 ac

Pond Area:

Pervious Pond Area: 1.40 ac
Water Surface Area: 1.62 ac (At the Treatment Volume Stage)
Total Pond Area: 3.02 ac

Total Area:

Impervious Area: 9.45 ac
Pervious Area: 5.53 ac
Water Surface Area: 1.62 ac
Total Area: 16.60 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.45 ac	926.3
Water Area	---	100	1.62 ac	162.0
Open Land (Grass cover 50% - 75%)	A	49	3.18 ac	155.9
Gravel (Rail Corridor)	A	76	2.33 ac	177.1
Open Land (Grass cover 50% - 75%)	A/D	84	0.02 ac	1.4
		Total:	16.60 ac	1422.6

CN = Total CN * Area / Total Area = **85.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.67 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.64 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-B1

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.68 ac-ft
1" over Total Area = 1.38 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.68 ac-ft

Required Attenuation Volume:

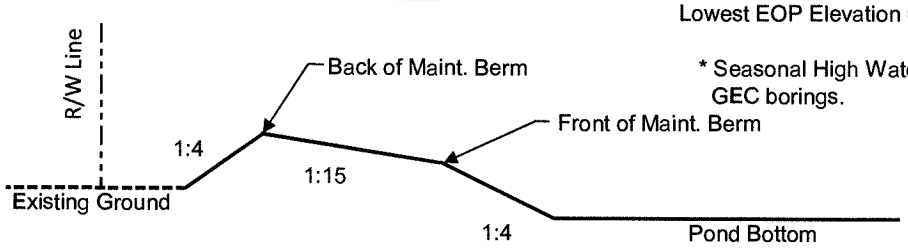
Total Runoff: Q_{pre} = 12.84 in
Q_{post} = 16.64 in
ΔQ = 3.80 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.26 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 25.0 ft
Seasonal High Water Elevation* = 16.0 ft
Lowest EOP Elevation = 35.0 ft



* Seasonal High Water El. From GEC borings.

Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
25.00	Back of Maintenance Berm	3.02 ac			14.27 ac-ft
24.00	Front of Maintenance Berm	2.40 ac			11.56 ac-ft
23.00	---	2.24 ac			9.24 ac-ft
20.00	---	1.77 ac			3.23 ac-ft
18.00	Pond Bottom	1.47 ac			0.00 ac-ft

Required Treatment Volume: 1.68 ac-ft
Required Treat. Vol. + Atten.: 6.94 ac-ft
Top El. Of Treatment Volume: 19.04
Top El. Of Treat. Vol. + Atten.: 22.01

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A2 (Pond 2 in Permit No. 64105-6)

STATION LIMITS: From: 2933+50 To: 3038+00

Roadway Length: 10450 ft
R/W Width: 300 ft

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 20.15 ac
Pervious Roadway Area: 55.59 ac
Total Roadway Area: 75.74 ac

Pond Area:

Pervious Pond Area: 8.17 ac
Water Surface Area: 0.00 ac
Total Pond Area: 8.17 ac

Total Area:

Impervious Area: 20.15 ac
Pervious Area: 63.76 ac
Water Surface Area: 0.00 ac
Total Area: 83.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	20.15 ac	1974.8
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	63.76 ac	3124.2
		Total:	83.91 ac	5099.0

CN = Total CN * Area / Total Area = **60.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.46 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.51 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A2 (Pond 2 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 4.04 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 54.90 ac
Pervious Roadway Area: 20.84 ac
Total Roadway Area: 75.74 ac

Pond Area:

Pervious Pond Area: 2.00 ac
Water Surface Area: 6.17 ac (At the Treatment Volume Stage)
Total Pond Area: 8.17 ac

Total Area:

Impervious Area: 54.90 ac
Pervious Area: 22.84 ac
Water Surface Area: 6.17 ac
Total Area: 83.91 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	54.90 ac	5380.1
Water Area	---	100	6.17 ac	617.0
Rail Corridor (Gravel)	A	76	10.77 ac	818.5
Open Land (Grass cover 50% - 75%)	A	49	12.07 ac	591.5
		Total:	83.91 ac	7407.1

CN = Total CN * Area / Total Area = **88.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 1.33 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **17.00 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 409
POND NAME: 409-A2 (Pond 2 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 9.21 ac-ft
1" over Total Area = 6.99 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 9.21 ac-ft

Required Attenuation Volume:

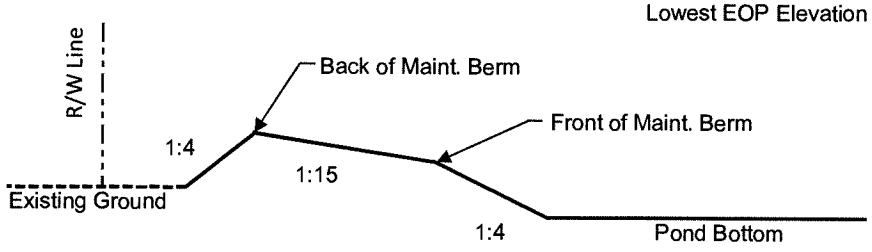
Total Runoff: Q_{pre} = 12.51 in
Q_{post} = 17.00 in
ΔQ = 4.48 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 31.34 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 22.2 ft
Lowest EOP Elevation = 35.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
36.00	Back of Maintenance Berm	8.17 ac			55.73 ac-ft
35.00	Front of Maintenance Berm	7.36 ac			47.97 ac-ft
34.00	---	7.15 ac			40.71 ac-ft
33.00	---	6.94 ac			33.67 ac-ft
27.75	Pond Bottom	5.89 ac			0.00 ac-ft

Required Treatment Volume: 9.21 ac-ft
Required Treat. Vol. + Atten.: 40.56 ac-ft
Top El. Of Treatment Volume: 29.19
Top El. Of Treat. Vol. + Atten.: 33.98

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 410
POND NAME: 410 (Pond 410A is Pond 3 in Permit No. 64105-6)

STATION LIMITS: From: 3038+00 To: 3072+00
Roadway Length: 3400 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		84 ft

Additional Impervious (ramps, turn lanes, etc.): 0.00 ac

Impervious Roadway Area: 6.56 ac
Pervious Roadway Area: 17.96 ac
Total Roadway Area: 24.52 ac

Pond Area:

Pervious Pond Area: 4.10 ac
Water Surface Area: 0.00 ac
Total Pond Area: 4.10 ac

Total Area:

Impervious Area: 6.56 ac
Pervious Area: 22.06 ac
Water Surface Area: 0.00 ac
Total Area: 28.62 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.56 ac	642.5
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	22.06 ac	1081.1
		Total:	28.62 ac	1723.6

CN = Total CN * Area / Total Area = **60.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.60 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.41 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 410
POND NAME: 410 (Pond 410A is Pond 3 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	8	96 ft
Wall	2 ft	2	4 ft
Shoulder	4 ft	2	8 ft
Shoulder	6 ft	2	12 ft
Shoulder	12 ft	4	48 ft
		Total Impervious Width:	168 ft

Additional Impervious: 2.03 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 15.14 ac
Pervious Roadway Area: 9.38 ac
Total Roadway Area: 24.52 ac

Pond Area:

Pervious Pond Area: 1.33 ac
Water Surface Area: 2.77 ac (At the Treatment Volume Stage)
Total Pond Area: 4.10 ac

Total Area:

Impervious Area: 15.14 ac
Pervious Area: 10.71 ac
Water Surface Area: 2.77 ac
Total Area: 28.62 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	15.14 ac	1484.0
Water Area	---	100	2.77 ac	277.0
Open Land (Grass cover 50% - 75%)	A	49	7.92 ac	387.9
Gravel (Transit Corridor)	A	76	2.79 ac	212.0
		Total:	28.62 ac	2361.0

CN = Total CN * Area / Total Area = **82.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.12 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **16.18 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 410
POND NAME: 410 (Pond 410A is Pond 3 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.77 ac-ft
1" over Total Area = 2.39 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.77 ac-ft

Required Attenuation Volume:

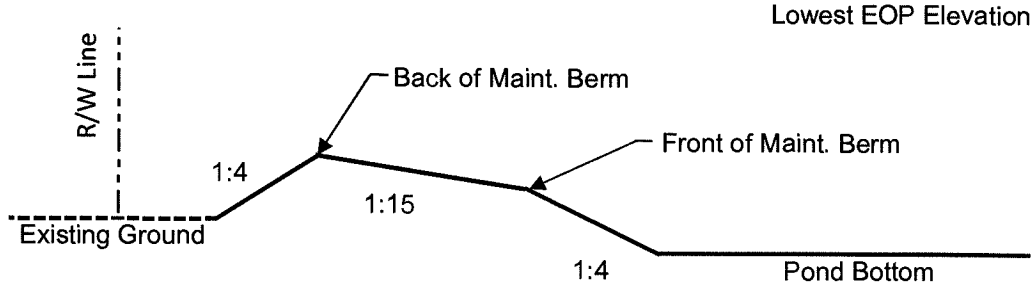
Total Runoff: Q_{pre} = 12.41 in
Q_{post} = 16.18 in
ΔQ = 3.77 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 8.99 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 54.0 ft @ 1:4

Existing Ground Elevation = 75.0 ft
Seasonal High Water Elevation = 51.0 ft
Lowest EOP Elevation = 68.0 ft



Pond Section

POND 410A

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
64.00	Back of Maintenance Berm	4.10 ac			22.08 ac-ft
63.00	Front of Maintenance Berm	3.50 ac			18.28 ac-ft
62.00	---	3.35 ac			14.85 ac-ft
60.00	---	3.04 ac			8.46 ac-ft
57.00	Pond Bottom	2.60 ac			0.00 ac-ft

Required Treatment Volume: 2.77 ac-ft
Required Treat Vol. + Atten.: 11.76 ac-ft
Top El. Of Treatment Volume: 57.98
Top El. Of Treat. Vol. + Atten.: 61.03

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 411
POND NAME: 411 (Pond 3 in Permit No. 76095-1)

STATION LIMITS: From: 3072+00
To: 3080+72

Roadway Length: 872 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	2	16 ft
		Total Impervious Width:	84 ft

Additional Impervious: 5.70 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 7.38 ac
Pervious Roadway Area: 28.42 ac
Total Roadway Area: 35.80 ac

Pond Area:

Pervious Pond Area: 2.71 ac
Water Surface Area: 0.00 ac
Total Pond Area: 2.71 ac

Total Area:

Impervious Area: 7.38 ac
Pervious Area: 31.13 ac
Water Surface Area: 0.00 ac
Total Area: 38.51 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	7.38 ac	723.4
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	31.13 ac	1525.3
		Total:	38.51 ac	2248.7

CN = Total CN * Area / Total Area = **58.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.13 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.05 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 411
POND NAME: 411 (Pond 3 in Permit No. 76095-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	10	120 ft
Wall	2 ft	2	4 ft
Shoulder	10 ft	4	40 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		212 ft

Additional Impervious: 8.09 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 12.33 ac
Pervious Roadway Area: 23.47 ac
Total Roadway Area: 35.80 ac

Pond Area:

Pervious Pond Area: 0.98 ac
Water Surface Area: 1.73 ac (At the Treatment Volume Stage)
Total Pond Area: 2.71 ac

Total Area:

Impervious Area: 12.33 ac
Pervious Area: 24.45 ac
Water Surface Area: 1.73 ac
Total Area: 38.51 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	12.33 ac	1208.7
Water Area	---	100	1.73 ac	173.0
Open Land (Grass cover 50% - 75%)	A	49	23.74 ac	1163.1
Gravel Transit Corridor	A	76	0.71 ac	54.0
		Total:	38.51 ac	2598.8

CN = Total CN * Area / Total Area = **67.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 4.82 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **13.76 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 411
POND NAME: 411 (Pond 3 in Permit No. 76095-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.89 ac-ft
1" over Total Area = 3.21 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.21 ac-ft

Required Attenuation Volume:

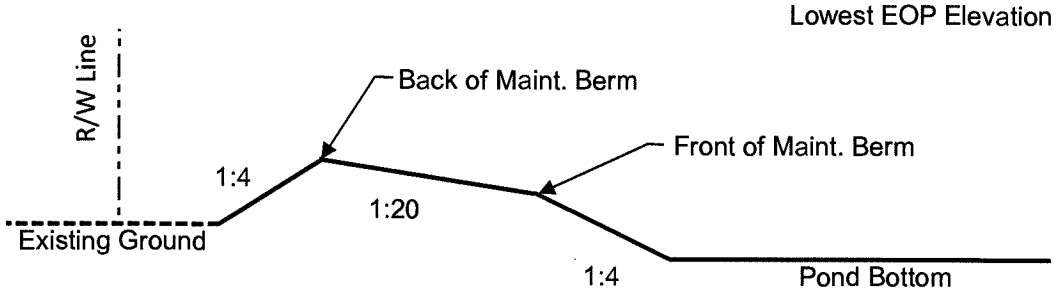
Total Runoff: Q_{pre} = 12.05 in
Q_{post} = 13.76 in
ΔQ = 1.71 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 5.48 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:20
Pond Tie-In Width = 18.0 ft @ 1:4

Existing Ground Elevation = 57.0 ft
Seasonal High Water Elevation = 45.5 ft
Lowest EOP Elevation = 65.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
55.00	Back of Maintenance Berm	2.71 ac			13.44 ac-ft
54.00	Front of Maintenance Berm	2.14 ac			11.02 ac-ft
53.00	---	2.04 ac			8.93 ac-ft
50.00	---	1.73 ac			3.27 ac-ft
48.00	Pond Bottom	1.54 ac			0.00 ac-ft

Required Treatment Volume: 3.21 ac-ft
Required Treat. Vol. + Atten.: 8.69 ac-ft
Top El. Of Treatment Volume: 49.96
Top El. Of Treat. Vol. + Atten.: 52.88

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 412
POND NAME: 412

STATION LIMITS: From: 54+00 SR 427 Roadway Length: 1635 ft
To: 70+35 R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	10 ft	0	0 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		40 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 1.50 ac
Pervious Roadway Area: 37.91 ac
Total Roadway Area: 39.41 ac

Pond Area:

Pervious Pond Area: 2.45 ac
Water Surface Area: 0.00 ac
Total Pond Area: 2.45 ac

Total Area:

Impervious Area: 1.50 ac
Pervious Area: 40.36 ac
Water Surface Area: 0.00 ac
Total Area: 41.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	1.50 ac	147.1
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	40.36 ac	1977.7
		Total:	41.86 ac	2124.9

CN = Total CN * Area / Total Area = **50.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 9.70 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **10.44 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 412
POND NAME: 412

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Shoulder	8 ft	2	16 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		88 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.68 ac
Impervious Roadway Area:	6.98 ac
Pervious Roadway Area:	32.43 ac
Total Roadway Area:	39.41 ac

Pond Area:

Pervious Pond Area:	0.96 ac	
Water Surface Area:	1.49 ac	(At the Treatment Volume Stage)
Total Pond Area:	2.45 ac	

Total Area:

Impervious Area:	6.98 ac
Pervious Area:	33.39 ac
Water Surface Area:	1.49 ac
Total Area:	41.86 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.98 ac	684.3
Water Area	---	100	1.49 ac	149.0
Open Land (Grass cover 50% - 75%)	A	49	33.39 ac	1636.1
		Total:	41.86 ac	2469.4

CN = Total CN * Area / Total Area = **59.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.95 in Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.17 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 412
POND NAME: 412

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.47 ac-ft
1" over Total Area = 3.49 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 3.49 ac-ft

Required Attenuation Volume:

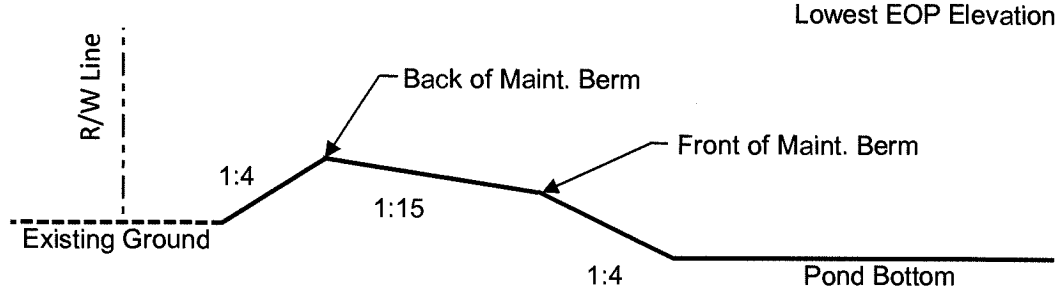
Total Runoff: Q_{pre} = 10.44 in
Q_{post} = 12.17 in
ΔQ = 1.72 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 6.01 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 10.0 ft @ 1:4

Existing Ground Elevation = 60.0 ft
Seasonal High Water Elevation = 49.0 ft
Lowest EOP Elevation = 65.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
60.00	Back of Maintenance Berm	2.45 ac			13.84 ac-ft
59.00	Front of Maintenance Berm	2.00 ac			11.62 ac-ft
58.00	---	1.89 ac			9.67 ac-ft
56.00	---	1.67 ac			6.11 ac-ft
51.80	Pond Bottom	1.24 ac			0.00 ac-ft

Required Treatment Volume: 3.49 ac-ft
Required Treat. Vol. + Atten.: 9.50 ac-ft
Top El. Of Treatment Volume: 54.20
Top El. Of Treat. Vol. + Atten.: 57.91

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 413
POND NAME: 413 Pond 4 in Permit Application No. 40-127-76095,-1,-2,-3,-4,-5)

STATION LIMITS: From: 076+18 To: 110+00 Roadway Length: 3382 ft R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built. * Pre Impervious area from Permit No. 40-76095-4-P

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24
Turn Lane	12 ft	1	12 ft
Curb and Gutter	5 ft	1	5 ft
Outside Shoulder	5 ft	1	5 ft
	Total Impervious Width:		46 ft

Additional Impervious: 3.31 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area:* 6.88 ac
Pervious Roadway Area: 19.25 ac
Total Roadway Area:* 26.13 ac

Pond Area:

Pervious Pond Area: 2.77 ac
Water Surface Area: 0.00 ac
Total Pond Area: 2.77 ac

Total Area:

Impervious Area: 6.88 ac
Pervious Area: 22.02 ac
Water Surface Area: 0.00 ac
Total Area: 28.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	6.88 ac	674.4
Water Area	---	100	0.00 ac	0.0
Meadow (Good Condition)	A	39	14.22 ac	554.5
County Pond Area & Contributing Area	A	30	7.80 ac	234.0
		Total:	28.90 ac	1462.9

CN = Total CN * Area / Total Area = **50.6**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 9.76 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **10.41 in**

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		date:
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checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 413
POND NAME: 413 Pond 4 in Permit Application No. 40-127-76095,-1,-2,-3,-4,-5)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	12 ft	1	12 ft
Outside Shoulder	12 ft	1	12 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.97 ac
Impervious Roadway Area:	9.56 ac
Pervious Roadway Area:	16.57 ac
Total Roadway Area:	26.13 ac

Pond Area:

Pervious Pond Area:	1.98 ac	
Water Surface Area:	0.79 ac	(At the Treatment Volume Stage)
Total Pond Area:	2.77 ac	

Total Area:

Impervious Area:	9.56 ac
Pervious Area:	18.55 ac
Water Surface Area:	0.79 ac
Total Area:	28.90 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.56 ac	936.9
Water Area	---	100	0.79 ac	79.2
Meadow (Good Condition)	A	39	10.75 ac	419.2
*County Pond and Contributing Area	A	30	7.80 ac	234.0
		Total:	28.90 ac	1669.3

CN = Total CN * Area / Total Area = **57.8**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.31 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.92 in**

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		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 413
POND NAME: 413 Pond 4 in Permit Application No. 40-127-76095,-1,-2,-3,-4,-5)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 2.20 ac-ft
1" over Total Area = 2.41 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.41 ac-ft

Required Attenuation Volume:

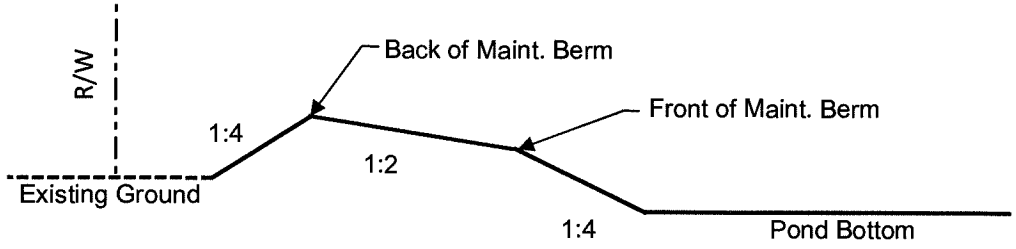
Total Runoff: Q_{pre} = 10.41 in
Q_{post} = 11.92 in
ΔQ = 1.51 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 3.63 ac-ft

---

Maintenance Area Width = 20.0 ft @ 1:2
Pond Tie-In Width = 34.2 ft @ 1:4

Existing Ground Elevation = 55.0 ft
Seasonal High Water Elevation = 22.0 ft (NAVD)
Lowest EOP Elevation = 52.5 ft



Pond Section

POND 413

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
48.95	Back of Maintenance Berm	2.77 ac			25.48 ac-ft
47.95	Front of Maintenance Berm	2.47 ac			22.86 ac-ft
46.95	---	2.27 ac			20.49 ac-ft
40.95	---	1.53 ac			9.09 ac-ft
34.95	---	0.75 ac			2.25 ac-ft
29.95	Pond Bottom	0.15 ac			0.00 ac-ft

Required Treatment Volume: 2.41 ac-ft
Required Treat Vol. + Atten.: 6.04 ac-ft
Top El. Of Treatment Volume: 35.30
Top El. Of Treat. Vol. + Atten.: 38.28

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 414
POND NAME: 414 (Pond 4 in Permit No. 64105-6)

STATION LIMITS: From: 3080+72
To: 3159+02

Roadway Length: 7830 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Inside Shoulder	10 ft	2	20 ft
Outside Shoulder	8 ft	4	32 ft
	Total Impervious Width:		124 ft

Additional Impervious: 2.69 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 24.98 ac
Pervious Roadway Area: 163.48 ac
Total Roadway Area: 188.46 ac

Pond Area:

Pervious Pond Area: 14.43 ac
Water Surface Area: 0.00 ac
Total Pond Area: 14.43 ac

Total Area:

Impervious Area: 24.98 ac
Pervious Area: 177.91 ac
Water Surface Area: 0.00 ac
Total Area: 202.89 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	24.98 ac	2447.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	177.91 ac	8717.7
		Total:	202.89 ac	11165.6

CN = Total CN * Area / Total Area = **55.0**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.17 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.36 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 414
POND NAME: 414 (Pond 4 in Permit No. 64105-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	6	72 ft
Wall	2 ft	2	4 ft
Shoulder	12 ft	4	48 ft
	Total Impervious Width:		124 ft

Additional Impervious: 3.00 ac
(ramps, turn lanes, etc.)
Impervious Roadway Area: 25.29 ac
Pervious Roadway Area: 163.17 ac
Total Roadway Area: 188.46 ac

Pond Area:

Pervious Pond Area: 5.42 ac
Water Surface Area: 9.01 ac (At the Treatment Volume Stage)
Total Pond Area: 14.43 ac

Total Area:

Impervious Area: 25.29 ac
Pervious Area: 168.59 ac
Water Surface Area: 9.01 ac
Total Area: 202.89 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	25.29 ac	2478.3
Water Area	---	100	9.01 ac	901.2
Open Land (Grass cover 50% - 75%)	A	49	161.81 ac	7928.7
Gravel (Transit Corridor)	A	76	6.78 ac	515.3
		Total:	202.89 ac	11823.4

CN = Total CN * Area / Total Area = **58.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.16 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **12.02 in**

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 414
POND NAME: 414 (Pond 4 in Permit No. 64105-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 11.09 ac-ft
1" over Total Area = 16.91 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 16.91 ac-ft

Required Attenuation Volume:

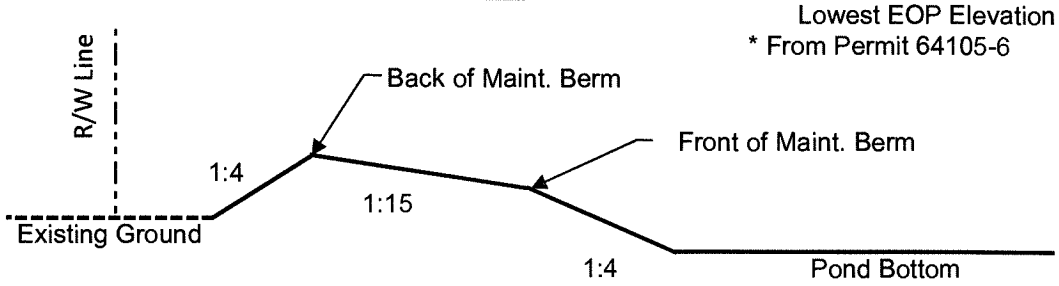
Total Runoff: Q_{pre} = 11.36 in
Q_{post} = 12.02 in
ΔQ = 0.66 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 11.20 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 50.0 ft
Seasonal High Water Elevation* = 31.7 ft
Lowest EOP Elevation = 55.0 ft
* From Permit 64105-6



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
51.00	Back of Maintenance Berm	14.43 ac			165.25 ac-ft
50.00	Front of Maintenance Berm	13.11 ac			151.48 ac-ft
49.00	---	12.85 ac			138.50 ac-ft
48.00	---	12.50 ac			125.82 ac-ft
36.00	Pond Bottom	8.47 ac			0.00 ac-ft

Required Treatment Volume: 16.91 ac-ft
Top El. Of Treatment Volume: 37.61
Required Treat. Vol. + Atten.: 28.11 ac-ft
Top El. Of Treat. Vol. + Atten.: 40.29

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 415
POND NAME: 415

STATION LIMITS: From: 44+12 SR 472 Roadway Length: 988 ft
To: 54+00 R/W Width: VARIES

EXISTING CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	10 ft	0	0 ft
Outside Shoulder	8 ft	2	16 ft
	Total Impervious Width:		40 ft

Additional Impervious: 0.00 ac
(ramps, turn lanes, etc.)

Impervious Roadway Area: 0.91 ac
Pervious Roadway Area: 3.71 ac
Total Roadway Area: 4.62 ac

Pond Area:

Pervious Pond Area: 0.72 ac
Water Surface Area: 0.00 ac
Total Pond Area: 0.72 ac

Total Area:

Impervious Area: 0.91 ac
Pervious Area: 4.43 ac
Water Surface Area: 0.00 ac
Total Area: 5.34 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	0.91 ac	88.9
Water Area	---	100	0.00 ac	0.0
Open Land (Grass cover 50% - 75%)	A	49	4.43 ac	217.2
		Total:	5.34 ac	306.1

CN = Total CN * Area / Total Area = **57.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 7.44 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **11.83 in**

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checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 415
POND NAME: 415

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Shoulder	8 ft	2	16 ft
Shoulder	12 ft	2	24 ft
	Total Impervious Width:		88 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.25 ac
Impervious Roadway Area:	2.25 ac
Pervious Roadway Area:	2.37 ac
Total Roadway Area:	4.62 ac

Pond Area:

Pervious Pond Area:	0.43 ac	
Water Surface Area:	0.29 ac	(At the Treatment Volume Stage)
Total Pond Area:	0.72 ac	

Total Area:

Impervious Area:	2.25 ac
Pervious Area:	2.80 ac
Water Surface Area:	0.29 ac
Total Area:	5.34 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.25 ac	220.1
Water Area	---	100	0.29 ac	29.0
Open Land (Grass cover 50% - 75%)	A	49	2.80 ac	137.4
		Total:	5.34 ac	386.5

CN = Total CN * Area / Total Area = **72.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.82 in

Precipitation (P) = 18.5 in (for 100yr/10dy storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **14.60 in**

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 415
POND NAME: 415

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.46 ac-ft
1" over Total Area = 0.45 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.46 ac-ft

Required Attenuation Volume:

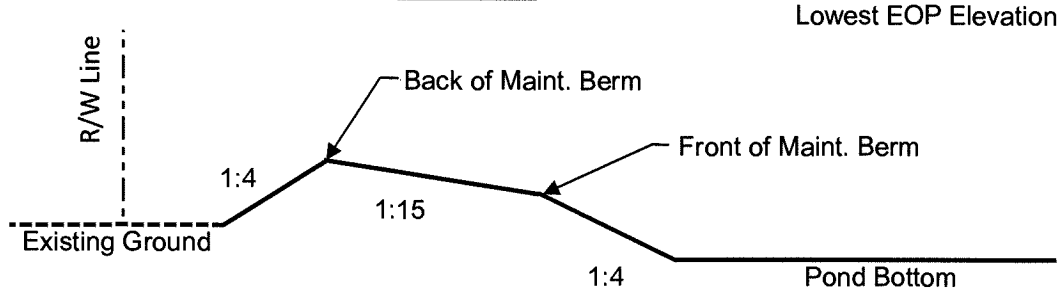
Total Runoff: Q_{pre} = 11.83 in
Q_{post} = 14.60 in
ΔQ = 2.76 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 1.23 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 50.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation = 40.0 ft
Lowest EOP Elevation = 55.0 ft



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
50.00	Back of Maintenance Berm	0.72 ac			2.74 ac-ft
49.00	Front of Maintenance Berm	0.50 ac			2.13 ac-ft
48.00	---	0.45 ac			1.66 ac-ft
46.00	---	0.35 ac			0.86 ac-ft
43.00	Pond Bottom	0.22 ac			0.00 ac-ft

Required Treatment Volume: 0.46 ac-ft
Required Treat. Vol. + Atten.: 1.69 ac-ft
Top El. Of Treatment Volume: 44.60
Top El. Of Treat. Vol. + Atten.: 48.07

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		date:
made by:	LDP	23-Dec-15
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 416
POND NAME: 416 (*Pond 1 in Permit No. 42-127-2852ANG, Application No. 78808-1)

STATION LIMITS: From: 10+00 To: 41+87 *N. Kentucky Ave
Roadway Length: 3187 ft
R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	2 ft	1	2 ft
Outside Shoulder	2 ft	1	2 ft
	Total Impervious Width:		28 ft

Additional Impervious (ramps, turn lanes, etc.): 0.06 ac

Impervious Roadway Area: 2.11 ac
*Pervious Roadway Area: 25.49 ac
Total Roadway Area: 27.60 ac

* Permitted offsite area, App. No. 42-127-2852ANG

Pond Area:

Pervious Pond Area: 1.61 ac
Water Surface Area: 0.00 ac
Total Pond Area: 1.61 ac

Total Area:

Impervious Area: 2.11 ac
Pervious Area: 27.10 ac
Water Surface Area: 0.00 ac
Total Area: 29.21 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.11 ac	206.7
Water Area	---	100	0.00 ac	0.0
Wood or Forest (Good Cover)	A	25	27.10 ac	677.6
		Total:	29.21 ac	884.3

CN = Total CN * Area / Total Area = **30.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 23.04 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **1.24 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 416
POND NAME: 416 (*Pond 1 in Permit No. 42-127-2852ANG, Application No. 78808-1)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Wall	2 ft	1	2 ft
Shoulder	2 ft	1	2 ft
	Total Impervious Width:		28 ft

Additional Impervious: (ramps, turn lanes, etc.)	1.33 ac
Impervious Roadway Area:	3.38 ac
Pervious Roadway Area:	24.22 ac
Total Roadway Area:	27.60 ac

Pond Area:

Pervious Pond Area:	0.64 ac	
Water Surface Area:	0.97 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.61 ac	

Total Area:

Impervious Area:	3.38 ac
Pervious Area:	24.86 ac
Water Surface Area:	0.97 ac
Total Area:	29.21 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	3.38 ac	331.1
Water Area	---	100	0.97 ac	97.0
Wood or Forest (Good Cover)	A	25	23.25 ac	581.3
Grass (Good Condition)	A	39	1.61 ac	62.9
		Total:	29.21 ac	1072.3

CN = Total CN * Area / Total Area = **36.7**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 17.24 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **2.10 in**

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 416
POND NAME: 416 (*Pond 1 in Permit No. 42-127-2852ANG, Application No. 78808-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.57 ac-ft
1" over Total Area = 2.43 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 2.43 ac-ft

Required Attenuation Volume:

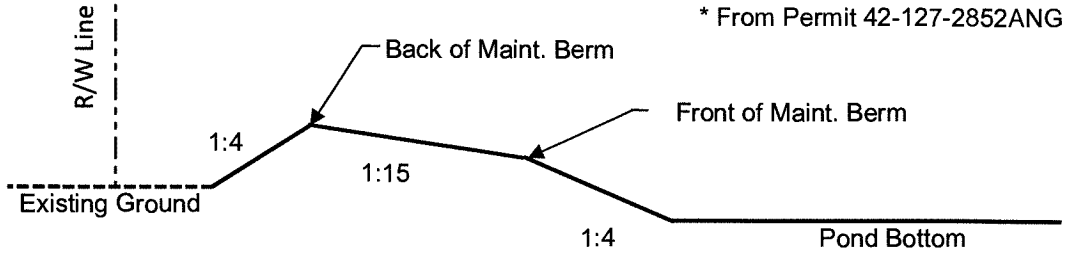
Total Runoff: Q_{pre} = 1.24 in
Q_{post} = 2.10 in
ΔQ = 0.86 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 2.09 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 17.8 ft @ 1:4

Existing Ground Elevation = 35.0 ft
Seasonal High Water Elevation* = 25.0 ft
Lowest EOP Elevation = 41.0 ft (NAVD)
* From Permit 42-127-2852ANG



Pond Section

POND 416

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
36.95	Back of Maintenance Berm	1.61 ac			8.61 ac-ft
35.95	Front of Maintenance Berm	1.29 ac			7.16 ac-ft
34.95	---	1.21 ac			5.91 ac-ft
31.95	---	0.98 ac			2.63 ac-ft
28.95	Pond Bottom	0.77 ac			0.00 ac-ft

Required Treatment Volume: 2.43 ac-ft
Top El. Of Treatment Volume: 31.73
Required Treat. Vol. + Atten.: 4.53 ac-ft
Top El. Of Treat. Vol. + Atten.: 33.68

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		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 417
POND NAME: 417 (Pond 2 in *Permit Application No. 42-127-2852ANG, 22827-0 & 22827-6)

STATION LIMITS: From: 41+87 Roadway Length: 972 ft
To: 51+59 *N. Kentucky Ave. R/W Width: VARIES

EXISTING CONDITION

Note: Existing condition reflects the previous condition before the current pond was built.

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Inside Shoulder	2 ft	1	2 ft
Outside Shoulder	2 ft	1	2 ft
	Total Impervious Width:		28 ft

Additional Impervious (ramps, turn lanes, etc.): 2.32 ac

Impervious Roadway Area: 2.94 ac
*Pervious Roadway Area: 5.85 ac
Total Roadway Area: 8.79 ac

Pond Area:

Pervious Pond Area: 1.71 ac
Water Surface Area: 0.00 ac
Total Pond Area: 1.71 ac

Total Area:

Impervious Area: 2.94 ac
Pervious Area: 7.56 ac
Water Surface Area: 0.00 ac
Total Area: 10.50 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.94 ac	288.6
Water Area	---	100	0.00 ac	0.0
Wood or Forest (Good Cover)	A	25	7.56 ac	188.9
		Total:	10.50 ac	477.5

CN = Total CN * Area / Total Area = **45.5**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 11.99 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **3.33 in**

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

		date:
made by:	LDP	23-Dec-15
checked by:	BJS	23-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 417
POND NAME: 417 (Pond 2 in *Permit Application No. 42-127-2852ANG, 22827-0 & 22827-6)

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Inside Shoulder	12 ft	1	12 ft
Outside Shoulder	12 ft	1	12 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.93 ac
Impervious Roadway Area:	5.54 ac
Pervious Roadway Area:	3.25 ac
Total Roadway Area:	8.79 ac

Pond Area:

Pervious Pond Area:	0.80 ac	
Water Surface Area:	0.91 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.71 ac	

Total Area:

Impervious Area:	5.54 ac
Pervious Area:	4.05 ac
Water Surface Area:	0.91 ac
Total Area:	10.50 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	5.54 ac	542.5
Water Area	---	100	0.91 ac	91.0
Wood or Forest (Good Cover)	A	25	2.34 ac	58.6
Grass (Good Condition)	A	39	1.71 ac	66.7
		Total:	10.50 ac	758.8

CN = Total CN * Area / Total Area = **72.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 3.84 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **7.07 in**

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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 417
POND NAME: 417 (Pond 2 in *Permit Application No. 42-127-2852ANG, 22827-0 & 22827-6)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (W/ OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.01 ac-ft
1" over Total Area = 0.88 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.01 ac-ft

Required Attenuation Volume:

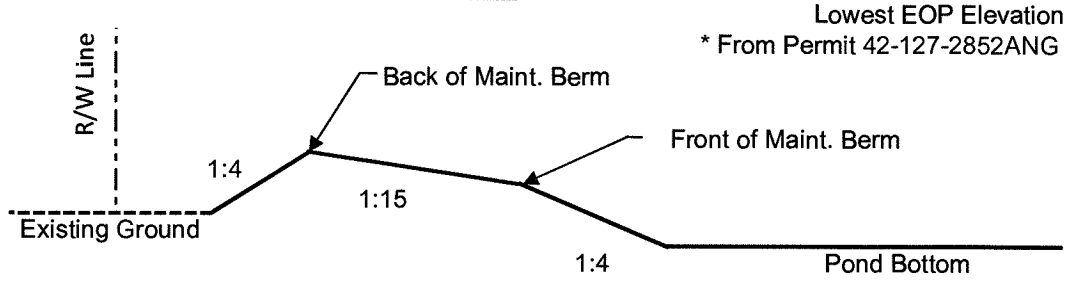
Total Runoff:
Q_{pre} = 3.33 in
Q_{post} = 7.07 in
ΔQ = 3.74 in

Attenuation V_{req} = $\Delta Q/12$ x Total Area = 3.27 ac-ft

---

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 50.2 ft @ 1:4

Existing Ground Elevation = 50.0 ft
Seasonal High Water Elevation* = 30.0 ft
Lowest EOP Elevation = 47.5 ft (NAVD)
* From Permit 42-127-2852ANG



Pond Section

POND 417

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
39.95	Back of Maintenance Berm	1.71 ac			7.22 ac-ft
38.95	Front of Maintenance Berm	1.35 ac			5.69 ac-ft
37.95	---	1.26 ac			4.39 ac-ft
35.95	---	1.08 ac			2.05 ac-ft
33.70	Pond Bottom	0.74 ac			0.00 ac-ft

Required Treatment Volume: 1.01 ac-ft
Required Treat. Vol. + Atten.: 4.29 ac-ft
Top El. Of Treatment Volume: 34.81
Top El. Of Treat. Vol. + Atten.: 37.86

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 418
POND NAME: 418 (Retention Pond VB-2 in West Volusia Beltline Project)

STATION LIMITS: From: 010+00 To: 035+00
Roadway Length: 2500 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	11 ft	2	22 ft
Shoulder	5 ft	1	5 ft
Shoulder	5 ft	1	5 ft
	Total Impervious Width:		32 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.62 ac
Impervious Roadway Area:	5.46 ac
Pervious Roadway Area:	9.86 ac
Total Roadway Area:	15.32 ac

Pond Area:

Pervious Pond Area:	0.57 ac	
Water Surface Area:	0.67 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.24 ac	

Total Area:

Impervious Area:	5.46 ac
Pervious Area:	10.43 ac
Water Surface Area:	0.67 ac
Total Area:	16.56 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	5.46 ac	534.7
Water Area	---	100	0.67 ac	67.0
Open Land (Good)	A	39	10.43 ac	406.9
		Total:	16.56 ac	1008.6

CN = Total CN * Area / Total Area = **60.9**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 6.42 in

Precipitation (P) = * 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.52 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: 418
POND NAME: 418 (Retention Pond VB-2 in West Volusia Beltline Project)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.26 ac-ft
1" over Total Area = 1.38 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.38 ac-ft

Required Attenuation Volume:

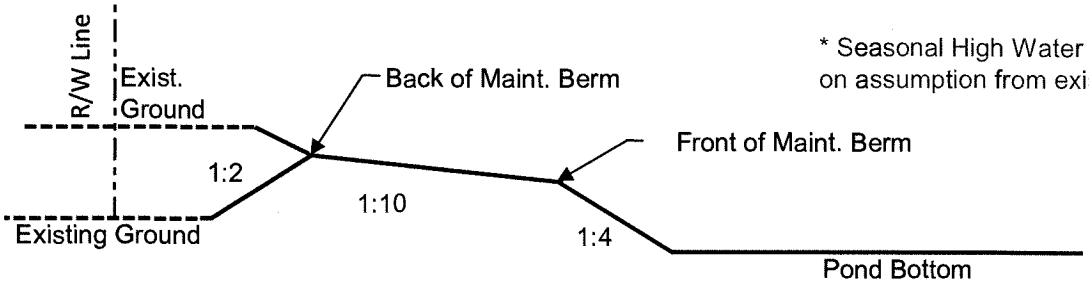
Total Runoff: Q_{post} = 5.52 in

Attenuation V_{req} = ΔQ/12 x Total Area = 7.61 ac-ft

Maintenance Area Width = 10.0 ft @ 1:10
Pond Tie-In Width = 16.0 ft @ 1:2

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation* = 25.0 ft
Lowest EOP Elevation = 26.8 ft

* Seasonal High Water El. based on assumption from exist. permit.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
37.00	Back of Maintenance Berm	1.24 ac			7.88 ac-ft
36.00	Front of Maintenance Berm	1.04 ac			6.74 ac-ft
35.00	---	0.97 ac			5.74 ac-ft
31.00	---	0.76 ac			2.28 ac-ft
27.50	Pond Bottom	0.54 ac			0.00 ac-ft

Required Treatment Volume: 1.38 ac-ft
Top El. Of Treatment Volume: 29.97

Required Treatment Volume: 7.61 ac-ft
Top El. Of Treat. Vol. + Atten.: 36.76

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: A
POND NAME: A (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 010+18 To: 055+27
Roadway Length: 4509 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	1.92 ac
Impervious Roadway Area:	9.37 ac
Pervious Roadway Area:	3.92 ac
Total Roadway Area:	13.29 ac

Pond Area:

Pervious Pond Area:	1.00 ac	
Water Surface Area:	5.56 ac	(At the Treatment Volume Stage)
Total Pond Area:	6.56 ac	

Total Area:

Impervious Area:	9.37 ac
Pervious Area:	4.92 ac
Water Surface Area:	5.56 ac
Total Area:	19.85 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	9.37 ac	918.5
Water Area	---	100	5.56 ac	556.0
Open Land (Good)	A	39	2.70 ac	105.2
Wood (Good)	A	25	2.22 ac	55.5
		Total:	19.85 ac	1635.2

CN = Total CN * Area / Total Area = **82.4**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 2.14 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **8.40 in**

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		date:
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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: A
POND NAME: A (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.80 ac-ft
1" over Total Area = 1.65 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.80 ac-ft

Required Attenuation Volume:

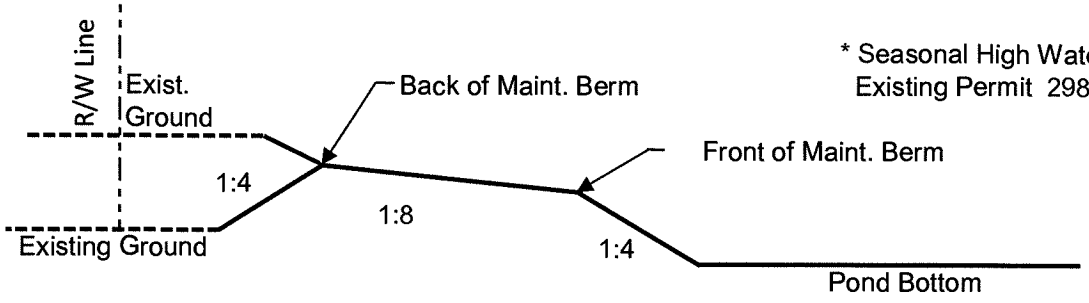
Total Runoff: Q_{post} = 8.40 in

Attenuation V_{req} = ΔQ/12 x Total Area = 13.90 ac-ft

Maintenance Area Width = 16.0 ft @ 1:8
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 25.0 ft
Seasonal High Water Elevation* = 16.8 ft
Lowest EOP Elevation = 26.8 ft

* Seasonal High Water El. From Existing Permit 29810-1.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
21.00	Back of Maintenance Berm	6.56 ac			19.73 ac-ft
20.00	Front of Maintenance Berm	6.17 ac			13.36 ac-ft
19.00	---	5.80 ac			7.38 ac-ft
18.00	---	5.61 ac			1.67 ac-ft
17.70	Pond Bottom	5.55 ac			0.00 ac-ft

Required Treatment Volume: 1.80 ac-ft
Top El. Of Treatment Volume: 18.02

Required Treatment Volume: 13.90 ac-ft
Top El. Of Treat. Vol. + Atten.: 20.08

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PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 55+27 To: 68+28
Roadway Length: 1301 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.33 ac
Impervious Roadway Area:	2.48 ac
Pervious Roadway Area:	6.75 ac
Total Roadway Area:	9.23 ac

Pond Area:

Pervious Pond Area:	0.77 ac	
Water Surface Area:	1.13 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.90 ac	

Total Area:

Impervious Area:	2.48 ac
Pervious Area:	7.52 ac
Water Surface Area:	1.13 ac
Total Area:	11.13 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.48 ac	243.1
Water Area	---	100	1.13 ac	113.0
Open Land (Good)	A	39	4.95 ac	193.0
Wood (Good)	A	25	2.57 ac	64.3
		Total:	11.13 ac	613.4

CN = Total CN * Area / Total Area = **55.1**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.15 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **4.70 in**

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		date:
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checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.72 ac-ft
1" over Total Area = 0.93 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.93 ac-ft

Required Attenuation Volume:

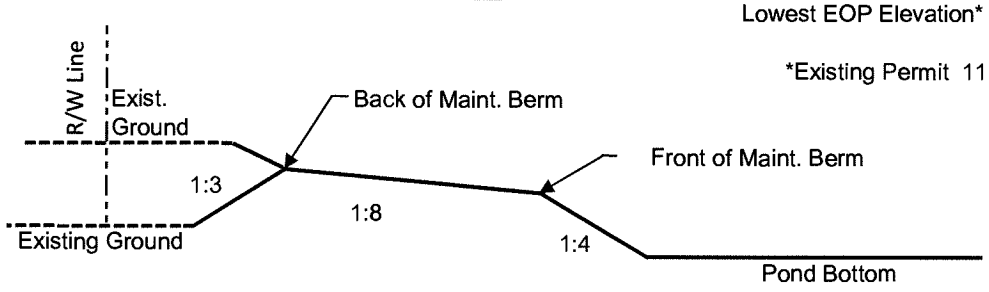
Total Runoff: Q_{post} = 4.70 in

Attenuation V_{req} = ΔQ/12 x Total Area = 4.36 ac-ft

Maintenance Area Width = 16.0 ft @ 1:8
Pond Tie-In Width = 14.0 ft @ 1:4

Existing Ground Elevation = 40.0 ft
Seasonal High Water Elevation* = 32.6 ft
Lowest EOP Elevation* = 41.3 ft

*Existing Permit 111974-1.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
41.00	Back of Maintenance Berm	1.90 ac			6.93 ac-ft
40.00	Front of Maintenance Berm	1.64 ac			5.16 ac-ft
39.00	---	1.39 ac			3.64 ac-ft
38.00	---	1.27 ac			2.31 ac-ft
36.00	Pond Bottom	1.04 ac			0.00 ac-ft

Required Treatment Volume: 0.93 ac-ft
Top El. Of Treatment Volume: 36.80

Required Treatment Volume: 4.36 ac-ft
Top El. Of Treat. Vol. + Atten.: 39.54

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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B1 (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 55+27 To: 68+28

Roadway Length: 1301 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		72 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.33 ac
Impervious Roadway Area:	2.48 ac
Pervious Roadway Area:	6.75 ac
Total Roadway Area:	9.23 ac

Pond Area:

Pervious Pond Area:	0.83 ac	
Water Surface Area:	0.92 ac	(At the Treatment Volume Stage)
Total Pond Area:	1.75 ac	

Total Area:

Impervious Area:	2.48 ac
Pervious Area:	7.58 ac
Water Surface Area:	0.92 ac
Total Area:	10.98 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.48 ac	243.1
Water Area	---	100	0.92 ac	92.0
Open Land (Good)	A	39	5.01 ac	195.4
Wood (Good)	A	25	2.57 ac	64.3
		Total:	10.98 ac	594.7

CN = Total CN * Area / Total Area = **54.2**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 8.46 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **4.57 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: B
POND NAME: B1 (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 0.72 ac-ft
1" over Total Area = 0.92 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 0.92 ac-ft

Required Attenuation Volume:

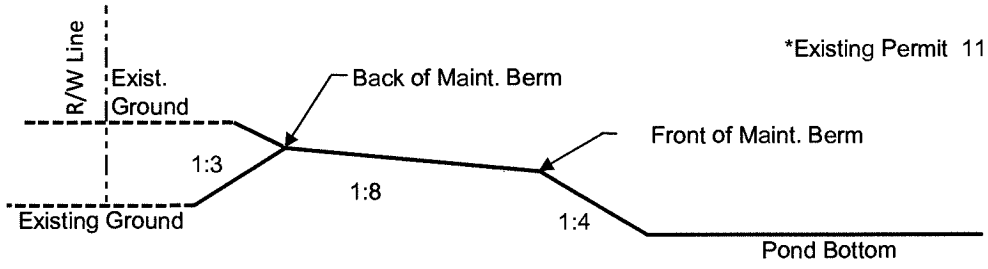
Total Runoff: Q_{post} = 4.57 in

Attenuation V_{req} = ΔQ/12 x Total Area = 4.18 ac-ft

Maintenance Area Width = 16.0 ft @ 1:8
Pond Tie-In Width = 26.0 ft @ 1:4

Existing Ground Elevation = 45.0 ft
Seasonal High Water Elevation* = 32.6 ft
Lowest EOP Elevation* = 41.3 ft

*Existing Permit 111974-1.



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
41.00	Back of Maintenance Berm	1.75 ac			5.64 ac-ft
40.00	Front of Maintenance Berm	1.26 ac			4.14 ac-ft
39.00	---	1.15 ac			2.93 ac-ft
38.00	---	1.03 ac			1.84 ac-ft
36.00	Pond Bottom	0.81 ac			0.00 ac-ft

Required Treatment Volume: 0.92 ac-ft
Top El. Of Treatment Volume: 36.99

Required Treatment Volume: 4.18 ac-ft
Top El. Of Treat. Vol. + Atten.: 40.15

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		date:
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HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: C
POND NAME: C (Rhode Island Ave, Pond A in Permit No. 111974-1)

STATION LIMITS: From: 68+28
To: 76+04

Roadway Length: 776 ft
R/W Width: VARIES

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	4	48 ft
Bike Lane	5 ft	2	10 ft
Side Walk	8 ft	2	16 ft
	Total Impervious Width:		74 ft

Additional Impervious: (ramps, turn lanes, etc.)	3.58 ac
Impervious Roadway Area:	4.90 ac
Pervious Roadway Area:	7.98 ac
Total Roadway Area:	12.88 ac

Pond Area:

Pervious Pond Area:	0.94 ac	
Water Surface Area:	1.26 ac	(At the Treatment Volume Stage)
Total Pond Area:	2.20 ac	

Total Area:

Impervious Area:	4.90 ac
Pervious Area:	8.92 ac
Water Surface Area:	1.26 ac
Total Area:	15.08 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	4.90 ac	480.1
Water Area	---	100	1.26 ac	126.0
Open Land (Good)	A	39	8.92 ac	347.9
		Total:	15.08 ac	954.0

CN = Total CN * Area / Total Area = **63.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 5.81 in

Precipitation (P) = 10.6 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **5.84 in**

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		date:
made by:	LDP	5-Dec-14
checked by:	BJS	5-Dec-14
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: C
POND NAME: C (Rhode Island Ave, Pond A in Permit No. 111974-1)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 1.14 ac-ft
1" over Total Area = 1.26 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 1.26 ac-ft

Required Attenuation Volume:

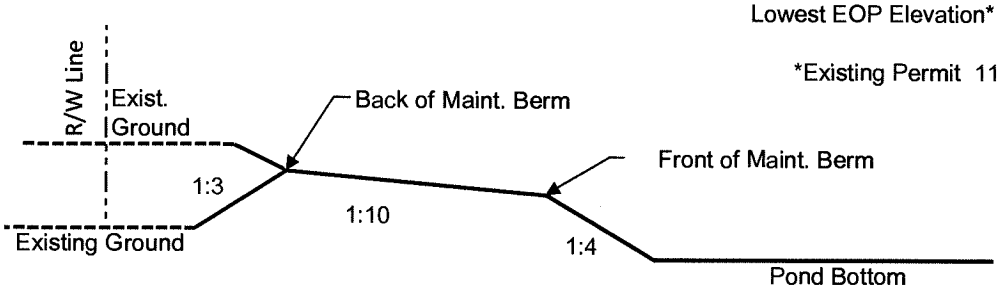
Total Runoff: Q_{post} = 5.84 in

Attenuation V_{req} = ΔQ/12 x Total Area = 7.34 ac-ft

Maintenance Area Width = 15.0 ft @ 1:15
Pond Tie-In Width = 43.0 ft @ 1:3

Existing Ground Elevation = 60.0 ft
Seasonal High Water Elevation* = 57.0 ft
Lowest EOP Elevation* = 73.0 ft

*Existing Permit 111974-1



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
71.00	Back of Maintenance Berm	2.20 ac			9.14 ac-ft
70.00	Front of Maintenance Berm	1.73 ac			7.17 ac-ft
69.00	---	1.61 ac			5.50 ac-ft
67.00	---	1.37 ac			2.52 ac-ft
65.00	Pond Bottom	1.15 ac			0.00 ac-ft

Required Treatment Volume: 1.26 ac-ft
Top El. Of Treatment Volume: 66.00

Required Treat. Vol. + Atten.: 7.34 ac-ft
Top El. Of Treat. Vol. + Atten.: 70.11

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		date:
made by:	LDP	20-Dec-14
checked by:	BJS	20-Dec-14

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: D
POND NAME: D (Normandy Blvd: Depression in Permit No. 42-127-1035ANG)

STATION LIMITS: From:* 26+87 To: 48+00
Roadway Length: 2113 ft
R/W Width: VARIES
* Stationing from Permit No. 42-127-1035ANG

PROPOSED CONDITION

Roadway Area:

Description	Width	Quantity	Total Width
Travel Lane	12 ft	2	24 ft
Bike Lane	4 ft	2	8 ft
Side Walk	8 ft	2	16 ft
		Total Impervious Width:	48 ft

Additional Impervious: (ramps, turn lanes, etc.)	0.00 ac
Impervious Roadway Area:	2.33 ac
Pervious Roadway Area:	67.97 ac
Total Roadway Area:	70.30 ac

Pond Area:

Pervious Pond Area:	4.57 ac	
Water Surface Area:	1.77 ac	(At the Treatment Volume Stage)
Total Pond Area:	6.34 ac	

Total Area:

Impervious Area:	2.33 ac
Pervious Area:	72.54 ac
Water Surface Area:	1.77 ac
Total Area:	76.64 ac

Curve Number:

Land Use Description	Soil Group	CN	Area	CN*Area
Impervious Area	---	98	2.33 ac	228.2
Water Area	---	100	1.77 ac	177.0
Open Land (Grass cover 75% or more)	A	25	70.58 ac	1764.5
Wood or Forest Land (Grass cover 75% or more)	A	39	1.96 ac	76.4
		Total:	76.64 ac	2246.2

CN = Total CN * Area / Total Area = **29.3**

Runoff:

Soil Capacity (S) = $\frac{1000}{CN} - 10$ = 24.12 in

Precipitation (P) = 11.0 in (for 100yr/24 hr storm event)

Runoff (Q) = $\frac{(P - 0.2S)^2}{(P + 0.8S)}$ = **1.26 in**

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

		date:
made by:	LDP	20-Dec-14
checked by:	BJS	20-Dec-14

HNTB job #: 59219

PROJECT: I-4 PD&E - SEGMENT 4

BASIN NAME: D
POND NAME: D (Normandy Blvd: Depression in Permit No. 42-127-1035ANG)

POND SIZING : DRY RETENTION POND (CLOSED BASIN) - SJRWMD (NO OUTFALL)

Required Treatment Volume:

1.25" over Impervious Area + 0.5" over Total Area= 3.44 ac-ft
1" over Total Area = 6.39 ac-ft

Treatment V_{req} = Largest of Trt. Vol. = 6.39 ac-ft

Required Attenuation Volume:

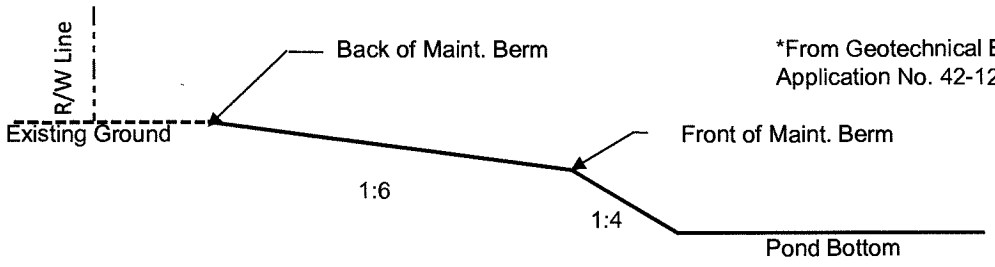
Total Runoff: Q_{post} = 1.26 in

Attenuation V_{req} = ΔQ/12 x Total Area = 8.04 ac-ft

Maintenance Area Width = 6.0 ft @ 1:6
Pond Tie-In Width = 34.2 ft @ 1:4

Existing Ground Elevation = 70.0 ft
Seasonal High Water Elevation* = 43.5 ft
Lowest EOP Elevation = 66.2 ft

*From Geotechnical Borings in Application No. 42-127-1035ANG



Pond Section

Elevation	Description	Area	Dimensions		Storage
			Length	Width	
63.95	Back of Maintenance Berm	6.34 ac			43.10 ac-ft
62.95	Front of Maintenance Berm	5.20 ac			37.33 ac-ft
59.95	---	4.32 ac			23.05 ac-ft
55.95	---	2.53 ac			9.35 ac-ft
48.95	Pond Bottom	0.14 ac			0.00 ac-ft

Required Treatment Volume: 6.39 ac-ft
Top El. Of Treatment Volume: 53.73

Required Treatment Volume: 8.04 ac-ft
Top El. Of Treat. Vol. + Atten.: 55.57

APPENDIX C –

FLOODPLAIN CALCULATIONS

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

		date:
made by:	SR	22-Dec-15
checked by:	BJS	22-Dec-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 4**

FLOODPLAIN COMPENSATION CALCULATIONS

WESTBOUND ROADWAY:

Station Limits:	2634+00 to	2651+00	Station Limits:	2651+00 to	2691+00
Roadway Length:	1700 ft		Roadway Length:	4000 ft	
Roadway Width:	13 ft		Roadway Width:	5 ft	
Station Limits:	2691+00 to	2724+00	Station Limits:	2724+00 to	2752+00
Roadway Length:	3300 ft		Roadway Length:	2800 ft	
Roadway Width:	45 ft		Roadway Width:	31 ft	

100 YR Floodplain Elevation:	9.0 ft
Seasonal High Elevation:	5.5 ft
Elevation Difference:	3.5 ft

Required Compensation = Roadway Length * Roadway Width * Elevation Difference: 22.29 ac-ft

---

EASTBOUND ROADWAY:

Station Limits:	2640+00 to	2661+00	Station Limits:	2661+00 to	2678+00
Roadway Length:	2100 ft		Roadway Length:	1700 ft	
Roadway Width:	33 ft		Roadway Width:	45 ft	
Station Limits:	2678+00 to	2709+00	Station Limits:	2709+00 to	2734+00
Roadway Length:	3100 ft		Roadway Length:	2500 ft	
Roadway Width:	33 ft		Roadway Width:	45 ft	
Station Limits:	2734+00 to	2752+00			
Roadway Length:	1800 ft				
Roadway Width:	31 ft				

100 YR Floodplain Elevation:	9.0 ft
Seasonal High Elevation:	5.5 ft
Elevation Difference:	3.5 ft

Required Compensation = Roadway Length * Roadway Width * Elevation Difference: 33.46 ac-ft

---

Total Roadway Required Compensation: **55.75 ac-ft**

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

		date:
made by:	LDP	22-Dec-15
checked by:	BJS	22-Dec-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 4**

POND NAME: FPC 403

FLOODPLAIN COMPENSATION CALCULATIONS

WESTBOUND ROADWAY:

Station Limits: 2842+20 to 2848+20

Roadway Length: 600 ft

Roadway Width: 35 ft

100 YR Floodplain Elevation: 40.0 ft
Seasonal High Elevation: 35.0 ft
Elevation Difference: 5.0 ft

Required Compensation = Roadway Length * Roadway Width * Elevation Difference: **2.41 ac-ft**

PROPOSED FLOODPLAIN POND:

100 YR Floodplain Elevation: 40.0 ft
Existing Ground Elevation: 45 - 50.0 ft

Seasonal High Water Elevation: 35.0 ft

Elevation	Area	Storage
40.00	1.32 ac	2.77 ac-ft
38.00	1.12 ac	0.33 ac-ft
35.00	0.83 ac	0.26 ac-ft

Total Storage Provided by FPC Ponds: **2.77 ac-ft**

Total Compensation Needed: **2.41 ac-ft**

Additional Storage Provided: **0.36 ac-ft**

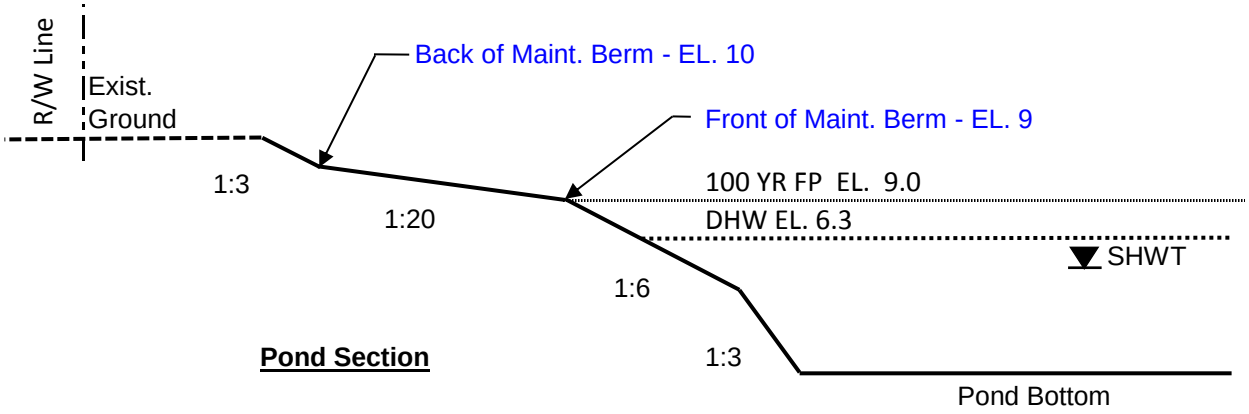
HNTB Corporation
610 Crescent Executive Court, Suite 400
Lake Mary, FL 32746

		date:
made by:	SR	22-Dec-15
checked by:	BJS	22-Dec-15
HNTB job #:	59219	

PROJECT: I-4 PD&E - SEGMENT 4

FLOODPLAIN COMPENSATION CALCULATIONS

EXISTING/PROPOSED TREATMENT POND: POND 400



Pond Section

Ave. Area Between 100 YR FP and DHW from Pond: 23.92 ac

100 YR FP Elevation:	9.0 ft
DHW Elevation:	6.3 ft
Elevation Difference:	2.7 ft

Amount of Cut = Ave. Area * Elevation Difference: 64.58 ac-ft

PROVIDED COMPENSATION

Provided Pond Compensation:	64.58 ac-ft
Required Roadway Compensation:	-55.75 ac-ft
Additional Provided Compensation:	8.84 ac-ft

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

		date:
made by:	SR	22-Dec-15
checked by:	BJS	22-Dec-15
HNTB job #:	59219	

PROJECT: **I-4 PD&E - SEGMENT 4**

POND NAME: FPC 407

FLOODPLAIN COMPENSATION CALCULATIONS

EASTBOUND RAMP TO SAXON BLVD:

Station Limits: 000+00 to 006+45

Roadway Length: 645 ft

Roadway Width: 36 ft

100 YR Floodplain Elevation: 24.3 ft *(Trout Lake - NAVD)
Seasonal High Elevation: 22.0 ft
Elevation Difference: 2.3 ft

Additional Floodplain Impacts = 2.51 AC

Required Compensation = Roadway Length * Roadway Width * Elevation Difference: **6.85 ac-ft**

PROPOSED FLOODPLAIN POND:

*100 YR Floodplain Elevation: 24.3 ft Seasonal High Water Elevation: 22.0 ft
*Elevation was determined from existing permit application no. 42-127-3037AN
Existing Ground Elevation: 30.0 ft

Elevation	Area	Storage
25.00	3.43 ac	9.57 ac-ft
24.25	3.31 ac	7.04 ac-ft
22.00	2.95 ac	0.00 ac-ft

Total Storage Provided by FPC Ponds: **7.04 ac-ft**

Total Compensation Needed: **6.85 ac-ft**

Additional Storage Provided: **0.20 ac-ft**

APPENDIX D –

CORRESPONDENCE

HNTB Corporation
The HNTB Companies
Engineers Architects Planners

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
Facsimile (407) 805-0227
www.hntb.com

Meeting Date/Time: April 23, 2013 / 2:00 PM

HNTB Project No. 59219

Meeting Name: I-4 SAMR SJRWMD Pre-Application Meeting

Location: SJRWMD, Maitland Office

Purpose: SJRWMD Pre-App for I-4 Ultimate

Attending: Barry Switzer, HNTB
Heather Johnstone, HNTB
Ken Lewis, SJRWMD

The purpose of this meeting was to discuss the I-4 PD&E project and the drainage approach to the project. The following items were discussed:

- Project Overview:
  - 5 Sections and 5 Reports – 5)US 27 to Polk County Line, 1)Polk County Line to SR 528, 2)SR 528 to Kirkman Interchange, 3)SR 434 to SR46, and 4)SR 46 to SR 472
  - Sections 1, 2, and 5 are located in SFWMD
  - Sections 3 and 4 are located in SJRWMD
  - Design to be completed by end of 2014

- Project Team:
  - HNTB – Roadway, Structures, Drainage and Permitting
  - Greenhorne & O'Mara – Contamination, Air, Noise and Wildlife
  - 3 E Consultants – Wetlands
  - Southeastern Archaeology Research – Cultural Resources
  - GEC – Geotechnical

- Areas of Interest:
  - Padgett Creek has had many complaints from the residents in the area. The residents believe I-4's construction restricted the ability of DeBary Bayou to be flushed by Lake Monroe. The ACOE study showed that there is no relationship between the I-4 causeway construction and the deterioration of the DeBary Bayou. HNTB asked if SJRWMD had any information related to the complaints. Ken stated that he did not, but he was aware of the complaints by the residents. Ken said that any improvements we made in this area, such as additional culverts under I-4, should make the residents happy.
  - We discussed the past flooding issues at the Saxon Boulevard Interchange. Ken stated that he has not seen any flooding since the interchange had been rebuilt.

- Commuter Rail was discussed. Barry explained that in other areas of the state, the rail was considered to be pervious. Ken agreed that would be appropriate for this project.
- HNTB asked if there were any known areas of flooding along the corridor. Ken stated that he wasn't aware of any.
- HNTB asked if the new Statewide Rule would have an impact on this project. Ken stated that for this project, there would not be a big impact. The smaller projects are more likely to be impacted by the new rule. The purpose of the new rule is for all water management districts to have the same rules with the same costs. Each individual water management district will still have different criteria for special basins, such as the Lake Apopka area. Phosphorus loading calculations will still be required in areas that are considered impaired. Nitrogen loading calculations are not required at this time. Phosphorus loading calculations can be completed through either the Lake Apopka method or the method outlined in the Stormwater Quality Handbook.

- Water Quality Criteria:
  - The water quality criteria have remained the same for wet detention ponds: 1" over the basin or 2.5" over impervious area and 8.6" of rainfall for the 25 yr/24 hr event.
  - Ken suggested that we check the DEP website for the verified list of impaired water.

Should any revisions, additions or clarifications of these notes be required, please advise Heather Johnstone at hjohnstone@hntb.com .

Heather Johnstone

From: Kenneth Lewis <KLewis@sjrwmd.com>
Sent: Wednesday, September 11, 2013 8:44 AM
To: Heather Johnstone
Subject: RE: I-4 PD&E at Padgett Creek

Heather,

It would be acceptable to provide treatment without attenuation under one of two possible circumstances:

First, that using the presumptive criteria found in Section 10.3 of the Applicant's Handbook: Management and Storage of Surface Waters you can demonstrate that the aggregate 25-year/24-hour peak rate of discharge to Lake Monroe in post-development does not exceed that of pre-development. In this case, you would consider all basins that discharge to Lake Monroe, including Basin 411, in demonstrating pre-/post- attenuation.

In the second circumstance, you could rely on the statutory criteria found in Section 8.3 with consideration of the applicable conditions for issuance in Section 9.1. In this case, you would provide reasonable assurance that the lack of attenuation in Basin 411 will not be inconsistent with the overall objectives of the District and will not be harmful to the water resources of the District. One way to provide that reasonable assurance would be to demonstrate conformance with the conditions for issuance found in paragraphs 9.1.1 (a) – (c), as they address adverse water quantity impacts, adverse flooding, and adverse impacts to existing surface water storage and conveyance capabilities.

If you have any further questions or comments, or would like to discuss this in more detail, please call me at your earliest convenience.

Sincerely,

KAL

Ken Lewis, P.E.
Sr. Professional Engineer
Maitland Service Center
St. Johns River Water Management District
Office Phone: 407-659-4831

From: Heather Johnstone [mailto:hjohnstone@HNTB.com]
Sent: Friday, September 06, 2013 1:33 PM
To: Kenneth Lewis
Subject: RE: I-4 PD&E at Padgett Creek

In the area along Basin 411, I am considering swales for treatment as an option. Considering that the swales would discharge to Lake Monroe directly, would it be acceptable to provide treatment in the swales without attenuation?

Heather J. Johnstone, P.E.

HNTB Corporation

Tel (407) 547-3007

From: Kenneth Lewis [mailto:KLewis@sjrwmd.com]
Sent: Tuesday, September 03, 2013 1:55 PM
To: Heather Johnstone
Cc: Barry Switzer
Subject: RE: I-4 PD&E at Padgett Creek

Heather,

If reconstruction is beyond milling and resurfacing, treatment is required for the reconstructed lanes.

The new SWERP will address only the administrative aspects of ERP, i.e., definitions, procedures, permit types, thresholds, and fees, etc. for the purposes of consolidation and consistency among the Districts and DEP.

All other criteria in a given District's BOR, AH, etc. are not affected. I suppose this would also apply to a given District's policies and interpretations.

Nonetheless, for the SJRWMD, reconstruction beyond milling and resurfacing requires treatment.

If you have any further questions or comments, or wish to meet to discuss, please contact me at your earliest convenience.

Sincerely,

KAL

Ken Lewis, P.E.
Sr. Professional Engineer
Maitland Service Center
St. Johns River Water Management District
Office Phone: 407-659-4831

P.S. I understand you're trying to minimize the project cost, and that you're probably already aware of this, but may I suggest you take into consideration in your design the new legislation concerning stormwater treatment for DOT projects found in subsection 373.413(6), F.S.:

373.413 Permits for construction or alteration.—
(6) It is the intent of the Legislature that the governing board or department exercise flexibility in the permitting of stormwater management systems associated with the construction or alteration of systems serving state transportation projects and facilities. Because of the unique limitations of linear facilities, the governing board or department shall balance the expenditure of public funds for stormwater treatment for state transportation projects and facilities with the benefits to the public in providing the most cost-efficient and effective method of achieving the treatment objectives. In consideration thereof, the governing board or department shall allow alternatives to onsite treatment, including, but not limited to, regional stormwater treatment systems. The Department of Transportation is responsible for treating stormwater generated from state transportation projects but is not responsible for the abatement of pollutants and flows entering its stormwater management systems from offsite sources; however, this subsection does not prohibit the Department of Transportation from receiving and managing such pollutants and flows when cost effective and prudent. Further, in association with right-of-way acquisition for state transportation projects, the Department of Transportation is responsible for providing stormwater treatment and attenuation for the acquired right-of-way but is not responsible for modifying permits for adjacent lands affected by right-of-way acquisition when it is not the permittee. The governing board or department may establish, by rule, specific criteria to implement the management and treatment alternatives and activities under this subsection.

From: Heather Johnstone [mailto:hjohnstone@HNTB.com]
Sent: Tuesday, September 03, 2013 8:48 AM
To: Kenneth Lewis
Cc: Barry Switzer
Subject: RE: I-4 PD&E at Padgett Creek

In our case, we are planning on reconstructing all of the lanes. SFWMD only requires treatment of new lanes regardless of whether or not the road will be reconstructed. Does the New Statewide Rules impact this decision?

Heather J. Johnstone, P.E.

HNTB Corporation

Tel (407) 547-3007

From: Kenneth Lewis [mailto:KLewis@sjrwmd.com]
Sent: Monday, September 02, 2013 5:53 PM
To: Heather Johnstone
Cc: Barry Switzer; Luis Diaz
Subject: RE: I-4 PD&E at Padgett Creek

Heather,

Sorry it took so long to get back to you; I was in training Wednesday through Friday.

As such, I haven't been able to research your second question, but I still have answers for both.

Yes, overtreatment by treating untreated lanes in one area/basin to compensate for the lack of treatment in others is acceptable.

With that said, the answer to the second question might be related to the answer to the first.

Unless you can find something in the correspondence (RAI letter, RAI Response, transmittal letter, revised stormwater narrative, etc.) to the contrary, I can only surmise that the change was made due to ROW acquisition issues, construction cost/logistics issues, that made it cost-effective to provide compensating treatment in Basin 410 rather than direct treatment in Pond 411.

I hope this helps. If you'd like to discuss this more, please contact me at your earliest convenience.

Sincerely,

KAL

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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.
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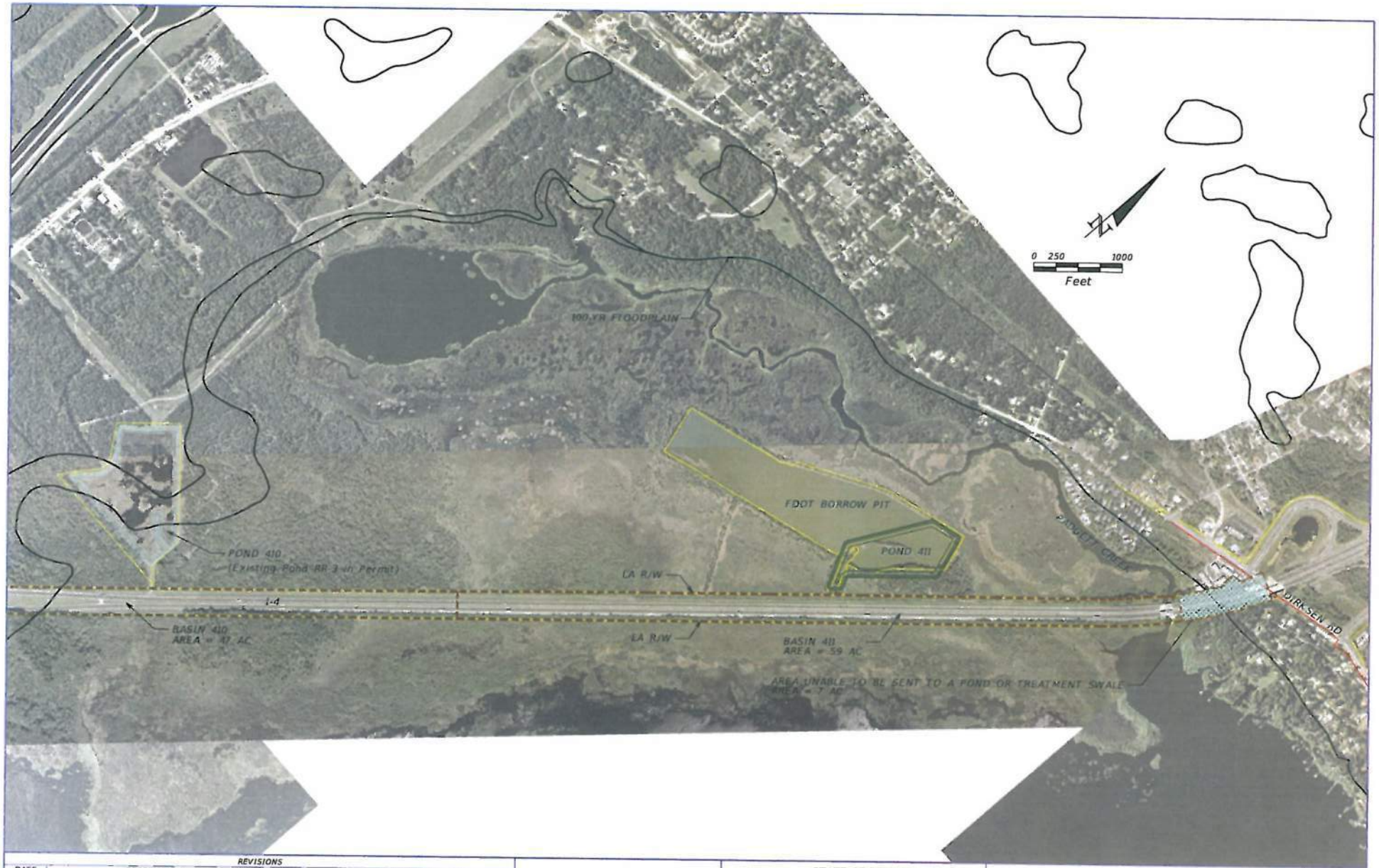

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

$USERS $DATES $TIMES $FILES

BASIN 411 FIGURE

SHEET NO.

HNTB Corporation
The HNTB Companies
Engineers Architects Planners

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
Facsimile (407) 805-0227
www.hntb.com

Meeting Date/Time: November 13, 2013

HNTB Project No. 59219

Meeting Name: I-4 SAMR SJRWMD Pre-Application Meeting

Location: SJRWMD, Maitland Office

Purpose: SJRWMD Pre-App for I-4 Ultimate PD&E

Attending: Luis Diaz, HNTB
Melinda Fischl, HNTB
Ken Lewis, SJRWMD
Lee Kissick, SJRWMD
Maurice Pearson, 3E
Gunda Griffin, 3E

The purpose of this meeting was to discuss the I-4 PD&E project and the drainage approach to the project. The following items were discussed:

- Project Overview:
  - 5 Sections and 5 Reports – 5)US 27 to Polk County Line, 1)Polk County Line to SR 528, 2)SR 528 to Kirkman Interchange, 3)SR 434 to SR46, and 4)SR 46 to SR 472
  - Sections 1, 2, and 5 are located in SFWMD
  - Sections 3 and 4 are located in SJRWMD
  - Design to be completed by end of 2014

- Project Team:
  - HNTB – Roadway, Structures, Drainage and Permitting
  - 3 E Consultants – Wetlands

- Areas of Interest:
  - Segment 3 – There was very little by way of wetlands
  - Segment 4 – Pond 411– the borrow pit is a very nice location because it has a connection to St. Johns
    - Would rather use somewhere than borrow lake (prior to this, the use of swales was suggested and they were talked out of it).
  - Padgett Creek – Melinda discussed the "Flushing Approach" and will send Lee and Ken the ACOE Study and the Power Point the FDOT wants to use as an approach. Lee was in agreement with this idea.
  - Ken pointed out overtreatment using OFW quantities is good or using compensating treatment of currently non-treated as long as it is within the same receiving water.

- Lee likes long, linear ponds and/or swales. He says the wetlands along the road within the right-of-way are very poor quality and he would give FDOT a break on using those (check the existing permit for the area between 17/92 and Padgett Creek).
    - There are 3 mitigation banks within this area and FDOT has a preference to use the banks.
    - Ken will send a mitigation map showing the basins.

- Engineering:
    - Recent list of impaired water bodies.
    - Stay within the easement of SSL and Tribe
    - The use of SSL for barge equipment is something to consider.
    - Luis stated that we are not doing anything in the water, just above it (in the area of the bridge over St. Johns/Lake Monroe).
    - Individual Permit:
        - The project area may slightly change, making it a major permit modification for fees impacted but not the way it is permitted.
        - CH 62-330
        - SWERP (Volume 1)
        - District Rules (Volume 2)

- Environmental Considerations:
    - 3E Consultants (3E) presented a general overview of how wetlands and surface waters were delineated throughout the corridor. Within the existing right-of-way (ROW) and potential pond locations, the limits of jurisdictional systems were identified using handheld Global Positioning System (GPS) devices. In locations outside of the existing ROW, GPS devices were used in combination with on the ground aerial interpretation.

    - The group discussed a proposed pond location just north of Padgett Creek on the west side of the existing ROW within a portion of a borrow pit. Lee indicated that he felt the quality of the borrow pit was good and that design considerations should look to avoid converting the pit into a stormwater pond. Lee discussed that he permitted I-4 improvements through this section of roadway near Padgett Creek and the borrow pit. During that permit review, FDOT avoided impacts to the borrow pit by doing a long linear stormwater system near the edge of the road. Lee suggested that consideration for such a treatment system should be considered again as a part of our planning. In this area of large wetland systems, Lee's preference is for a stormwater treatment facility that is a linear system through areas of disturbed wetland communities.

    - Melinda mentioned that the FDOT's approach to the possible addition of culverts under I-4 at Lake Monroe and Padgett Creek could create flushing of the creek. Lee indicated that mitigation value may be given for the improvements created by the culvert addition.

    - Maurice indicated that mitigation options are being explored including mitigation banking.

- Lee mentioned that the project should not have Riparian Habitat Protection Zone (RHPZ) involvement.

- Lee indicated that the project traverses three (3) hydrologic basins.

  The project will likely require an Individual permit under the major modification.

Should any revisions, additions or clarifications of these notes be required, please advise Melinda Fischl at mfischl@hntb.com .

Heather Johnstone

From: Luis Diaz
Sent: Wednesday, January 15, 2014 7:50 AM
To: Heather Johnstone
Subject: Fw: Soil investigation near pond 401 related to widening of I-4

From: Steven R Miller [mailto:srmiller@sjrwmd.com]
Sent: Wednesday, January 15, 2014 06:39 AM
To: Luis Diaz; 'beata.stys-palasz@dot.state.fl.us' <beata.stys-palasz@dot.state.fl.us>
Cc: Ray Bunton <RBunton@sjrwmd.com>; Diana Bankhardt <dbankhar@sjrwmd.com>; Peter Henn <phenn@sjrwmd.com>; Brian Emanuel <BEmanuel@sjrwmd.com>; Woody Boynton <WBoynton@sjrwmd.com>
Subject: Soil investigation near pond 401 related to widening of I-4

Mr Diaz

I am in receipt of the January 6, 2014, letter from Beata Stys-Palasz regarding the soil investigation you desire to complete adjacent to pond 401 as related to the I-4 widening project. I serve the St Johns River Water management District as the Chief of the Land Management Bureau. As such I represent the District as a landowner, I have no role or responsibility with regards to the District's regulatory functions.

As a landowner, the SJRWMD will be happy to work with you to get the access you desire, however SJRWMD has a procedure for granting access such as you are requesting. The mechanism for granting the access you desire is called a Special use Authorization (SUA). Diana Bankhardt, who is copied on this email, processes requests for SUA's. Please contact her at least 14 days before you will actually require access, so that we can get the paperwork through our respective agencies.

Also, please be aware that the parcel on which you wish to do the work was acquired as mitigation for the previous expansion of I-4. Therefore any impacts to the land, or any additional real estate DOT will require from that parcel in order to expand I-4, may require remitigation.

If you have any questions regarding this matter, please contact me.

Steve

Steven R. Miller, Chief
Bureau of Land Management
St Johns River Water Management District
386-329-4399

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Sanam Rai

From: Meade, Ron <Ron.Meade@dot.state.fl.us>
Sent: Thursday, January 29, 2015 9:50 AM
To: Sanam Rai; 'Richard Archambault'; Read, James; Golloway, Jeremy
Cc: Kirts, Scott; Snow, Rick; Barry Switzer
Subject: RE: I4 Segment 4 Cross Drains

You are welcome and I've had no known issues at these locations from internal staff.

Thanks,

Ron

Ron J. Meade
Deland Operations Engineer
Office (386) 740-3401
Main (386)740-3400
Cell (386) 956-8959

From: Sanam Rai [mailto:sarai@HNTB.com]
Sent: Thursday, January 29, 2015 9:45 AM
To: 'Richard Archambault'; Read, James; Golloway, Jeremy
Cc: Kirts, Scott; Meade, Ron; Snow, Rick; Barry Switzer
Subject: RE: I4 Segment 4 Cross Drains

All,

Thank you for helping me out with this task.

Ron, thanks again for coordinating and responding so promptly.

Sanam

From: Richard Archambault [mailto:ozzy.archambault@tmeenterprises.com]
Sent: Wednesday, January 28, 2015 3:31 PM
To: 'Read, James'; 'Golloway, Jeremy'
Cc: 'Kirts, Scott'; Sanam Rai; 'Meade, Ron'; 'Snow, Rick'
Subject: RE: I4 Segment 4 Cross Drains

Jim,

I am unaware of any issues with the referenced cross drains. Let me know if you need anything else.

Richard "Ozzy" Archambault
Project Manager – Orlando, Fl.
Office: (407) 730–2232
Cell: (407) 494–9032
Fax: (407) 704–7642
Email: Richard.archambault@tmeenterprises.com

TME ENTERPRISES
INCORPORATED
RIGHT OF WAY MAINTENANCE

From: Read, James [mailto:James.Read@dot.state.fl.us]
Sent: Wednesday, January 28, 2015 2:44 PM
To: Richard Archambault; Golloway, Jeremy
Cc: Kirts, Scott; sarai@HNTB.com; Meade, Ron; Snow, Rick
Subject: FW: I4 Segment 4 Cross Drains

Jeremy, Ozzy

We would like your input as well. Please see below and respond to all. Thanks

James Read
Field Operations Manager
Deland Operations
386-740-3406
M - F 7:00 am to 3:30 pm

FDOT

From: Meade, Ron
Sent: Wednesday, January 28, 2015 1:59 PM
To: Read, James; Snow, Rick; McGhee, William; Woods, Charles
Subject: FW: I4 Segment 4 Cross Drains

Team,
Do we have any known issues at these locations that we can share with these designers?

Ron J. Meade
Deland Operations Engineer
Office (386) 740-3401
Main (386)740-3400
Cell (386) 956-8959

From: Sanam Rai [mailto:sarai@HNTB.com]
Sent: Wednesday, January 28, 2015 1:39 PM
To: Meade, Ron
Cc: Barry Switzer; Luz Phillip
Subject: I4 Segment 4 Cross Drains

Ron,

Attached are the drainage maps that show the existing crossdrains located along the I-4 project limits within Volusia County. I have placed a text note and a pop up note box at each crossdrain location for your reference.

As I mentioned earlier over the phone, I need to know of any issues (flooding, scour, sedimentation) with any of the crossdrains for our Location Hydraulics Report (LHR).

If you have any questions or comments, feel free to email or call me.

Thanks,

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

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HNTB Corporation
The HNTB Companies
Engineers Architects Planners

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
Facsimile (407) 805-0227
www.hntb.com

Meeting Date/Time: April 23, 2013 / 2:00 PM

HNTB Project No. 59219

Meeting Name: I-4 SAMR SJRWMD Pre-Application Meeting

Location: SJRWMD, Maitland Office

Purpose: SJRWMD Pre-App for I-4 Ultimate

Attending: Barry Switzer, HNTB
Heather Johnstone, HNTB
Ken Lewis, SJRWMD

The purpose of this meeting was to discuss the I-4 PD&E project and the drainage approach to the project. The following items were discussed:

- Project Overview:
  - 5 Sections and 5 Reports – 5)US 27 to Polk County Line, 1)Polk County Line to SR 528, 2)SR 528 to Kirkman Interchange, 3)SR 434 to SR46, and 4)SR 46 to SR 472
  - Sections 1, 2, and 5 are located in SFWMD
  - Sections 3 and 4 are located in SJRWMD
  - Design to be completed by end of 2014

- Project Team:
  - HNTB – Roadway, Structures, Drainage and Permitting
  - Greenhorne & O'Mara – Contamination, Air, Noise and Wildlife
  - 3 E Consultants – Wetlands
  - Southeastern Archaeology Research – Cultural Resources
  - GEC – Geotechnical

- Areas of Interest:
  - Padgett Creek has had many complaints from the residents in the area. The residents believe I-4's construction restricted the ability of DeBary Bayou to be flushed by Lake Monroe. The ACOE study showed that there is no relationship between the I-4 causeway construction and the deterioration of the DeBary Bayou. HNTB asked if SJRWMD had any information related to the complaints. Ken stated that he did not, but he was aware of the complaints by the residents. Ken said that any improvements we made in this area, such as additional culverts under I-4, should make the residents happy.
  - We discussed the past flooding issues at the Saxon Boulevard Interchange. Ken stated that he has not seen any flooding since the interchange had been rebuilt.

- Commuter Rail was discussed. Barry explained that in other areas of the state, the rail was considered to be pervious. Ken agreed that would be appropriate for this project.
- HNTB asked if there were any known areas of flooding along the corridor. Ken stated that he wasn't aware of any.
- HNTB asked if the new Statewide Rule would have an impact on this project. Ken stated that for this project, there would not be a big impact. The smaller projects are more likely to be impacted by the new rule. The purpose of the new rule is for all water management districts to have the same rules with the same costs. Each individual water management district will still have different criteria for special basins, such as the Lake Apopka area. Phosphorus loading calculations will still be required in areas that are considered impaired. Nitrogen loading calculations are not required at this time. Phosphorus loading calculations can be completed through either the Lake Apopka method or the method outlined in the Stormwater Quality Handbook.

- Water Quality Criteria:
  - The water quality criteria have remained the same for wet detention ponds: 1" over the basin or 2.5" over impervious area and 8.6" of rainfall for the 25 yr/24 hr event.
  - Ken suggested that we check the DEP website for the verified list of impaired water.

Should any revisions, additions or clarifications of these notes be required, please advise Heather Johnstone at hjohnstone@hntb.com .

Heather Johnstone

From: Kenneth Lewis <KLewis@sjrwmd.com>
Sent: Wednesday, September 11, 2013 8:44 AM
To: Heather Johnstone
Subject: RE: I-4 PD&E at Padgett Creek

Heather,

It would be acceptable to provide treatment without attenuation under one of two possible circumstances:

First, that using the presumptive criteria found in Section 10.3 of the Applicant's Handbook: Management and Storage of Surface Waters you can demonstrate that the aggregate 25-year/24-hour peak rate of discharge to Lake Monroe in post-development does not exceed that of pre-development. In this case, you would consider all basins that discharge to Lake Monroe, including Basin 411, in demonstrating pre-/post- attenuation.

In the second circumstance, you could rely on the statutory criteria found in Section 8.3 with consideration of the applicable conditions for issuance in Section 9.1. In this case, you would provide reasonable assurance that the lack of attenuation in Basin 411 will not be inconsistent with the overall objectives of the District and will not be harmful to the water resources of the District. One way to provide that reasonable assurance would be to demonstrate conformance with the conditions for issuance found in paragraphs 9.1.1 (a) – (c), as they address adverse water quantity impacts, adverse flooding, and adverse impacts to existing surface water storage and conveyance capabilities.

If you have any further questions or comments, or would like to discuss this in more detail, please call me at your earliest convenience.

Sincerely,

KAL

Ken Lewis, P.E.
Sr. Professional Engineer
Maitland Service Center
St. Johns River Water Management District
Office Phone: 407-659-4831

From: Heather Johnstone [mailto:hjohnstone@HNTB.com]
Sent: Friday, September 06, 2013 1:33 PM
To: Kenneth Lewis
Subject: RE: I-4 PD&E at Padgett Creek

In the area along Basin 411, I am considering swales for treatment as an option. Considering that the swales would discharge to Lake Monroe directly, would it be acceptable to provide treatment in the swales without attenuation?

Heather J. Johnstone, P.E.

HNTB Corporation

Tel (407) 547-3007

From: Kenneth Lewis [mailto:KLewis@sjrwmd.com]
Sent: Tuesday, September 03, 2013 1:55 PM
To: Heather Johnstone
Cc: Barry Switzer
Subject: RE: I-4 PD&E at Padgett Creek

Heather,

If reconstruction is beyond milling and resurfacing, treatment is required for the reconstructed lanes.

The new SWERP will address only the administrative aspects of ERP, i.e., definitions, procedures, permit types, thresholds, and fees, etc. for the purposes of consolidation and consistency among the Districts and DEP.

All other criteria in a given District's BOR, AH, etc. are not affected. I suppose this would also apply to a given District's policies and interpretations.

Nonetheless, for the SJRWMD, reconstruction beyond milling and resurfacing requires treatment.

If you have any further questions or comments, or wish to meet to discuss, please contact me at your earliest convenience.

Sincerely,

KAL

Ken Lewis, P.E.
Sr. Professional Engineer
Maitland Service Center
St. Johns River Water Management District
Office Phone: 407-659-4831

P.S. I understand you're trying to minimize the project cost, and that you're probably already aware of this, but may I suggest you take into consideration in your design the new legislation concerning stormwater treatment for DOT projects found in subsection 373.413(6), F.S.:

373.413 Permits for construction or alteration.—
(6) It is the intent of the Legislature that the governing board or department exercise flexibility in the permitting of stormwater management systems associated with the construction or alteration of systems serving state transportation projects and facilities. Because of the unique limitations of linear facilities, the governing board or department shall balance the expenditure of public funds for stormwater treatment for state transportation projects and facilities with the benefits to the public in providing the most cost-efficient and effective method of achieving the treatment objectives. In consideration thereof, the governing board or department shall allow alternatives to onsite treatment, including, but not limited to, regional stormwater treatment systems. The Department of Transportation is responsible for treating stormwater generated from state transportation projects but is not responsible for the abatement of pollutants and flows entering its stormwater management systems from offsite sources; however, this subsection does not prohibit the Department of Transportation from receiving and managing such pollutants and flows when cost effective and prudent. Further, in association with right-of-way acquisition for state transportation projects, the Department of Transportation is responsible for providing stormwater treatment and attenuation for the acquired right-of-way but is not responsible for modifying permits for adjacent lands affected by right-of-way acquisition when it is not the permittee. The governing board or department may establish, by rule, specific criteria to implement the management and treatment alternatives and activities under this subsection.

From: Heather Johnstone [mailto:hjohnstone@HNTB.com]
Sent: Tuesday, September 03, 2013 8:48 AM
To: Kenneth Lewis
Cc: Barry Switzer
Subject: RE: I-4 PD&E at Padgett Creek

In our case, we are planning on reconstructing all of the lanes. SFWMD only requires treatment of new lanes regardless of whether or not the road will be reconstructed. Does the New Statewide Rules impact this decision?

Heather J. Johnstone, P.E.

HNTB Corporation

Tel (407) 547-3007

From: Kenneth Lewis [mailto:KLewis@sjrwmd.com]
Sent: Monday, September 02, 2013 5:53 PM
To: Heather Johnstone
Cc: Barry Switzer; Luis Diaz
Subject: RE: I-4 PD&E at Padgett Creek

Heather,

Sorry it took so long to get back to you; I was in training Wednesday through Friday.

As such, I haven't been able to research your second question, but I still have answers for both.

Yes, overtreatment by treating untreated lanes in one area/basin to compensate for the lack of treatment in others is acceptable.

With that said, the answer to the second question might be related to the answer to the first.

Unless you can find something in the correspondence (RAI letter, RAI Response, transmittal letter, revised stormwater narrative, etc.) to the contrary, I can only surmise that the change was made due to ROW acquisition issues, construction cost/logistics issues, that made it cost-effective to provide compensating treatment in Basin 410 rather than direct treatment in Pond 411.

I hope this helps. If you'd like to discuss this more, please contact me at your earliest convenience.

Sincerely,

KAL

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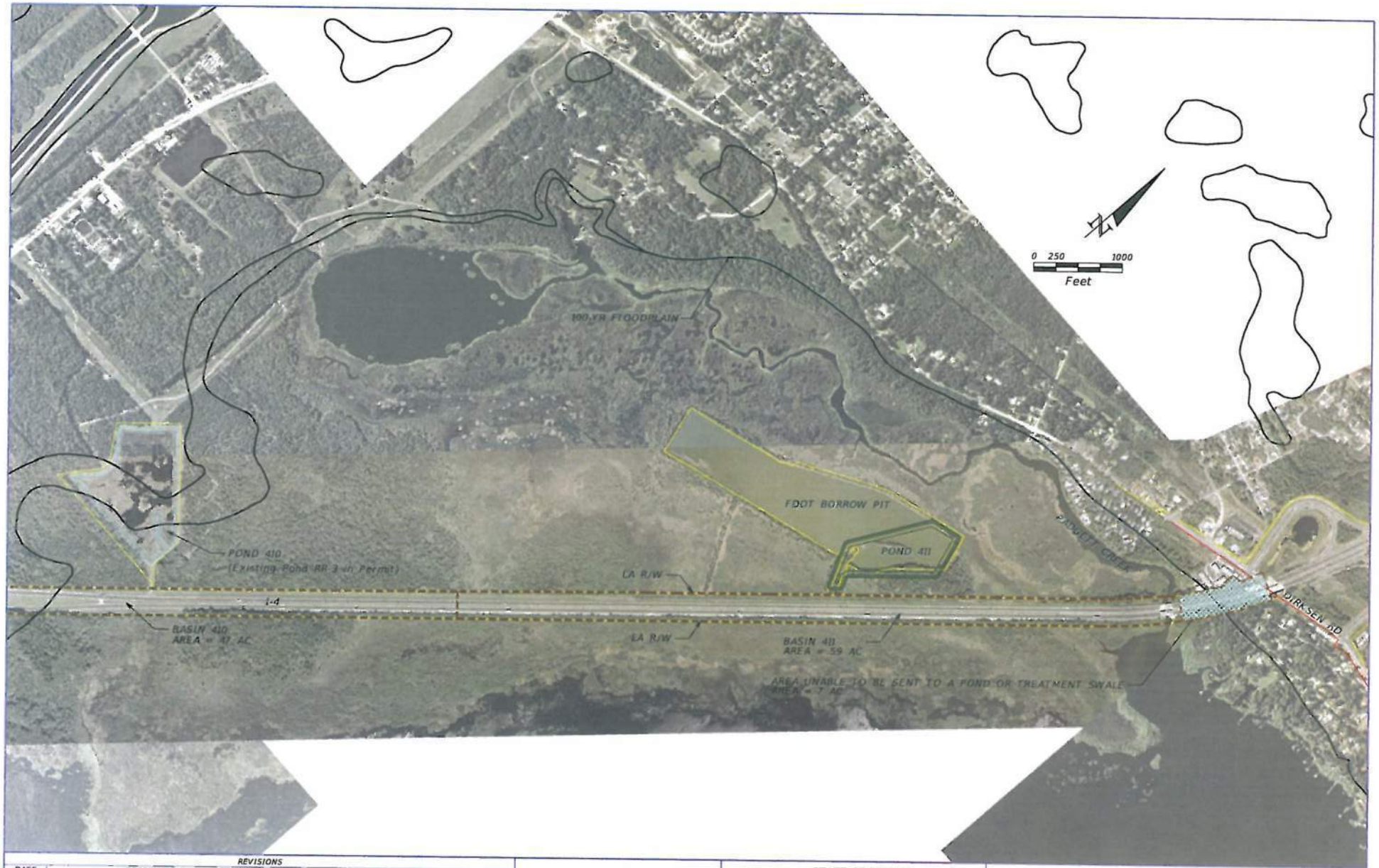

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

$USERS $DATES $TIMES $FILES

BASIN 411 FIGURE

SHEET NO.

HNTB Corporation
The HNTB Companies
Engineers Architects Planners

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
Facsimile (407) 805-0227
www.hntb.com

Meeting Date/Time: November 13, 2013

HNTB Project No. 59219

Meeting Name: I-4 SAMR SJRWMD Pre-Application Meeting

Location: SJRWMD, Maitland Office

Purpose: SJRWMD Pre-App for I-4 Ultimate PD&E

Attending: Luis Diaz, HNTB
Melinda Fischl, HNTB
Ken Lewis, SJRWMD
Lee Kissick, SJRWMD
Maurice Pearson, 3E
Gunda Griffin, 3E

The purpose of this meeting was to discuss the I-4 PD&E project and the drainage approach to the project. The following items were discussed:

- Project Overview:
  - 5 Sections and 5 Reports – 5)US 27 to Polk County Line, 1)Polk County Line to SR 528, 2)SR 528 to Kirkman Interchange, 3)SR 434 to SR46, and 4)SR 46 to SR 472
  - Sections 1, 2, and 5 are located in SFWMD
  - Sections 3 and 4 are located in SJRWMD
  - Design to be completed by end of 2014

- Project Team:
  - HNTB – Roadway, Structures, Drainage and Permitting
  - 3 E Consultants – Wetlands

- Areas of Interest:
  - Segment 3 – There was very little by way of wetlands
  - Segment 4 – Pond 411– the borrow pit is a very nice location because it has a connection to St. Johns
    - Would rather use somewhere than borrow lake (prior to this, the use of swales was suggested and they were talked out of it).
  - Padgett Creek – Melinda discussed the "Flushing Approach" and will send Lee and Ken the ACOE Study and the Power Point the FDOT wants to use as an approach. Lee was in agreement with this idea.
  - Ken pointed out overtreatment using OFW quantities is good or using compensating treatment of currently non-treated as long as it is within the same receiving water.

- Lee likes long, linear ponds and/or swales. He says the wetlands along the road within the right-of-way are very poor quality and he would give FDOT a break on using those (check the existing permit for the area between 17/92 and Padgett Creek).
    - There are 3 mitigation banks within this area and FDOT has a preference to use the banks.
    - Ken will send a mitigation map showing the basins.

- Engineering:
    - Recent list of impaired water bodies.
    - Stay within the easement of SSL and Tribe
    - The use of SSL for barge equipment is something to consider.
    - Luis stated that we are not doing anything in the water, just above it (in the area of the bridge over St. Johns/Lake Monroe).
    - Individual Permit:
        - The project area may slightly change, making it a major permit modification for fees impacted but not the way it is permitted.
        - CH 62-330
        - SWERP (Volume 1)
        - District Rules (Volume 2)

- Environmental Considerations:
    - 3E Consultants (3E) presented a general overview of how wetlands and surface waters were delineated throughout the corridor. Within the existing right-of-way (ROW) and potential pond locations, the limits of jurisdictional systems were identified using handheld Global Positioning System (GPS) devices. In locations outside of the existing ROW, GPS devices were used in combination with on the ground aerial interpretation.

    - The group discussed a proposed pond location just north of Padgett Creek on the west side of the existing ROW within a portion of a borrow pit. Lee indicated that he felt the quality of the borrow pit was good and that design considerations should look to avoid converting the pit into a stormwater pond. Lee discussed that he permitted I-4 improvements through this section of roadway near Padgett Creek and the borrow pit. During that permit review, FDOT avoided impacts to the borrow pit by doing a long linear stormwater system near the edge of the road. Lee suggested that consideration for such a treatment system should be considered again as a part of our planning. In this area of large wetland systems, Lee's preference is for a stormwater treatment facility that is a linear system through areas of disturbed wetland communities.

    - Melinda mentioned that the FDOT's approach to the possible addition of culverts under I-4 at Lake Monroe and Padgett Creek could create flushing of the creek. Lee indicated that mitigation value may be given for the improvements created by the culvert addition.

    - Maurice indicated that mitigation options are being explored including mitigation banking.

- Lee mentioned that the project should not have Riparian Habitat Protection Zone (RHPZ) involvement.

- Lee indicated that the project traverses three (3) hydrologic basins.

  The project will likely require an Individual permit under the major modification.

Should any revisions, additions or clarifications of these notes be required, please advise Melinda Fischl at mfischl@hntb.com .

Heather Johnstone

From: Luis Diaz
Sent: Wednesday, January 15, 2014 7:50 AM
To: Heather Johnstone
Subject: Fw: Soil investigation near pond 401 related to widening of I-4

From: Steven R Miller [mailto:srmiller@sjrwmd.com]
Sent: Wednesday, January 15, 2014 06:39 AM
To: Luis Diaz; 'beata.stys-palasz@dot.state.fl.us' <beata.stys-palasz@dot.state.fl.us>
Cc: Ray Bunton <RBunton@sjrwmd.com>; Diana Bankhardt <dbankhar@sjrwmd.com>; Peter Henn <phenn@sjrwmd.com>; Brian Emanuel <BEmanuel@sjrwmd.com>; Woody Boynton <WBoynton@sjrwmd.com>
Subject: Soil investigation near pond 401 related to widening of I-4

Mr Diaz

I am in receipt of the January 6, 2014, letter from Beata Stys-Palasz regarding the soil investigation you desire to complete adjacent to pond 401 as related to the I-4 widening project. I serve the St Johns River Water management District as the Chief of the Land Management Bureau. As such I represent the District as a landowner, I have no role or responsibility with regards to the District's regulatory functions.

As a landowner, the SJRWMD will be happy to work with you to get the access you desire, however SJRWMD has a procedure for granting access such as you are requesting. The mechanism for granting the access you desire is called a Special use Authorization (SUA). Diana Bankhardt, who is copied on this email, processes requests for SUA's. Please contact her at least 14 days before you will actually require access, so that we can get the paperwork through our respective agencies.

Also, please be aware that the parcel on which you wish to do the work was acquired as mitigation for the previous expansion of I-4. Therefore any impacts to the land, or any additional real estate DOT will require from that parcel in order to expand I-4, may require remitigation.

If you have any questions regarding this matter, please contact me.

Steve

Steven R. Miller, Chief
Bureau of Land Management
St Johns River Water Management District
386-329-4399

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Sanam Rai

From: Meade, Ron <Ron.Meade@dot.state.fl.us>
Sent: Thursday, January 29, 2015 9:50 AM
To: Sanam Rai; 'Richard Archambault'; Read, James; Golloway, Jeremy
Cc: Kirts, Scott; Snow, Rick; Barry Switzer
Subject: RE: I4 Segment 4 Cross Drains

You are welcome and I've had no known issues at these locations from internal staff.

Thanks,

Ron

Ron J. Meade
Deland Operations Engineer
Office (386) 740-3401
Main (386)740-3400
Cell (386) 956-8959

From: Sanam Rai [mailto:sarai@HNTB.com]
Sent: Thursday, January 29, 2015 9:45 AM
To: 'Richard Archambault'; Read, James; Golloway, Jeremy
Cc: Kirts, Scott; Meade, Ron; Snow, Rick; Barry Switzer
Subject: RE: I4 Segment 4 Cross Drains

All,

Thank you for helping me out with this task.

Ron, thanks again for coordinating and responding so promptly.

Sanam

From: Richard Archambault [mailto:ozzy.archambault@tmeenterprises.com]
Sent: Wednesday, January 28, 2015 3:31 PM
To: 'Read, James'; 'Golloway, Jeremy'
Cc: 'Kirts, Scott'; Sanam Rai; 'Meade, Ron'; 'Snow, Rick'
Subject: RE: I4 Segment 4 Cross Drains

Jim,

I am unaware of any issues with the referenced cross drains. Let me know if you need anything else.

Richard "Ozzy" Archambault
Project Manager – Orlando, Fl.
Office: (407) 730–2232
Cell: (407) 494–9032
Fax: (407) 704–7642
Email: Richard.archambault@tmeenterprises.com

TME ENTERPRISES
INCORPORATED
RIGHT OF WAY MAINTENANCE

From: Read, James [mailto:James.Read@dot.state.fl.us]
Sent: Wednesday, January 28, 2015 2:44 PM
To: Richard Archambault; Golloway, Jeremy
Cc: Kirts, Scott; sarai@HNTB.com; Meade, Ron; Snow, Rick
Subject: FW: I4 Segment 4 Cross Drains

Jeremy, Ozzy

We would like your input as well. Please see below and respond to all. Thanks

James Read
Field Operations Manager
Deland Operations
386-740-3406
M - F 7:00 am to 3:30 pm

FDOT

From: Meade, Ron
Sent: Wednesday, January 28, 2015 1:59 PM
To: Read, James; Snow, Rick; McGhee, William; Woods, Charles
Subject: FW: I4 Segment 4 Cross Drains

Team,
Do we have any known issues at these locations that we can share with these designers?

Ron J. Meade
Deland Operations Engineer
Office (386) 740-3401
Main (386)740-3400
Cell (386) 956-8959

From: Sanam Rai [mailto:sarai@HNTB.com]
Sent: Wednesday, January 28, 2015 1:39 PM
To: Meade, Ron
Cc: Barry Switzer; Luz Phillip
Subject: I4 Segment 4 Cross Drains

Ron,

Attached are the drainage maps that show the existing crossdrains located along the I-4 project limits within Volusia County. I have placed a text note and a pop up note box at each crossdrain location for your reference.

As I mentioned earlier over the phone, I need to know of any issues (flooding, scour, sedimentation) with any of the crossdrains for our Location Hydraulics Report (LHR).

If you have any questions or comments, feel free to email or call me.

Thanks,

Sanam

Sanam Rai, PE
Project Engineer - Drainage

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

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Fax (407) 805-0227
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MEETING NOTES

Date: 2/14/15

HNTB Project No. 59219 – I-4 BtU PD&E

Meeting Name: Coordination Meeting with the City of Deltona **Meeting Date:** 1/22/15

Location: City of Deltona Conference Room

Purpose: Coordinate the Saxon Boulevard drainage with the City.

Attending: Heather Johnstone – FDOT
Beata Stys-Palasz – FDOT
Michael Dollery – FDOT
Robert Denney – HNTB
Sanam Rai - HNTB
Joe Joe – City of Deltona
Joe Joe – City of Deltona
Joe Joe – City of Deltona
Joe Joe – City of Deltona
Joe Joe – City of Deltona

The meeting started with introductions and a brief overview of the project limits. It was explained that the start of the design phase of the project would start early 2015, as the southern portion of the project was recently advertised for design. The northern section of the project would be advertised for design December 1st, 2014. Mr. Dollery explained that the project right of way acquisition won't occur for a few years.

Discussion started with the 6" line located within the SR 535 interchange and along SR 535, north and south of the interchange. It was discussed that the new interchange configuration will most likely impact the line. Joe stated that the global agreement between FDOT and FGT would apply, which would require a certain distance from pile driving operations, wall locations, access, etc.

Joe indicated this is the only line that feeds Disney, so any work on the line would need to consider peak demand.

If improvements are anticipated along SR 535, Joe confirmed that FGT will not reside longitudinally under newly constructed roadway; therefore an easement would need to be secured for areas where relocation would be required. Joe indicated that a 30-foot easement, plus 6" for the pipe diameter (total of 30'-6") would be needed, plus 25-feet of clear temporary workspace are for construction and maintenance. Ty mentioned what could end up happening is FDOT would just provide FGT a 50-foot easement to FGT. Robert indicated that the plans are still concept level / work in progress, and impacts to this line will need to be evaluated, as well as where the 50-foot easement would be located. Joe also indicated the 50-foot easement is "exclusive" to FGT. No other utilities are allowed in it.

Action Item: Robert to email Joe the current preferred SR 535 alternative with utilities turned on.

The next area we focused on was the area between SR 429 and World Drive. Robert explained there are going to be impacts to the OUC Transmission Line easement, which will push the FGT easement. At the same time there is TECO Gas in this area and a Kinder-Morgan jet fuel line (which is in a 15-foot easement per Michael Dollery). Robert indicated the existing FGT easement is 15-feet and would be replaced with a 15-foot easement; however Joe said that is probably incorrect, and is most likely a 15-foot easement with an additional 35-foot construction easement for a total of 50-feet, as he has never seen a 15-foot easement for an FGT line. This relocation will also require an additional 25 feet of temporary workspace as provided for under the Global Settlement Agreement.

Action Item: Robert to double check RW maps and coordinate this with Joe.

Robert also explained the Celebration Blvd improvements, and indicated that this is not part of our project, however it looked like there will be FGT impacts based on the roll plot we were looking at. Once again it was discussed that the replacement easement would be exclusive to FGT, and would not be shared with any of the other utilities.

Robert also indicated at the SR 429 interchange, there is a section of FGT line that will end up running longitudinally under the pavement, which is not allowed. Robert indicated he would look at this and see if the design could be tweaked a bit to avoid this conflict.

Action Item: Robert to evaluate the SR 429, WB Express Lane Ramp to eliminate this impact.

Joe also indicated that there could be impacts at the Quest Diagnostics parcel that is located just east of the World Drive interchange.

Action Item: Robert to review this parcel and the potential impacts. During VE it was recommended to make adjustments to not impact this parcel.

We then shifted our focus to the Dirksen Drive, where Joe indicated the line under I-4 at this location is in fact out of service and filled with inert gas. If the contactor wishes, during construction of I-4 BtU, he could remove this gas line.

Joe also indicated there is a 3" FGT crossing under I-4, north of SR 46, near the Cracker Barrel. This was not on our list; Robert indicated he would double check our green-lines and get back to Joe.

Action Item: Robert to double check green-lines, and if we don't have the 3" FGT, he will email Joe for more info.

Discussion also took place regarding the SR 535 impacts and the SR 429 to World Drive impacts, and that if a new easement was going to be required, FGT would require 90% plans for these areas in order for them to perform their permitting, and comply with the Federal Energy Regulatory Commission (FERC).

Beata indicated that FDOT is committed to providing 90% plans for these two areas to FGT.

END OF MINUTES

HNTB Corporation
Engineers Architects

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
Facsimile (407) 805-0227
www.hntb.com

MEETING ATTENDANCE

Project: I-4 PD&E

Location: SJRWMD Maitland Service Center, Maitland, FL

Subject: Segment 4 Saxon Blvd. Stormwater Management Alternatives Meeting

Date: 3/12/2015

Attendee	Representing	Telephone	E-mail
Heather Johnstone	FDOT	386-943-5540	heather.johnstone@dot....
Luis Diaz	HNTB	407-805-0355	LDIAZ@HNTB.COM
Gerald Chancellor	City of Deltona	3868788998	—
Sarah Rae	HNTB	(407) 805-0355	SARAE@HNTB.COM
Jerry Mayes	City of Deltona	(386)878-8619	jmayes@deltonafl.gov
Matt Doan	City of Deltona	386-878-8973	mdoan@deltonafl.gov
Chris Bowley	"	386.878.8602	cbowley@deltonafl.gov
Ken Lewis	SJRWMD	407 659 4831	klewis@sjrwmd.com
Lee Kissick	"	" 4850	LKissick@sjrwmd.com

MEETING NOTES

Date: 3/12/2015

HNTB Project No. 59219 – I-4 PD&E Segment 4

Meeting Name: I-4 PD&E – Saxon Blvd. (City of Deltona) Stormwater Management Alternatives Meeting

Location: SJRWMD Maitland Service Center, Maitland, FL, 2:00 PM

Purpose: To discuss proposed stormwater management alternatives along Saxon Blvd. including an underground stormwater vault/pump system

Attending: FDOT – Heather Johnstone
HNTB – Sanam Rai, Luis Diaz
City of Deltona – Gerald Chancellor, Jerry Mayes, Matt Doan, Chris Bowley
SJRWMD – Ken Lewis, Lee Kissick

Mr. Chancellor gave a brief overview of the history of pump stations in the City of Deltona in Volusia County. He mentioned a case study of Lake Monroe which has water withdrawal for reclaimed water use. He talked about the Tivoli/Wheeling pump station which includes 2 pumps for larger storm events including hurricanes and 1 jockey pump for normal storm events that can handle up to 2 million gallons per day (MGD) of volume.

Mr. Rai, Mr. Diaz and Ms. Johnstone gave a brief overview of the I-4 Segment 4 PD&E project limits and specifically, the I-4/Saxon Blvd. interchange and the Saxon Blvd. improvements east of I-4.

It was explained that there are several stormwater management alternatives along Saxon Blvd. at the I-4/Saxon Blvd. Interchange including several stormwater ponds and 2 underground storage vaults. Saxon Blvd. and offsite areas drain to Trout Lake, which is a closed basin. In the existing condition, untreated roadway runoff from Saxon Blvd. discharges directly to Trout Lake which is located southeast of the interchange. The proposed storage vaults have been preliminary designed to store a 10 year, 24 hour design storm event runoff volume. Excess runoff from a larger storm event would be pumped to a City of Deltona stormwater/wastewater treatment plant, treated and reused for other purposes.

Mr. Lewis indicated that the underground storage vault design seemed reasonable since it would function like a stormwater pond by providing treatment and attenuation at the City of Deltona stormwater/wastewater treatment plant.

Mr. Kissick pointed out that Trout Lake is considered a 'minimum flows and levels' lake according to SJRWMD Chapter 40C-8, F.A.C, Minimum Flows and Levels. Minimum flows and levels are used to impose limitations on withdrawals of groundwater and surface water for proposed stormwater management systems. He stated that the rule needs to be met for the underground storage vault design since the proposed vault alternative removes and stores runoff from Saxon Blvd., which currently drains to Trout Lake, and pumps it to a treatment plant. Mr. Rai mentioned that Saxon Blvd. is a small drainage area compared to the surrounding offsite area that drains to Trout Lake.

A few other alternatives were discussed about providing the loss in volume from Saxon Blvd. with additional volume from I-4. One potential alternative mentioned was providing additional volume to Lake Trout from the proposed I-4 improvements by providing no attenuation and/or minimum treatment in the I-4 stormwater ponds to compensate for Saxon Blvd.

Mr. Lewis stated that the underground vault would have to meet the SJRWMD stormwater management pond recovery criteria. It was discussed and understood that the corresponding pump system, force main and receiving treatment plant would be designed to meet the recovery criteria.

While discussing different alternatives for Trout Lake, Goose Lake, a lake just west of I-4, was also mentioned. It was mentioned that Goose Lake is connected to Trout Lake via a cross drain under I-4. Mr. Kissick mentioned that he wasn't sure if there was a connection between the two lakes. It was agreed that this issue would be looked into and addressed by HNTB.

END OF MINUTES

HNTB Corporation
Engineers Architects

610 Crescent Executive Court
Suite 400
Lake Mary, FL 32746

Telephone (407) 805-0355
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HNTB

MEETING ATTENDANCE

Project: I-4 PD&E

Location: 610 Crescent Executive Court, Suite 400, Lake Mary, Florida 32746

Subject: Janice & Donald Wenger / Pond 408B
Coordination for I-4 PD&E

Date: 12/15/2014

Attendee	Representing	Telephone	E-mail
SANAM RAI	HNTB		SARAI@HNTB.COM
Heather Johnstone	FDOT	386-943-5540	heather.johnstone@dot.state.fl.us
LUIS DIAZ	HNTB	407-805-0535	LDIAZ@HNTB.com
DON & JAN WENGER		386-717-1814	WENGERCOIN@CFL.RR.COM
Lucy Phillip	HNTB		lphillip@hntb.com

MEETING NOTES

Date: 12/15/2014

HNTB Project No. 59219 – I-4 PD&E

Meeting Name: I-4 PD&E – Pond 408B

Location: HNTB Office - 610 Crescent Executive Court, Suite 400, Lake Mary, Florida 32746, 11:00 AM

Purpose: To discuss proposed ponds and project timeline

Attending: FDOT – Heather Johnstone, HNTB – Sanam Rai, Luz Phillip, Luis Diaz, Robert Denney, Property Owner – Janice & Donald Wenger

Ms. Johnstone and Mr. Denney gave a brief overview of the project limits and explained the PD&E study concept and its preliminary phase. It was explained that the start of the design phase of the project would start sometime in the first quarter of 2015, at the earliest.

Mr. and Mrs. Wenger were interested about the project, its potential impacts to their property and the anticipated timeline of the project. They mentioned that they own a business named Wenger Coins, which is part of the proposed pond site.

Ms. Wenger stated that their parcel was originally two separate parcels which were combined as one to provide parking for their business. She also mentioned that they would sell their property to FDOT if they were compensated accordingly.

Ms. Johnstone indicated that she would coordinate with Michael Dollery, FDOT right of way acquisition coordinator, regarding their property.

Ms. Johnstone mentioned that the property owner can visit the following website to find out the necessary project information and any updates: www.i4express.com

END OF MINUTES

RECORD OF TELEPHONE CALL

Job #	59219	**Date**	1/13/2014
Call From	Heather Johnstone	**Of**	HNTB
Call To	Ramon Pena	**Of**	
Parcel ID	13-18-30-03-19-0250		

Subject Discussed

Ramon Pena wanted to know more information about the project and what would be involved. I explained that the project is just in the study phase and the design project is at least 2 years out. During the design phase, pond sites would be re-evaluated and at that time right-of-way acquisition would begin. I further explained that the pond (Pond 420-A2) is one of two alternatives for that area. Ramon expressed interest in selling his property. He mentioned that he owns several lots in the area and would be interested in selling them to the FDOT.

Action to be Taken

None.

RECORD OF TELEPHONE CALL

Job #	59219	**Date**	12/11/14
Call From	Joan Lebeda	**Of**	HNTB
Call To	Robert Denney	**Of**	1930 Saxon Blvd
Parcel ID	30-18-31-03-37-0120		

Subject Discussed

Joan Lebeda called me and because we are proposing a pond in the location where she resides. Joan indicated she was on top of a hill and water would not flow to her parcel. Joan also indicated she was approached by a doctor who wanted to buy her house and a few of the neighbors houses as well. She said she is ready to sell, but not sure who to sell to now that she was notified about a pond in her area.

Action to be Taken

Call Joan back and tell her we double checked the pond contours and the parcel will work just fine.

PHONE MEETING NOTES

Date: 9/4/2014

HNTB Project No. 59219 – I-4 PD&E

Meeting Name: I-4 PD&E – Basin 402

Location: Phone Meeting

Purpose: To discuss proposed ponds and project timeline

Attending: HNTB – Sanam Rai, Attorney – Kurt H. Garber

Mr. Garber was interested about the project, specifically regarding the I-4 / Dirksen Dr. interchange area. He mentioned that he did not represent a property owner nor is he a property owner that has been impacted by the I-4 project. He stated that he was contacted by a property owner who owns land around the I-4 / Dirksen Dr. Interchange and was asked to inquire about the project.

Mr. Garber was curious about the pond alternatives for Basin 402. Mr. Rai explained that the pond sites are alternatives and are subject to change based on many factors.

Mr. Rai mentioned to Mr. Garber to visit the following website to find out the necessary project information and any updates: www.i4express.com

END OF MINUTES

PHONE MEETING NOTES

Date: 12/30/2014

HNTB Project No. 59219 – I-4 PD&E

Meeting Name: I-4 PD&E – Basin 408D1

Location: Phone Meeting

Purpose: To discuss proposed ponds and project timeline

Attending: HNTB – Sanam Rai, Property Owner – James Brown

Mr. Rai wasn't able to get in touch with Mr. Brown but spoke with another individual who took Mr. Rai's contact information and he said he would forward it to Mr. Brown.

END OF MINUTES

PHONE MEETING NOTES

Date: 1/20/2015

HNTB Project No. 59219 – I-4 PD&E

Meeting Name: I-4 PD&E – Basin 408B

Location: Phone Meeting

Purpose: To discuss proposed ponds and project timeline

Attending: HNTB – Lucy Phillip, Property Owner – Don Hutchens

Mr. Hutchens has been a property owner along Saxon Blvd. for the past 28 years and wanted to know if the retention ponds were definitely going to be built along Saxon and if it is already set in stone. Ms. Phillip explained to him that we are still in the planning phase and if, in the near future, there are any other proposed alternatives, it will be on the website.

Ms. Phillip mentioned to Mr. Hutchens to visit the following website to find out the necessary project information and any updates: www.i4express.com.

END OF MINUTES

PHONE MEETING NOTES

Date: 8/27/2014

HNTB Project No. 59219 – I-4 PD&E

Meeting Name: I-4 PD&E – Pond 409A1, 409A2

Location: Phone Meeting

Purpose: To discuss proposed ponds and project timeline

Attending: HNTB – Sanam Rai, Property Owner – David Colton (3700 Humboldt Investment Co.)

Mr. Colton was interested about the project, its potential impacts to his property and the anticipated timeline of the project.

Mr. Rai explained the PD&E study concept and its preliminary phase. It was explained that the pond sites are alternatives and are subject to change based on many factors.

Mr. Colton mentioned that the property was originally bought by his father and that they were not in the market to sell it. Mr. Rai clarified to Mr. Colton that the pond site is an alternate and that the PD&E study isn't final yet. It was explained to Mr. Colton that once the study is final, and the preferred pond site is chosen, FDOT would inform him with another letter if his property falls within the preferred pond site.

Mr. Rai mentioned that the property owners can visit the following website to find out the necessary project information and any updates: www.i4express.com

END OF MINUTES

PHONE MEETING NOTES

Date: 12/30/2014

HNTB Project No. 59219 – I-4 PD&E

Meeting Name: I-4 PD&E – Basin 408B

Location: Phone Meeting

Purpose: To discuss proposed ponds and project timeline

Attending: HNTB – Sanam Rai, Property Owner – Shawn Dresser

Mr. Dresser mentioned that he owned a house and a business along Saxon Blvd.

He stated that Colleen Jarrell from HNTB had contacted him already and he did not have any other questions regarding the project or the stormwater pond impacting his property.

Mr. Rai mentioned to Mr. Dresser to visit the following website to find out the necessary project information and any updates: www.i4express.com

END OF MINUTES

APPENDIX E –

EXISTING PERMITS

Permit No. 64105-3

I-4 St. Johns River Bridge Replacement and Six-Laning

Volume 1
of
Drainage Calculations
Supporting
Modification to Permit No. 4-127-64105-1

For

I-4 (SR 400) St. Johns River Bridge Replacement and Six-Laning

Financial Project ID: 242702-1-52-01

Contract No. U5001

Prepared for:

St. Johns River Water Management District
and
Florida Department of Transportation

RECEIVED
JUL 27 2001
64105-3
PDS
ORLANDO
SJR WMD

Prepared by:

URS, Inc.

JULY 27, 2001

3.4 Basin SS-2

SS-2

Basin SS-2 is defined by the limits of the proposed roadway improvements, the proposed Pond SSR-2 site and the existing contributing area to the basin outfall structure under Dirksen/ Debary Blvd. The pre and post-developed hydrographs were developed for the 2.33-yr/24-hr (Mean Annual), 10-yr/24-hr, 25-yr/24-hr, and 50-yr/24-hr storm events to comply with SJRWMD criteria and to provide tail water conditions for the storm sewer design.

Pond SS-2 is located within the infield area of the Dirksen Debary I-4 west bound ramp. The pond is designed as a wet detention pond that will accommodate the interim improvements only. Control elevation in the pond is set at the average seasonal water table obtained from soil borings AB-1, AB-2, and AB-5, as depicted on the pond SS-2 detail sheet. The pond uses the current 24" RCP infield drain under the ramp for its outfall, adapted for use as pond control.

The point of pre-post development no-adverse effect demonstration is at the headwaters of the existing cross culvert under Dirksen Drive. This structure discharges ultimately into Padgett Creek through a series of culverts and open ditches. Historical drainage of I-4, south of the interchange with Dirksen Drive and North of Padgett creek will be maintained. Proposed widening in this sub-basin will be released through the existing median drainage system into Padgett Creek and is considered the best option for safety considerations. As discussed and demonstrated in the Basin RR-2 calculations, the release of this runoff will not adversely impact the surrounding environment.

The pre-developed discharge rate for all four (4) storms has been defined by developing multiple hydrographs converging at the existing culvert under Dirksen/Debary. The post-developed runoff rate was determined using the improvements to I-4 routed through the pond with pre-post conditions demonstrated at the Dirksen/Debary crossing. Tailwater conditions of the basin hydraulic model were estimated from available information on the

Lake Monroe coastal plain (Seminole County Monroe Basin Engineering Study and Drainage Inventory Update – Final Report December 1999) and Padgett Creek.

Recovery of the pond is accomplished by using a small orifice slowly bleeding-down one-half of the pollution abatement volume within the required range of 48-60 hours. The proposed pond was analyzed to determine if available volume is recovered within 14 days after the end of the design storm, which it did not. At the end of 14 days, the pond was at elevation 14.19; therefore, the volume of an additional design storm was stacked in the pond. The total volume of runoff from a design storm (6.28" over 11.67 acres and 6.55" over 23.74 acres) equals an volume of 19.07 acre-feet. A "static" stacking of this additional volume is contained within the pond.

URS CORPORATION

MADE BY:	JCW	DATE:	08/31/01	JOB NO.	242702
CHECKED BY:	AFY	DATE:	09/04/01	SHEET NO.	
CALCULATIONS FOR:	Pond SS-2			BASIN:	SS-2

Permanent Pool Calculations

Basin Characteristics

Land Use	Area (ac)	Runoff Coeff.	Product
Roadway Paved Area	16.19	0.95	15.38
Roadway Pervious Area	12.30	0.20	2.46
Pond Pervious Area	2.98	0.20	0.60
Pond Area at NWL	3.93	1.00	3.93
Total	35.40		22.36

Composite C = 0.63

Wet Season Normal Rainfall (P) = 31 in

Min. Permanent Pool Vol. = Area x Composite C x P x 14 / 153 / 12 = **5.3 ac-ft**

Min. Permanent Pool Vol. Req. If Littoral Zone Is Not Provid = 1.5 x Min Perm Pool Vol. = **7.9 ac-ft**

Stage Storage Calc.

ELEV. (ft)		AREA (ac)	AVG AREA (ac)	Delta D (ft)	Delta storage (ac-ft)	Sum Storage (ac-ft)
19.00		6.91				
18.00		5.07				
15.00	(PAV)	4.19				
						33
14.10	(NWL)	3.93	3.10	10.60	33	
3.50		2.28				

Permanent Pool Volume Provided = **32.9 ac-ft**

Resident Time Provided = Perm. Pool Vol. Provided *153*12 / Area / C / P **87.1 Days**

Note: An additional 50% permanent pool volume is provided in lieu of providing a littoral zone. (See 40C-42.026)

Mean Depth = Permanent Pool Volume / Area at NWL = **8.38 ft**

3.5 Basin East of Bifurcation

Stormwater management for the remainder of the project north (east) of Basin SS will be provided in a dry, on-line retention facility adjacent to eastbound I-4 travel lanes. The stormwater management consists of a stepped retention facility that is controlled by ditch checks and discharges to the East Side of I-4. The basin limits are defined by the proposed improvements north of the existing water body in the bifurcated median of I-4.

Runoff from Basin EB-2 will be discharged without treatment because of physical constraints. However, sub-basins Compensatory treatment is provided for area north of basin outfall, unable to collect, by providing management from existing I-4 pavement near the existing water body in the bifurcated area.

No tailwater conditions were evaluated since dry retention will be provided below the flow line elevation of the existing outfall structure under I-4.

Recovery of the retention system is through natural percolation. The estimated recovery of the systems analyzed with the " Ponds" computer program is well within the required time of 72hrs following the storm event. The seasonal high water elevation was determined from field verified geotechnical information, analyzed for the existing condition. Several of the retention systems will be excavated several feet below their existing elevations. Therefore, the SHW was assumed to be the elevation at which water was encountered after 24 hours (see geotechnical information). Also, an average SHW elevation between each system was utilized. Note: the recovered volumes that are provided approximate the available volume within each system, except for System 1. In all other cases, the required treatment volume was much less than the available volume and the program was giving erroneous results. In all cases, at least the minimum required treatment volume is recovered in less than 72 hours.

The entire dry retention system was analyzed to demonstrate compliance with pre-post attenuation requirements for the 2.33-yr/24-hour and 25-year/24-hour storm events.

DETERMINE BASIN AREA AND TREATMENT VOLUME FOR BASIN EAST OF BIFURCATION

Sub-Basin	Begin Station	End Station	Impervious Area (ac)	Pervious Area (ac)	CN*	1.25" over Imp. (ac-ft)	0.5" R.O. (ac-ft)	Total Treatment Volume (ac-ft)	Total Treatment Volume (cf)
WB	1272+00	1280+00	1.8	0.52	84.8	0.188	0.097	0.28	12,378
EB-1A	272+00	288+00	0.88	3.5	50.9	0.092	0.183	0.27 0.37	11,943
EB-1B	288+00	292+00	0.22	1.57	46.3	0.023	0.075	0.10 0.15	4,247
EB-1C	292+00	296+00	0.22	0.87	50.9	0.023	0.045	0.07 0.09	2,977
EB-1D	296+00	300+00	0.22	0.45	58.4	0.023	0.028	0.05 0.06	2,214
EB-2	300+00	307+20	0.44	1.13	55.5	0.046	0.065	0.11 0.13	4,846

* - CN = 98 for impervious and 39 for pervious area. 11.82ac

Ao'd
0.65 1.28
0.89
0.84
.19
.09

B5-2

3.0 PROPOSED CONDITION

The majority of the project is located within the larger Lake Monroe watershed basin. Therefore, hydraulic conditions within the basin are affected predominately by stages in Lake Monroe and to a lesser extent, the St. Johns River. Overall drainage flows and basin divides will remain as they are in the existing condition. Minor variations in these basins can be ignored since the stormwater treatment facilities discharge into the larkger Lake Monroe Basin and are not isolated. The proposed improvements to I-4 are represented in the attached Construction Plans. As stated in the previous section, I-4 was constructed prior to any regulatory requirements. As part of this improvement effort, every attempt will be made to treat and attenuate runoff from the interstate and its associated ramps in compliance with all regulations set forth by Seminole County, Volusia County, FDOT and the SJRWMD.

The proposed drainage scheme incorporates the use of shoulder gutter and stormsewer to convey runoff to the water management facilities. I-4 will be reconstructed from the beginning of the project to station 156+00, approximately. Between the beginning of the project and station 83+00, the runoff from the roadway will be conveyed to the water management facilities via shoulder gutter and stormsewer conveyance. Between Sta. 83+00 and Dirksen Drive, a portion of the runoff will be conveyed via sheet flow and median drains to a treatment swale located between Sta. 49+00 and 100+00 along the westbound lanes. The remaining runoff is to be released untreated into the Lake Monroe Basin. However, an overall pollutant removal efficiency was developed for the basin which demonstrates that the overall quality of discharge is improved over the existing condition. From Dirksen Drive to the end of the project, improvements consist of widening I-4 one lane in each direction in the median. The widened pavement slopes toward the median where it is collected in median drains and conveyed to the stormwater management facilities via stormsewer.

This project is an interim project with the respect to the ultimate conditions detailed in the I-4 – Section 2 PD&E Study. In general, the stormwater management facilities will

accommodate the ultimate improvements to I-4 including all ramps, high occupancy vehicle (HOV) lanes and general use lanes (GUL). Any exceptions or clarifications are presented in the individual design narrative and calculations in Appendix B. See Exhibit 3 for the Post-Developed Drainage Maps and Exhibit 4 for the SCS Soils Maps and Exhibit 5 for limits of the FEMA floodplain map.

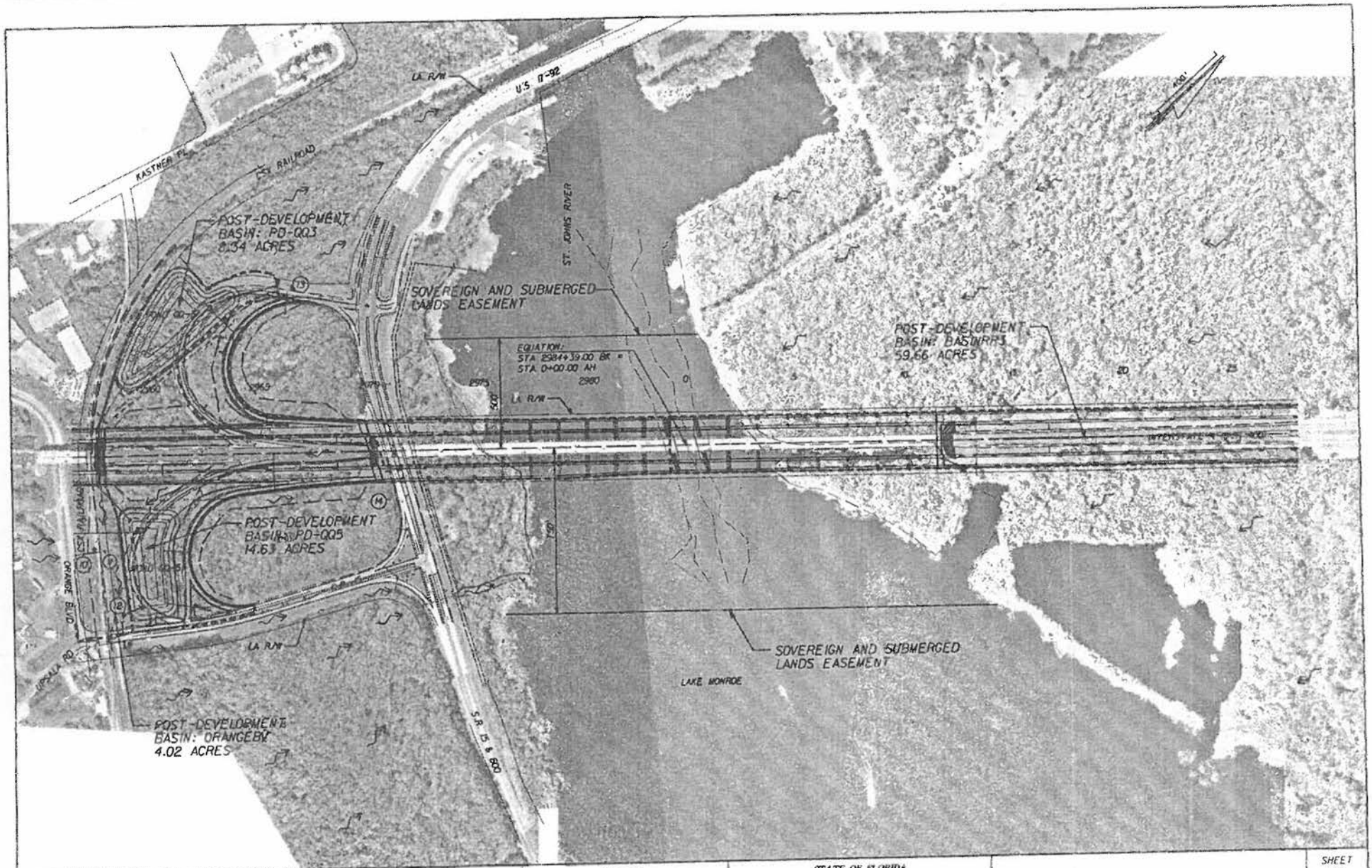
Unavoidable impacts to wetlands have been permitted and are depicted in Appendix C. Construction over the St. Johns River and Padgett Creek is within a Sovereign and Submerged Land Easement provided in Appendix D. Impacts to the Lake Monroe floodplain are summarized in Appendix E.

3.1 Basin QQ-3 and QQ-5

Ponds QQ-3 and QQ-5 are interconnected and provide treatment and attenuation for the combined basin for the interim condition. With minor modifications to the basin limits and stormsewer system, the ponds will accommodate the ultimate condition. Pond QQ-3 discharges into the downstream end of the existing cross culvert located under the westbound off ramp at US 17-92. Pond QQ-5 discharges into the upstream end of the existing cross culvert under CR 15. Conveyance to this pond system is via ditch and stormsewer system.

3.2 Basin RR-3

Pond RR-3 is designed to provide treatment and attenuation for the basin and discharges into an existing ditch that eventually flows to the St. Johns River. This pond will accommodate the ultimate condition and the results of both the ultimate and interim design can be found in Appendix B. Conveyance to this stormwater treatment facility is by median ditch and stormsewer flow.



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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315 E. ROBINSON STREET, SUITE 245
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NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	SEM & VOL	242702-1-52-01

SR 400 (I-4) WIDENING
DRAINAGE MAP

SHEET NO.

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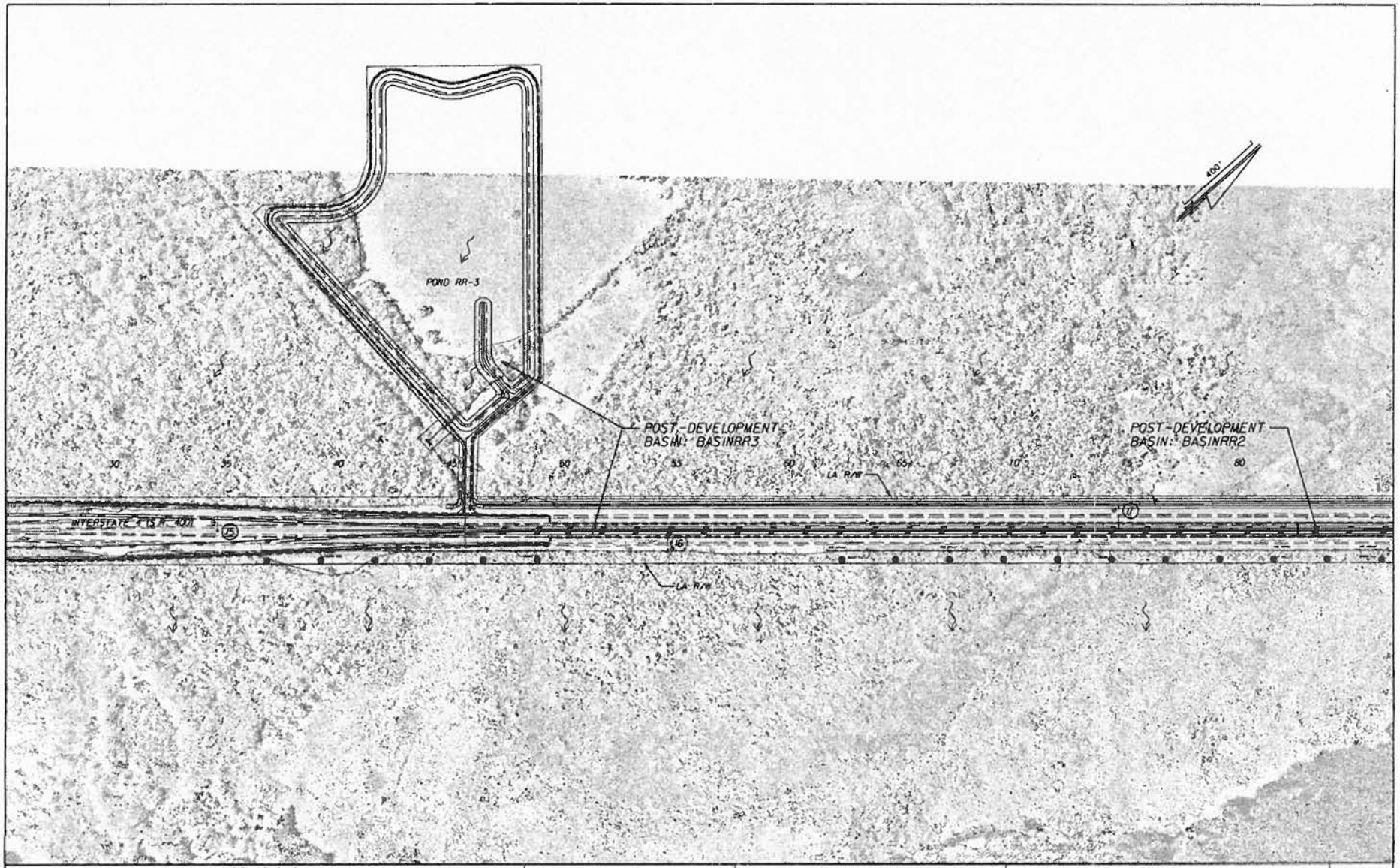

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SR 400	SEM & VOL	242702-1-52-01

SR 400 (I-4) WIDENING
DRAINAGE MAP

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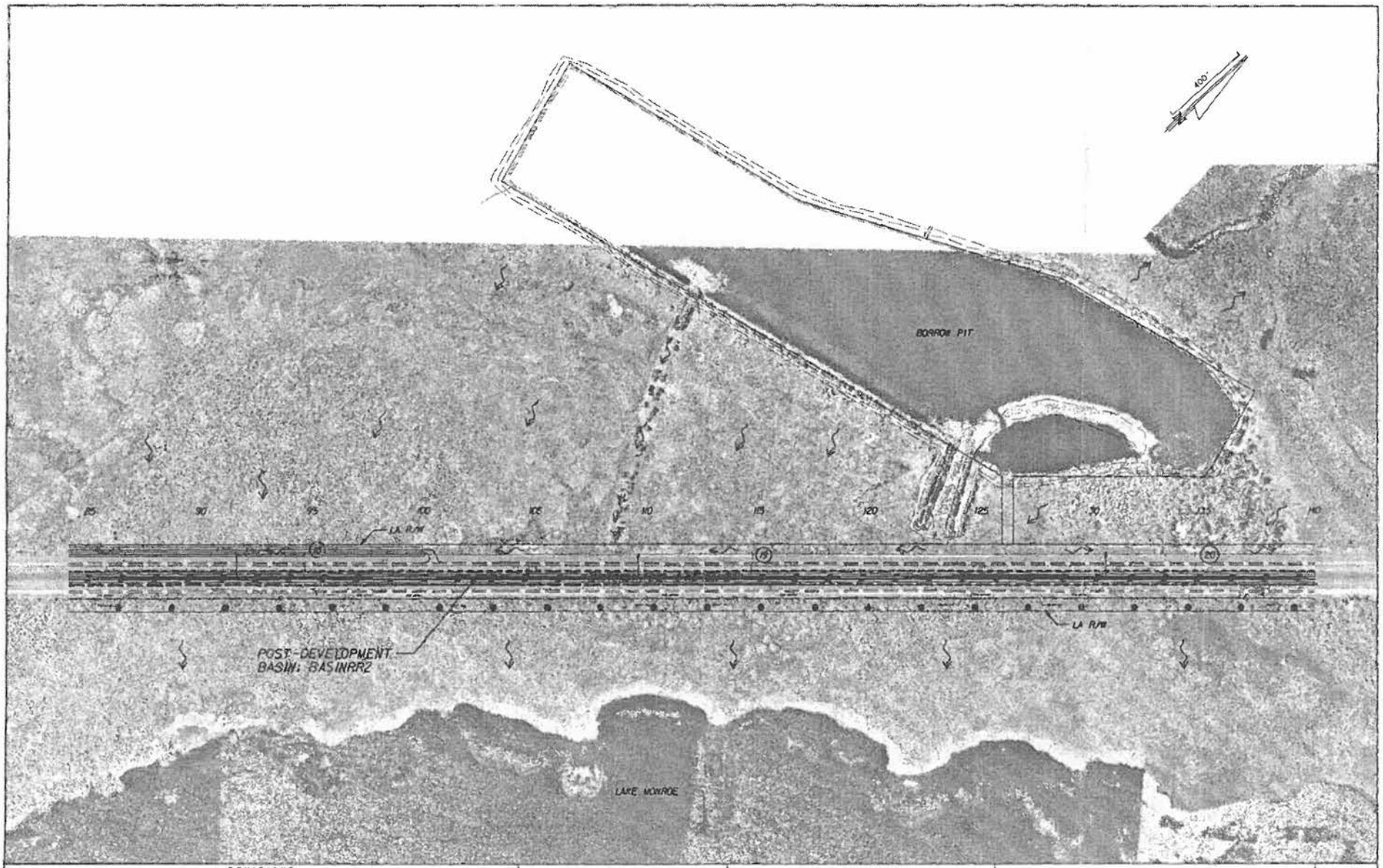

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SR 400	SEM & VOL	242702-1-52-01

SR 400 (I-4) WIDENING
DRAINAGE MAP

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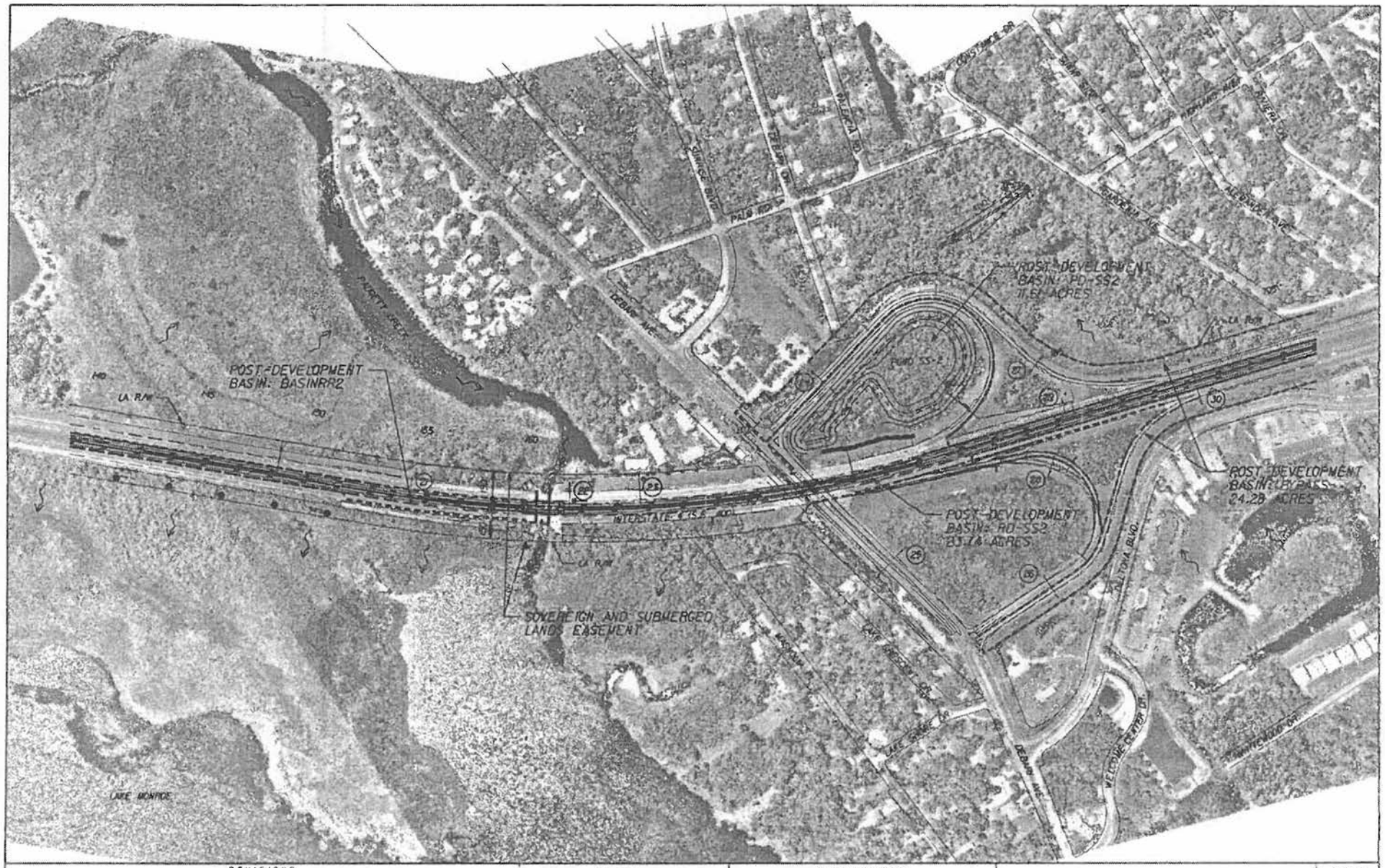

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ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	SEM & VOL	242702-1-52-01

SR 400 (I-4) WIDENING
DRAINAGE MAP

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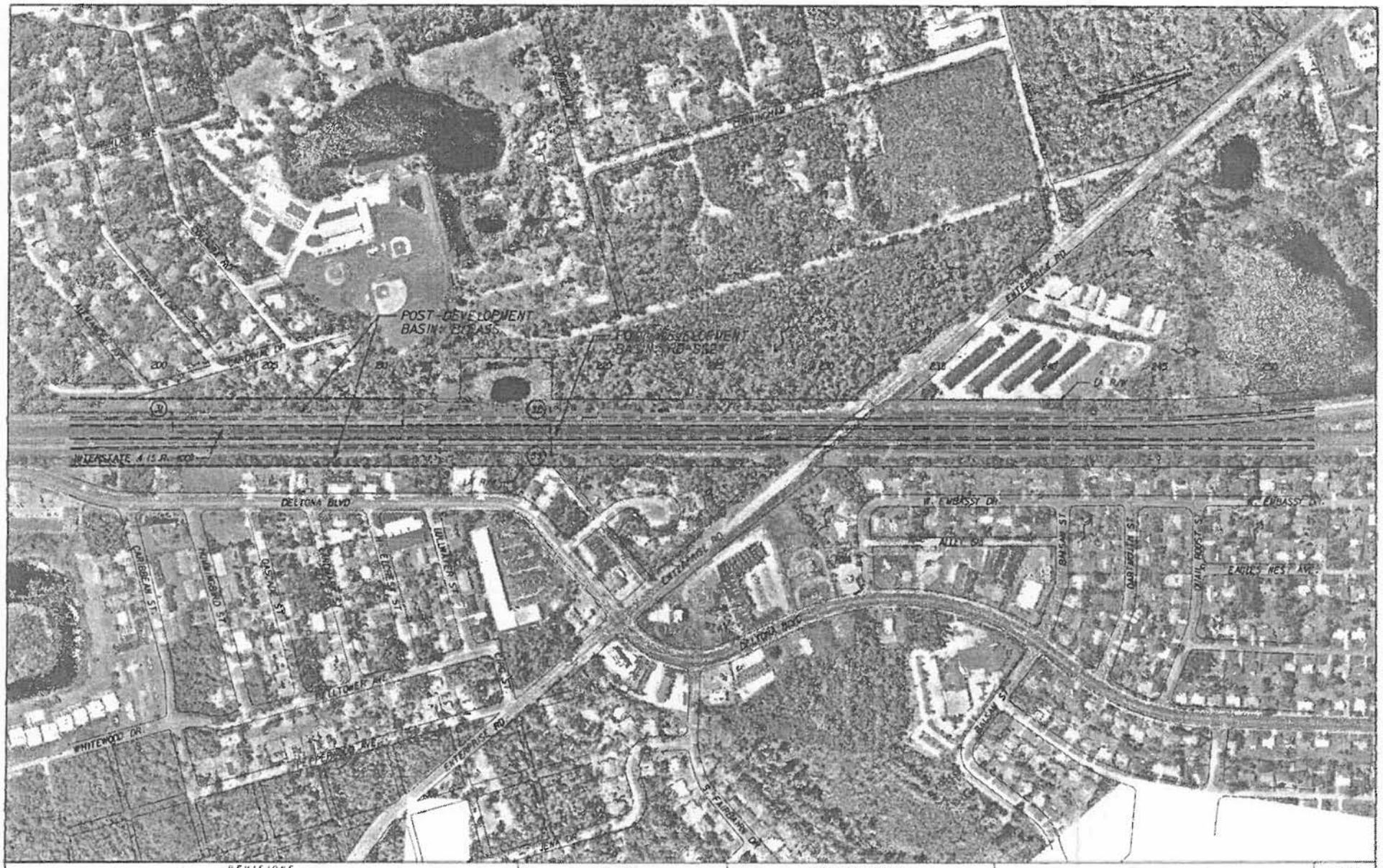

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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ORLANDO, FL 32801-1949
PH (407) 422-0353 FAX (407) 423-2695
NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	SEM & VOL	242702-1-52-01

SR 400 (I-4) WIDENING
POST-DEVELOPMENT DRAINAGE MAP

SHEET NO.

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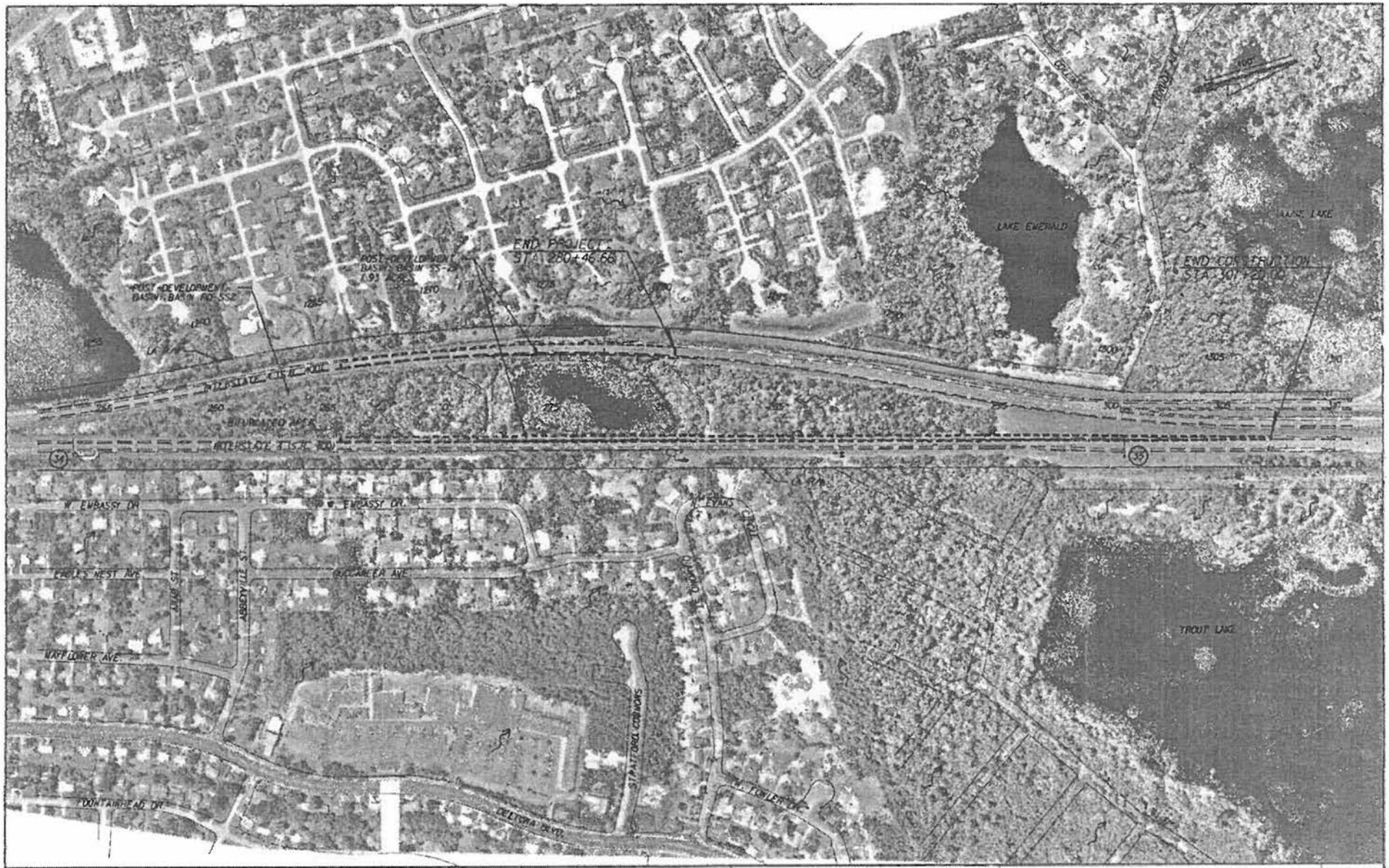

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

URS
315 E. ROBINSON STREET, SUITE 245
ORLANDO, FL 32801-1949
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NO. 000002

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	SEM & VOL	242702-1-52-01

SR 400 (I-4) WIDENING
POST-DEVELOPMENT DRAINAGE MAP

SHEET NO. 16

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Pond RR-3 is located on SJRWMD owned property. As a part of the original agreement between the FDOT and SJRWMD, this pond has been expanded approximately 10 acres over the previously submitted information (See Appendix D).

3.3 Basin RR-2

Basin RR-2 improvements are governed by a "overall basin improvement" philosophy. The basis of reference for this approach includes the improvements between the St. Johns River and Dirksen Drive (referred to as the Lake Monroe coastal plain). Within this coastal plain basin, a treatment swale (Basin RR-3) and Pond RR-3 are proposed to provide 95% pollutant removal efficiency for the roadway runoff that each accepts. The runoff from the remainder of the improvements within the coastal plain is to be released untreated, which corresponds to an efficiency of 0% pollutant removal. However, the overall basin efficiency exceeds the minimum 80% pollutant removal and therefore, the quality of the runoff entering the basin is improved overall.

3.4 Basin SS-2

Pond SS-2 is designed to provide treatment and attenuation for the interim condition of this basin and discharges into an existing stormsewer system that outfalls into Padgett Creek. In the ultimate condition, the infield area bounded by the EB I-4 off loop ramp will be graded as an additional pond; therefore, the combination of SS-2 and this future pond will accommodate the ultimate condition. Conveyance to this pond is by overland, ditch and stormsewer flow.

3.5 Ditch East of Bifurcation

The stormwater management system for the basin east of the bifurcation consists of a dry retention roadside ditch. This system is designed to manage runoff from a combination of existing and proposed roadway areas. The basin is divided into three sub-basins, WB, EB1 and EB2.

TABLE 3.1 SUMMARY OF SUB-BASINS FOR DITCH TREATMENT

Basin	Station Limits	Total Basin Area (ac)	Exist. Pavement (ac)	Proposed Pavement (ac)	Total Pavement (ac)
WB	1272+00 to 1280+00	2.32	1.36	0.44	1.80
EB1	272+00 to 300+00	4.03	0.31	1.36	1.67
EB2	300+00 to 302+70	1.57	0.08	0.36	0.44
Total		**7.92**	**1.75**	**2.16**	**3.91**

Due to limited space for storm water management in basin EB2, runoff from the proposed widening will be released without treatment. Required treatment volumes for the entire basin is 0.73 ac-ft based on the total basin area of 7.92 ac and 3.91 ac of pavement area. To compensate for this release and to prevent any adverse effect to water quality in the basin, over treatment and treatment of existing I-4 area is proposed. Total retention provided is 2.83 ac-ft within the roadside ditch system. Recovery of this system is based on soil permeability rate of 2ft/day. The Volusia soils report indicate permeability rates for Poala sands to be in the order of 20 in/hr and greater. Resulting recovery of the retention volume is less than 8 hrs. See Appendix B for details.

3.6 Summary of Proposed Conditions

TABLE 3.2 SUMMARY OF PROPOSED BASIN CONDITIONS

Basin	Area	Tc (minutes)	Curve Number	25-year/24-hour Peak Q (cfs)
PD-QQ-3	8.34	15.36	87.0	39.60
PD-QQ-5	43.49	N/A	N/A	105.31
RR-3	59.66	64.5	88.3	132.25
SS-2	59.63	N/A	N/A	138.60

TABLE 3.3 COMPARISON OF MANAGED (ROUTED) PROPOSED VERSUS EXISTING DISCHARGE RATES

Basin	Pre-Developed 25-year/24-hour, (cfs)	Pre-Dev Stage At basin Outfall (NAVD)	Post-Developed 25-year/24-hour, (cfs)	Post-Dev Stage At basin Outfall (NAVD)
RD-QQ-3	37.33		33.0	N/A
RD-QQ-5	51.68	6.94	50.82	6.90
RR-3	79.30		8.41	N/A
SS-2	36.62	16.56	30.01	16.23

6

Volume 2
of
Revised Drainage Calculations Supporting
Response to SJRWMD Permit 4-127-64105-3
RAI #2

I-4 (SR 400) St. Johns River Bridge Replacement and Six-Laning

Financial Project ID: 242702-1-52-01

Contract No. U5001

Prepared for:
St. Johns River Water Management District

Prepared by:

URS, Inc.

40-127-64105-3

SEPTEMBER 5, 2001

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3.3 Basin RR-2

Basin RR-2 is defined by the limits of the proposed roadway improvements between the Pond RR-3 and the Pond SS-2 basins. The treatment and attenuation for this basin was initially proposed as wet detention within the existing borrow pit. However, upon coordination with the SJRWMD staff, it was agreed to provide dry retention adjacent to the westbound lanes of I-4 for a portion of the overall basin. To quantify an overall basin improvement, calculations have been provided to demonstrate that between the St. Johns River and Padgett Creek a minimum 80% pollutant removal is achieved by a combination of over-treatment within Pond RR-3, dry retention and compensating area. Since Basin RR-2 is located within the overall Lake Monroe watershed, this approach is valid and provides benefits to the overall design, both engineering and environmentally.

The dry retention area has been analyzed by demonstrating recovery of the required treatment volume within 72 hours. Recovery of the treatment volume is through natural percolation and has been calculated using the "Ponds" computer program. Water Table and Aquifer elevations were obtained from local soil borings and summarized in tabular form.

In addition to demonstrating pre/post attenuation of the mean annual and 25-yr/24-hr storm events for Basin RR-2, calculations have been provided that address compliance for the entire basin between the St. Johns River and Padgett Creek. In both cases, the overall basin discharge is less in the post-developed condition.

URS

Page ___ of ___

Job SLR Bridge | Project No. V10000413.00 | Sheet ___ of ___

Description Pre/Post Attenuation For Basin RR.2 Retention | Computed by CCB | Date 8.31.01

Checked by ___ | Date ___

Reference

Pre-Developed Basin Area

① 49+00 → 83+00 (WB 1-4)

Total = 7.73ac

Imp = 2.65ac.

② 83+00 → 99+00

Total = 1600'*(99+60) = 5.84ac.

Imp = 1600'*(34+4+4) = 1.54ac.

③ Total Pre-Dev. = 13.57ac.

Pre-Dev. Imp. = 4.19 ac.

$$CN_{PRE} = \frac{4.19(98) + 19.38(61)}{13.57} = 72.4 \checkmark$$

(61 ← Bluff, sandy loam)

T_c = 10 min

URS

Page ____ of ____

Job SIR Bridge | Project No. V1000004413.00 | Sheet ____ of ____

Description Basin RR-2 Ditch Post-Development | Computed by CCB | Date 8-31-01

Checked by ____ | Date ____

Reference

Post-Developed

① 49+00 → 83+00 (WB 1-4)
Total = 7.73 ac
Imp = 2.65 ac

② 83+00 → 99+00 (159')
Total = 1600' * (99+60) = 5.84 ac.
Imp = 1600' * (34'+49') = 3.05 ac.

③ Total Post-Dev. = 13.57 ac.
Post-Dev. Imp. = 5.70 ac.

$$CN_{post} = \frac{5.70(98) + 7.87(61)}{13.57} = 76.5$$

Stage/Storage

Elev.	Area
5.0	10' * 5350' = 1.23 ac.
7.0	30' * 5360' = 3.69 ac

Stage/Time

URS

Page ____ of ____

Job SJR Bridge D/B | Project No. V10000413.00 | Sheet ____ of ____

Description Treatment Volume Req. for Basin RR.2 | Computed by CCB | Date 8.31.01

Checked by [illegible] | Date 09/04/01

Reference

Treatment Volume:

Total Basin area =

@ 49+00 → 83+00 3400 x 99' ✓ comp. treatment
Total = 7.73
Imp. = 2.65

ⓑ 83+00 → 99+00 1600 60-49
Total = 1600(99+11) = 4.04ac. 5.84
Imp = 1600(49) = 1.80ac. 3.05

Total = 7.73 + 4.04 = 11.77 ac. 13.57
Imp. = 4.45ac. 5.70

Vol. = 4.45 (5.70) (1.25'/12) + 11.77 (13.57) (.5"/12) =

0.46 ac-ft + 0.49 ac-ft

= 0.95 ac-ft. 1.16 acft

= 41,382 cf req'd. ✓

1.31 acft prov'd

URS

Page ____ of ____

Job SIRB D/B Project No. V10000413.00 Sheet ____ of ____

Description Determine overall basin efficiency for Basin RR.2 Computed by CCB Date 8.31.01

Checked by [illegible] Date 09/04/01

Reference

① 49+00 → 83+00 (Existing I-4 WB lanes that do not require treatment, but are captured in the dry retention area & treated).

Total Area = 3400' * 99' = 7.73ac. ✓
Imp Area = 3400' * 34' = 2.65ac.

② 83+00 → 99+00 (Area requiring treatment, captured and treated in the dry ret. area).

Total Area = 1600' * (99+60) = 5.84 ac. ✓

③ 99+00 → 170+00 (Area that requires treatment, but is released untreated)

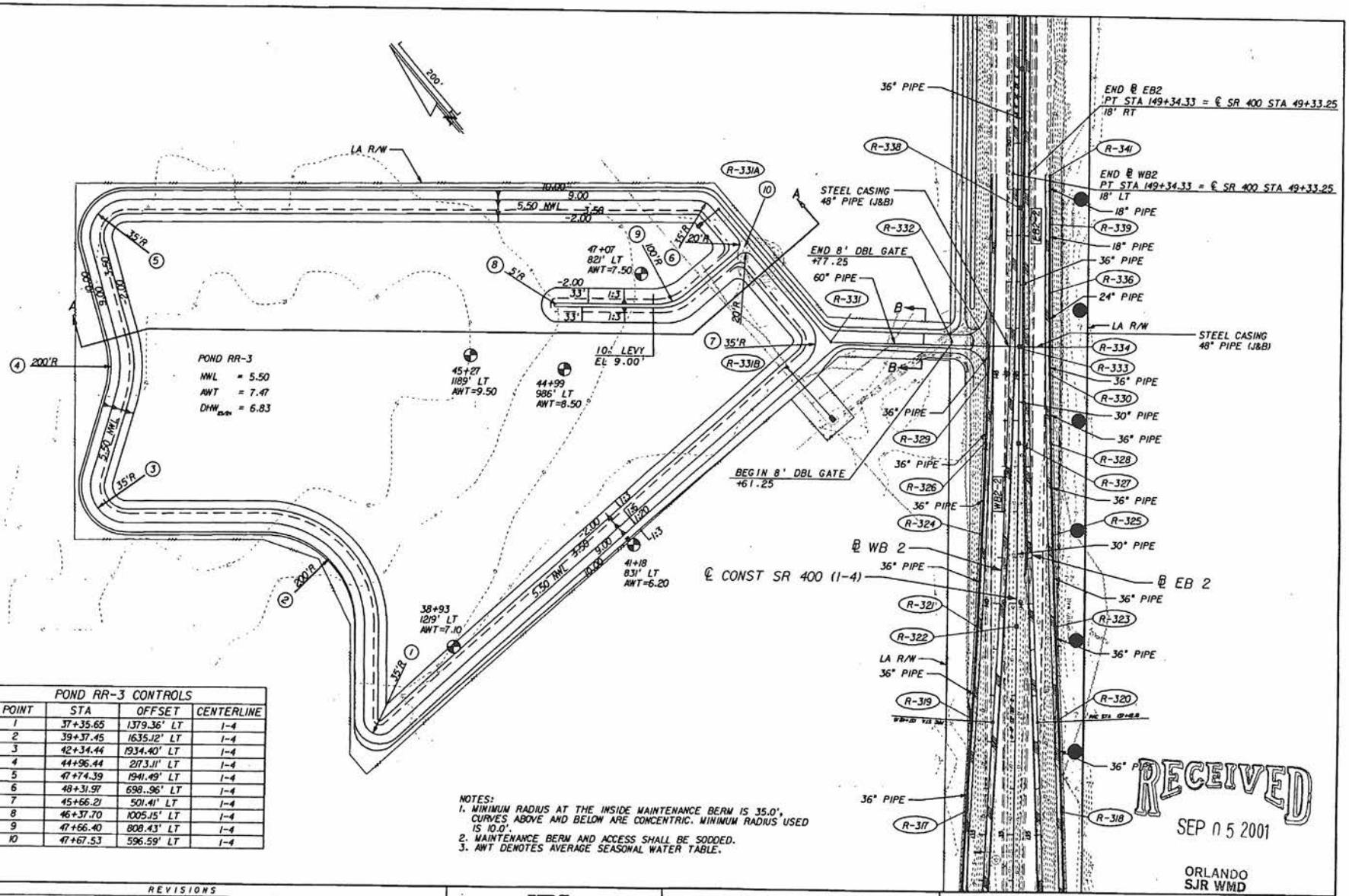
Total Area = 7100' * 60' = 9.78 ac. ✓
Imp. Area = 7100' * 49' = 7.99 ac.

④. Reduce the untreated area calculated in ③ by the area of trade-off in ①:

Total : 9.78 − 7.73 = 2.05 ac.
Imp : 7.99 − 2.65 = 5.34 ac ✓ ← use this for most conservative result.

⑤. Since Pond RR-3 provides 95% pollutant removal, the overall efficiency including the untreated 5.34 acres is:

$$\frac{31.08(95) + 5.34(0)}{31.08+5.34} = \underline{81.1\%}$$ ✓



POND RR-3 CONTROLS			
POINT	STA	OFFSET	CENTERLINE
1	37+35.65	1379.36' LT	I-4
2	39+37.45	1635.12' LT	I-4
3	42+34.44	1934.40' LT	I-4
4	44+96.44	2173.11' LT	I-4
5	47+74.39	1941.49' LT	I-4
6	48+31.97	698..96' LT	I-4
7	45+66.21	501.41' LT	I-4
8	46+37.70	1005.15' LT	I-4
9	47+66.40	808.43' LT	I-4
10	47+67.53	596.59' LT	I-4

NOTES:
1. MINIMUM RADIUS AT THE INSIDE MAINTENANCE BERM IS 35.0', CURVES ABOVE AND BELOW ARE CONCENTRIC. MINIMUM RADIUS USED IS 10.0'.
2. MAINTENANCE BERM AND ACCESS SHALL BE SODDED.
3. AWT DENOTES AVERAGE SEASONAL WATER TABLE.

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	SEM & VOL	242702-1-52-01

POND RR-3
DETAIL SHEET
40-127 - 64105-3

SHEET NO. 1.72

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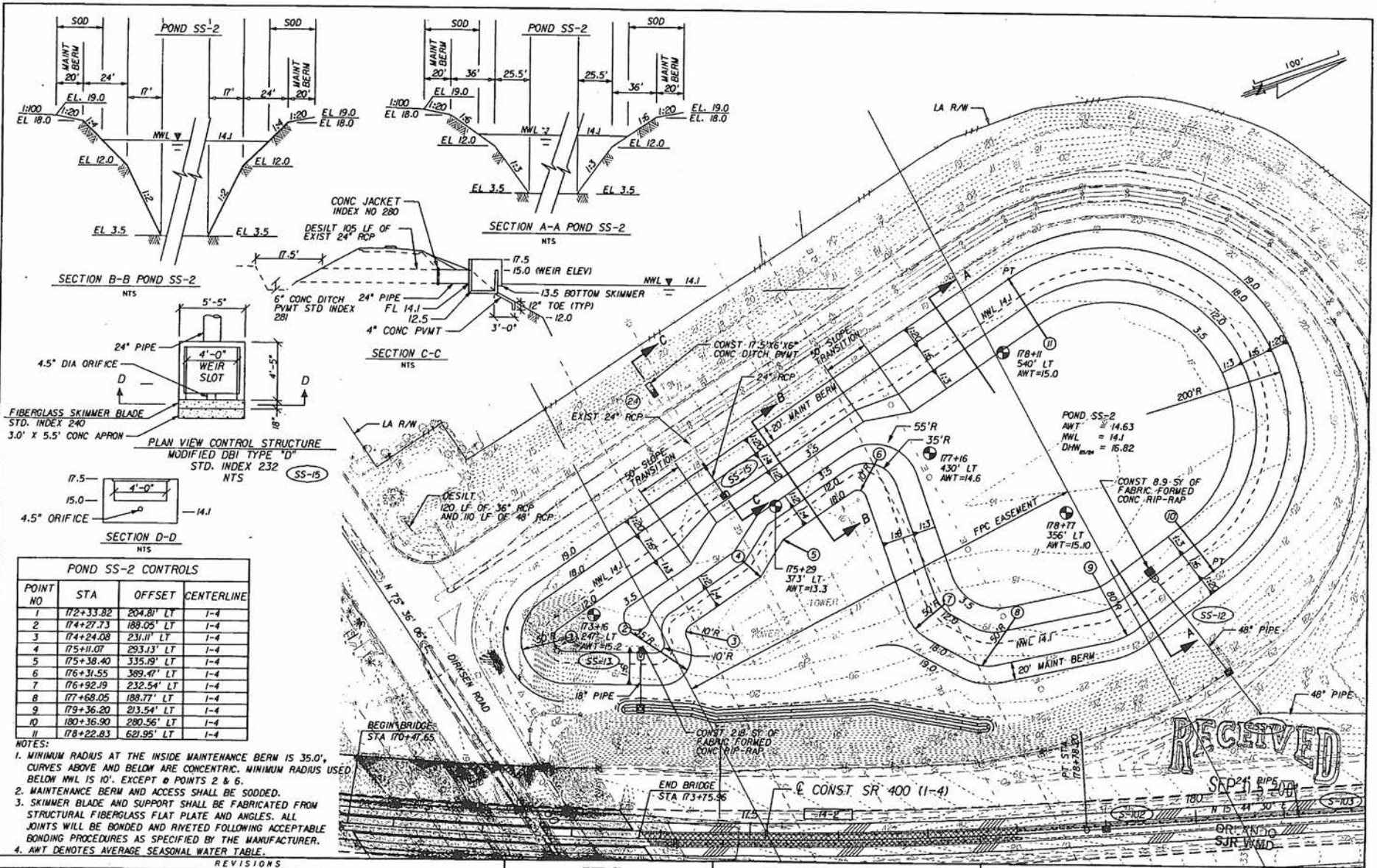

POND SS-2 CONTROLS			
POINT NO	STA	OFFSET	CENTERLINE
1	172+33.82	204.81' LT	I-4
2	174+27.73	188.05' LT	I-4
3	174+24.08	231.11' LT	I-4
4	175+11.07	293.13' LT	I-4
5	175+38.40	335.19' LT	I-4
6	176+31.55	389.47' LT	I-4
7	176+92.19	232.54' LT	I-4
8	177+68.05	188.77' LT	I-4
9	179+36.20	213.54' LT	I-4
10	180+36.90	280.56' LT	I-4
11	178+22.83	621.95' LT	I-4

NOTES:
1. MINIMUM RADIUS AT THE INSIDE MAINTENANCE BERM IS 35.0', CURVES ABOVE AND BELOW ARE CONCENTRIC. MINIMUM RADIUS USED BELOW NWL IS 10'. EXCEPT @ POINTS 2 & 6.
2. MAINTENANCE BERM AND ACCESS SHALL BE SODDED.
3. SKIMMER BLADE AND SUPPORT SHALL BE FABRICATED FROM STRUCTURAL FIBERGLASS FLAT PLATE AND ANGLES. ALL JOINTS WILL BE BONDED AND RIVETED FOLLOWING ACCEPTABLE BONDING PROCEDURES AS SPECIFIED BY THE MANUFACTURER.
4. AWT DENOTES AVERAGE SEASONAL WATER TABLE.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 400	SEM & VOL	242702-1-52-01

POND SS-2
DETAIL SHEET
40-127-64105-3

SHEET NO. 2.57

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Permit No. 64105-6

I-4 Widening from Saxon Blvd. to SR 472

storm. Due to the high water table elevations, proposed Pond 1 and Pond 1A will be analyzed utilizing wet detention design criteria for treatment volume estimation. Pond 1 and Pond 1A will accommodate the typical section in the ultimate conditions.

Pond 1 and Pond 1A are within the right-of-way already required for the project as mentioned in Item # 2, Section 3 of pond site report. In order to mitigate for the additional runoff resulting from lane widening and high water table in the area, the existing dry detention ponds will be converted to a wet detention ponds. The conversion to the wet detention ponds will require modification to the existing control structures. Also the existing pond bottom will be lowered to allow for additional water quality treatment, as well as additional flood storage. Note that this pond is proposed to detain the treatment volume and retain the attenuation volume resulting from the I-4 ultimate conditions which not only includes the improvements associated with the I-4 mainline, but with the northeast and southeast ramps at Saxon Boulevard, as well as a portion of Saxon Boulevard. With lowering of Pond 1 an additional storage of 7.00ac-ft will be available. For a 25year 96hour storm event, Basin 1 requires 1.7ac-ft of runoff attenuation, however Pond 1 and Pond 1A will have the capacity to provide 15.7ac-ft of attenuation.

The post development discharge for the 25 year-96 year storm event is 39.81 cfs, as shown on Table IV-1. The post development drainage basin is delineated on Figures 4-1, while the post development nodal diagram is shown on Figure 4-7.

BASIN 2 & 3

Basin 2 begins at Station 332+33.63, which is just north of the I-4/Saxon Boulevard interchange and ends at 365+24.17, just north of Lake Mallard. Basin 3 begins at Station 365+24.17, which is just north of Lake Mallard and ends at 441+73.4, which is south of Graves Avenue/Howland Boulevard. This proposed basin is approximately 55.05 acres, of which 18.74 acres are impervious in the ultimate conditions.

The proposed method for conveying runoff for Basin 2 and 3 will be through the construction of a conveyance ditch along the east side of the roadway, and ultimately discharging to the proposed Pond 2 site. Median drainage will be conveyed through the construction of a series of 18" cross drains conveying runoff from the median to the proposed conveyance ditch on the east side.

Basin 2 and 3 discharges to Lake Mallard, which is considered, land-locked. Consequently, this basin will be designed as a closed basin based on the 25-year / 96-hour design storm. Due to relatively low water table elevations at this site (SCS Soil Type 42 which has a historic depth to the Season High Water Table greater than 6 feet), this pond has been analyzed using dry retention design criteria for treatment volume estimation and recovery through soil infiltration.

The discharge from Pond 2 will back up the proposed right ditch to a proposed weir, top elevation at 30.50 ft, at the existing crossdrain in Basin 2 at Sta 360+00 where it will join runoff from the offsite contributing area and flow to the west side. The offsite area is about 88.40 acres, of which 10.94 acres are impervious. The crossdrain in Basin 3 at Sta 395+54 will convey only runoff from the offsite contributing area. This offsite area is about 706.00 acres, of which 128.47 acres are impervious. Both offsite areas will not be treated in Pond 2. Median area between station 378+97 to 385+00 will not be treated in Pond 2 either. The runoff from the median area will drain through an existing median pipe under the westbound lane to Lake Mallard as in the pre-development condition. The compensating treatment for the offsite median area will be provided in the east side swale area as shown in Figure 4-3.

Note that after discussions with the FDOT right of way department and the FDOT Interstate Management team in District 5, Pond 2 will accommodate the typical section in the ultimate conditions. Pond 2 is a 4.7-acre site located on an undeveloped parcel east of I-4 and north of Saxon Boulevard. Pond 2 will be designed to retain the greater of the proposed treatment volume or the attenuation volume for both Basins 2 and 3 in the ultimate conditions.

The basin area is 55.05 acres, of which 18.74 acres are impervious, and includes the proposed pond area. The post development discharge for the 25 year-96 year storm event is 20.31cfs, as shown on Table IV-1, which summarizes Basins 2 and 3 in their post development conditions. The post development drainage basin is delineated on Figures 4-2 and 4-3, while the post development nodal diagram is shown on Figure 4-10.

BASIN 4

Basin 4 begins at Station 441+73.40, which is south of Graves Avenue/Howland Boulevard and ends at 486+53.18, which is at the SR 472 interchange. This proposed basin is approximately 25.60 acres, of which 9.69 acres are impervious in the ultimate conditions.

The proposed method for conveying runoff for Basin 4 will be through the construction of a conveyance ditch along the east side of the roadway, and ultimately discharging to the proposed pond site. Median drainage will be conveyed through the construction of a series of 18" cross drains conveying runoff from the median to the proposed conveyance ditch on the east side.

Basin 4 discharges into a series of depressional areas east and west of I-4. These depressional areas are considered land-locked; therefore, Basin 4 will be designed as a closed basin based on the 25-year / 96-hour design storm. Water quality and increased runoff attenuation for Basin 4 will be provided in the proposed Pond 3. Pond 3 will accommodate the typical section in the ultimate conditions. Pond 3 is a vacant site within the interchange infield area that was acquired by FDOT in order to reconstruct the I-4/SR 472 Interchange. Pond 3 is proposed to be 3.53 acres and will serve to retain the greater of the proposed treatment volume or attenuation volume for Basin 4.

Due to relatively low water table elevations at this site (SCS Soil Type 4 and 42 which has a historic depth to the Season High Water Table greater than 6 feet, and SCS Soil Type 63 which has a historic depth to the SHWT between 3.5 and 6 feet), this pond will be analyzed using dry detention design criteria for treatment volume estimation and recovery through soil infiltration.

Runoff from the West Grave Ave Basin which is not treated in Pond 3 will be compensated by treating runoff from the east side ditch. Runoff produced by West Grave Ave Basin for a 25-year 96-hour storm is 1.85 ac-ft, while for the same storm event runoff from east side ditch is 2.30ac-ft. Since all the flow from east side ditch will be treated in Pond 3, treatment volume compensation is satisfied for this basin.

The post development discharge for the 25 year-96 year storm event is 2.30 cfs, as shown on Table IV-1. The post development drainage basin is delineated on Figures 4-4, while the post development nodal diagram is shown on Figure 4-12.

BASIN 5

Basin 5 begins at Station 486+53.18, which is located at I-4/SR 472 Interchange and ends at 565+00, which is the high point in the existing roadway profile outside of the project limits, which is north of Orange Camp Road. Water quality and increased runoff attenuations for Basin 5 will be provided in Pond 4. Pond 4 will accommodate the typical section in the ultimate conditions. Note that for the segment outside of the project limits to the north (Stations 524+47.17 to 565+00), the ultimate conditions consist of 6-laning only (no HOV lanes.) Consequently, Pond 4 design calculations for the north portion outside the project limits reflect the 6-laning typical section. Basin 5 is approximately 165.74 acres, of which 25.03 acres are impervious in the ultimate conditions.

The proposed method for conveying runoff for Basin 5 will be through the construction of a conveyance ditch along the west side of the roadway, and ultimately discharging to the proposed pond site. Median drainage will be conveyed through the construction of a series of 18" cross drains conveying runoff from the median to the proposed conveyance ditch on the west side.
Basin 5 includes runoff from the ultimate conditions to the north of the project limits. Basin 5 discharges to a series of depress ional areas east and west of I-4. These depressional areas are considered land-locked; therefore, Basin 5 will be designed as a closed basin based on the 25-year / 96-hour design storm. Due to relatively low water table elevations, ponds will be analyzed using dry retention design criteria for treatment volume estimation and recovery through soil infiltration.
Pond 4 is a 11.73-acre site that is partially wooded and vacant and is located east of I-4 just north of Cassadaga Road. This site is not anticipated to cause wetland and/or environmental impacts.
Pond 4 will serve to retain the greater of the required treatment volume or attenuation volume for Basin 5.

The post development discharge for the 25 year-96 hour storm event is 0 cfs, as shown on Table IV-1. The post development drainage basin is delineated on Figures 4-5 and 4-6, while the post development nodal diagram is shown on Figure 4-14. The contributory basins that will be treated in Pond-4 is listed in Figure 4-5.

The following Table IV shows the post developed conditions summary for the basins located within the project boundaries

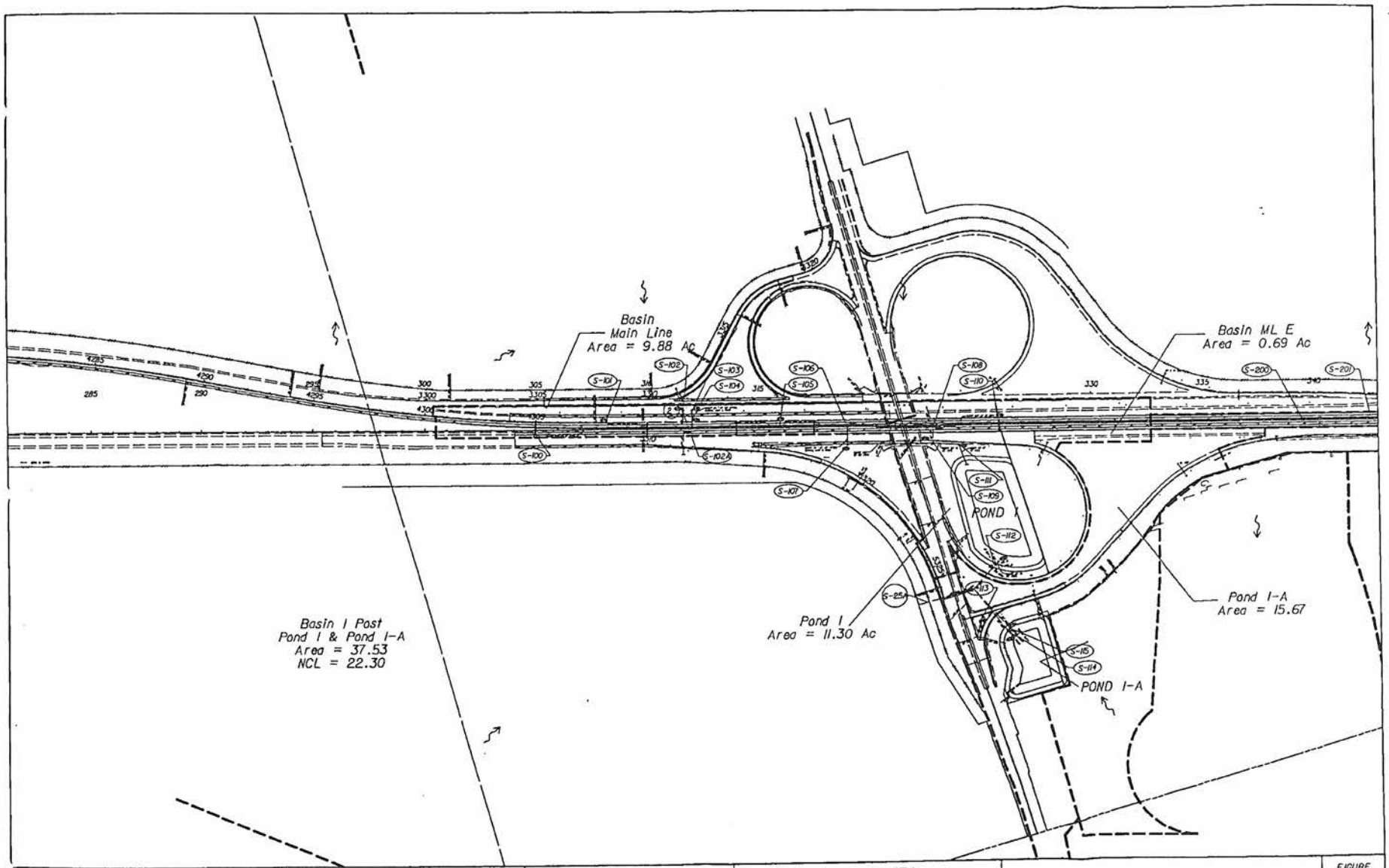
Table IV-1

BASIN	POND No	AREA (ac)	CN[1]	TC[1] (min)	Q (25Y/96H) Discharge[2] (ft /s)	STAGE (ft)
1	Pond 1 & Pond 1A	37.53	71	30.0	39.81	24.36 & 24.13
2/3	Pond 2	55.05	61.5	31.79/65.52	20.31	31.71
4	Pond 3	25.60	69.73	39.96	2.30	60.77
5	Pond 4	165.73	48	148.5	0	43.84

Table IV-1: Post Development Conditions Summary

[1]Curve Number and Time of Concentration worksheets are located in Appendix B.

[2]AdICPR output data for the 10 year-24 hr, 25 year-96 hr, and 100 year-24 hr storms can be found in Appendix C.



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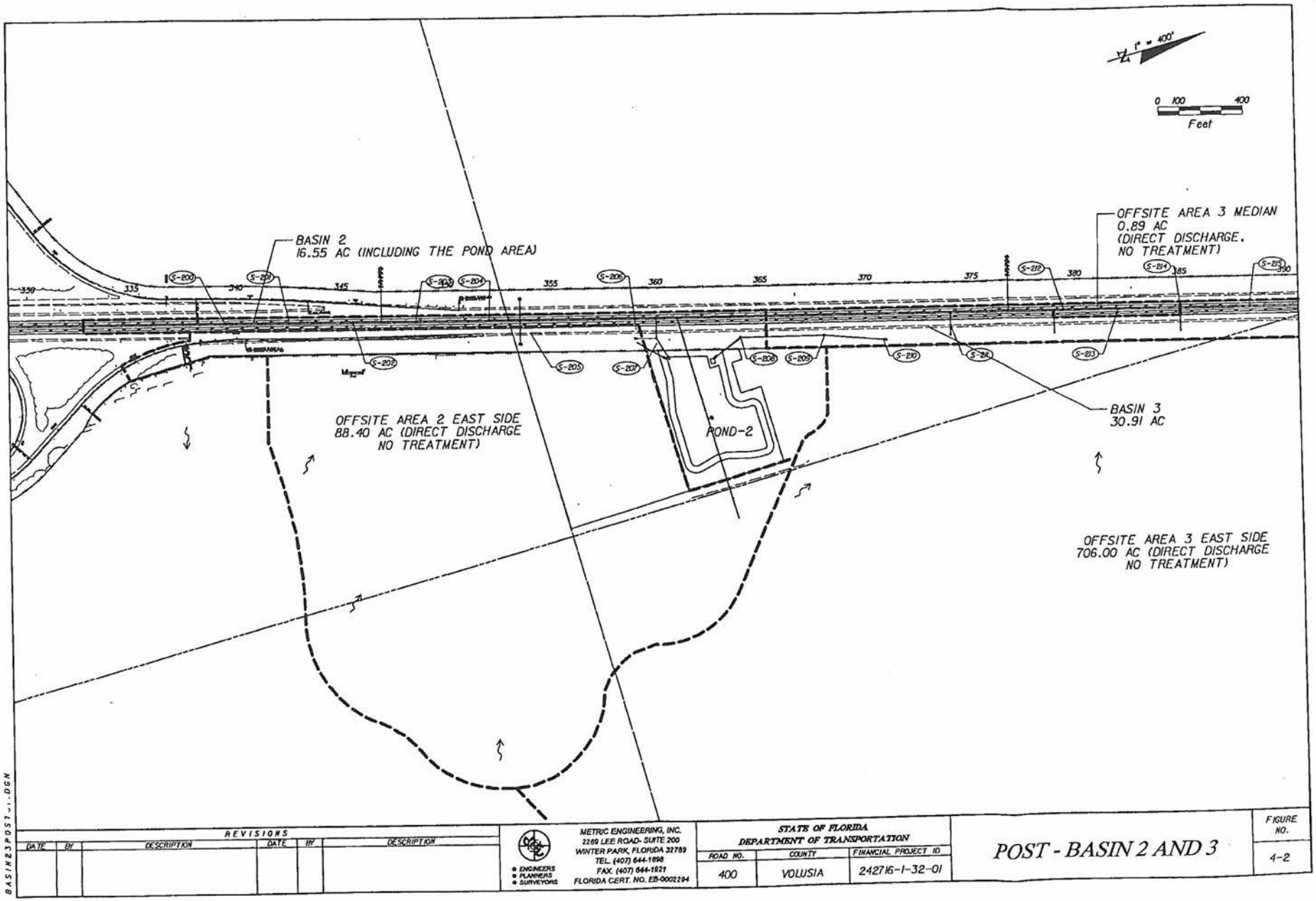
• PLANNERS
• SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-32-01

POST - BASIN 1

FIGURE NO. 4-1



BASIN2POST...DGN

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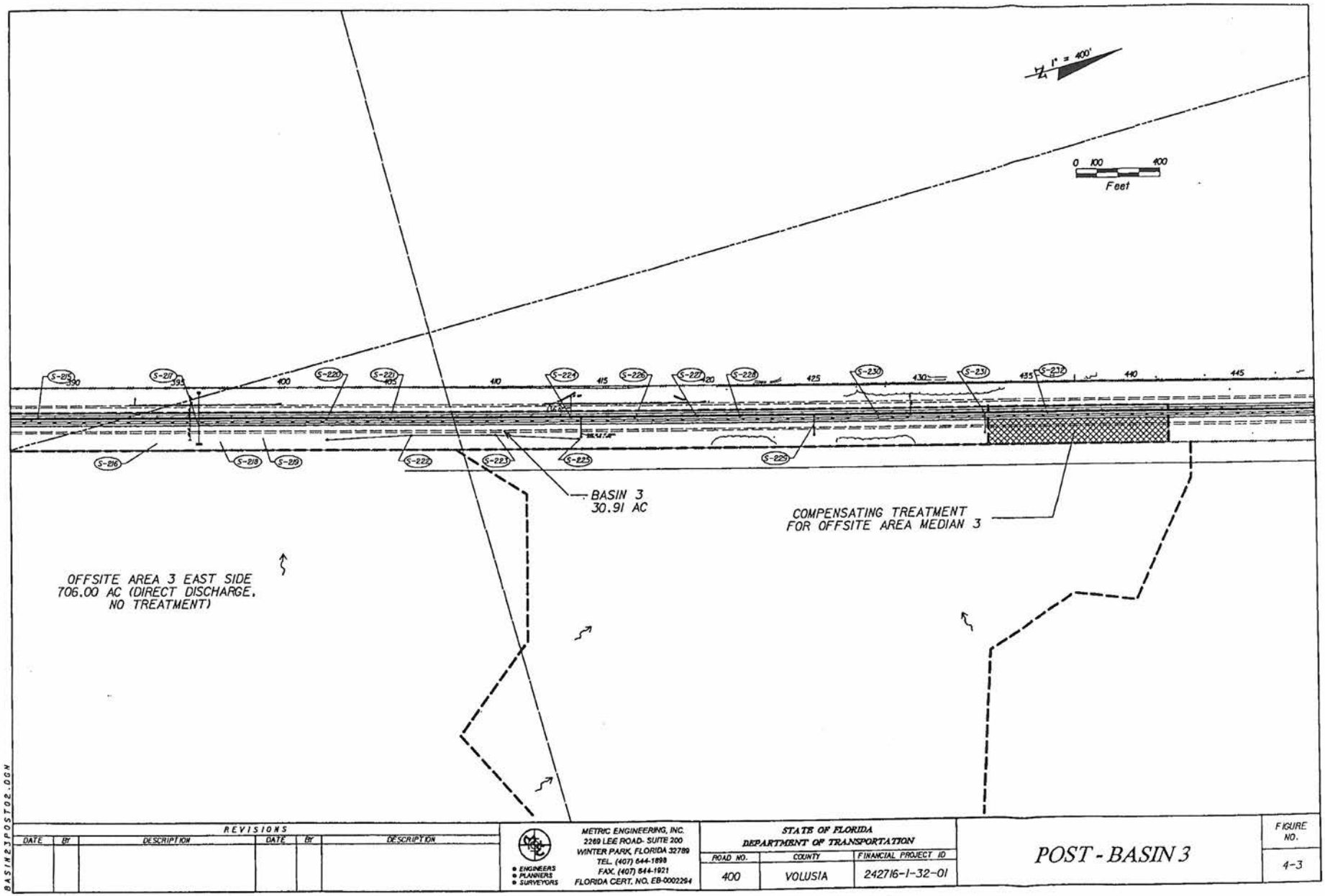
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-32-01

POST - BASIN 2 AND 3

FIGURE NO. 4-2



BASIN3POST02.DGN

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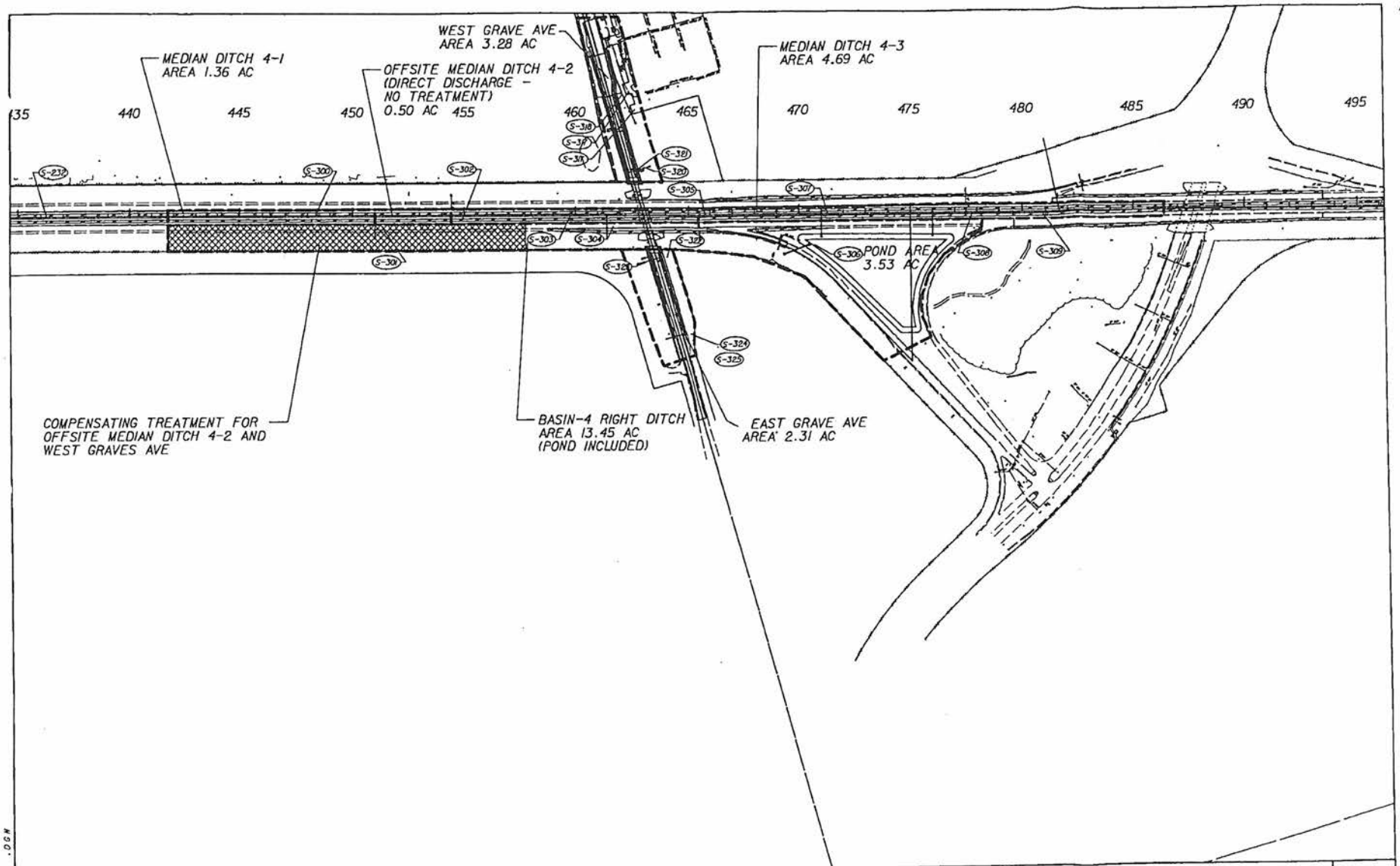
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-32-01

POST - BASIN 3

FIGURE NO. 4-3



BASIN4POS .DGN

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FLORIDA CERT. NO. EB-0002294
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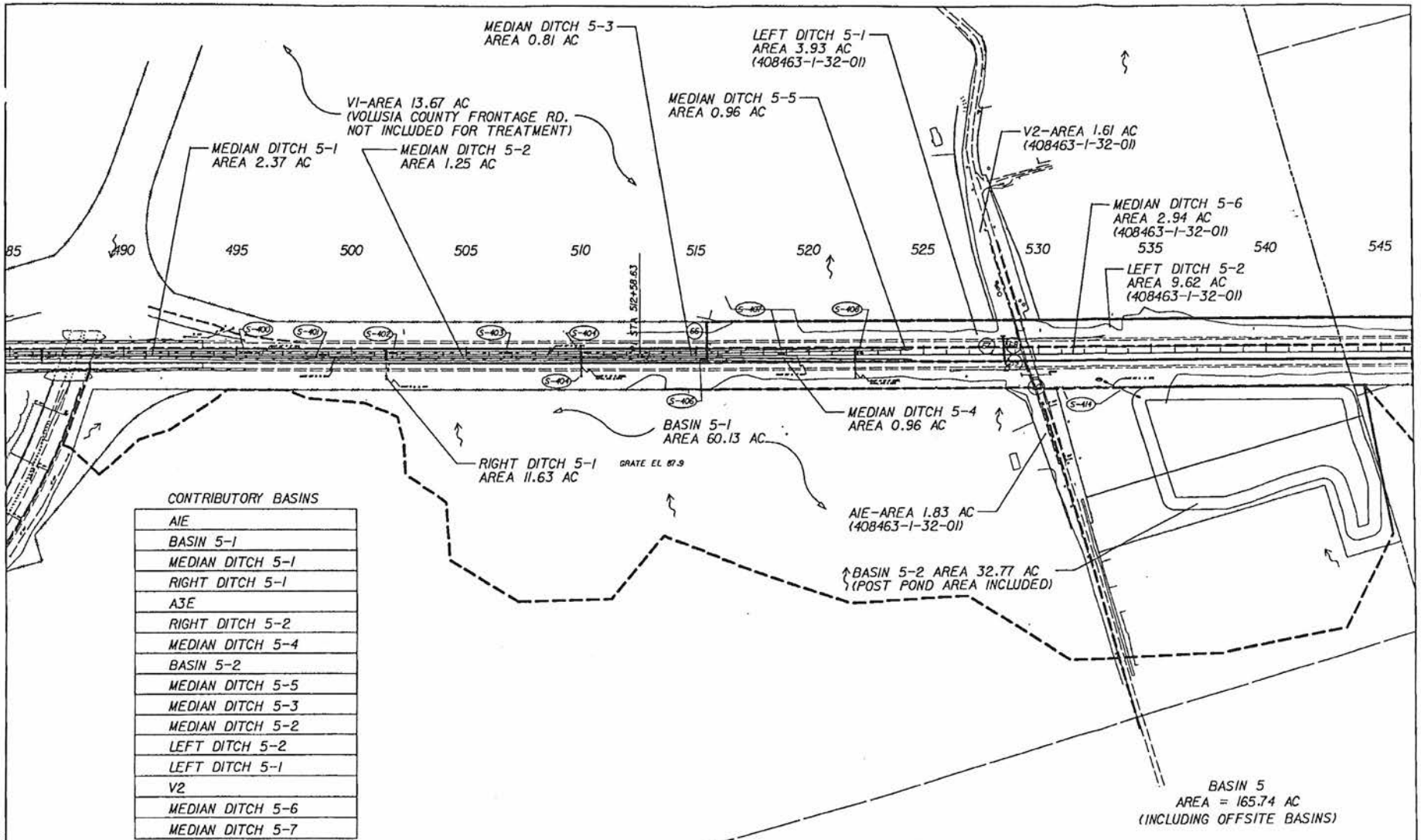
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-32-01

POST - BASIN 4

FIGURE NO. 4-4



CONTRIBUTORY BASINS

AIE
BASIN 5-1
MEDIAN DITCH 5-1
RIGHT DITCH 5-1
A3E
RIGHT DITCH 5-2
MEDIAN DITCH 5-4
BASIN 5-2
MEDIAN DITCH 5-5
MEDIAN DITCH 5-3
MEDIAN DITCH 5-2
LEFT DITCH 5-2
LEFT DITCH 5-1
V2
MEDIAN DITCH 5-6
MEDIAN DITCH 5-7

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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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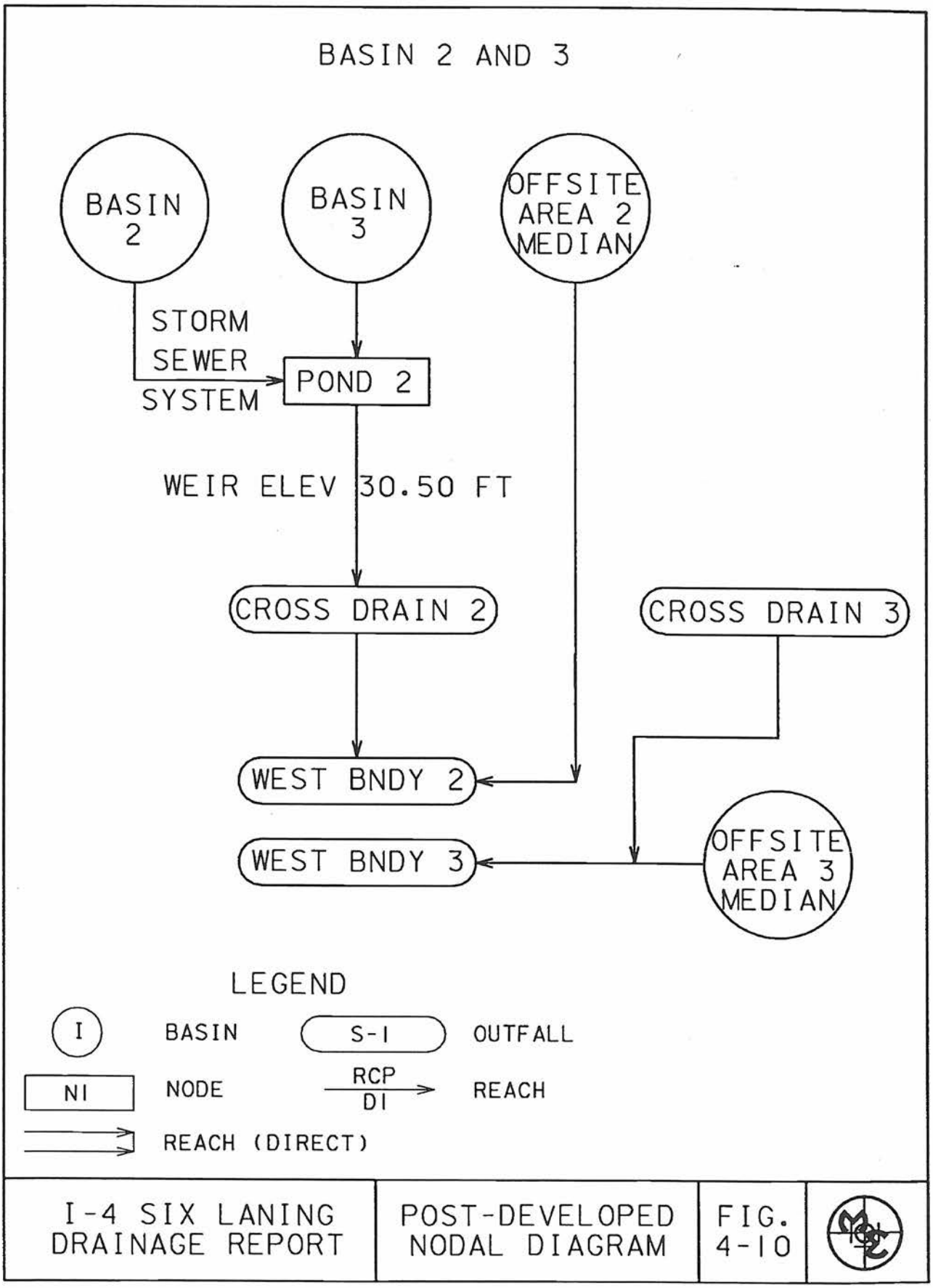
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID.
400	VOLUSIA	242716-1-32-01

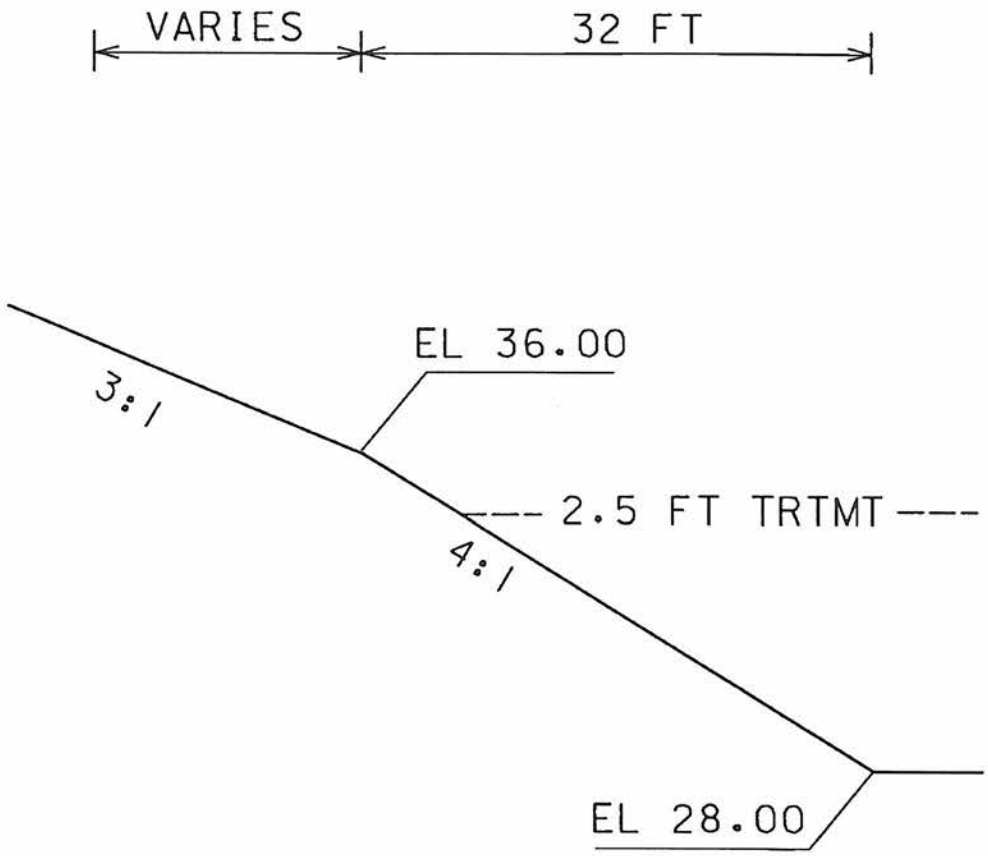
POST - BASIN 5

FIGURE NO. 4-5

BASINSPO.DGN


BASIN 2 AND 3
BASIN 2
BASIN 3
OFFSITE AREA 2 MEDIAN
STORM SEWER SYSTEM
POND 2
WEIR ELEV 30.50 FT
CROSS DRAIN 2
CROSS DRAIN 3
WEST BNDY 2
WEST BNDY 3
OFFSITE AREA 3 MEDIAN
LEGEND
I
BASIN
S-I
OUTFALL
NI
NODE
RCP
DI
REACH
REACH (DIRECT)
I-4 SIX LANING DRAINAGE REPORT
POST-DEVELOPED NODAL DIAGRAM
FIG. 4-10

DRY RETENTION POND TYPICAL SECTION
POND 2



I-4 SIX LANING DRAINAGE REPORT	POND DETAILS NTS	FIG. 4-11	

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JOB #: _____ SHEET ___ OF ___
PROJECT NAME: _____
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POND 2 (BASIN 2 AND 3)

1) WATER QUALITY CALCULATIONS

Pond 2 is in a closed basin and shall be designed to store over the duration of the storm the greater of the treatment volume or the attenuation volume in Post Development. Pond 2 is a dry detention system.

A) TREATMENT VOLUME

- TOTAL BASIN AREA = 55.05 AC
- PAVED AREA = 18.74 AC

  - 1.25" over impervious area or 0.5" over total area, whichever greater add 0.5" of total area:

    A) 18.74 AC (1.25" / 12") =1.95 ac-ft
    B) 55.05 AC (0.5" / 12") = 2.29 ac-ft ← GOVERNS
    - 2.29 ac-ft + 55.05 AC (0.5" / 12") = 4.58 ac-ft

∴ ***Treatment volume required = 4.58 ac-ft.***

2) ATTENUATION VOLUME CALCULATIONS

PRE ATTENUATION VOLUME CALCULATIONS

Using $Q=(P-0.2S)^2/(P+0.8S)$, where $S=(1000/CN)-10$ and $P_{25yr\text{-}96\text{-}hr}$ = 12.33 in., We find the Runoff Volume (Vr) in ac-ft.

- TOTAL BASIN AREA = 50.91 AC
- AVERAGE CN = 50.78

S = 9.69
Q = 5.38 in
Vr= 22.82 ac-ft

Pre-Peak Attenuation Volume = 22.82 **Ac-Ft**

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POST ATTENUATION VOLUME CALCULATIONS

Using $Q=(P-0.2S)^2/(P+0.8S)$, where $S=(1000/CN)-10$ and $P_{25yr\text{-}96\text{-}hr} = 12.33$ in., We find the Runoff Volume (Vr) in ac-ft.

- TOTAL BASIN AREA = 55.05 AC
- AVERAGE CN = 61.5

S = 6.26
Q = 7.08 in
Vr= 32.48 ac-ft

Post-Peak Attenuation Volume = 32.48 **Ac-Ft**

DIFFERENCE BETWEEN PRE AND POST ATTENUATION VOLUME

Difference in attenuation volume = 32.48 –22.82 = 9.66 **Ac-Ft**

∴ The required treatment volume is 9.66 ac-ft.

3) STAGE / STORAGECALCULATIONS

STAGE (FT)	AREA (AC)	AVG AREA (AC)	□d	STORAGE (AC-FT)	□STORAGE (AC-FT)
28 (BOTTOM)	3.26				0
		3.89	7	27.23	
35	4.52				27.23
		4.61	1	4.61	
36	4.70				31.84

Treatment Vol. Required= 9.66 ac-ft

Corresponding Stage per stage/storage calculations = 30.48 ft

Set weir at elevation = 30.50 ft

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB # _____ SHEET # ____ OF ____ PROJECT NAME: _____ SUBJECT: _____ CALCULATED BY: _____ DATE: _____ CHECKED BY: _____ DATE: _____

4) TREATMENT VOLUME PROVIDED

Per enclosed stage-storage computer output (FDOT program DTBSINGR.EXE):

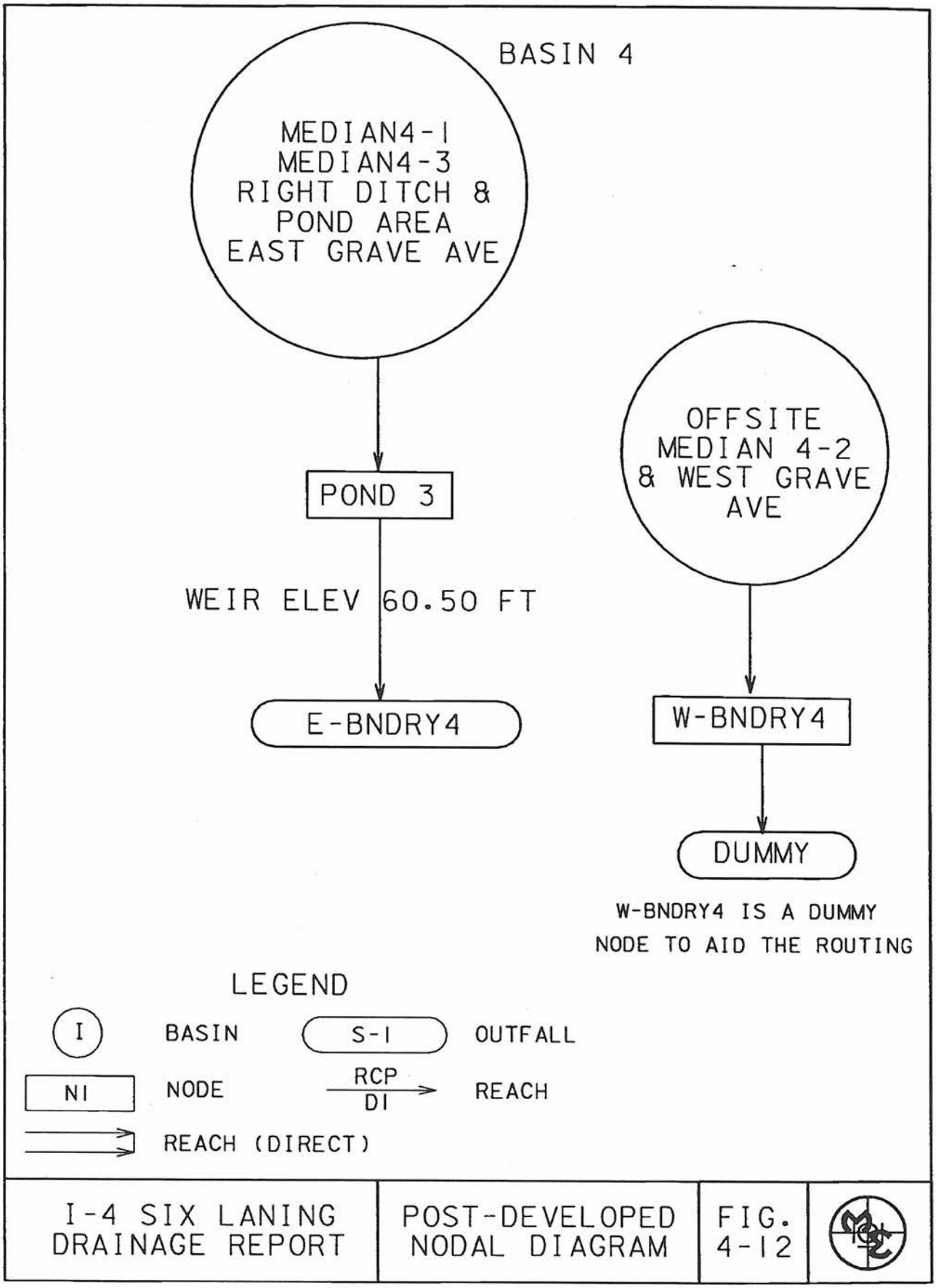
STAGE EL. (FT)	STORAGE (AC-FT)
30.50 FT	9.73 AC-FT

∴ Treatment volume provided = 9.73 ac-ft

5) DRAW DOWN VOLUME

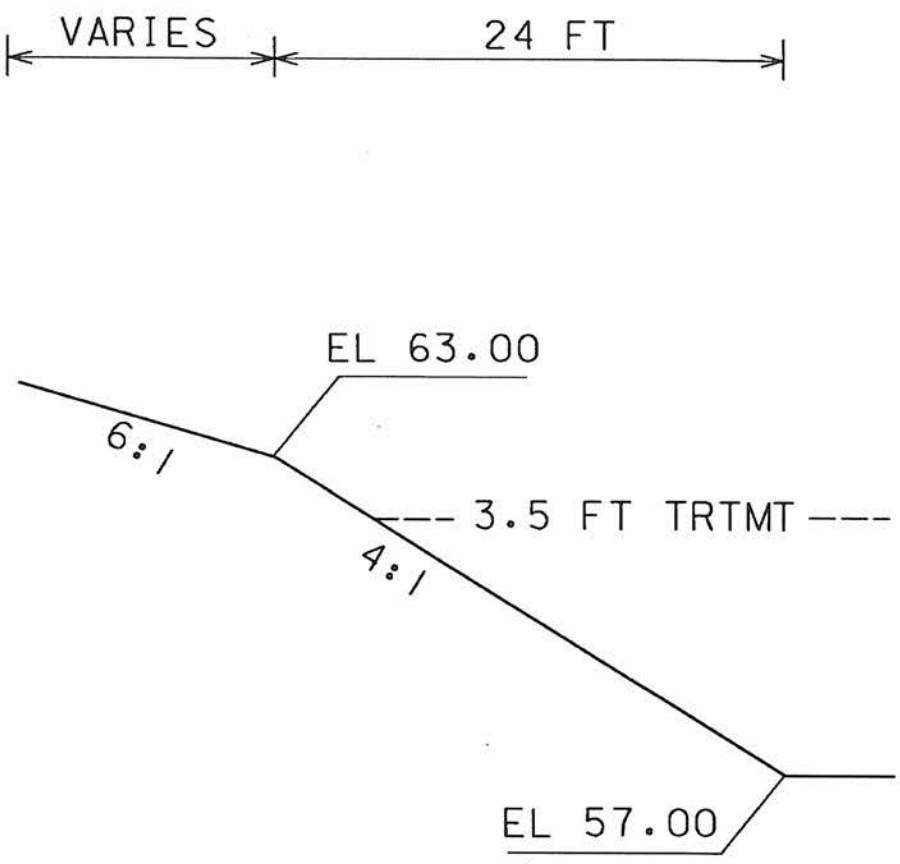
For a dry retention system, the treatment volume must be recovered within 72 hours following the storm event assuming average antecedent moisture conditions, and that the entire volume in a retention pond should recover within fourteen days following a storm event. Per MODRET output data in Appendix D, this criterion has not been satisfied for pond 2.

Due to the pond not recovering in 14 days, a volume analysis was performed to demonstrate that the water management system could treat and store a second treatment volume without flooding the surrounding areas. The first treatment volume stage is 30.50 NAVD and the treatment volume is 9.66 ac-ft. With the first treatment volume the pond recovers to a depth of 30.22 NAVD in 14 days. Since the pond does not recover completely within 14 days a second treatment volume is added to the remaining storage area to determine if the water management system could treat and store. The remaining storage area in pond after treating the first treatment volume is 24.24 ac-ft between stage 30.22 NAVD and 36.00 NAVD. The second treatment volume requires 9.66 ac-ft of storage. Pond 2 is capable of treating and storing the second treatment volume.



I-4 SIX LANING DRAINAGE REPORT	POST-DEVELOPED NODAL DIAGRAM	FIG. 4-12	

DRY RETENTION POND TYPICAL SECTION
POND 3



I-4 SIX LANING DRAINAGE REPORT	POND DETAILS NTS	FIG. 4-13	

METRIC ENGINEERING, INC.
ENGINEERS, PLANNERS, SURVEYORS

JOB #: _____ SHEET ___ OF ___
PROJECT NAME: _____
SUBJECT: _____
CALCULATED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

POND 3 (BASIN 4)

1) WATER QUALITY CALCULATIONS

Pond 3 is in a closed basin and shall be designed to store over the duration of the storm the greater of the treatment volume or the attenuation volume in Post Development. Pond 3 is a dry detention system.

A) TREATMENT VOLUME

- TOTAL BASIN AREA = 25.60 AC
- PAVED AREA = 9.69 AC

  - 1.25" over impervious area or 0.5" over total area, whichever greater add 0.5" of total area:

    A) 9.69 AC (1.25" / 12") = 1.00 ac-ft
    B) 25.60 AC (0.5" / 12") = 1.06 ac-ft ≥ GOVERNS
    - 1.06 ac-ft + 25.60 AC (0.5" / 12") = 2.13 ac-ft

☐ ***Treatment volume required = 2.13 ac-ft.***

2) ATTENUATION VOLUME CALCULATIONS

PRE ATTENUATION VOLUME CALCULATIONS

Using $Q=(P-0.2S)^2/(P+0.8S)$, where $S=(1000/CN)-10$ and $P_{25yr\text{-}96\text{-}hr} = 12.33$ in., We find the Runoff Volume (Vr) in ac-ft.

- TOTAL BASIN AREA = 17.04 AC
- AVERAGE CN = 51.42

S = 9.45
Q = 5.48 in
Vr= 7.78 ac-ft

Pre-Peak Attenuation Volume = 7.78 **Ac-Ft**

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB # _____ SHEET # ____ OF ___ PROJECT NAME: _____ SUBJECT: _____ CALCULATED BY: _____ DATE: _____ CHECKED BY: _____ DATE: _____

POST ATTENUATION VOLUME CALCULATIONS

Using $Q=(P-0.2S)^2/(P+0.8S)$, where $S=(1000/CN)-10$ and $P_{25yr\text{-}96\text{-}hr} = 12.33$ in., We find the Runoff Volume (Vr) in ac-ft.

- TOTAL BASIN AREA = 25.60 AC
- AVERAGE CN = 69.73

S = 4.34
Q = 8.31 in
Vr= 17.74 ac-ft

Post-Peak Attenuation Volume = 17.74 **Ac-Ft**

DIFFERENCE BETWEEN PRE AND POST ATTENUATION VOLUME

Difference in attenuation volume = 17.74 – 7.78 = **9.96 Ac-Ft**

The required treatment volume is 9.96 ac-ft.

3) STAGE / STORAGECALCULATIONS

STAGE (FT)	AREA (AC)	AVG AREA (AC)	□d	STORAGE (AC-FT)	□STORAGE (AC-FT)
57 (BOTTOM)	2.48				0
		2.88	4.50	12.96	
61.5	3.27				12.96
		3.4	1.50	5.1	
63	3.53				18.06

Treatment Vol. Required= 9.96 Ac-Ft

Corresponding Stage per stage/storage calculations = 60.46 Ft

Set weir at elevation = 60.5 Ft

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB #_____ SHEET #____ OF ___ PROJECT NAME:_____ SUBJECT:_____ CALCULATED BY:_____ DATE:_____ CHECKED BY:_____ DATE:_____

4) TREATMENT VOLUME PROVIDED

Per enclosed stage-storage computer output (FDOT program DTBSINGR.EXE):

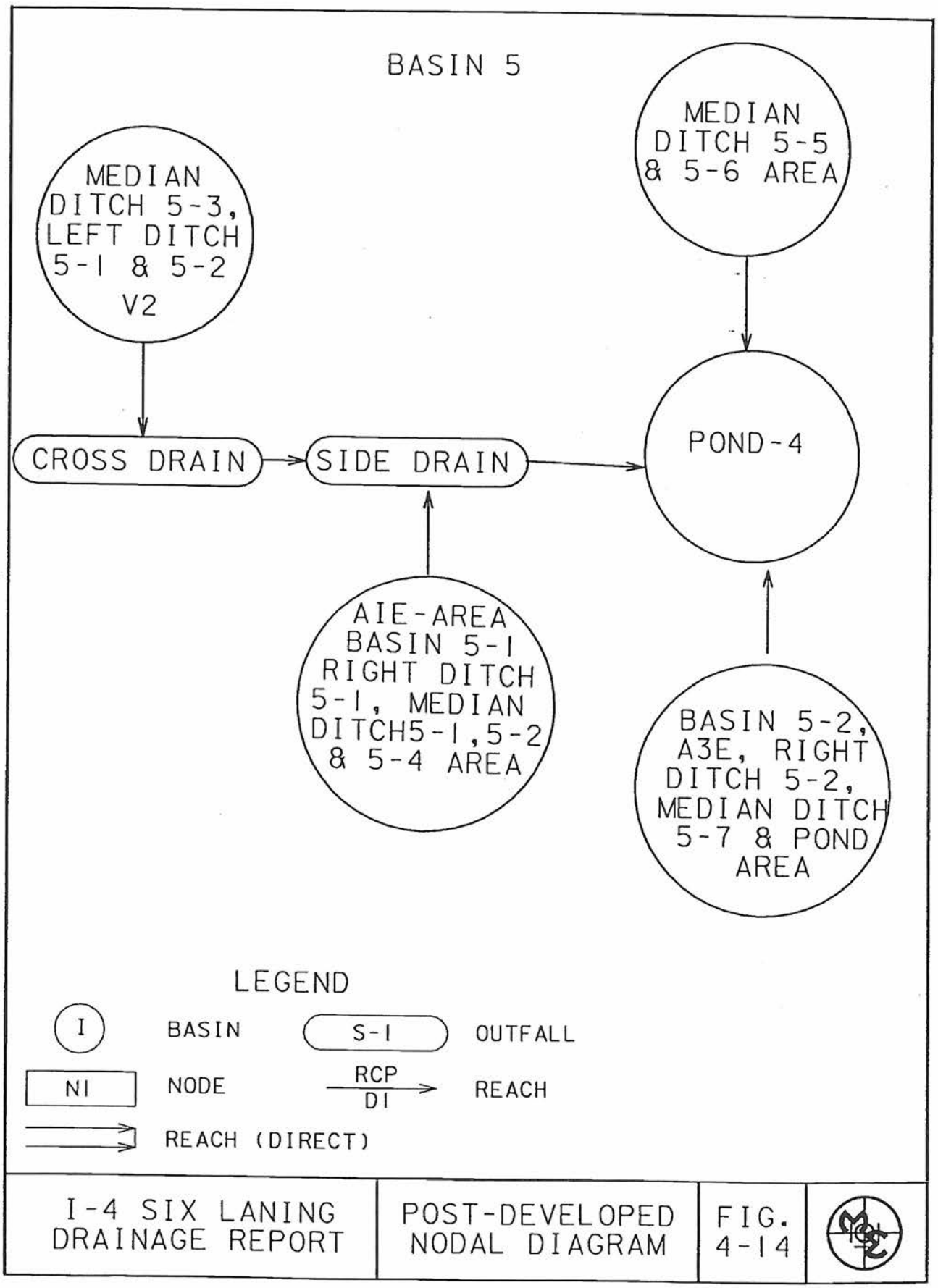
STAGE EL. (FT)	STORAGE (AC-FT)
60.50 FT	9.76 AC-FT

∴ Treatment volume provided = 9.76 ac-ft

5) DRAW DOWN VOLUME

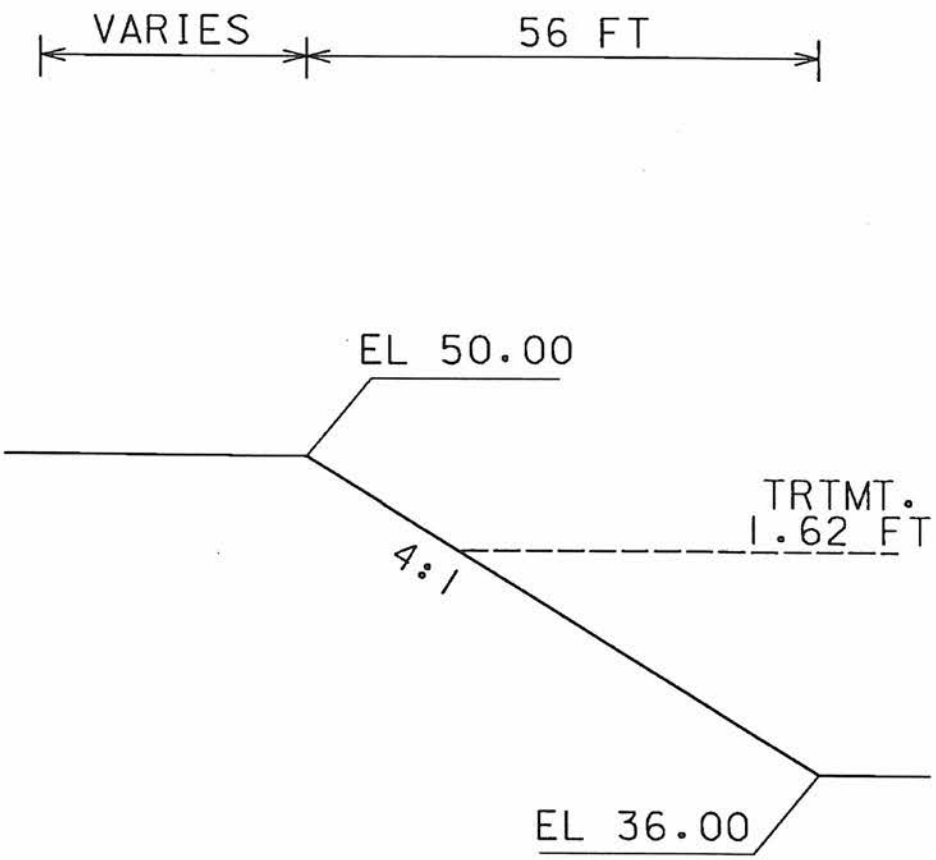
For a dry retention system, the treatment volume must be recovered within 72 hours following the storm event assuming average antecedent moisture conditions, and that the entire volume in a retention pond should recover within fourteen days following a storm event. Per MODRET output data in Appendix D, this criterion has not been satisfied for pond 3.

Due to the pond not recovering in 14 days, a volume analysis was performed to demonstrate that the water management system could treat and store a second treatment volume without flooding the surrounding areas. The first treatment volume stage is 60.50 NAVD and the treatment volume is 9.96 ac-ft. With the first treatment volume the pond recovers to a depth of 58.58 NAVD in 14 days. Since the pond does not recover completely within 14 days a second treatment volume is added to the remaining storage area to determine if the water management system could treat and store. The remaining storage area in pond after treating the first treatment volume is 13.85 ac-ft between stage 58.58 NAVD and 63.00 NAVD. The second treatment volume requires 9.96 ac-ft of storage. Pond 4 is capable of treating and storing the second treatment volume.



I-4 SIX LANING DRAINAGE REPORT	POST-DEVELOPED NODAL DIAGRAM	FIG. 4-14	

DRY RETENTION POND TYPICAL SECTION
POND 4



I-4 SIX LANING DRAINAGE REPORT	POND DETAILS NTS	FIG. 4-15	

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB # _____ SHEET # ____ OF ___ PROJECT NAME: _____ SUBJECT: _____ CALCULATED BY: _____ DATE: 11/14/2003 CHECKED BY: _____ DATE: _____

POND 4 (BASIN 5)

1) WATER QUALITY CALCULATIONS

Pond 4 is in a closed basin and shall be designed to store over the duration of the storm the greater of the treatment volume or the attenuation volume in Post Development. Pond 4 is a dry detention system.

TREATMENT VOLUME

- TOTAL BASIN AREA = 165.74 AC
- PAVED AREA = 25.03 AC

  - 1.25" over impervious area or 0.5" over total area, whichever greater add 0.5" of total area:

    A) 25.03 AC (1.25" / 12") = 2.61 ac-ft
    B) 165.74 AC (0.5" / 12") = 6.91 ac-ft ← GOVERNS
       - 6.91 ac-ft + 165.74 AC (0.5" / 12") = 13.82 ac-ft

∴ ***Treatment volume required = 13.82 ac-ft.***

2) ATTENUATION VOLUME CALCULATIONS

PRE ATTENUATION VOLUME CALCULATIONS

Using $Q=(P-0.2S)^2/(P+0.8S)$, where $S=(1000/CN)-10$ and $P_{25yr\text{-}96\text{-}hr} = 12.33$ in., We find the Runoff Volume (Vr) in ac-ft.

- TOTAL BASIN AREA = 165.54 AC
- AVERAGE CN = 46.99

S = 11.28
Q = 4.75 in
Vr= 65.53 ac-ft

Pre-Peak Attenuation Volume = 65.53 **Ac-Ft**

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB # _____ SHEET # ____ OF ___ PROJECT NAME: _____ SUBJECT: _____ CALCULATED BY: _____ DATE: 11/14/2003 CHECKED BY: _____ DATE: _____

POST ATTENUATION VOLUME CALCULATIONS

Using $Q=(P-0.2S)^2/(P+0.8S)$, where $S=(1000/CN)-10$ and $P_{25yr\text{-}96\text{-}hr} = 12.33$ in., We find the Runoff Volume (Vr) in ac-ft.

- TOTAL BASIN AREA = 165.74 AC
- AVERAGE CN = 47.89

S = 10.88
Q = 4.90 in
Vr= 67.68 ac-ft

Post-Peak Attenuation Volume = 67.68 **Ac-Ft**

DIFFERENCE BETWEEN PRE AND POST ATTENUATION VOLUME

Difference in attenuation volume = 67.68 – 65.53= 2.15 **Ac-Ft**

∴ The required treatment volume is 13.82 ac-ft.

3) STAGE / STORAGECALCULATIONS

STAGE (FT)	AREA (AC)	AVG AREA (AC)	□d	STORAGE (AC-FT)	□STORAGE (AC-FT)
36 (BOTTOM)	7.49				0
		8.55	7.00	59.85	
43	9.61				59.85
		10.67	7.00	74.69	
50	11.73				134.54

Treatment Vol. Required= 13.82 Ac-ft

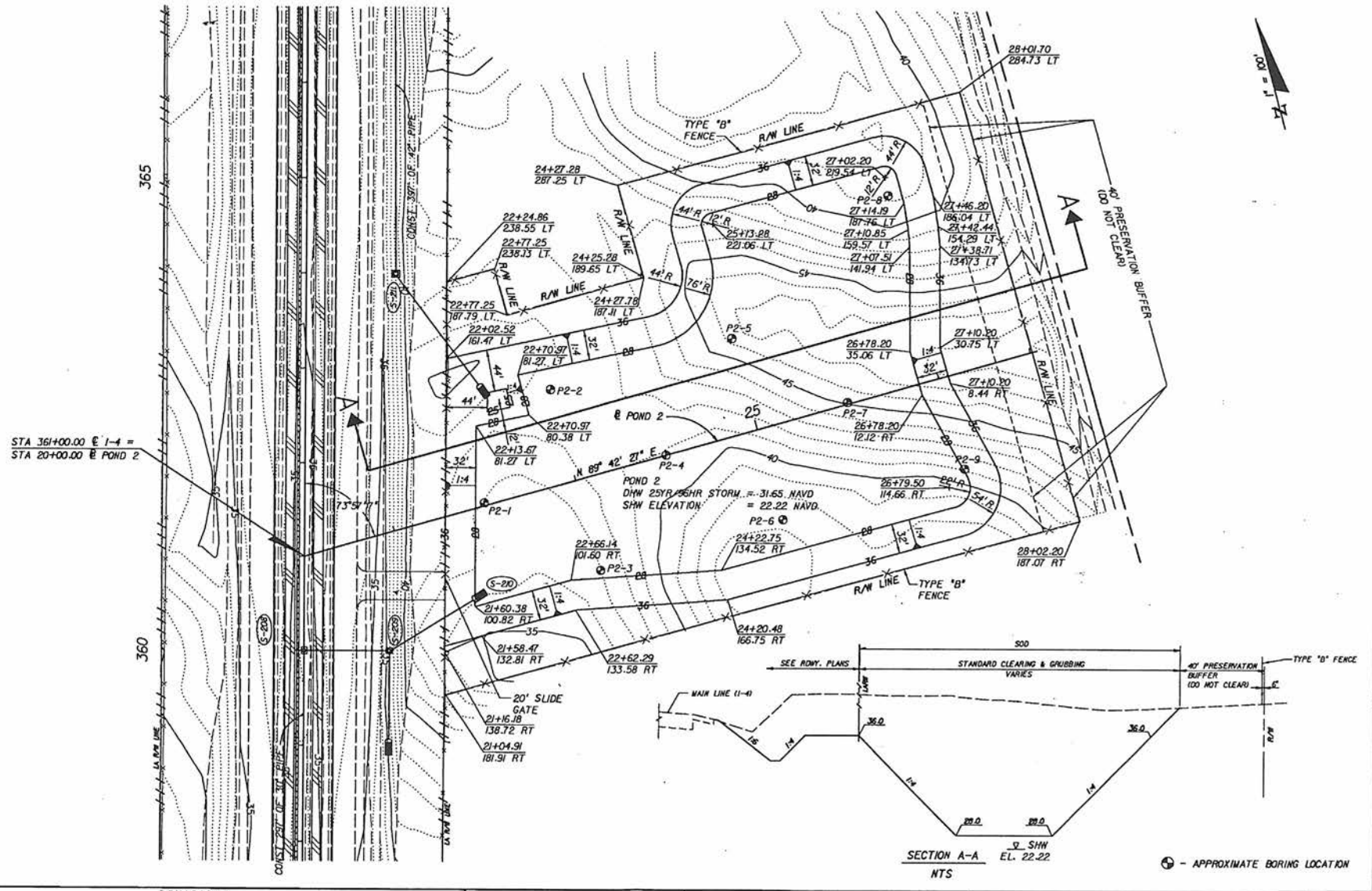
Corresponding Stage per stage/storage calculations = 37.62 Ft

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB #_____ SHEET #____ OF ___ PROJECT NAME:_____ SUBJECT:_____ CALCULATED BY:_____ DATE: 11/19/2003 CHECKED BY:_____ DATE:_____

4) DRAW DOWN VOLUME

For a dry retention system, the treatment volume must be recovered within 72 hours following the storm event assuming average antecedent moisture conditions, and that the entire volume in a retention pond should recover within fourteen days following a storm event. Per MODRET output data in Appendix D, this criterion has not been satisfied for pond 4.

Due to the pond not recovering in 14 days, a volume analysis was performed to demonstrate that the water management system could treat and store a second treatment volume without flooding the surrounding areas. The first treatment volume stage is 37.62 NAVD and the treatment volume is 13.82 ac-ft. With the first treatment volume the pond recovers to a depth of 37.21 NAVD in 14 days. Since the pond does not recover completely within 14 days a second treatment volume is added to the remaining storage area to determine if the water management system could treat and store. The remaining storage area in pond after treating the first treatment volume is 125.25 ac-ft between stage 37.21 NAVD and 50.00 NAVD. The second treatment volume requires 13.82 ac-ft of storage. Pond 4 is capable of treating and storing the second treatment volume.



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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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FLORIDA CERT. NO. EB-0002294

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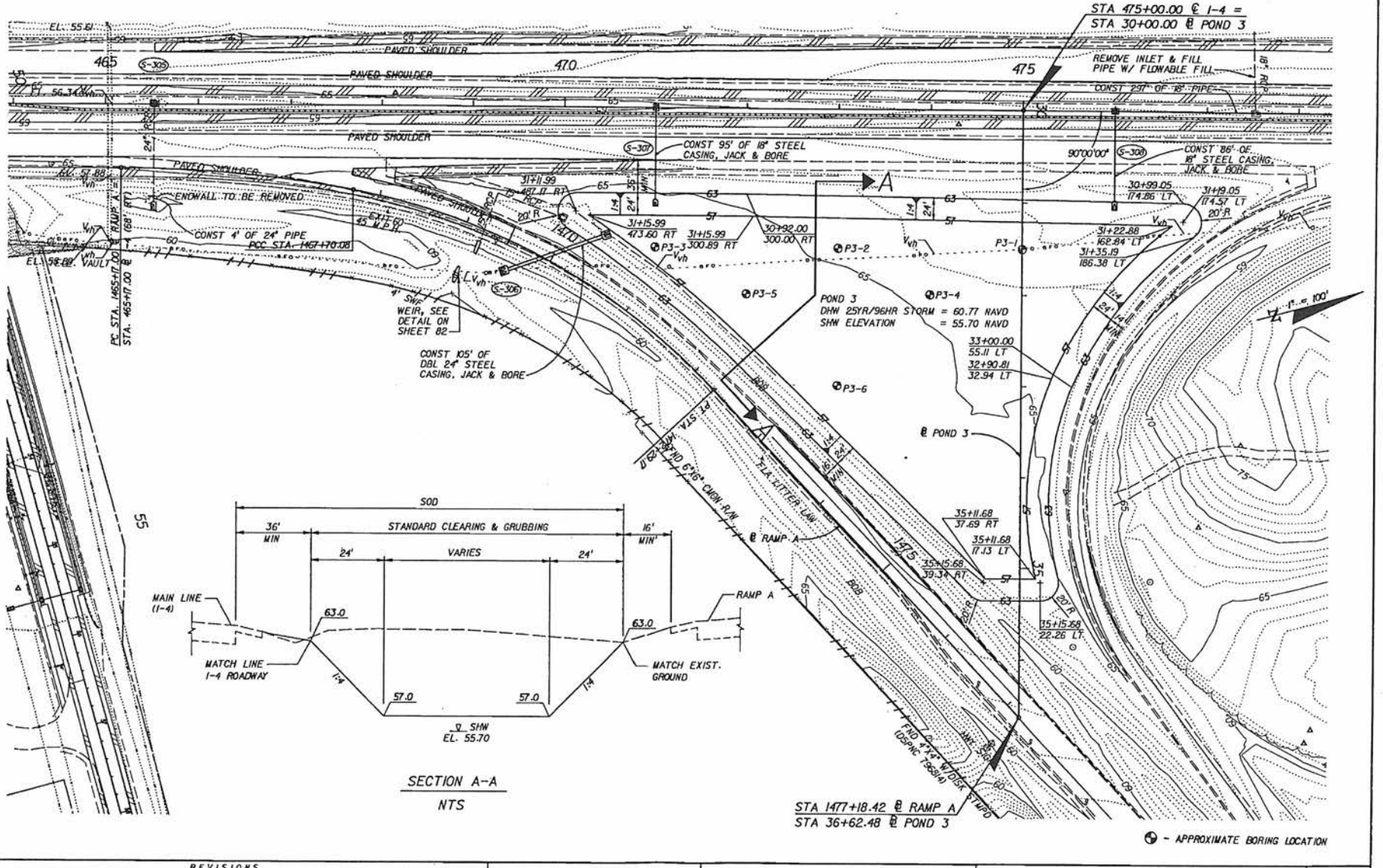
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-52-01

POND NO. 2 DETAIL

SHEET NO. 85



RETARD03.DGN

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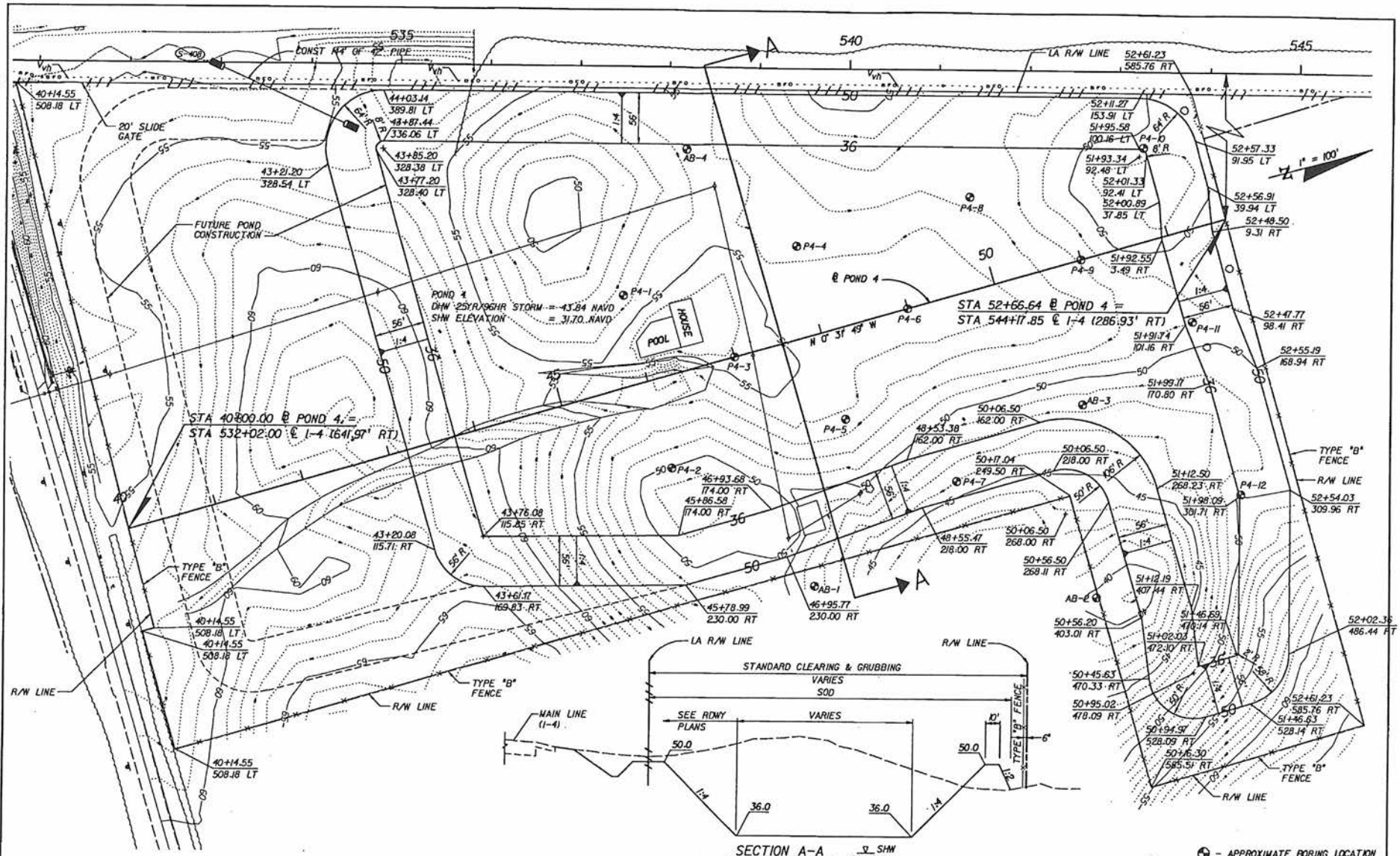
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-52-01

POND NO. 3 DETAIL

SHEET NO. 86



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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-52-01

POND NO. 4 DETAIL

SHEET NO. 87

St. John's River Water Management District
Environmental Resource Permit (ERP)
Addendum to Application

INTERSTATE 4

From South of Saxon Blvd. to North of SR 472

FINANCIAL PROJECT NO(s). 242716-1-52-01
VOLUSIA COUNTY, FLORIDA

Prepared for:

Florida Department of Transportation
District 5
719 S. Woodland Boulevard
DeLand, FL 32720

Prepared by:

Metric Engineering, Inc.
2269 Lee Road
Winter Park, FL 32789
Telephone: (407) 644-1898
Fax: (407) 644-1921

64105-6

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ALTAMONTE SVC CTR

March 2004

Certified by:

Joseph A. Yarid, P.E. No. 44201
3/11/04

RECOVERY ANALYSIS SUMMARY

The St. Johns River Water Management District (SJRWMD) requires that the treatment volume within wet detention ponds recovered in 72 hours following a storm event and that the entire volume in a detention pond recovers within fourteen days following a storm event. This project consists of two wet detention ponds, which meet this criteria: Pond 1 and Pond 1-A. The recovery analysis performed on these ponds suggests that Pond 1 and Pond 1-A did not recover in the required 14 days following a 25 year – 96 hour storm event.

Due to the ponds not recovering in 14 days, a stage analysis was preformed to demonstrate the stormwater management systems could treat and store a second 25 year – 96 hour storm event, which occurs 14 days after the first storm, without flooding the surrounding area. The second storm event was added at the 14^{th} day recovery elevation of the first storm event. Top of the berm elevation of Pond 1 and Pond 1-A is 26.00 NAVD. Table below summarizes the results of the analysis.

Pond	Seasonal High Water Elevations (ft-NAVD)	Peak Pond Stage During First 25yr/96hr storm (ft-NAVD)	Pond Stage 14 Days Following 25yr/96hr storm (ft-NAVD)	Pond Stage After Adding Second 25yr/96hr storm (ft-NAVD)
Pond 1	23.75	25.83	23.89	25.85
Pond 1-A	23.75	25.55	23.89	25.56

POND 1-SOUTH (BASIN 1)

1) WATER QUALITY CALCULATIONS

Pond-1 is a wet detention system.

- TOTAL BASIN AREA = 21.86 AC
- IMPERVIOUS AREA = 13.62 AC

A) 1" over total basin area = 1.82 ac-ft
B) 2.5" over impervious area = 2.83 ac-ft ← GOVERNS

∴ ***Treatment volume required = 2.83 ac-ft.***

2) TREATMENT VOLUME PROVIDED

Entering 2.83 ac-ft in the stage storage computer output data the water quality required for this pond is 24.75 ft.

Per enclosed stage-storage computer output (FDOT program DTBSINGR.EXE):

STAGE EL. (FT)	STORAGE (AC-FT)
23.75(NCL EL)	22.64
24.75(WEIR EL)	25.50

∴ ***Treatment volume provided = 2.86 ac-ft***

3) CALCULATE MINIMUM PERMANENT POOL VOLUME THAT WILL PROVIDE REQUIRED RESIDENCE TIME.

Since the non-littoral zone option is being utilized, the permanent pool must be sized to provide a residence time of at least 21 days (i.e. 14 days plus an additional 50%) during the wet season (June to October).

$$PPV = \frac{(DA)(C)(R)(RT)}{(WS)(CF)}$$

DA = 21.86 ac
WS = 153 days
R = 30 inches (per Figure 29-1)

RT = 21 days
C = [(0.3)(5.52) + (0.95)(13.62) + (1)(2.72)]/21.86 = 0.792

PPV = [(21.86 ac)(0.792)(30 in)(21 days)]/ [(153 days)(12 in/ft)] = **5.94 ac-ft**

The pond volume below elevation 23.75 FT (NCL) is **22.64 ac-ft**. Therefore, adequate storage is provided to satisfy the permanent pool criteria.

4) BLEED DOWN VOLUME

Recover ½ treatment volume provided in 24 to 30 hours...

$\frac{1}{2} V_{PROVIDED} = \frac{1}{2}$ (2.83 AC-FT) = 1.42 AC-FT = 61,855 FT^3

Q_{AVG} = (61,855 FT^3/24 HRS) x (1 HR/3600 SEC) = 0.72 CFS

5) V-NOTCH SIZING

The v-notch size will actually be determined through a trial-and-error process in the AdICPR drainage program, but in order to determine a "starting" point, the following calculations are performed:

V-NOTCH EQUATION → $Q = CH^{5/2} \tan(\theta/2)$

Rearranging...

$\theta = 2\tan^{-1}[(0.492 \times Q)/H^{2.5}]$

WHERE, θ = Angle of V-notch (degrees)

Q = Flow (cfs)= 0.72 cfs

H = (h1 + h2)/2,
Where h1 = 24.75 – 23.75 = 1.00 ft
and h2 = ½ h1 = ½ (1.00) = 0.50 ft
So H = (1.00 + 0.50) / 2 = 0.75 ft

Solving...
$\theta = 2\tan^{-1}[(0.492 \times Q)/H^{2.5}] = 2 \times \tan^{-1}[(0.492 \times 0.72)/(0.75)^{2.5}] = 72°$
Therefore, in ADICPR, start with an initial v-notch angle of 65°.

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB #_____SHEET #____ OF ___ PROJECT NAME: SUBJECT: CALCULATED BY:_____ DATE: CHECKED BY:_____ DATE:

★ **Since ½ of the treatment volume (61,855 FT^3) must be recovered between 24 to 30 hours, through trial and error, *A FINAL V-NOTCH ANGLE OF 65°* is used in order to achieve *A RECOVERY TIME OF 24.51 HOURS*. (See attached AdICPR treatment recovery output).**

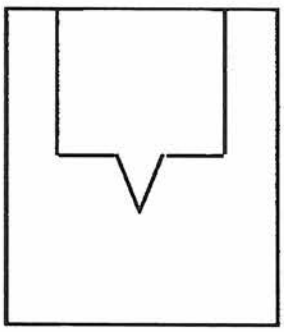
6) CHECK MEAN DEPTH OF POND

The mean depth of the permanent pool must be between 2 and 8 feet.

Mean Depth (MD) = PPV/Ap

Where PPV = Permanent Pool Volume below NCL elevation = 22.64 ac-ft
Ap = Area of pond @ NCL = 2.82 ac

MD = 22.64 ac-ft /2.82 = 8.00 **ft, which is consistent with the mean depth criteria.**



WEIR EL: 24.75

NCL EL: 23.75

7) RECOVERY ANALYSIS

Pond 1 has a seasonal high ground water table of 23.75' NAVD. During the first 25 year 96 hour storm event Pond 1 peak stage is 25.83' NAVD. The pond recovers to depth of 23.89' NAVD in fourteen days. The pond does not completely recover within 14 days; therefore a second 25 year 96 hour storm event was added to Pond 1 with setting the normal control elevation of the pond at 23.89' NAVD. With the second 25 year 96 hour storm added to the pond, the pond's peak stage is 25.85' NAVD. The second storm event peak stage is still lower than the berm elevation at 26.00' ND. Pond 1 is capable of treating and storing the second storm event volume without flooding on-site or off-site property.

METRIC ENGINEERING, INC.
ENGINEERS, PLANNERS, SURVEYORS

JOB #: _____ SHEET ____ OF ____
PROJECT NAME: _____
SUBJECT: _____
CALCULATED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____

POND 1-A (BASIN 1)

1) WATER QUALITY CALCULATIONS

- TOTAL BASIN AREA = 15.67 AC
- PAVED AREA = 6.74 AC

A) 1" over total basin area = 1.30 ac-ft
B) 2.5" over impervious area = 1.44 ac-ft ← GOVERNS

∴ ***Treatment volume required = 1.44 ac-ft.***

2) TREATMENT VOLUME PROVIDED

Entering 1.44 ac-ft into the stage storage output the water quality elevation required for this project s 24.75 ft.
Per enclosed stage-storage computer output (FDOT program DTBSINGR.EXE):

STAGE EL. (FT)	STORAGE (AC-FT)
23.75(NCL EL)	9.76
24.75(WEIR EL)	11.27

∴ ***Treatment volume provided = 1.51 ac-ft***

3) CALCULATE MINIMUM PERMANENT POOL VOLUME THAT WILL PROVIDE REQUIRED RESIDENCE TIME.

Since the non-littoral zone option is being utilized, the permanent pool must be sized to provide a residence time of at least 21 days (i.e. 14 days plus an additional 50%) during the wet season (June to October).

$$PPV = \frac{(DA)(C)(R)(RT)}{(WS)(CF)}$$

DA = 15.97 ac
WS = 153 days
R = 30 inches (per Figure 29-1)
RT = 21 days
C = [(0.3)(7.41) + (0.95)(6.74) + (1)(1.52)]/15.67 = 0.65

PPV = [(15.67 ac)(0.65(30 in)(21 days)]/ [(153 days)(12 in/ft)] = **3.5 ac-ft**

The pond volume below elevation 23.75 feet (NCL) is **9.76 ac-ft**. Therefore, adequate storage is provided to satisfy the permanent pool criteria.

4) BLEED DOWN VOLUME

Recover ½ treatment volume provided in 24 to 30 hours...

$\frac{1}{2} V_{PROVIDED} = \frac{1}{2}$ (1.44 AC-FT) = 0.72 AC-FT = 31,363 FT^3

Q_{AVG} = (31,363 FT^3/24 HRS) x (1 HR/3600 SEC) = 0.36 CFS

5) V-NOTCH SIZING

The v-notch size will actually be determined through a trial-and-error process in the AdICPR drainage program, but in order to determine a "starting" point, the following calculations are performed:

V-NOTCH EQUATION → $Q = CH^{5/2} \tan(\theta/2)$

Rearranging...

$\theta = 2\tan^{-1}[(0.492 \times Q)/H^{2.5}]$

WHERE, θ = Angle of V-notch (degrees)

Q = Flow (cfs)= 0.36 cfs (Total discharge through S-114 & S-115)
Q = Flow (cfs)= 0.18 cfs (Discharge through one structure)
H = (h1 + h2)/2,
where h1 = 24.75 – 23.75 = 1.00 ft
and h2 = ½ h1 = ½ (1.00) = 0.50 ft
So H = (1.00 + 0.50)/ 2 = 0.75 ft

Solving...

$\theta = 2\tan^{-1}[(0.492 \times Q)/H^{2.5}] = 2 \times \tan^{-1}[(0.492 \times 0.18)/(0.75)^{2.5}] = 21°$
Therefore, in ADICPR, start with an initial v-notch angle of 20°

METRIC ENGINEERING, INC. ENGINEERS, PLANNERS, SURVEYORS	JOB #_____ SHEET #____ OF ___ PROJECT NAME:_____ SUBJECT:_____ CALCULATED BY:_____ DATE:_____ CHECKED BY: DATE:

★ **Since ½ of the treatment volume (31,363ft^3) must be recovered between 24 to 30 hours, through trial and error, *A FINAL V-NOTCH ANGLE OF 20°* is used in both structure S-114 and S-115 in order to achieve *A RECOVERY TIME OF 21.01 HOURS*. (See attached AdICPR treatment recovery output).**

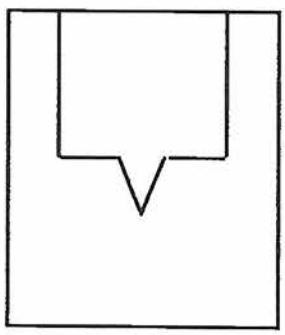
6) CHECK MEAN DEPTH OF POND

The mean depth of the permanent pool must be between 2 and 8 feet.

Mean Depth (MD) = PPV/Ap

Where PPV = Permanent Pool Volume below NCL elevation = 9.79 ac-ft
Ap = Area of pond @ NCL = 1.41 ac

MD = 9.79 ac-ft / 1.41 = **6.92 ft, which is consistent with the mean depth criteria.**

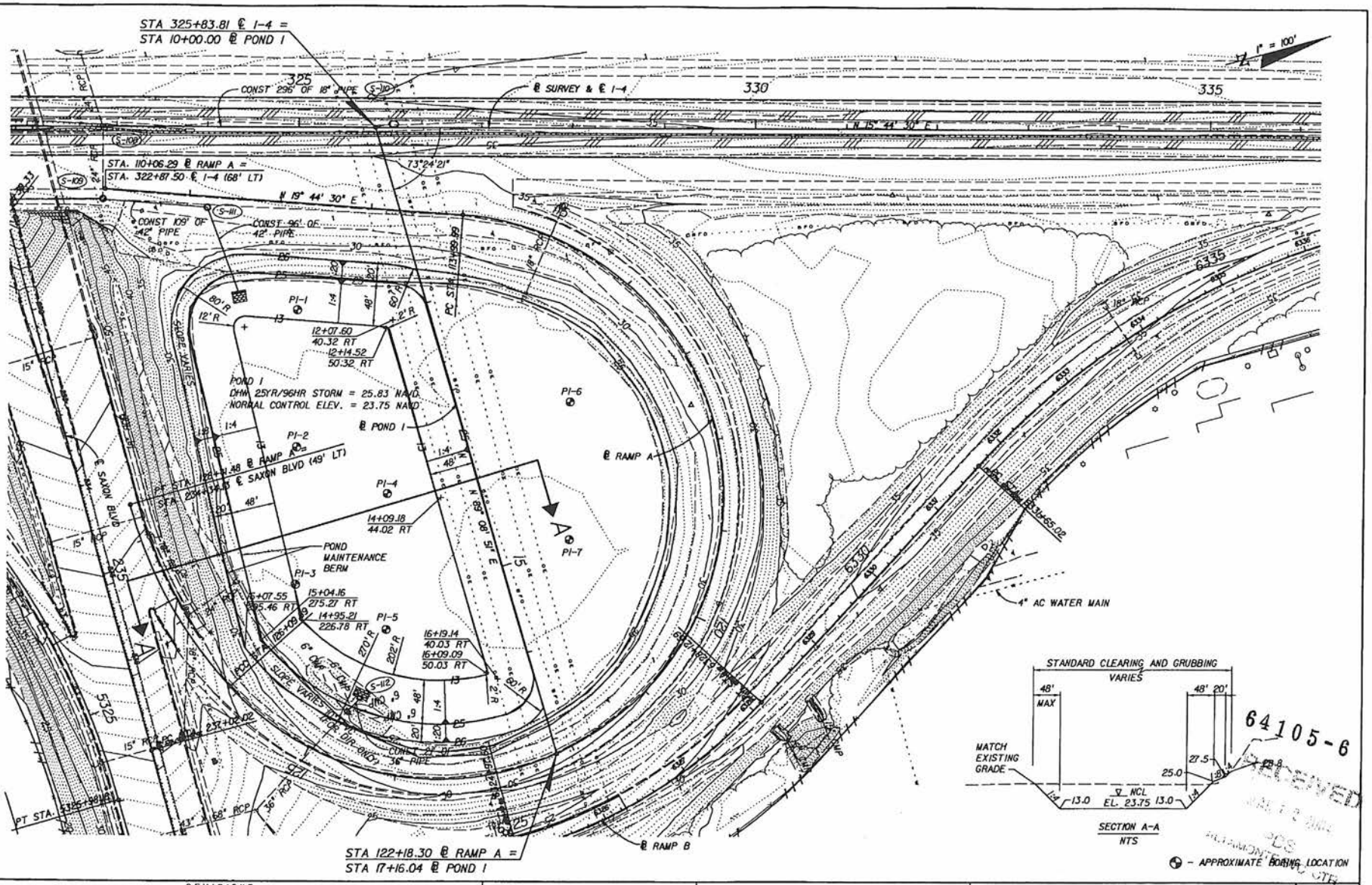


WEIR EL: 24.75

NCL EL: 23.75

7) RECOVERY ANALYSIS

Pond 1-A has a seasonal high ground water table of 23.75' NAVD. During the first 25 year 96 hour storm event Pond 1-A peak stage is 25.55' NAVD. The pond recovers to depth of 23.89' NAVD in fourteen days. The pond does not completely recover within 14 days; therefore a second 25 year 96 hour storm event was added to Pond 1 with setting the normal control elevation of the pond at 23.89' NAVD. With the second 25 year 96 hour storm added to the pond, the pond's peak stage is 25.56' NAVD. The second storm event peak stage is still lower than the berm elevation at 26.00' ND. Pond 1-A is capable of treating and storing the second storm event volume without flooding on-site or off-site property.



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RETARC01.DGN

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METRIC ENGINEERING, INC.
2269 LEE ROAD - SUITE 200
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FLORIDA CERT. NO. EB-0002294

• ENGINEERS
• PLANNERS
• SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-52-01

POND NO. 1 DETAIL

SHEET NO. 83

64105-6

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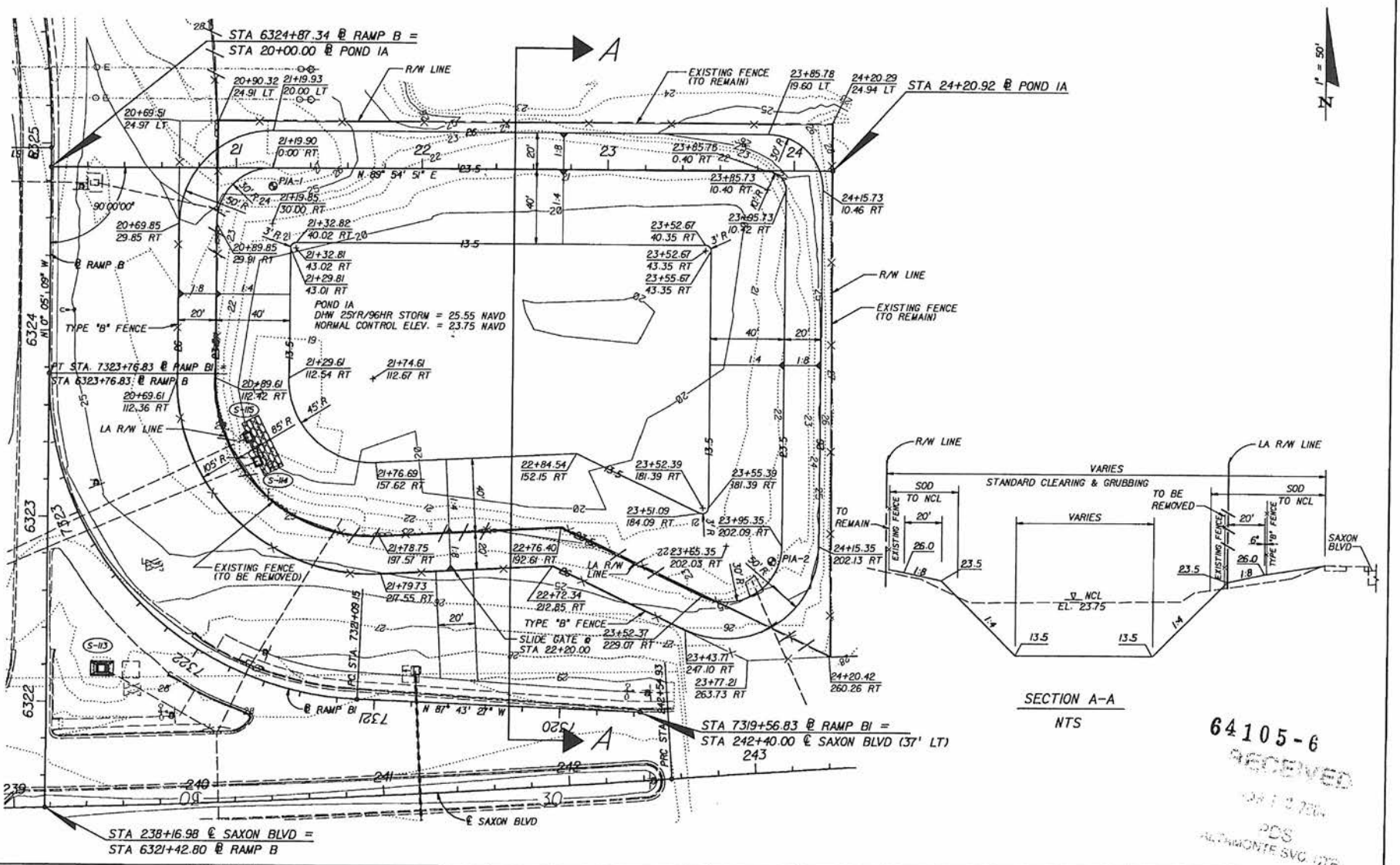
DCS
ALAMONTE SITE

E64



64105-6

RECEIVED
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DCS
ALTAMONTE SVC CTR

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

RETAIO1A.DGN

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• SURVEYORS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
400	VOLUSIA	242716-1-52-01

POND NO. 1A DETAIL

SHEET NO. 84

Permit No. 22931-1

I-4/Saxon Boulevard Interchange

RAI #2

PREVIOUS SUBMITTALS

Predevelopment conditions included no treatment for stormwater runoff from existing impervious areas. As shown in previous submittals, the post development condition included treatment of the majority of impervious area in the basin as follows:

	Pre-Dev.	Post-Dev.	Difference
Impervious Area (Ac)	32.1	50.7	18.6
Amount Treated (Ac)	0	34.4	34.4

CURRENT SUBMITTALS

In response to SJRWMD's comment, ditch checks have been added to the contract documents as follows:

#	Location	# of Ditch Checks	Basin Area Served*
1	I-4 EB & Ramp B	2	3.1 Ac.
2	I-4 WB & Ramp G	9	11.1 Ac.
3	Ramp E	3	0.5 Ac.
4	I-4 WB & Ramp E	7	6.0 Ac.
5	I-4 EB	5	4.9 Ac.
6	I-4 EB & Ramp C	4	7.9 Ac.
7	Ramp F & C-D Road	3	3.6 Ac.
	Total	33	37.1 Ac.

* There are 153 acres in the project basin area.

JH14-008

Pre- and Post Development Impervious Areas

The pre- and post-development conditions for impervious area runoff treatment within the basins that ditch checks have been added is now improved. An additional 11.4 acres of impervious area is receiving improved treatment through utilization of ditch checks. Overall, the project now provides for the following pre-and post development conditions for treatment of stormwater runoff from impervious areas:

	Pre-Dev.	Post-Dev.	Difference
Impervious Area (Ac)	32.1	50.7	18.6
Amount Treated (Ac)	0	45.8	45.8

With reference to the Preapplication Meeting Memorandum dated January 23, 1990, we note that 90.3% of the impervious areas (both existing and proposed) in the total project area is now being treated. Of the approximately 10% remaining, only 1.4 acres of new impervious areas (or 3% of the impervious area in the total project area) discharges directly into Class III waters.

Ditch check references on the Plans include the Supplementary Interchange Drainage Map (Sheet 4) and the respective Cross Sections where they are shown. Also, attached is a Supplemental Sheet 4 illustrating the basin areas tributary to ditch check locations. The swale treatment parameters show that at least one (1") inch of runoff from impervious areas is treated in swales, as follows:

Ditch Check/ Basin Area Location #	Treatment Depth in Swales (ft.)	Tributary Imp. Areas to Swales (sq. ft.)	Treatment Volumes (cu. ft.)	Impervious Area Runoff Treated (in.)
1	0.7	55,180	5,692	1.24
2	0.9	129,470	20,242	1.88
3	0.4	7,350	883	1.44
4	1.2	158,653	23,406	1.77
5	1.1	59,350	8,967	1.81
6	0.4	49,950	14,317	3.44
7	0.4	38,500	4,675	1.46

Summary of Water Management Facilities

Treatment is provided in the post development condition by incorporating Best Management Practices and by means of the following water management facilities (WMF):

WMF	Treatment Volume Provided* (Ac Ft)
Pond A	2.36
Pond B	1.99
Pond F	2.60
Swales	1.51
Total	8.46

* Treatment Volume Required for The Project = 6.39 Ac Ft

We note that, per SCS Soil Survey for Volusia County, permeability rates can be considered to be 20 inches per hour. Therefore, in support of water quality treatment provided by ditch checks, the following is a summary of drawdown times (with a factor of safety of 2) for basin areas served by ditch checks:

Ditch Checks Location #	Drawdown Time (in hours)
1	0.80
2	1.11
3	0.46
4	0.67
5	1.29
6	0.50
7	0.50

RAI #3

With reference to the Location Hydraulics Report (dated September 1990) previously submitted, we note that the floodplain encroachment calculations (Pages 64 through 89) show that compensating storage requirements are met or exceeded. The calculations reference the following sheets which are included in the Plan Sets attached to this package:

INTERSTATE 4 / SAXON BOULEVARD INTERCHANGE

TABLE 1
"SUMMARY OF REQUIRED POST-DEVELOPMENT RETENTION VOLUMES"

POND I.D.	BASIN I.D.	BASIN AREA (ac)	TOTAL IMPERVIOUS AREA (ac)	PAVEMENT AREA[2] (ac)	RETENTION VOLUMES[3] 1/2" OF RUNOFF (ac-ft)	1" x IMP. AREA (ac-ft)	REQ'D RET. VOLUME (ac-ft)	PROV'D RET. VOLUME (ac-ft)
F	1	34.76	7.34	7.24	1.45	0.61	1.45	1.63
D[1]	2	22.86	11.04	9.20	0.93	0.92	0.93	--
A	3	35.53	9.40	9.40	1.48	0.78	1.48	2.36
B	4	60.13	22.89	7.41	2.51	1.91	2.51	1.99
TOTALS		153.28	50.67	33.25	6.37	4.22	6.37	5.98

NOTES:

1 -- Pond D is a wetland mitigation / 100-year floodplain compensation area.

2 -- The increase in pavement area from pre-development condition equates to :
= {[(33.25 ac) - (14.52 ac)] / (14.52 ac)} * 100%
= 129 %

3 -- Required retention volumes are based on the worst case of treating 1 inch of rainfall over the entire basin area (Runoff from this first inch of rainfall is approx. 0.5 inches).

HNTB/
3-5-91

E30

Michael D. Sims & Associates, Inc.
Consulting Engineers in the Earth Sciences, Geotechnology, Hydrogeology and Construction Materials Testing

(407) 297-0292
Fax (407) 297-0075

May 30, 1990

Howard, Needles, Tammen and
Bergendoff Engineers & Planners
5900 Lake Ellenor Drive
Orlando, Florida 32809

Attention: Mr. Kevin Perko

Subject: INCREMENTAL SEEPAGE ANALYSIS, PROPOSED VERTICAL VOLUME RECOVERY STRUCTURES, PROPOSED RETENTION PONDS A, B, AND F, I-4/SAXON BOULEVARD INTERCHANGE, VOLUSIA COUNTY, FLORIDA (PN 86-046.7)

Dear Mr. Perko:

As requested, we have performed seepage analyses for the proposed Ponds A, B and F at the subject site. The following report presents the results of our evaluations and conclusions.

PROJECT DESCRIPTION

Our scope of services for this project included performing engineering evaluations for determining the number of Vertical Volume Recovery Structures (VVRS) required in each of the subject ponds that would result in stormwater volume recovery within 72 hours (3 days) or less (with a minimum factor of safety of 2.0). The following report presents our evaluations and design of the Vertical Volume Recovery Structures.

The stormwater runoff, routing, retention and detention volume analysis and design of the overflow structures were conducted by Howard, Needles, Tammen and Bergendoff Engineers & Planners (HNTB). Michael D. Sims & Associates, Inc., was provided with the stage-storage data, required retention volumes and tailwater elevations for input to our analysis. This information is summarized below:

RETENTION AREA DESCRIPTION	POND BOTTOM ELEVATION (feet)	OUTFALL WEIR ELEVATION (feet)	TAILWATER ELEVATION (feet)	RETENTION VOLUME (cu. ft.)
POND A	+25	+25.5	+22	102,783
POND B	+21	+22	+18	86,606
POND F	+35	+35.6	+32	71,007

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by KSP	Date 2-9-90	Job Number 11326-21-02
For	Checked by JEM	Date 6-7-90	Sheet Number 17R
	Backchecked by	Date	

WATER QUALITY TREATMENT

	Basin	Impervious Area, Ac
Pre-Development	A	5.65
	B	1.43
	C	1.25
	D	11.11
	E	1.43
	F	11.21
		32.08 Ac

Total Basin Area = 153.28 Ac

Post-Development	1	7.34
	2	11.04
	3	9.40
	4	22.89
		50.67 Ac

Total Basin Area = 153.28 Ac

Required Treatment

½" over total area: $V_R = (\frac{1}{2}\text{ in})(1\text{ ft}/12\text{ in})(153.28\text{ Ac}) = 6.39\text{ AF}$

1" over total impervious area: $V_R = (1\text{ in})(1\text{ ft}/12\text{ in})(50.67\text{ Ac}) = 4.22\text{ AF}$

Provided Treatment

Pond	Treatment Vol. (AF)	@ Elev.
A	2.36	25.5
B	1.99	22.0
F	1.63	35.6
	5.98	

∴ Total Tmt. Volume equates to 0.47" over total area. or 1.42" over total impervious area.

ME101-0488(REV)

Job Desc: I-4/Saxon Blvd. Interchange
Job No: 11326-21-02

Made By: KSP
Date: 11-03-89
CHECKED BY: JEM 1-8-90

IMPERVIOUS CALCULATIONS
BASIN 1 (Post-Dev.)

A: It (Impervious Area)

No.	Land Use	Area(Ac)	%It	Area, It (Ac)
1	Roadway - Pavement	7.24 ✓	100	7.24
2	Residential - ⅓ Ac. Lots	0.33 ✓	30	0.10
3	Open Space	17.88 ✓	0	0
4	Woods	9.31 ✓	0	0
	TOTALS	34.76 (2)		7.34 (1)

% Total Imp. = (1)/(2) = 21 11 ✓

B: DCIA (Directly Connected Impervious Area)

No.	Land Use	Area(Ac)	%DCIA	Area, DCIA (Ac)
1	Roadway - Pavement	7.24	22.24 ✓	1.61 ✓
2	Residential - ⅓ Ac. Lots	0.33	0	0
3	Open Space	17.88	0	0
4	Woods	9.31	0	0
	TOTALS	34.76 (4)		1.61 (3)

% DCIA = (3)/(4) = 4.63 ✓

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by KSP	Date 12-29-89	Job Number 11326-21-02
For	Checked by JEM	Date 1-8-90	Sheet Number 65R
	Backchecked by KAC	Date 2/5/90	

Pond "F"

Elev	Area (ft²)	ΔVol (AF)	ΣVol (AF)
35	116,712 ✓		0.000 ✓
		1.630 ✓	
35.6	119,978 ✓		1.630 ✓
		1.112 ✓	
36	122,156 ✓		2.742 ✓
		1.418 ✓	
36.5	124,878 ✓		4.160 ✓
		1.449 ✓	
37	127,599 ✓		5.609 ✓
		1.480 ✓	
37.5	130,321 ✓		7.089 ✓
		1.511 ✓	
38	133,043 ✓		8.600 ✓
		1.543 ✓	
38.5	135,765 ✓		10.143 ✓
		1.574 ✓	
39	138,487 ✓		11.717 ✓

Weir Elev. = 36.0 Treatment Vol = 2.74 AF

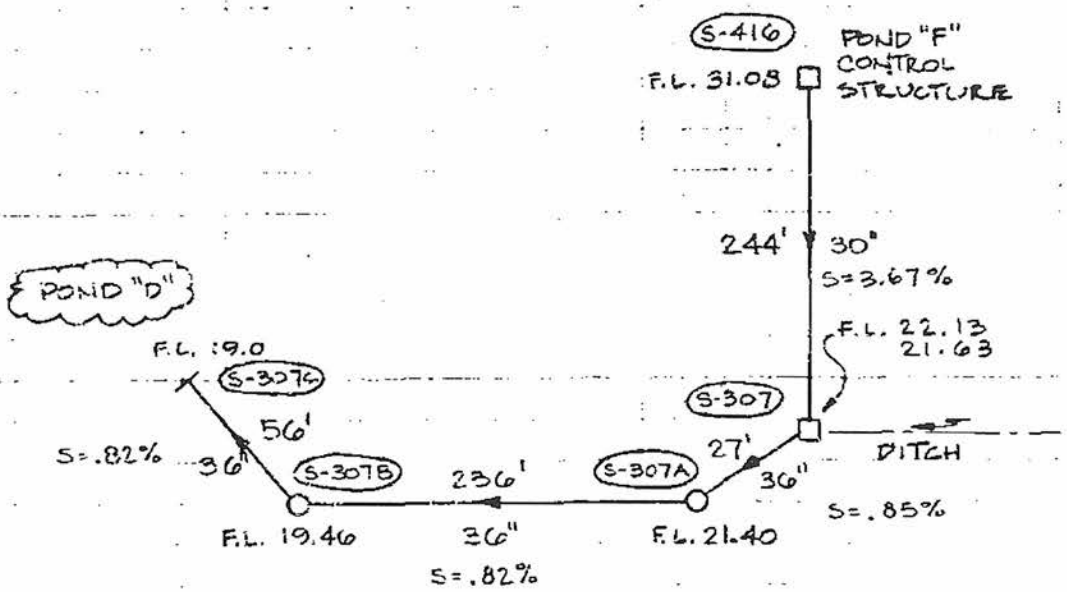
DHW_{10} = 36.77

DHW_{25} = 37.08

$DHW_{\frac{25}{96}}$ = 37.76 (25 yr, 96 hr)

ME101-0488(REV)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by	Date	Job Number
	Checked by	Date	
For	Backchecked by	Date	Sheet Number 69



ME101-0488(REV)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by KSP	Date 12-29-89	Job Number 11326-21-02
For	Checked by JEM	Date 1-6-90	Sheet Number 114
	Backchecked by KAC	Date 2/5/90	

Discharge - Storage Values

for Flood Routing

Basin 1 - Pond "F"

Outlet Structure - Type "D" Inlet w/6' weir @ 36.0
30" ø RCP

Static Water El. - N/A (Normally Dry)

Elev (ft)	Discharge - cfs	Storage - AF
35.0	0	0.000
35.6	0	1.630
36.0	0	2.742
36.5	6.42	4.160
37.0	17.53	5.609
37.5	31.05	7.089
38.0	56.84	8.600
38.5	62.41	10.143
39.0	63.33	11.717

ME1C1-0486(REV)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by KSP	Date 12-28-90	Job Number 11326-21-02
For	Checked by JEM	Date 2-13-90	Sheet Number 140
	Backchecked by	Date	

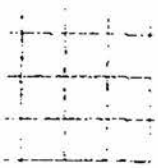
Pond "D"

Elev.	Area (ft^2)	ΔVol (AF)	ΣVol (AF)
20	140,188		0
		1.643	
20.5	146,006		1.643
		1.709	
21.0	151,825		3.352
		1.751	
21.5	153,280		5.103
		1.768	
22.0	154,735		6.871

Triangular Area between Ramps "D" and "E"

Elev	Area (ft^2)	ΔVol (AF)	ΣVol (AF)
20	41,050		0
		0.479	
20.5	42,398		0.479
		0.494	
21.0	43,746		0.973
		0.504	
21.5	44,083		1.477
		0.508	
22.0	44,420		1.985

DHW_{25} = 20.63



ME101-04RR(REV)

Job Desc: I-4/Saxon Blvd. Interchange
Job No: 11326-21-02

Made By: KSP
Date: 11-03-89
CHECKED BY: JEM 1-16-90

IMPERVIOUS CALCULATIONS
BASIN 2 (Post-Dev)

A: It (Impervious Area)

No.	Land Use	Area(Ac)	%It	Area, It (Ac)
1	Roadway - Pavement	9.20	100	9.20
2	Open Space	9.72	0	0
3	Woods	0.50 ✓	0	0
4	Open Water	1.84	100	1.84
5	Mitigation Area	1.60	0	0
	TOTALS	22.86 (2) ✓		11.04 ✓ (1)

% Total Imp. = (1)/(2) = 48.29 % ✓

B: DCIA (Directly Connected Impervious Area)

No.	Land Use	Area(Ac)	%DCIA	Area, DCIA (Ac)
1	Roadway - Pavement	9.20	17.93 ✓	1.65
2	Open Space	9.72	0	0
3	Woods	0.50	0	0
4	Open Water	1.84	100 ✓	1.84
5	Mitigation Area	1.60	0	0
	TOTALS	22.86 (4) ✓		3.49 ✓ (3)

% DCIA = (3)/(4) = 15.27 % ✓

Worksheet 2: Runoff curve number and runoff

Project I-4/Saxon Blvd Interchange By KSP Date 11-03-89

Location Volusia County Checked JEM Date 1-16-90

Circle one: Present (Developed) Basin 2

1. Runoff curve number (CN)

(Pervious & NDCIA)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
	Pavement	98			7.55	739.90
#37-Orsino #42-Paola "A"	Open Space - Fair Cond.	49			1.70	83.30
#37-Orsino #42-Paola "A"	Open Space - Good Cond.	39			4.82	187.98
#33-Myakka "D"	Open Space - Fair Cond.	84			0.52	43.68
#33-Myakka "D"	Open Space - Good Cond.	80			1.32	105.60
#17-Daytona "B"	Open Space - Good Cond.	61			1.36	82.96
#42-Poola "A"	Woods - Fair Cond.	36			0.20	7.20
				Totals =		

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = ——— = ———; Use CN = ☐

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr			
Rainfall, P (24-hour) ..... in			
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)			

Job Desc: I-4/Saxon Blvd. Interchange
Job No: 11326-21-02

Made By: KSP
Date: 11-03-89
Checked: JEM 1-5-90

IMPERVIOUS CALCULATIONS
BASIN 3 (Post-Dev.)

A: It (Impervious Area)

No.	Land Use	Area(Ac)	%It	Area, It (Ac)
1	Roadway - Pavement	9.40	100	9.40
2	Open Space	21.09	0	0
3	Woods	5.04	0	0
	TOTALS	35.53 (2)		9.40 (1)

% Total Imp. = (1)/(2) = 26.46 % ✓

B: DCIA (Directly Connected Impervious Area)

No.	Land Use	Area(Ac)	%DCIA	Area, DCIA (Ac)
1	Roadway - Pavement	9.40	21.81 ✓	2.05
2	Open Space	21.09	0	0
3	Woods	5.04	0	0
	TOTALS	35.53 (4)		2.05 (3)

% DCIA = (3)/(4) = 5.77 % ✓

Worksheet 2: Runoff curve number and runoff

Project I-4/Saxon Blvd. Interchange By KSP Date 11-03-89

Location Volusia County Checked JEM Date 1-5-90

Circle one: Present (Developed) Basin 3

1. Runoff curve number (CN)

(Pervious & NDCIA)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ■ acres □ mi² □ *	Product of CN x area
	Pavement	98			7.35	720.30
#42-Paola "A"	Open Space - Fair Cond.	49			1.89	92.61
#37-Orsino #42-Paola "A"	Open Space - Good Cond.	39			17.48	681.72
#42-Paola "A"	Woods - Fair Cond.	36			5.04	181.44
#33 Myakka "D"	Open Space - Good Cond.	80			1.72	137.60
					Totals =	33.48 / 1813.67

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1813.67}{33.48} = 54.17$; Use CN = 54 ✓

2. Runoff

$S = \frac{1000}{54.17} - 10 = 8.46"$ ✓

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25		
Rainfall, P (96-hour) ..... in	11.70		
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	5.42 ✓		

17.12 AF Total Runoff (includes DCIA)

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF For	Made by KSP	Date 12-19-89	Job Number 11326-21-02
	Checked by JEM	Date 1-5-90	
	Backchecked by KAC	Date 2/8/90	Sheet Number 170

Elevation - Volume

Pond "A"

Elev (ft)	Area (ft²)	ΔVol (AF)	Σ Vol (AF)
25	203,800 ✓		0.000
		2.359	
25.5	207,331 ✓		2.359
		2.400	
26	210,863 ✓		4.759
		4.922	
27	217,925 ✓		9.681
		5.230	
28	237,750 ✓		14.911

Weir Elevation = 25.5

DHW_{10} = 26.04

DHW_{25} = 26.29

ME101-0488(REV)

Job Desc: I-4/Saxon Blvd. Interchange
Job No: 11326-21-02

Made By: KSP
Date: 11-03-89
CHECKED BY: JEM 1-5-90

IMPERVIOUS CALCULATIONS
BASIN 4 (Post-Dev)

A: It (Impervious Area)

No.	Land Use	Area(Ac)	%It	Area, It (Ac)
1	Roadway - Pavement	7.41 ✓	100	7.41
2	Residential-¼ Ac. Lots	20.19 ✓	38	7.67
3	Residential-⅓ Ac. Lots	16.50 ✓	30	4.95
4	Open Space	5.08	0	0
5	Woods	7.59	0	0
6	Commercial	3.36 ✓	85	2.86
	TOTALS	60.13 (2)		22.89 (1)

% Total Imp. = (1)/(2) = 38.07% ✓

B: DCIA (Directly Connected Impervious Area)

No.	Land Use	Area(Ac)	%DCIA	Area, DCIA (Ac)
1	Roadway - Pavement	7.41	86.37	6.40
2	Residential - ¼ Ac. Lots	20.19	0	0
3	Residential - ⅓ Ac. Lots	16.50	0	0
4	Open Space	5.08	0	0
5	Woods	7.59	0	0
6	Commercial	3.36	50	1.68
	TOTALS	60.13 (4)		8.08 (3)

% DCIA = (3)/(4) = 13.44% ✓

Worksheet 2: Runoff curve number and runoff

Project I-4/Saxon Blvd. Interchange By KSP Date 11-03-89

Location Volusia County Checked JEM Date 1-8-90

Circle one: Present (Developed) Basin 4

1. Runoff curve number (CN)

(Pervious & NDCIA)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
	Pavement	98			1.01	98.98
#42 - Paola "A"	Residential - 1/4 Ac. Lots	61			20.19	1231.59
#1 - Apopka #42 - Paola "A"	Residential - 1/3 Ac. Lots	57			16.50	940.50
#1 - Apopka #37 - Orsino "A" #42 - Paola	Open Space - Fair Cond.	49			2.92	143.08
#37 - Orsino #42 - Paola "A"	Open Space - Good Cond.	39			0.76	29.64
#33 - Myakka "D"	Open Space - Good Cond.	80			1.40	112.00
#37 - Orsino #42 - Paola "A"	Woods - Fair Cond	79			7.59	599.61
				Totals =		

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}}$ = ——— = _____; Use CN = ☐

2. Runoff

	Storm #1	Storm #2	Storm #3
Frequency ..... yr			
Rainfall, P (24-hour) ..... in			
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)			

Worksheet 2: Runoff curve number and runoff

Project _____ By KSP Date 11-03-89

Location _____ Checked JEM Date 1-8-90

Circle one: Present Developed Basin 4 (Cont'd.)

1. Runoff curve number (CN) (Pervious & NDCIA)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☒ acres ☐ mi² ☐ %	Product of CN x area
#37-Orsino #42-Paola "A"	Commercial	89			1.57	139.73
#33-Myakka "D"	Commercial	95			0.11	10.45
1/ Use only one CN source per line.				Totals =	52.05 ✓	3305.58 ✓

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{3305.58}{52.05} = 63.51$ ✓ Use CN = 64 ✓

2. Runoff $S = \frac{1000}{63.77} - 10 = 5.68"$

	Storm #1	Storm #2	Storm #3
Frequency ..... yr			
Rainfall, P (24-hour) ..... in			
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)			

HNTB HOWARD NEEDLES TAMMEN & BERGENDOFF	Made by KSP	Date 12-11-89	Job Number 11326-21-02
For	Checked by JEM	Date 1-5-90	Sheet Number 182
	Backchecked by KAC	Date 2/9/90	

Elevation - Volume

Pond "B"

Elev	Area (ft^2)	ΔVol (AF)	ΣVol (AF)
21	84225 ✓		0.000 ✓
		1.988 ✓	
22	88988		1.988 ✓
		2.097	
23	93750		4.085 ✓
		2.207 ✓	
24	98513 ✓		6.292 ✓

Treatment Vol = 1.988 AF @ El. 22.0

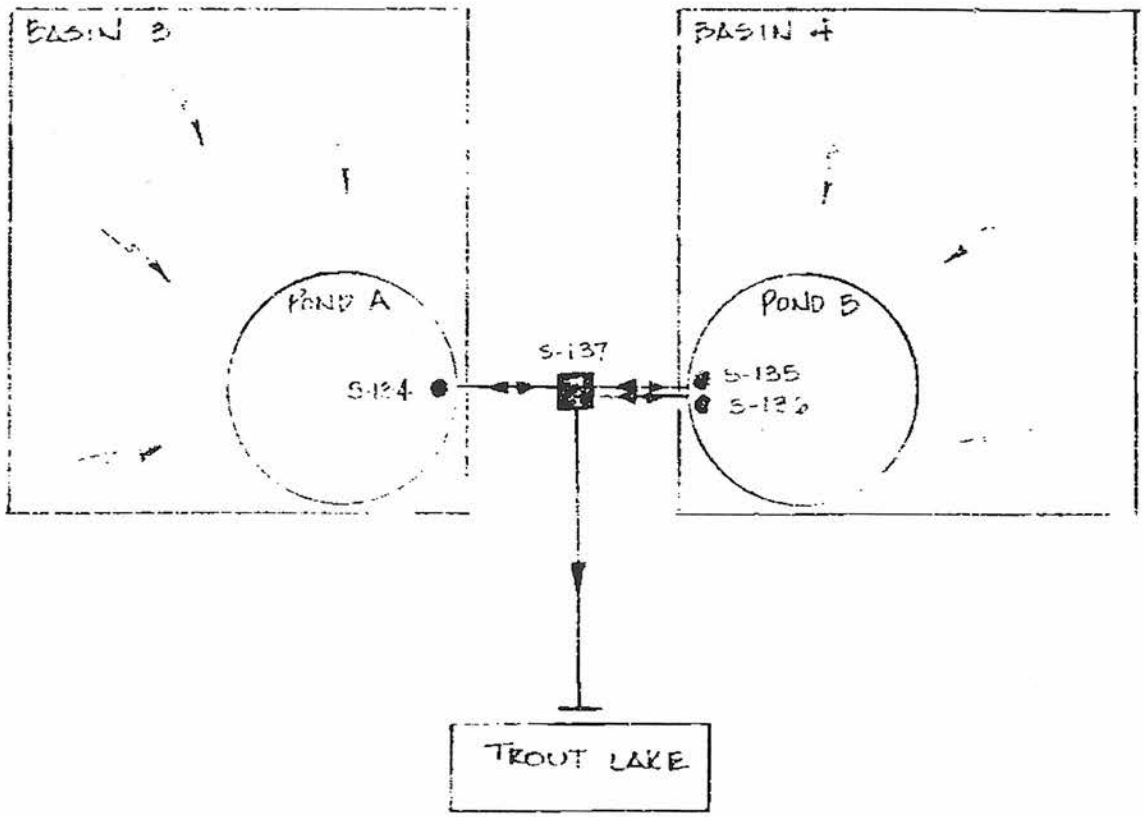
DHW_{10} = 22.87 (24 hr. duration)
DHW_{25} = 23.16 (24 hr. duration)

NE1(1-0488(REV)

10 yr-24 hr.
P = 7.4"

Node	#	Name	Type	Inflow	Outflow	Stage	Storage
1		POND B	POND	90.620	87.440	22.874	6.377
2		POND A	POND	33.844	3.645	26.043	4.971
3		BASIN 4	SUBAREA	90.620	90.620	20.000	0.000
4		BASIN 3	SUBAREA	33.844	33.844	20.000	0.000
5		S-135	JUNCTION	43.720	43.707	22.905	0.275
6		S-136	JUNCTION	43.720	43.707	22.905	0.275
7		S-134	JUNCTION	3.645	3.571	23.111	0.245
8		S-137	JUNCTION	87.738	87.734	23.078	0.002
9		TROUT LAKE	OUTFALL	87.734	16.848	23.200	16.615

(Page 1 of 1)



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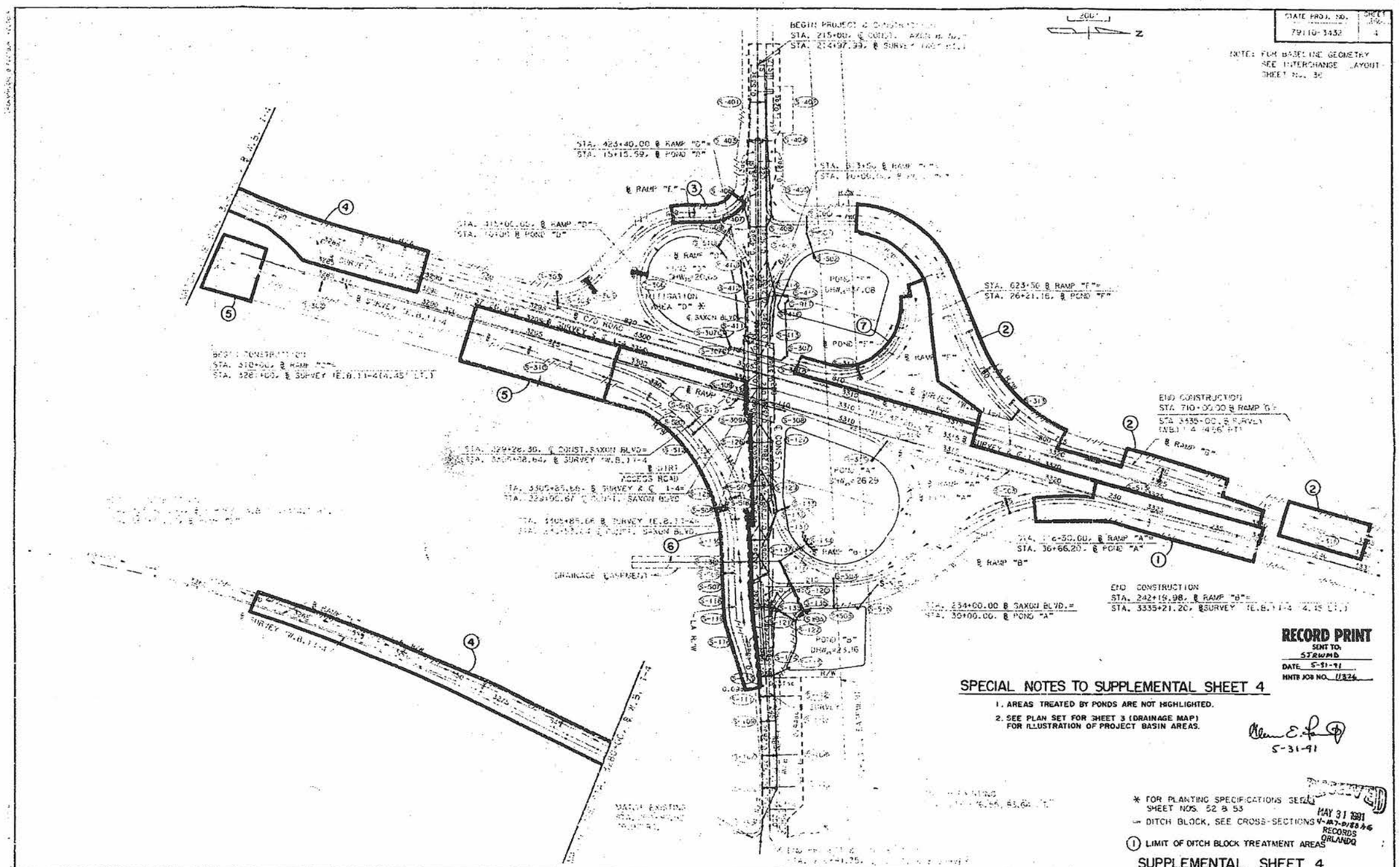

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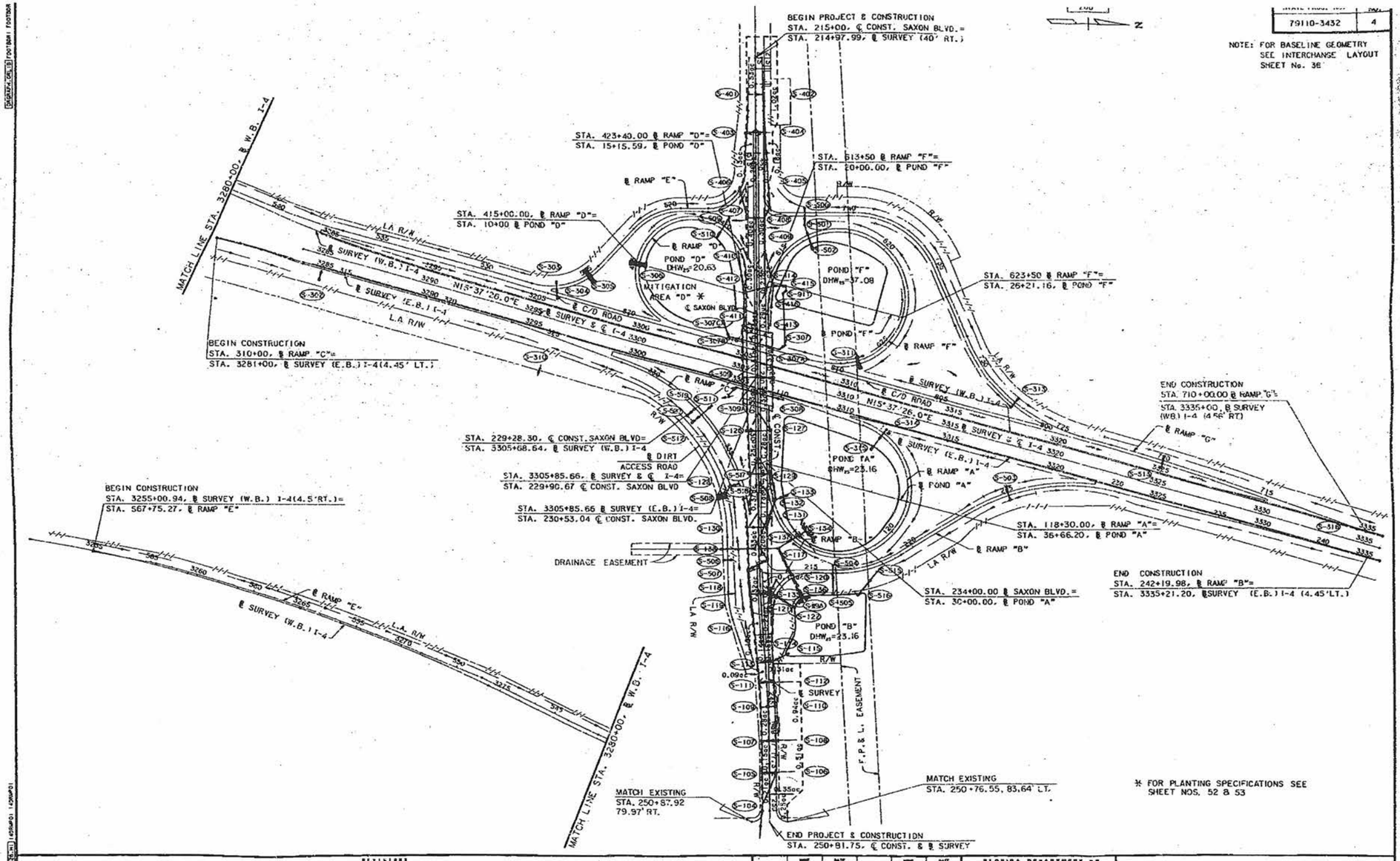
NOTE: FOR BASELINE GEOMETRY SEE INTERCHANGE LAYOUT SHEET No. 38



REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

	NAME	DATE		NAME	DATE
DESIGNED BY	KSP	5-90	DRAWN BY	PRS	5-90
CHECKED BY	YMM	5-90	CHECKED BY	KSP	5-90
SUPERVISED BY KAC					

FLORIDA DEPARTMENT OF TRANSPORTATION
APPROVED BY
DATE

SUPPLEMENTARY DRAINAGE MAP INTERCHANGE AT I-4 & SAXON BLVD.

0167

Permit No. 76095-1

SR 472 & Howland Boulevard Interchange

The area east of I-4 can be broken into four sub-basins with each individual basin providing storage within a localized low area. The portion of the project that is located within a new alignment provides much of the same topography and drainage characteristics. Field visits during the project design discovered no standing water within the proposed alignment. This is even after much of the heavy rainfall that we had the 97-98 winter. The only water feature, in the vicinity of the project, is located on the east side of I-4 south of the most southern ramp connecting into I-4 (Ramp A).

Soils within the project site consist of Astatula, Tavares, Orsino, and Paola fine sands. All of these soils have well-drained characteristics and are identified as Type A soils by the Soil Conservation Service. Two detailed soil reports are contained in the Environmental Resource Permit (ERP) application of this report. These reports indicate that the highest estimated seasonal water elevation occurs at an elevation of 15 feet below existing grade.

The existing land use on site consists of impervious roadway areas and grassed areas along the existing Interchange. The undeveloped portions of the site consist of a dense pine and palmetto underbrush throughout the proposed alignment. There are no wetlands within the limits of the proposed project. The topography along the alignment ranges from elevation 85 to lows of approximately 45 within some of the isolated low areas. It is not uncommon for there to be a 15-40 foot range in high to low areas within the existing basins. The existing basins have been identified on the drainage map for review purposes.

Proposed Conditions

The project has been divided into four post development basins with stormwater management facilities located within each basin. Each facility has been analyzed, based on soil tests, for the previously referenced storm events to ensure that there will be no offsite impacts or any adverse impacts to the existing systems. This analysis includes a PONDS analysis for the ponds based on specific soil information developed for each pond location. Project and basin areas are included in Table 1, below, for reference.

Table 1 – Project and Basin Areas

Basin	Project Area (w/in ROW), Acres	Offsite Area, Acres	Basin Area, Acres
Basin 1	1.81	0	1.81
Basin 2	1.66	0	1.66
Basin 3	24.26	12.36	36.62
Basin 4	12.62	9.72	22.34
Total	**40.35**	**22.08**	**62.43**

Basin/Ponds 1 & 2

These proposed basins are located on the west side of I-4 and consist primarily of the ramps and mainline in the vicinity of the ramp connections. The ponds are developed between the old ramps and the new ramps by grading the proposed ramps to match existing grades. This creates a "natural" ponding area that will be utilized for stormwater quality and quantity aspects for the project.

The portion of the project west of I-4 utilizes a compensatory methodology to address stormwater management issues. Due to restricted right-of-way requirements in Basins 1 and 2 it will be demonstrated that after the completion of the proposed improvements less roadway area will be left untreated than under existing conditions. Specifically, the untreated impervious area within the project area presently totals 2.55 acres; however, under proposed conditions the untreated area will be reduced to 2.15 acres. The calculations for determining these areas are included on page C-16. This will enhance any offsite discharges from the proposed project, as the proposed treated areas will meet the water quality and quantity requirements for the project.

The proposed retention ponds for Basins 1 and 2 are designed for the 100 year, 24 hour and 25 year, 96 hour storm events. The Post Development Basins section and the PONDS analysis section contain detailed calculations that itemize the proposed areas to ensure that the water quality and quantity requirements are met.

Basin/Pond 3

Basin 3 consists of the area east of I-4 and extends to station 225+00 along SR 472. The pond for this area encompasses an existing low area and a portion of the existing ramp that will be removed after completion of the new interchange. This basin will receive some offsite areas that are adjacent to the roadway and sheet flow into the proposed roadway swales. The proposed pond will be designed to accommodate the 100 year, 24 hour event and the 25 year, 96 hour event without impacting existing facilities or offsite properties. The Post Development Basins contains the post development hydrology and the PONDS analysis section contains the PONDS recovery analysis for the specified storm events.

Basin/Pond 4

This basin starts at station 225+00 and goes to the end of the project including areas associated with the realignment of Howland Blvd. Pond 4 is located to the south of the old Howland Blvd. as previously designed by Volusia County. This pond has been designed to accommodate the 100 year 24 hour and 25 year 96 hour event for the proposed project. There is no outfall from this pond and all water quality and water quantity criteria are provided within this pond. Refer to the Post Development Basins and the PONDS analysis section of the report for hydrology and recovery analysis.

Table 2 - Post Development Hydrology

Basin	Area Acres	CN	Tc Min.
Basin 1	1.81	61	11
Basin 2	1.66	71	11
Basin 3	36.62	50	75
Basin 4	22.34	50	46

Table 3 - Peak Stages

Basin	T.O.B.	100 yr. 24 hr. (ft.)	25 yr. 96 hr. (ft.)
Basin 1	71.0	67.97	67.85
Basin 2	68.0	67.68	67.61
Basin 3	54.0	52.40	55.44
Basin 4	49.0	45.58	48.58

Table 4 - Treatment Volume Recovery

Pond	Water Quality (slug load)		Water Quantity (25yr-96hr)	
	Volume ac-ft	Recovery Time days	Volume ac-ft	Recovery Time days
Pond 1	.15	<0.1	0.77	<14
Pond 2	0.16	<0.1	0.92	<14
Pond 3	1.53	<0.1	10.38	<14
Pond 4	.93	<0.1	6.29	>14, *

* Pond 4 will contain second water quantity volume (6.29 ac-ft) at day 14.

In order to determine peak stages within the proposed pond the PONDS program with the appropriate input data and hydrograph where computed. In order to determine recovery time for the water quality requirement the pond was slug loaded with the appropriate volumes.

The geotechnical information used for the ponds analysis was taken from the actual field tests and borings performed for the project. A summary of this information compared to the values used in the design are presented within table 5.

Table 5 Aquifer Data

Pond	Observed			Design			
	Aquifer Depth (ft)	SHWT (ft)	Hydraulic Conductivity (ft/day)	Aquifer Depth (ft)	SHWT (ft)	Hydraulic Conductivity (ft/day)	
						Horz.	Vert.
Pond 1	45.0	62.5	16.8	45.0	62.5	12.0	6.0
Pond 2	18.5	54.5	N/A	18.5	54.5	12.0	6.0
Pond 3	35.5	45.5	40.0	35.5	45.5	26.0	13.0
Pond 4	39.0	40.50	7.8-29.7	39.0	40.5	15.0	7.8

Basin 3

Approximate Stations: 200+00 to 225+00 & Ramps A & B
Area 36.62 Acres
Soils Astatula (4), Orsino (37), Paola (42, 43), Tavares (63)

Weighted CN Calculations

Land Use	Soil Class	Area (Acres)	CN	Product
IMPERVIOUS AREAS				
from S-8A		1.32	98	129.36
from S-11A		0.51	98	49.98
from S-12B		0.26	98	25.48
from S-37		5.33	98	522.34
pond bottom		1.47	98	144.06
Impervious Subtotal =		8.89		871.22
PERVIOUS AREAS				
Offsite:				
from S-37, brush	A	6.35	30	190.50
adjacent to pond, brush	A	6.01	30	180.30
Onsite:				
from S-8A, pervious grass	A	0.42	39	16.38
from S-11A, pervious grass	A	0.29	39	11.31
from S-37, pervious grass	A	11.69	39	455.91
adj. to pond, pervious grass	A	2.97	39	115.83
Pervious Subtotal =		27.73		970.23
Total =		36.62		1841.45
			Weighted CN =	**50**

Time of Concentration

Sheet Flow	Length (ft)=	300		
	n=	0.8	(dense underbrush)	
	Slope (ft/ft)=	0.033		
	P2(in)=	4.8		
	Time of conc. (hr)=	1.00	Subtotal =	1.00
Ditch Flow	Length (ft)=	860		
	Velocity (ft/s)=	1.5		
	Time of conc. (hr)=	0.16	Subtotal =	0.16
Pipe Flow	Length (ft)=	942		
	Velocity (ft/s)=	3.0		
	Time of conc. (hr)=	0.09	Subtotal =	0.09
			Total Tc (hr) =	1.25
			Total Tc (min) =	**75**

Retention Volume

AREA (ac) Total = 36.62
PRECIPITATION, P (in) = 12.33 (25 YR /96 HR STORM EVENT)
(LANDLOCKED BASIN)
(P(25/96)=8.6 times multiplier 1.434 for 96 hour event=12.33 inches rainfall)
Q= (P-0.2*S)^2/P+0.8*S WHERE S= 1000/CN - 10 **Soil Storage= 9.89 inches**
Q (runoff) = 5.30 inches
Volume = 16.16 ac-ft

Pond Storage

Stage (Ft)	Area (Ac)	Area (CF)	Total Volume (Ac-Ft)
48	1.31	57064	0.000
49	1.45	63162	1.380
50	1.59	69260	2.900
51	1.74	75794	4.565
52	1.89	82328	6.380
53	2.05	89298	8.350
54	2.22	96703	10.485
55	2.72	118483	12.955
56	2.86	124582	15.745

Water Quality Volumes
percent impervious 20.26%

40C-42.026 (Section 4)
Provide one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, for systems which serve a basin with <40% impervious area and contain only SCS hydrologic group type 'A' soils
0.5" runoff= 1.53 ac-ft
1.25" over impervious = 0.77 ac-ft

Total Water Quality = 1.53 ac-ft

Water Quantity Requirements
Drawdown the Post-development volume for 25 yr. 96 hr event within 14 days.
Volume to Recover = 16.16 ac-ft

Additional Pond Parameters for Ponds program

Pond Volume at elev 56 = 685852 sf
Estimated Pond Peri meter at elev 56 = 1440 ft
Pond depth = 8 ft
Equivalent Pond Length = 569 ft
Equivalent Pond Width = 151 ft
Water Table Elevation = 45.5 ft, NGVD
(estimated SHWT at boring MA-2)
Base of Aquifer Elevation = 35.5 ft, NGVD
(top of confining stratum, avg. from borings MA-1 & 2)
meas. infiltration rate at ground surface at Pond 2 = 40 ft/dy
Unsaturated Vertical Infiltration Rate (w/ F.S. = 3) = 13 ft/dy
Horizontal Saturated Hydraulic Conductivity = 26 ft/dy
(Vert. Inf. Rate x 2)

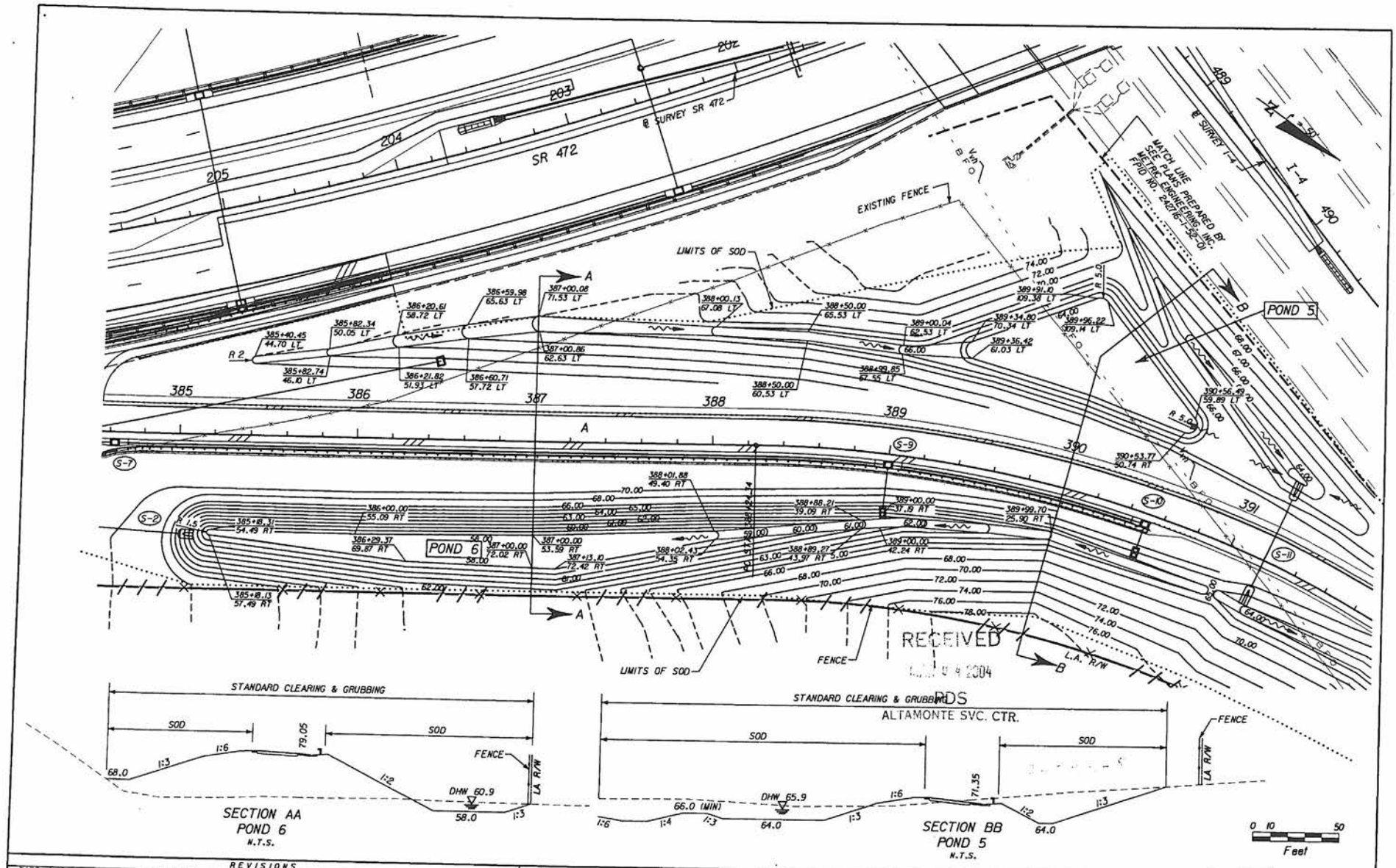
Additional Retention Requirement

Due to the fact that the pond does not recover the 25 yr, 96 hr storm event in the required 14 days, it will
be shown that the pond will contain an additional storm event that will begin at day 14. In order to show this,
additional storage in the adjacent swales will be taken into account as tabulated below.

	53	54	55	56
swale on SR 472, LT		0.12	0.32	0.55
swale on ramps A/B, RT		0.08	0.13	0.26
swale on ramps A/B, median			0.06	0.16
swale on ramps A/B, LT	0.12	0.26	0.43	0.71
total =	0.12	0.46	0.94	1.68

Total Storage including Swales

Stage (Ft)	Area (Ac)	Area (cf)	Total Volume (Ac-Ft)
48	1.31	57064	0.000
49	1.45	63162	1.380
50	1.59	69260	2.900
51	1.74	75794	4.565
52	1.89	82328	6.380
53	2.17	94525	8.410
54	2.68	116741	10.835
55	3.66	159430	14.005
56	4.54	197762	18.105



REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Washington Group International
Integrated Engineering, Construction, and Management Solutions
6950 HAZELTINE NATIONAL DRIVE, SUITE 840
ORLANDO, FLORIDA 32822
A. LeRoy McCown, P.E.
FLORIDA P.E. LICENSE NUMBER: 45016
(CERTIFICATE OF AUTHORIZATION) 6902

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 472	VOLUSIA	242655-1-52-01

POND LAYOUT SHEET

3-4-04

SHEET NO. 31

02/16/2004 03:34:28 PM U:\F-235800-ROADWAY-CADD-LDP\R00.dgn

Permit No. 76095-3

I-4/SR 472 Interchange

Existing Conditions

Presently there is an existing interchange for SR 472 and I-4 at the location of the proposed improvements. This interchange includes the recently completed Ramp B modification that allows the westbound SR 472 traffic to access the eastbound I-4 corridor. This access requires a left turn across the eastbound SR 472 traffic. The proposed Ramp E improvement will provide a direct access from westbound SR 472 to eastbound I-4 thus eliminating a potentially hazardous condition.

The project is located in an area of Volusia County that consists of many small isolated land-locked basins with Type A soils. Prior to the SR 472/Howland Boulevard Improvements (SJRWMD Permit Number 40-127-0499G-ERP) there were no formal stormwater treatment areas. The original storm sewers discharged to the west with the runoff eventually flowing off the right-of-way into isolated depressed areas. The SR 472/Howland Boulevard project provided stormwater treatment for the improvements by constructing retention ponds, within the right-of-way, at 4 separate locations to treat the runoff from the proposed improvements. Our proposed Ramp "E" is located within the drainage basin for Pond 3. The proposed safety improvement for Ramp "D" along westbound I-4 is located adjacent to the drainage basin for Pond 2.

Soils within the project site consist of Apopka, Astatula, Orsina, Paola and Tavares fine sands. All of these soils are identified as Type A soils by the Soil Conservation Service and have well-drained characteristics. The attached Geotechnical Report indicates an estimated groundwater level between elevations 40 feet and 45 feet ngvd, which is consistent with the previous design that used elevation 45.5 feet for Pond 3.

The existing land use within the right-of-way consists of paved roadway areas, sidewalk and grassed slopes along the existing interchange. The undeveloped portion of the right-of-way consists of dense pine and palmetto underbrush along the proposed Ramp "E" alignment. There are no wetlands located within the limits of the proposed project. The existing roadway profile and swale topography within the project limits ranges from elevation 54 to 86. The topography of the undeveloped, natural area ranges from elevation 60 to 80.

Proposed Conditions

Ramp "D"

The project involves the extension of the existing Ramp "D" for westbound traffic on I-4 to exit to SR 472. The intersection of SR 472 and Ramp "D" is a signalized intersection that could, during the stop cycle, cause traffic to backup on the short ramp and potentially onto the westbound lanes of I-4. This would create a significant hazard for the westbound thru traffic on I-4. To alleviate this potential hazard Ramp "D" is being extended approximately 1200 feet including 250 feet of transition. This safety improvement will increase the queue capacity for vehicles exiting I-4 and eliminate the potential for a fatal accident.

The Ramp "D" extension includes the construction of a 12-foot paved roadway with a 4-foot paved shoulder. This 16 feet of pavement will replace the existing 10-foot paved shoulder. The total new impervious area for this widening is only 6,555 sq. ft. The Environmental Resource Permit Application for the adjacent I-4 Improvements (Application No. 4-127-64105-6) that is currently being processed by SJRWMD has accounted for the additional runoff created by the safety improvements to Ramp "D".

Ramp "E"

The project also includes the construction of a new Ramp "E" to connect the existing westbound SR 472 directly to eastbound I-4. This would eliminate the potential hazard from traffic stopping on SR 472 and turning left, across oncoming eastbound SR 472 traffic, to access the existing Ramp "B" that loops westerly to connect to I-4 before crossing under the SR 472 bridge over I-4.

The new ramp is partially located in the drainage basin for the previously permitted Pond 3 and partially in the area adjacent to I-4 that currently has no formal stormwater treatment areas. With the construction of Ramp "E" we are increasing the amount of impervious area along I-4 that will potentially runoff into the existing swales. This additional runoff has been accounted for in the Environmental Resource Permit Application for the adjacent I-4 Improvements (Application No. 4-127-64105-6) that is currently being processed by SJRWMD. Exhibit 'A' identifies the limits of the drainage areas and Table 1, below, summarizes the runoff.

Table 1 – I-4 Runoff (to be treated in I-4 Pond)

	Prior to Ramp "E" Construction		After Ramp "E" Construction	
	Area (ac.)	CA*	Area (ac.)	CA*
Impervious	1.58	1.42	1.89	1.70
Pervious	4.98	1.49	3.72	1.12
Total	**6.56**	**2.91**	**5.61**	**2.82**

* Based on C_{Imp}= 0.90 and C_{Perv}= 0.30

The proposed construction will increase the impervious area within the I-4 corridor. However the construction of Ponds 5 and 6 will intercept 0.95 acres of the original runoff to I-4 resulting in a reduction of the total runoff that is going to I-4 thus reducing the impact to the I-4 Improvement Project.

Pond 3 was evaluated with the new Ramp "E" and additional runoff from I-4. The pond has the capacity to provide the required stormwater treatment, however the additional runoff from the back-to-back 25 yr, 96 hr storm event would cause stormwater to encroach onto the pavement of Ramp "B". Therefore we have provided additional Ponds 5 and 6 to treat a portion of the stormwater runoff from Ramp "E". Ponds 5 and 6 reduce the total runoff area from the offsite brush area that discharges to Pond 3 by 2.95 ac. The construction of Ramp E adds 0.28 ac. of new pavement that was originally grass. The reduction of the pervious areas increases the Curve Number for the runoff calculations

but the overall result is an increase of only 0.12' in Pond 3 which is still lower than the existing top of berm (See Table 5).

Pond 5 is located in the area between SR 472, I-4 and Ramp "E". Pond 6 is located on the east side of Ramp "E" between Sta. 383 Rt. and Sta. 389 Rt. in a natural low area. The new ponds are designed to accommodate the 100 year, 24 hour event and the 25 year, 96 hour event without impacting existing facilities or offsite properties. Exhibit 'B' identifies the limits of Drainage Basins 5 and 6. Table 2, below, provides a breakdown of the drainage areas for each pond including the original Pond 3 information for comparison. The total proposed area is 0.95 acres larger than the existing Pond 3 area due to the additional area now intercepted by Ponds 5 and 6 as noted above.

Table 2 – Drainage Area Summary

	Existing	Proposed		
	Pond 3 Original	Pond 3 w/ portion of Ramp E	Pond 5	Pond 6
Impervious	8.89	9.17	0.17	0.33
Pervious	27.73	24.50	1.45	1.96
Total	**36.62**	**33.67**	**1.62**	**2.29**

The PONDS analysis section contains the PONDS recovery analysis for the specified storm events. Tables 3, 4 and 5, below, summarize the results of the PONDS analysis.

Table 3 – Post Development Hydrology

Basin	Area (Acres)	CN	Tc (min.)
Pond 3 Original	36.62	50	75
Pond 3 w/ Ramp E	33.67	53	75
Pond 5	1.62	45	13
Pond 6	2.29	48	14

Table 4 – Peak Stages

Basin	T.O.B. (ft.)	100 yr. 24 hr. (ft.)	25 yr. 96 hr. (ft.)
Pond 3 Original	56.00	52.40	55.44
Pond 3 w/ Ramp E	56.00	52.48	55.56
Pond 5	66.00	65.69	65.86
Pond 6	62.00	60.77	60.92

Table 5 – Treatment Volume Recovery

Pond	Water Quality (slug load)		Water Quantity (25 yr-96hr)	
	Volume ac-ft	Recovery Time days	Volume ac-ft	Recovery Time days
Pond 3 Original	1.53	<1.5	16.16	>14*
Pond 3 w/ Ramp E	1.40	<1.5	15.89	>14*
Pond 5	0.07	<1.5	0.60	<14
Pond 6	0.11	<1.5	0.92	<14

* Pond 3 was evaluated with a composite hydrograph of back to back 25 yr. 96 hr storms.

In order to determine peak stages within the proposed ponds the PONDS program with the appropriate input data and hydrograph were computed. In order to determine recovery time for the water quality requirement the pond was slug loaded with the appropriate volumes.

The geotechnical information used for the PONDS analysis was taken from the actual field tests and borings performed for the project. A summary of this information compared to the values used in the design is presented within Table 6. The information for Pond 3 reflects the information provided in the original design. Ponds 5 and 6 are based on the geotechnical report included in this report. Per the attached geotechnical report, groundwater was not encountered in any of the borings. Based on USDA/SCS information it is anticipated to be between elevations 40 and 45. Conservatively, we used the same groundwater level as Pond 3 (elevation 45.5) which is 0.5 feet higher than the recommendation from the geotechnical report.

Table 6 – Aquifer Data

Pond / Test No.	Observed			Design			
	Aquifer Depth (ft.)	SHWT (ft.)	Hydraulic Conductivity (ft/day)	Aquifer Depth (ft.)	SHWT (ft.)	Hydraulic Conductivity (ft/day)	
						Horz.	Vert.
Pond 3	35.5	45.5	40.0	35.5	45.5	26.0	13.0
Pond 5 / P-2	N/A	N/A	9.5	35.5	45.5	9.5	4.75
Pond 6 / P-1	N/A	N/A	8.5	35.5	45.5	8.5	4.25

The original design for the SR 472/Howland Blvd. project included an inlet and 18" pipe to drain the natural low area (where Pond 6 is currently proposed) to Pond 3. To assure there is no adverse impact on the adjacent property a 24" culvert has been provided to direct any overflow (due to storms greater than the 25 yr, 96 hr and 100 yr, 24 hr design storms) from Pond 6 to the Pond 3 drainage system. This has been accomplished by setting the invert of the culvert at the peak stage elevation for Pond 6.

Post Development Hydrology
I-4 / SR 472
Basin 6 on Ramp "E"

Date : 02-02-04
By : ALH

Basin 6

Approximate Stations: 385+00 Rt. to 391+00 Rt. On Ramp "E" to I-4
Area 2.29 Acres (Includes Ramp "E" and the swale to the right side)
Soils Astatula (4), Orsino (37), Paola (42, 43), Tavares (63)

Weighted CN Calculations

Land Use	Soil Class	Area (Acres)	CN	Product
IMPERVIOUS AREAS				
Ramp "E" Pvm't and Rt. Shldr (Sta 385 to 391 +/-)		0.25	98	24.50
Proposed and Existing Sidewalk along SR 472		0	98	0
pond bottom		0.08	98	7.84
	Impervious Subtotal =	0.33		32.34
PERVIOUS AREAS				
Offsite:				
Brush	A	0	30	0
Brush, adjacent to pond	A	0	30	0
Onsite:				
Pervious grass, adjacent to pond	A	1.96	39	76.44
	Pervious Subtotal =	1.96		76.44
	Total =	2.29		108.78
			Weighted CN =	**48**

Time of Concentration

Sheet Flow	Length (ft) =	150		
	n =	0.5	(dense grass)	
	Slope (ft/ft) =	0.06		
	P2 =	4.8		
	Time of Conc. (hr) =	0.18	Subtotal =	0.18
Ditch Flow	Length (ft) =	280		
	Velocity (ft/s) =	1.5		
	Time of Conc. (hr) =	0.05	Subtotal =	0.05
Pipe Flow	Length (ft) =	0		
	Velocity (ft/s) =	3.0		
	Time of Conc. (hr) =	0.00	Subtotal =	0.00
			Total Tc (hr) =	0.23
			Total Tc (min) =	**14**

Retention Volume

AREA (ac) Total =	2.29	
PRECIPITATION, P (in) =	12.33	(25 YR / 96 HR STORM EVENT) (LANDLOCKED BASIN)

(P(25/96) = 8.6 times multiplier 1.434 for 96 hour event = 12.33 inches rainfall)

Q= (P - 0.2*S)^2 / (P + 0.8*S) WHERE S = 1000/CN - 10

Soil Storage =	**11.05**	**inches**
Q (runoff) =	**4.84**	**inches**
Volume =	**0.92**	**ac-ft**

Pond Storage

Stage (Ft)	Area (Ac)	Area (sf)	Total Volume (Ac-Ft)
58	0.08	3,521	0.000
59	0.12	5,177	0.100
60	0.16	6,994	0.240
61	0.21	8,969	0.423
62	0.25	11,098	0.653

Water Quality Volumes

percent impervious = 10.92%

40C-42.026 (Section 4)
Provide one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, for systems which serve a basin with <40% impervious area and contain only SCS hydrologic group type 'A' soils

0.5" runoff =	0.10	ac-ft
1.25" over impervious =	0.03	ac-ft
Total Water Quality =	**0.10**	**ac-ft**

Water Quantity Requirements

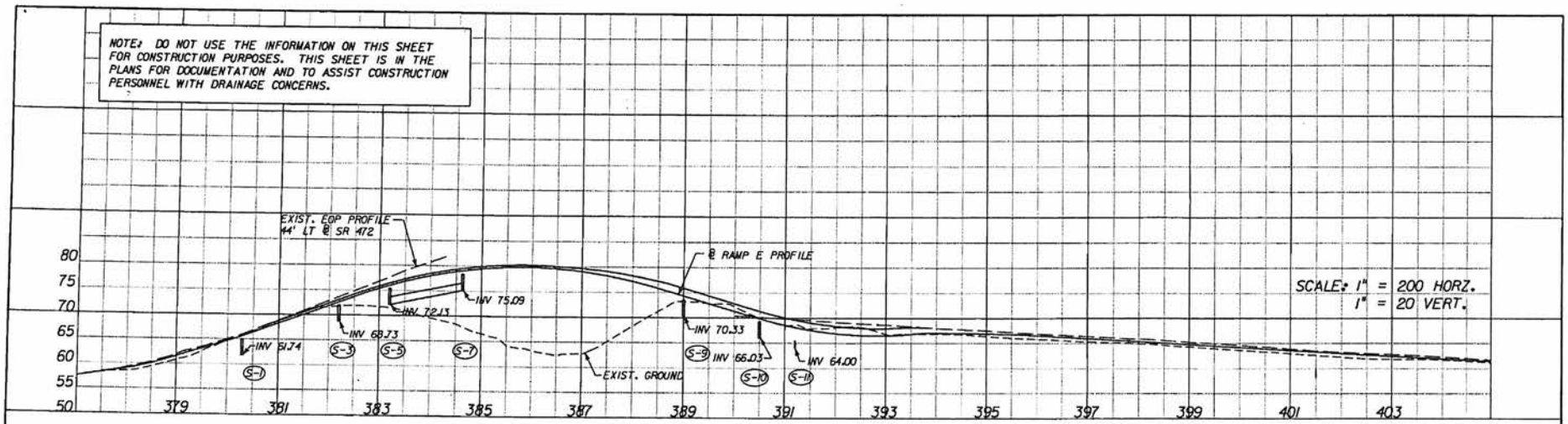
Drawdown the Post-development volume for 25 yr. 96 hr. event within 14 days.

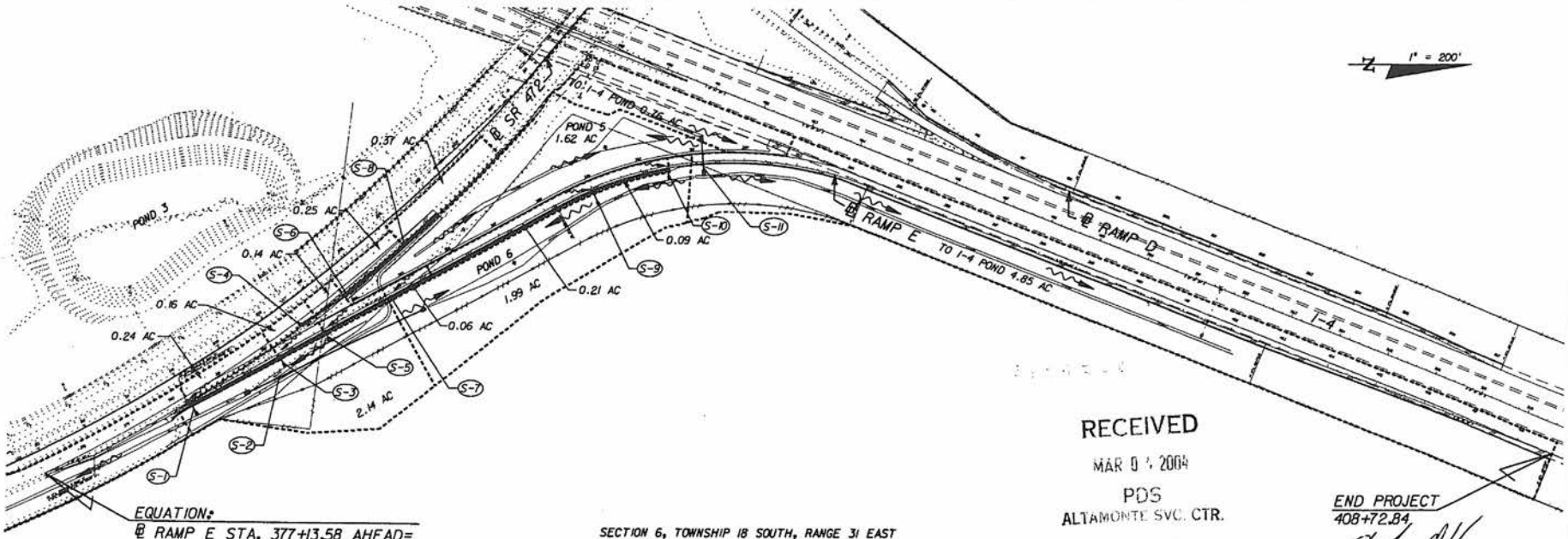
Volume to recover =	**0.92**	**ac-ft**

Additional Pond Parameters for Ponds Program

Pond Volume at elev 62 =	28,450	cf
Estimated Pond Perimeter at elev 62 =	830	ft
Pond Depth =	4	ft
Equivalent Pond Length =	290	ft
Equivalent Pond Width =	38	ft
Water Table Elevation =	45.5	ngvd (estimated SHWT at boring MA-2)
Base of Aquifer Elevation =	35.5	ngvd (top of confining stratum, avg. from borings MA-1 & MA-2)
Measured Infiltration Rate =	8.5	ft/dy (at ground surface at Pond 6)
Unsaturated Vertical Infiltration Rate =	4.25	ft/dy (w/ F.S. = 2)
Horz Saturated Hydraulic Conductivity =	8.50	ft/dy (vertical infiltration rate x 2)

NOTE: 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.





EQUATION:
@ RAMP E STA. 377+13.58 AHEAD=
@ S.R. 472 STA. 213+10.00 BACK

SECTION 6, TOWNSHIP 18 SOUTH, RANGE 31 EAST

RECEIVED
MAR 0 ? 2004
PDS
ALTAMONTE SVC. CTR.

END PROJECT
408+72.84

3-4-04

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Washington Group International
Integrated Engineering, Construction, and Management Solutions
5950 HAZELTINE NATIONAL DRIVE, SUITE 640
ORLANDO, FLORIDA 32822
A. Leroy McCown, P. E.
FLORIDA P.E. LICENSE NUMBER 46016
(CERTIFICATE OF AUTHORIZATION) 6602

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

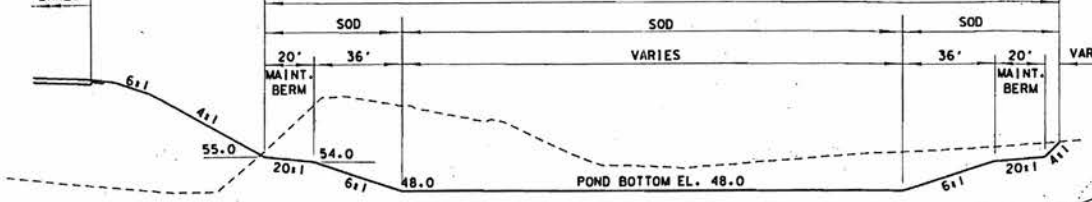
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 472	VOLUSIA	242655-1-52-01

DRAINAGE MAP

SHEET NO. 3

02/16/2004 11:50:46 AM U:\235800\ROADWAY\CADD\drnprp09.dgn

COUNTY PROJ. NO.	SHEET NO.
P - 4671	95



POND 3 SECTION - DRY RETENTION

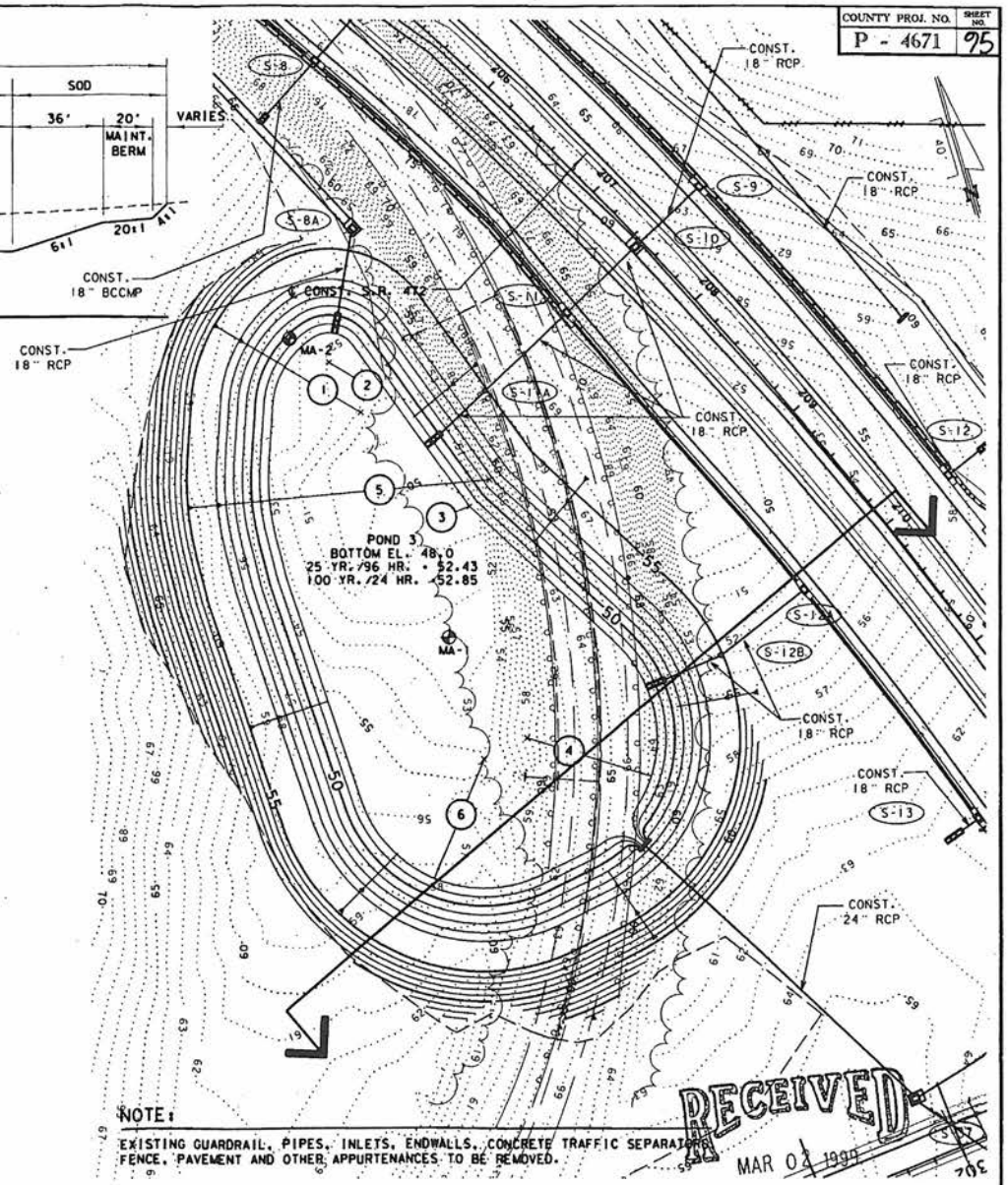
N.T.S.

LEGEND

BORING LOCATION

AB-1

CONTROL POINT	STATION, OFFSET	RADIUS
1	206+94.99, 216.47' RT	60'
2	206+52.82, 207.79' RT	20'
3	207+99.73, 207.09' RT	N/A
4	209+57.63, 280.77' RT	88'
5	207+95.33, 184.71' RT	150'
6	209+49.37, 312.42' RT	88'



NOTE:

EXISTING GUARDRAIL, PIPES, INLETS, ENDWALLS, CONCRETE TRAFFIC SEPARATOR, FENCE, PAVEMENT AND OTHER APPURTENANCES TO BE REMOVED.

RECEIVED
MAR 02 1999

REVISIONS															
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

VOLUSIA COUNTY
ENGINEERING DEPARTMENT

PREPARED BY: DRMP

PDS S.R. 472
ORLANDO
SJR WIERD NO.3

E107

Permit No. 40-76095-4

Howland Blvd and Graves Ave Improvements

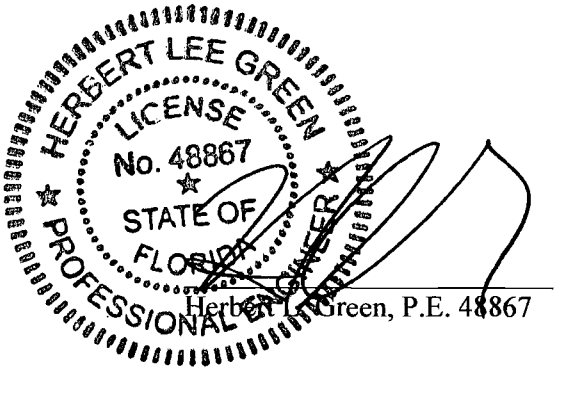
Howland Blvd & Graves Ave Improvements
Request for Permit Modification
Original Permit #40-127-0499G

CITY OF DELTONA, FLORIDA

Exhibits & Calculations in Support of Permit Request

Prepared For

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT



February 2, 2012

Prepared for Deltona Retail Holdings, LLC
By CADJAZZ

Herbert L. Green, P.E. 48867

40 - 76095 - 4

RECEIVED

FEB 02 2012

MAITLAND

AERIAL MAP

CADJAZZ
• Engineering Consultants •
P.O. Box 450006 • Kissimmee, Fl. 32789
Phone: (407) 348-1979 Fax: (407) 628-3168

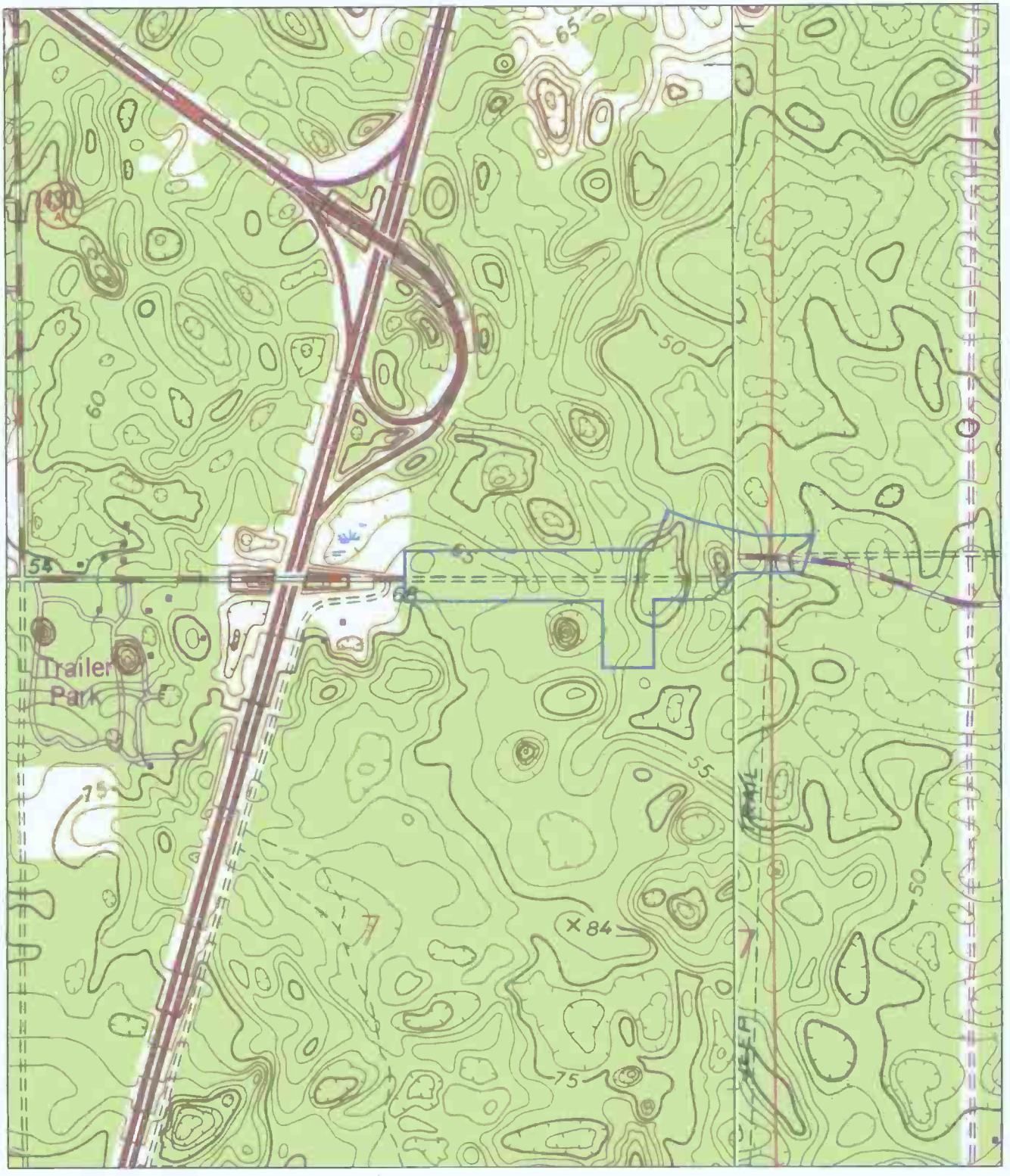
Aerial Map

Howland Blvd & Graves Ave Improvements
City of Deltona, Volusia County, Florida

Deltona Retail Holdings, LLC

SHEET NUMBER
1
OF 1 SHEETS

USGS QUADRANGLE MAP



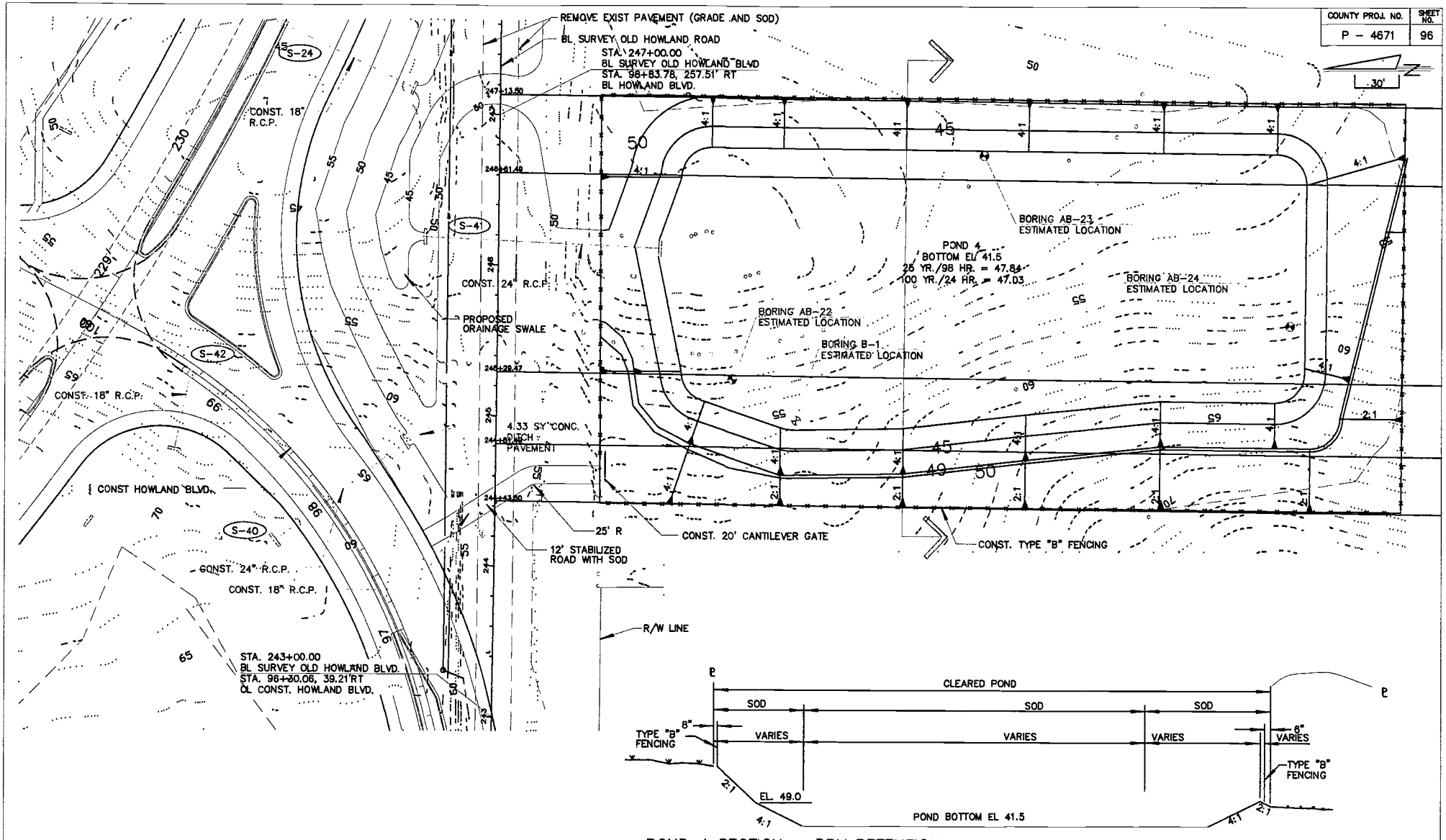
CADJAZZ
• Engineering Consultants •
1000 N. Orlando Avenue • Suite A • Winter Park, FL 32789
Phone: (407) 628-3168 Fax: (407) 628-9554

USGS QUADRAANGLE MAP

Howland Blvd & Graves Ave. Improvements
City of Deltona, Volusia County, Florida

Deltona Retail Holdings, LLC

SHEET NUMBER
1
OF 1 SHEETS



POND 4 SECTION – DRY RETENTION

N.T.S.

COUNTY PROJ. NO.	SHEET NO.
P – 4671	96

REVISIONS

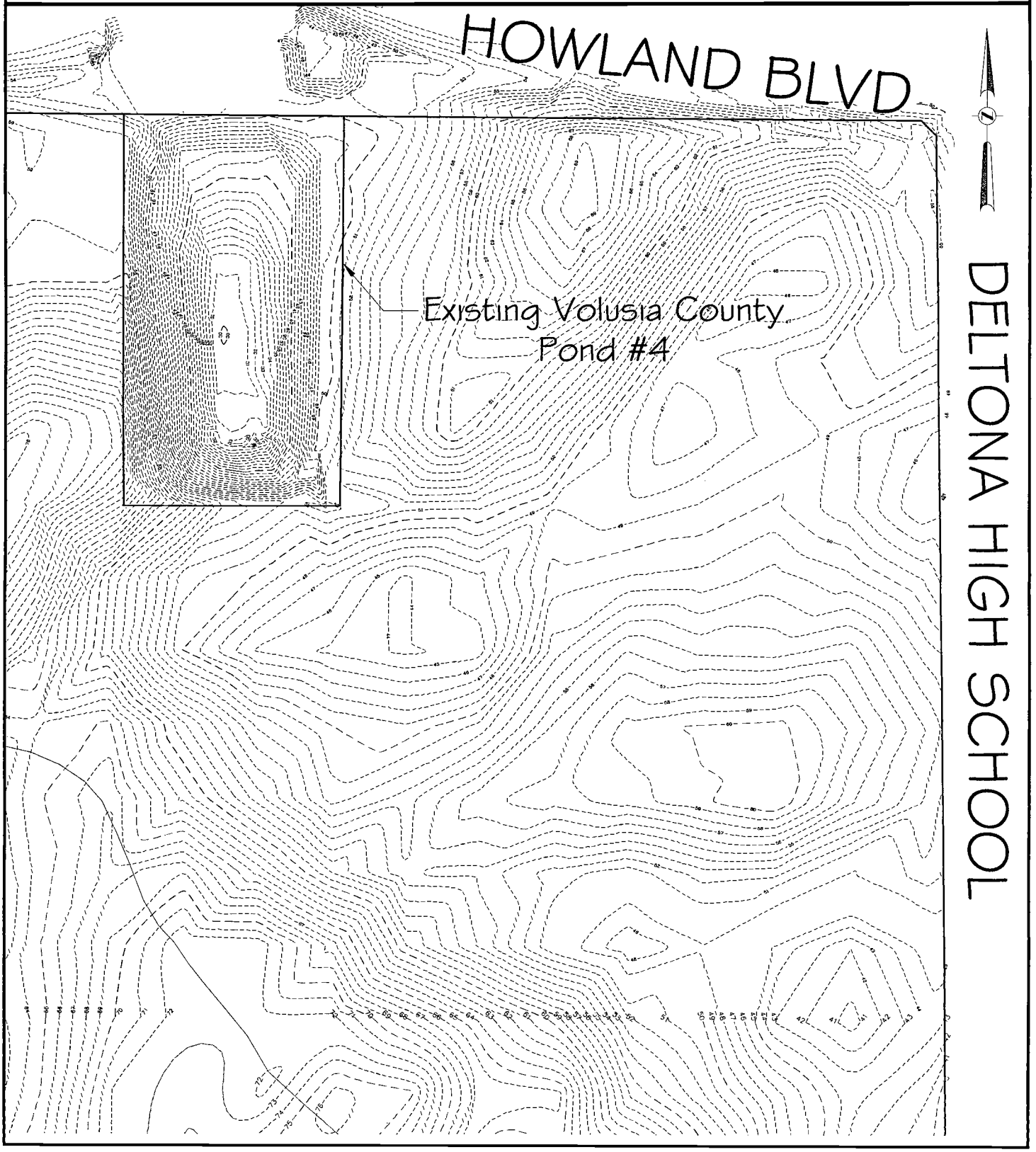
DATE	BY	DESCRIPTION
9/99	NMN	Revised Pond ,removed maintenance berms,lowered pond 2',recalculated earthwork

VOLUSIA COUNTY ENGINEERING DEPARTMENT

PREPARED BY: DRMP

S.R. 472
POND NO.4

Volusia County Pond #4 Exhibit



CADJAZZ
• Engineering Consultants •
1000 N. Orlando Avenue • Suite A • Winter Park, Fl. 32789
Phone: (407) 628-3168 Fax: (407) 628-9554

Existing Pond #4 Exhibit

Howland Blvd & Graves Ave. Improvements
City of Deltona, Volusia County, Florida

Deltona Retail Holdings, LLC

SHEET NUMBER
1
OF 1 SHEETS

SR 427 Basin #4 Runoff Estimates

Request for Modification to Permit #40-127-0499G

Pre S.R. 472 (Howland) & Graves Ave. Runoff 25 year/96 hour Storm

Pond #4 Basin Area =	22.34	acres	
SCS Curve Number =	50		(See Below Wt CN Calculations as permitted, no change to permitted design to date)
S(retention variable) = (1,000/CN) - 10	10.00	inches	
Rainfall (P) (25y/96hr)	11.2	inches	
Q (runoff) = (P-0.2*S)^2/(P+0.8*S)	4.41	inches	
Runoff Volume =	8.21	ac-ft	**Pre 25 yr/96 hr Stage = 47.70'**

Post S.R. 472 (Howland) & Graves Ave. Runoff 25 year/96 hour Storm

Pond #4 Basin Area =	22.34	acres	
SCS Curve Number =	53		(See Below Wt CN Calculations, Including additional paved lanes)
S(retention variable) = (1,000/CN) - 10	8.87	inches	
Rainfall (P) (25y/96hr)	11.2	inches	
Q (runoff) = (P-0.2*S)^2/(P+0.8*S)	4.86	inches	
Runoff Volume =	9.04	ac-ft	**Post 25 yr/96 hr Stage = 48.03'**

Water Quality - 40C-42.026(4) System less than 40% impervious and SCS Type A soils

1.0" over the total area =	1.86	ac-ft	
1.25" over the imp. Area =	0.69	ac-ft	
Required Water Quality =	**1.86**	**ac-ft**	**Water Quality Stage = 44.65'**

SR 427 Basin #4 Runoff Estimates

Request for Modification to Permit #40-127-0499G

Pre-Improvements CN per existing permit #40-127-0499G

Land Use	Soil Class	Area (ac)	CN	Product
Impervious Areas				
from S-41	Imp.	4.25	98	416.5
pond bottom	Imp.	1.46	98	143.08
Impervious Area Subtotal		5.71		
Pervious Areas				
Offsite:				
from S-4, brush	A	2.26	30	67.8
adjacent to pond, brush	A	7.46	30	223.8
Onsite:				
from S-41, pervious grass	A	5.18	39	202.02
adjacent to pond	A	1.73	39	67.47
Pervious Subtotal		16.63		
	Total =	22.34		1120.67
			Wt CN =	**50**

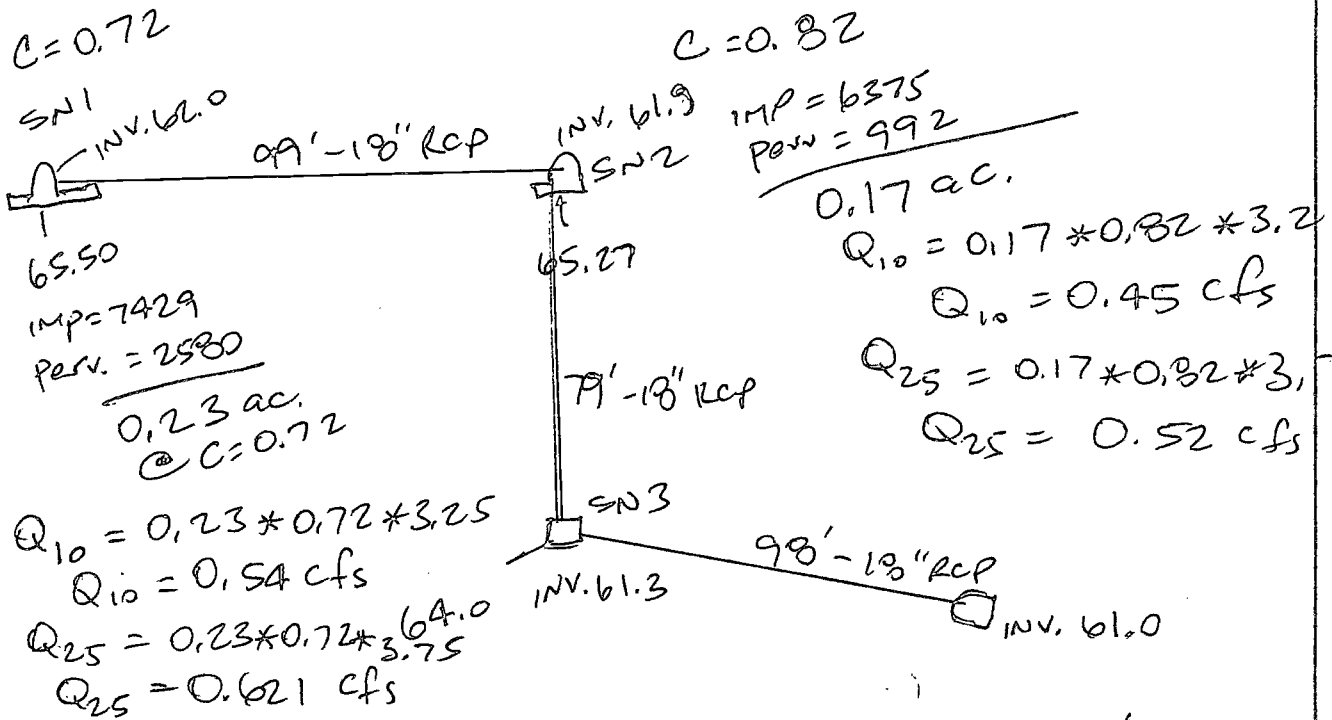
UPDATED WEIGHTED CN, INCLUDING ADDITIONAL IMPROVEMENTS ON S.R. 472 AND GRAVES AVENUE

Land Use	Soil Class	Area (ac)	CN	Product	
Impervious Areas					
from S-41	Imp.	5.15	98	504.7	**(Original 4.25 acres plus an additional Paved Area 39,082 s.f.)**
pond bottom	Imp.	1.46	98	143.08	**(The 39,082 s.f. includes future 11,700 s.f. widening of Graves Ave.)**
Impervious Area Subtotal		6.61			
Pervious Areas					
Offsite:					
from S-41, brush	A	2.26	30	67.8	
adjacent to pond, brush	A	7.46	30	223.8	
Onsite:					
from S-41, pervious grass	A	4.28	39	166.92	
adjacent to pond	A	1.73	39	67.47	
Pervious Subtotal		15.73			
	Total =	22.34		1173.77	
			Wt CN =	**53**	

Total Storage for Basin 4 Pond and Swales Per Approved Permit #40-127-0499G

Stage (ft)	Area (ac)	Area (s.f.)	Total Volume (ac*ft)
43.5	1.52	66,211	0
44	1.56	67,954	0.77
45	1.8	78,408	2.45
46	1.97	85,813	4.335
47	2.31	100,624	6.475
48	2.63	114,563	8.945
49	2.93	127,631	11.725

Graves Ave.



$Q_{10} = 0.23 * 0.72 * 3.25$

$Q_{10} = 0.54$ cfs

$Q_{25} = 0.23 * 0.72 * 3.75$

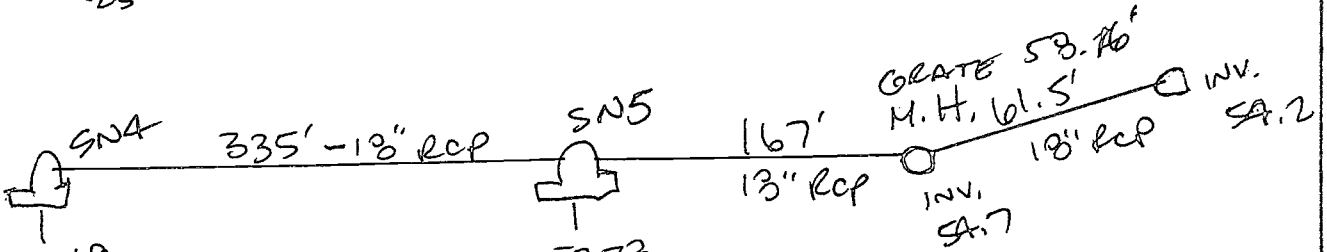
$Q_{25} = 0.621$ cfs

$Q_{10} = 0.17 * 0.82 * 3.25$

$Q_{10} = 0.45$ cfs

$Q_{25} = 0.17 * 0.82 * 3.75$

$Q_{25} = 0.52$ cfs



IMP = 9895

PERV. = 4781

0.34 ac.

C = 0.70

$Q_{10} = 0.77$ cfs

$Q_{25} = 0.89$ cfs

C = 0.76

IMP = 19639

PERV = 5767

0.58 ac.

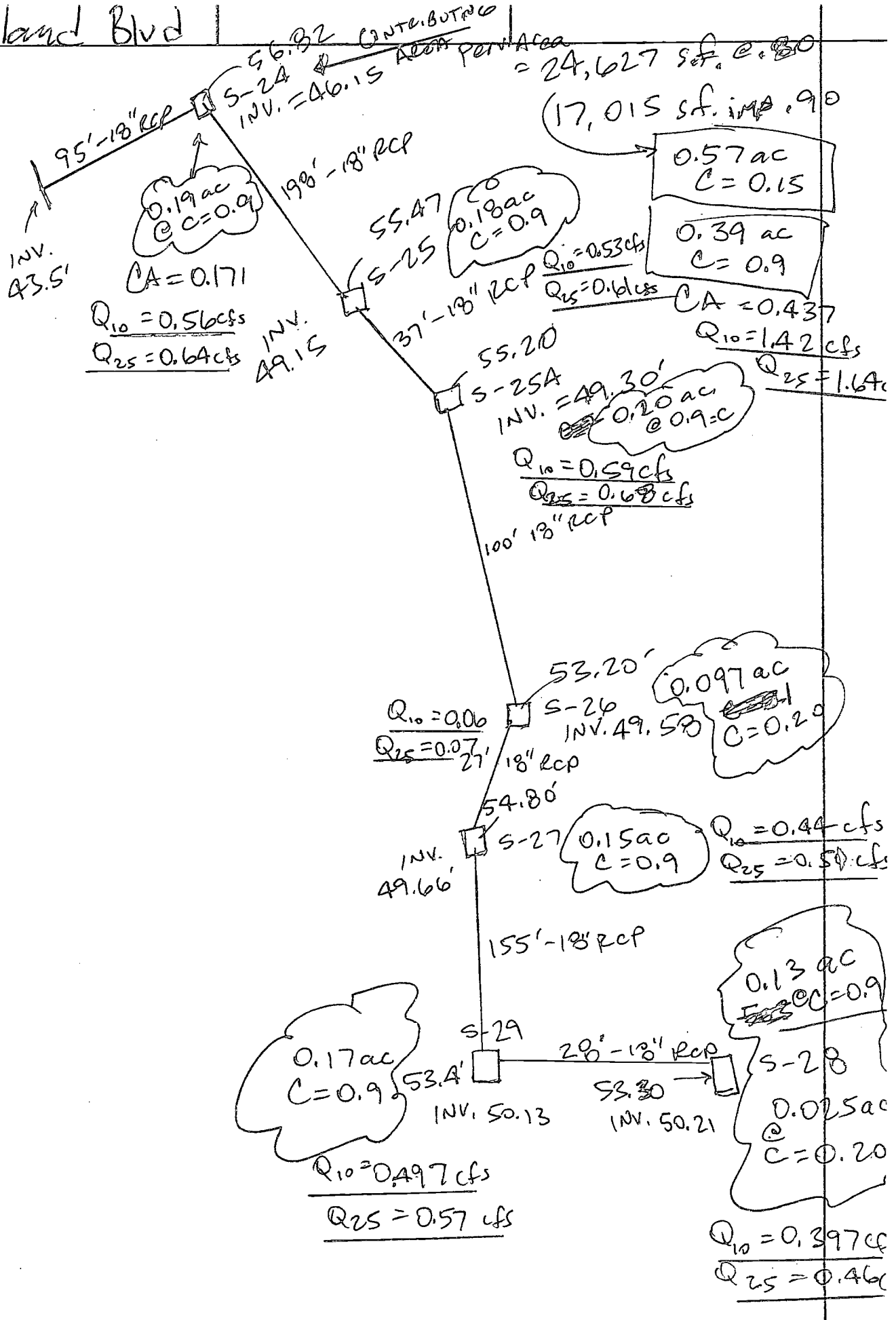
$Q_{10} = 1.43$ cfs

$Q_{25} = 1.65$ cfs

10yr 1 hr — 3.25 in/hr

25yr 1 hr — 3.75 in/hr

Howland Blvd



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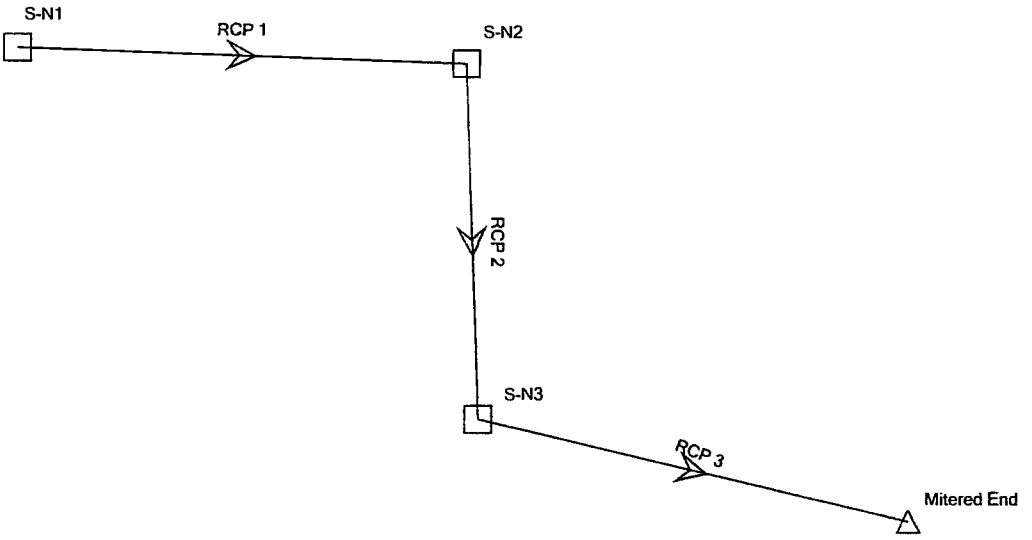

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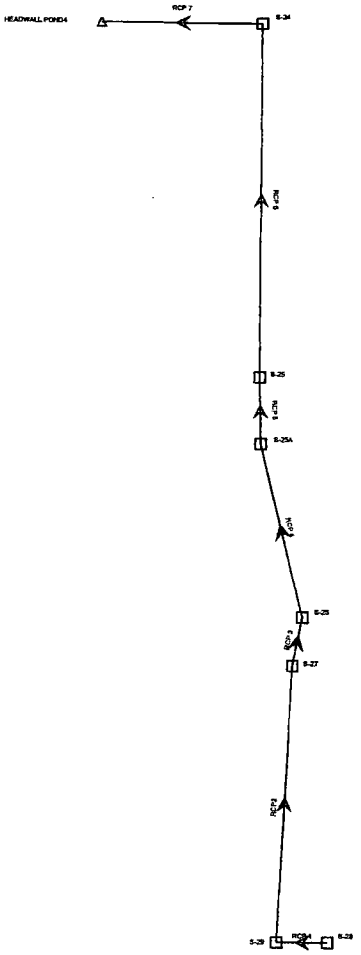


Graves Avenue Stormwater Analysis 10 Year Storm Design

Label	-Node- Upstream Downstream	Upstream Inlet Area (acres)	Upstream Inlet C ()	Upstream CA (acres)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	Section Discharge Capacity (ft/s)	Length (ft)	Velocity (Average) (ft/s)
RCP 1	S-N1	(N/A)	(N/A)	0	65.5	62.39	0.54	99	1.39
	S-N2				65.27	62.17	3.34		
RCP 2	S-N2	(N/A)	(N/A)	0	65.27	62.15	0.45	79	2.69
	S-N3				64	61.58	9.15		
RCP 3	S-N3	(N/A)	(N/A)	0	64	61.58	0.45	98	1.96
	Mitered End				61	61.25	5.81		

Graves Avenue Stormwater Analysis 25 Year Storm Design

Label	-Node- Upstream Downstream	Upstream Inlet Area (acres)	Upstream Inlet C ()	Upstream CA (acres)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	Section Discharge Capacity (ft/s)	Length (ft)	Velocity (Average) (ft/s)
RCP 1	S-N1	(N/A)	(N/A)	0	65.5	62.42	0.62	99	1.44
	S-N2				65.27	62.19	3.34		
RCP 2	S-N2	(N/A)	(N/A)	0	65.27	62.17	0.52	79	2.8
	S-N3				64	61.6	9.15		
RCP 3	S-N3	(N/A)	(N/A)	0	64	61.6	0.52	98	2.04
	Mitered End				61	61.27	5.81		

Graves Avenue Stormwater Analysis 10 Year Storm Design

Label	-Node- Upstream Downstream	Upstream Inlet Area (acres)	Upstream Inlet C ()	Upstream CA (acres)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	Section Discharge Capacity (ft/s)	Length (ft)	Velocity (Average) (ft/s)
RCP-1	S-N4	(N/A)	(N/A)	0	62.69	55.87	0.77	335	0.98
	S-N5				57.78	55.71	0.62		
RCP-2	S-N5	(N/A)	(N/A)	0	57.78	55.71	1.43	167	1.82
	MH SN6				58.16	55.21	1.23		
RCP-3	MH SN6	(N/A)	(N/A)	0	58.16	55.21	1.43	62	3.96
	Mitered End				54.2	54.67	3.2		

Graves Avenue Stormwater Analysis 25 Year Storm Design

Label	-Node- Upstream Downstream	Upstream Inlet Area (acres)	Upstream Inlet C ()	Upstream CA (acres)	-Ground- Upstream Downstream (ft)	-HGL- Upstream Downstream (ft)	Section Discharge Capacity (ft/s)	Length (ft)	Velocity (Average) (ft/s)
RCP-1	S-N4	(N/A)	(N/A)	0	62.69	55.99	0.89	335	1.13
	S-N5				57.78	55.8	0.62		
RCP-2	S-N5	(N/A)	(N/A)	0	57.78	55.8	1.65	167	2.1
	MH SN6				58.16	55.25	1.23		
RCP-3	MH SN6	(N/A)	(N/A)	0	58.16	55.25	1.65	62	4.11
	Mitered End				54.2	54.71	3.2		

Howland Boulevard Stormwater Analysis 10 Year Storm Design

Label	-Node- Upstream Downstream	Upstream Inlet Area (acres)	Upstream Inlet C ()	Upstream CA (acres)	-Ground- Upstream (ft)	-Ground- Downstream (ft)	-HGL- Upstream (ft)	-HGL- Downstream (ft)	Section Discharge Capacity (ft/s)	Length (ft)	Velocity (Average) (ft/s)
RCP 7	HEADWALL POND4	(N/A)	(N/A)	0	43.5		46.69		2.04	89	7.19
	S-24				56.82		43.83		-19.64		
RCP 6	S-24	(N/A)	(N/A)	0	56.82		49.43		0.59	198	3.93
	S-25				55.47		46.69		-14.01		
RCP 5	S-25	(N/A)	(N/A)	0	55.47		49.6		0.65	37	2.54
	S-25A				55.2		49.45		-7.25		
RCP 4	S-25A	(N/A)	(N/A)	0	55.2		49.87		0.5	100	2.06
	S-26				53.2		49.6		-6.02		
RCP 3	S-26	(N/A)	(N/A)	0	53.2		49.93		0.44	28	2
	S-27				54.8		49.87		-6.08		
RCP2	S-27	(N/A)	(N/A)	0	54.8		50.42		0.5	155	2.12
	S-29				53.4		49.93		-6.27		
RCP 1	S-29	(N/A)	(N/A)	0	53.4		50.47		0.4	28	1.94
	S-28				53.3		50.42		-6.08		

Howland Boulevard Stormwater Analysis 25 Year Storm Design

Label	-Node- Upstream Downstream	Upstream Inlet Area (acres)	Upstream Inlet C ()	Upstream CA (acres)	-Ground- Upstream (ft)	-Ground- Downstream (ft)	-HGL- Upstream (ft)	-HGL- Downstream (ft)	Section Discharge Capacity (ft/s)	Length (ft)	Velocity (Average) (ft/s)
RCP 7	HEADWALL PO	(N/A)	(N/A)	0	43.5		46.73		2.35	89	7.49
	S-24				56.82		43.85		-19.64		
RCP 6	S-24	(N/A)	(N/A)	0	56.82		49.46		0.68	198	4.09
	S-25				55.47		46.73		-14.01		
RCP 5	S-25	(N/A)	(N/A)	0	55.47		49.63		0.75	37	2.65
	S-25A				55.2		49.47		-7.25		
RCP 4	S-25A	(N/A)	(N/A)	0	55.2		49.89		0.58	100	2.15
	S-26				53.2		49.63		-6.02		
RCP 3	S-26	(N/A)	(N/A)	0	53.2		49.96		0.51	28	2.09
	S-27				54.8		49.89		-6.08		
RCP2	S-27	(N/A)	(N/A)	0	54.8		50.44		0.57	155	2.21
	S-29				53.4		49.96		-6.27		
RCP 1	S-29	(N/A)	(N/A)	0	53.4		50.49		0.46	28	2.03
	S-28				53.3		50.44		-6.08		

Curb Spread Calculations 10 Year

Job Number: CDJ.02.01.09.DEL
Project Name: Howland Blvd & Grave Ave Improvements

Curb Calculations are based on the following Manning's Equation:

$$Q = \frac{.56}{n} S_x^{5/3} S_L^{1/2} T^{8/3} \qquad \text{therefore } T_{min} = (Qn/.56\ Sx^{5/3} S_L^{1/2})^{3/8}$$

Q = Gutter Flow rate (cfs), (Note: 1/2 Q for each basin/inlet area used in calculations)
n = Manning's Roughness Coefficient (from FDOT Drainage Handbook, Table 3.2)
Sx = Pavement Cross slope (ft/ft)
S_L = Longitundinal Slope (ft/ft), (Note: min. slopes used for each basin/inlet area)
T = Width of flow or spread (ft) (Note: T_{actual} = lane width + 1' gutter)

Graves Avenue & Howland Boulevard Inlets

Inlet	Q_{total} (cfs)	Q (cfs)	S_x (%)	S_L (%)	n	T_{min} (ft)	T_{actual} (ft)
S-N1	1.08	0.54	2	0.62	0.013	5.82	13
S-N2	0.90	0.45	2	0.24	0.013	6.49	13
S-N4	1.54	0.77	2	1.68	0.013	5.51	13
S-N5W	0.82	0.41	2	0.24	0.013	6.27	13
S-N5E	1.94	0.97	2	0.81	0.013	6.89	13
S-28	0.79	0.40	2	0.52	0.013	5.36	13
S-29	0.99	0.50	2	0.67	0.013	5.56	13
S-27	0.88	0.44	2	0.64	0.013	5.36	13
S-25A	1.18	0.59	2	0.54	0.013	6.17	13
S-25	1.06	0.53	2	0.67	0.013	5.69	13
S-24	1.12	0.56	2	0.67	0.013	5.81	13

Curb Spread Calculations 25 Year

Job Number: CDJ.02.01.09.DEL
Project Name: Howland Blvd & Grave Ave Improvements

Curb Calculations are based on the following Manning's Equation:

$$Q = \frac{.56}{n} S_x^{5/3} S_L^{1/2} T^{8/3} \qquad \text{therefore } T_{min} = (Qn/.56\ Sx^{5/3} S_L^{1/2})^{3/8}$$

Q = Gutter Flow rate (cfs), (Note: 1/2 Q for each basin/inlet area used in calculations)
n = Manning's Roughness Coefficient (from FDOT Drainage Handbook, Table 3.2)
Sx = Pavement Cross slope (ft/ft)
S_L = Longitundinal Slope (ft/ft), (Note: min. slopes used for each basin/inlet area)
T = Width of flow or spread (ft) (Note: T_{actual} = lane width + 1' gutter)

Graves Avenue & Howland Boulevard Inlets

Inlet	Q_{total} (cfs)	Q (cfs)	S_x (%)	S_L (%)	n	T_{min} (ft)	T_{actual} (ft)
S-N1	1.24	0.62	2	0.62	0.013	6.13	13
S-N2	1.04	0.52	2	0.24	0.013	6.85	13
S-N4	1.78	0.89	2	1.68	0.013	5.82	13
S-N5W	0.94	0.47	2	0.24	0.013	6.60	13
S-N5E	2.24	1.12	2	0.81	0.013	7.27	13
S-28	0.92	0.46	2	0.52	0.013	5.66	13
S-29	1.14	0.57	2	0.67	0.013	5.85	13
S-27	1.02	0.51	2	0.64	0.013	5.66	13
S-25A	1.36	0.68	2	0.54	0.013	6.51	13
S-25	1.22	0.61	2	0.67	0.013	6.00	13
S-24	1.28	0.64	2	0.67	0.013	6.11	13

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : Howland & Graves Improvements PAV Recove
MANUAL RUNOFF DATA USED
UNSATURATED ANALYSIS INCLUDED

Pond Bottom Area	66,211.00 ft²
Pond Volume between Bottom & DHWL	510,741.00 ft³
Pond Length to Width Ratio (L/W)	7.00
Elevation of Effective Aquifer Base	30.00 ft
Elevation of Seasonal High Groundwater Table	40.00 ft
Elevation of Starting Water Level	40.00 ft
Elevation of Pond Bottom	41.50 ft
Design High Water Level Elevation	49.00 ft
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.30
Unsaturated Vertical Hydraulic Conductivity	23.40 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	46.80 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.24
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	1.00

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

MODRET

TIME - RUNOFF INPUT DATA

PROJECT NAME: HOWLAND & GRAVES IMPROVEMENTS PAV RECOVE

STRESS PERIOD NUMBER	INCREMENT OF TIME (hrs)	VOLUME OF RUNOFF (ft^3)
Unsat	0.00	0.00
1	0.10	81,021.60
2	12.00	0.00
3	12.00	0.00
4	12.00	0.00
5	12.00	0.00
6	12.00	0.00
7	12.00	0.00
8	12.00	0.00
9	12.00	0.00
10	12.00	0.00
11	12.00	0.00
12	12.00	0.00
13	12.00	0.00
14	12.00	0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves Improvements PAV Recove

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
00.00 - 0.00	40.000	0.000 *		
			0.00000	
0.00	40.000	0.82170		
			0.81719	
0.10	41.500	0.81267		0.00
			0.27114	
12.10	41.500	0.20498		0.00
			0.13883	
24.10	41.500	0.11651		0.00
			0.09418	
36.10	41.500	0.08345		0.00
			0.07271	
48.10	41.500	0.06624		0.00
			0.05978	
60.10	41.500	0.05541		0.00
			0.05104	
72.10	41.500	0.04782		0.00
			0.04460	
84.10	41.500	0.04213		0.00
			0.03965	
96.10	41.500	0.03768		0.00
			0.03572	
108.10	41.500	0.03409		0.00
			0.03245	
120.10	41.500	0.03111		0.00
			0.02976	
132.10	41.500	0.02863		0.00
			0.02750	
144.10	41.500	0.02648		0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves Improvements PAV Recove

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.02547	
156.10	40.720			0.00

Maximum Water Elevation: 41.500 feet @ 0.10 hours
* Time increment when there is no runoff
Maximum Infiltration Rate: 1.244 ft/day

Recovery @ > 33.113 hours

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : Howland & Graves Improvements 25yr 96hr
MANUAL RUNOFF DATA USED
UNSATURATED ANALYSIS INCLUDED

Pond Bottom Area	66,211.00 ft²
Pond Volume between Bottom & DHWL	510,741.00 ft³
Pond Length to Width Ratio (L/W)	7.00
Elevation of Effective Aquifer Base	30.00 ft
Elevation of Seasonal High Groundwater Table	40.00 ft
Elevation of Starting Water Level	40.00 ft
Elevation of Pond Bottom	41.50 ft
Design High Water Level Elevation	49.00 ft
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.30
Unsaturated Vertical Hydraulic Conductivity	23.40 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	46.80 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.24
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	1.00

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

MODRET

TIME - RUNOFF INPUT DATA

PROJECT NAME: HOWLAND & GRAVES IMPROVEMENTS 25YR 96HR

STRESS PERIOD NUMBER	INCREMENT OF TIME (hrs)	VOLUME OF RUNOFF (ft^3)
Unsat	0.00	0.00
1	0.10	1,000.00
2	12.00	356,627.59
3	12.00	0.00
4	12.00	0.00
5	12.00	0.00
6	12.00	0.00
7	12.00	0.00
8	12.00	0.00
9	12.00	0.00
10	12.00	0.00
11	12.00	0.00
12	12.00	0.00
13	12.00	0.00
14	12.00	0.00
15	12.00	357,627.59
16	12.00	0.00
17	24.00	0.00
18	24.00	0.00
19	24.00	0.00
20	24.00	0.00
21	24.00	0.00
22	24.00	0.00
23	24.00	0.00
24	24.00	0.00
25	24.00	0.00
26	24.00	0.00
27	24.00	0.00
28	24.00	0.00
29	24.00	0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves Improvements 25yr 96hr

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
00.00 - 0.00	40.000	0.000 *		
			0.00000	
0.00	40.000	0.00001		
			0.01097	
0.10	41.500	0.02193		0.00
			1.33715	
12.10	45.284	0.99465		0.00
			0.65216	
24.10	44.787	0.54314		0.00
			0.43413	
36.10	44.457	0.38288		0.00
			0.33163	
48.10	44.205	0.30112		0.00
			0.27062	
60.10	43.999	0.25000		0.00
			0.22939	
72.10	43.824	0.21437		0.00
			0.19935	
84.10	43.672	0.18782		0.00
			0.17630	
96.10	43.538	0.16716		0.00
			0.15802	
108.10	43.418	0.15056		0.00
			0.14311	
120.10	43.309	0.13691		0.00
			0.13070	
132.10	43.209	0.12543		0.00
			0.12016	
144.10	43.118	0.11563		0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves Improvements 25yr 96hr

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.11111	
156.10	43.033	0.84582		0.00
			1.58054	
168.10	48.132	1.18814		0.00
			0.79573	
180.10	47.526	0.68580		0.00
			0.46594	
204.10	46.817	0.40078		0.00
			0.33562	
228.10	46.306	0.29995		0.00
			0.26427	
252.10	45.903	0.24129		0.00
			0.21831	
276.10	45.571	0.20210		0.00
			0.18589	
300.10	45.288	0.17377		0.00
			0.16166	
324.10	45.042	0.15221		0.00
			0.14276	
348.10	44.825	0.13520		0.00
			0.12765	
372.10	44.630	0.12144		0.00
			0.11524	
396.10	44.455	0.11006		0.00
			0.10488	
420.10	44.295	0.10049		0.00
			0.09610	
444.10	44.149	0.09233		0.00

MODRET

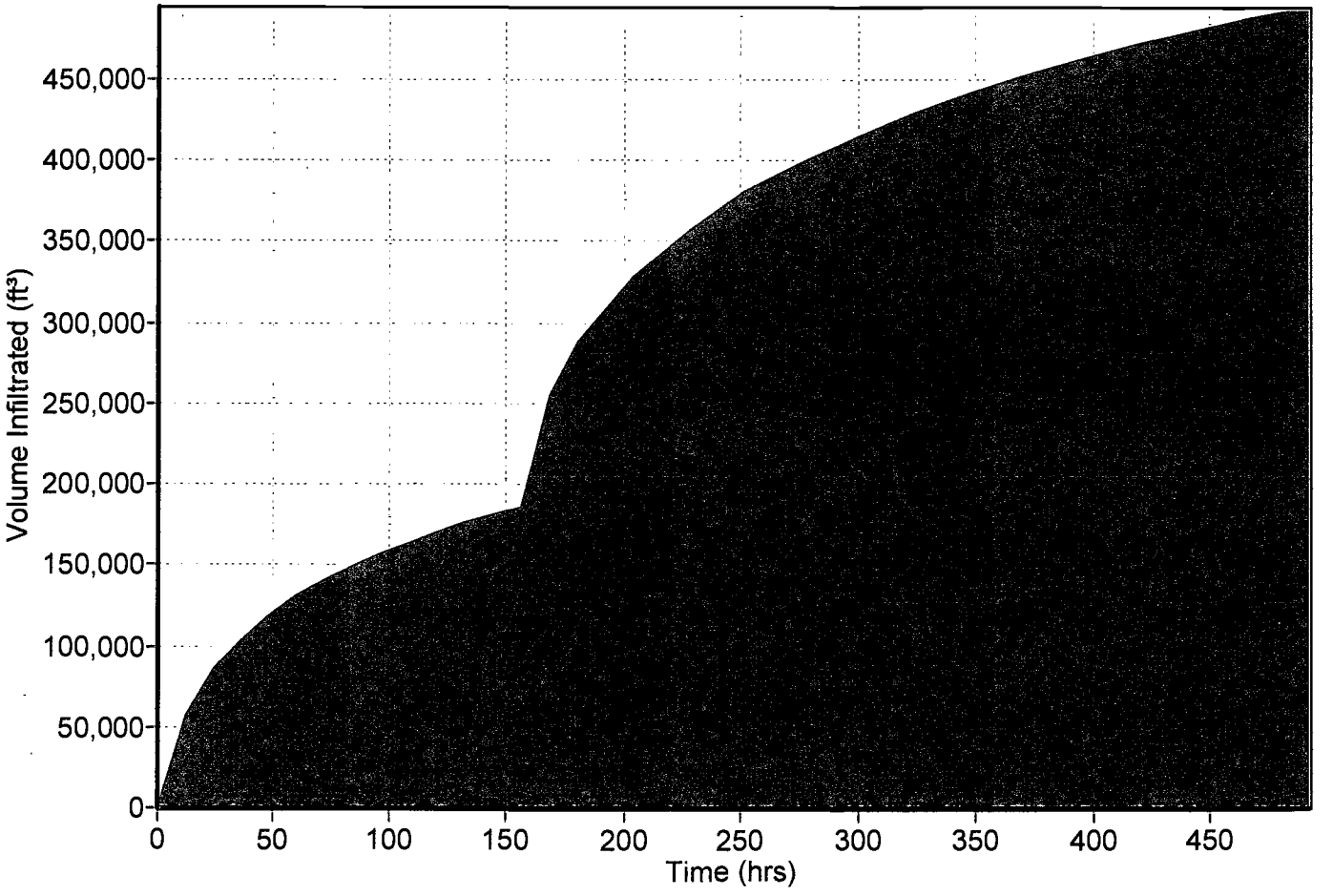
SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves Improvements 25yr 96hr

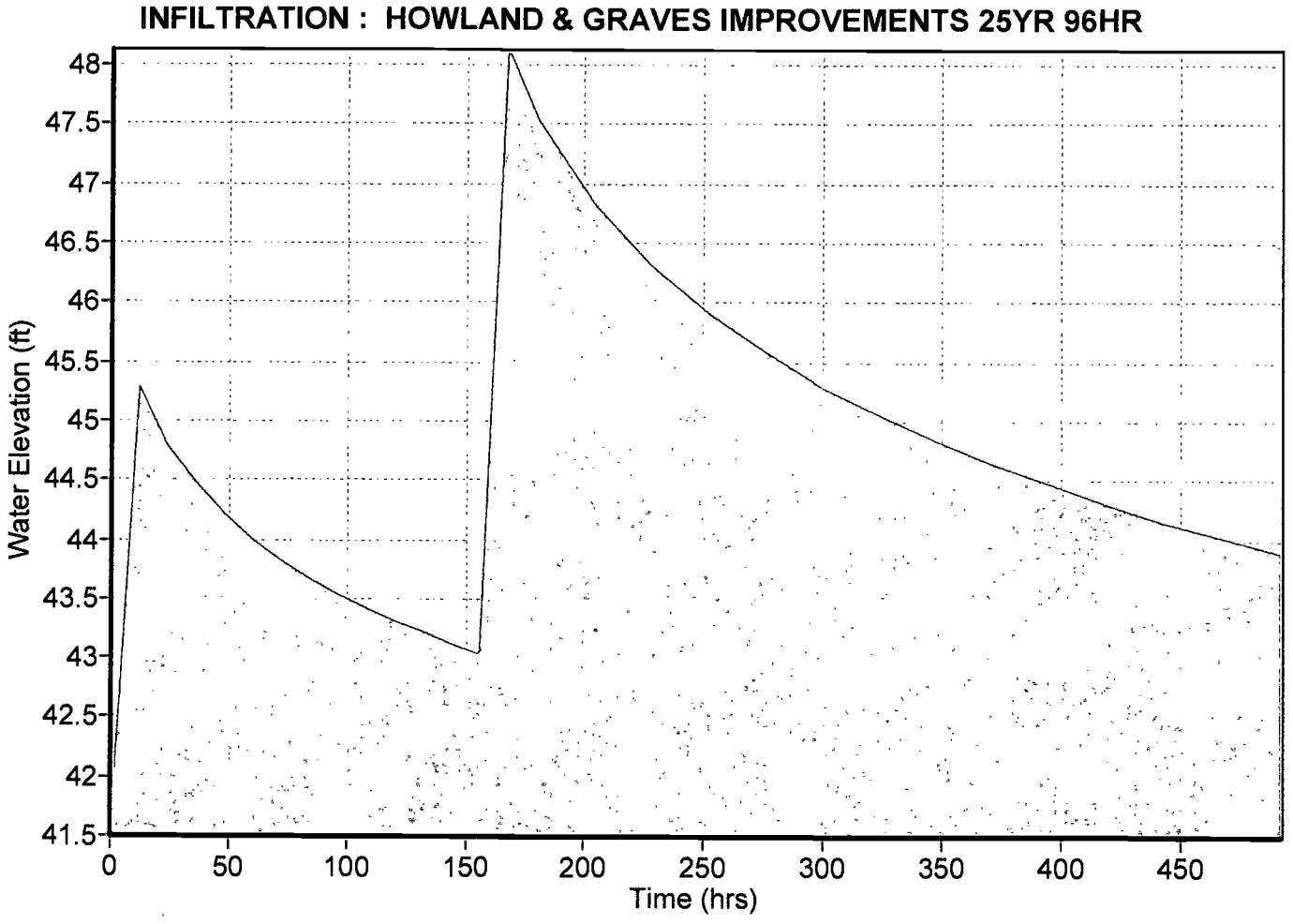
CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.08855	
468.10	44.014	0.08526		0.00
			0.08196	
492.10	43.889			0.00

Maximum Water Elevation: 48.132 feet @ 168.10 hours Recovery @ > 492.100 hours
* Time increment when there is no runoff
Maximum Infiltration Rate: 2.406 ft/day

INFILTRATION : HOWLAND & GRAVES IMPROVEMENTS 25YR 96HR



Total Volume Infiltrated = 494,548 ft³



Max Water Elevation = 48.13 ft

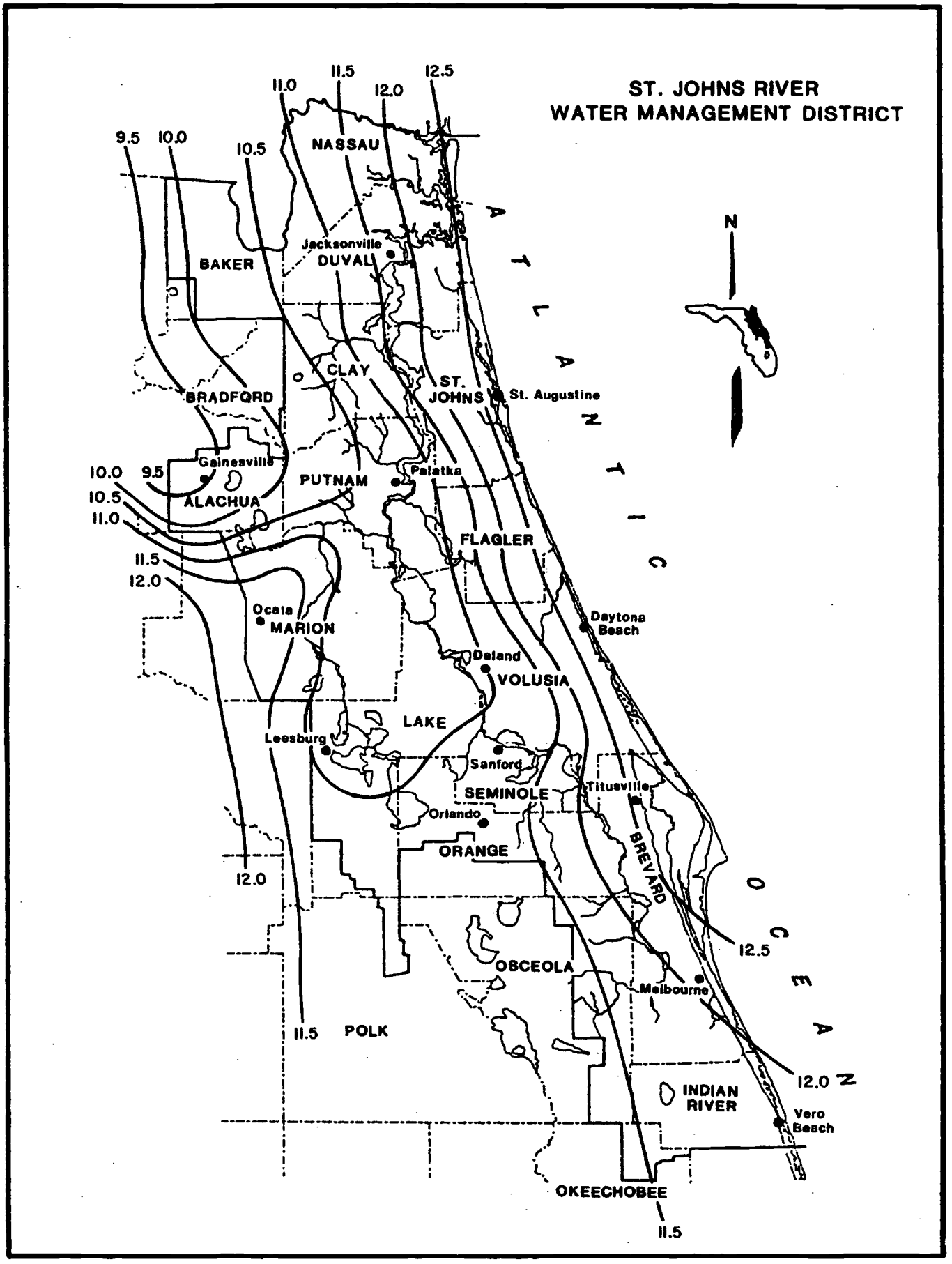


Figure 13. 25-Year 96-Hour Maximum Rainfall for Northeast Florida, Inches.

SR 427 Basin #4 Runoff Estimates

Request for Modification to Permit #40-127-0499G

Pre S.R. 472 (Howland) & Graves Ave. Runoff 25 year/96 hour Storm

Pond #4 Basin Area =	23.77	acres	
SCS Curve Number =	49		(See Below Wt CN Calculations as permitted, no change to permitted design to date)
S(retention variable) = (1,000/CN) - 10	10.41	inches	
Rainfall (P) (25y/96hr)	11.2	inches	
Q (runoff) = (P-0.2*S)^2/(P+0.8*S)	4.26	inches	
Runoff Volume =	**8.43**	**ac-ft**	**Pre 25 yr/96 hr Stage = 41.38'**

Post S.R. 472 (Howland) & Graves Ave. Runoff 25 year/96 hour Storm

Pond #4 Basin Area =	23.77	acres	
SCS Curve Number =	52		(See Below Wt CN Calculations, Including additional paved lanes)
S(retention variable) = (1,000/CN) - 10	9.23	inches	
Rainfall (P) (25y/96hr)	11.2	inches	
Q (runoff) = (P-0.2*S)^2/(P+0.8*S)	4.71	inches	
Runoff Volume =	**9.33**	**ac-ft**	**Post 25 yr/96 hr Stage = 41.99'**

Water Quality - 40C-42.026(4) System less than 40% impervious and SCS Type A soils

1.0" over the total area =	1.98	ac-ft	
1.25" over the imp. Area =	0.66	ac-ft	
Required Water Quality =	**1.98**	**ac-ft**	**Water Quality Stage = 35.20'**

SR 427 Basin #4 Runoff Estimates

Request for Modification to Permit #40-127-0499G

Pre-Improvements CN Per As-Built Drainage Basin Tabulations

Land Use	Soil Class	Area (ac)	CN	Product
Impervious Areas				
Howland Blvd & Graves Avenue	Imp.	5.22	98	511.56
Impervious Area Subtotal		5.22		
Pervious Areas				
Offsite or Not Within Road R/W:				
County Pond Area & Contributing Area	A	7.8	30	234
Within Road Right of Way:				
roadway median	A	0.49	39	19.11
roadway outside of edge of pavement	A	10.26	39	400.14
Pervious Subtotal		18.55		
	Total =	23.77		1164.81
			Wt CN =	**49**

UPDATED WEIGHTED CN, INCLUDING ADDITIONAL IMPROVEMENTS ON S.R. 472 AND GRAVES AVENUE

Land Use	Soil Class	Area (ac)	CN	Product	
Impervious Areas					
Howland Blvd & Graves Avenue	Imp.	6.29	98	616.42	**(Original 5.22 acres plus an additional Paved Area 46,609.20 s.f.) (The 46,609 s.f. includes future 11,700 s.f. widening of Graves Ave.)**
Impervious Area Subtotal		6.29			
Pervious Areas					
Offsite or Not Within Road R/W:					
County Pond Area & Contributing Area	A	7.8	30	234	
Within Road Right of Way:					
roadway median	A	0.31	39	12.09	
roadway outside of edge of pavement	A	9.37	39	365.43	
Pervious Subtotal		17.48			
	Total =	23.77		1227.94	
			Wt CN =	**52**	

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40-76095-4-P

Existing Volusia County Pond#4

Elev	Area (sf)	Incremental Vol (cf)	Cummulative Vol (cf)	Cummulative Vol (af)
30	157.6			
		3,492.15		
31	6826.7		3,492.15	0.08
		10,394.15		
32	13961.6		13,886.30	0.32
		17,208.55		
33	20455.5		31,094.85	0.71
		22,512.80		
34	24570.1		53,607.65	1.23
		26,635.45		
35	28,700.80		80,243.10	1.84
		30,702.35		
36	32,703.90		110,945.45	2.55
		34,884.80		
37	37,065.70		145,830.25	3.35
		39,515.05		
38	41,964.40		185,345.30	4.25
		44,546.15		
39	47,127.90		229,891.45	5.28
		53,316.80		
40	59,505.70		283,208.25	6.50
		60,001.50		
41	60,497.30		343,209.75	7.88
		63,610.80		
42	66,724.30		406,820.55	9.34
		69,419.65		
43	72,114.99		476,240.20	10.93
		74,690.20		
44	77,265.40		550,930.39	12.65
		79,872.10		
45	82,478.80		630,802.49	14.48
		85,094.75		
46	87,710.70		715,897.24	16.43
		90,391.10		
47	93,071.50		806,288.34	18.51
		95,927.10		
48	98,782.70		902,215.44	20.71
		103,280.05		
49	107,777.40		1,005,495.49	23.08
		114,239.26		
50	120,701.11		1,119,734.75	25.71

Existing Swale Just North of County Pond#4

Elev	Area (sf)	Incremental Vol (cf)	Cummulative Vol (cf)	Cummulative Vol (af)
43	1055			
		3,065.50		
44	5076		3,065.50	0.07
		5,975.00		
45	6874		9,040.50	0.21
		7,858.50		
46	8843		16,899.00	0.39
		10,039.50		
47	11236		26,938.50	0.62
		12,772.50		
48	14309		39,711.00	0.91
		16,408.00		
49	18507		56,119.00	1.29
		20,209.00		
50	21911		76,328.00	1.75

Combined Cummulative Volume (af)
0.08
0.32
0.71
1.23
1.84
2.55
3.35
4.25
5.28
6.50
7.88
9.34
10.93
12.72
14.69
16.82
19.13
21.62
24.37
27.46

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : Howland & Graves PAV Recovery
MANUAL RUNOFF DATA USED
UNSATURATED ANALYSIS EXCLUDED

Pond Bottom Area	6,827.00 ft²
Pond Volume between Bottom & DHWL	639,896.38 ft³
Pond Length to Width Ratio (L/W)	2.20
Elevation of Effective Aquifer Base	22.00 ft
Elevation of Seasonal High Groundwater Table	23.00 ft
Elevation of Starting Water Level	31.00 ft
Elevation of Pond Bottom	31.00 ft
Design High Water Level Elevation	45.00 ft
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.30
Unsaturated Vertical Hydraulic Conductivity	1.20 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	37.20 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.30
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	1.00

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

MODRET

TIME - RUNOFF INPUT DATA

PROJECT NAME: HOWLAND & GRAVES PAV RECOVERY

STRESS PERIOD NUMBER	INCREMENT OF TIME (hrs)	VOLUME OF RUNOFF (ft^3)
Unsat	0.00	0.00
1	0.10	86,248.80
2	11.90	0.00
3	12.00	0.00
4	12.00	0.00
5	12.00	0.00
6	12.00	0.00
7	12.00	0.00
8	12.00	0.00
9	12.00	0.00
10	12.00	0.00
11	12.00	0.00
12	12.00	0.00
13	12.00	0.00
14	12.00	0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves PAV Recovery

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
00.00 - 0.00	23.000	0.000 *		
			0.00000	
0.00	23.000	0.17407		
			0.17591	
0.10	32.886	0.17775		0.00
			0.39702	
12.00	32.513	0.42696		0.00
			0.45715	
24.00	32.081	0.43380		0.00
			0.41044	
36.00	31.693	0.37780		0.00
			0.34517	
48.00	31.367	0.31882		0.00
			0.29247	
60.00	31.091	0.27273		0.00
			0.25298	
64.56	31.000	0.23767		0.00
			0.22236	
84.00	30.642	0.21006		0.00
			0.19776	
96.00	30.455	0.18765		0.00
			0.17753	
108.00	30.287	0.16915		0.00
			0.16077	
120.00	30.135	0.15383		0.00
			0.14689	
132.00	29.996	0.14102		0.00
			0.13516	
144.00	29.868	0.13017		0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves PAV Recovery

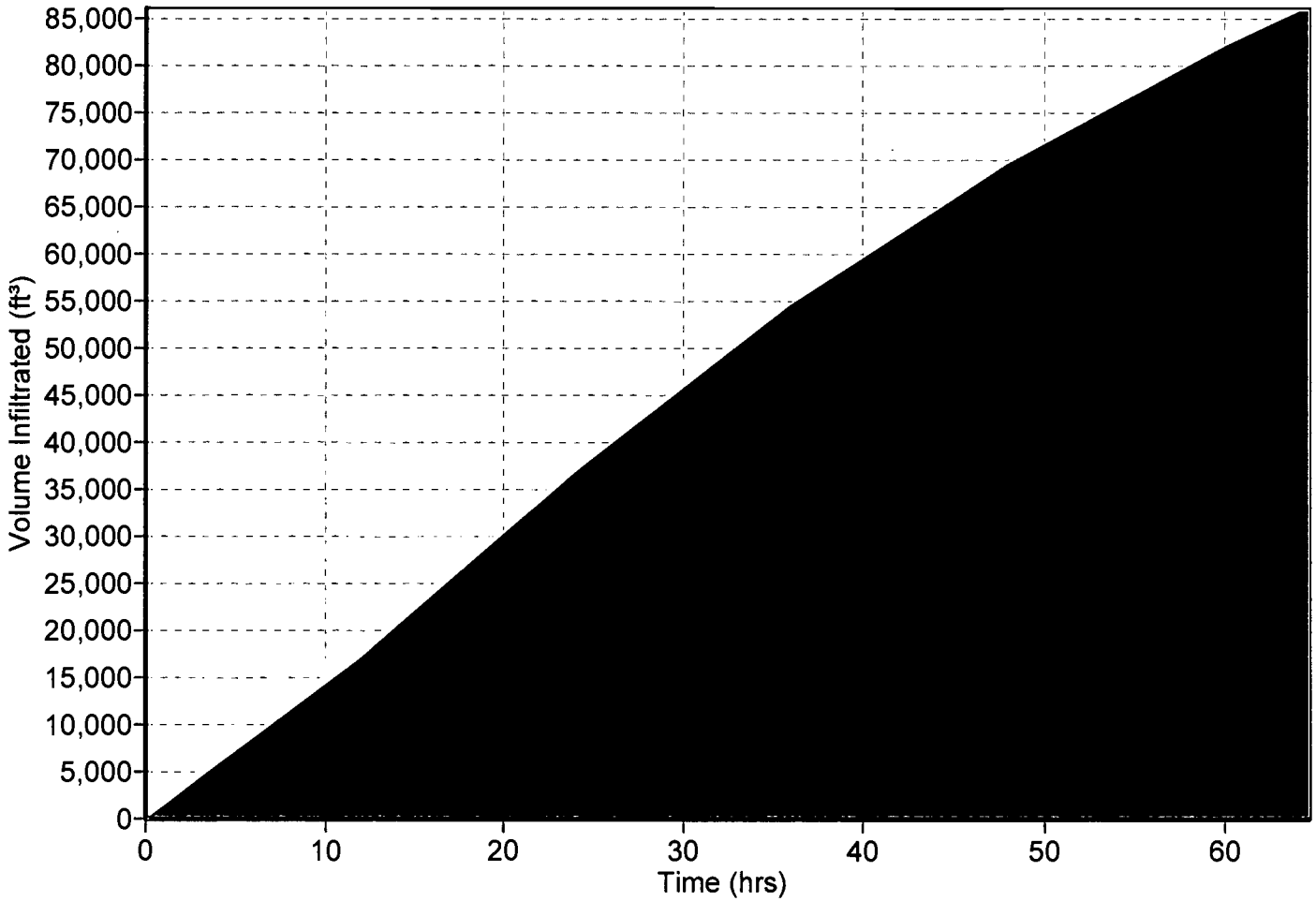
CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.12518	
156.00	29.750			0.00

Maximum Water Elevation: 32.886 feet @ 0.10 hours Recovery @ 64.558 hours

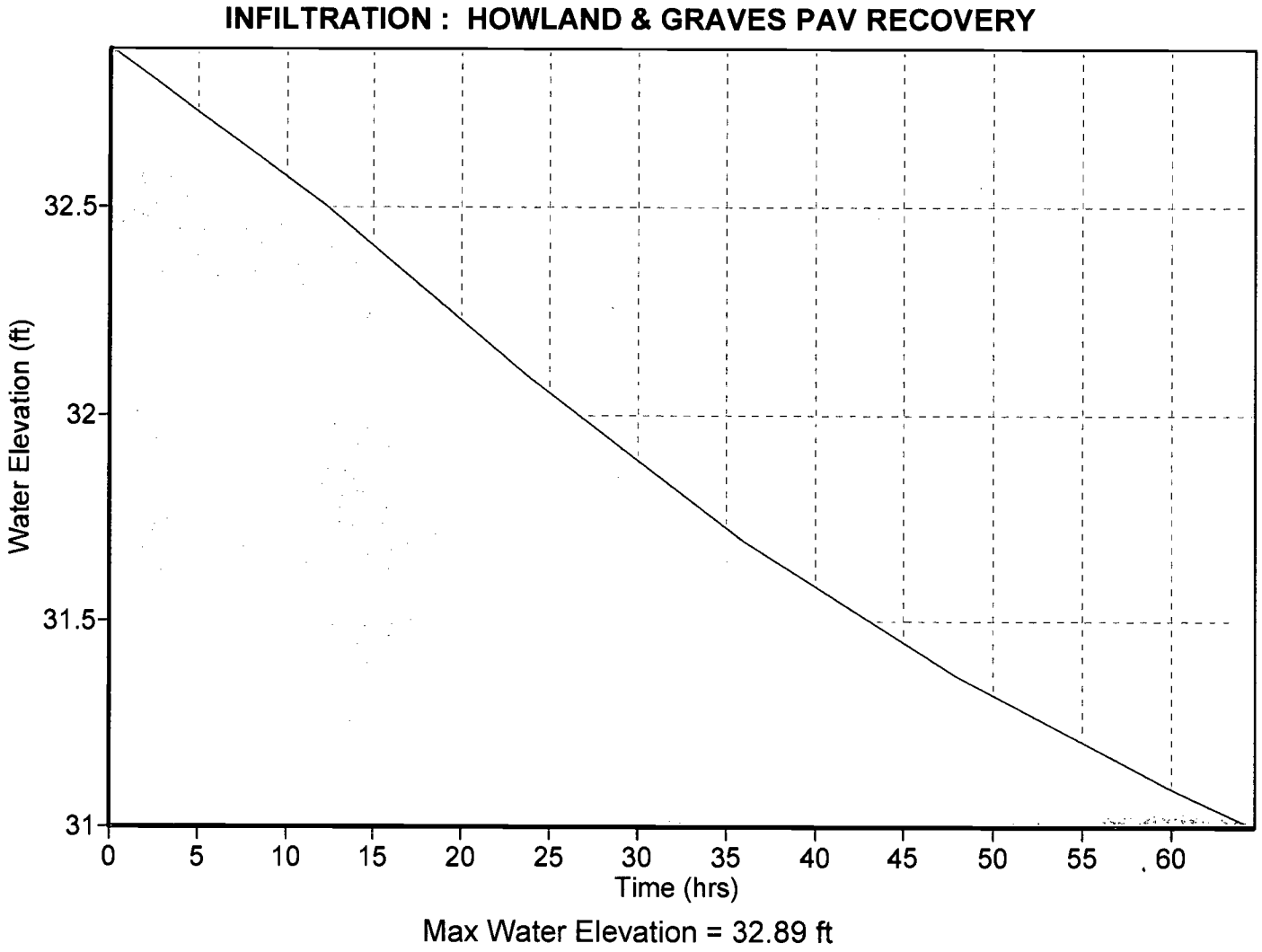
* Time increment when there is no runoff

WARNING Maximum Infiltration Rate: 0.864 ft/day Exceeds Vertical Permeability: 0.600 ft/day

INFILTRATION : HOWLAND & GRAVES PAV RECOVERY



Total Volume Infiltrated = 86,249 ft³



Max Water Elevation = 32.89 ft

MODRET

SUMMARY OF UNSATURATED & SATURATED INPUT PARAMETERS

PROJECT NAME : Howland & Graves 25yr_96hr Recovery
MANUAL RUNOFF DATA USED
UNSATURATED ANALYSIS EXCLUDED

Pond Bottom Area	6,827.00 ft²
Pond Volume between Bottom & DHWL	639,896.38 ft³
Pond Length to Width Ratio (L/W)	2.20
Elevation of Effective Aquifer Base	22.00 ft
Elevation of Seasonal High Groundwater Table	23.00 ft
Elevation of Starting Water Level	31.00 ft
Elevation of Pond Bottom	31.00 ft
Design High Water Level Elevation	45.00 ft
Avg. Effective Storage Coefficient of Soil for Unsaturated Analysis	0.30
Unsaturated Vertical Hydraulic Conductivity	1.20 ft/d
Factor of Safety	2.00
Saturated Horizontal Hydraulic Conductivity	37.20 ft/d
Avg. Effective Storage Coefficient of Soil for Saturated Analysis	0.30
Avg. Effective Storage Coefficient of Pond/Exfiltration Trench	1.00

Hydraulic Control Features:

	Top	Bottom	Left	Right
Groundwater Control Features - Y/N	N	N	N	N
Distance to Edge of Pond	0.00	0.00	0.00	0.00
Elevation of Water Level	0.00	0.00	0.00	0.00
Impervious Barrier - Y/N	N	N	N	N
Elevation of Barrier Bottom	0.00	0.00	0.00	0.00

MODRET

TIME - RUNOFF INPUT DATA

PROJECT NAME: HOWLAND & GRAVES 25YR_96HR RECOVERY

STRESS PERIOD NUMBER	INCREMENT OF TIME (hrs)	VOLUME OF RUNOFF (ft^3)
Unsat	0.00	0.00
1	0.10	406,414.81
2	11.90	0.00
3	12.00	0.00
4	24.00	0.00
5	24.00	0.00
6	24.00	0.00
7	24.00	0.00
8	24.00	0.00
9	24.00	0.00
10	24.00	0.00
11	24.00	0.00
12	24.00	0.00
13	24.00	0.00
14	24.00	0.00
15	24.00	0.00
16	24.00	406,414.81
17	24.00	0.00
18	24.00	0.00
19	24.00	0.00
20	24.00	0.00
21	24.00	0.00
22	24.00	0.00
23	24.00	0.00
24	24.00	0.00
25	24.00	0.00
26	24.00	0.00
27	24.00	0.00
28	24.00	0.00
29	24.00	0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves 25yr_96hr Recovery

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
00.00 - 0.00	23.000	0.000 *		
			0.00000	
0.00	23.000	0.24022		
			0.24783	
0.10	39.890	0.25544		0.00
			1.16089	
12.00	38.802	1.11533		0.00
			1.06938	
24.00	37.791	0.95391		0.00
			0.72298	
48.00	36.424	0.61507		0.00
			0.50717	
72.00	35.466	0.44401		0.00
			0.38084	
96.00	34.746	0.34147		0.00
			0.30209	
120.00	34.175	0.27554		0.00
			0.24900	
144.00	33.704	0.23009		0.00
			0.21119	
168.00	33.305	0.19726		0.00
			0.18333	
192.00	32.958	0.17278		0.00
			0.16223	
216.00	32.652	0.15401		0.00
			0.14578	
240.00	32.376	0.13915		0.00
			0.13252	
264.00	32.126	0.12699		0.00

MODRET

SUMMARY OF RESULTS

PROJECT NAME : Howland & Graves 25yr_96hr Recovery

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.12146	
288.00	31.896	0.11674		0.00
			0.11201	
312.00	31.684	0.53111		0.00
			0.95021	
336.00	38.780	0.75629		0.00
			0.56237	
360.00	37.717	0.47972		0.00
			0.39707	
384.00	36.966	0.35426		0.00
			0.31144	
408.00	36.377	0.28502		0.00
			0.25860	
432.00	35.889	0.24038		0.00
			0.22215	
456.00	35.469	0.20859		0.00
			0.19503	
480.00	35.100	0.18441		0.00
			0.17379	
504.00	34.771	0.16521		0.00
			0.15663	
528.00	34.475	0.14953		0.00
			0.14243	
552.00	34.206	0.13646		0.00
			0.13049	
576.00	33.959	0.12540		0.00
			0.12032	
600.00	33.732	0.11597		0.00

MODRET

SUMMARY OF RESULTS

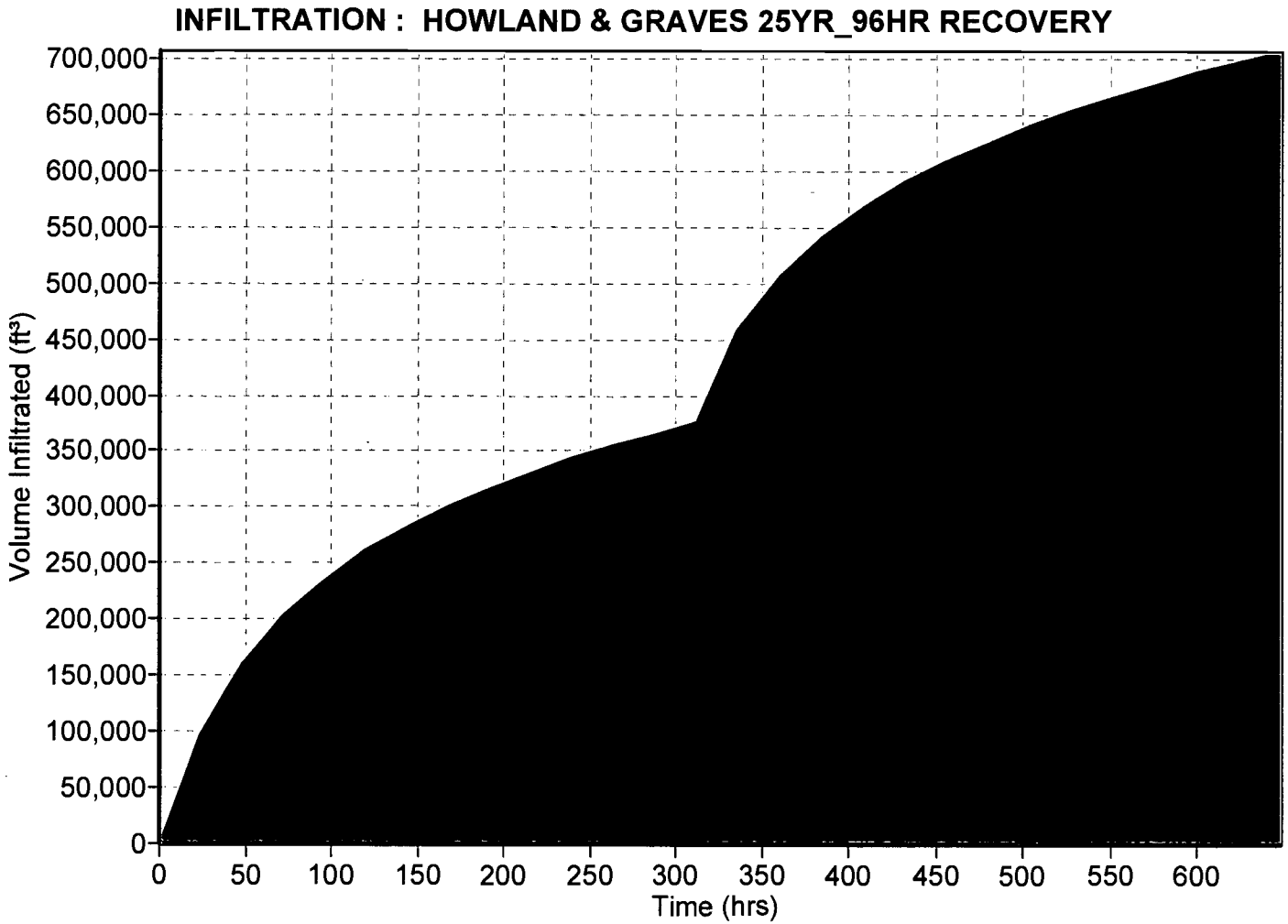
PROJECT NAME : Howland & Graves 25yr_96hr Recovery

CUMULATIVE TIME (hrs)	WATER ELEVATION (feet)	INSTANTANEOUS INFILTRATION RATE (cfs)	AVERAGE INFILTRATION RATE (cfs)	CUMULATIVE OVERFLOW (ft^3)
			0.11163	
624.00	33.521	0.10787		0.00
			0.10412	
648.00	33.324			0.00

Maximum Water Elevation: 39.890 feet @ 0.10 hours Recovery @ > 648.000 hours

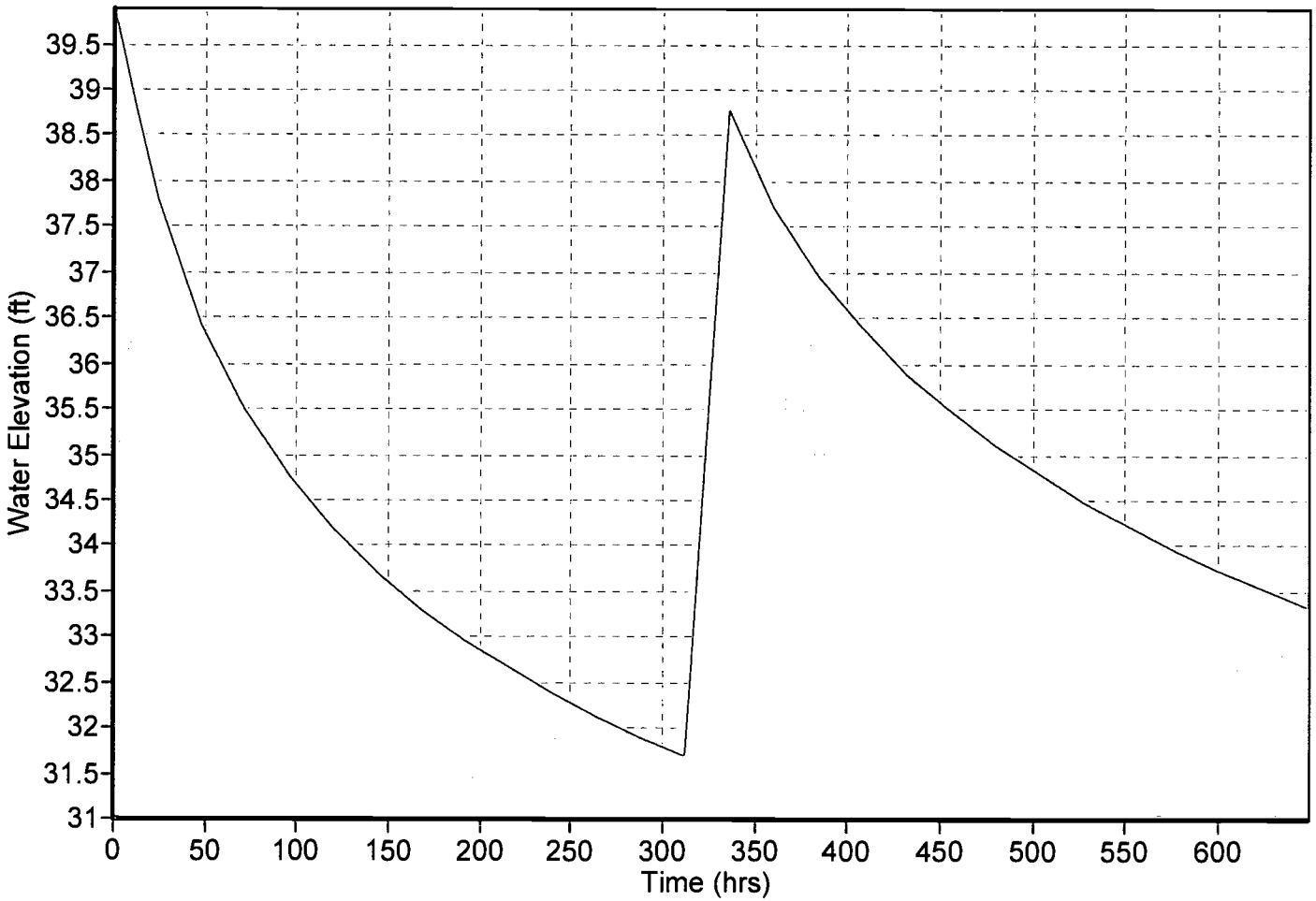
* Time increment when there is no runoff

WARNING Maximum Infiltration Rate: 2.194 ft/day Exceeds Vertical Permeability: 0.600 ft/day



Total Volume Infiltrated = 706,599 ft³

INFILTRATION : HOWLAND & GRAVES 25YR_96HR RECOVERY



Max Water Elevation = 39.89 ft

BECHTOL ENGINEERING AND TESTING, inc.

May 8, 2012
BET Project No. G11132

TO: Mr. Frank DeMarsh
Deltona Retail Holdings LLC.
P.O. Box 2076
Deland, FL 32720-2076

RE: Soil Borings and Permeability Testing
Deltona Village - County Pond
Deltona, Florida

Dear Mr. DeMarsh:

As requested, Bechtol Engineering and Testing, Inc. (BET) has conducted soil borings and field permeability/hydraulic conductivity testing at the subject site. The purpose of BET's borings and testing was to gain general insight as to the soil, groundwater and permeability characteristics in the area of the existing Volusia County stormwater retention pond near the intersection of Howland Boulevard and Graves Avenue in Deltona, Florida, and based on these characteristics to provide recommended design parameters for stormwater recovery analysis.

Approximate locations of the borings and permeability tests performed are shown on the Boring Location Plan presented on the attached Figure 1. Encountered subsurface soils, encountered and estimated seasonal high groundwater levels, and applicable permeability data are summarized on the Soil Profiles, also presented on Figure 1. Based on the encountered conditions, BET recommends the following input parameters for use in stormwater pond recovery analyses:

DESIGN PARAMETER	RECOMMENDED VALUE
ELEVATION OF EFFECTIVE AQUIFER BASE (FEET, NAVD88)	22.0
ELEVATION OF SEASONAL HIGH GROUNDWATER (FEET, NAVD88)	23.0
UNSATURATED VERTICAL HYDRAULIC CONDUCTIVITY (FPD)	1.2
SATURATED HORIZONTAL HYDRAULIC CONDUCTIVITY (FPD)	37.2

The recommended parameters are based the assumption that the top of the deeper seated clay layer at average elevation of 22' NAVD88 represents the base of the effective aquifer. Seasonal high groundwater (SHGW) level is assumed to be the average of the SHGW elevations at P-1, P-2 and P-3. Horizontal hydraulic conductivity is assumed to be the average of the two measured horizontal permeability rates in the effective aquifer soils. Recommended vertical hydraulic conductivity is based on the estimated vertical permeability rate in the slightly clayey sands in the lower portion of the effective aquifer.

The boring profiles depict subsurface conditions only at the specific locations drilled and to the termination depths noted. Permeability and hydraulic conductivity rates noted are based on actual field measured parameters and do not incorporate any factor of safety for design.

The services requested and performed are for the sole purpose of aiding the design engineer in evaluating and designing stormwater management systems. Variations in subsurface conditions not disclosed by the borings and testing performed may occur, and could influence the performance and construction of such systems.

BET appreciates the opportunity to be of service, and trusts this information is complete and sufficient for your needs. If you should have any questions or if BET may be of further service, please do not hesitate to call.

Respectfully,

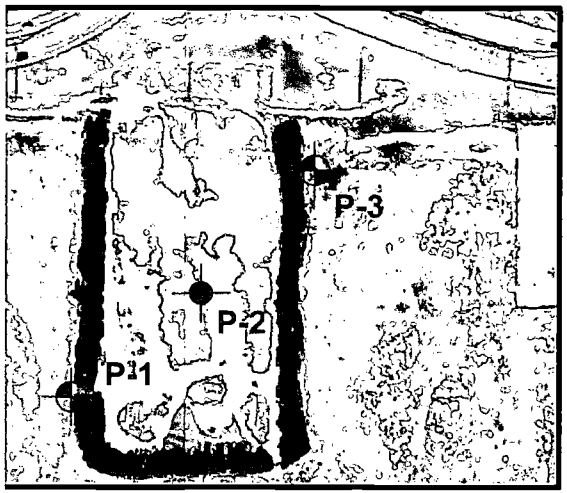
Bechtol Engineering and Testing, Inc.
Certificate of Authorization No. 00005492

THOMAS R BECHTOL LICENSE 38538 STATE OF FLORIDA PROFESSIONAL ENGINEER 5/8/12

Thomas Bechtol, P.E.
President / Principal Engineer
Florida License No. 38538
G11132 Perm Report - May 8, 2012.wpd

cc: Herb Greco, P.E., MGA Engineering

LOCATION PLAN



SCALE (feet)
0 100 200 300

OOGLE EARTH
IUARY 19, 2012

SYMBOL LEGEND

AY-BROWN FINE SAND, (SP), VERY LOOSE

BROWN TO LIGHT BROWN TO GRAY FINE SAND, (SP), VERY LOOSE
JM DENSE

AY TO GRAY TO LIGHT BROWN TO YELLOW-BROWN SLIGHTLY
O CLAYEY FINE SAND, (SP-SC)(SC), MEDIUM DENSE TO DENSE

GRAY-BROWN CLAY TO SLIGHTLY SANDY CLAY, (CH), FIRM TO HARD

OIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL
TION

WATER LEVEL, REFERENCED IN FEET TO EXISTING GROUND
, DATE OF READING

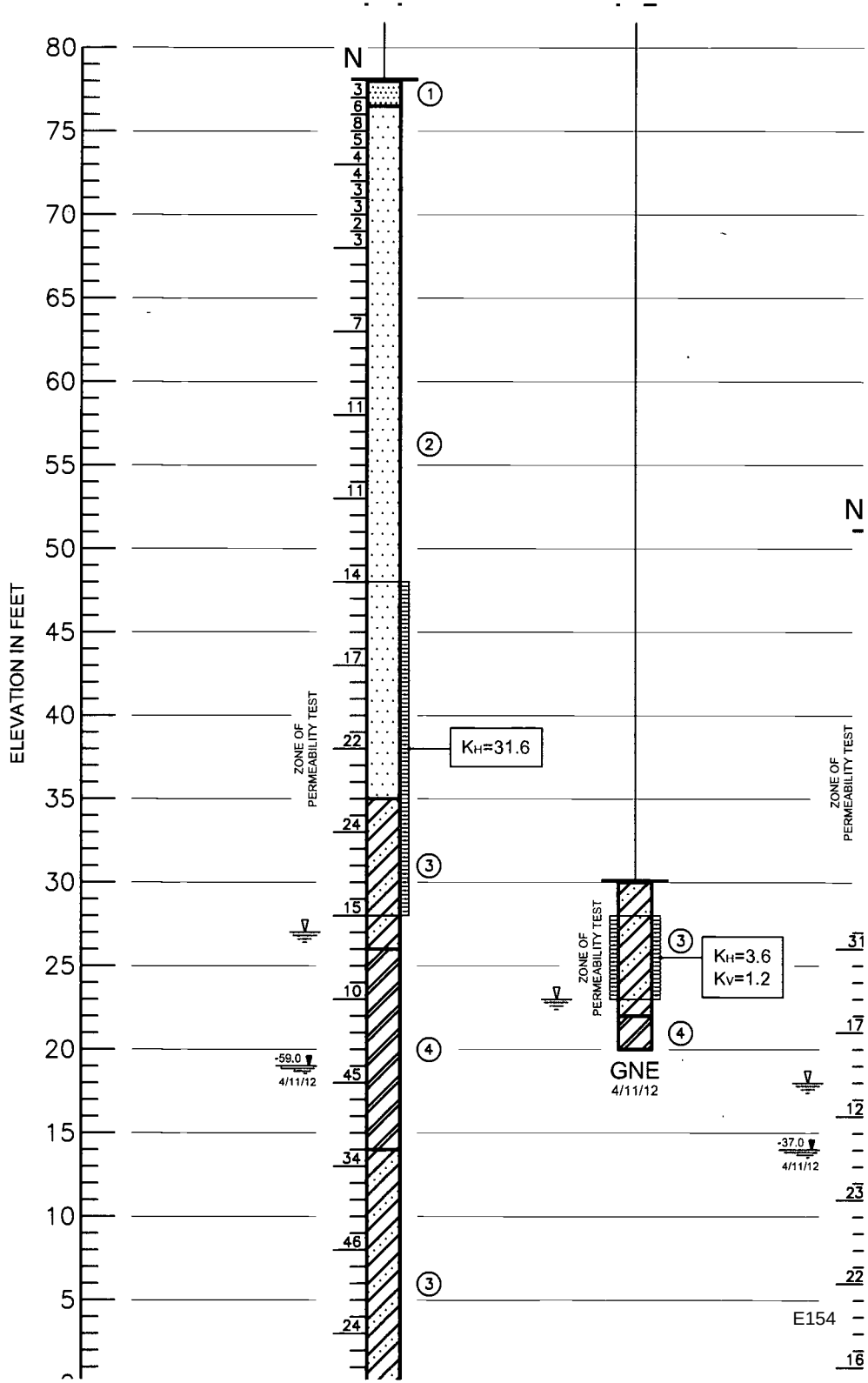
WATER NOT ENCOUNTERED TO DEPTH OF BORING ON DATE NOTED

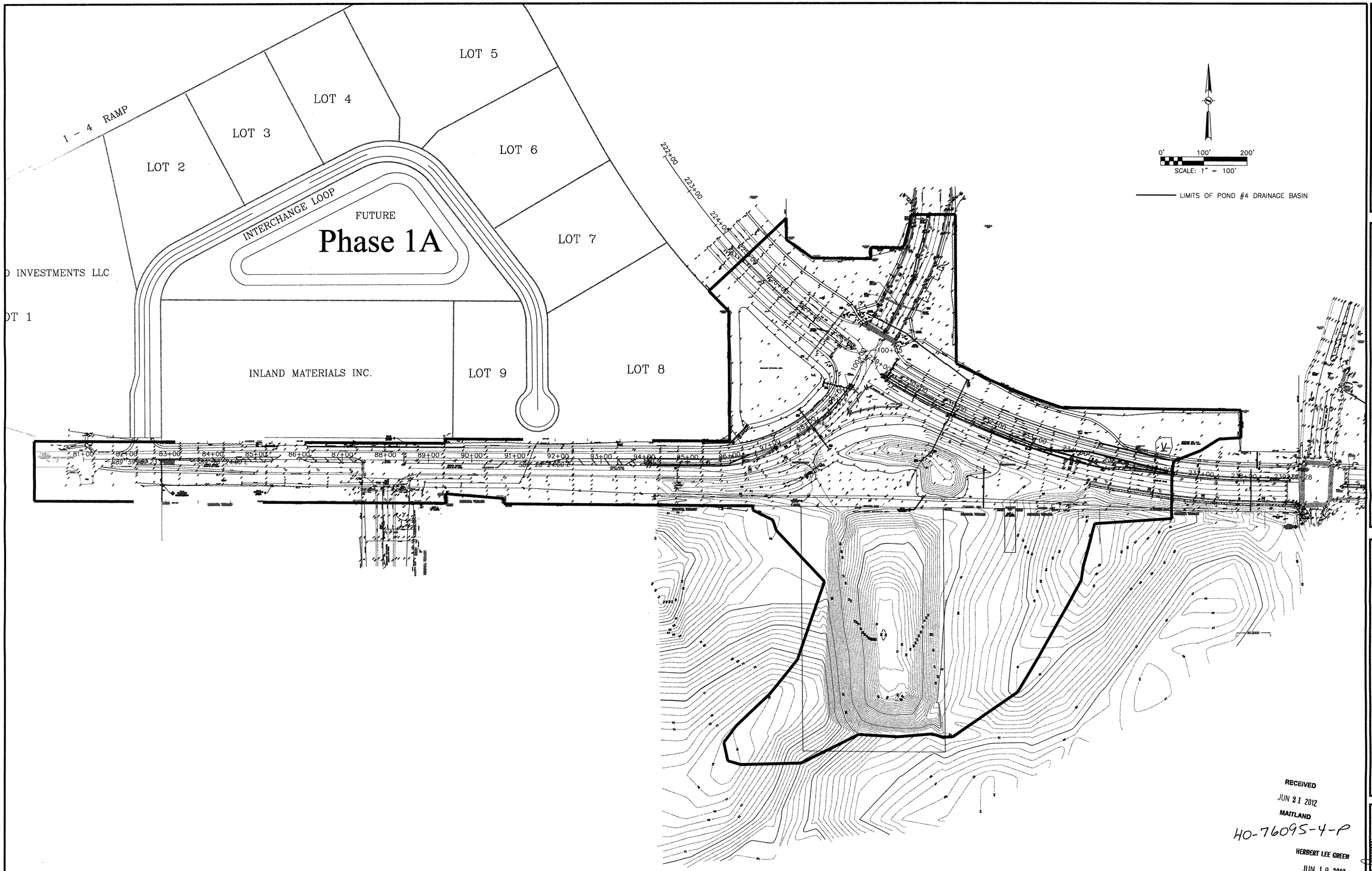
ED AVERAGE SEASONAL HIGH GROUNDWATER LEVEL

D PENETRATION RESISTANCE IN BLOWS PER FOOT

ED COEFFICIENT OF HORIZONTAL PERMEABILITY
PER DAY)

ED COEFFICIENT OF VERTICAL PERMEABILITY
PER DAY)





DESIGNED BY: JEM	DRAWN BY: VCS	CHKD BY: HLG
FDR NUMBER: CD3.02.01.09-EP.DWL	DATE: 04/2010	SCALE: 1" = 40'

NO.	REVISIONS	DATE	APPL
1			
2			
3			
4			
5			

HOWLAND DRAINAGE BASIN

HOWLAND BLVD & GRAVES AVE IMPROVEMENTS
CITY OF DELTONA, FLORIDA

DELTONA RETAIL HOLDINGS, LLC

RECEIVED
JUN 21 2012
MAITLAND
HO-76095-4-P

HERBERT LEE GREEN
JUN 19 2012
P.E. # 48867

PRE-DEVELOPMENT AREA SUMMARY

ROADWAY IMPERVIOUS AREA (CN OF 98) =	227,192 S.F.	(5.22 ACRES)
ROADWAY MEDIAN PERVIOUS AREA (CN OF 39) =	21,286 S.F.	(0.49 ACRES)
ROADWAY OUTSIDE OF EDGE OF PAVEMENT PERVIOUS AREA (CN OF 39) =	447,030 S.F.	(10.26 ACRES)
SUBTOTAL OF RIGHT OF WAY AREA =	695,508 S.F.	(15.97 ACRES)
PERVIOUS AREA OF POND#4 AND CONTRIBUTING AREA (CN OF 30) =	339,916 S.F.	(7.80 ACRES)
TOTAL OF RIGHT OF WAY & OFFSITE AREA =	1,035,424 S.F.	(23.77 ACRES)

POST-DEVELOPMENT AREA SUMMARY

ROADWAY IMPERVIOUS AREA (CN OF 98) =	262,118 S.F.	(6.02 ACRES)
ROADWAY IMPERVIOUS AREA FUTURE WIDENING GRAVES (CN OF 98) =	11,700 S.F.	(0.27 ACRES)
ROADWAY MEDIAN PERVIOUS AREA (CN OF 39) =	13,631 S.F.	(0.31 ACRES)
ROADWAY OUTSIDE OF EDGE OF PAVEMENT PERVIOUS AREA (CN OF 39) =	408,059 S.F.	(9.37 ACRES)
SUBTOTAL OF RIGHT OF WAY AREA =	695,508 S.F.	(15.97 ACRES)
PERVIOUS AREA OF POND#4 AND CONTRIBUTING AREA (CN OF 30) =	339,916 S.F.	(7.80 ACRES)
TOTAL OF RIGHT OF WAY & OFFSITE AREA =	1,035,424 S.F.	(23.77 ACRES)

CAZAZ
Engineering Consultants
P.O. Box 450006•Kissimmee, Florida 34745
Phone: (407) 738-1979 Fax: (407) 348-7552
CERTIFICATION OF AUTHORIZATION # 28509

THESE PLANS MAY NOT BE COPIED OR MODIFIED WITHOUT WRITTEN PERMISSION OF HERBERT LEE GREEN

HERBERT LEE GREEN LICENSE No. 48867 STATE OF FLORIDA PROFESSIONAL ENGINEER
NOT VALID UNLESS SIGNED, DATED & EMBOSSED WITH A REGISTERED ENGINEER'S SEAL

SHEET NUMBER
EX

Permit No. 42-127-2852DNG

Kentucky Avenue (C.R. #4139)

From Graves Avenue to S.R. 472

County of Volusia

Public Works Services Center

Construction Engineering Group

123 West Indiana Avenue ● DeLand, Florida 32720-4262

Telephone (904) 736-5967 ◐ 257-6067 ◐ 423-3874 ● FAX 822-5736

May 17, 1999

RECEIVED

MAY 20 1999

42-127-2852NG

PDS

ORLANDO

SJR WMD

Marjorie D. Cook, P.E.
Department of Resource Management
St Johns River Water Management District
618 East South Street
Orlando, FL 32801

RE: Kentucky Avenue, Graves to S.R. 472, #42-127-2852NG

Dear Ms. Cook:

The County of Volusia wishes to extend the above referenced permit for an additional two (2) years. The permit was originally issued June 3, 1994.

The project consists of widening Kentucky Avenue from Graves Avenue to S.R. 472 from an existing two lane to a four lane roadway. A set of plans is enclosed for your review.

If you need any more information to issue a permit extension, please feel free to call me at (904) 736-5967 extension 2701.

Sincerely,

Kimberly Dixon
Civil Engineer

c: William Gray, County Engineer
Scott Martin, County Drainage Engineer

VOLUSIA RECYCLES

Printed On Recycled Paper

County of Volusia

DEPARTMENT OF ENGINEERING
123 West Indiana Avenue • DeLand, Florida 32720-4262
Telephone (904) 736-5967 • 257-6067 • 423-3874 • FAX 822-5736

RECEIVED
MAY 16 1994
42-127-2852ANG
RECORDS
ORLANDO

May 12, 1994

Rick Ottesen, Engineer
Department of Resource Management
St. Johns River Water Management District
618 East South Street
Orlando, FL 32801

Re: General Correspondence
Kentucky Avenue
Application #42-127-2852ANG

Dear Mr. Ottesen:

The purpose of this letter is to transmit three (3) copies of the drainage calculations performed by Dyre, Riddle, Mills and Precourt, Inc. and the soils report for Kentucky Avenue.

Should you have any questions or desire additional information, please feel free to call me at Suncom 377-2323.

Sincerely yours,

Scott H. Martin, P.E.
County Drainage Engineer

SHM/kp

c: William G. Gray, County Engineer

WP51\EG\CE\MARTIN\OTTESEN

VOLUSIA RECYCLES
Printed On Recycled Paper.

STORMWATER CALCULATIONS

FOR

PERMIT APPLICATION:

KENTUCKY AVENUE WIDENING
VOLUSIA COUNTY, FLORIDA

PREPARED FOR

VOLUSIA COUNTY

SUBMITTED TO

St. Johns River Water Management District

BY

DYER, RIDDLE, MILLS & PRECOURT, INC.

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Soil Legend	4
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Pond Perc Rates	8
Drawdown Analysis	9
Project Hydrographs	10-15
Structure Tabulations	16

Appendix A-
Soils Report by American Testing Labs

KENTUCKY AVENUE
DRAINAGE DESIGN OVERVIEW

LOCATION:

This project is located approximately 1/2 mile west of Interstate 4 ,in Volusia County. It begins at the intersection with Graves Avenue and ends at S.R. 472. The proposed construction consists of replacing the existing two lane roadway with a four lane divided roadway with a 22' grassed median.

DESIGN CRITERIA:

Roadway drainage will be collected in 1' deep grassed swales and deposited into ditch bottom inlets located at the sags where it will then be piped to the retention ponds. The topography in this area is characterized as having rolling hills and numerous isolated depressions which collect and store runoff . There is no positive outfall for roadway drainage on this project, consequently all runoff will be stored in retention areas where it will percolate into the ground. The soils in the immediate area are all classified in hydrologic group "A" with a depth to seasonal high water table over 17 feet. Calculated permeability rates are very high. (See soils report included with these calculations) Pond bottoms will remain bare to facilitate exfiltration into the soil

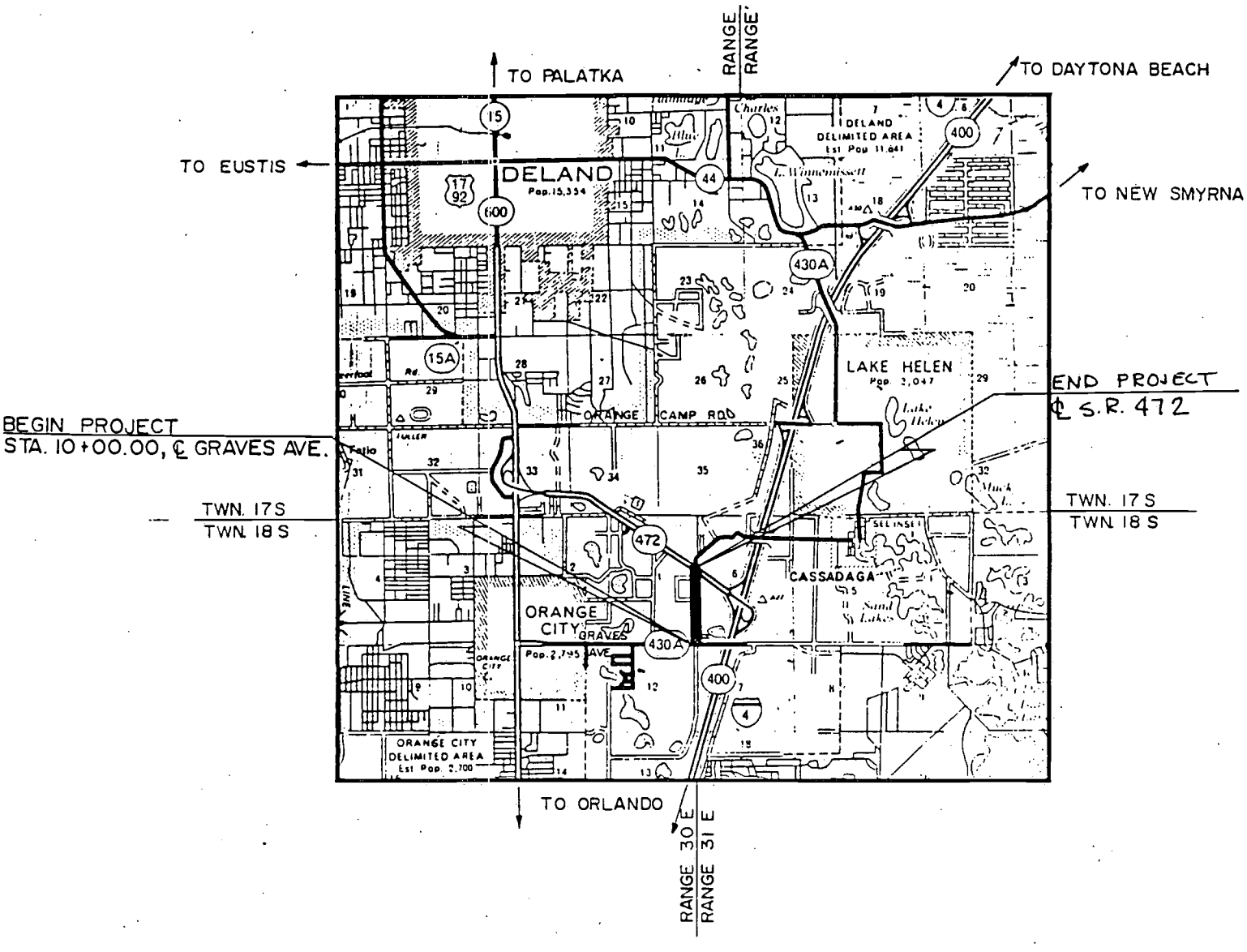
BASIN DESCRIPTIONS:

Basin # 1: Sta. 10+00 To Sta. 41+87.25

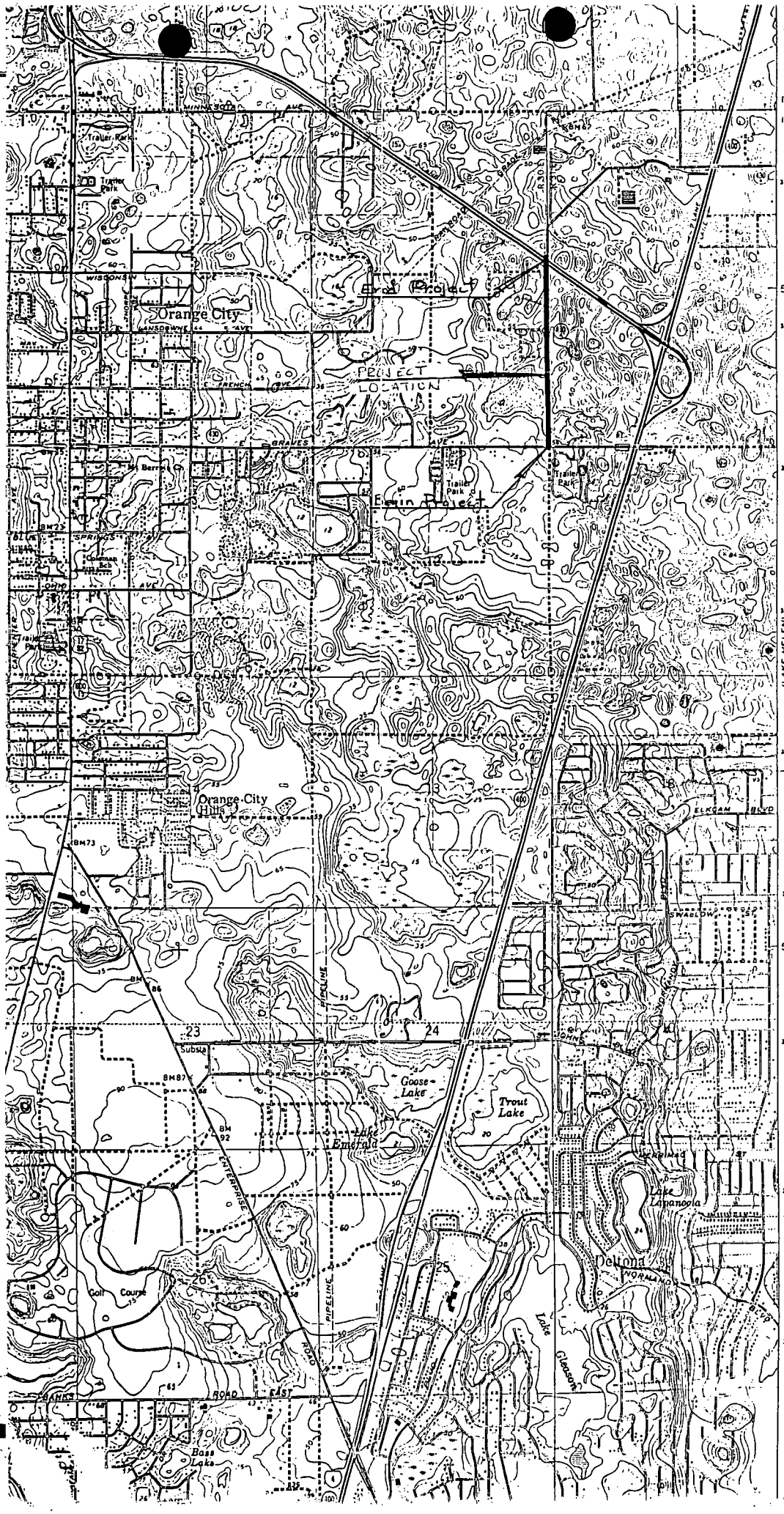
This basin starts at the intersection with Graves Avenue and continues northward to the crest of a vertical curve at Sta. 41+87.25. It also includes 16.95 acres outside the right-of-way that drains toward the project. All runoff from these areas will be stored in retention pond # 1. The existing ground cover is heavily wooded outside of the existing roadway limits. The retention area will be constructed adjacent to the roadway on the edge of an existing depression. The retention area is designed to hold the entire runoff from a 100 year, 24 hour storm. Drawdown will be via percolation through the pond bottom and sides.

Basin # 2: Sta. 41+87.25 To Sta. 51+59.00

This basin starts at the crest of a vertical curve at Sta. 41+87.25 and ends at the intersection with S.R. 472. It also includes 0.70 acres outside the right-of-way that drains toward the project. All runoff from these areas will be stored in the retention pond. The existing ground cover is heavily wooded outside of the existing roadway limits. The retention area will be constructed adjacent to the roadway next to an existing F.D.O.T. retention area. The retention area is designed to hold the entire runoff from a 100 year, 24 hour storm. Drawdown will be via percolation through the pond bottom and sides.



PROJECT VICINITY MAP


Orange City
Project
PROJECT
LOCATION
Elgin Project
Orange City
Hills
Golf Course
Goose
Lake
Trout
Lake
Lake
Emerald
Lake
Lapanooka
Deltona
Lake
Gleason
Bass
Lake
PIPELINE
ENTERPRISE
ROAD
EAST
SCALE: 1" = 2000'
N
57'30"
55'
KENTUCKY AVE. PROJECT LOCATION MAP

SOIL LEGEND

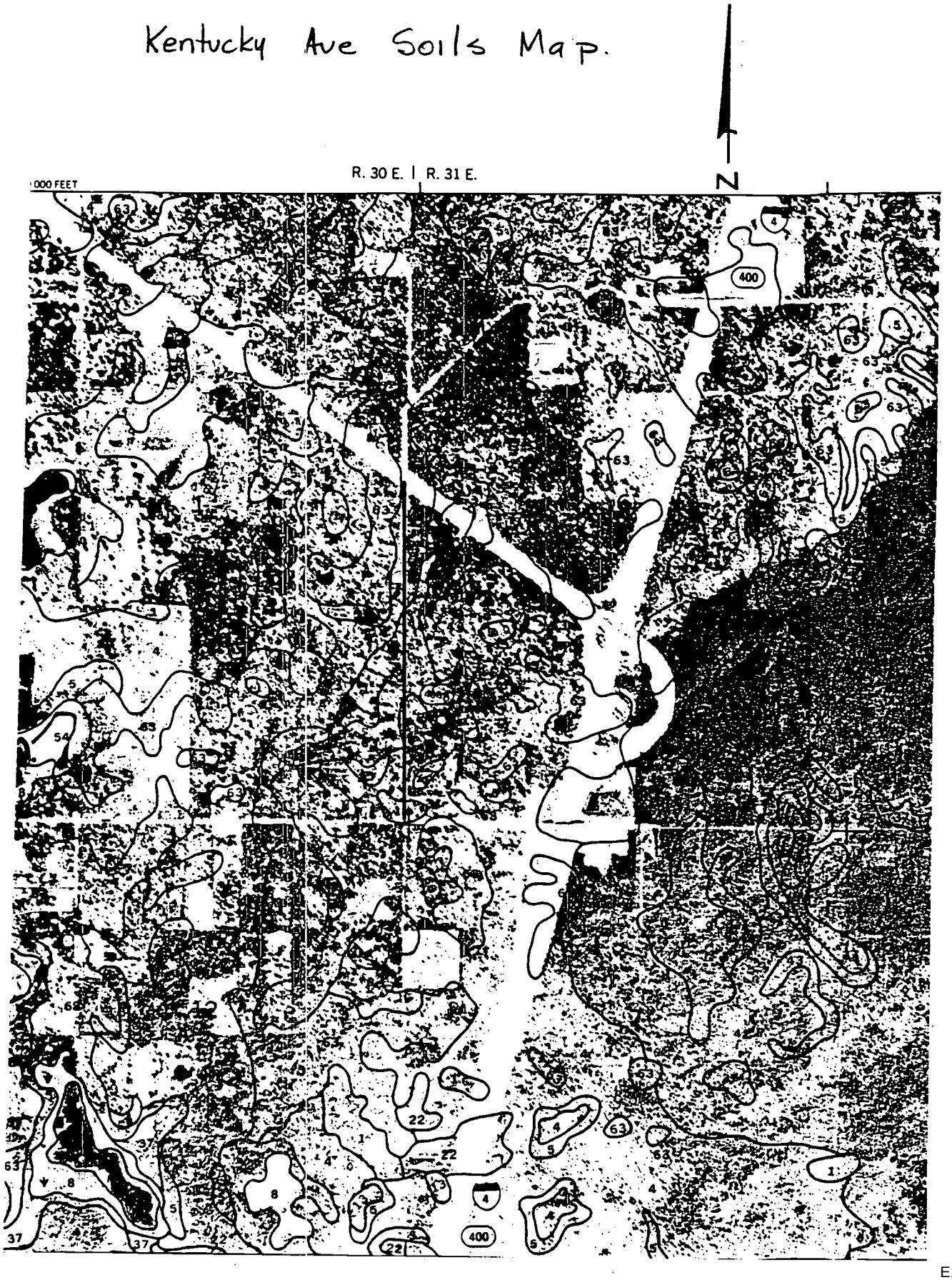
The legend is numeric. Soil names followed by the superscript 1/ are broadly defined units. The composition of these units is more variable than that of the other units in the survey area, but has been controlled well enough to be interpreted for the expected use of the soils. Soils without a slope designation in the name are those that occur only on nearly level landscapes.

SYMBOL	NAME
1	Apopka fine sand, 0 to 5 percent slopes
2	Apopka fine sand, 5 to 12 percent slopes
3	Arents 1/
4	Astatula fine sand, 0 to 8 percent slopes
5	Astatula fine sand, 8 to 17 percent slopes
6	Astatula-Urban land complex, 0 to 8 percent slopes
7	Astor fine sand
8	Basinger fine sand, depressional
9	Beaches
10	Bluff sandy clay loam
11	Bulow sand, 0 to 5 percent slopes
12	Canaveral sand, 0 to 5 percent slopes
13	Cassia fine sand
14	Chobee fine sandy loam
15	Cocoa sand, 0 to 5 percent slopes
16	Cocoa-Urban land complex, 0 to 5 percent slopes
17	Daytona sand, 0 to 5 percent slopes
18	Daytona-Urban land complex, 0 to 5 percent slopes
19	Deland fine sand, 0 to 5 percent slopes
20	EauGallie fine sand
21	EauGallie fine sand, depressional
22	Electra fine sand, 0 to 5 percent slopes
23	Farmton fine sand
24	Fluvaquents 1/
25	Gator muck
26	Holopaw sand
27	Hontoon mucky peat
28	Hydraquents 1/
29	Immokalee sand
30	Immokalee sand, depressional
31	Malabar fine sand
32	Myakka fine sand
33	Myakka fine sand, depressional
34	Myakka-St. Johns complex
35	Myakka-Urban land complex
36	Myakka Variant fine sand
37	Orsino fine sand, 0 to 5 percent slopes
38	Paisley fine sand
39	Palm Beach sand, 2 to 8 percent slopes
40	Palm Beach-Urbanland-Paola complex, 0 to 8 percent slopes
41	Palm Beach-Paola association, 2 to 8 percent slopes 1/
42	Paola fine sand, 0 to 8 percent slopes
43	Paola fine sand, 8 to 17 percent slopes
44	Paola-Urban land complex, 0 to 8 percent slopes
45	Pineda fine sand
46	Pinellas fine sand
47	Pits
48	Placid fine sand, depressional
49	Pomona fine sand
50	Pomona fine sand, depressional
51	Pomona-St. Johns complex
52	Pompano fine sand
53	Pompano-Placid complex
54	Quartzipsamments, gently sloping 1/
55	Riviera fine sand
56	Samsula muck
57	Satellite sand
58	Satellite-Urban land complex
59	Scoggin sand
60	Smyrna fine sand
61	St. Johns fine sand
62	St. Lucie fine sand, 0 to 8 percent slopes
63	Tavares fine sand, 0 to 5 percent slopes
64	Tequesta muck
65	Terra Ceia muck
66	Tomoka muck
67	Turnbull muck
68	Turnbull Variant sand
69	Tuscawilla fine sand
70	Tuscawilla-Urban land complex
71	Urban land
72	Valkaria fine sand
73	Wabasso fine sand
74	Wabasso fine sand, depressional
75	Wauchula fine sand
76	Wauchula fine sand, depressional
77	Winder fine sand

DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS · SURVEYORS · SCIENTISTS · PLANNERS

SH. NO.:	JOB NO.: 85-411.78	
MADE BY: ROD	DATE: 11	13 | 89
CHECKED BY:	DATE:	

Kentucky Ave Soils Map.



VOLUSIA COUNTY, KENTUCKY AVENUE POST DEVELOPMENT

Basin 1 Station 10+00 To Station 41+87.25

Areas Total = 29.00 Acres (Includes 16.95 Acres Offsite)

Soils Apopka, Astatula & Tavares Fine Sands

Weighted CN Calculations

LAND USE	AREA (ac)	CN	PRODUCT
Pavement	4.76	98	466.48
Grass "A"	7.52	39	293.28
Woods "A"	15.95	36	574.20
Pond	0.77	98	75.46
TOTAL	29.00		1409.42

WEIGHTED CN = 48.60

Time of Concentration

Kinematic SCS TR 55		Concentrated Flow TR 55	
Length =	300	Length =	1700
n=	0.4	Slope =	0.019
Slope =	0.007		
Intensity=	4.75		
Time of Conc. (hr)=	1.08	Time of Conc. (hr)=	0.21

Total Tc = 1.29 hrs

Stage / Storage Information

Stage (El.)	Area (Ac.)	Storage (Ac.-Ft.)
30.0	0.52	0.00
31.0	0.59	0.56
32.0	0.65	1.18
33.0	0.72	1.86
34.0	0.78	2.61
35.0	0.85	3.43
36.00	0.91	4.31
37.00	0.98	5.25
38.00	1.04	6.26

VOLUSIA COUNTY, KENTUCKY AVENUE POST DEVELOPMENT

Basin 2 Station 41+87.25 To Station 51+59.00

Areas Total= 4.97 Acres (Includes 0.70 Acres Offsite)

Soils Apopka, Astatula & Tavares Fine Sands

Weighted CN Calculations

LAND USE	AREA (ac)	CN	PRODUCT
Grass "A"	2.77	39	108.03
Pavement	1.86	98	182.28
Pond Bottom	0.34	98	33.32
TOTAL	4.97		323.63
		WEIGHTED CN =	65.10

Time of Concentration

Kinematic SCS TR 55

Length =	300
n=	0.24
Slope =	0.0085
Intensity=	4.75
Time of Conc. (hr)=	0.66

Concentrated Flow TR 55

Length =	500
Slope =	0.0236
Time of Conc. (hr)=	0.06

Total Tc = 0.72 hrs

Stage / Storage Information

Stage (El.)	Area (Ac.)	Storage(Ac.-Ft.)
35.00	0.34	0.00
36.00	0.39	0.37
37.00	0.44	0.78
38.00	0.49	1.25
39.00	0.54	1.76
40.00	0.59	2.33
41.00	0.64	2.94

DYER, RIDDLE, MILLS & PRECOURT, INC.
ENGINEERS · SURVEYORS · SCIENTISTS · PLANNERS

SH. NO.:	JOB NO.: 85-411.78
MADE BY: ROD	DATE: 11/10/89
CHECKED BY:	DATE:

Kentucky Ave.. Basin #1 Perc Rates

Soils : Apopka, Astatula Tavares Fine Sand
Hydrologic Group "A"
Steady state infiltration rate = 30.4"/hr.
Estimated design infiltration rate = 6"/hr.

Max. infiltration rate 6"/hr. x. 51 Ac = .255 Ac Ft/hr.
= 3.09 cfs.
It is assumed that the pond bottom will absorb up to 3.09 cfs during the design storm (100 yr., 24 hr.) The remaining volume will be stored in the pond

Kentucky Ave. Basin # 2 Perc. Rates

Soils: Same as basin # 1

Estimated design infiltration rate = 6"/hr.
Max infiltration rate 6"/hr x. 34 Ac = .17 Ac Ft/hr
= 2.06 cfs.

Drawdown Analysis
Pond # 1.

Volume stored = 5.92 Ac Ft = 257,875 cf.
Perc rate = 3.09 cfs
Drawdown time = 257,875/3.09/3600 = 23.2 hrs.

Pond # 2.
Volume stored = 1.11 Ac Ft = 48,352 cf
Perc rate = 2.06 cfs
Drawdown time = 48,352/2.06/3600 = 6.51 hrs.

DYER, RIDDLE, MILLS & PRECOURT
SANTA BARBARA URBAN HYDROGRAPH
KENTUCKY AVE. VOLUSIA CO.

FILE NAME:n JOB No. 85-411.78
11-13-1989

DATA FOR HYDROGRAPH BASIN 1 No. 1

DRAINAGE AREA (ACRES)= 29.00
CURVE NUMBER = 48.60
TIME OF CONC. (HOURS)= 1.290
COMPUTATIONAL INTER. (MIN.)= 15.0000
DESIGN STORM 100 YEAR 24 HOUR
24 HOUR RAINFALL AMOUNT 10.80 INCHES
INTERIM FLORIDA SCS RAINFALL DISTRIBUTION

DYER, RIDDLE, MILLS & PRECOURT
SANTA BARBARA URBAN HYDROGRAPH
KENTUCKY AVE. VOLUSIA CO.

FILE NAME:N JOB No. 85-411.78
11-13-1989

DATA FOR HYDROGRAPH BASIN 2 No. 1

DRAINAGE AREA (ACRES)= 4.97
CURVE NUMBER = 65.10
TIME OF CONC. (HOURS)= 0.720
COMPUTATIONAL INTER. (MIN.)= 7.5000
DESIGN STORM 100 YEAR 24 HOUR
24 HOUR RAINFALL AMOUNT 10.80 INCHES
INTERIM FLORIDA SCS RAINFALL DISTRIBUTION

AMERICAN TESTING LABORATORIES, INC.

CONSULTANTS IN GEOTECHNICAL ENGINEERING AND MATERIALS TESTING

Report No: 89-3372

October 23, 1989

Dyer, Riddle, Mills & Precourt
P. O. 538505
Orlando, Florida 32853-8505

Attention: Ron Magahey

Reference: Subsurface Soils Investigation
Kentucky Avenue - CR 4139
Volusia County, Florida

ATL Project No: 89.03405

Dear Mr. Magahey:

Per your approval of our Proposal No. 88-P3000R1, AMERICAN TESTING LABORATORIES, INC., performed a subsurface soils exploration for the above referenced project. The following report presents our results and is submitted for your review and consideration.

AMERICAN TESTING LABORATORIES, INC., appreciates the opportunity to be of service on this project. Should you have any questions, or if we can be of further assistance, please do not hesitate to call this office.

Respectfully submitted,

Marianne Sweeney

Marianne Sweeney, E.I.
Staff Engineer

P. Ralph Brown, P.E.
Vice President

MS/PRB/cjr

Dist: 2 Client

SUBSURFACE SOILS INVESTIGATION

FOR

KENTUCKY AVENUE - CR 4139

VOLUSIA COUNTY, FLORIDA

October 23, 1989

1. FIELD EXPLORATION AND DATA

The field exploration program consisted of drilling eight 20-ft and eight 7-ft Auger Borings (ASTM D-1452), AB-1 through AB-16, two field permeability tests, K-1 and K-2, and two double ring infiltrometer tests, DRI-1 and DRI-2. These test borings were drilled to evaluate the suitability of the subsurface soils as pavement subgrade. Additionally, the borings provided an estimate of the groundwater table in order to assess its effect on the proposed pavement and its performance.

The approximate locations of the test borings with respect to the site are illustrated on Sheet 1. A soils legend is presented on Sheet 2. The logs of the test borings are presented on Sheet 3, the results of the Field Permeability Tests are on Sheets 4 and 5, and the results of the Double Ring Infiltrometer Tests are on Sheets 6 and 7. All sheets are included in this report. A brief description of the auger boring, and a schematic diagram of the Field Permeability Test, can be found in the Appendix at the end of this report.

2. FIELD DATA EVALUATION

The soils encountered during our drilling operations were generally light brown to orange fine sands and clayey fine sands.

For an exact description of each boring log, see Sheet 3.

Soil gradations were run on five samples of typical soils. Results of these gradations are shown on Sheets 8 through 12.

The soil stratifications presented on Sheet 3 are based on gradations as well as a visual examination of the soil samples.

The groundwater level was not encountered within 20-ft of the existing ground surface in any of our borings except AB-3 at Station 25+40, 14-ft right of centerline. The groundwater level in this boring was encountered at a depth of 18.25-ft beneath the existing ground surface.

The Field Permeability Tests and Double Ring Infiltrometer Tests were performed in the proposed retention pond areas.

The field permeability coefficients were calculated and ranged from 3.3×10^{-4} ft/min to 1.1×10^{-1} ft/min. These are considered to be moderate to fast drainage rates.

The soils were classified according to AASHTO Soil Classification System. They were found to be types A-3 and A-7-5. These are AASHTO Soil Classification symbols and correspond to fine sand and clay. Note that the clay was encountered in Pond 2 above the proposed bottom elevation of that pond. The water table was not encountered to a depth of 20-ft below the existing ground surface in either retention pond area.

Based on the fact that the groundwater table was not encountered to a depth of 20-ft, our estimate of the seasonal high water table is 18-ft beneath the existing ground surface in both pond locations.

The Double Ring Infiltrometer Tests showed the steady state infiltration rates to be 30.4-in/hr in Pond 1 and 27.5-in/hr in Pond 2. Our estimate of the design infiltration rate is 6-in/hr for both ponds.

Limerock Bearing Ratio Tests were run on three samples. Test results are shown on Sheets 13 through 18. Limerock Bearing Ratios range from to 12 to 16. Corresponding SSV's range from 4 to 5.

Noticing

1722

SJR WATER MANAGEMENT DISTRICT

Henry Dean, Executive Director
John R. Wehle, Assistant Executive Director

POST OFFICE BOX 1429 PALATKA, FLORIDA 32178-1429
TELEPHONE 904/329-4500 SUNCOM 904/860-4500
FAX (EXECUTIVE/LEGAL) 329-4125 (PERMITTING) 329-4315 (ADMINISTRATION/FINANCE) 329-4508

FIELD STATIONS

618 E. South Street
Orlando, Florida 32801
407/897-4300

7775 Baymeadows Way
Suite 102
Jacksonville, Florida 32256
904/730-6270

PERMITTING:
305 East Drive
Melbourne, Florida 32904
407/984-4940

OPERATIONS:
2133 N. Wickham Road
Melbourne, Florida 32935-8109
407/254-1762

MAY 13, 1994

BRIAN S. BARNETT, SECTION LEADER
GAME & FRESH WATER FISH COMM
110 43RD AVENUE, SOUTHWEST
VERO BEACH, FL 32962

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. BARNETT:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

SHOULD YOU DESIRE ADDITIONAL INFORMATION OR FEEL YOU HAVE A SUBSTANTIAL OBJECTION REGARDING THE PROJECT, PLEASE REFER TO THE ENCLOSED LEGAL DESCRIPTION FOR THE APPROPRIATE PROCEDURES YOU SHOULD FOLLOW TO REQUEST THE INFORMATION OR TO FILE AN OBJECTION.

SINCERELY,

SBarican

SHANNON BARICAN, SR. PERMIT DATA TECHNICIAN
DIVISION OF PERMIT DATA SERVICES

CC: DISTRICT PERMIT FILE(S)
LORI DOWDY, DATA MANAGEMENT SUPERVISOR

42-127-0855ANGE 42-127-1095ANGE 42-127-2848AN

42-127-2849AN 42-127-2850AN 42-127-2851ANG

42-127-2852ANG 42-127-2853AN 42-127-2854AN

Joe E. Hill, CHAIRMAN LEESBURG
Patricia T. Harden, VICE CHAIRMAN SANFORD
Jesse J. Parrish, III, TREASURER TITUSVILLE
Lenore N. McCullagh, SECRETARY ORANGE PARK
Reid Hughes DAYTONA BEACH
Dan Roach FERNANDINA BEACH
William Segal MAITLAND
Denise M. Prescod JACKSONVILLE
James H. Williams OCALA

SJR WATER MANAGEMENT DISTRICT

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John R. Wehle, Assistant Executive Director

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407/254-1762

MAY 13, 1994

BRIAN WOODS
ADVANCED DRAINAGE SYSTEM INC.
600 EAST LANDSTREET ROAD
ORLANDO, FL 32824-7801

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. WOODS:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

SHOULD YOU DESIRE ADDITIONAL INFORMATION OR FEEL YOU HAVE A SUBSTANTIAL OBJECTION REGARDING THE PROJECT, PLEASE REFER TO THE ENCLOSED LEGAL DESCRIPTION FOR THE APPROPRIATE PROCEDURES YOU SHOULD FOLLOW TO REQUEST THE INFORMATION OR TO FILE AN OBJECTION.

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SHANNON BARICAN, SR. PERMIT DATA TECHNICIAN
DIVISION OF PERMIT DATA SERVICES

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SJR WATER MANAGEMENT DISTRICT

Henry Dean, Executive Director
John R. Wehle, Assistant Executive Director

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407/254-1762

MAY 13, 1994

CARLOS MERIDA
PHILLIPS & JORDAN
3000 HOLIDAY DRIVE
FT. LAUDERDALE, FL 33316

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. MERIDA:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

SHOULD YOU DESIRE ADDITIONAL INFORMATION OR FEEL YOU HAVE A SUBSTANTIAL OBJECTION REGARDING THE PROJECT, PLEASE REFER TO THE ENCLOSED LEGAL DESCRIPTION FOR THE APPROPRIATE PROCEDURES YOU SHOULD FOLLOW TO REQUEST THE INFORMATION OR TO FILE AN OBJECTION.

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LORI DOWDY, DATA MANAGEMENT SUPERVISOR

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407/254-1762

MAY 13, 1994

CHARLES LEE
FLORIDA AUDUBON SOCIETY
460 HIGHWAY 436, SUITE 200
CASSELBERRY, FL 32707

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. LEE:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

SHOULD YOU DESIRE ADDITIONAL INFORMATION OR FEEL YOU HAVE A SUBSTANTIAL OBJECTION REGARDING THE PROJECT, PLEASE REFER TO THE ENCLOSED LEGAL DESCRIPTION FOR THE APPROPRIATE PROCEDURES YOU SHOULD FOLLOW TO REQUEST THE INFORMATION OR TO FILE AN OBJECTION.

SINCERELY,

SBarican

SHANNON BARICAN, SR. PERMIT DATA TECHNICIAN
DIVISION OF PERMIT DATA SERVICES

CC: DISTRICT PERMIT FILE(S)
LORI DOWDY, DATA MANAGEMENT SUPERVISOR

42-127-0855ANGE 42-127-1095ANGE 42-127-2848AN

42-127-2849AN 42-127-2850AN 42-127-2851ANG

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Joe E. Hill, CHAIRMAN LEESBURG
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Reid Hughes DAYTONA BEACH
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William Segal MAITLAND
Denise M. Prescod JACKSONVILLE
James H. Williams OCALA

SJR WATER MANAGEMENT DISTRICT

Henry Dean, Executive Director
John R. Wehle, Assistant Executive Director

POST OFFICE BOX 1429 PALATKA, FLORIDA 32178-1429
TELEPHONE 904/329-4500 SUNCOM 904/860-4500
FAX (EXECUTIVE/LEGAL) 329-4125 (PERMITTING) 329-4315 (ADMINISTRATION/FINANCE) 329-4508

FIELD STATIONS

618 E. South Street
Orlando, Florida 32801
407/897-4300

7775 Baymeadows Way
Suite 102
Jacksonville, Florida 32256
904/730-6270

PERMITTING:
305 East Drive
Melbourne, Florida 32904
407/984-4940

OPERATIONS:
2133 N. Wickham Road
Melbourne, Florida 32935-8109
407/254-1762

MAY 13, 1994

CITY OF DELAND
PLANNING DEPARTMENT
POST OFFICE DRAWER 449
DELAND, FL 32721-0449

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR SIR/MADAM:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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407/254-1762

MAY 13, 1994

DENISE O'TOOLE
901 6TH STREET
DAYTONA BEACH NEWS-JOURNAL
DAYTONA BEACH, FL 32015-0431

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MS. O'TOOLE:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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2133 N. Wickham Road
Melbourne, Florida 32935-8109
407/254-1762

MAY 13, 1994

DORIS L. CAPITANIO
F. W. DODGE DIVISION
1809 ART MUSEUM DRIVE, SUITE 104
POST OFFICE BOX 5647
JACKSONVILLE, FL 32247-5647

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MS. CAPITANIO:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

DOUG STORER
DCC CONSTRUCTION
POST OFFICE BOX 521108
LONGWOOD, FL 32752-1108

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. STORER:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

FLORIDA DEPARTMENT OF NATURAL RESOURCES
DIVISION OF RECREATION AND PARKS
1800 WEKIVA CIRCLE
APOPKA, FL 32712

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR SIR/MADAM:

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MAY 13, 1994

FLORIDA INLAND NAVIGATION DISTRICT
DAVID K. ROACH, ASSISTANT EXECUTIVE DIRECTOR
1314 MARCINSKI ROAD
JUPITER, FL 33477

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. ROACH:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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2133 N. Wickham Road
Melbourne, Florida 32935-8109
407/254-1762

MAY 13, 1994

GLENN R. SWEENEY, PLANNER
CITY OF ORMOND BEACH
P. O. BOX 277
ORMOND BEACH, FL 32175-0277

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. SWEENEY:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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SHANNON BARICAN, SR. PERMIT DATA TECHNICIAN
DIVISION OF PERMIT DATA SERVICES

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SJR WATER MANAGEMENT DISTRICT

Henry Dean, Executive Director
John R. Wenle, Assistant Executive Director

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2133 N. Wickham Road
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MAY 13, 1994

GRATTEN WHITE
CRAGGS CONSTRUCTION COMPANY
POST OFFICE BOX 540317
ORLANDO, FL 32854-0317

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. WHITE:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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Henry Dean, Executive Director
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MAY 13, 1994

JAMES AND MARY HAGEL
3741 STATE ROAD 44
NEW SMYRNA BEACH, FL 32168

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. & MRS. HAGEL:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

JIM HUNT
DYER RIDDLE CORPORATION
1505 EAST COLONIAL DRIVE
ORLANDO, FL 32803

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. GANDY:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

JOHN A. HIGHTOWER/LARRY TIBLIS
EIGHTEEN CONSTRUCTION CO. INC.
12843 PHILLIPS HIGHWAY
JACKSONVILLE, FL 32256

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR SIRS:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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POST OFFICE BOX 1429 PALATKA, FLORIDA 32178-1429
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FAX (EXECUTIVE/LEGAL) 329-4125 (PERMITTING) 329-4315 (ADMINISTRATION/FINANCE) 329-4508

FIELD STATIONS

618 E. South Street
Orlando, Florida 32801
407/897-4300

7775 Baymeadows Way
Suite 102
Jacksonville, Florida 32256
904/730-6270

PERMITTING:
305 East Drive
Melbourne, Florida 32904
407/984-4940

OPERATIONS:
2133 N. Wickham Road
Melbourne, Florida 32935-8109
407/254-1762

MAY 13, 1994

LEE BIDGOOD
FLAGLER/VOLUSIA ENVIRONMENTAL PAC
310 QUAY ASSISI
NEW SMYRNA BEACH, FL 32169

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. BIDGOOD:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

SHOULD YOU DESIRE ADDITIONAL INFORMATION OR FEEL YOU HAVE A SUBSTANTIAL OBJECTION REGARDING THE PROJECT, PLEASE REFER TO THE ENCLOSED LEGAL DESCRIPTION FOR THE APPROPRIATE PROCEDURES YOU SHOULD FOLLOW TO REQUEST THE INFORMATION OR TO FILE AN OBJECTION.

SINCERELY,

SBarican

SHANNON BARICAN, SR. PERMIT DATA TECHNICIAN
DIVISION OF PERMIT DATA SERVICES

CC: DISTRICT PERMIT FILE(S)
LORI DOWDY, DATA MANAGEMENT SUPERVISOR

42-127-0355ANGE 42-127-1095ANGE 42-127-2843AN

42-127-2849AN 42-127-2850AN 42-127-2851ANG

42-127-2852ANG 42-127-2853AN 42-127-2854AN

Joe E. Hill, CHAIRMAN LEESBURG
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Dan Roach FERNANDINA BEACH
William Segal MAITLAND
Denise M. Prescod JACKSONVILLE
James H. Williams OCALA

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

Henry Dean, Executive Director
John R. Wehle, Assistant Executive Director

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MAY 13, 1994

NANCY LARIVIERE
LAKE WINNEMISSETT CIVIC ASSOC.
2215 EAST NEW YORK AVENUE
DELAND, FL 32724

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR SIR/MADAM:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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DIVISION OF PERMIT DATA SERVICES

CC: DISTRICT PERMIT FILE(S)
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407/254-1762

MAY 13, 1994

PRESIDENT, CCPC/RG, INC.
POST OFFICE BOX 171
LAKE COMO, FL 32157

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR SIR/MADAM:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

RICHARD ROGERS
COUCH PUMP COMPANY
POST OFFICE BOX 255
GRANT, FL 32949

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. ROGERS:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

ROBIN FRATTIN
SIERRA CONSERVATION CHAIR
18 CAPISTRANO DRIVE
ORMOND BEACH, FL 32074

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MS. FRATTIN:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

TODD SWEARINGEN
CENTRAL FLORIDA WETLANDS SOCIETY
909 BALLARD ST., UNIT B
ALTAMONTE SPRINGS, FL 32701

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. SWEARINGEN:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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Melbourne, Florida 32935-8109
407/254-1762

MAY 13, 1994

WENDELL DURHAM, OFFICE ENGINEER
PHILLIPS & JORDAN, INC.
4935 SOUTHFORK, SUITE 2
LAKELAND, FL 33813-2050

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR MR. DURHAM:

IN COMPLIANCE WITH YOUR REQUEST, ENCLOSED IS A COPY OF THE "NOTICE OF RECEIPT OF APPLICATION" RELATING TO THE PERMIT APPLICATION APPLIED FOR WITHIN THE ABOVE REFERENCED COUNTY.

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MAY 13, 1994

ZEV COHEN & ASSOC., INC.
ATTN: SUE LITTRELL
55 SETON TRAIL
ORMOND BEACH, FL 32176

SUBJECT: INTERESTED PARTY
VOLUSIA COUNTY

DEAR SIR/MADAM:

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FISCAL YEAR	SHEET NO.
89	1

COUNTY OF VOLUSIA

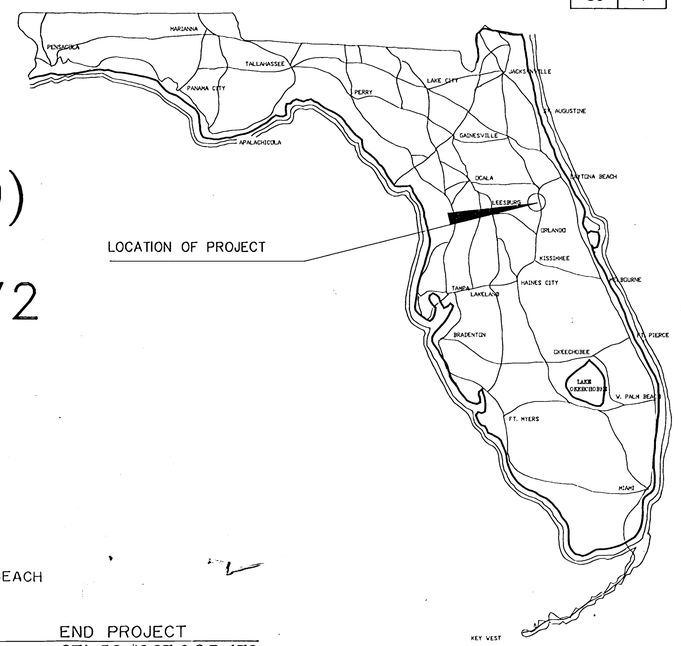
FLORIDA

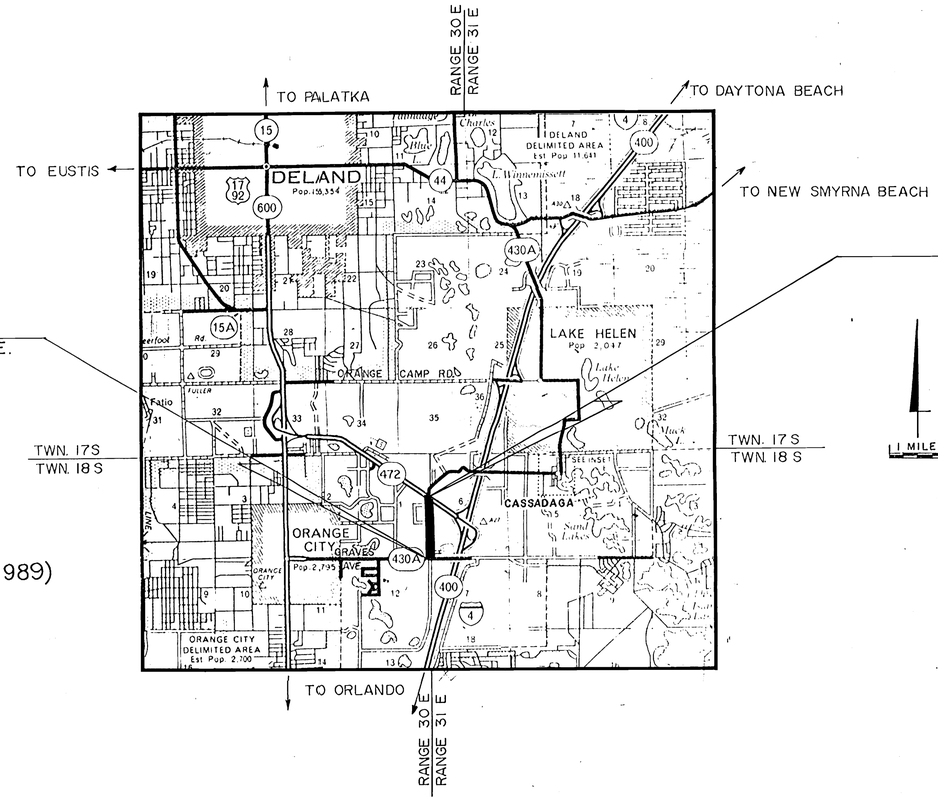
PLANS OF PROPOSED

KENTUCKY AVENUE (C.R. # 4139)

FROM GRAVES AVENUE TO S.R. 472

VOLUSIA COUNTY PROJECT NO. 4055





ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

PLANS PREPARED BY

DYER, RIDDLE, MILLS & PRECOURT, INC.

ENGINEERS – SURVEYORS

1505 E. COLONIAL DRIVE

ORLANDO, FLORIDA 32803

RECEIVED
MAY 06 1994
42-12-2852
RECORDS DIVE
ORLANDO

GOVERNING SPECIFICATIONS STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1986 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL PROVISIONS FOR THIS PROJECT

THIS CONTRACT PLAN SET INCLUDES

ROADWAY PLANS
SIGNALIZATION
SIGNING & MARKING

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	DRAINAGE MAP
3	TYPICAL SECTION
4	SUMMARY OF QUANTITIES
5-8	ROADWAY PLAN & PROFILES
9-10	DRAINAGE STRUCTURES
11-12	RETENTION POND DETAILS
13	SOIL SURVEY
14-23	CROSS SECTIONS
24-27	SIGNALIZATION
27-30	SIGNING & MARKING

ROADWAY AND TRAFFIC DESIGN STANDARDS (BOOKLET DATED JANUARY, 1989)

001
002
102
201
232
261
273
280
281
300
302
452
453
500
505
513
515
532

LENGTH OF PROJECT		
	LINEAR FEET	MILES
ROADWAY	4,216.27	0.798
BRIDGES	0	0
NET LENGTH OF PROJECT	4,216.27	0.798
EXCEPTIONS	0	0
GROSS LENGTH OF PROJECT	4,216.27	0.798

SIGNALIZATION & SIGNING & MARKING PLANS APPROVED BY:

R.E. MAGAHEY

P.E. # 9950

DATE: 12/7/89

ROADWAY PLANS APPROVED BY:

WAYNE D. CHALIFOUX

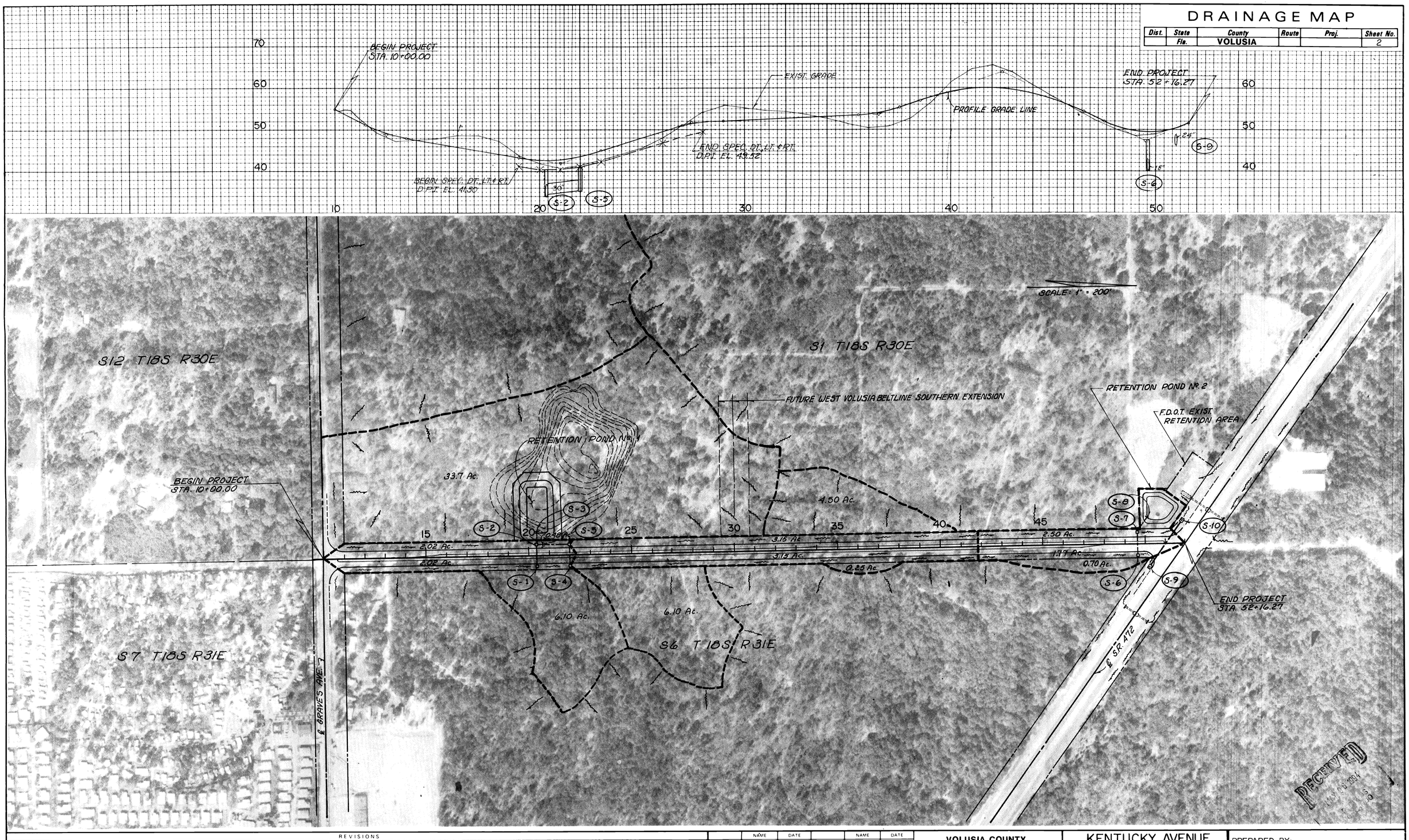
P.E. # 31070

DATE: 12/7/89

4055 E201

DRAINAGE MAP

Dist.	State	County	Route	Proj.	Sheet No.
	Fla.	VOLUSIA			2



RECEIVED
JUN 10 1994
FDOT

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	R.O.D.	3-89	DRAWN BY	L.J.R	3-89
CHECKED BY	W.D.C.	4-89	CHECKED BY	T.S.	4-89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY

APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

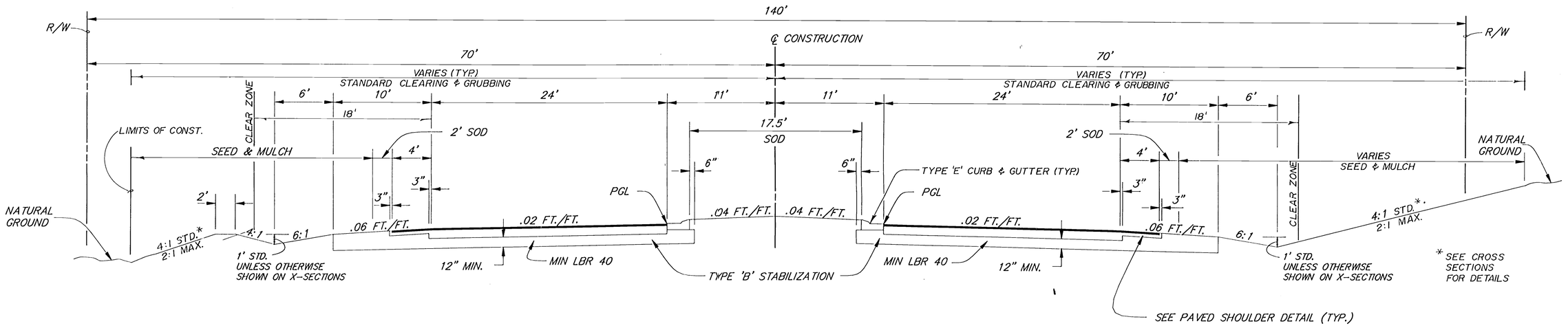
KENTUCKY AVENUE
DRAINAGE MAP

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

E202

COUNTY PROJ. NO.	SHEET NO.
4055	3

CADD # KYTYP



STA. 10+20.71 TO STA. 51+56.00

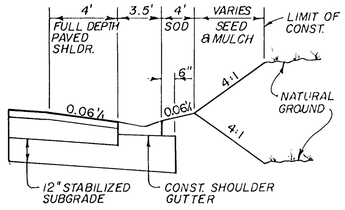
DESIGN SPEED 50 MPH

FOR ADDITIONAL DETAILS SEE INDEX NOS.
281, 300, 500, 505, 513, 515, 532 AND 700

GENERAL NOTES

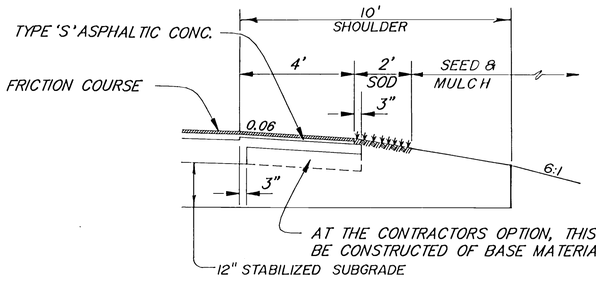
1. NONE OF THE EXISTING LIMEROCK BASE THAT IS REMOVED IS TO BE USED IN THE CONSTRUCTION OF THE NEW LIMEROCK BASE.
2. ALL OF THE EXISTING LIMEROCK BASE THAT IS REMOVED IS TO BE INCORPORATED IN THE STABILIZED PORTION OF THE SUBGRADE.
3. FOR MEDIAN STABILIZING SEE STANDARD INDEX NO. 500
4. FOR STABILIZING AT INTERSECTIONS, TURNOUTS, AND GRADED CONNECTIONS SEE STANDARD INDEX NO. 515. SEE TYPICAL SECTION FOR DEPTH AND LBR.
5. SOD SLOPES STEEPER THAN 3:1.

10" LIMEROCK BASE COURSE WITH TYPE S, STRUCTURAL COURSE (200 LBS/SY) AND FRICTION COURSE, FC-1, (100 LBS/SY)



TYPICAL SECTION
SHOULDER GUTTER

STA. 11+09.77, 29.97'RT., ℄ GRAVES TO
STA. 13+50.00, 39'RT, ℄ KENTUCKY AVE.



TYPICAL SECTION
PAVED SHOULDER DETAIL
(4") LIMEROCK BASE COURSE WITH TYPE S ASPHALTIC CONC. (100 LBS/SY) AND FRICTION COURSE FC-1 (100 LBS/SY)

RECEIVED
NOV 30 1994
FDOT

REVISIONS											
NO.	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION			

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	3/89	DRAWN BY	R.O.D.	3/89
CHECKED BY	W.D.C.	3/89	CHECKED BY	T.S.	3/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVENUE
TYPICAL SECTION

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055 203

SUMMARY OF QUANTITIES

COUNTY PROJECT NO.	SHEET NO.
4055	4

SUMMARY OF PAY ITEMS

ITEM NO.	ITEM	UNIT	QUANTITY
102-1	MAINTENANCE OF TRAFFIC	L.S.	1
104-10	BALED HAY OR STRAW	TN	4.8
110-1	CLEARING AND GRUBBING (PLAN QUANTITY 15.5 AC.)	L.S.	1
120-1	REGULAR EXCAVATION (PLAN QUANTITY 42,796 C.Y.)	L.S	1
160-4	TYPE 'B' STABILIZATION	S.Y.	36,405
200-1	LIMEROCK BASE (4")	S.Y	3,446
200-1	LIMEROCK BASE (10")	S.Y.	24,667
400-1-2	CLASS I CONCRETE ENDWALLS	C.Y.	5.38
415-1-1	REINFORCING STEEL	LB.	219
425-1	INLETS, (D.B.I., TYPE 'E' <10')	EA.	6
430-1	CONCRETE PIPE CULVERT, ROUND, (18")	L.F.	172
430-1	CONCRETE PIPE CULVERT, ROUND, (24")	L.F.	220
430-1	CONCRETE PIPE CULVERT, ROUND, CLASS IV (24")	L.F.	204
430-1	CONCRETE PIPE CULVERT, ROUND, (30")	L.F.	194
430-21	MITERED END SECTION, (24") S.D.	EA.	2
520-2-2	CONCRETE CURB, TYPE 'B'	L.F.	142
520-5-16	CONCRETE TRAFFIC SEPARATOR, TYPE I, (8.5' WIDE)	L.F.	456
520-6	CONCRETE SHOULDER GUTTER	L.F.	355
520-1-7	CONCRETE CURB AND GUTTER, TYPE 'E'	L.F.	7,020
522-1	CONCRETE SIDEWALK, (4")	S.Y.	115.4
522-2	CONCRETE SIDEWALK, (6")	S.Y.	278.4
530-1-1	RIP RAP (SAND CEMENT)	C.Y.	1.24
550-2	FENCING, TYPE 'B'	L.F.	1,712
550-79-20	SLIDING GATE (CANTILEVER)	EA.	2
570-2	SEED AND MULCH	S.Y.	18,587
575-1	SODDING	S.Y.	24,287
5331-2	TYPE 'S' ASPHALTIC CONCRETE	TN	2,616.6
5337-2-1	ASPHALTIC CONCRETE FRICTION COURSE, (FC-1)(1")	TN	1,388.6

PAY ITEM NOTES:

ITEM NO. 102-1	TO INCLUDE THE COST OF ALL BARRICADES, TEMPORARY PAVEMENT, TEMPORARY PAVEMENT MARKING, LIGHTS, SIGNS AND ALL INCIDENTALS NECESSARY FOR SAFE MAINTENANCE OF TRAFFIC.
ITEM NO. 200-1	TO INCLUDE ALL BASE MATERIAL, SHAPING, COMPACTING AND PRIME COAT.
ITEM NO. 522-1	INCLUDES THE COST OF CONCRETE FOR THE CHANNELIZING ISLAND AT S.R. 472
ITEM NO. 522-2	INCLUDES THE COST OF CONCRETE FOR THE CHANNELIZING ISLAND AT GRAVES AVE.
ITEM NO. 550-2	TO INCLUDE THE COSTS OF ALL HARDWARE, LINE POSTS, PULL AND END POSTS, CORNER POSTS, ECT.
ITEM NO. 570-2	INCLUDES THE COST OF SEEDS, MULCH, WATER, FERTILIZER AND MAINTENANCE FOR THE PROJECT DURATION.
ITEM NO. 575-1	INCLUDES THE COST OF WATER, FERTILIZER AND MAINTENANCE FOR THE PROJECT DURATION.
ITEM NO. 5331-2	TO INCLUDE THE COST OF TACK COAT.

SUMMARY OF EARTHWORK

DESCRIPTION	P CY	F CY
ROADWAY EXCAVATION =	32,216	
RETENTION POND EXCAVATION =	10,580	
REGULAR EXCAVATION, TOTAL =	42,796	
ROADWAY FILL + 50%	25,628	
RETENTION POND BERM FILL + 50%	5,742	
FILL TOTAL =	31,370	
EXCESS MATERIAL	11,426	

EXCESS MATERIAL TO BE DISPOSED OF BY THE CONTRACTOR IN AREAS PROVIDED BY HIM.

SUMMARY OF SODDING

STATION TO STATION	SQUARE YARDS LT.	RT.	TOTAL
MEDIAN:			
TRAFFIC SEPARATOR TRANSITIONS (BOTH)	291.36	291.36	583
MEDIAN CROSS-OVERS (BOTH SIDES)	74.79	74.79	149.6
15+69 TO 29+14.73	1308.35	1308.35	2616.7
30+85.27 TO 46+90	1560.15	1560.15	3120.3
ROADWAY:			
RETURN RADIUS @ GRAVES	26	–	26
10+94.17 TO 51+22.85	895.3	–	895.3
RETURN RADIUS @ S.R. 472	20.9	–	20.9
RETURN RADIUS @ GRAVES TO 13+50	–	160.8	160.8
13+50 TO 50+25.93	–	816.9	816.9
RETURN RADIUS @ S.R. 472	–	31.9	31.9
PONDS:			
NO. 1	6343	–	6343
NO. 2	2680	–	2680
BACKSLOPES:			
12+00 TO 15+00	–	500	500
16+00 TO 21+00	–	1056	1056
21+00 TO 24+00	400	–	400
24+00 TO 27+00	–	267	267
26+00 TO 31+00	1400	–	1400
36+00 TO 38+00	289	–	289
37+00 TO 40+00	–	433	433
40+00 TO 43+00	600	–	600
41+00 TO 46+00	–	1000	1000
47+00 TO 50+00	433	–	433
49+00 TO 51+00	–	400	400
DRAINAGE STRUCTURES:			
6 D.B. INLETS			42
2 M.E.S.			22
TOTAL			24,286.4

NOTE: THE LIMITS OF SODDING INDICATED ARE APPROXIMATE AND ARE TO BE ADJUSTED WHERE NECESSARY, AS DIRECTED BY THE ENGINEER, TO PROVIDE FOR CONTINUITY OF CONSTRUCTION OR TO SUIT THE ACTUAL REQUIREMENTS.

RECEIVED 1994 RECORDS ORLANDO

REVISIONS DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	11/89	DRAWN BY	R.L.M.	11/89
CHECKED BY	W.D.C.	11/89	CHECKED BY	T.S.	11/89

SUPERVISED BY W.D.C.

VOLUSIA COUNTY

APPROVED BY WAYNE D. CHALIFOUX DATE 12-89

KENTUCKY AVENUE
SUMMARY OF QUANTITIES

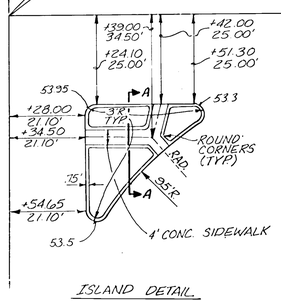
PREPARED BY:
DYER, RIDDLE, MILLS AND PRECOURT, INC.

4055 E204

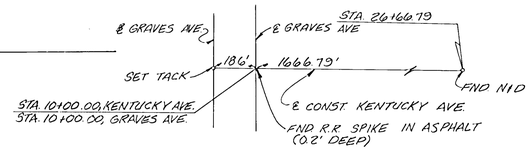
COUNTY PROJECT NO. 4055 — SHT 5

CADD # KYPP1

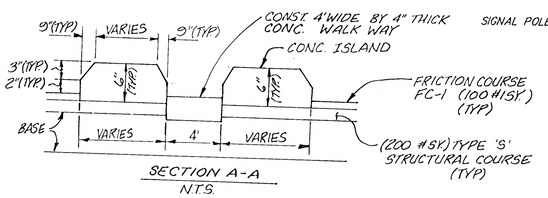
STA. 10+00.00 KENTUCKY AVE. = STA. 10+00.00 GRAVES AVE.



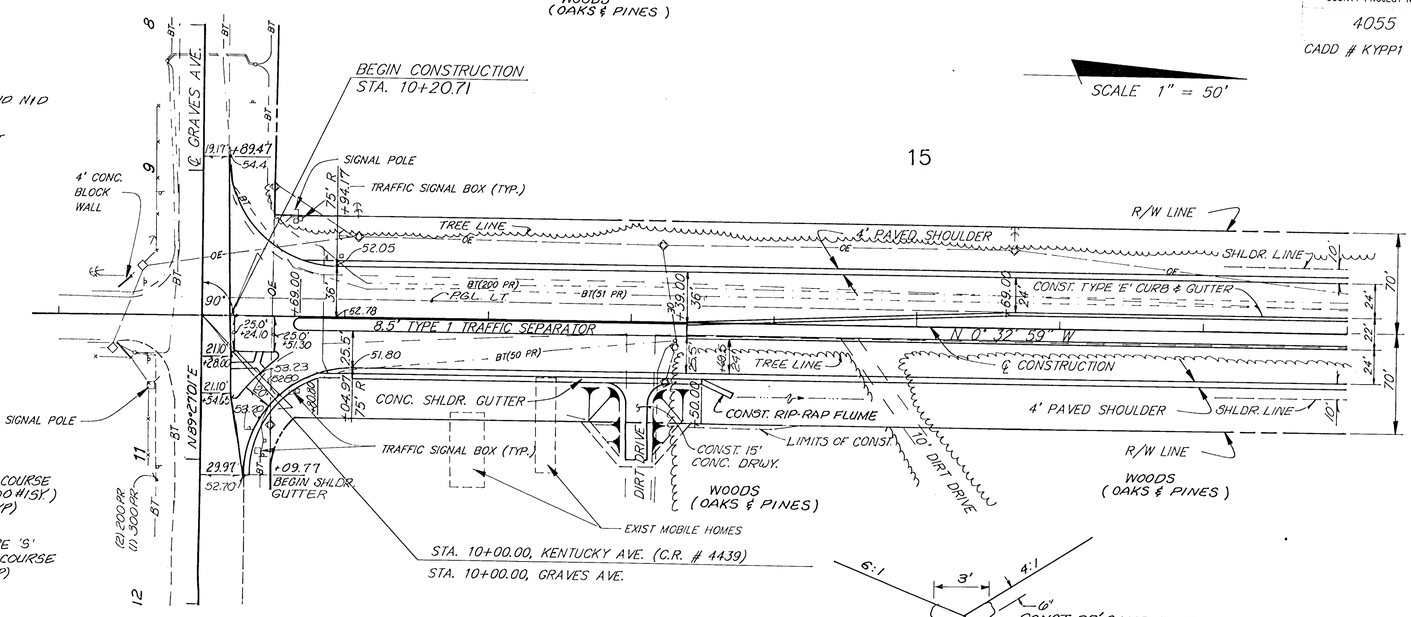
ISLAND DETAIL
1"=20'

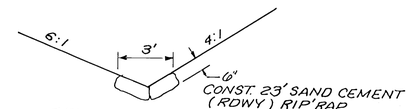


REFERENCE TIE
N.T.S.



SECTION A-A
N.T.S.

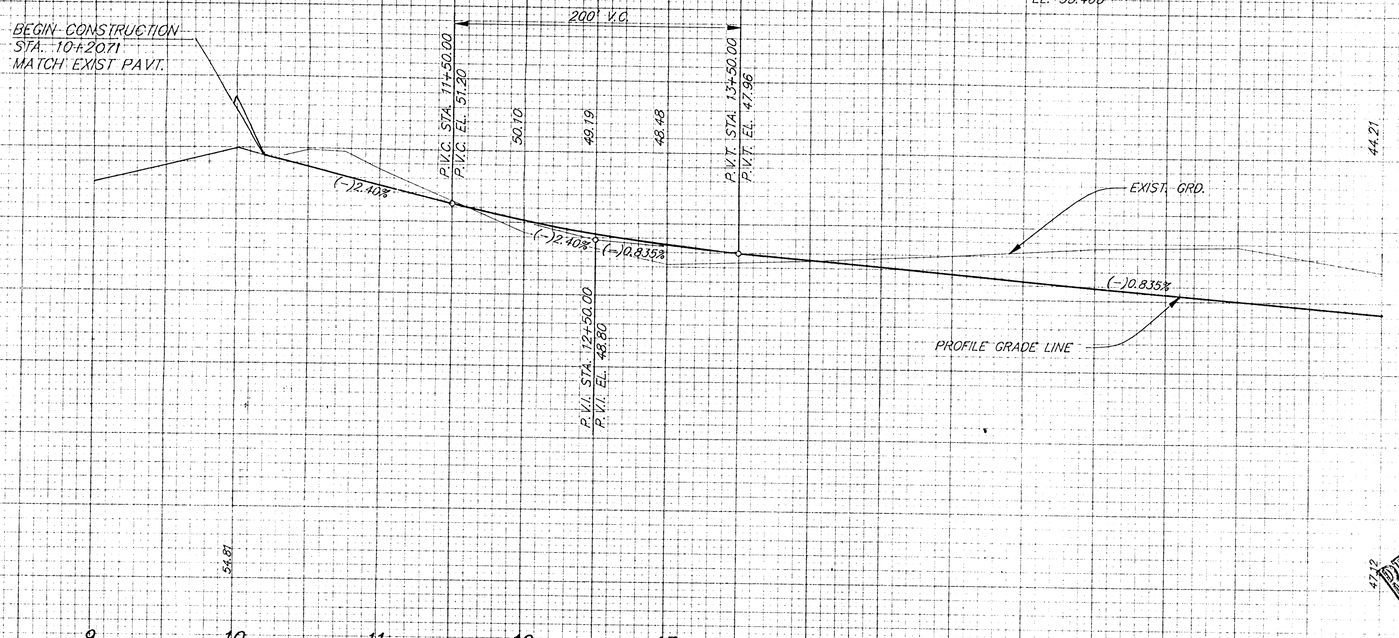




TYPICAL SECTION RIP-RAP FLUME
STA. 13+50.00, 41.5' RT. TO
STA. 13+70, 51' RT.

B.M. # 73-60.01
BRIDGE SPIKE IN S. SIDE OF 22" OAK
STA. 11+06.5, 105.5' LT. C/L CONST. KENTUCKY AVE.
EL. 58.088

B.M. # 73-60.02
BRIDGE SPIKE IN S.W. SIDE OF 24" OAK
STA. 18+00.00, 95' RT. C/L CONST. KENTUCKY AVE.
EL. 53.466



RECEIVED
MAY 09 1994
RECORDS ORLANDO

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	3/89	DRAWN BY	R.O.D.	3/89
CHECKED BY	W.D.C.	3/89	CHECKED BY	T.S.	3/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY WAYNE D CHALIFOUX
DATE 12-89

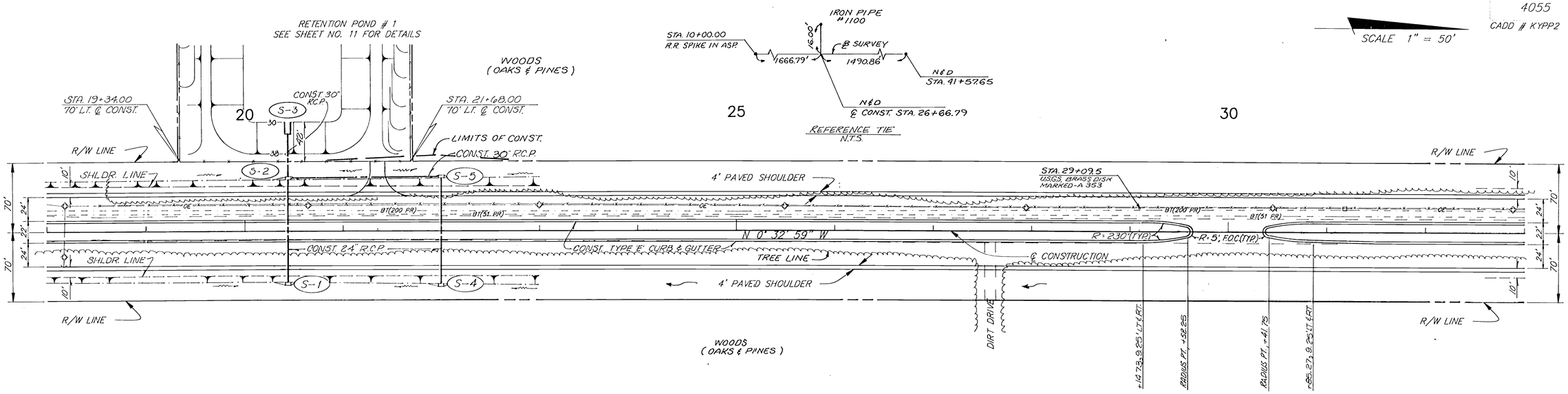
KENTUCKY AVE. (C.R. # 4139)
PLAN AND PROFILE
STA. 10+00.00 TO STA. 18+00.00

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

E205

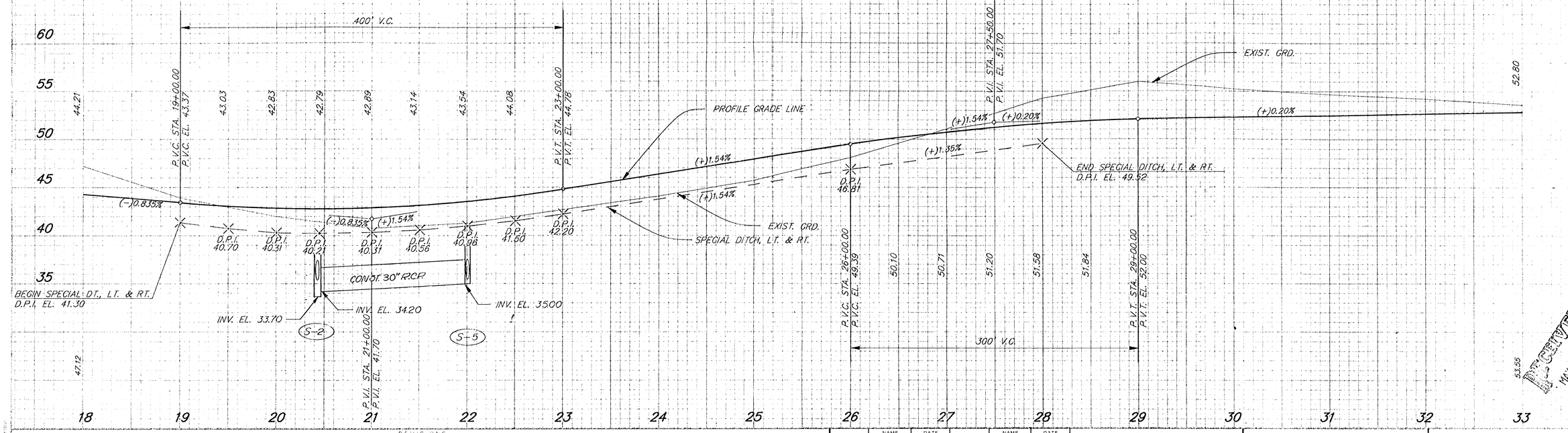
COUNTY PROJECT NO.
4055
6
CADD # KYPP2

SCALE 1" = 50'



B.M. # 73+61.01
BRIDGE SPIKE IN N. SIDE OF 6" PINE
STA. 24+97.7, 78' RT. ℄ CONST. KENTUCKY AVE.
EL. 43.423

B.M. # 73-61.02
BRIDGE SPIKE IN N. SIDE OF 4" OAK
STA. 31+97.0, 136.2' RT. ℄ CONST.
EL. 52.108



RECEIVED
MAY 06 1994
RECORDS ORLANDO

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S	3/89	DRAWN BY	ROD	3/89
CHECKED BY	WDC	3/89	CHECKED BY	TS	3/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVE. (C.R. # 4139)
PLAN AND PROFILE
STA. 18+00.00 TO STA. 33+00.00

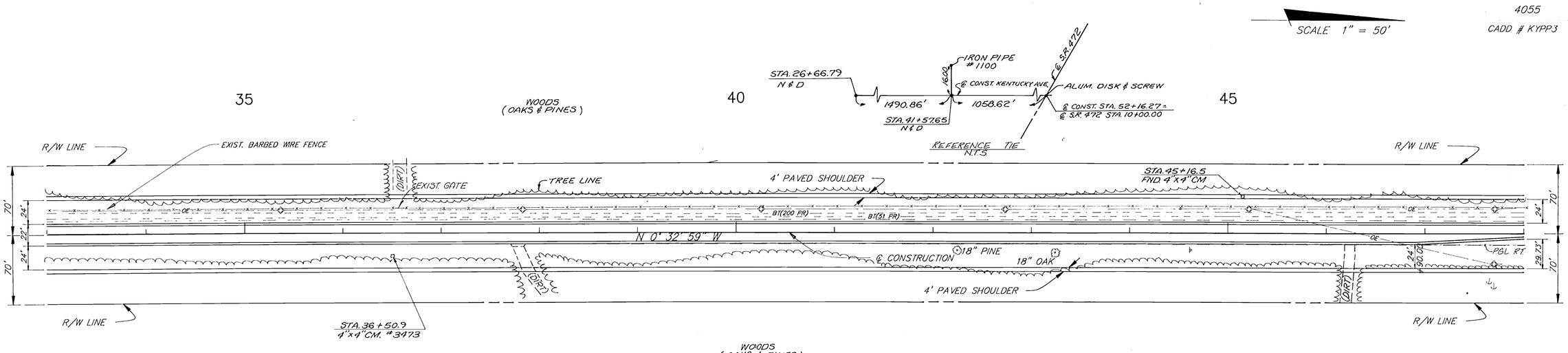
PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

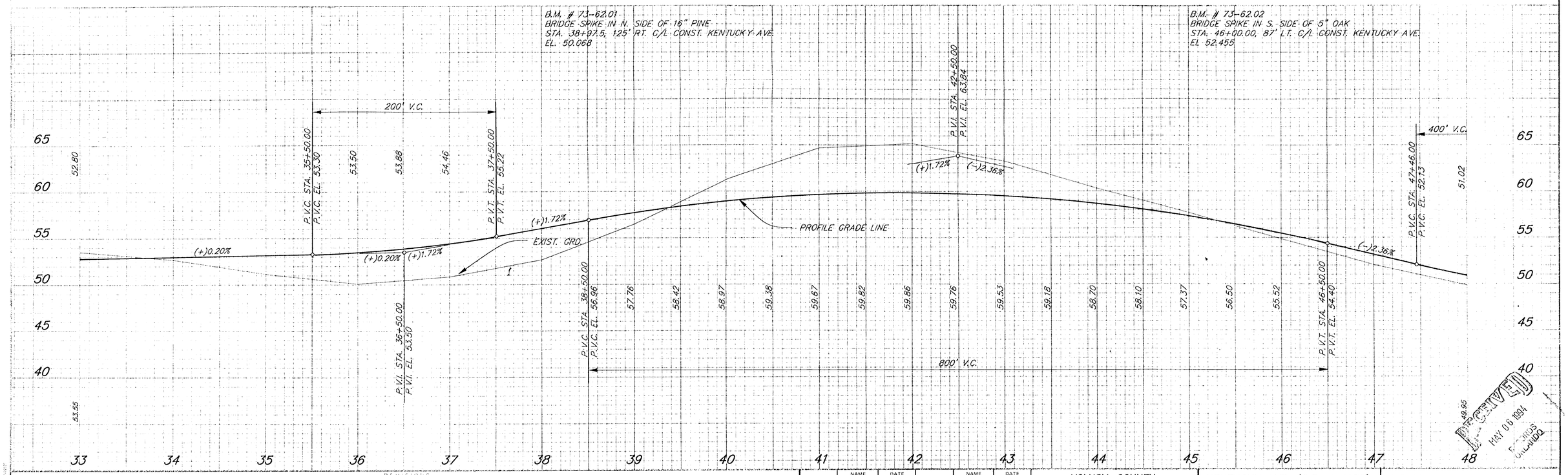
4055

E206

COUNTY PROJECT NO.
4055
7
CADD # KYPP3

SCALE 1" = 50'





APPROVED
MAY 06 1994
RECORDS
ORLANDO

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	3/89	DRAWN BY	R.O.D.	3/89
CHECKED BY	W.D.C.	3/89	CHECKED BY	T.S.	3/89
SUPERVISED BY W.D.C.					

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

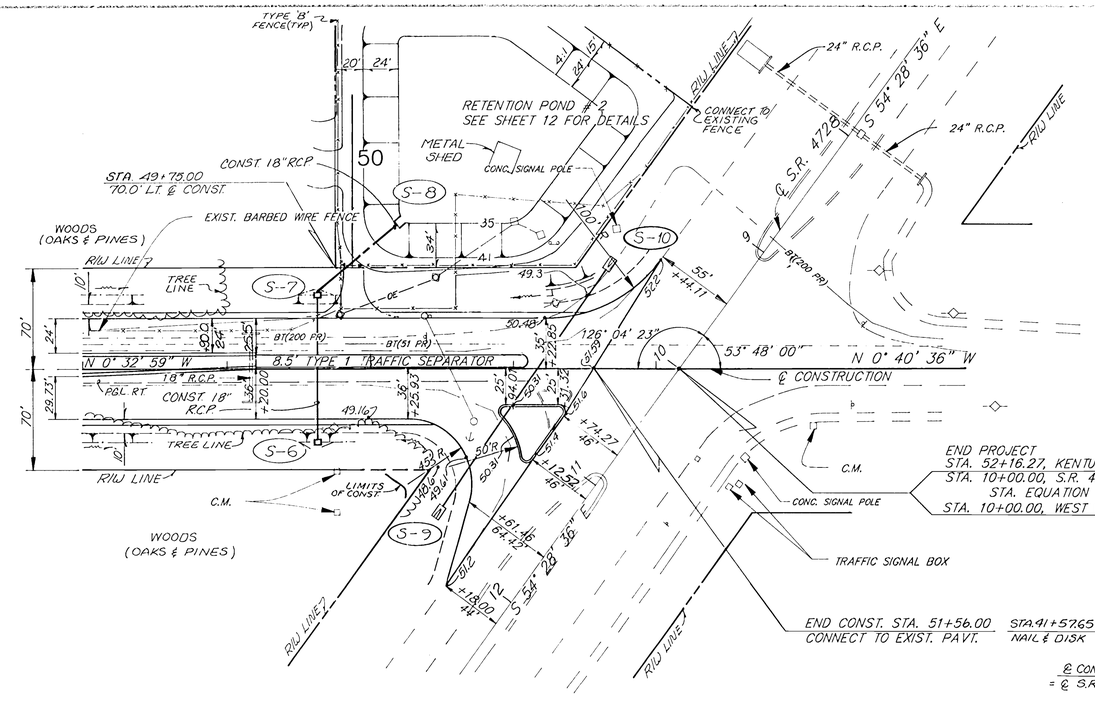
KENTUCKY AVE. (C.R. # 4139)
PLAN AND PROFILE
STA. 33+00.00 TO STA. 48+00.00

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

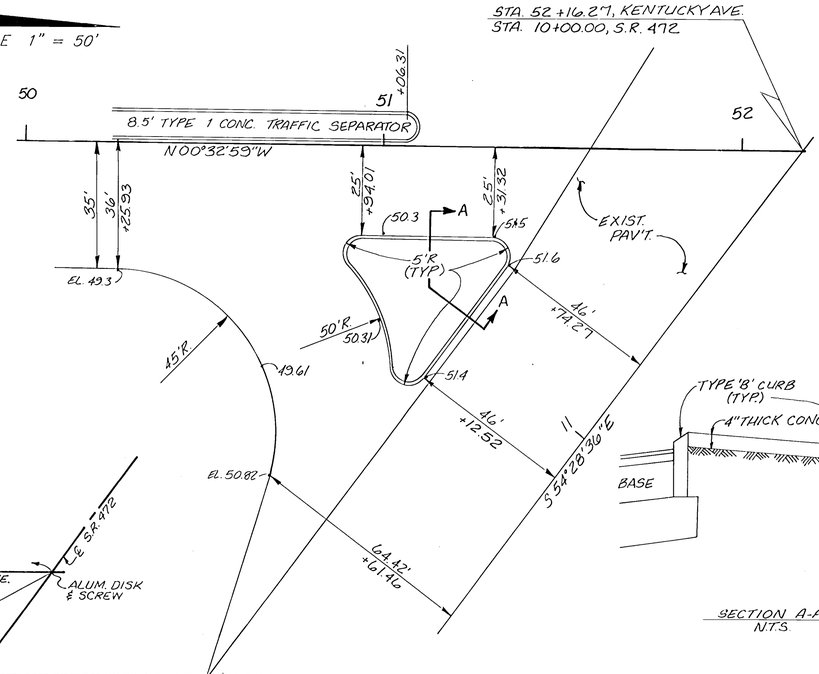
4 55

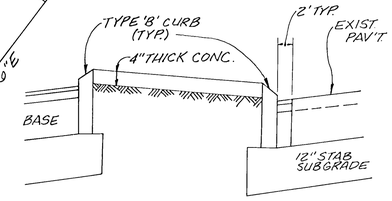
E207

COUNTY PROJECT NO. 4055 | SHEET NO. 8 | FPID# KYPP4



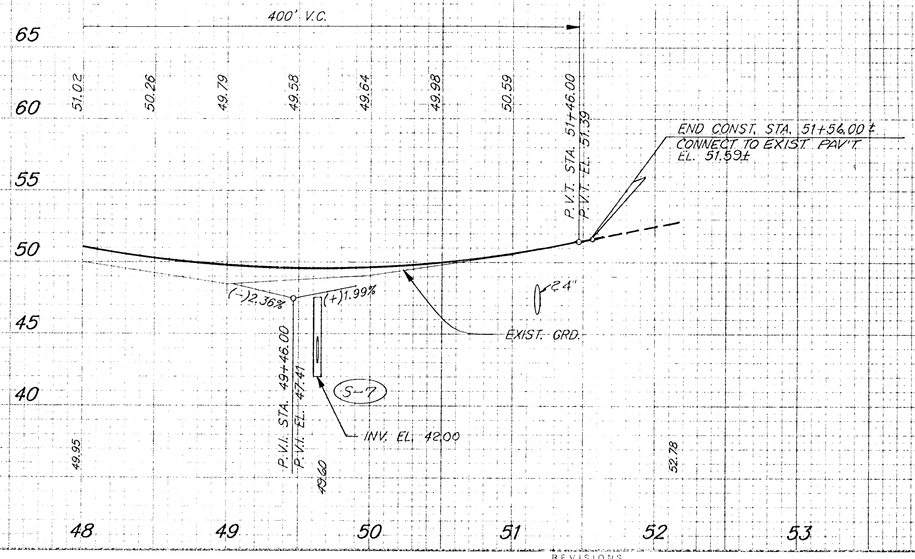
SCALE 1" = 50'





SECTION A-A
N.T.S.

B.M. # 73-62.02
BRIDGE SPIKE IN S. SIDE OF 3" OAK
STA. 46+00.00, 87' LT. C/L CONST. KENTUCKY AVE.
EL. 52.455



REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	3/89	DRAWN BY	R.O.D.	3/89
CHECKED BY	W.D.C.	3/89	CHECKED BY	T.S.	3/89

SUPERVISED BY W.D.C.

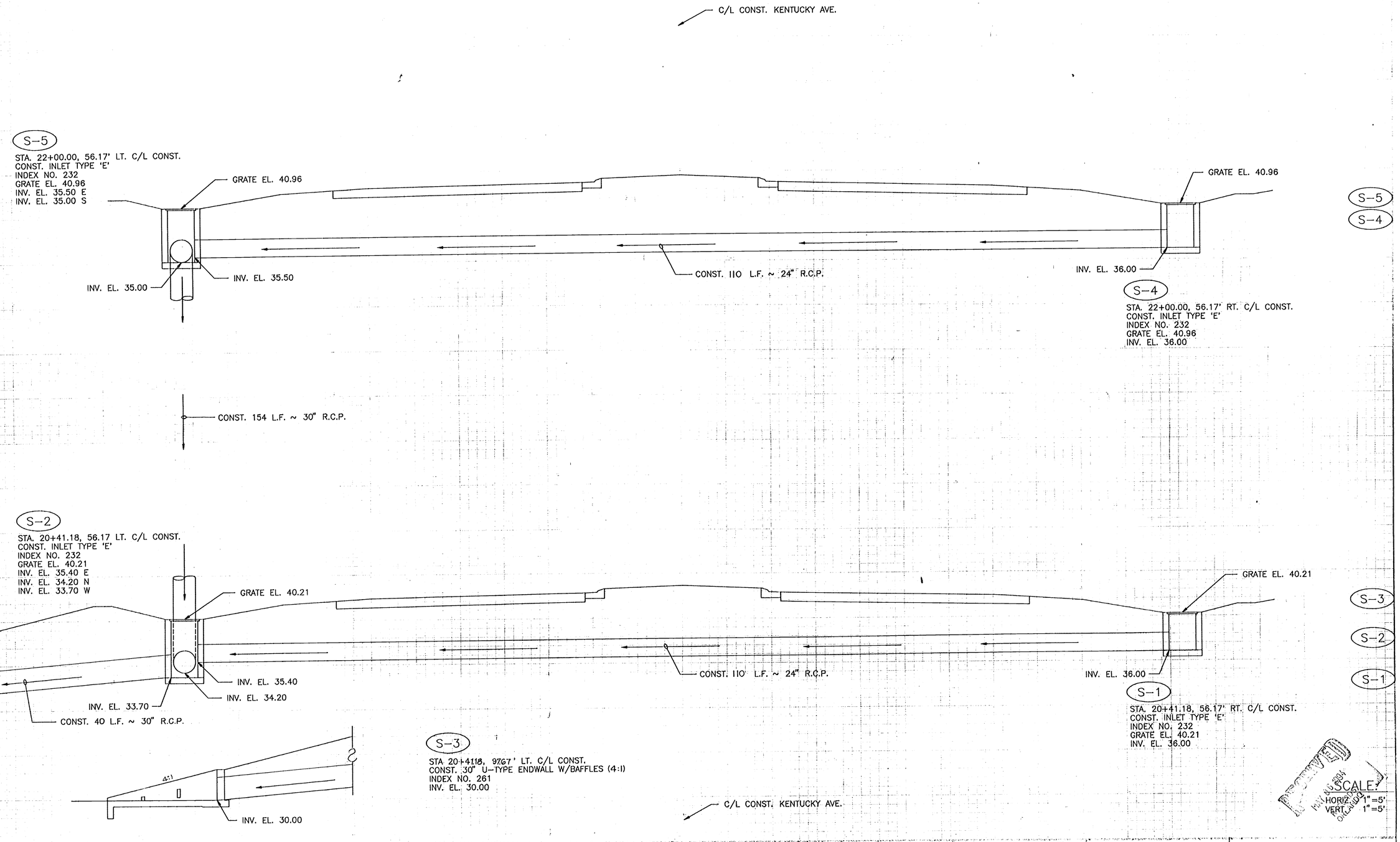
VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVE. (C.R. # 4139)
PLAN AND PROFILE
STA. 48+00.00 TO STA. 52+16.27

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

RECEIVED MAY 06 1994 RECORDS ORLANDO

4055 E208



SCALE:
HORIZ. 1" =5'
VERT. 1" =5'

R.O.D. 3/89	R.O.D. 3/89	VOLUSIA COUNTY	KENTUCKY AVENUE	PREPARED BY:
AVH 3/89 W.D.C.	T.S. 3/89	WAYNE O CHALIFOUX 12-89	DRAINAGE STRUCTURES	DYER, RIDDLE, MILLS & PRECOURT INC.

4055

4055 10

CADD # KYDSTR2

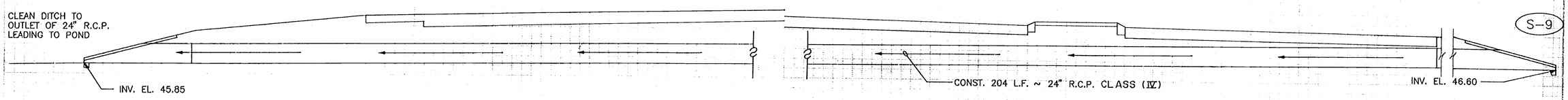
C/L CONST. KENTUCKY AVE.

S-10

STA. 51+62.00, 66.0' LT. C/L CONST.
CONST. MITERED END SECTION (4:1)
INDEX NO. 273
INV. EL. 45.85

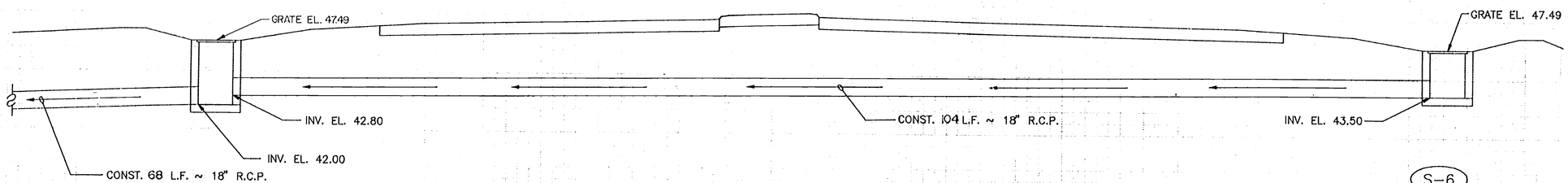
S-9

STA. 50+49.00, 97.0' RT. C/L CONST.
CONST. MITERED END SECTION (4:1)
INDEX NO. 273
INV. EL. 46.60



S-7

STA. 49+63.00, 53.17' LT. C/L CONST.
CONST. INLET TYPE 'E'
INDEX NO. 232
GRATE EL. 47.49
INV. EL. 42.80 E
INV. EL. 42.00 W

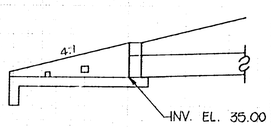


S-6

STA. 49+63.00, 53.17' RT. C/L CONST.
CONST. INLET TYPE 'E'
INDEX NO. 232
GRATE EL. 47.49
INV. EL. 43.50

S-8

STA. 50+15.00 98.00' LT. C/L CONST.
CONST. 18" U-ENDWALL W/BAFFLES (4:1)
INDEX NO. 261
INV. EL. 35.00



C/L CONST. KENTUCKY AVE.

RECEIVED
MAY 05 1994
DISTRICT 5

SCALE:
HORIZ. 1"=5'
VERT. 1"=5'

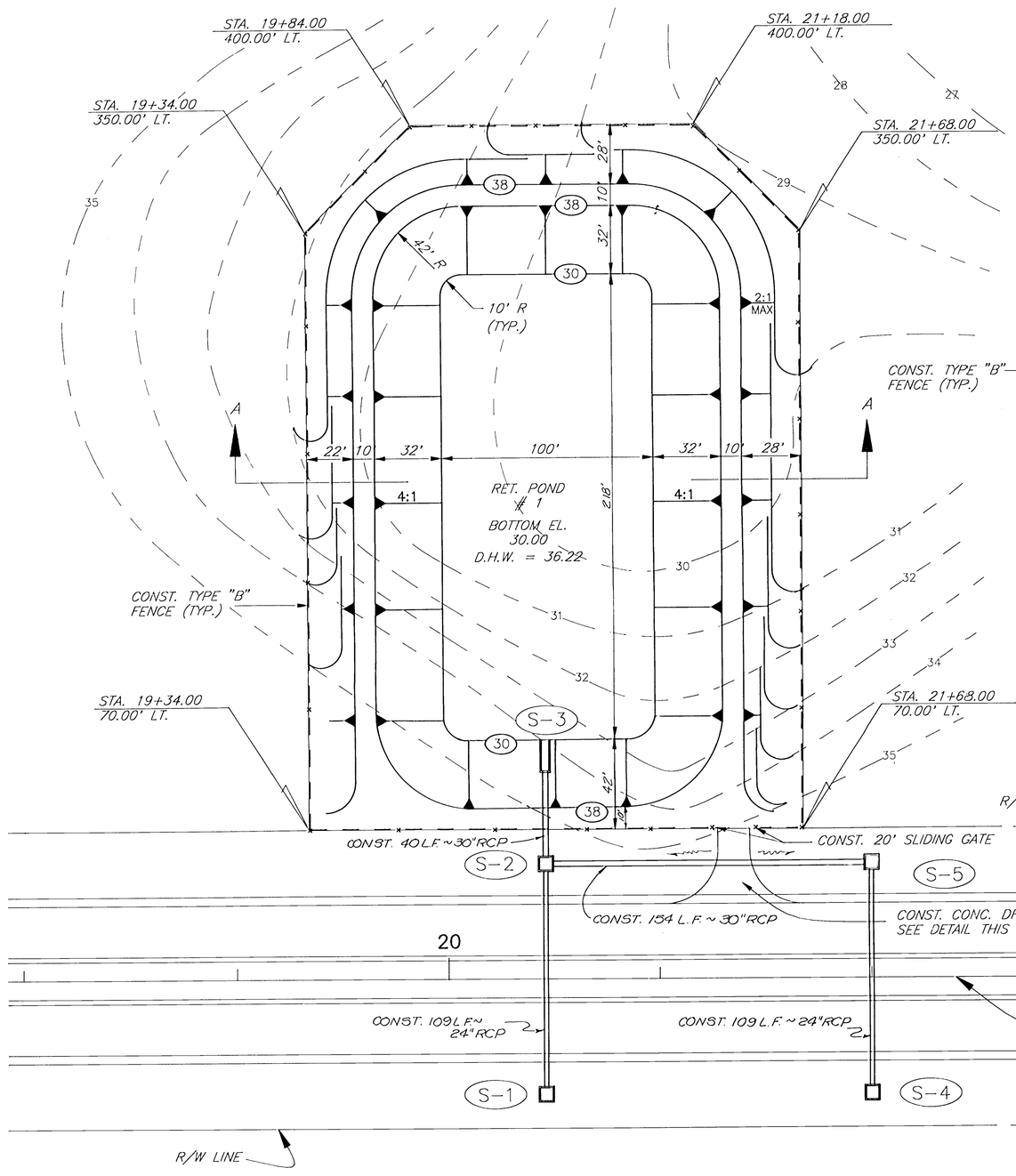
DESIGNED	R.O.D.	3/89	CHECKED	R.O.D.	3/89	FOR DEPARTMENT OF TRANSPORTATION	KENTUCKY AVENUE DRAINAGE STRUCTURES
DRAWN	A.Y.H	3/89	CHECKED	T.S.	3/89	WAYNE D CHALIFOUX 12-89	PREPARED BY: DYER, RIDDLE, MILLS & PRECOURT INC.
QUANTITIES BY	W.D.C.						

405

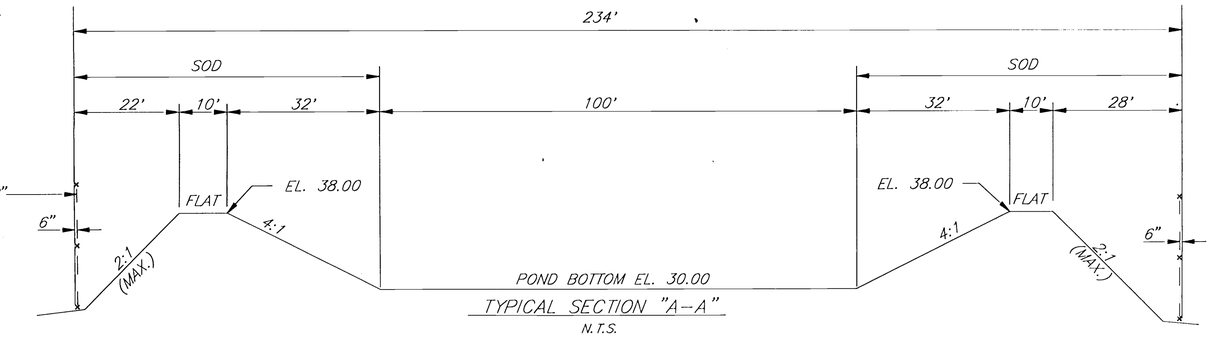
E210

COUNTY PROJECT NO.	SHEET NO.
4055	11

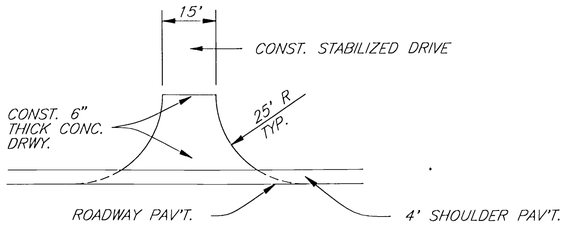
CADD # KYPOND1R



SCALE 1" = 30'



TYPICAL SECTION "A-A"
N.T.S.



TYPICAL RETENTION
POND DRIVEWAY
PLAN
N.T.S.

RECEIVED
MAY 10 1994
40-10-78852
ORANGE COUNTY

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	R.O.D	9/89	DRAWN BY	R.O.D	9/89
CHECKED BY	W.D.C.	9/89	CHECKED BY	T.S.	9/89
SUPERVISED BY W.D.C.					

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVENUE
RETENTION POND #1

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055

E211

COUNTY PROJECT NO.	SHEET NO.
4055	12

CADD # KYPOND2R

SCALE 1" = 30'

STA. 49+75.00
265.00' LT.

CONNECT TO EXISTING FENCE

STA 51+19.00
265.00' LT.

EXIST. F.D.O.T. RET. POND

EXISTING FENCE

EXIST. 24" R.C.P.

CONNECT TO EXISTING FENCE

STA 52+26.50
104.00' LT.

S 54° 28' 36" E

℄ S.R. 472

CONST. 68 L.F. ~18" RCP

STA. 49+75.00
70.00' LT.

CONST. 20' SLIDING GATE

CONST. CONC. DRIVEWAY
SEE DETAIL THIS SHEET

N 0° 32' 59" W

EXIST. 18" R.C.P.

℄ CONSTRUCTION

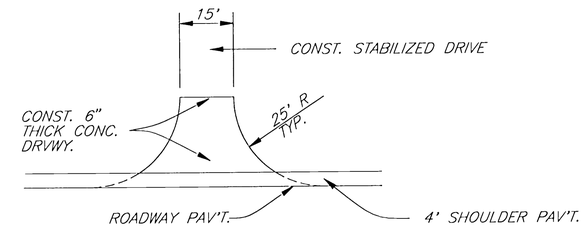
CONST. 99 L.F. ~18" RCP

CONST. 204 L.F.
~24" RCP

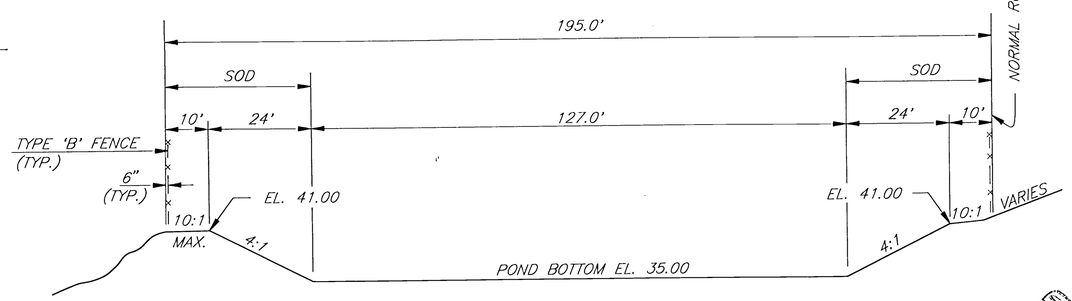
STA 51+43.50
70.5' LT.

S 54° 28' 36" E

S-6 S-7 S-8 S-9 S-10



TYPICAL RETENTION POND DRIVEWAY PLAN
N.T.S.



TYPICAL SECTION "A-A"
N.T.S.

RECEIVED
MAY 06 1994
RECORDS
ORLANDO

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	R.O.D.	3/89	DRAWN BY	R.O.D.	3/89
CHECKED BY	W.D.C.	3/89	CHECKED BY	T.S.	3/89
SUPERVISED BY W.D.C.					

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVE. (C.R. # 4139)
RETENTION POND # 2

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055
E212

COUNTY PROJ. NO.	SHEET NO.
4055	13

REPORT OF TESTS OF MATERIAL FROM ROADWAY FOR USE IN EMBANKMENT AND SUBGRADE

DATE SAMPLED: 2-25-89 to 10-11-89
SAMPLED BY: D. LAW, M. SWEENEY, J. ZABALA
DATE TESTED: 3-3-89 to 10-12-89

STRATUM Nº	% PASSING 200	LIQUID LIMIT	PLASTICITY INDEX	GROUP	DESCRIPTION
1.	1.9-3.3	N/P	N/P	A-3	LIGHT BROWN FINE SAND
2.	26.0-34.0	N/P	N/P	A-2-4	LIGHT GRAY TO BROWN CLAYEY FINE SAND
3.	8.9	N/P	N/P	A-3	LIGHT BROWN TO ORANGE SLIGHTLY SILTY FINE SAND
4.	17.0	N/P	N/P	A-2-4	GRAY TO BROWN MODERATLY SILTY FINE SAND
5.	28.7-34.0	N/P	N/P	A-2-4	LIGHT GRAY TO WHITE SILTY FINE SAND
6.	33.7	48	27	A-2-7	LIGHT GRAY TO ORANGE CLAYEY FINE SAND

NOTES:
1. GNE = GROUNDWATER NOT ENCOUNTERED

RECEIVED
MAY 05 1994
RECORDS
ORLANDO

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY			DRAWN BY	T.k.n.	11-17-89
CHECKED BY			CHECKED BY	J.R.D.C.	
SUPERVISED BY P. RALPH BROWN P.E.					

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVE.
SOIL SURVEY

PREPARED BY:
AMERICAN TESTING LABORATORIES
4055

E213

COUNTY 4055 14

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

℄ CONST

RW LINE

RW LINE

STA. 15+69.00,
END MEDIAN TAPER LT.

46.71 46.71 47.94 4:1 6:1 4:1 4:1

15 + 00

47.55 47.55 47.47 2:1

14 + 00

48.48 48.48 47.14 4 1 6 GNE

CONST. 6" THICK CONC. DRWY.

STA. 13+39.00,
BEGIN MEDIAN TAPER LT
END TRAFFIC SEPARATOR

13 + 00

50.10 50.10 49.24 .006 4:1

12 + 00

RW LINE

RW LINE

52.40 52.40 53.58 VARIES 6:1 4:1 TO C-2 .006 4:1

11 + 00

STA. 10+65.00,
BEGIN TRAFFIC SEPARATOR
STA. 10+20.71,
BEGIN PAVE & CONST. & EARTHWORK

℄ CONST

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

812 6
142 3
369 335
57 178
109 737
2 220
19 524
8 63
467 0
244 0
276 0
237 0 0 0

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

RECORDS ORLANDO

SUPERSEDES	REVISIONS DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	9/89	DRAWN BY	T.D.	9/89
CHECKED BY	A.V.H.	9/89	CHECKED BY	B.A.S.	9/89

SUPERVISED BY W.D.C.

VOLUSIA COUNTY
APPROVED BY WAYNE D CHALIFOUX
DATE 12-89

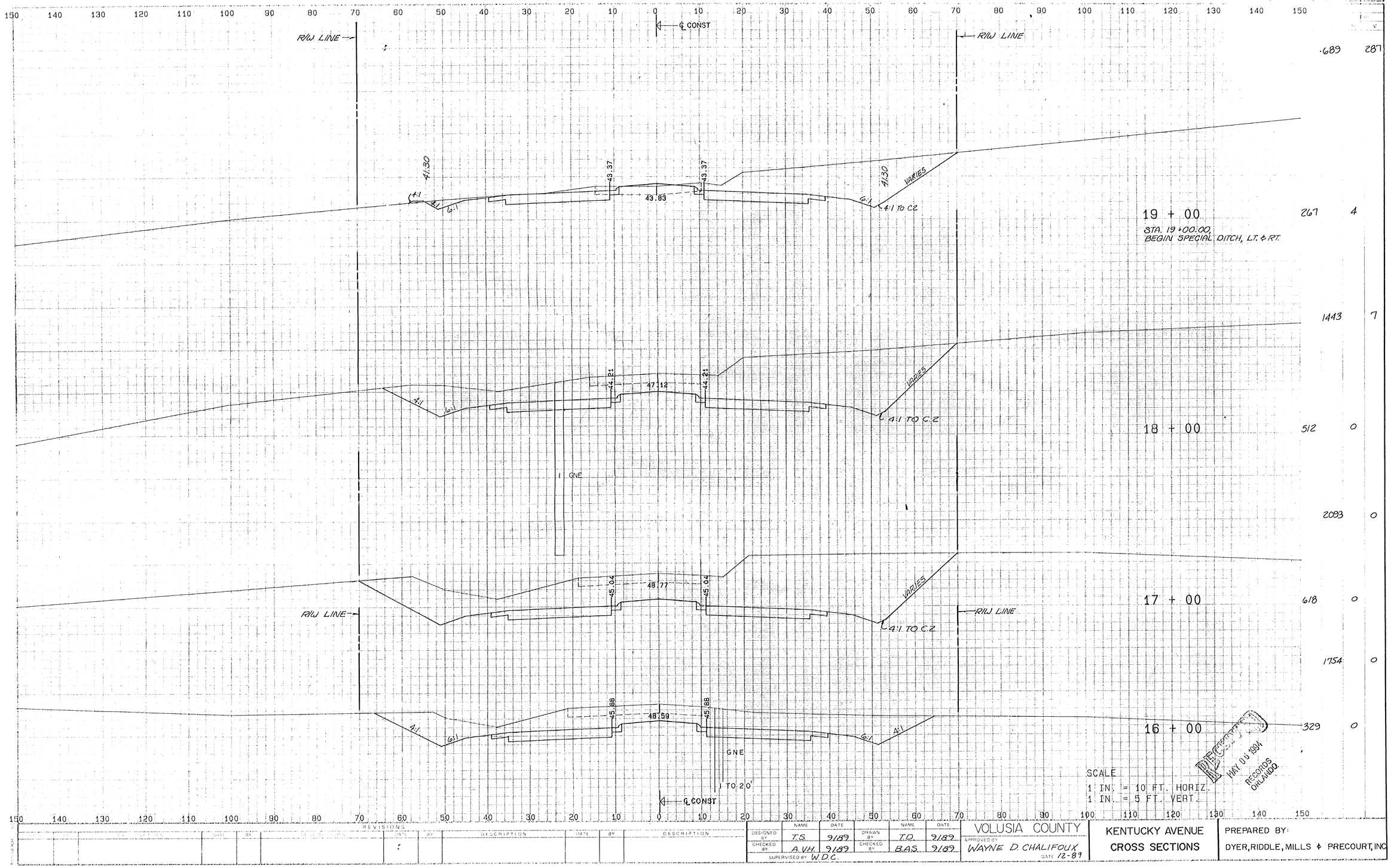
KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4177

E214

COUNTY 4055 | SHEET NO. 15



	.689 287
19 + 00	267 4
STA. 19+00.00, BEGIN SPECIAL DITCH, LT. & RT.	
	1443 7
18 + 00	512 0
	2093 0
17 + 00	618 0
	1754 0
16 + 00	329 0

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

FILED MAY 09 1994 RECORDS ORLANDO

REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	9/89	DRAWN BY	T.D.	9/89
CHECKED BY	A.V.H.	9/89	CHECKED BY	B.A.S.	9/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055

E215

COUNTY 4055 | 16

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ℄ CONST. 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

R/W LINE

40.96 4:1 6:1 43.54 41.24 43.54 6:1 4:1 40.96

R/W LINE

2:1

22 + 00 — 43 1000

STA. 21+35
CONST. MAINT. DRIVE LEFT — 58 1163

CONST. TYPE 'B' FENCE

40.31 42.89 42.89 40.31

VARIES 4:1 40.73 4:1

21 + 00 — 9 338

POND 1
SEE RETENTION POND DETAIL SHEET

R/W LINE

210 906

CONST. TYPE 'B' FENCE

40.31 42.83 42.83 40.31

VARIES 4:1 6:1 41.93 6:1 VARIES

POND 1
SEE RETENTION POND DETAIL SHEET

GNE (STA 20+15)

20 + 00 — 150 151

4:1

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 ℄ CONST. 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

RECEIVED MAY 0 6 1994 RECORDS CYLAUDIA

REVISIONS

NO.	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	8/89	DRAWN BY	T.D.	8/89
CHECKED BY	A.V.H.	8/89	CHECKED BY	B.A.S.	8/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4:55

E216

COUNTY 4055 17

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

RIW LINE — ℄ CONST — RIW LINE

VARIES 48.17 6:1 50.71 51.00 50.71 48.17 6:1 4:1 49.63 4:1

27 + 00

VARIES 46.82 49.39 48.01 49.39 46.82 48.31 VARIES

26 + 00

4:1 46.77 45.29 47.85 45.67 47.85 45.28 46.77 2:1

25 + 00

▼ (18.25)
(STA 25+40)
2

45.24 43.74 46.32 3 TO 15
1 TO 19
3 TO 20 46.32 43.74 45.24

4:1 4:1

24 + 00

44.03

RIW LINE — RIW LINE

VARIES 43.70 42.20 4:1 6:1 44.78 42.63 44.78 42.20 43.70 6:1 4:1 4:1

1
2
1
ONE
(STA 23+05)

23 + 00

℄ CONST

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1159 89
205 48
515 420
73 179
156 883
11 298
28 917
4 197
7 828
0 250

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

RECEIVED MAY 30 1990 DOT

REVISIONS												
NO.	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	8/89	DRAWN BY	T.D.	8/89
CHECKED BY	A.V.H.	8/89	CHECKED BY	B.A.S.	8/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY WAYNE D CHALIFOUX
DATE 12-89

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055

E217

COUNTY 4055 18

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

R/W LINE — ℄ CONST — R/W LINE

| | | |

COUNTY 4055 | 19

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

℄ CONST

RIW LINE

RIW LINE

56.09 56.09

4:1 4:1 6:1 6:1 4:1 2:1

52.89

38 + 00 0 504

54.46 54.46

VARIES

4:1

50.89

38 + 00 0 1995

GNE

4 TO 15
5 TO 20

53.50 53.50

4:1

50.12

37 + 00 0 574

STA. 36 + 50.00 0 1722

36 + 00 0 357

53.20 53.20

4:1 4:1 4:1 4:1

51.18

RIW LINE

RIW LINE

GNE

35 + 00 4 935

2 148

53.00

2 TO 12.5
4 TO 15
TO 20

4:1 6:1 6:1 4:1

52.70

341 311

34 + 00 182 20

℄ CONST

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

RECEIVED MAY 05 1994 RECORDS PHILADA

REVISIONS

NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	8/89	DRAWN BY	T.D.	8/89
CHECKED BY	A.V.H.	8/89	CHECKED BY	B.A.S.	8/89

SUPERVISED BY W.D.C.

VOLUSIA COUNTY
APPROVED BY WAYNE D CHALIFOUX
DATE 12-89

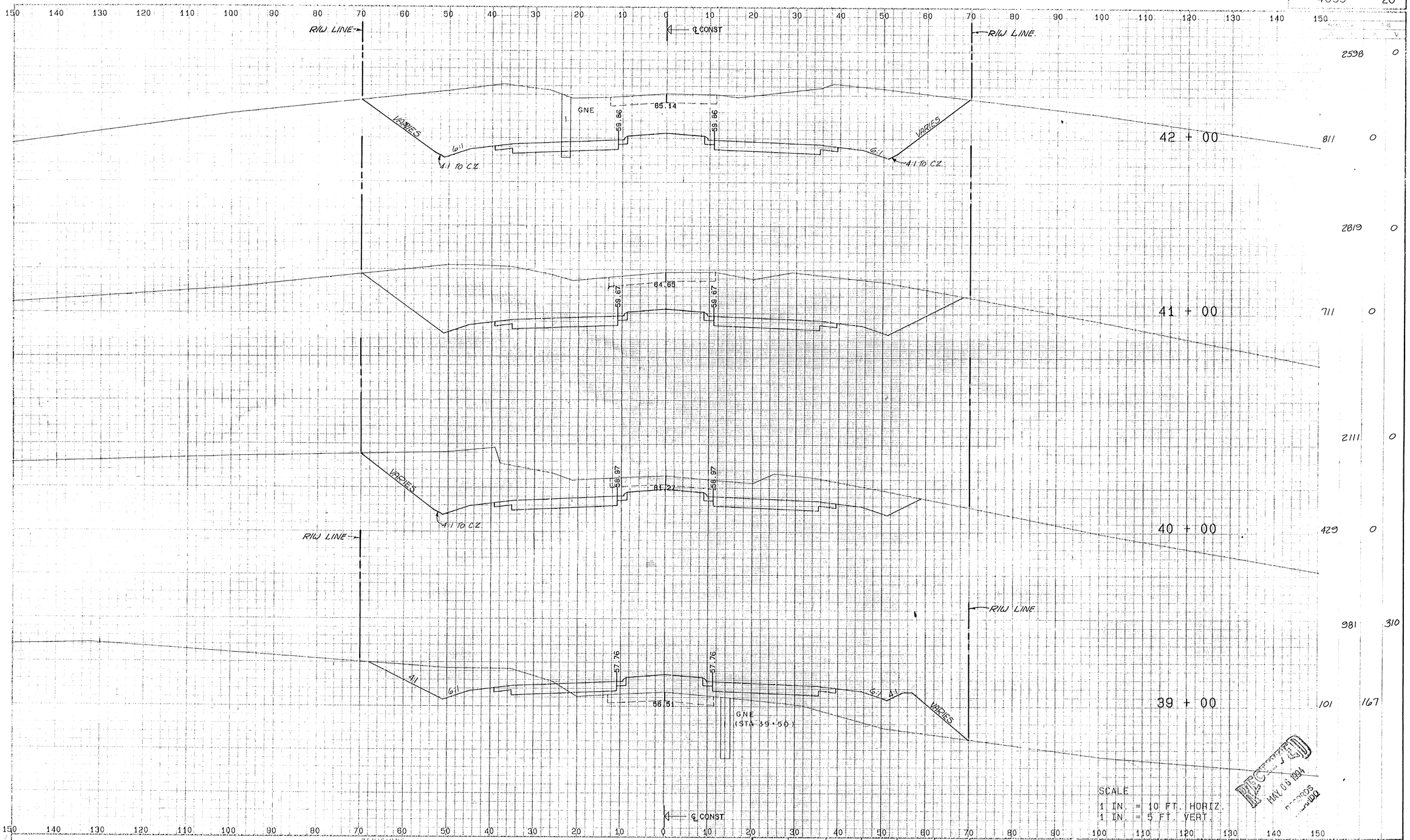
KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

4

E219

COUNTY	SHEET NO.
4055	20



SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

RECEIVED
MAY 09 1990
RECORDS

REVISIONS												
DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	8/89	DRAWN BY	T.O.	8/89
CHECKED BY	A.V.H.	8/89	CHECKED BY	B.A.S.	8/89
SUPERVISED BY	W.D.C.				

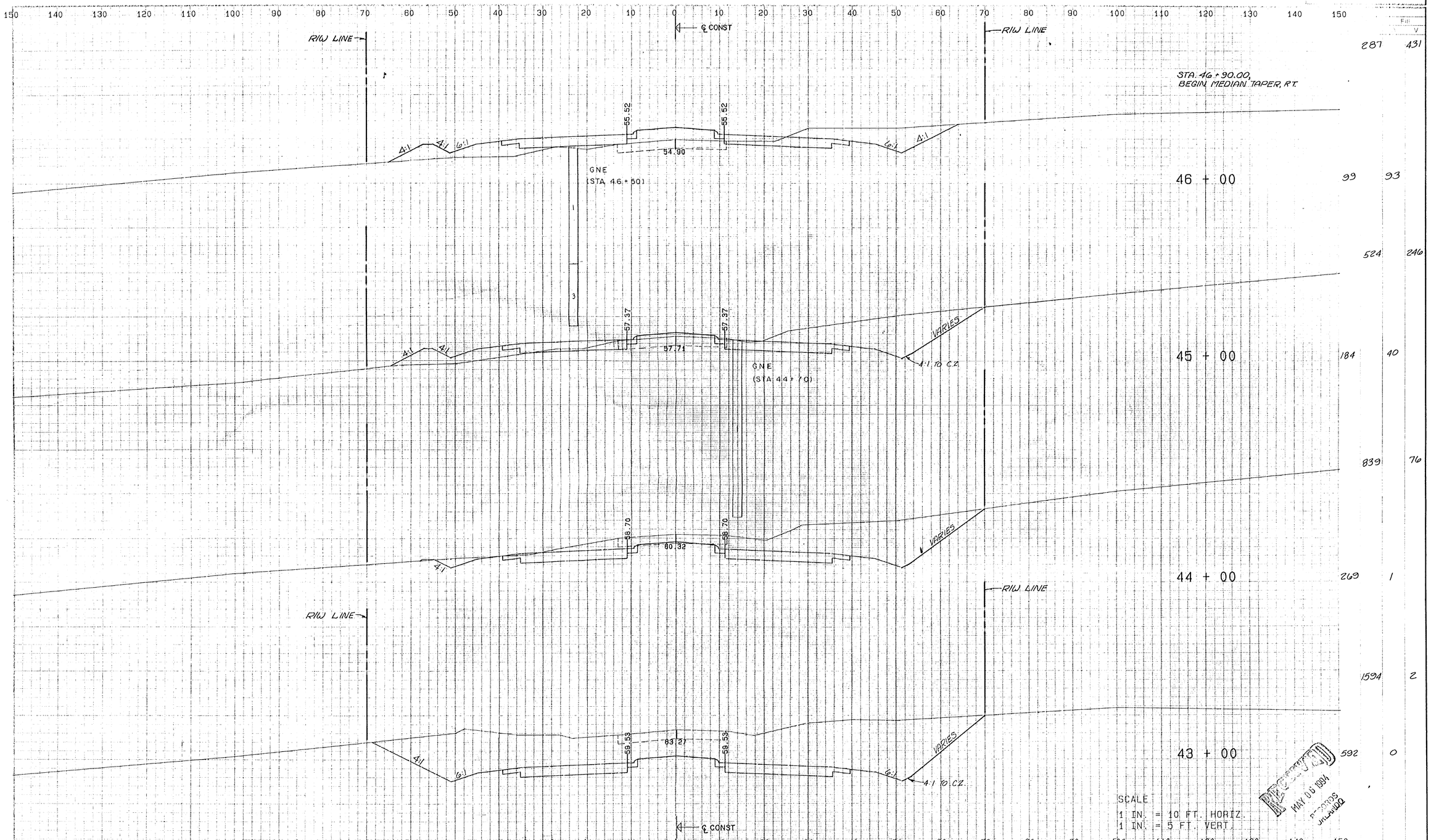
VOLUSIA COUNTY
APPROVED BY
WAYNE D. CHALIFOUX
DATE 12-89

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED:
DYER, RIDDLE, MILLS & PRECOURT, INC.

E220

COUNTY 4055 | SHEET NO. 21



REVISIONS												
NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	8/89	DRAWN BY	T.D.	8/89
CHECKED BY	A.V.H.	8/89	CHECKED BY	B.A.S.	8/89
SUPERVISED BY	W.D.C.				

VOLUSIA COUNTY
APPROVED BY: WAYNE D CHALIFOUX
DATE: 12-89

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY:
DYER, RIDDLE, MILLS & PRECOURT, INC.

E221

COUNTY 4055 | SHEET NO. 22

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

℄ CONST

	Fill	Cut
51 + 00	90	55
50 + 00	105	102
49 + 00	250	36
48 + 00	26	175
47 + 00	56	140

CONST. TYPE 'B' FENCE
50.59
50.59
50.51
50.31
CONNECT TO EXIST. PAVT.
STA. 51+06.31
END TRAFFIC SEPARATOR
4:1
4:1
6:1
POND # 2
SEE RETENTION POND DETAIL SHEET
10:1
4:1
BOTTOM EL. 35.0
CONST. TYPE 'B' FENCE
49.64
49.64
49.03
4:1
6:1
VARIES
R/W LINE
STA. 49+20,
END MEDIAN TAPER R.T.
BEGIN TRAFFIC SEPARATOR
R/W LINE
49.79
49.79
48.42
VARIES
GNE
51.02
51.02
49.92
VARIES
R/W LINE
R/W LINE
53.22
53.22
52.12
4:1
4:1
6:1
6:1
4:1

193 148
361 291
657 256
511 391
152 583

RECEIVED
MAY 09 1994
RECORDS ORLANDO

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

NO.	DESCRIPTION	DATE	BY	NO.	DESCRIPTION	DATE	BY

	NAME	DATE		NAME	DATE
DESIGNED BY	T.S.	8/89	DRAWN BY	T.D.	8/89
CHECKED BY	A.V.H.	8/89	CHECKED BY	B.A.S.	8/89
SUPERVISED BY	W.D.C.		APPROVED	WAYNE D CHAIFOUX DAT 12-89	

VOLUSIA COUNTY

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055

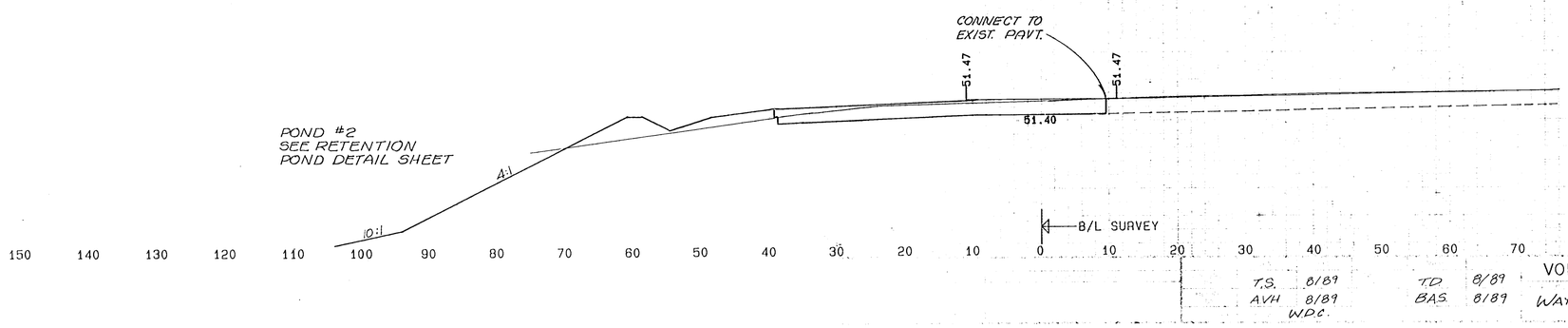
COUNTY

4055 23

SUMMARY OF EARTHWORK	
ROADWAY EXCAVATION	32,216 C.Y.
FILL + 50 % (17,085 + 8,543)	25,628 C.Y.

STA. 52+16.27,
END PROJECT

STA. 51+56.00,
END CONSTRUCTION,
END EARTHWORK



51 + 50

SCALE
1 IN. = 10 FT. HORIZ.
1 IN. = 5 FT. VERT.

0 0
92 0
15 3
25

MAY 06 1994
42-12-2852ONG
T. CRAIG
ORLANDO

T.S. 8/89
AVH 8/89
WDC.

TD 8/89
BAS 8/89

VOLUSIA COUNTY
WAYNE D. CHALIFOUX 12-89

KENTUCKY AVENUE
CROSS SECTIONS

PREPARED BY
DYER, RIDDLE, MILLS & PRECOURT, INC.

4055

E223

Permit No. 4-127-22827-6

Veterans Memorial Parkway Extension

(Graves Avenue to S.R. 472)

22827-6

Bound Reports
1720

Veterans Memorial Parkway

(from Graves Ave. to SR. 472)

- **Revised Storm-water Calculations for submission to St. Johns River Water Management District**

St. JRWMD Application # 4-127-22827-6

Post - Construction 25 yr. – 96 hr. Storm

RECEIVED
22827-6
APR 29 2002
PDS
ALTAMONTE SVC. CTR

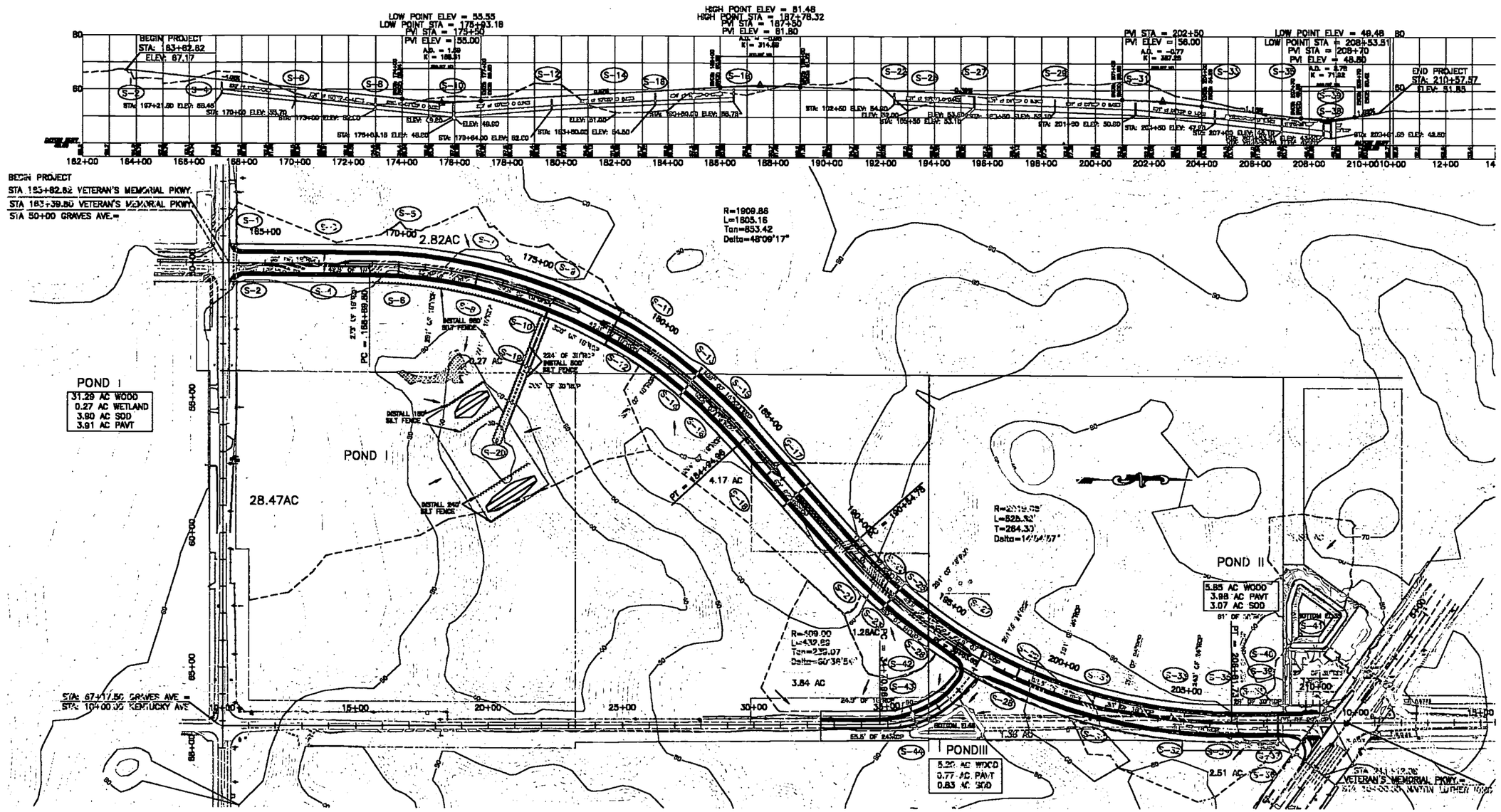
By: Scott H. Martin, P.E.
Volusia County
DPW - Construction Engineering Division

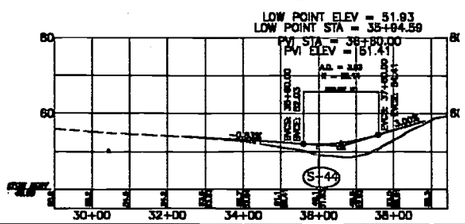
REC
APR
PDS
ALTAMONTE SVC. CTR

County of Volusia
123 W. Indiana Ave.
DeLand, FL 32720

Scott H. Martin, P.E.
FL. License # 38722

BEST AVAILABLE COPY





REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

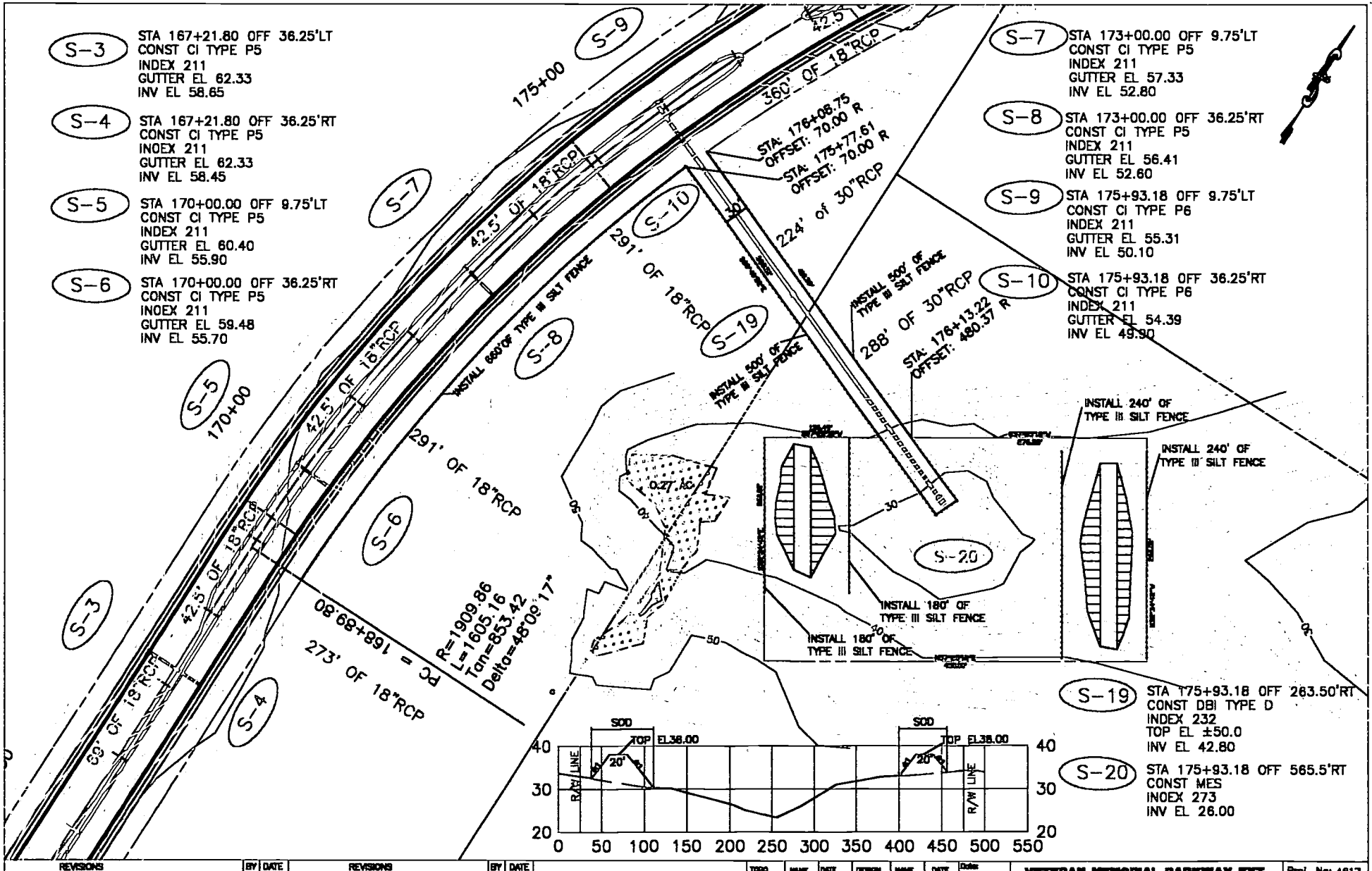
TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD			CADD	ID	10/01
CHECKED			CHECKED	SM	3/02
FIELD BOOK NO.	PAGE	TO	DESIGNED	TM	10/01

Date: 4/02
SCALE:
HORIZ 1"=200'
VERT 1"=20'

VETERAN MEMORIAL PKWY. EXTENSION
DRAINAGE MAP

Proj. No: 4817
Draw No: 4817
Sheet No: 2 of 51

E227


S-3
STA 167+21.80 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 62.33
INV EL 58.65
S-4
STA 167+21.80 OFF 36.25'RT
CONST CI TYPE P5
INOEX 211
GUTTER EL 62.33
INV EL 58.45
S-5
STA 170+00.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 60.40
INV EL 55.90
S-6
STA 170+00.00 OFF 36.25'RT
CONST CI TYPE P5
INOEX 211
GUTTER EL 59.48
INV EL 55.70
S-7
STA 173+00.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 57.33
INV EL 52.80
S-8
STA 173+00.00 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 56.41
INV EL 52.60
S-9
STA 175+93.18 OFF 9.75'LT
CONST CI TYPE P6
INDEX 211
GUTTER EL 55.31
INV EL 50.10
S-10
STA 175+93.18 OFF 36.25'RT
CONST CI TYPE P6
INDEX 211
GUTTER EL 54.39
INV EL 49.90
S-19
STA 175+93.18 OFF 263.50'RT
CONST DBI TYPE D
INDEX 232
TOP EL ±50.0
INV EL 42.80
S-20
STA 175+93.18 OFF 565.5'RT
CONST MES
INOEX 273
INV EL 26.00
175+00
170+00
42.5' OF 18"RCP
360' OF 18"RCP
291' OF 18"RCP
273' OF 18"RCP
224' of 30"RCP
288' OF 30"RCP
STA: 176+08.75
OFFSET: 70.00 R
STA: 175+77.61
OFFSET: 70.00 R
STA: 176+13.22
OFFSET: 480.37 R
INSTALL 500' OF TYPE III SILT FENCE
INSTALL 660'OF TYPE III SILT FENCE
INSTALL 240' OF TYPE III SILT FENCE
INSTALL 180' OF TYPE III SILT FENCE
0.27 AC
R=1909.86
L=1605.16
Tan=853.42
Delta=48°09'17"
168+89.80 = PC
SOD
TOP EL38.00
20'
R/W LINE
VETERAN MEMORIAL PARKWAY EXT.
POND 1
COUNTY ENGINEER
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA
Proj. No: 4617
Draw No: 4617
Sheet No: 43of44

E228

Worksheet 2: Runoff curve number and runoff

Project VETERAN MEM PKWY EXT #4617 By I.O. Date 4/02

Location ORANGE CITY Checked ____ Date ____

Circle one: Present Developed FDOT (SOUTH)

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐acres ☐mi² ☐%	Product of CN x area	
A-	WOODS	36.			31.27	1126.44	OFF-SITE
A	SOD	39			3.90	152.10	
A	IMPERVIOUS	98			3.91	383.18	
D	WETLAND	98			0.27	26.46	
					Totals =	39.37	1688.18

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1688.18}{39.37} = 42.89$; Use CN = 43

2. Runoff

S = 13.26 ✓

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25		
Rainfall, P (24-hour) ..... in	12		
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	3.87		

$Q = \frac{(P-0.25)^2}{P+0.85} = 3.87$ ✓ $V = \frac{3.81}{12} \times 39.37 = 12.68$ ✓

$T_c = 0.21$ hr.

K – VERT – 0.18
K – HOR – 0.45

$V = 16.1345\, s^{1/2}$ UNP

$V = 20.3282\, s^{1/2}$ PVMT.

1288 / 1.02 % $\Rightarrow$ 0.01', $V = 2.05$

425 / 0.47 % $\Rightarrow$ 0.004', $V = 1.39$

224 / 2.7 % $\Rightarrow$ 0.027', $V = 3.34$

228 / 5.0 % $\Rightarrow$ 0.058', $V = 4.89$

$$T_c = \frac{1288}{2.05 \cdot 3600} + \frac{425}{1.39 \cdot 3600} + \frac{224}{3.34 \cdot 3600} + \frac{228}{4.89 \cdot 3600} = 0.21 \text{ hr}.$$

	Ac	Ac-ft	Cum	PER
26	0.097		0	— 256.43
28	0.219	0.316	0.316	— 378.37
30	0.405	0.624	0.94	— 512.54
32	0.681	1.086	2.026	— 694.17
34	0.973	1.654	3.68	— 816.19
36	1.225	2.198	5.873	— 912.20
38	1.647	2.872	8.75	— 1075.25

K VERT $8.7/2/24 = 0.18$

K HOR $8.7/2/24 \times 2.5 = 0.45$

$Wq = 3.28$ acft

Report Covering

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Created.: Fri Nov 09 15:42:28 2001
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Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

Project Contains 2 Paths.
Project Contains 3 Nodes.
Project Contains 0 Sgnls.

Path	Up Stream Node Name	Down Stream Node Name	Path Type
0	BASIN SOUTH	SOUTH POND	DIRECT
1	SOUTH POND	GROUND WATER	RECHARGE

Node	Name	Node Type
0	BASIN SOUTH	SCS SITE
1	SOUTH POND	POND
2	GROUND WATER	MOUNDING

Node	Name	Node Type	Min El.	at Hr.	Max El.	at Hr.
0	BASIN SOUTH	SCS SITE	38.0	0.00	38.0	0.00
1	SOUTH POND	POND	26.0	0.00	35.0	61.00
2	GROUND WATER	MOUNDING	25.0	0.00	26.0	132.50

Elevations in Feet, Nodes marked with an '*' have Flooded.

Node	Name	Maximum CFS Inflow	Maximum CFS Outflow
0	BASIN SOUTH	79.03 @ 60.00 Hours	79.03 @ 60.00 Hours
1	SOUTH POND	79.03 @ 60.00 Hours	14.80 @ 61.00 Hours
2	GROUND WATER	12.61 @ 62.75 Hours	0.00 @ 0.00 Hours

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Project Run Converged.

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1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0095 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0751 Percent

Project Contains 2 Paths.
Path 000 from Node 000 (BASIN SOUTH) to Node 001 (SOUTH POND)

Path 000 ID 1012238182 Type DIRECT	US Std
00	DIRECT..----------
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	HW PE/KE NO
16	TW PE/KE YES
17	Max HW.. 38.000 Ft
18	Max TW.. 38.000 Ft

Path 000 Output Data Type DIRECT	US Std
00	Input ID 1012238182
01	Flow TO. 0.000 CFS
02	Vol TO.. 0 CF
03	Max In.. 79.031 CFS
04	Min In.. 0.000 CFS
05	Max Out. 79.031 CFS
06	Min Out. 0.000 CFS
07	
08	
09	
10	
11	
12	
13	
14	
15	Fwd K... 0.000
16	Rev K... 0.000
17	Fwd X... 0.000
18	Rev X... 0.000

Path 001 from Node 001 (SOUTH POND) to Node 002 (GROUND WATER)

Path 001 ID 1018546580 Type RECHARGE		US Std
00	Horz K..	0.450 FPH
01	Vert K..	0.180 FPH
02		
03	Max Perc	FPH
04		
05	Handle..	Name
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE YES	
16	TW PE/KE NO	
17	Max HW..	38.000 Ft
18	Max TW..	38.000 Ft

Path 001 Output Data Type RECHARGE		US Std
00	Input ID 1018546580	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	14.803 CFS
04	Min In..	0.000 CFS
05	Max Out.	12.605 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Report Covering

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Project Run Converged.

Prepared By

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1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0095 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0751 Percent

Project Contains 3 Nodes.

Node 000 Name BASIN SOUTH — Input# 1018546690
Type SCS SITE — US Std

00	Flood El.	38.000 Ft	
01			
02	Storm....	LWRB96	Freeze... YES
03	RainFall.	12.000 In	Freeze... YES
04			
05	Area.....	39.370 Ac	
06	Curve No.	43.000	
07	UHG File.	SCS_323	
08	Ia Factor	0.200	
09	Tc.....	0.210 Hrs	
10			
11			
12			
13			
14			
15			
16			
17	Base Flow	0.00 CFS	Stage TO. Ft
18	X Coord..	Ft	Y Coord.. Ft

Node 000 Name BASIN SOUTH Type SCS SITE		Output Data US Std
00	Input ID.....	1018546690
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	38.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	38.000 Feet
05	Minimum Stage Reached.....	38.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	38.000 Feet
09	Time of Maximum Stage.....	0.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	79.031 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	79.031 CFS
16	Time of Peak Output.....	60.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.000 Feet

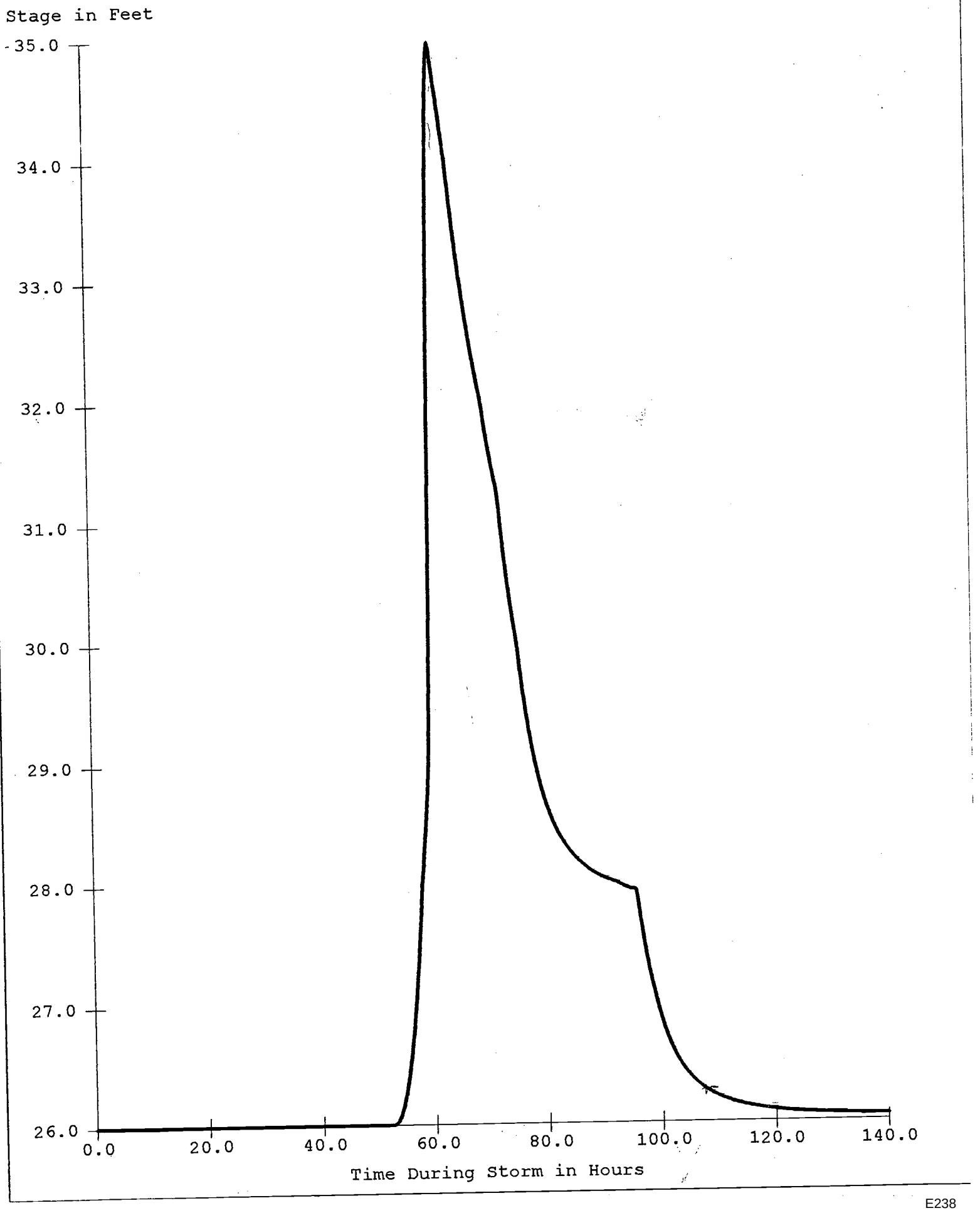
Node 001 Name SOUTH POND Type POND				Input# 1012590246 US Std	
00	Top El...	38.000 Ft	Top Area.	1.647 Ac	8.75
01	El.....	36.000 Ft	Area.....	1.225 Ac	5.88
02	El.....	34.000 Ft	Area.....	0.973 Ac	3.68
03	El.....	32.000 Ft	Area.....	0.681 Ac	2.07
04	El.....	30.000 Ft	Area.....	0.405 Ac	.94
05	El.....	28.000 Ft	Area.....	0.219 Ac	.32
06	El.....	Ft	Area.....	Ac	
07	El.....	Ft	Area.....	Ac	
08	El.....	Ft	Area.....	Ac	
09	El.....	Ft	Area.....	Ac	
10	Bot El...	26.000 Ft	Bot Area.	0.097 Ac	
11					
12	Top Perim	1075.3 Ft	Side %Per	100.0 Pct	
13	Mid Perim	694.1 Ft	Base %Per	100.0 Pct	
14	Bot Perim	256.4 Ft			
15					
16					
17	Base Flow	0.00 CFS	Stage TO.	25.000 Ft	
18	X Coord..	Ft	Y Coord..	Ft	

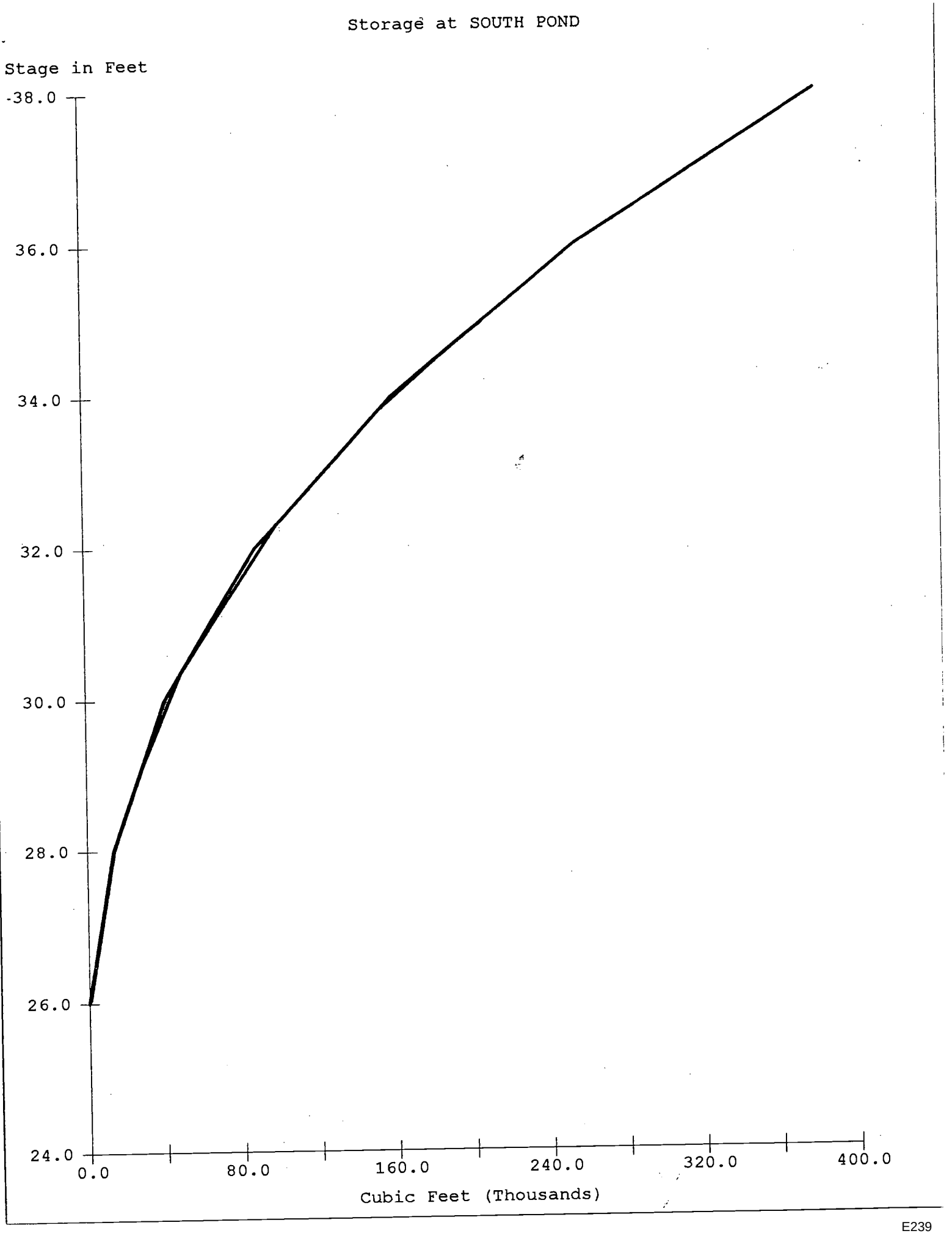
Node 001 Name SOUTH POND Type POND		Output Data US Std
00	Input ID.....	1012590246
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	26.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	34.980 Feet
05	Minimum Stage Reached.....	26.000 Feet
06	Maximum Gross Storage.....	207222 CF
07	Maximum Detention Storage.....	207222 CF
08	Final Stage Elevation.....	26.047 Feet
09	Time of Maximum Stage.....	61.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	79.031 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	14.803 CFS
16	Time of Peak Output.....	61.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.009 Feet

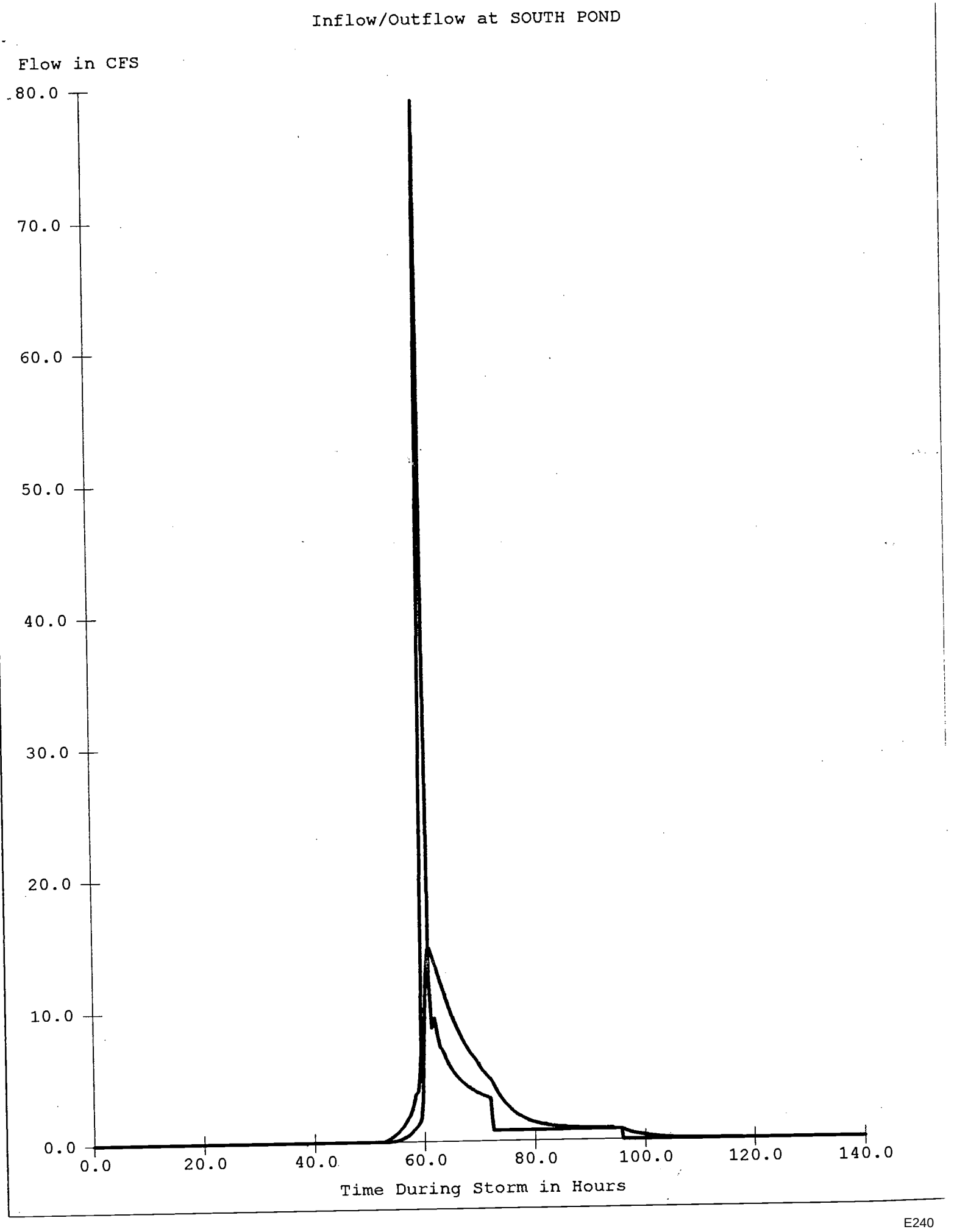
Node 002 Name GROUND WATER Type MOUNDING			Input# 1018641685 US Std
00	Flood El.	38.000 Ft	Auto Warn NO
01			
02	Porosity.	20.00 Pct	
03	Saturated	25.00 Pct	
04			
05	S Yield..	20.00 Pct	
06	Hyd Cond.	0.3300 FPH	
07	Length...	1600.0 Ft	
08	Width....	1200.0 Ft	
09	Toler....	0.0100000 Ft	
10	Method...	HANTUSH 2	
11			
12	Base El..	-99.000 Ft	
13			
14			
15			
16			
17	Base Flow	CFS	Stage TO. 25.000 Ft
18	X Coord..	Ft	Y Coord.. Ft

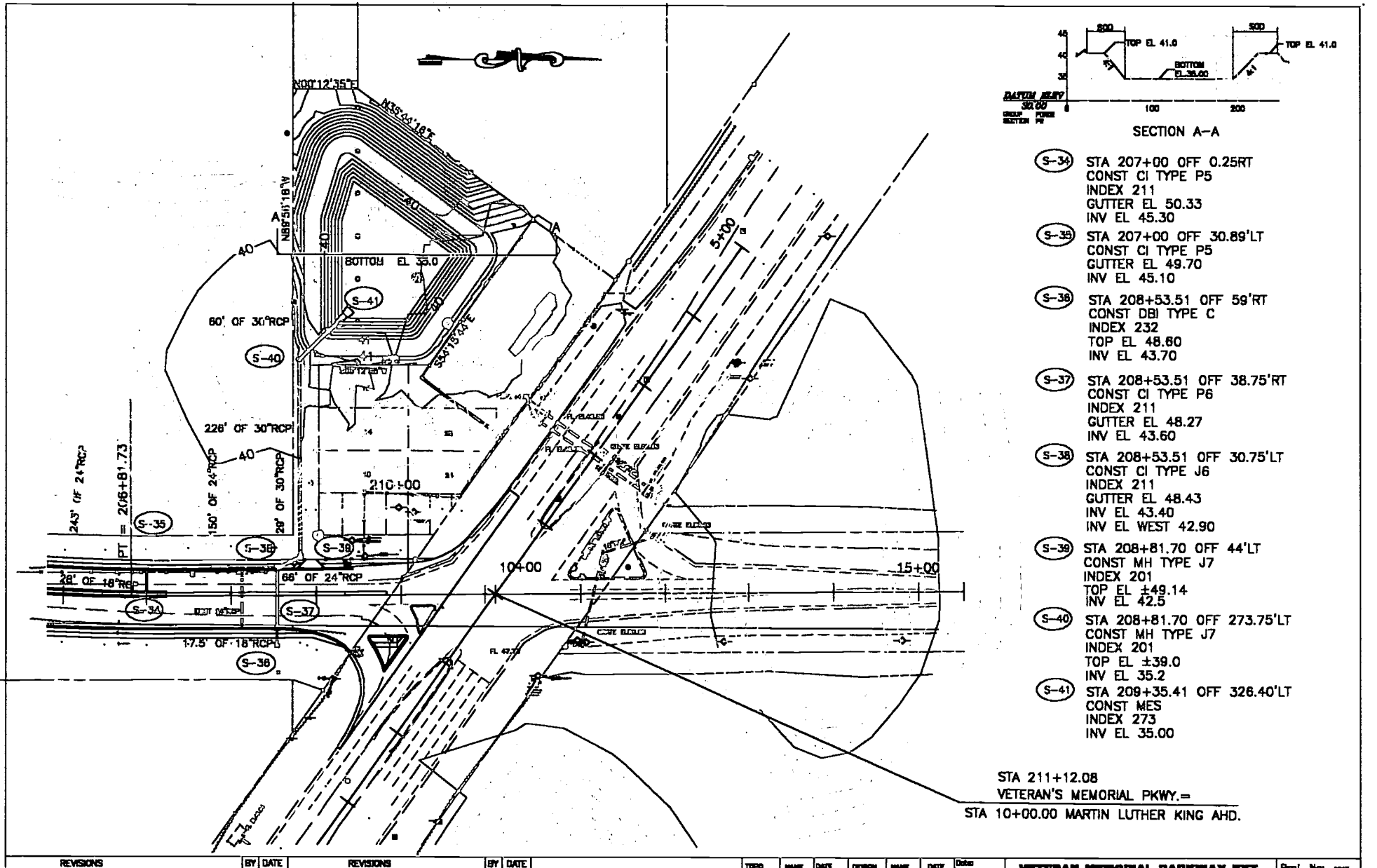
Node 002 Name GROUND WATER Type MOUNDING		Output Data US Std
00	Input ID.....	1018641685
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	25.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	26.048 Feet
05	Minimum Stage Reached.....	25.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	26.047 Feet
09	Time of Maximum Stage.....	132.500 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	12.605 CFS
14	Time of Peak Intake.....	62.750 Hours
15	Peak Nodal Output.....	0.000 CFS
16	Time of Peak Output.....	0.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.001 Feet

Stage El. at SOUTH POND




Storage at SOUTH POND
Stage in Feet
38.0
36.0
34.0
32.0
30.0
28.0
26.0
24.0
0.0
80.0
160.0
240.0
320.0
400.0
Cubic Feet (Thousands)


Inflow/Outflow at SOUTH POND
Flow in CFS
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours



SECTION A-A

(S-34) STA 207+00 OFF 0.25RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 50.33
INV EL 45.30

(S-35) STA 207+00 OFF 30.89'LT
CONST CI TYPE P5
GUTTER EL 49.70
INV EL 45.10

(S-36) STA 208+53.51 OFF 59'RT
CONST DBI TYPE C
INDEX 232
TOP EL 48.60
INV EL 43.70

(S-37) STA 208+53.51 OFF 38.75'RT
CONST CI TYPE P6
INDEX 211
GUTTER EL 48.27
INV EL 43.60

(S-38) STA 208+53.51 OFF 30.75'LT
CONST CI TYPE J6
INDEX 211
GUTTER EL 48.43
INV EL 43.40
INV EL WEST 42.90

(S-39) STA 208+81.70 OFF 44'LT
CONST MH TYPE J7
INDEX 201
TOP EL ±49.14
INV EL 42.5

(S-40) STA 208+81.70 OFF 273.75'LT
CONST MH TYPE J7
INDEX 201
TOP EL ±39.0
INV EL 35.2

(S-41) STA 209+35.41 OFF 326.40'LT
CONST MES
INDEX 273
INV EL 35.00

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
				JG	11/01
				BM	
FIELD BOOK NO.	PAGE NO.			TM	

Date 4/02
SCALES: HORIZ 1"=40' VERT 1"=10'

VETERAN MEMORIAL PARKWAY EXT.
POND # 2

Proj. No: 4617
Draw No: 4617
Sheet No: 44 of 44

E241

Worksheet 2: Runoff curve number and runoff

Project VETERAN MEMORIAL PKWY EXT # 4617 By ____ Date 4/02

Location ORANGE CITY Checked ____ Date ____

Circle one: Present Developed POND 11 (NORTH)

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐ acres ☐ mi² ☐ %	Product of CN x area
A	WOOD	36			5.65	203.40
A	SOIL	39			3.07	119.73
A	PAVT	98			3.98	390.04
	Totals =				12.70	713.17

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{713.17}{12.70} = 56.15$; Use CN = 56

2. Runoff

$S = \frac{1000}{56} - 10 = 7.86$

Storm #1	Storm #2	Storm #3
25		
12		
5.95		

Frequency ..... yr

Rainfall, P (24-hour) ..... in

Runoff, Q ..... in
(Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

$Q = \frac{(P - 0.2S)^2}{P + 0.8S} = 5.95$

$V = 6.29$ AC-FT ✓

	Ac	cuft	CUN	PER
35	0.31		0	476.85
		0.335	0.335	
36	0.26			509.33
		0.385	0.720	
37	0.41			541.82
		0.435	1.155	
38	0.46			574.23
		0.485	1.640	
39	0.51			601.93
		0.540	2.180	
40	0.57			627.50
		0.560	2.74	
41	0.63			653.38

$V = 20.3282 \cdot S^{1/2}$

1472 / 0.39% $\Rightarrow$ 0.004 ', $V = 1.28$

604 / 1.16% $\Rightarrow$ 0.011 ', $V = 2.13$

29 / 1.38% $\Rightarrow$ 0.014 ', $V = 2.40$

227 / 3.22% $\Rightarrow$ 0.032 '/. $V = 3.64$

60 / 0.33% $\Rightarrow$ 0.003 ', $V = 1.11$

$$T_c = \frac{1472}{1.28 \cdot 3600} + \frac{604}{2.13 \cdot 3600} + \frac{29}{2.40 \times 3600} + \frac{227}{3.64 \cdot 3600} + \frac{60}{1.11 \cdot 3600} = 0.40$$

0.32 0.05 0.003 0.017 0.015

$W_q = 1.06 \text{ acft}$

K_{VERT} $9.1/2/24 = 0.19$

K_{HOR} $9.1/2/24 \times 25 = 0.47$

Report Covering

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1049 Dunlap Avenue
Spring Hill, Florida

Project Contains 2 Paths.
Project Contains 3 Nodes.
Project Contains 0 Sgnls.

Path	Up Stream Node Name	Down Stream Node Name	Path Type
0	BASIN NORTH	NORTH POND	DIRECT
1	NORTH POND	GROUND WATER	RECHARGE

Node	Name	Node Type
0	BASIN NORTH	SCS SITE
1	NORTH POND	POND
2	GROUND WATER	MOUNDING

Node	Name	Node Type	Min El.	at Hr.	Max El.	at Hr.
0	BASIN NORTH	SCS SITE	41.0	0.00	41.0	0.00
1	NORTH POND	POND	35.0	0.00	40.5	61.50
2	GROUND WATER	MOUNDING	25.0	0.00	36.1	74.50

Elevations in Feet, Nodes marked with an '*' have Flooded.

Node	Name	Maximum CFS Inflow	Maximum CFS Outflow
0	BASIN NORTH	27.04 @ 60.00 Hours	27.04 @ 60.00 Hours
1	NORTH POND	27.04 @ 60.00 Hours	6.95 @ 61.50 Hours
2	GROUND WATER	6.75 @ 62.00 Hours	0.00 @ 0.00 Hours

Report Covering

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Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0006 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0091 Percent

Project Contains 2 Paths.
Path 000 from Node 000 (BASIN NORTH) to Node 001 (NORTH POND)

Path 000 ID 1005590610 Type DIRECT US Std	
00	DIRECT..----------
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	HW PE/KE NO
16	TW PE/KE YES
17	Max HW.. 41.000 Ft
18	Max TW.. 41.000 Ft

Path 000 Output Data Type DIRECT US Std		
00	Input ID 1005590610	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	27.040 CFS
04	Min In..	0.000 CFS
05	Max Out.	27.040 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Path 001 from Node 001 (NORTH POND) to Node 002 (GROUND WATER)

Path 001 ID 1018620381 Type RECHARGE		US Std
00	Horz K..	0.470 FPH
01	Vert K..	0.190 FPH
02		
03	Max Perc	FPH
04		
05	Handle..	Name
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE YES	
16	TW PE/KE NO	
17	Max HW..	41.000 Ft
18	Max TW..	41.000 Ft

Path 001 Output Data Type RECHARGE		US Std
00	Input ID 1018620381	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	6.949 CFS
04	Min In..	0.000 CFS
05	Max Out.	6.747 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Report Covering

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Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0006 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0091 Percent

Project Contains 3 Nodes.

Node 000 Name BASIN NORTH — Input# 1018626029
Type SCS SITE — US Std

00	Flood El.	41.000 Ft	
01			
02	Storm....	LWRB96	Freeze... YES
03	RainFall.	12.000 In	Freeze... YES
04			
05	Area.....	12.700 Ac	
06	Curve No.	56.000	
07	UHG File.	SCS_323	
08	Ia Factor	0.200	
09	Tc.....	0.400 Hrs	
10			
11			
12			
13			
14			
15			
16			
17	Base Flow	0.00 CFS	Stage TO. Ft
18	X Coord..	Ft	Y Coord.. Ft

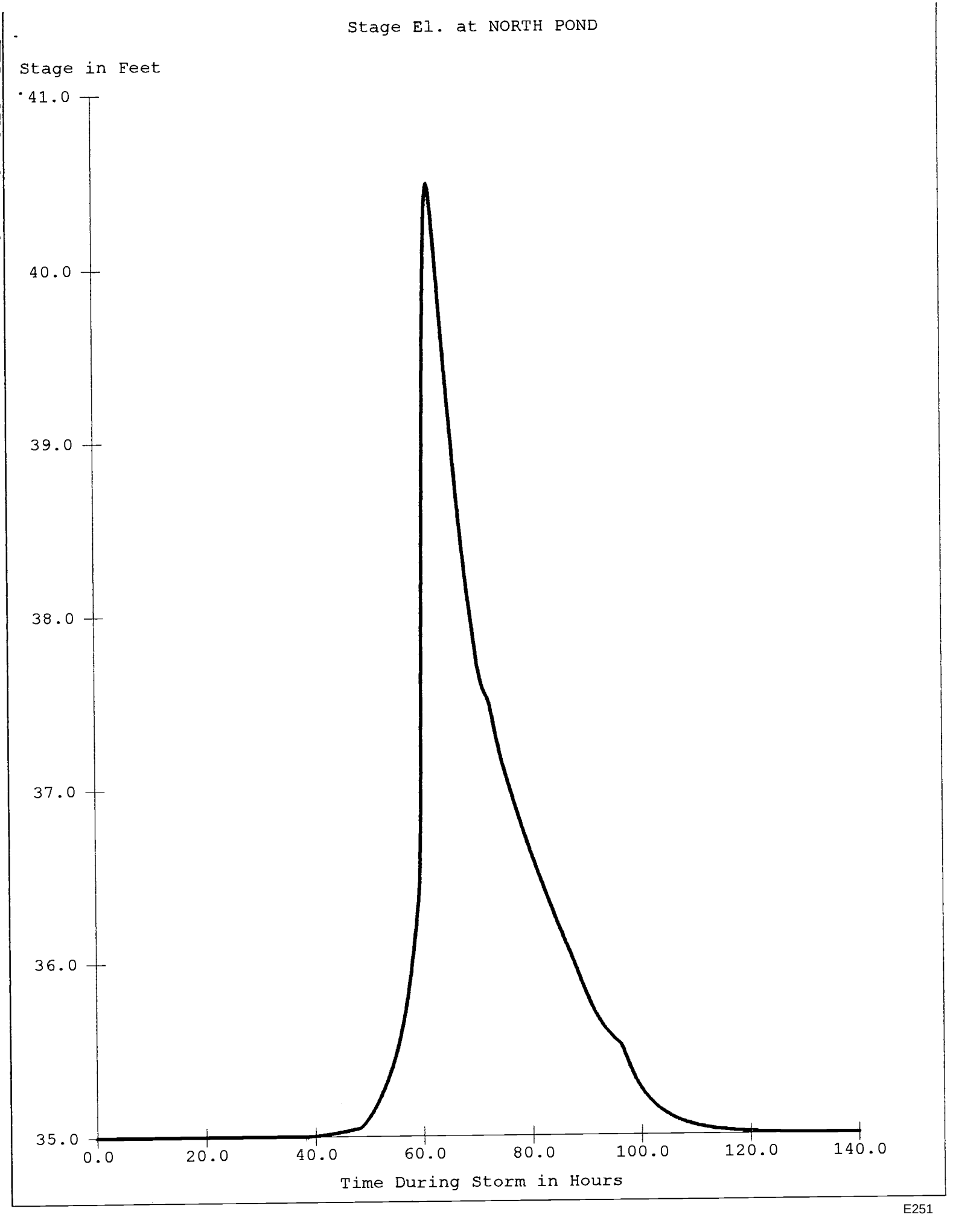
Node 000 Name BASIN NORTH Type SCS SITE		Output Data US Std
00	Input ID.....	1018626029
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	41.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	41.000 Feet
05	Minimum Stage Reached.....	41.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	41.000 Feet
09	Time of Maximum Stage.....	0.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	27.040 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	27.040 CFS
16	Time of Peak Output.....	60.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.000 Feet

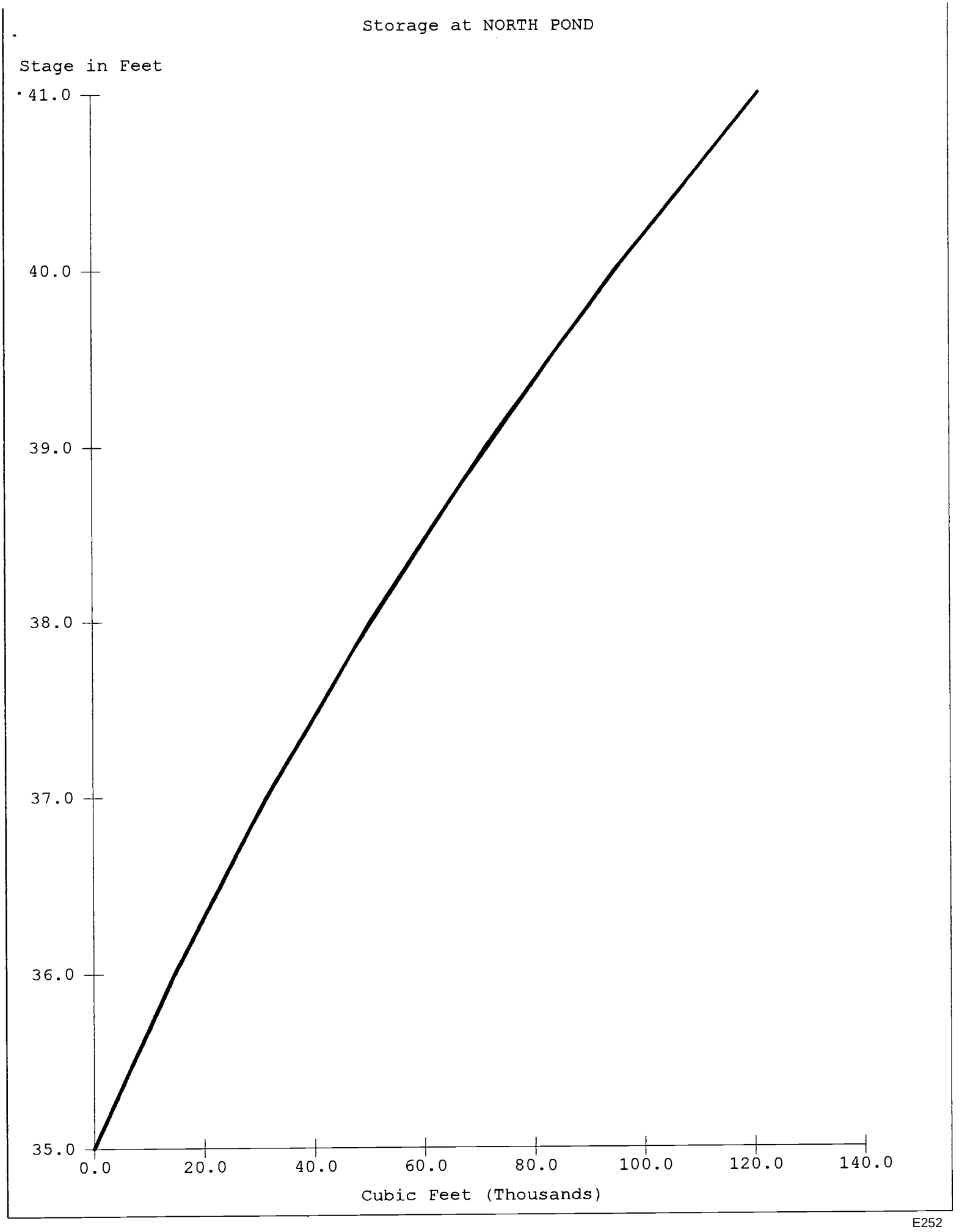
Node 001 Name NORTH POND Type POND				Input# 1005591882 US Std
00	Top El...	41.000 Ft	Top Area.	0.630 Ac
01	El.....	40.000 Ft	Area.....	0.570 Ac
02	El.....	39.000 Ft	Area.....	0.510 Ac
03	El.....	38.000 Ft	Area.....	0.460 Ac
04	El.....	37.000 Ft	Area.....	0.410 Ac
05	El.....	36.000 Ft	Area.....	0.360 Ac
06	El.....	Ft	Area.....	Ac
07	El.....	Ft	Area.....	Ac
08	El.....	Ft	Area.....	Ac
09	El.....	Ft	Area.....	Ac
10	Bot El...	35.000 Ft	Bot Area.	0.310 Ac
11				
12	Top Perim	653.4 Ft	Side %Per	100.0 Pct
13	Mid Perim	574.2 Ft	Base %Per	100.0 Pct
14	Bot Perim	476.9 Ft		
15				
16				
17	Base Flow	0.00 CFS	Stage TO.	25.000 Ft
18	X Coord..	Ft	Y Coord..	Ft

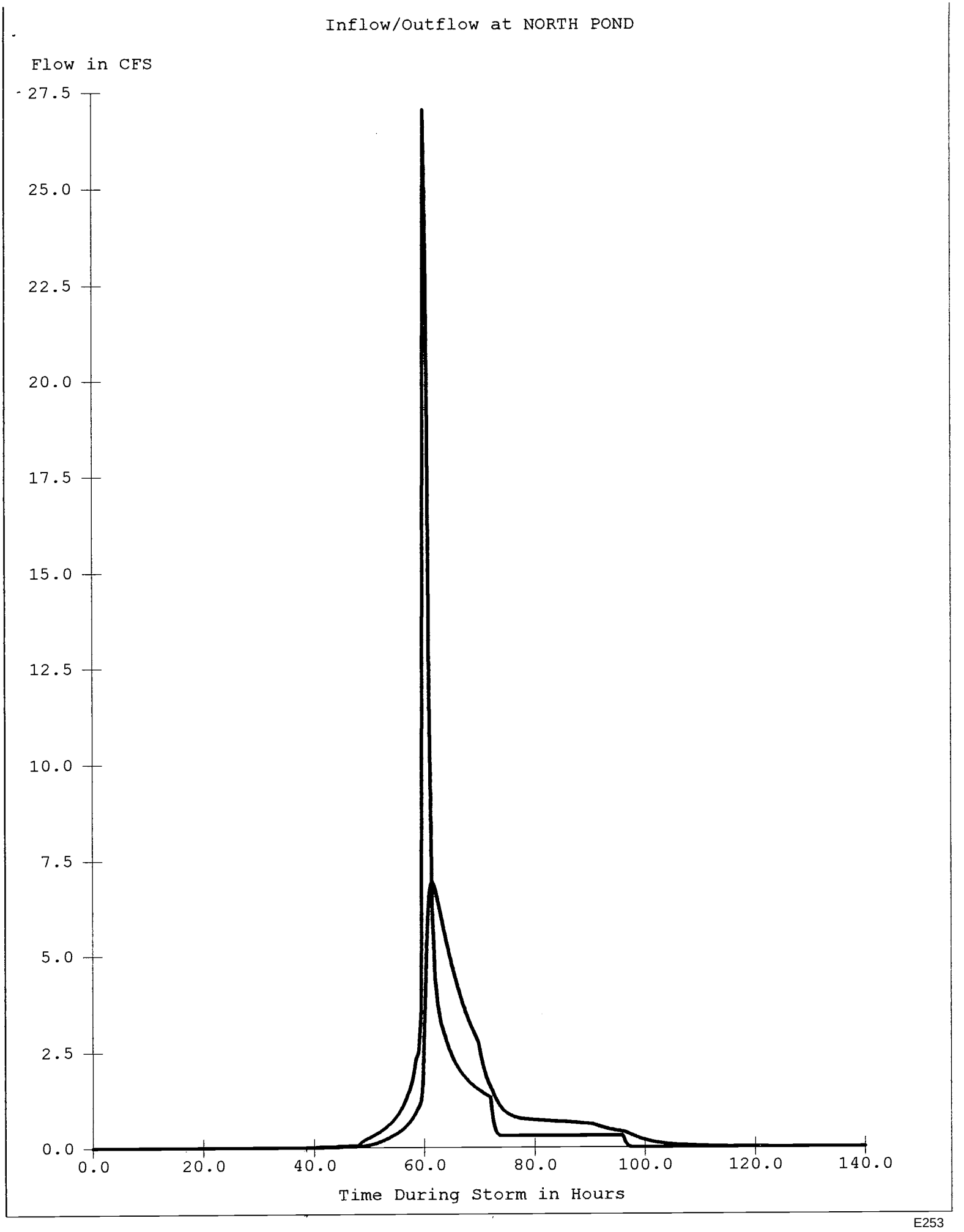
Node 001 Name NORTH POND Type POND		Output Data US Std
00	Input ID.....	1005591882
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	35.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	40.492 Feet
05	Minimum Stage Reached.....	35.000 Feet
06	Maximum Gross Storage.....	107809 CF
07	Maximum Detention Storage.....	107809 CF
08	Final Stage Elevation.....	35.002 Feet
09	Time of Maximum Stage.....	61.500 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	27.040 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	6.949 CFS
16	Time of Peak Output.....	61.500 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.008 Feet

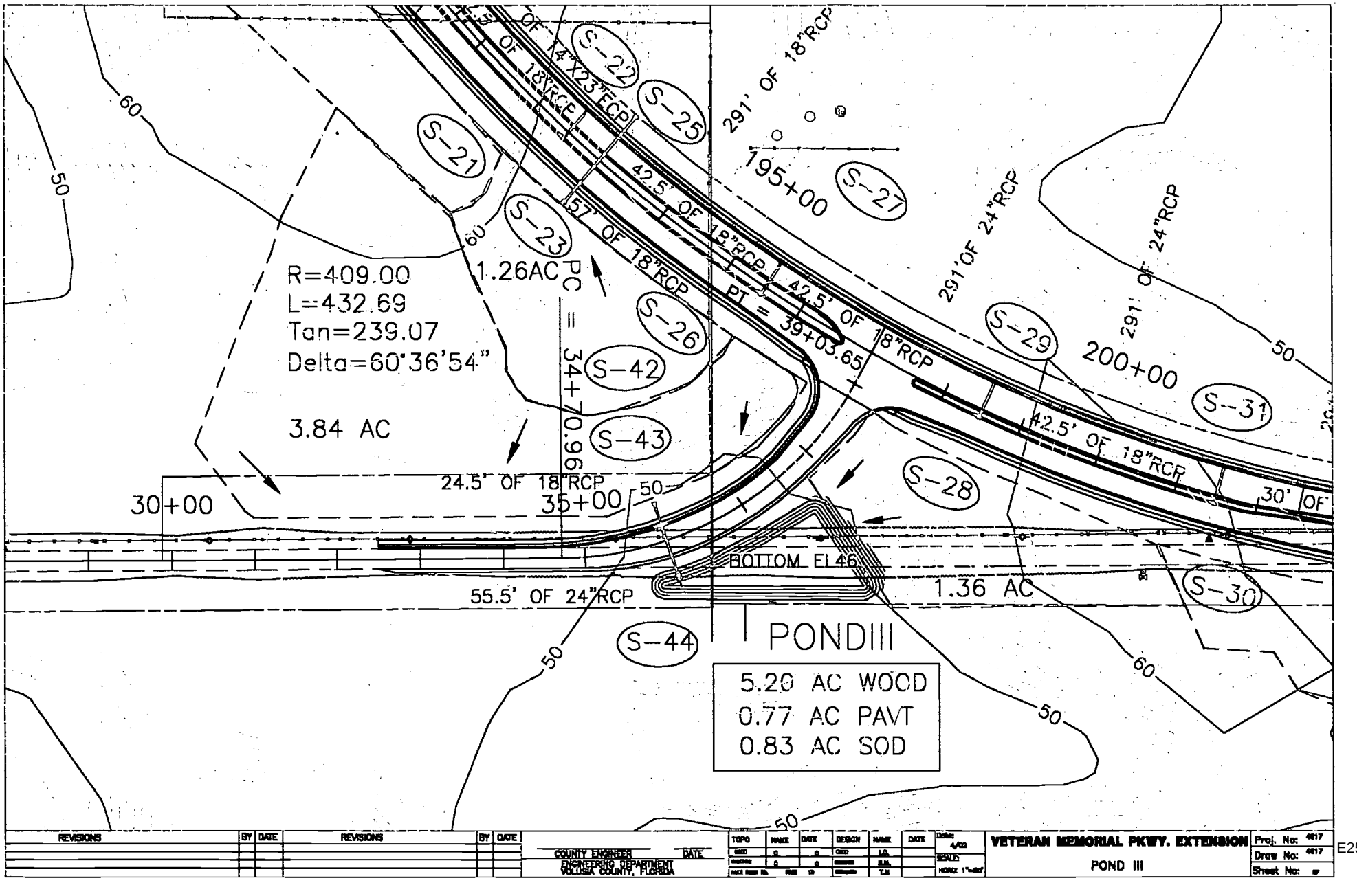
Node 002 Name GROUND WATER Type MOUNDING			Input# 1018640162 US Std
00	Flood El.	41.000 Ft	Auto Warn YES
01			
02	Porosity.	20.00 Pct	
03	Saturated	25.00 Pct	
04			
05	S Yield..	20.00 Pct	
06	Hyd Cond.	0.3800 FPH	
07	Length...	300.0 Ft	
08	Width....	200.0 Ft	
09	Toler....	0.0100000 Ft	
10	Method...	HANTUSH 2	
11			
12	Base El..	-99.000 Ft	
13			
14			
15			
16			
17	Base Flow	CFS	Stage TO. 25.000 Ft
18	X Coord..	Ft	Y Coord.. Ft

Node 002 Name GROUND WATER Type MOUNDING		Output Data US Std
00	Input ID.....	1018640162
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	25.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	36.149 Feet
05	Minimum Stage Reached.....	25.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	29.587 Feet
09	Time of Maximum Stage.....	74.500 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	6.747 CFS
14	Time of Peak Intake.....	62.000 Hours
15	Peak Nodal Output.....	0.000 CFS
16	Time of Peak Output.....	0.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.008 Feet


Stage El. at NORTH POND
Stage in Feet
41.0
40.0
39.0
38.0
37.0
36.0
35.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours


Storage at NORTH POND
Stage in Feet
41.0
40.0
39.0
38.0
37.0
36.0
35.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Cubic Feet (Thousands)


Inflow/Outflow at NORTH POND
Flow in CFS
27.5
25.0
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
0.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
SCD			CHKD	LG	
CHKD			DRAWN	BAL	
PROJ MGR RA		PROJ ENG		TJB	

Date: 4/02
SCALED
HORIZ 1"=60'

VETERAN MEMORIAL PKWY. EXTENSION
POND III

Proj. No: 4817
Draw No: 4817
Sheet No: 8

E254

Worksheet 2: Runoff curve number and runoff

Project VETERAN MEMORIAL PKWY EXT. II 4617 By I.O Date 4/02

Location ORANGE CITY Checked ____ Date ____

Circle one: Present Developed POND III (EAST)

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐acres ☐mi² ☐%	Product of CN x area
A	WOODS	36			5.20	187.20
A	SOD	39			0.83	32.37
A	PAVT	98			0.77	75.46
					6.80	295.03

1/ Use only one CN source per line. Totals =

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{295}{6.80} = 43.38$; Use CN = 43

2. Runoff

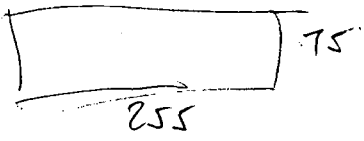
$\int = 13.25$

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25		
Rainfall, P (24-hour) ..... in	12		
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	3.86		

$Q = \frac{(P - 0.2S)^2}{P + 0.8S} = 3.86$

$V = 2.19$ Ac FT

(210-VI-TR-55, Second Ed., June 1986)



	Ac	Acft	Cum	Per
46	0.218	0.24	0.24	344.78
47	0.27	0.30	0.54	769.06
48	0.32	0.35	0.89	494.27
49	0.37	0.40	1.29	617.81
50	0.44			641.86

300 ⇒ 3 %. — 0.03 V = 2.79 V = 16.1345 S^1/2.

175 ⇒ 0.6 % — 0.006 V = 1.25 V = 20.3282 S^1/2

435 ⇒ 1.15 % — 0.01 V = 1.73.

24.5 ⇒ 0.40 % — 0.004 V = 1.29.

55 ⇒ 0.18 % — 0.0018 V = 0.86.

$$T_c = \frac{300}{2.79 \cdot 3600} + \frac{175}{1.25 \times 3600} + \frac{435}{1.73 \cdot 3600} + \frac{24.5}{1.29 \times 3600} + \frac{55}{0.86 \cdot 3600}$$

0.03 + 0.04 + 0.07 + 0.005 + 0.01

$T_c = 0.16$ hr.

$Wq = (6.8\,ac)(1\,in)(1/2) = .56\,acft$

Report Covering

C:\HSSWPACK\INA.WBS\EAST.BRN

Created.: Tue Nov 13 13:40:49 2001
Revised.: Fri Apr 12 16:13:09 2002
Executed: Fri Apr 12 16:13:25 2002

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

Project Contains 2 Paths.
Project Contains 3 Nodes.
Project Contains 0 Sgnls.

Path	Up Stream Node Name	Down Stream Node Name	Path Type
0	BASIN EAST	EAST POND	DIRECT
1	EAST POND	GROUND WATER	RECHARGE

Node	Name	Node Type
0	BASIN EAST	SCS SITE
1	EAST POND	POND
2	GROUND WATER	MOUNDING

Node	Name	Node Type	Min El.	at Hr.	Max El.	at Hr.
0	BASIN EAST	SCS SITE	51.6	0.00	51.6	0.00
1	EAST POND	POND	46.0	0.00	48.9	61.00
2	GROUND WATER	MOUNDING	25.0	0.00	26.9	96.25

Elevations in Feet, Nodes marked with an '*' have Flooded.

Node	Name	Maximum CFS Inflow	Maximum CFS Outflow
0	BASIN EAST	13.65 @ 60.00 Hours	13.65 @ 60.00 Hours
1	EAST POND	13.65 @ 60.00 Hours	2.28 @ 61.00 Hours
2	GROUND WATER	0.81 @ 72.50 Hours	0.00 @ 0.00 Hours

Report Covering

C:\HSSWPACK\INA.WBS\EAST.BRN

Created.: Tue Nov 13 13:40:49 2001
Revised.: Fri Apr 12 16:13:09 2002
Executed: Fri Apr 12 16:13:25 2002

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0002 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0072 Percent

Project Contains 2 Paths.

Path 000 from Node 000 (BASIN EAST) to Node 001 (EAST POND)

Path 000 ID 1005753244 Type DIRECT US Std	
00	DIRECT..----------
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	HW PE/KE NO
16	TW PE/KE YES
17	Max HW.. 51.580 Ft
18	Max TW.. 50.000 Ft

Path 000 Output Data Type DIRECT US Std		
00	Input ID	1005753244
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	13.650 CFS
04	Min In..	0.000 CFS
05	Max Out.	13.650 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Path 001 from Node 001 (EAST POND) to Node 002 (GROUND WATER)

Path 001 ID 1005753295 Type RECHARGE		US Std
00	Horz K..	0.470 FPH
01	Vert K..	0.190 FPH
02		
03	Max Perc	FPH
04		
05	Handle..	Name
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE YES	
16	TW PE/KE NO	
17	Max HW..	50.000 Ft
18	Max TW..	50.000 Ft

Path 001 Output Data Type RECHARGE		US Std
00	Input ID 1005753295	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	2.285 CFS
04	Min In..	0.000 CFS
05	Max Out.	0.809 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Report Covering

C:\HSSWPACK\INA.WBS\EAST.BRN

Created.: Tue Nov 13 13:40:49 2001
Revised.: Fri Apr 12 16:13:09 2002
Executed: Fri Apr 12 16:13:25 2002

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0002 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0072 Percent

Project Contains 3 Nodes.

Node 000 Name BASIN EAST — Input# 1018642198
Type SCS SITE — US Std

00	Flood El. 51.580 Ft	
01		
02	Storm.... LWRB96	Freeze... YES
03	RainFall. 12.000 In	Freeze... YES
04		
05	Area..... 6.800 Ac	
06	Curve No. 43.000	
07	UHG File. SCS_323	
08	Ia Factor 0.200	
09	Tc..... 0.160 Hrs	
10		
11		
12		
13		
14		
15		
16		
17	Base Flow 0.00 CFS	Stage TO. Ft
18	X Coord.. Ft	Y Coord.. Ft

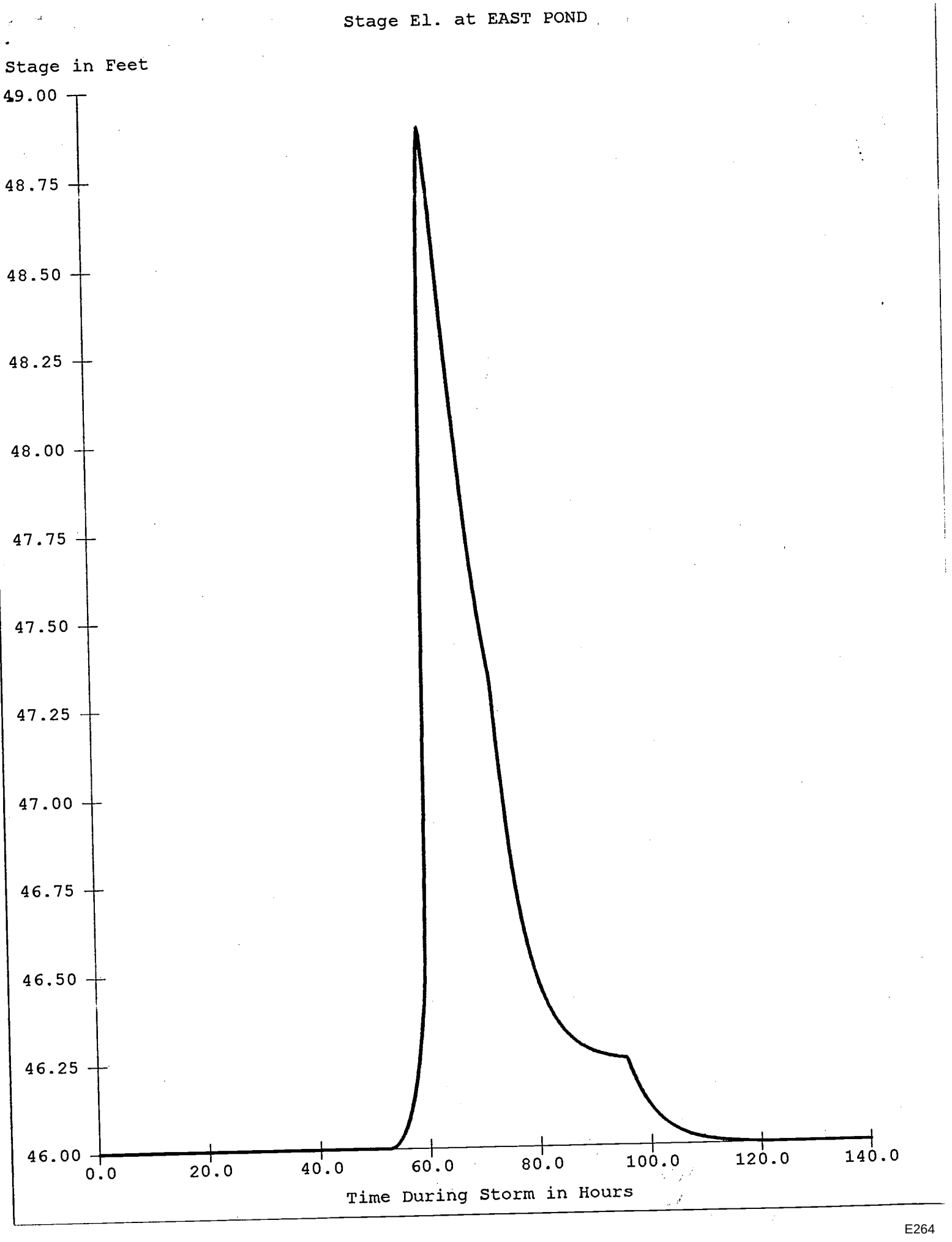
Node 000 Name BASIN EAST Type SCS SITE		Output Data US Std
00	Input ID.....	1018642198
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	51.580 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	51.580 Feet
05	Minimum Stage Reached.....	51.580 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	51.580 Feet
09	Time of Maximum Stage.....	0.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	13.650 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	13.650 CFS
16	Time of Peak Output.....	60.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.000 Feet

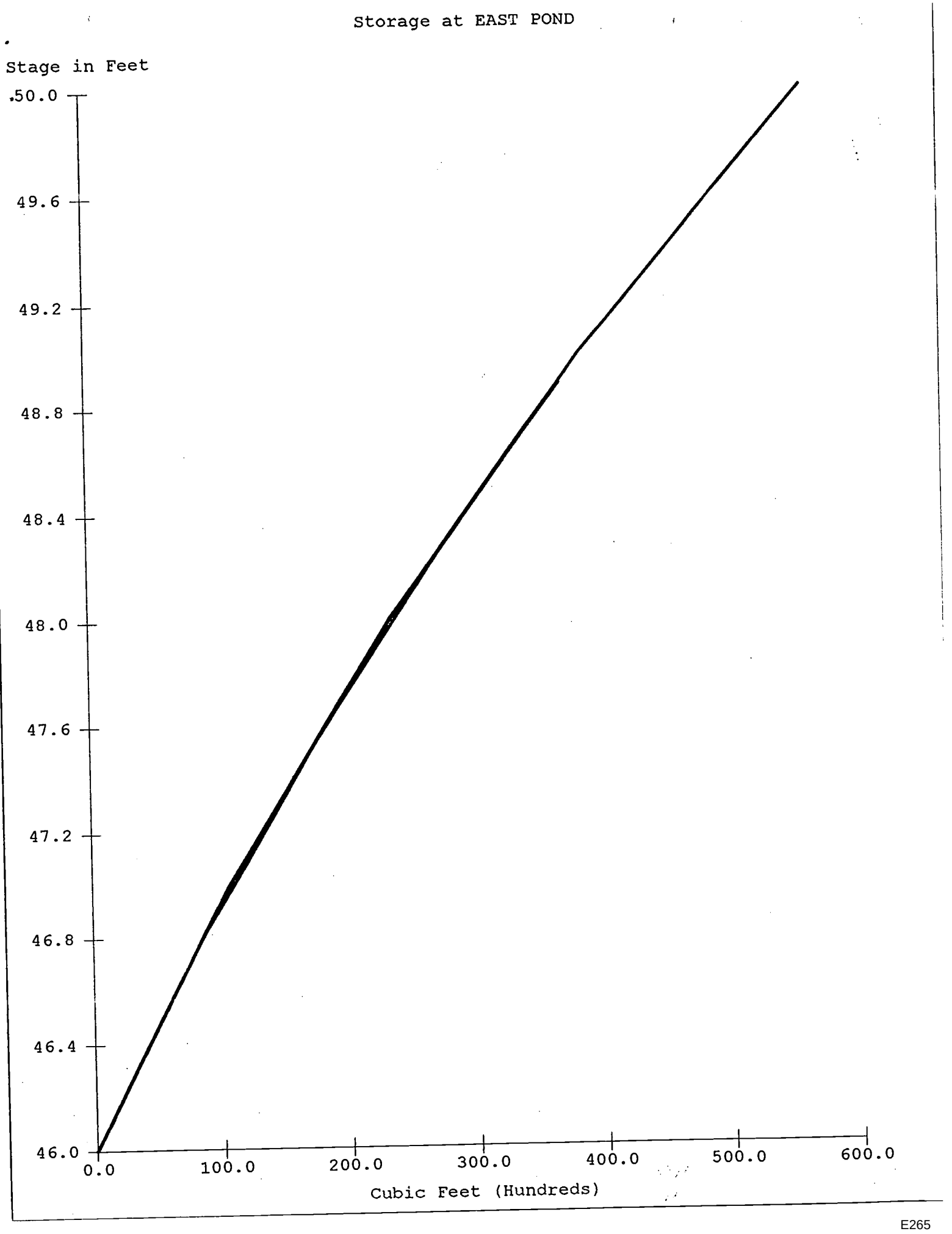
Node 001 Name EAST POND Type POND				Input# 1018642335 US Std	
00	Top El...	50.000	Ft ✓	Top Area.	0.440 Ac ✓
01	El.....	49.000	Ft	Area.....	0.370 Ac
02	El.....	48.000	Ft	Area.....	0.320 Ac
03	El.....	47.000	Ft	Area.....	0.270 Ac
04	El.....		Ft	Area.....	Ac
05	El.....		Ft	Area.....	Ac
06	El.....		Ft	Area.....	Ac
07	El.....		Ft	Area.....	Ac
08	El.....		Ft	Area.....	Ac
09	El.....		Ft	Area.....	Ac
10	Bot El...	46.000	Ft ✓	Bot Area.	0.218 Ac ✓
11					
12	Top Perim	641.9	Ft	Side %Per	100.0 Pct
13	Mid Perim	594.3	Ft	Base %Per	100.0 Pct
14	Bot Perim	544.8	Ft		
15					
16					
17	Base Flow	0.00	CFS	Stage T0.	25.000 Ft
18	X Coord..		Ft	Y Coord..	Ft

Node 001 Name EAST POND Type POND		Output Data US Std
00	Input ID.....	1018642335
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	46.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	48.895 Feet
05	Minimum Stage Reached.....	46.000 Feet
06	Maximum Gross Storage.....	36926 CF
07	Maximum Detention Storage.....	36926 CF
08	Final Stage Elevation.....	46.002 Feet
09	Time of Maximum Stage.....	61.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	13.650 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	2.285 CFS
16	Time of Peak Output.....	61.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.007 Feet

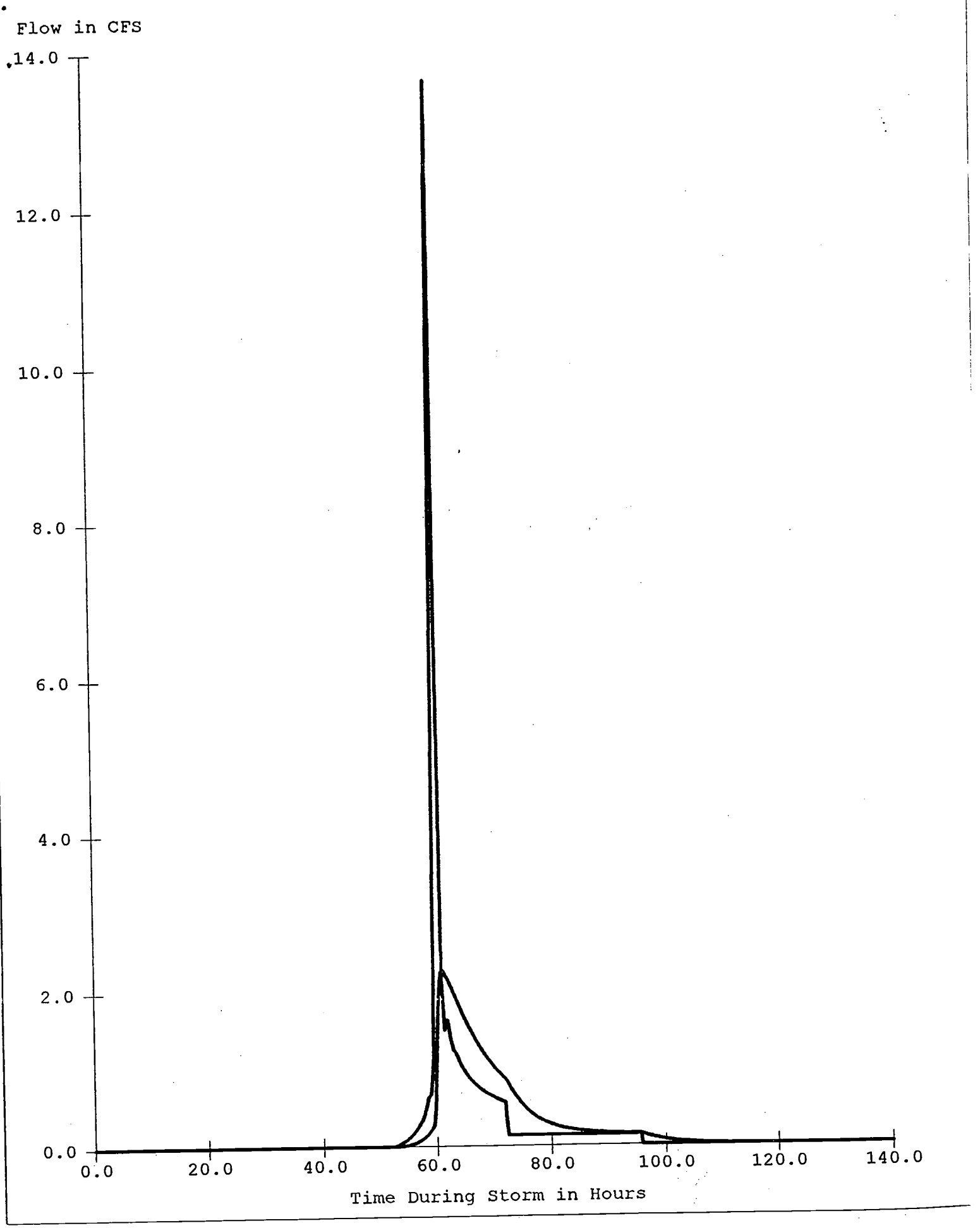
Node 002 Name GROUND WATER Type MOUNDING			Input# 1018642389 US Std
00	Flood El.	50.000 Ft	Auto Warn YES
01			
02	Porosity.	20.00 Pct	
03	Saturated	25.00 Pct	
04			
05	S Yield..	20.00 Pct	
06	Hyd Cond.	0.3300 FPH	
07	Length...	300.0 Ft	
08	Width....	100.0 Ft	
09	Toler....	0.0100000 Ft	
10	Method...	HANTUSH 2	
11			
12	Base El..	-99.000 Ft	
13			
14			
15			
16			
17	Base Flow	CFS	Stage T0. 25.000 Ft
18	X Coord..	Ft	Y Coord.. Ft

Node 002 Name GROUND WATER Type MOUNDING		Output Data US Std
00	Input ID.....	1018642389
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	25.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	26.861 Feet
05	Minimum Stage Reached.....	25.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	25.745 Feet
09	Time of Maximum Stage.....	96.250 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	0.809 CFS
14	Time of Peak Intake.....	72.500 Hours
15	Peak Nodal Output.....	0.000 CFS
16	Time of Peak Output.....	0.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.005 Feet


Stage El. at EAST POND
Stage in Feet
49.00
48.75
48.50
48.25
48.00
47.75
47.50
47.25
47.00
46.75
46.50
46.25
46.00
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours


Storage at EAST POND
Stage in Feet
50.0
49.6
49.2
48.8
48.4
48.0
47.6
47.2
46.8
46.4
46.0
0.0
100.0
200.0
300.0
400.0
500.0
600.0
Cubic Feet (Hundreds)

Inflow/Outflow at EAST POND



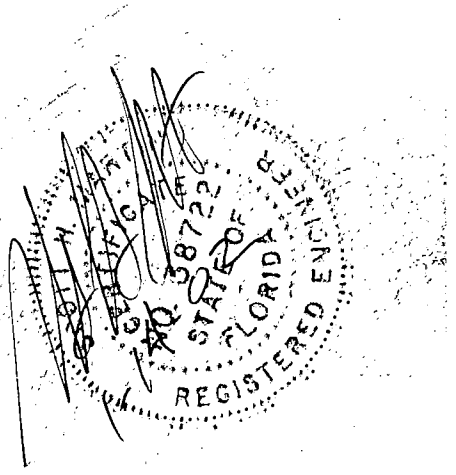
Veterans Memorial Parkway

(from Graves Ave. to SR. 472)

- **Application**
- **Quad. & Location map**
- **Soils Map**
- **Pond Sizing Calculations**

Post - Construction 25 yr. – 96 hr. Storm

By: Scott H. Martin, P.E.
Volusia County



2287-6
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JAN 16 2002
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123 W. Indiana Ave.
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Scott H. Martin, P.E.
FL. License # 38722

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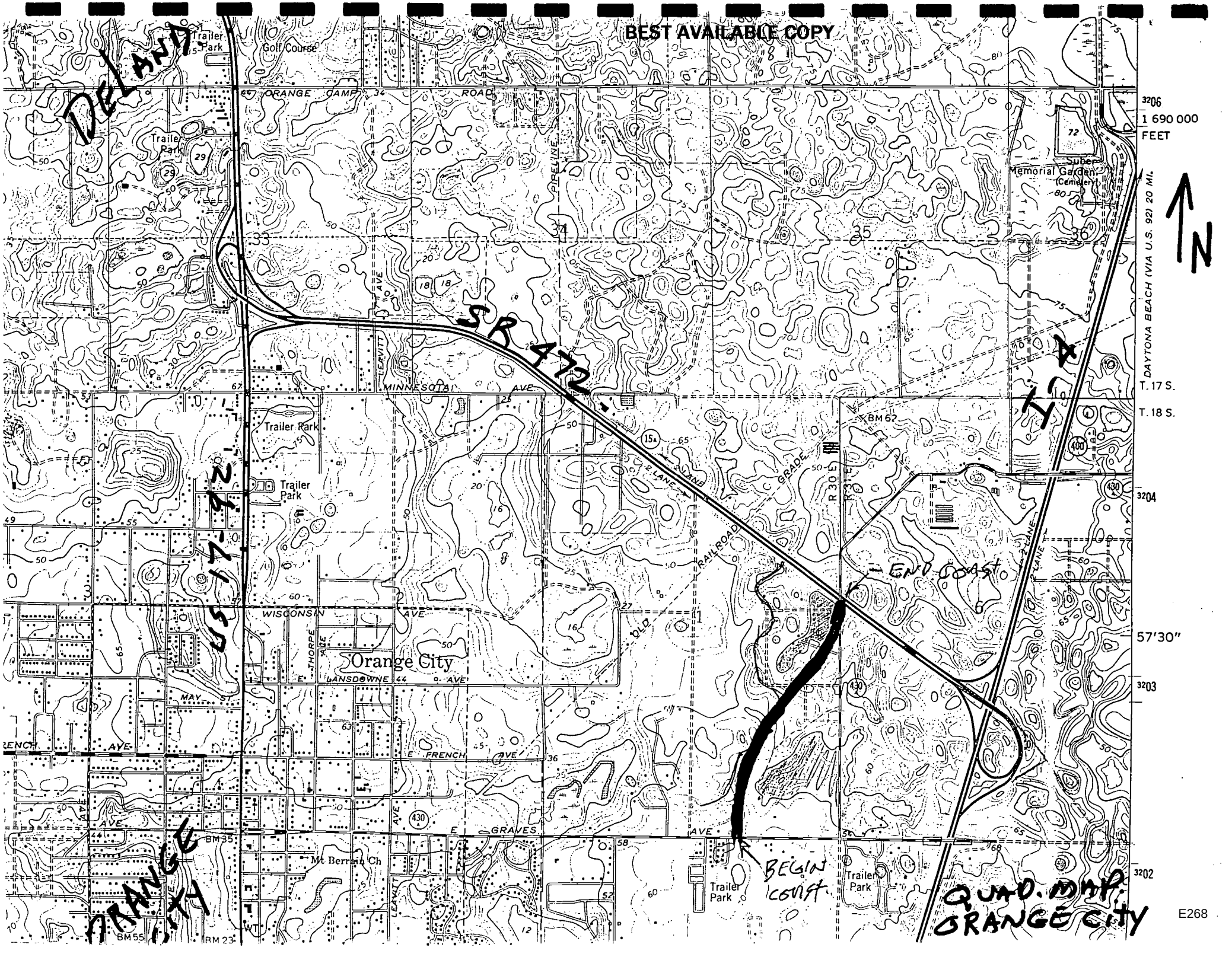

Veterans Memorial Pkwy Ext.

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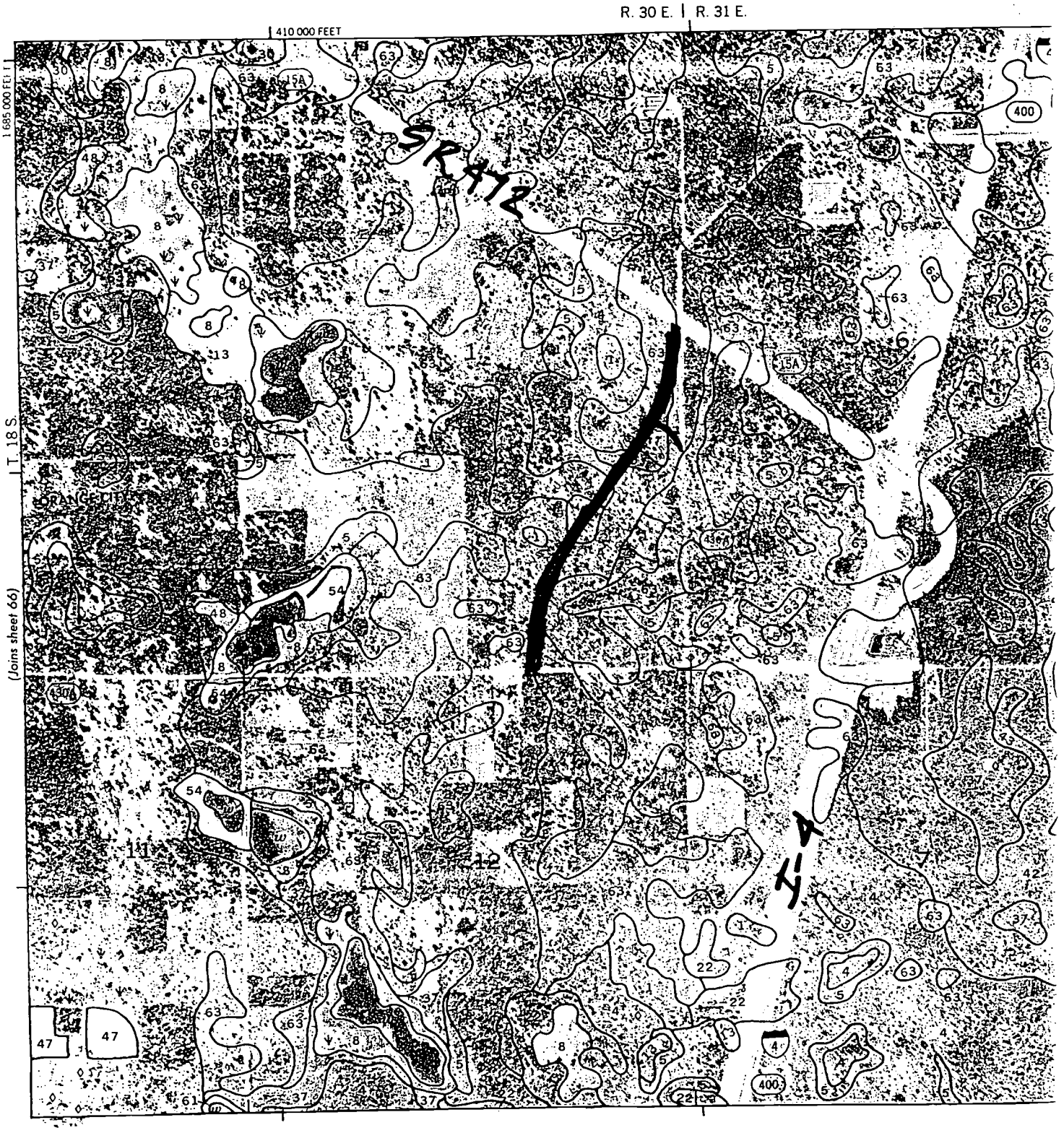

Page 67

Pond # 1

South Pond

Veterans Memorial Parkway
(from Graves Ave. to SR. 472)

Pond Sizing Calculations

Post – Construction 25 yr. – 96 hr. Storm

By: Scott H. Martin, P.E.
Volusia County

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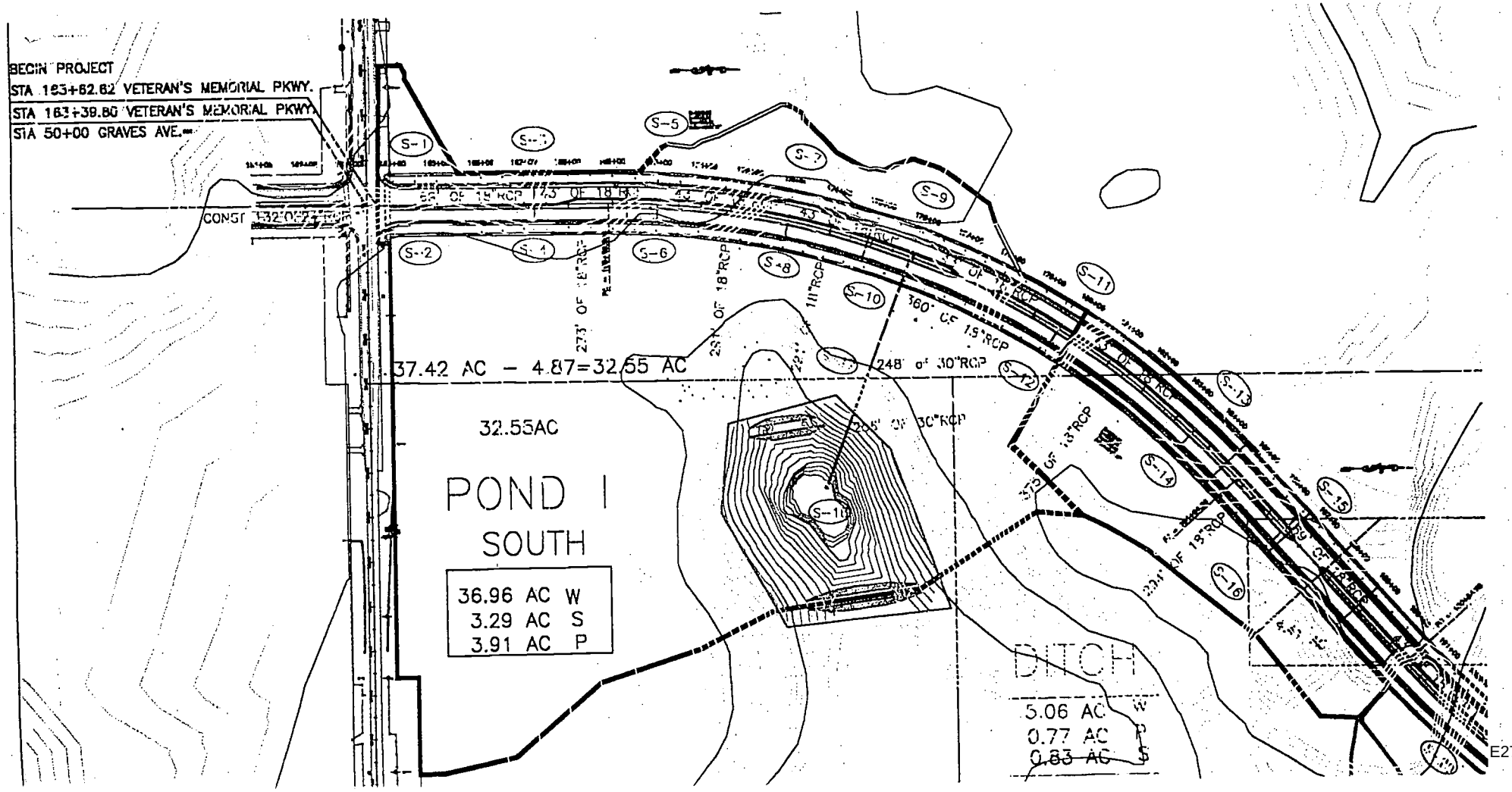
Sta 175+93.18 ℄ PEL — 54.85

RW SURF = 5.17 Ac



E271

Worksheet 2: Runoff curve number and runoff

Project VETERAN MEM PKWY EXT # 4617 By I.O. Date 10/2001

Location ORANGE CITY Checked ____ Date ____

Circle one: Present Developed POND I (SOUTH)

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐acres ☐mi² ☐%	Product of CN x area
A	WOODS.	36			36.96	1330.56
A	FOODS	39			3.29	128.31
A	IMPERVIOUS	98			3.91	383.18
	Totals =				44.16.	1842.05

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{1842.05}{44.16} = 41.72$; Use CN = 42.

2. Runoff $S = \frac{1000}{CN} - 10$. $S = 13.81$

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25		
Rainfall, P (24-hour) ..... in	12		
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	3.70		

$V = 13.61$ AC FT.

$Q = \frac{(P-0.2S)^2}{(P+0.8S)}$

Report Covering

C:\HSSWPACK\INA.WBS\SOUTH.BRN

Created.: Fri Nov 09 15:42:28 2001
Revised.: Wed Dec 26 17:00:36 2001
Executed: Wed Dec 26 17:00:44 2001

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0160 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.1176 Percent

Project Contains 2 Paths.
Path 000 from Node 000 (BASIN SOUTH) to Node 001 (SOUTH POND)

Path 000 ID 1009403973 Type DIRECT US Std	
00	DIRECT..----------
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	HW PE/KE NO
16	TW PE/KE YES
17	Max HW.. 54.850 Ft
18	Max TW.. 38.000 Ft

Path 000 Output Data Type DIRECT US Std		
00	Input ID	1009403973
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	47.864 CFS
04	Min In..	0.000 CFS
05	Max Out.	47.864 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Path 001 from Node 001 (SOUTH POND) to Node 002 (GROUND WATER)

Path 001 ID 1009403520 Type RECHARGE		US Std
00	Horz K..	0.470 FPH
01	Vert K..	0.190 FPH
02		
03	Max Perc	FPH
04		
05	Handle..	Name
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE YES	
16	TW PE/KE NO	
17	Max HW..	38.000 Ft
18	Max TW..	37.000 Ft

Path 001 Output Data Type RECHARGE		US Std
00	Input ID 1009403520	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	14.747 CFS
04	Min In..	0.000 CFS
05	Max Out.	13.392 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Report Covering

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Created.: Fri Nov 09 15:42:28 2001
Revised.: Wed Dec 26 17:00:36 2001
Executed: Wed Dec 26 17:00:44 2001

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0160 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.1176 Percent

Project Contains 3 Nodes.

Node 000 Name BASIN SOUTH — Input# 1009403426
Type SCS SITE — US Std

00	Flood El.	54.850 Ft	
01			
02	Storm....	LWRB96	Freeze... YES
03	RainFall.	12.000 In	Freeze... YES
04			
05	Area.....	44.160 Ac	
06	Curve No.	42.000	
07	UHG File.	SCS_323	
08	Ia Factor	0.200	
09	Tc.....	0.550 Hrs	
10			
11			
12			
13			
14			
15			
16			
17	Base Flow	0.00 CFS	Stage T0. Ft
18	X Coord..	Ft	Y Coord.. Ft

Node 000 Name BASIN SOUTH Type SCS SITE		Output Data US Std
00	Input ID.....	1009403426
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	54.850 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	54.850 Feet
05	Minimum Stage Reached.....	54.850 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	54.850 Feet
09	Time of Maximum Stage.....	0.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	47.864 CFS
14	Time of Peak Intake.....	60.500 Hours
15	Peak Nodal Output.....	47.864 CFS
16	Time of Peak Output.....	60.500 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.000 Feet

Node 001 Name SOUTH POND Type POND				Input# 1009403638 US Std
00	Top El...	38.000 Ft	Top Area.	2.460 Ac
01	El.....	36.000 Ft	Area.....	1.860 Ac
02	El.....	34.000 Ft	Area.....	1.320 Ac
03	El.....	32.000 Ft	Area.....	0.870 Ac
04	El.....	30.000 Ft	Area.....	0.500 Ac
05	El.....	28.000 Ft	Area.....	0.323 Ac
06	El.....	Ft	Area.....	Ac
07	El.....	Ft	Area.....	Ac
08	El.....	Ft	Area.....	Ac
09	El.....	Ft	Area.....	Ac
10	Bot El...	26.000 Ft	Bot Area.	0.140 Ac
11				
12	Top Perim	1282.5 Ft	Side %Per	100.0 Pct
13	Mid Perim	795.3 Ft	Base %Per	100.0 Pct
14	Bot Perim	329.6 Ft		
15				
16				
17	Base Flow	0.00 CFS	Stage T0.	25.000 Ft
18	X Coord..	Ft	Y Coord..	Ft

Node 001 Name SOUTH POND Type POND		Output Data US Std
00	Input ID.....	1009403638
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	26.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	33.905 Feet
05	Minimum Stage Reached.....	26.000 Feet
06	Maximum Gross Storage.....	206565 CF
07	Maximum Detention Storage.....	206565 CF
08	Final Stage Elevation.....	26.124 Feet
09	Time of Maximum Stage.....	62.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	47.864 CFS
14	Time of Peak Intake.....	60.500 Hours
15	Peak Nodal Output.....	14.747 CFS
16	Time of Peak Output.....	62.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.010 Feet

Node 002 Name GROUND WATER Type MOUNDING			Input# 1009404036 US Std
00	Flood El.	37.000 Ft	Auto Warn NO
01			
02	Porosity.	20.00 Pct	
03	Saturated	25.00 Pct	
04			
05	S Yield..	20.00 Pct	
06	Hyd Cond.	0.2900 FPH	
07	Length...	1600.0 Ft	
08	Width....	1200.0 Ft	
09	Toler....	0.0100000 Ft	
10	Method...	HANTUSH 2	
11			
12	Base El..	-99.000 Ft	
13			
14			
15			
16			
17	Base Flow	CFS	Stage T0. 25.000 Ft
18	X Coord..	Ft	Y Coord.. Ft

Node 002 Name GROUND WATER Type MOUNDING		Output Data US Std
00	Input ID.....	1009404036
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	25.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	26.129 Feet
05	Minimum Stage Reached.....	25.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	26.128 Feet
09	Time of Maximum Stage.....	132.750 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	13.392 CFS
14	Time of Peak Intake.....	63.250 Hours
15	Peak Nodal Output.....	0.000 CFS
16	Time of Peak Output.....	0.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.001 Feet

Report Covering

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Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

Node 001 Format Data
Type POND — US Std

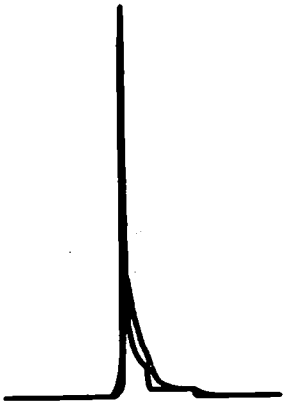
00	Input ID.....	1009403638
01	Base Flow.....	0.000 CFS
02	Storage Data Points.....	7
03	Local Flow Generated.....	NO
04	Node Balance Type.....	STORAGE
05	Number of Up Paths.....	1
06	Number of Down Paths.....	1
07	Maximum Possible Elevation....	38.000 Feet
08	Minimum Possible Elavation....	26.000 Feet
09	Autocalc Initial Stage.....	NO
10		
11		
12		
13		
14		
15		
16		
17		
18		

Node 001 Name SOUTH POND Type POND				Input# 1009403638 US Std
00	Top El...	38.000 Ft	Top Area.	2.460 Ac
01	El.....	36.000 Ft	Area.....	1.860 Ac
02	El.....	34.000 Ft	Area.....	1.320 Ac
03	El.....	32.000 Ft	Area.....	0.870 Ac
04	El.....	30.000 Ft	Area.....	0.500 Ac
05	El.....	28.000 Ft	Area.....	0.323 Ac
06	El.....	Ft	Area.....	Ac
07	El.....	Ft	Area.....	Ac
08	El.....	Ft	Area.....	Ac
09	El.....	Ft	Area.....	Ac
10	Bot El...	26.000 Ft	Bot Area.	0.140 Ac
11				
12	Top Perim	1282.5 Ft	Side %Per	100.0 Pct
13	Mid Perim	795.3 Ft	Base %Per	100.0 Pct
14	Bot Perim	329.6 Ft		
15				
16				
17	Base Flow	0.00 CFS	Stage T0.	25.000 Ft
18	X Coord..	Ft	Y Coord..	Ft

Node 001 Name SOUTH POND Type POND		Output Data US Std
00	Input ID.....	1009403638
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	26.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	33.905 Feet
05	Minimum Stage Reached.....	26.000 Feet
06	Maximum Gross Storage.....	206565 CF
07	Maximum Detention Storage.....	206565 CF
08	Final Stage Elevation.....	26.124 Feet
09	Time of Maximum Stage.....	62.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	47.864 CFS
14	Time of Peak Intake.....	60.500 Hours
15	Peak Nodal Output.....	14.747 CFS
16	Time of Peak Output.....	62.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.010 Feet

Inflow/Outflow at SOUTH POND

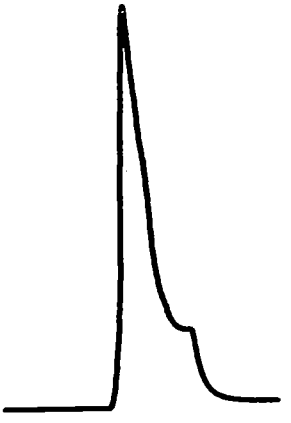
Flow in CFS



Time During Storm in Hours

Stage El. at SOUTH POND

Stage in Feet



Time During Storm in Hours

Hour	Local CFS	Intake CFS	Output CFS
0.00	0.000	0.000	0.000
0.25	0.000	0.000	0.000
0.50	0.000	0.000	0.000
0.75	0.000	0.000	0.000
1.00	0.000	0.000	0.000
1.25	0.000	0.000	0.000
1.50	0.000	0.000	0.000
1.75	0.000	0.000	0.000
2.00	0.000	0.000	0.000
2.25	0.000	0.000	0.000
2.50	0.000	0.000	0.000
2.75	0.000	0.000	0.000
3.00	0.000	0.000	0.000
3.25	0.000	0.000	0.000
3.50	0.000	0.000	0.000
3.75	0.000	0.000	0.000
4.00	0.000	0.000	0.000
4.25	0.000	0.000	0.000
4.50	0.000	0.000	0.000
4.75	0.000	0.000	0.000
5.00	0.000	0.000	0.000
5.25	0.000	0.000	0.000
5.50	0.000	0.000	0.000
5.75	0.000	0.000	0.000
6.00	0.000	0.000	0.000
6.25	0.000	0.000	0.000
6.50	0.000	0.000	0.000
6.75	0.000	0.000	0.000
7.00	0.000	0.000	0.000
7.25	0.000	0.000	0.000
7.50	0.000	0.000	0.000
7.75	0.000	0.000	0.000
8.00	0.000	0.000	0.000
8.25	0.000	0.000	0.000
8.50	0.000	0.000	0.000
8.75	0.000	0.000	0.000
9.00	0.000	0.000	0.000
9.25	0.000	0.000	0.000
9.50	0.000	0.000	0.000
9.75	0.000	0.000	0.000
10.00	0.000	0.000	0.000
10.25	0.000	0.000	0.000
10.50	0.000	0.000	0.000
10.75	0.000	0.000	0.000
11.00	0.000	0.000	0.000

Hour	Local CFS	Intake CFS	Output CFS
11.25	0.000	0.000	0.000
11.50	0.000	0.000	0.000
11.75	0.000	0.000	0.000
12.00	0.000	0.000	0.000
12.25	0.000	0.000	0.000
12.50	0.000	0.000	0.000
12.75	0.000	0.000	0.000
13.00	0.000	0.000	0.000
13.25	0.000	0.000	0.000
13.50	0.000	0.000	0.000
13.75	0.000	0.000	0.000
14.00	0.000	0.000	0.000
14.25	0.000	0.000	0.000
14.50	0.000	0.000	0.000
14.75	0.000	0.000	0.000
15.00	0.000	0.000	0.000
15.25	0.000	0.000	0.000
15.50	0.000	0.000	0.000
15.75	0.000	0.000	0.000
16.00	0.000	0.000	0.000
16.25	0.000	0.000	0.000
16.50	0.000	0.000	0.000
16.75	0.000	0.000	0.000
17.00	0.000	0.000	0.000
17.25	0.000	0.000	0.000
17.50	0.000	0.000	0.000
17.75	0.000	0.000	0.000
18.00	0.000	0.000	0.000
18.25	0.000	0.000	0.000
18.50	0.000	0.000	0.000
18.75	0.000	0.000	0.000
19.00	0.000	0.000	0.000
19.25	0.000	0.000	0.000
19.50	0.000	0.000	0.000
19.75	0.000	0.000	0.000
20.00	0.000	0.000	0.000
20.25	0.000	0.000	0.000
20.50	0.000	0.000	0.000
20.75	0.000	0.000	0.000
21.00	0.000	0.000	0.000
21.25	0.000	0.000	0.000
21.50	0.000	0.000	0.000
21.75	0.000	0.000	0.000
22.00	0.000	0.000	0.000
22.25	0.000	0.000	0.000

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ACCUMULATED MASS BALANCE ERROR.....	0.0160 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.1176 Percent

Node 001 Name SOUTH POND — Input# 1009403638
Type POND — US Std

00	Top El...	38.000 Ft	Top Area.	2.460 Ac
01	El.....	36.000 Ft	Area.....	1.860 Ac
02	El.....	34.000 Ft	Area.....	1.320 Ac
03	El.....	32.000 Ft	Area.....	0.870 Ac
04	El.....	30.000 Ft	Area.....	0.500 Ac
05	El.....	28.000 Ft	Area.....	0.323 Ac
06	El.....	Ft	Area.....	Ac
07	El.....	Ft	Area.....	Ac
08	El.....	Ft	Area.....	Ac
09	El.....	Ft	Area.....	Ac
10	Bot El...	26.000 Ft	Bot Area.	0.140 Ac
11				
12	Top Perim	1282.5 Ft	Side %Per	100.0 Pct
13	Mid Perim	795.3 Ft	Base %Per	100.0 Pct
14	Bot Perim	329.6 Ft		
15				
16				
17	Base Flow	0.00 CFS	Stage TO.	25.000 Ft
18	X Coord..	Ft	Y Coord..	Ft

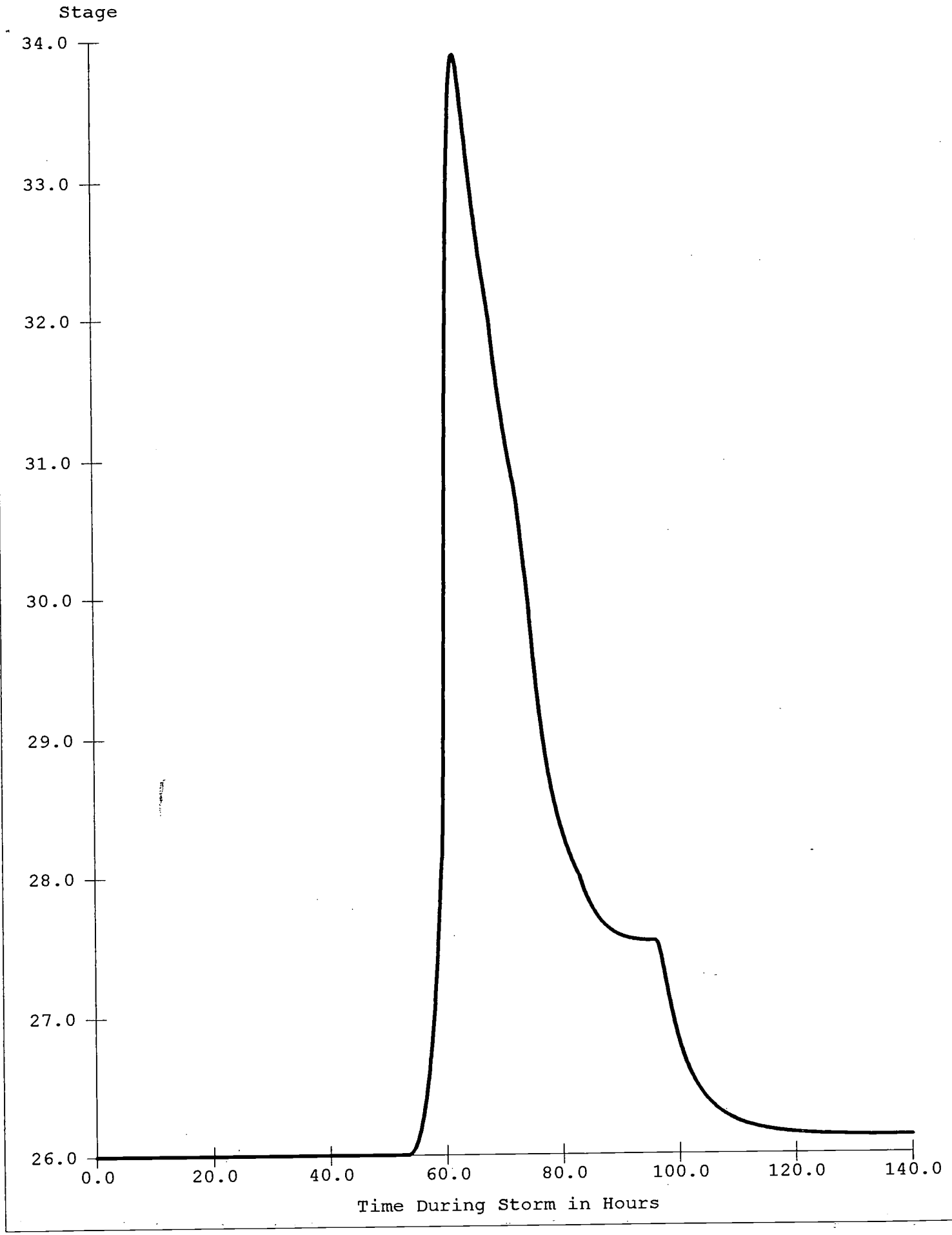
Node 001 Name SOUTH POND — Output Data
Type POND — US Std

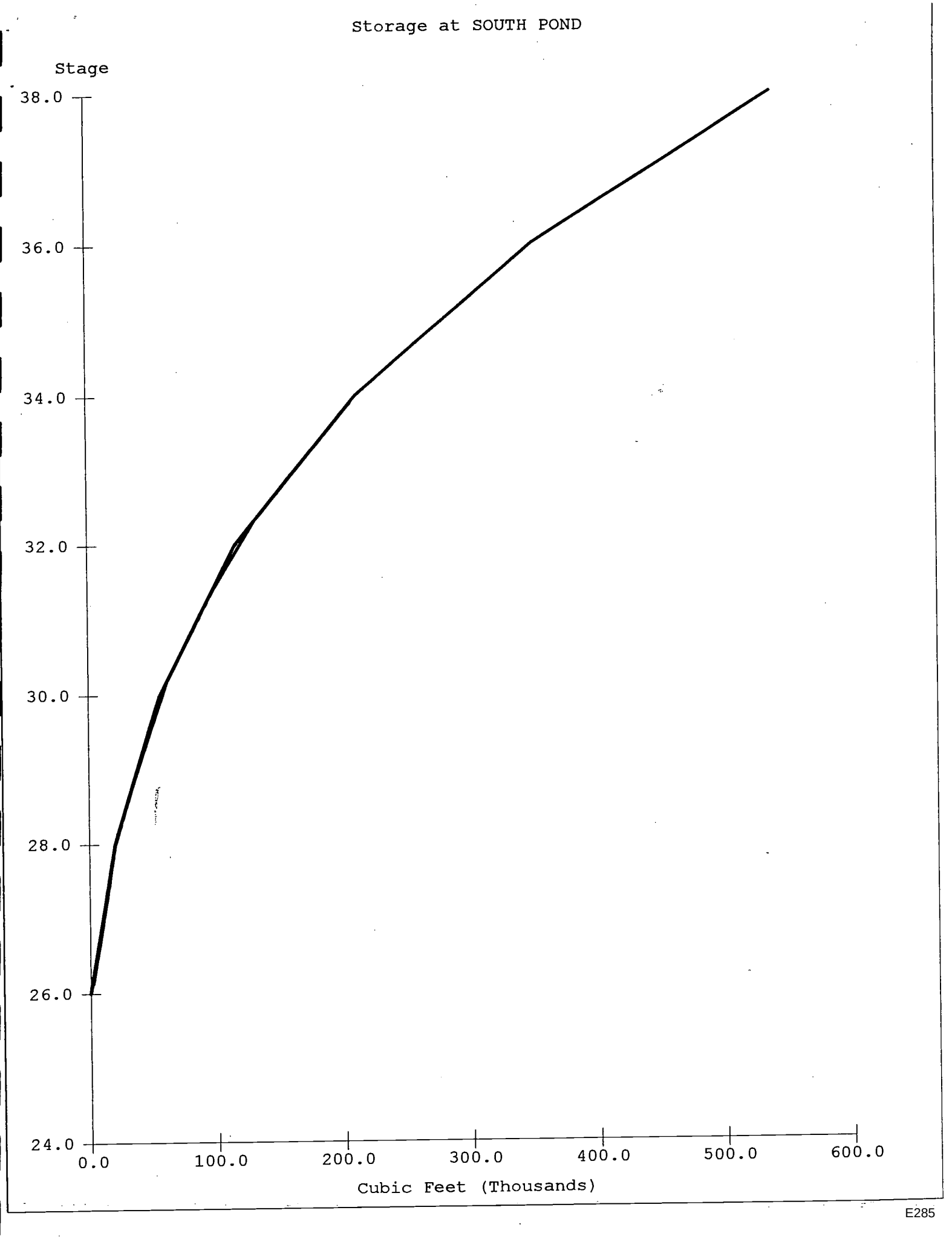
00	Input ID.....	1009403638
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	26.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	33.905 Feet
05	Minimum Stage Reached.....	26.000 Feet
06	Maximum Gross Storage.....	206565 CF
07	Maximum Detention Storage.....	206565 CF
08	Final Stage Elevation.....	26.124 Feet
09	Time of Maximum Stage.....	62.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	47.864 CFS
14	Time of Peak Intake.....	60.500 Hours
15	Peak Nodal Output.....	14.747 CFS
16	Time of Peak Output.....	62.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.010 Feet

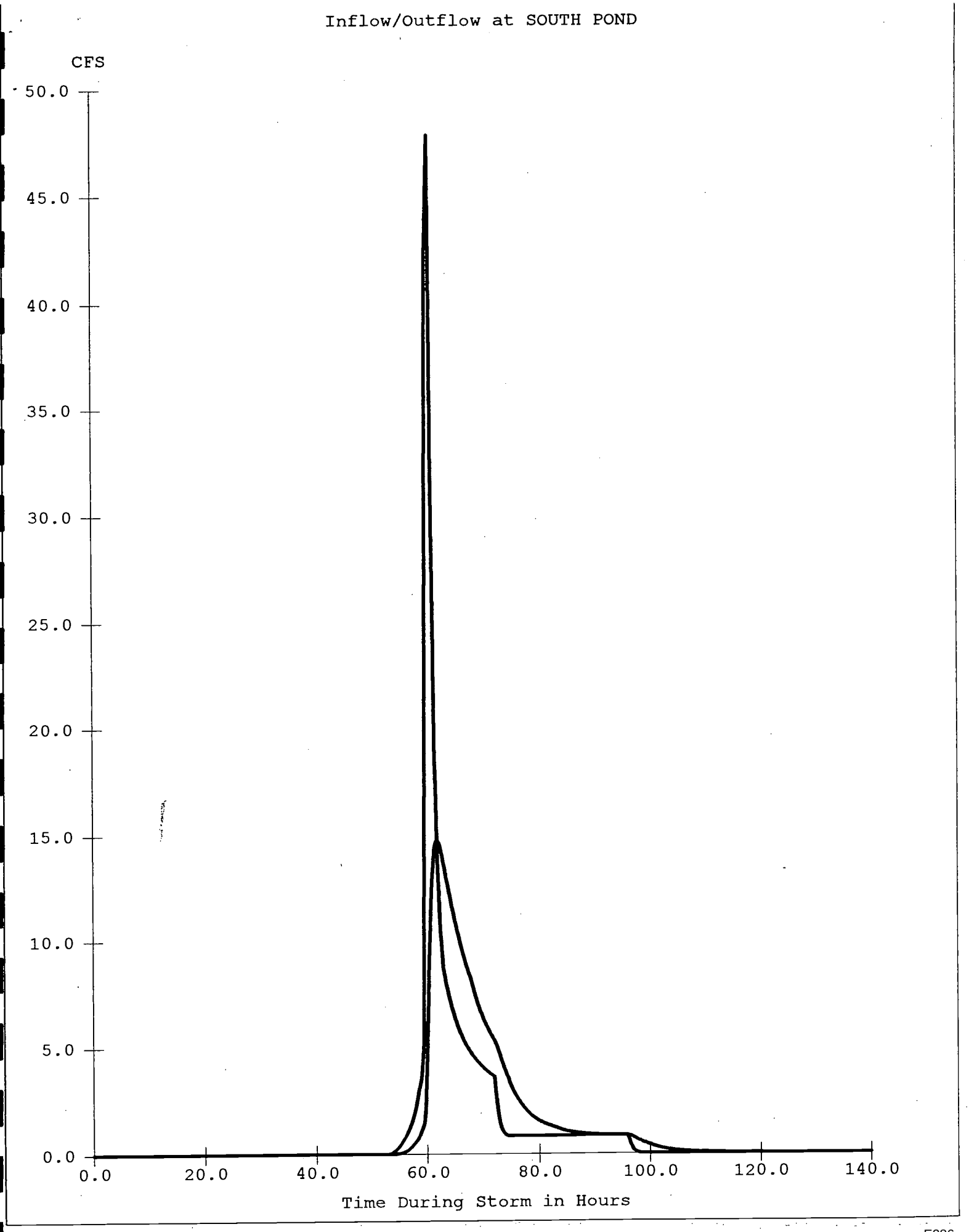
Hour	Local CFS	Intake CFS	Output CFS
0.00	0.000	0.000	0.000
0.25	0.000	0.000	0.000
0.50	0.000	0.000	0.000
0.75	0.000	0.000	0.000
1.00	0.000	0.000	0.000
1.25	0.000	0.000	0.000
1.50	0.000	0.000	0.000
1.75	0.000	0.000	0.000
2.00	0.000	0.000	0.000
2.25	0.000	0.000	0.000
2.50	0.000	0.000	0.000
2.75	0.000	0.000	0.000
3.00	0.000	0.000	0.000
3.25	0.000	0.000	0.000
3.50	0.000	0.000	0.000
3.75	0.000	0.000	0.000
4.00	0.000	0.000	0.000
4.25	0.000	0.000	0.000
4.50	0.000	0.000	0.000
4.75	0.000	0.000	0.000
5.00	0.000	0.000	0.000
5.25	0.000	0.000	0.000
5.50	0.000	0.000	0.000
5.75	0.000	0.000	0.000
6.00	0.000	0.000	0.000
6.25	0.000	0.000	0.000
6.50	0.000	0.000	0.000
6.75	0.000	0.000	0.000
7.00	0.000	0.000	0.000
7.25	0.000	0.000	0.000
7.50	0.000	0.000	0.000
7.75	0.000	0.000	0.000
8.00	0.000	0.000	0.000
8.25	0.000	0.000	0.000
8.50	0.000	0.000	0.000
8.75	0.000	0.000	0.000
9.00	0.000	0.000	0.000
9.25	0.000	0.000	0.000
9.50	0.000	0.000	0.000

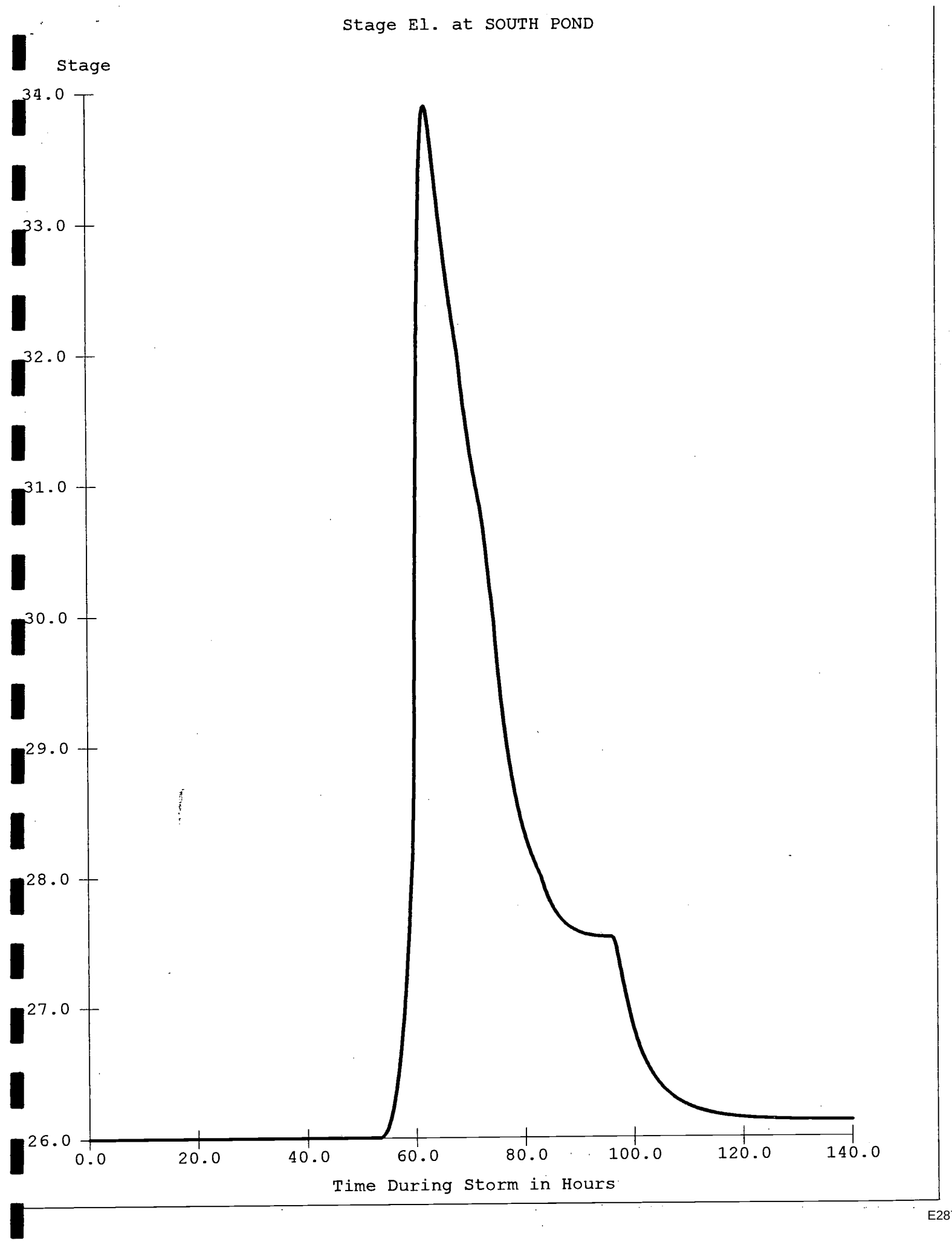
Hour	Local CFS	Intake CFS	Output CFS
9.75	0.000	0.000	0.000
10.00	0.000	0.000	0.000
10.25	0.000	0.000	0.000
10.50	0.000	0.000	0.000
10.75	0.000	0.000	0.000
11.00	0.000	0.000	0.000
11.25	0.000	0.000	0.000
11.50	0.000	0.000	0.000
11.75	0.000	0.000	0.000
12.00	0.000	0.000	0.000
12.25	0.000	0.000	0.000
12.50	0.000	0.000	0.000
12.75	0.000	0.000	0.000
13.00	0.000	0.000	0.000
13.25	0.000	0.000	0.000
13.50	0.000	0.000	0.000
13.75	0.000	0.000	0.000
14.00	0.000	0.000	0.000
14.25	0.000	0.000	0.000
14.50	0.000	0.000	0.000
14.75	0.000	0.000	0.000
15.00	0.000	0.000	0.000
15.25	0.000	0.000	0.000
15.50	0.000	0.000	0.000
15.75	0.000	0.000	0.000
16.00	0.000	0.000	0.000
16.25	0.000	0.000	0.000
16.50	0.000	0.000	0.000
16.75	0.000	0.000	0.000
17.00	0.000	0.000	0.000
17.25	0.000	0.000	0.000
17.50	0.000	0.000	0.000
17.75	0.000	0.000	0.000
18.00	0.000	0.000	0.000
18.25	0.000	0.000	0.000
18.50	0.000	0.000	0.000
18.75	0.000	0.000	0.000
19.00	0.000	0.000	0.000
19.25	0.000	0.000	0.000

Stage El. at SOUTH POND




Storage at SOUTH POND
Stage
38.0
36.0
34.0
32.0
30.0
28.0
26.0
24.0
0.0
100.0
200.0
300.0
400.0
500.0
600.0
Cubic Feet (Thousands)


Inflow/Outflow at SOUTH POND
CFS
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours


Stage El. at SOUTH POND
Stage
34.0
33.0
32.0
31.0
30.0
29.0
28.0
27.0
26.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours

Pond # 2

North Pond

Veterans Memorial Parkway
(from Graves Ave. to SR. 472)

Pond Sizing Calculations

Post – Construction 25 yr. – 96 hr. Storm

By: Scott H. Martin, P.E.
Volusia County

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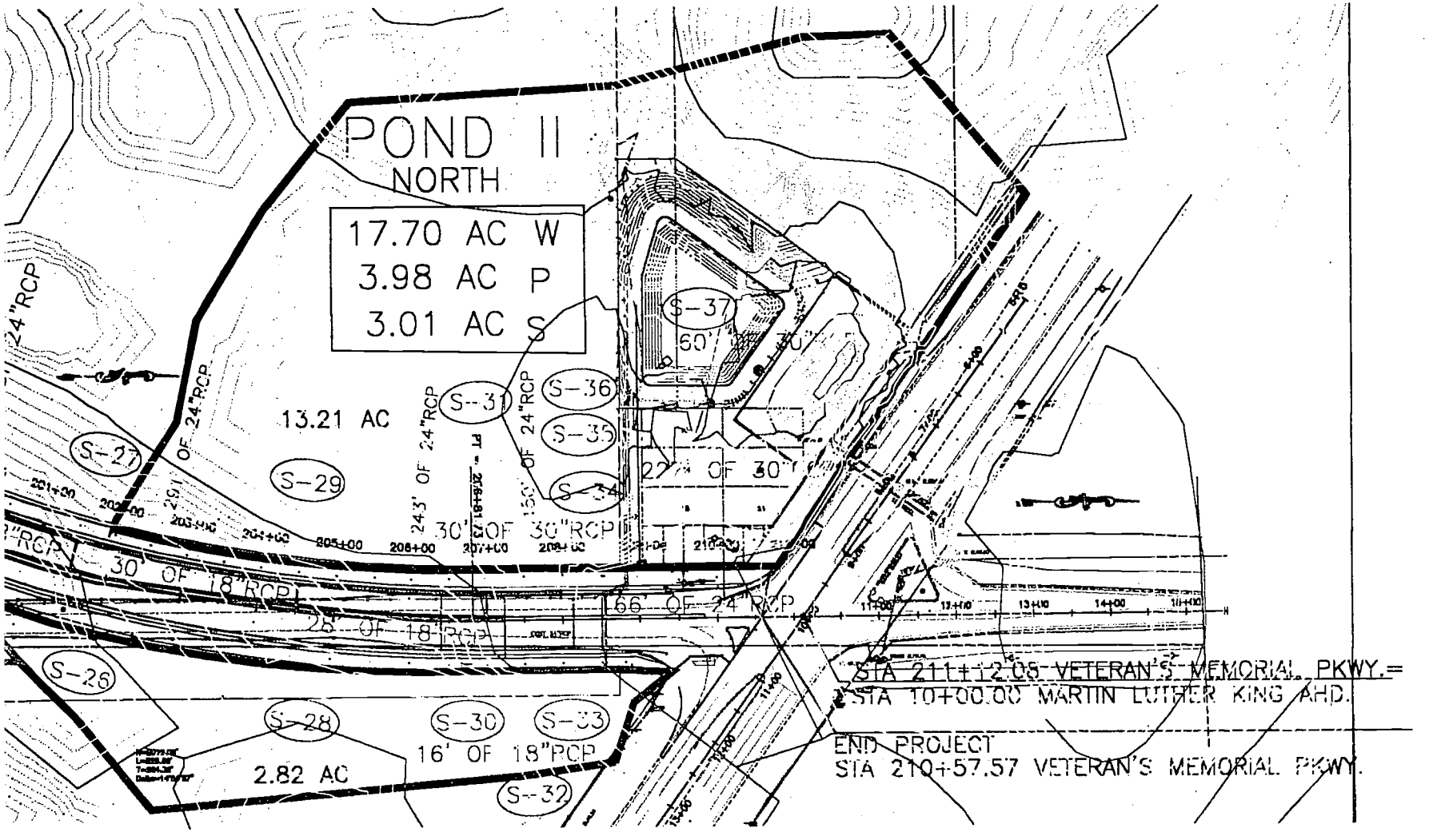
STA 208+81.69 — EP EL - 48.9



Worksheet 2: Runoff curve number and runoff

Project VETERAN MEM PKWY EXT #4617 By ____ Date 10/2001

Location ORANGE CITY Checked ____ Date ____

Circle one: Present Developed POND 11 (NORTH)

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐ acres ☐ mi^2 ☐ %	Product of CN x area
A	WOODS	36			4.49	161.64
A	SOIL	39			3.01	117.39
A	PAV	98			3.98	390.04
Totals =					11.48	669.07

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{669.07}{11.48} = 58.28$; Use CN = 58

2. Runoff

$S = \frac{1000}{CN} - 10 = 7.24$

Storm #1	Storm #2	Storm #3
25		
12		
6.26		

Frequency ..... yr

Rainfall, P (24-hour) ..... in

Runoff, Q ..... in
(Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)

$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} =$ $V = 5.98$ Ac-ft.

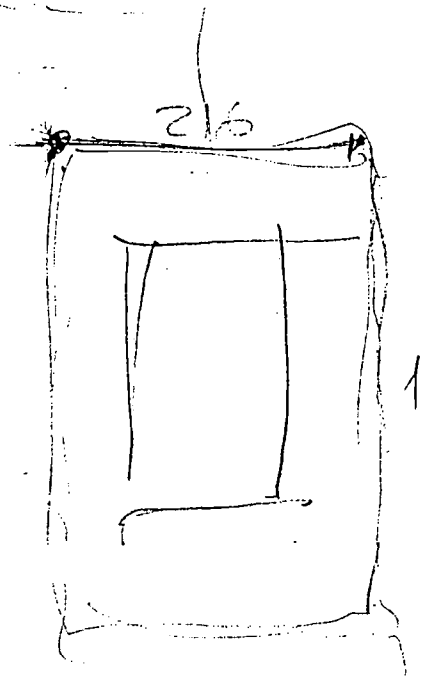
BOTTOM EL 35

$216 \times 126.70 = 27368.81\ FT^2 = 0.62$

6' | 192 x 102.70 BOTTOM

POND 1:

	FT^2	Ac	Ac FT	CUM
476.85	35	13686.89	0.31		0
509.33	36	15651.74	0.36	0.335	0.335
541.82	37	17781.14	0.41	0.385	0.720
574.23	38	19925.06	0.46	0.435	1.155
601.93	39	22233.52	0.51	0.485	1.640
627.50	40	24676.52	0.57	0.540	2.180
653.38	41	27368.81	0.63	0.560	2.74



.57 .19

$$Tc = \frac{886}{1.4 \times 3600} + \frac{684}{2.5 \times 3600} + \frac{287}{2.9 \times 3600} = 0.28$$

(0.176 + 0.076 + 0.027)

Report Covering

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Created.: Mon Nov 12 13:37:33 2001
Revised.: Fri Nov 16 09:54:23 2001
Executed: Fri Nov 16 10:11:29 2001

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

Project Contains 2 Paths.
Project Contains 3 Nodes.
Project Contains 0 Sgnls.

Path	Up Stream Node Name	Down Stream Node Name	Path Type
0	BASIN NORTH	NORTH POND	DIRECT
1	NORTH POND	GROUND WATER	RECHARGE

Node	Name	Node Type
0	BASIN NORTH	SCS SITE
1	NORTH POND	POND
2	GROUND WATER	MOUNDING

Node	Name	Node Type	Min El. at Hr.		Max El. at Hr.	
0	BASIN NORTH	SCS SITE	48.9	0.00	48.9	0.00
1	NORTH POND	POND	35.0	0.00	40.4	61.25
2	GROUND WATER	MOUNDING	25.0	0.00	39.3	72.75

Elevations in Feet, Nodes marked with an '*' have Flooded.

Node	Name	Maximum CFS Inflow	Maximum CFS Outflow
0	BASIN NORTH	31.25 @ 60.00 Hours	31.25 @ 60.00 Hours
1	NORTH POND	31.25 @ 60.00 Hours	6.76 @ 61.25 Hours
2	GROUND WATER	6.76 @ 61.25 Hours	0.00 @ 0.00 Hours

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Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0019 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0322 Percent

Project Contains 2 Paths.
Path 000 from Node 000 (BASIN NORTH) to Node 001 (NORTH POND)

Path 000 ID 1005590610 Type DIRECT	US Std
00	DIRECT..----------
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	HW PE/KE NO
16	TW PE/KE YES
17	Max HW.. 48.900 Ft
18	Max TW.. 41.000 Ft

Path 000 Output Data Type DIRECT	US Std
00	Input ID 1005590610
01	Flow T0. 0.000 CFS
02	Vol T0.. 0 CF
03	Max In.. 31.250 CFS
04	Min In.. 0.000 CFS
05	Max Out. 31.250 CFS
06	Min Out. 0.000 CFS
07	
08	
09	
10	
11	
12	
13	
14	
15	Fwd K... 0.000
16	Rev K... 0.000
17	Fwd X... 0.000
18	Rev X... 0.000

Path 001 from Node 001 (NORTH POND) to Node 002 (GROUND WATER)

Path 001 ID 1005594197 Type RECHARGE		US Std
00	Horz K..	0.470 FPH
01	Vert K..	0.190 FPH
02		
03	Max Perc	FPH
04		
05	Handle..	Name
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE YES	
16	TW PE/KE NO	
17	Max HW..	41.000 Ft
18	Max TW..	41.000 Ft

Path 001 Output Data Type RECHARGE		US Std
00	Input ID 1005594197	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	6.757 CFS
04	Min In..	0.000 CFS
05	Max Out.	6.757 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Report Covering

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Executed: Fri Nov 16 10:11:29 2001

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0019 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0322 Percent

Project Contains 3 Nodes.

Node 000 Name BASIN NORTH — Input# 1005922463
Type SCS SITE — US Std

00	Flood El.	48.900 Ft	
01			
02	Storm....	LWRB96	Freeze... YES
03	RainFall.	12.000 In	Freeze... YES
04			
05	Area.....	11.500 Ac	
06	Curve No.	58.000	
07	UHG File.	SCS_323	
08	Ia Factor	0.200	
09	Tc.....	0.280 Hrs	
10			
11			
12			
13			
14			
15			
16			
17	Base Flow	0.00 CFS	Stage TO. Ft
18	X Coord..	Ft	Y Coord.. Ft

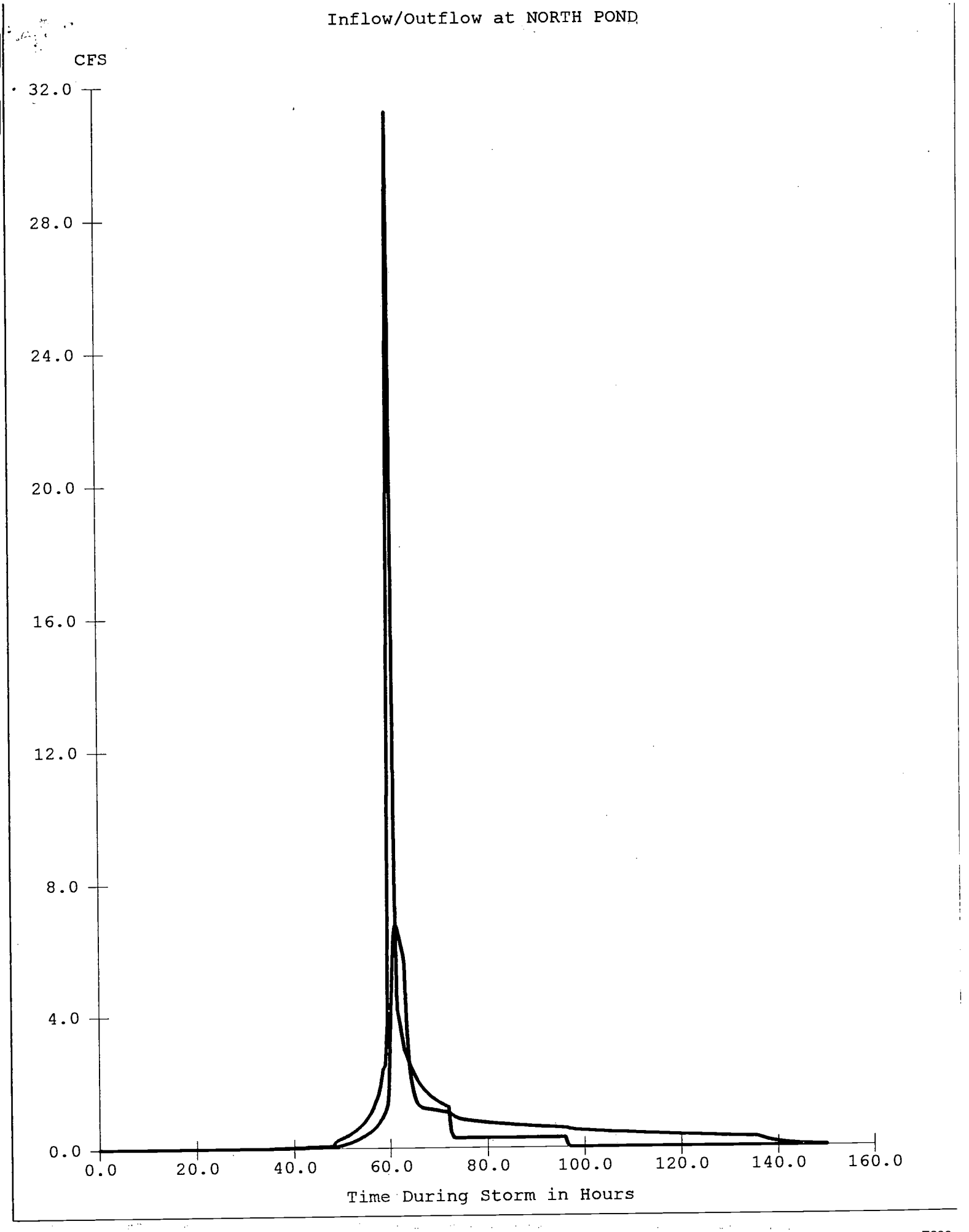
Node 000 Name BASIN NORTH Type SCS SITE		Output Data US Std
00	Input ID.....	1005922463
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	48.900 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	48.900 Feet
05	Minimum Stage Reached.....	48.900 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	48.900 Feet
09	Time of Maximum Stage.....	0.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	31.250 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	31.250 CFS
16	Time of Peak Output.....	60.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.000 Feet

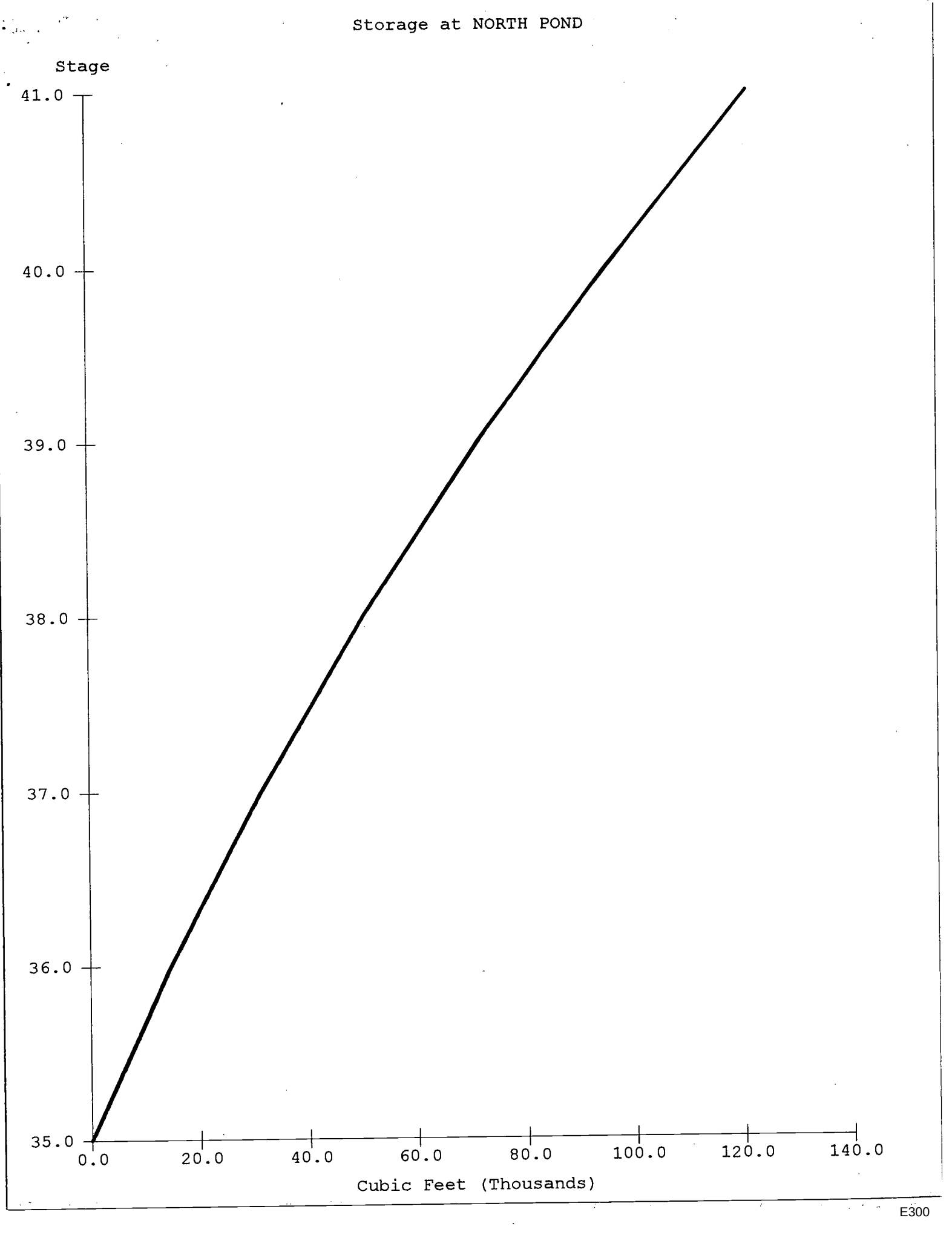
Node 001 Name NORTH POND Type POND				Input# 1005591882 US Std
00	Top El...	41.000 Ft	Top Area.	0.630 Ac
01	El.....	40.000 Ft	Area.....	0.570 Ac
02	El.....	39.000 Ft	Area.....	0.510 Ac
03	El.....	38.000 Ft	Area.....	0.460 Ac
04	El.....	37.000 Ft	Area.....	0.410 Ac
05	El.....	36.000 Ft	Area.....	0.360 Ac
06	El.....	Ft	Area.....	Ac
07	El.....	Ft	Area.....	Ac
08	El.....	Ft	Area.....	Ac
09	El.....	Ft	Area.....	Ac
10	Bot El...	35.000 Ft	Bot Area.	0.310 Ac
11				
12	Top Perim	653.4 Ft	Side %Per	100.0 Pct
13	Mid Perim	574.2 Ft	Base %Per	100.0 Pct
14	Bot Perim	476.9 Ft		
15				
16				
17	Base Flow	0.00 CFS	Stage T0.	25.000 Ft
18	X Coord..	Ft	Y Coord..	Ft

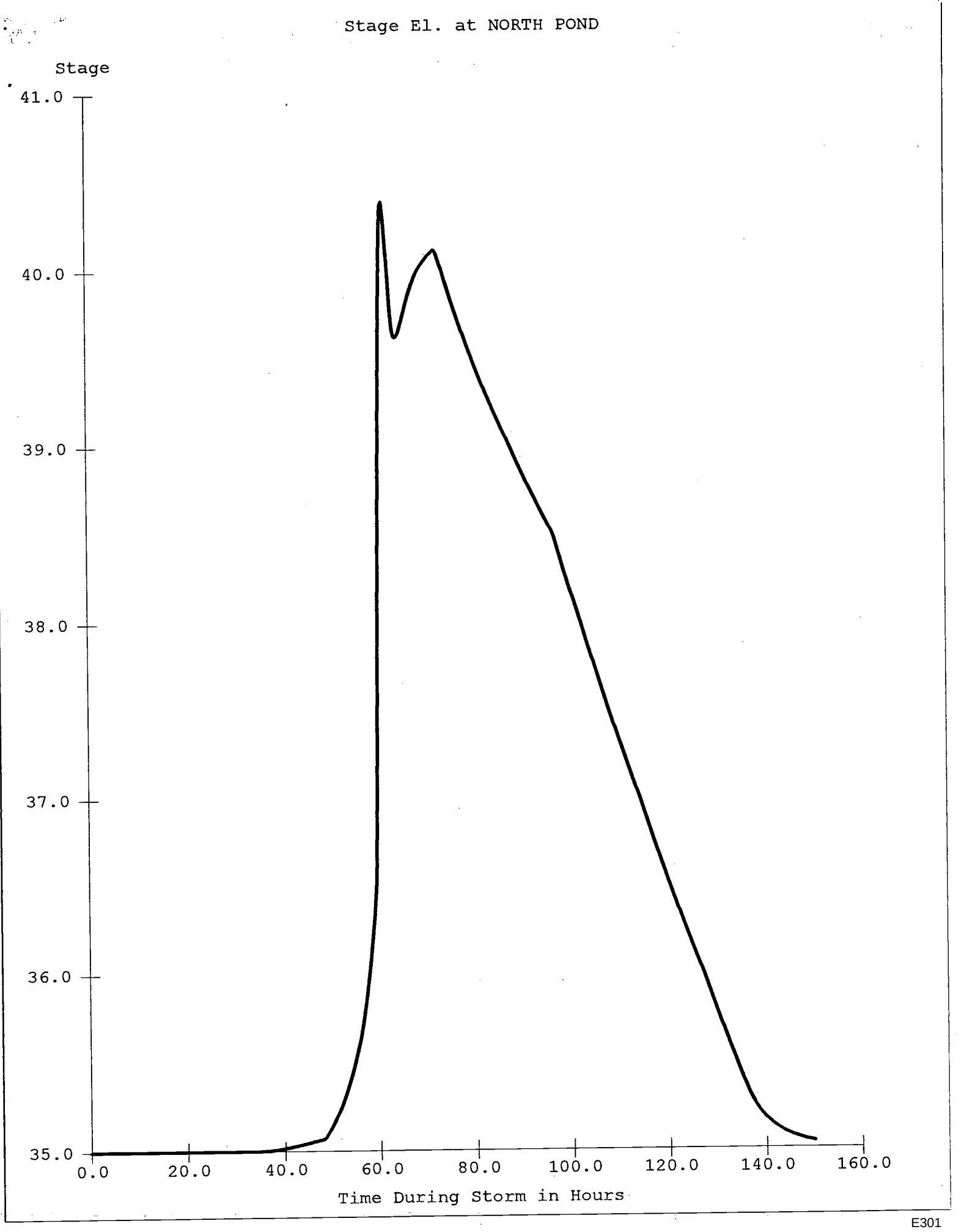
Node 001 Name NORTH POND Type POND		Output Data US Std
00	Input ID.....	1005591882
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	35.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	40.390 Feet
05	Minimum Stage Reached.....	35.000 Feet
06	Maximum Gross Storage.....	105157 CF
07	Maximum Detention Storage.....	105157 CF
08	Final Stage Elevation.....	35.036 Feet
09	Time of Maximum Stage.....	61.250 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	31.250 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	6.757 CFS
16	Time of Peak Output.....	61.250 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.005 Feet

Node 002 Name GROUND WATER Type MOUNDING			Input# 1005595402 US Std
00	Flood El.	41.000 Ft	Auto Warn YES
01			
02	Porosity.	20.00 Pct	
03	Saturated	25.00 Pct	
04			
05	S Yield..	20.00 Pct	
06	Hyd Cond.	0.3000 FPH	
07	Length...	210.0 Ft	
08	Width....	120.0 Ft	
09	Toler....	0.0100000 Ft	
10	Method...	HANTUSH 2	
11			
12	Base El..	-99.000 Ft	
13			
14			
15			
16			
17	Base Flow	CFS	Stage T0. 25.000 Ft
18	X Coord..	Ft	Y Coord.. Ft

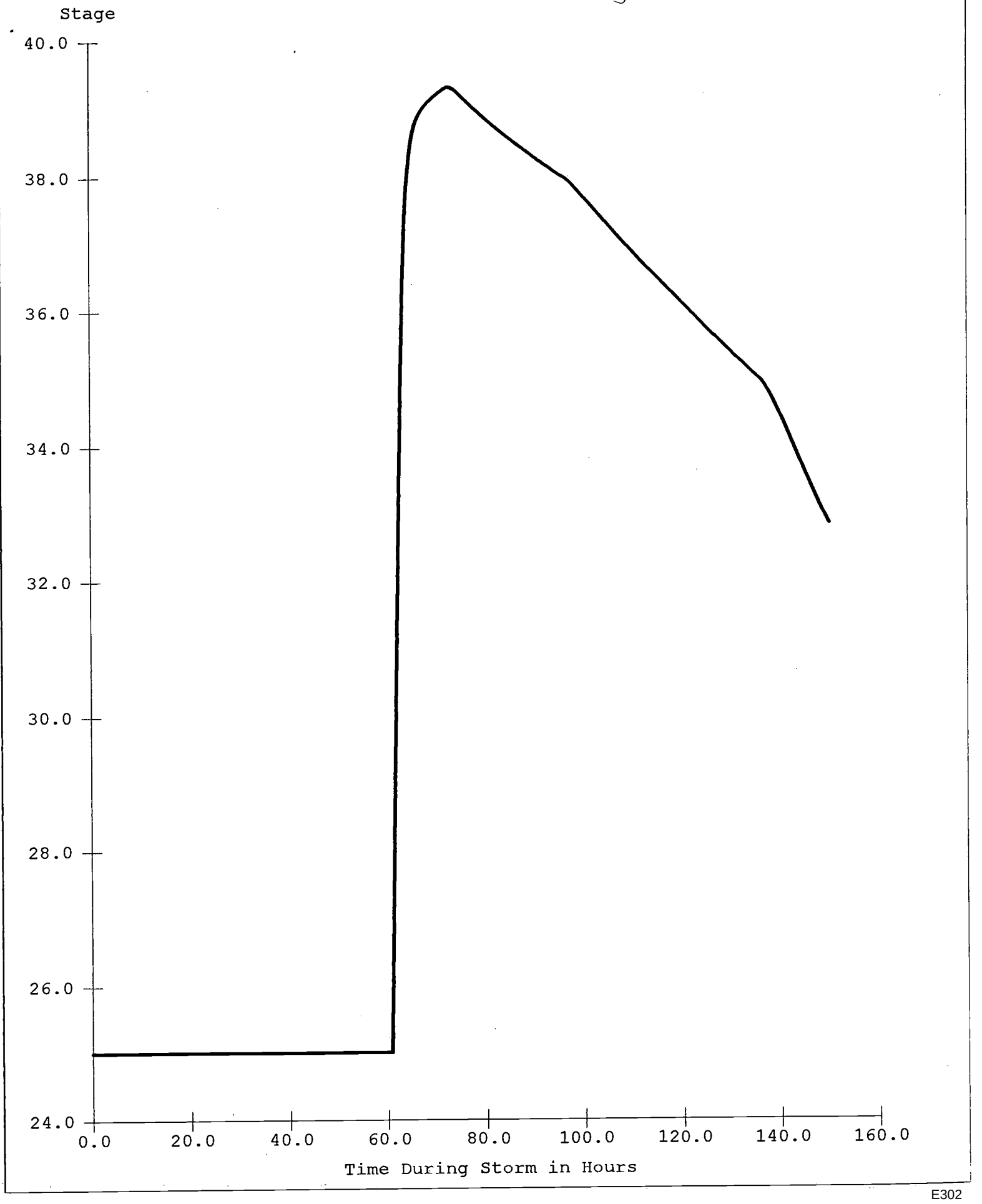
Node 002 Name GROUND WATER Type MOUNDING		Output Data US Std
00	Input ID.....	1005595402
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	25.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	39.317 Feet
05	Minimum Stage Reached.....	25.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	32.842 Feet
09	Time of Maximum Stage.....	72.750 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	6.757 CFS
14	Time of Peak Intake.....	61.250 Hours
15	Peak Nodal Output.....	0.000 CFS
16	Time of Peak Output.....	0.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.009 Feet


Inflow/Outflow at NORTH POND
CFS
32.0
28.0
24.0
20.0
16.0
12.0
8.0
4.0
0.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time During Storm in Hours

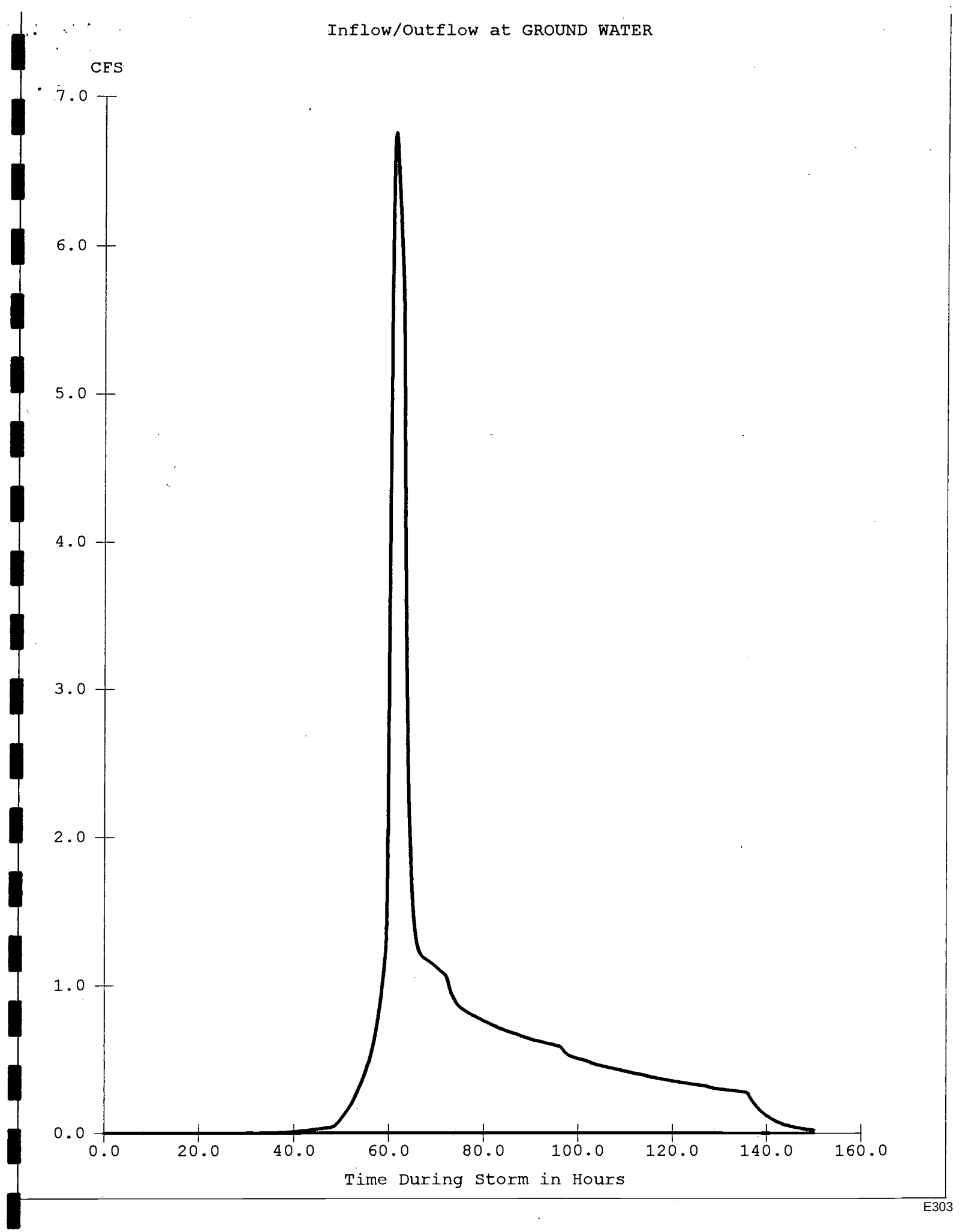

Storage at NORTH POND
Stage
41.0
40.0
39.0
38.0
37.0
36.0
35.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Cubic Feet (Thousands)


Stage El. at NORTH POND
Stage
41.0
40.0
39.0
38.0
37.0
36.0
35.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time During Storm in Hours

Stage El. at GROUND WATER



E302


Inflow/Outflow at GROUND WATER
CFS
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
160.0
Time During Storm in Hours

Pond # 3

East Pond

Veterans Memorial Parkway
(from Graves Ave. to SR. 472)

Pond Sizing Calculations

Post – Construction 25 yr-96 hr. Storm

By: Scott H. Martin, P.E.
Volusia County

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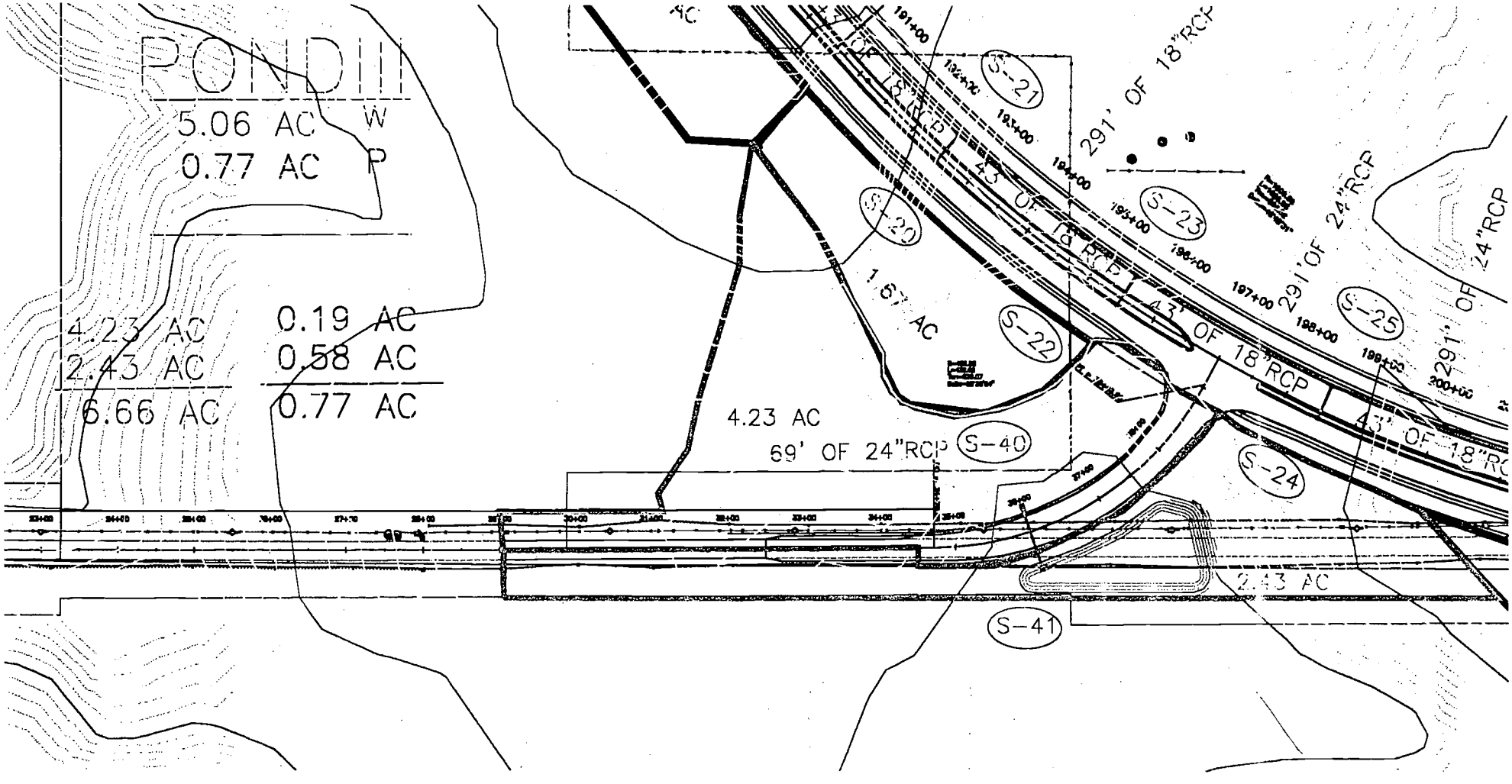
STA 36+00 EP EL -51.53



E305

Worksheet 2: Runoff curve number and runoff

Project VETERANS MEM PKWY # 1617 By J.O. Date 10/2001

Location ORANGE CITY Checked _____ Date _____

Circle one: Present Developed EAST

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐acres ☐mi² ☐%	Product of CN x area
A	WOODS	36			5.05	182.16
A	FOS	39			0.83	32.37
A	PAVT	98			0.77	75.46
					6.65	289.99

1/ Use only one CN source per line. Totals =

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{289.63}{6.65} = 43.54$; Use CN = 44

2. Runoff

$S = \frac{1000}{CN} - 10 = 12.72$

	Storm #1	Storm #2	Storm #3
Frequency ..... yr	25		
Rainfall, P (24-hour) ..... in	12		
Runoff, Q ..... in (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	4.03		

$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} = 4.0$

$V = 2.2 A_c Q$

(210-VI-TR-55, Second Ed., June 1986)

Worksheet 2: Runoff curve number and runoff

Project VETERANS MEM PKWY # 1617 By J.O. Date 10/2001

Location ORANGE CITY Checked _____ Date _____

Circle one: Present Developed EAST

1. Runoff curve number (CN)

Soil name and hydrologic group (appendix A)	Cover description (cover type, treatment, and hydrologic condition; percent impervious; unconnected/connected impervious area ratio)	CN 1/ Table 2-2	CN 1/ Fig. 2-3	CN 1/ Fig. 2-4	Area ☐acres ☐mi² ☐%	Product of CN x area
A	WOODS	36			5.65	182.16
A	SOD	39			0.83	32.37
A	PAVT	98			0.77	75.46
	Totals =				6.65	289.99

1/ Use only one CN source per line.

CN (weighted) = $\frac{\text{total product}}{\text{total area}} = \frac{289.63}{6.65} = 43.54$; Use CN = 44

2. Runoff

$S = \frac{1000}{CN} - 10 = 12.72$

		Storm #1	Storm #2	Storm #3
Frequency	yr	25		
Rainfall, P (24-hour)	in	12		
Runoff, Q (Use P and CN with table 2-1, fig. 2-1, or eqs. 2-3 and 2-4.)	in	4.03		

$Q = \frac{(P - 0.2S)^2}{(P + 0.8S)} = 4.0$

$V = 2.2 A_c Q$

Report Covering

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Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

Project Contains 2 Paths.
Project Contains 3 Nodes.
Project Contains 0 Sgnls.

Path	Up Stream Node Name	Down Stream Node Name	Path Type
0	BASIN EAST	EAST POND	DIRECT
1	EAST POND	GROUND WATER	RECHARGE

Node	Name	Node Type
0	BASIN EAST	SCS SITE
1	EAST POND	POND
2	GROUND WATER	MOUNDING

Node	Name	Node Type	Min El.	at Hr.	Max El.	at Hr.
0	BASIN EAST	SCS SITE	51.6	0.00	51.6	0.00
1	EAST POND	POND	47.0	0.00	49.6	61.00
2	GROUND WATER	MOUNDING	25.0	0.00	30.3	77.00

Elevations in Feet, Nodes marked with an '*' have Flooded.

Node	Name	Maximum CFS Inflow	Maximum CFS Outflow
0	BASIN EAST	14.03 @ 60.00 Hours	14.03 @ 60.00 Hours
1	EAST POND	14.03 @ 60.00 Hours	2.28 @ 61.00 Hours
2	GROUND WATER	1.31 @ 67.50 Hours	0.00 @ 0.00 Hours

Report Covering

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Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0001 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0054 Percent

Project Contains 2 Paths.
Path 000 from Node 000 (BASIN EAST) to Node 001 (EAST POND)

	Path 000 ID 1005753244 Type DIRECT US Std
00	DIRECT..----------
01	
02	
03	
04	
05	
06	
07	
08	
09	
10	
11	
12	
13	
14	
15	HW PE/KE NO
16	TW PE/KE YES
17	Max HW.. 51.580 Ft
18	Max TW.. 50.000 Ft

	Path 000 Output Data Type DIRECT US Std	
00	Input ID 1005753244	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	14.032 CFS
04	Min In..	0.000 CFS
05	Max Out.	14.032 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Path 001 from Node 001 (EAST POND) to Node 002 (GROUND WATER)

Path 001 ID 1005753295 Type RECHARGE		US Std
00	Horz K..	0.470 FPH
01	Vert K..	0.190 FPH
02		
03	Max Perc	FPH
04		
05	Handle..	Name
06		
07		
08		
09		
10		
11		
12		
13		
14		
15	HW PE/KE YES	
16	TW PE/KE NO	
17	Max HW..	50.000 Ft
18	Max TW..	50.000 Ft

Path 001 Output Data Type RECHARGE		US Std
00	Input ID 1005753295	
01	Flow T0.	0.000 CFS
02	Vol T0..	0 CF
03	Max In..	2.285 CFS
04	Min In..	0.000 CFS
05	Max Out.	1.311 CFS
06	Min Out.	0.000 CFS
07		
08		
09		
10		
11		
12		
13		
14		
15	Fwd K...	0.000
16	Rev K...	0.000
17	Fwd X...	0.000
18	Rev X...	0.000

Report Covering

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Executed: Mon Nov 19 17:26:40 2001

Project Run Converged.

Prepared By

Hydraulic Systems Software
1049 Dunlap Avenue
Spring Hill, Florida

ACCUMULATED MASS BALANCE ERROR.....	0.0001 Acre Feet
ERROR AS A PERCENT OF OUTFLOW.....	0.0054 Percent

Project Contains 3 Nodes.

Node 000 Name BASIN EAST		Input# 1006203009
Type SCS SITE		US Std
00 Flood El. 51.580 Ft		
01		
02 Storm.... LWRB96		Freeze... YES
03 RainFall. 12.000 In		Freeze... YES
04		
05 Area..... 6.660 Ac		
06 Curve No. 44.000		
07 UHG File. SCS_323		
08 Ia Factor 0.200		
09 Tc..... 0.160 Hrs		
10		
11		
12		
13		
14		
15		
16		
17 Base Flow 0.00 CFS		Stage T0. Ft
18 X Coord.. Ft		Y Coord.. Ft

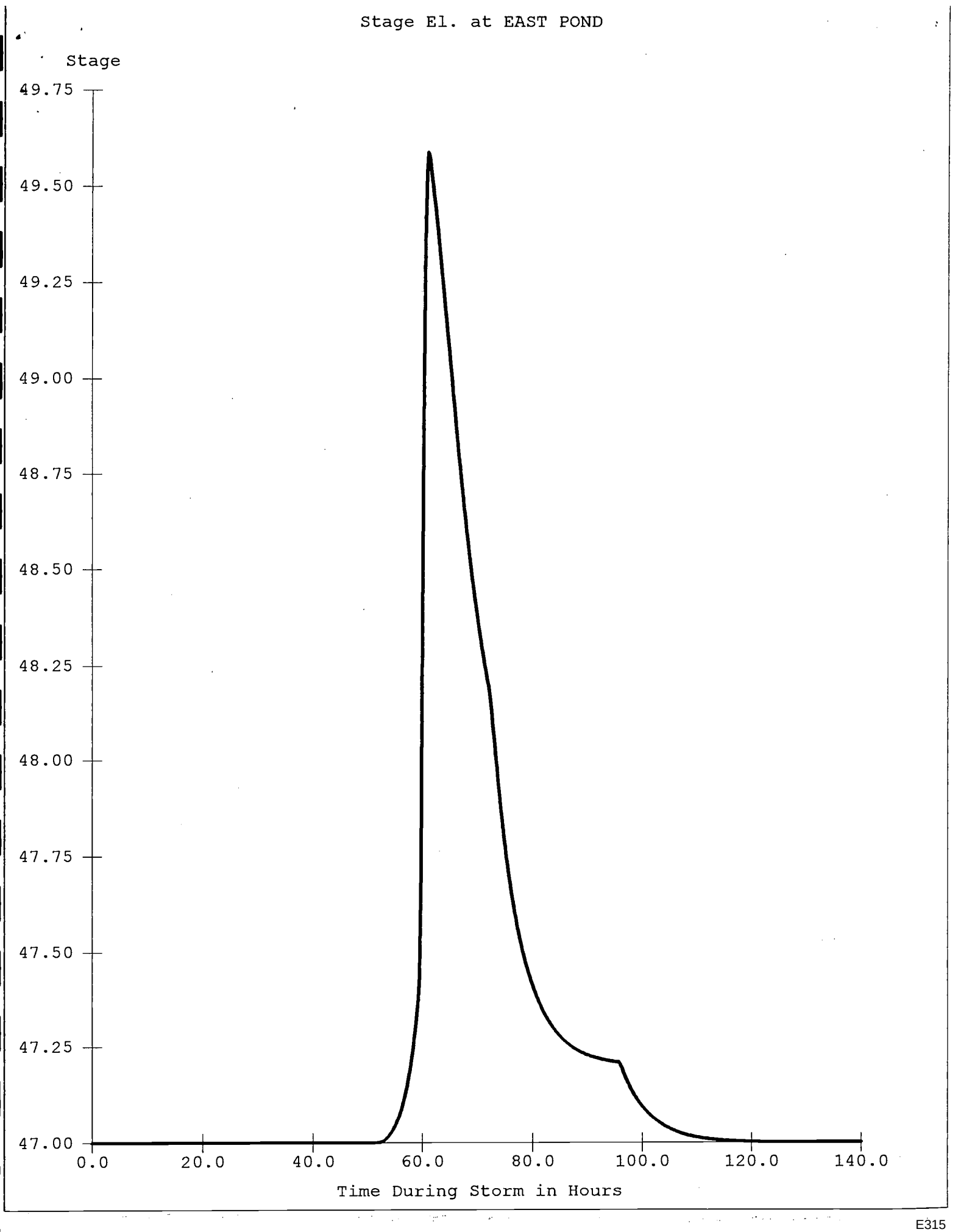
Node 000 Name BASIN EAST Type SCS SITE		Output Data US Std
00	Input ID.....	1005938333
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	51.580 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	51.580 Feet
05	Minimum Stage Reached.....	51.580 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	51.580 Feet
09	Time of Maximum Stage.....	0.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	14.032 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	14.032 CFS
16	Time of Peak Output.....	60.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.000 Feet

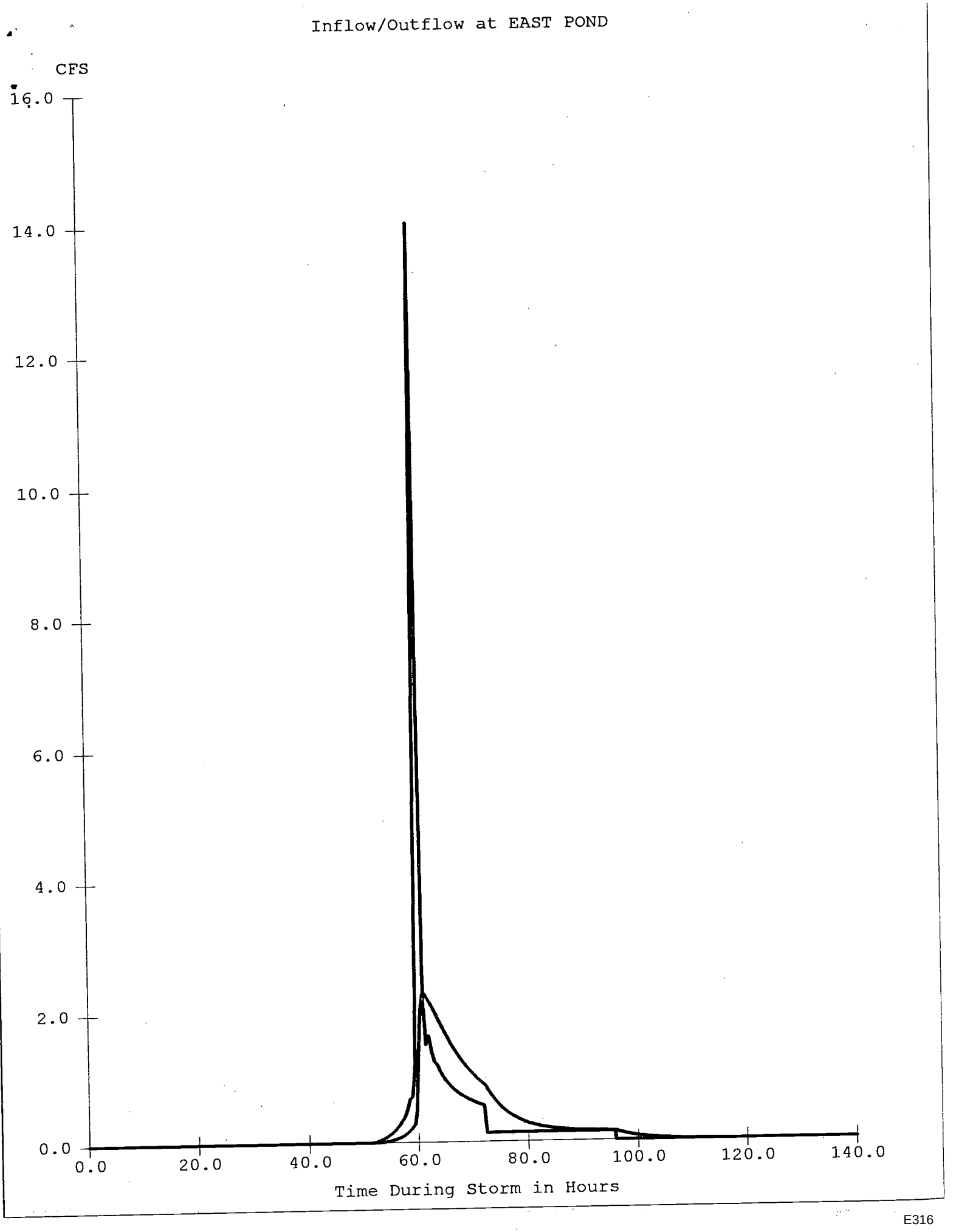
Node 001 Name EAST POND Type POND				Input# 1006208789 US Std
00	Top El...	50.000 Ft	Top Area.	0.429 Ac
01	El.....	49.000 Ft	Area.....	0.373 Ac
02	El.....	48.000 Ft	Area.....	0.320 Ac
03	El.....	Ft	Area.....	Ac
04	El.....	Ft	Area.....	Ac
05	El.....	Ft	Area.....	Ac
06	El.....	Ft	Area.....	Ac
07	El.....	Ft	Area.....	Ac
08	El.....	Ft	Area.....	Ac
09	El.....	Ft	Area.....	Ac
10	Bot El...	47.000 Ft	Bot Area.	0.269 Ac
11				
12	Top Perim	616.8 Ft	Side %Per	100.0 Pct
13	Mid Perim	579.1 Ft	Base %Per	100.0 Pct
14	Bot Perim	540.6 Ft		
15				
16				
17	Base Flow	0.00 CFS	Stage T0.	25.000 Ft
18	X Coord..	Ft	Y Coord..	Ft

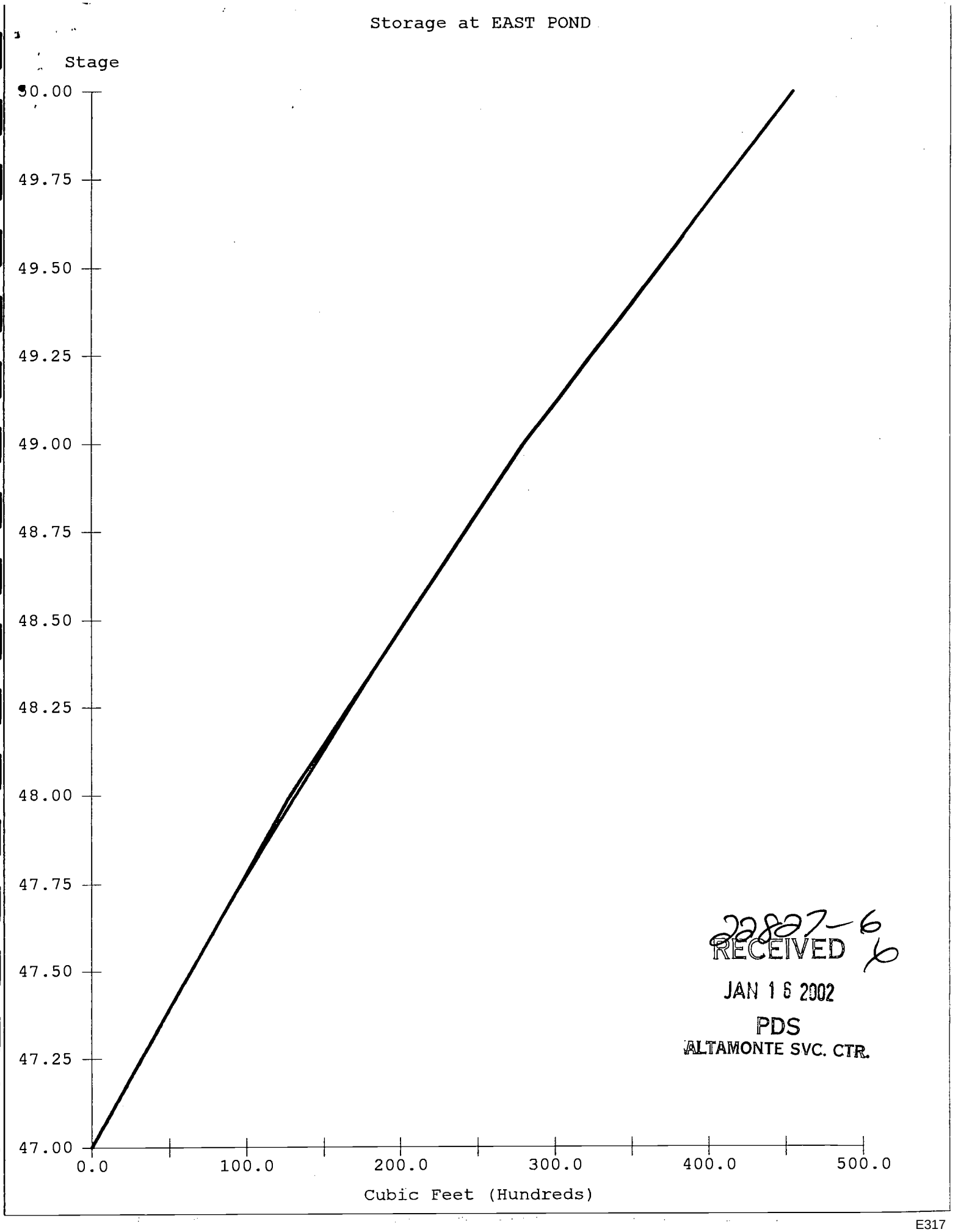
Node 001 Name EAST POND Type POND		Output Data US Std
00	Input ID.....	1006208789
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	47.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	49.592 Feet
05	Minimum Stage Reached.....	47.000 Feet
06	Maximum Gross Storage.....	38255 CF
07	Maximum Detention Storage.....	38255 CF
08	Final Stage Elevation.....	47.001 Feet
09	Time of Maximum Stage.....	61.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	14.032 CFS
14	Time of Peak Intake.....	60.000 Hours
15	Peak Nodal Output.....	2.285 CFS
16	Time of Peak Output.....	61.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.003 Feet

Node 002 Name GROUND WATER Type MOUNDING			Input# 1006205112 US Std
00	Flood El.	50.000 Ft	Auto Warn YES
01			
02	Porosity.	20.00 Pct	
03	Saturated	25.00 Pct	
04			
05	S Yield..	20.00 Pct	
06	Hyd Cond.	0.3000 FPH	
07	Length...	217.0 Ft	
08	Width....	75.0 Ft	
09	Toler....	0.0100000 Ft	
10	Method...	HANTUSH 2	
11			
12	Base El..	-99.000 Ft	
13			
14			
15			
16			
17	Base Flow	CFS	Stage T0. 25.000 Ft
18	X Coord..	Ft	Y Coord.. Ft

Node 002 Name GROUND WATER Type MOUNDING		Output Data US Std
00	Input ID.....	1006205112
01	Flood Elevation Reached.....	NO
02	Initial Stage Elevation.....	25.000 Feet
03	Initial Storage.....	0 CF
04	Maximum Stage Reached.....	30.341 Feet
05	Minimum Stage Reached.....	25.000 Feet
06	Maximum Gross Storage.....	0 CF
07	Maximum Detention Storage.....	0 CF
08	Final Stage Elevation.....	26.437 Feet
09	Time of Maximum Stage.....	77.000 Hours
10	Time of Minimum Stage.....	0.000 Hours
11		
12		
13	Peak Nodal Intake.....	1.311 CFS
14	Time of Peak Intake.....	67.500 Hours
15	Peak Nodal Output.....	0.000 CFS
16	Time of Peak Output.....	0.000 Hours
17	Points Out of Tolerance.....	0
18	Maximum Stage Error.....	0.007 Feet


Stage El. at EAST POND
Stage
49.75
49.50
49.25
49.00
48.75
48.50
48.25
48.00
47.75
47.50
47.25
47.00
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours


Inflow/Outflow at EAST POND
CFS
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0.0
20.0
40.0
60.0
80.0
100.0
120.0
140.0
Time During Storm in Hours



22827-6
RECEIVED
JAN 16 2002
PDS
ALTAMONTE SVC. CTR.

22827-6

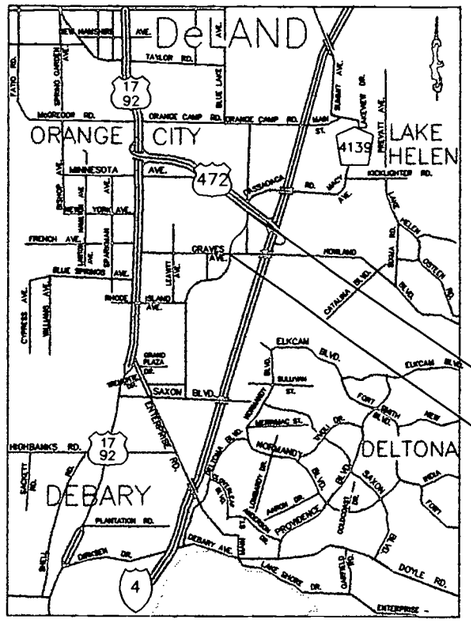
Drawings
11" Wide
1757

COUNTY OF VOLUSIA
STATE OF FLORIDA

VETERAN'S MEMORIAL PARKWAY
FROM GRAVES AVE. TO SR 472
COUNTY PROJECT NO. 4617

INDEX OF SHEETS

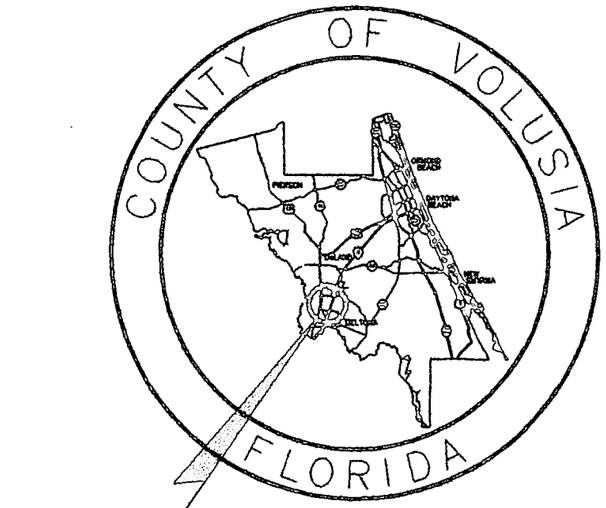
SHEET NO.	DESCRIPTION
1	KEY SHEET
2	DRAINAGE MAPS
3	TYPICAL SECTIONS
4	SUMMARY OF QUANTITIES
5	SUMMARY OF DRAINAGE STRUCTURES
6-10	PLAN & PROFILE
11-42	CROSS SECTIONS
43	POND #1
44	POND #2
S-1	SIGNING & MARKING TABULATION OF QUANTITIES
S-2 TO S-3	SIGNING & MARKING PLAN SHEETS



END PROJECT STA. 210+57.57

BEGIN PROJECT STA. 163+62.62

VETERANS MEM PKWY	4,694.95 FT.	0.889 MILES
KENTUCY AVE	632.48 FT	0.120 MILES
TOTAL	5,327.43 FT	1.009 MILES



LOCATION OF PROJECT

FINAL PERMITTED PLANS

DATE 1/10/03

INITIAL mc

Scott H. Martin, P.E.
FL. License # 38722

22827-6

RECEIVED
APR 29 2002
PDS
ALTAMONTE SVC. CTR.

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA.

County of Volusia
123 W. Indiana Ave.
DeLand, FL 32720

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)

REVISIONS	BY	DATE	REVISIONS	BY	DATE

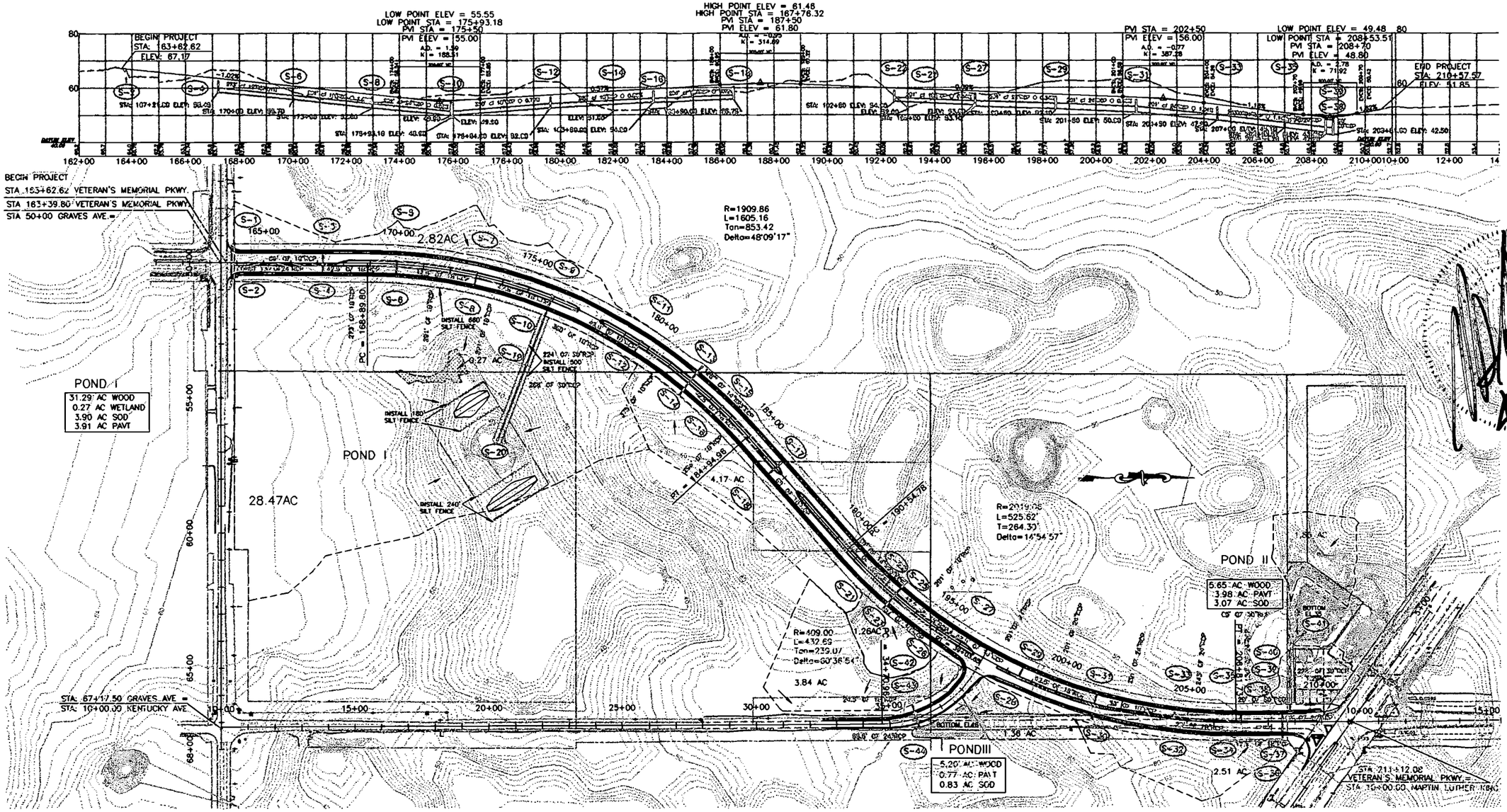
COUNTY ENGINEER _____ DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	0	0	CADD	IO	12/01
CHECKED	0	0	CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	12/01

Date: 12/01
SCALE: NTS

VETERANS MEMORIAL PARKWAY EXT.
KEY SHEET
VOLUSIA COUNTY , FLORIDA

Proj. No: 4617
Draw No: 4617
Sheet No: 1 of 51



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

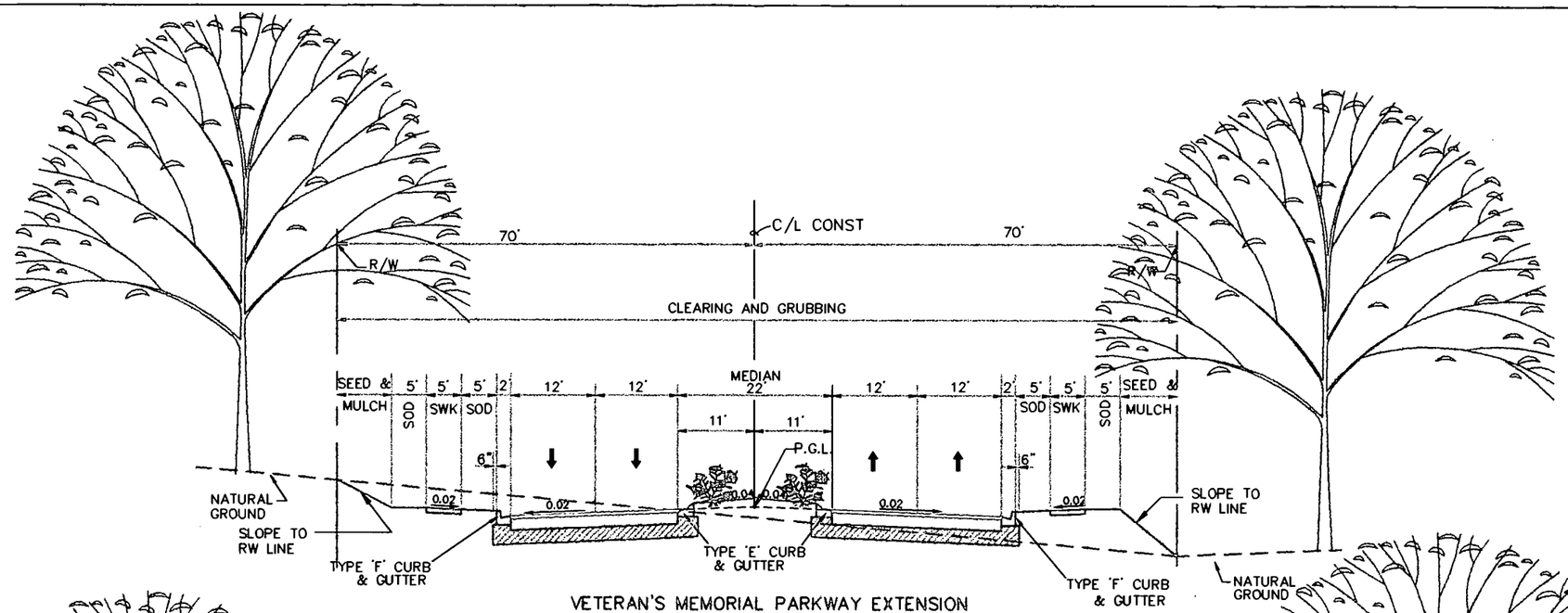
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

	NAME	DATE		NAME	DATE
TOPO			DESIGN		
CADD			CADD	IO	10/01
CHECKED			CHECKED	SM	3/02
FIELD BOOK NO. PAGE TO			DESIGNED	TM	10/01

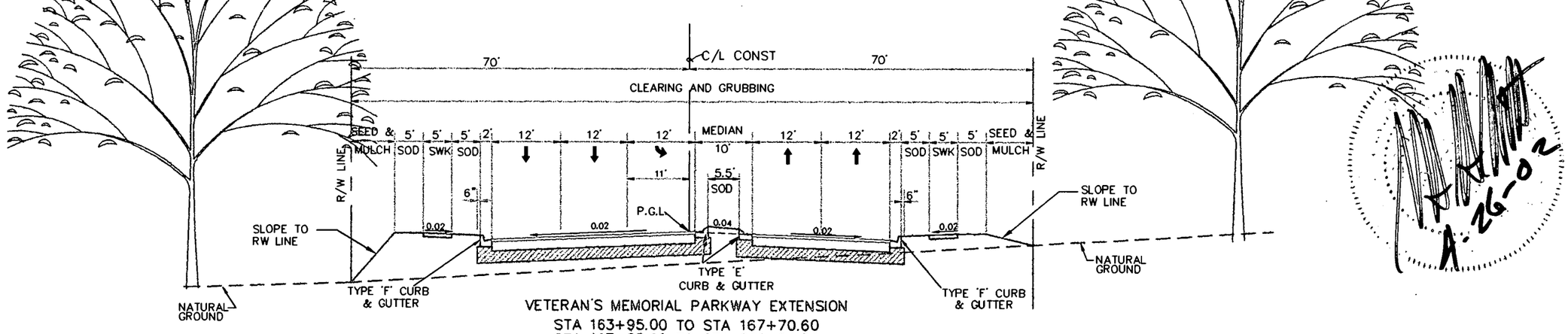
Date: 4/02
SCALE:
HORIZ 1"=200'
VERT 1"=20'

VETERAN MEMORIAL PKWY. EXTENSION
DRAINAGE MAP

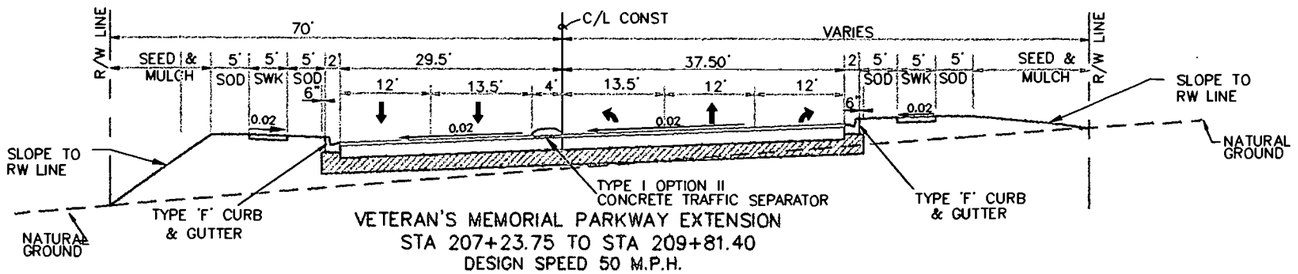
Proj. No: 4617
Draw No: 4617
Sheet No: 5 of 31



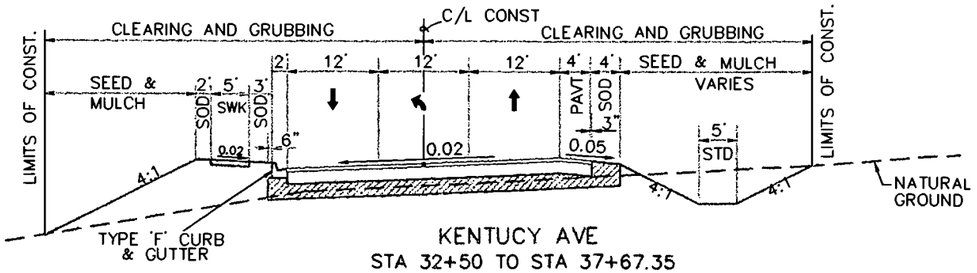
VETERAN'S MEMORIAL PARKWAY EXTENSION
STA168+20.60 TO STA 196+20.79
PROPOSED TWO LANE ROADWAY
DESIGN SPEED 50 M.P.H.



VETERAN'S MEMORIAL PARKWAY EXTENSION
STA 163+95.00 TO STA 167+70.60
STA 197+85.06 TO STA 201+84.54
DESIGN SPEED 50 M.P.H.



VETERAN'S MEMORIAL PARKWAY EXTENSION
STA 207+23.75 TO STA 209+81.40
DESIGN SPEED 50 M.P.H.



KENTUCY AVE
STA 32+50 TO STA 37+67.35
DESIGN SPEED 30 M.P.H.

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD			CADD	IO	11/01
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	11/01

Date: 3/02
SCALE: N.T.S.

VETERANS MEMORIAL PARKWAY EXT.
TYPICAL SECTIONS

Proj. No: 4617
Draw No: ~~4617~~ E571
Sheet No: 3 of 51

SUMMARY OF DRAINAGE STRUCTURES

STR. No.	INDEX No.	STATION	SIDE	TYPE	SIZE	CONC. PIPE						CURB INLETS			D.B.I.		M.H.		M.E.S			
						18"		24"		30"	14"X23"	P-5	P-6	J-6	C	D	P	J	18"	24"	30"	14"X23"
						S.D.	C.D.	S.D.	C.D.	S.D.	C.D.								C.D.	C.D.	S.D.	C.D.
S-1	232	163+80.00	LT	INLET, PIPE	24"				132						1							
S-2	272	163+80.00	RT	M.E.S.	24"															1		
S-3	211	167+21.80	LT	INLET, PIPE	18"		69					1										
S-4	211	167+21.80	RT	INLET, PIPE	18"	273						1										
S-5	211	170+00.00	LT	INLET, PIPE	18"		42.5					1										
S-6	211	170+00.00	RT	INLET, PIPE	18"	291						1										
S-7	211	173+00.00	LT	INLET, PIPE	18"		42.5					1										
S-8	211	173+00.00	RT	INLET, PIPE	18"	291						1										
S-9	211	175+93.18	LT	INLET, PIPE	18"		42.5						1									
S-10	211	175+93.18	RT	INLET, PIPE	30"					224			1									
S-11	211	179+64.00	LT	INLET, PIPE	18"		42.5					1										
S-12	211	179+64.00	RT	INLET, PIPE	18"	360						1										
S-13	272	182+00.00	LT	M.E.S., PIPE	14"X23"						126											1
S-14	272	182+00.00	RT	M.E.S.	14"X23"																	1
S-15	211	183+50.00	LT	INLET, PIPE	18"		42.5					1										
S-16	211	183+50.00	RT	INLET, PIPE	18"	375						1										
S-17	211	186+50.00	LT	INLET, PIPE	18"		69					1										
S-18	211	186+50.00	RT	INLET, PIPE	18"	294						1										
S-19	232	175+93.18	RT	INLET, PIPE	30"					285						1						
S-20	273	175+93.18	RT	M.E.S.	30"																1	
S-21	211	192+50.00	RT	INLET, PIPE	18"		42.5					1										
S-22	211	192+50.00	LT	INLET, PIPE	18"	291						1										
S-23	272	193+00.00	RT	M.E.S., PIPE	18"		57												1			
S-24	201	193+00.00	CL	M.H.,PIPE	14"X23"						60						1					
S-25	272	193+00.00	LT	M.E.S.	14"X23"															1		
S-26	211	195+50.00	RT	INLET, PIPE	18"		42.5					1										
S-27	211	195+50.00	LT	INLET, PIPE	24"			291				1										
S-28	211	198+50.00	RT	INLET, PIPE	18"		42.5					1										
S-29	211	198+50.00	LT	INLET, PIPE	24"			291				1										
S-30	211	201+50.00	RT	INLET, PIPE	18"		42.5					1										
S-31	211	201+50.00	LT	INLET, PIPE	24"			291				1										
S-32	211	204+50.00	LT	INLET, PIPE	18"		30					1										
S-33	211	204+50.00	LT	INLET, PIPE	24"			243				1										
S-34	211	207+00.00	RT	INLET, PIPE	18"		28					1										
S-35	211	207+00.00	LT	INLET, PIPE	24"			150				1										
S-36	232	208+53.51	RT	INLET, PIPE	18"	17.5									1							
S-37	211	208+53.51	RT	INLET, PIPE	24"				66				1									
S-38	211	208+53.51	LT	INLET, PIPE	30"					29				1								
S-39	273	208+81.70	LT	MH. PIPE	30"					226								1				
S-40	201	208+81.70	LT	MH. PIPE	30"					60								1				
S-41	273	209+35.41	LT	M.E.S.	30"																1	
S-42	232	36+00.00	LT	INLET,PIPE	18"		24.5								1							
S-43	211	36+00.00	LT	INLET,PIPE	24"				55.5				1									
S-44	272	36+00.00	RT	M.E.S.	24"															1		
TOTAL						2,192.5	660	1,266	253.5	824	186	24	4	1	3	1	1	2	1	2	2	3

DRAINAGE STRUCTURES NOTES:

1. MITERED END SECTION TO BE PAID FOR AS PER EACH. SEE INDEX # 272 AND # 273 COLUMN "F" FOR LENGTH. CHECK FOR CORRESPONDING TYPE OF PIPE CALLED FOR IN PLANS.
2. MITERED END SECTION TO BE 4:1 SLOPE ,EXCEPT THOSE IN STA 182+00 AND 193+00 WHICH ARE 2:1 SLOPE.

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD			CADD	I.O.	2/2002
CHECKED			CHECKED		
FIELD BOOK NO. PAGE TO			DESIGNED	I.O.	2/2002

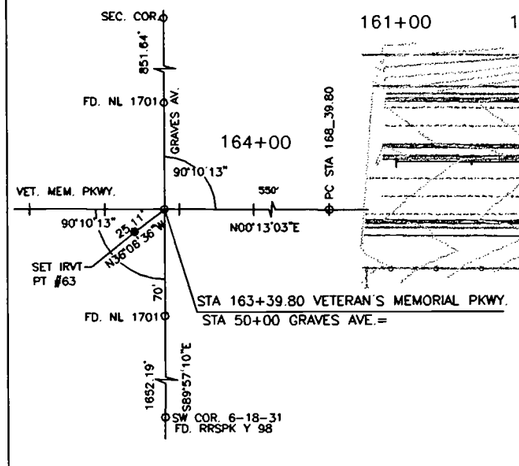
Date: 2/2002
SCALE: N.T.S.

VETERANS MEMORIAL PARKWAY EXT.
SUMMARY OF DRAINAGE

Proj. No: 4617
Draw No: 4617
Sheet No: 5 OF 51

BEGIN PROJECT
STA 163+62.62 VETERAN'S MEMORIAL PKWY.
STA 163+39.80 VETERAN'S MEMORIAL PKWY.
STA 50+00 GRAVES AVE.=

REFERENCE TIE
STA 163+39.80



(S-1) STA 163+80.00 OFF 63'LT
CONST DBI TYPE C
INDEX 232
TOP EL 66.80
INV EL 62.30

(S-2) STA 163+80.00 OFF 81'RT
CONST MES
INDEX 272
INV EL 62.00

(S-3) STA 167+21.80 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 62.33
INV EL 58.65

(S-4) STA 167+21.80 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 62.33
INV EL 58.45

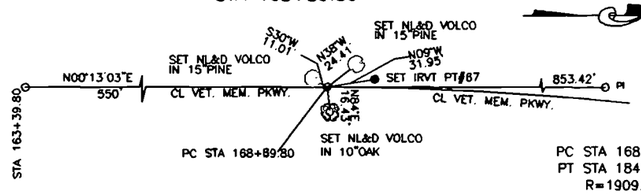
(S-5) STA 170+00.000FF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 60.40
INV EL 55.90

(S-6) STA 170+00.00 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 59.48
INV EL 55.70

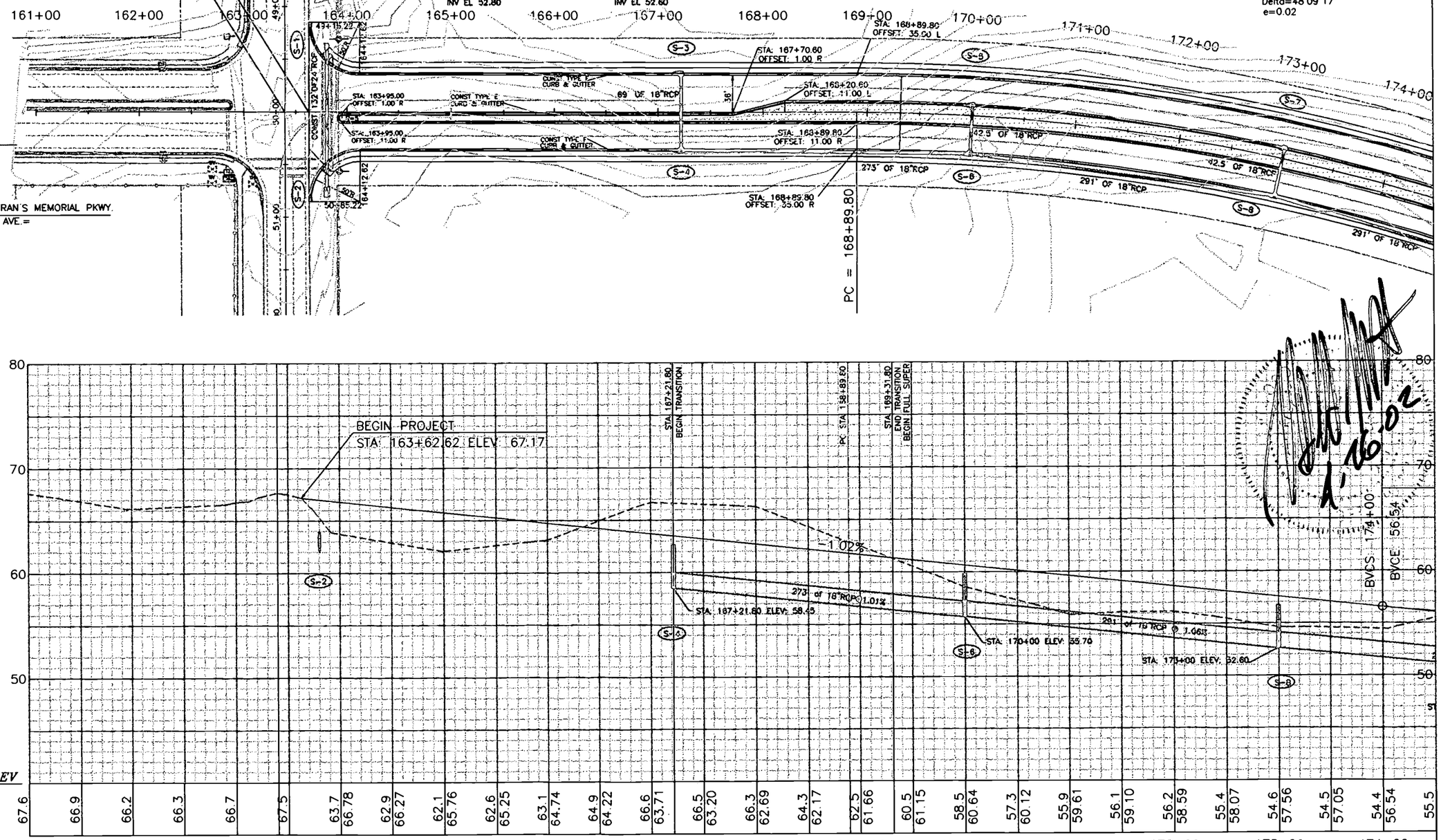
(S-7) STA 173+00.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 57.33
INV EL 52.80

(S-8) STA 173+00.00 OFF 38.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 56.41
INV EL 52.60

REFERENCE TIE
STA 168+89.80



PC STA 168+89.80
PT STA 184+94.98
R=1909.86
L=1605.16
Tan=853.42
Delta=48°09'17"
e=0.02



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD			CADD	I.O	8/01
CHECKED			CHECKED		
FIELD BOOK NO. 404 PAGE TO			DESIGNED	I.O	8/01

Date: 8/01
SCALE: HORIZ 1"=50' VERT 1"=5'

VETERANS MEMORIAL PARKWAY EXT.
PLAN AND PROFILE
STA 161+00 TO STA 174+00

Proj. No: 4617
Draw No: ~~4617~~ 4623
Sheet No: 6 of 51

S-9 STA 175+93.18 OFF 9.75'LT
CONST CI TYPE P6
INDEX 211
GUTTER EL 55.31
INV EL 50.10

S-10 STA 179+93.18 OFF 36.25'RT
CONST CI TYPE P6
INDEX 211
GUTTER EL 54.39
INV EL 49.90
INV EL EST 48.90

S-11 STA 179+64.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 57.11
INV EL 52.60

S-12 STA 179+64.00 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 56.19
INV EL 52.60

S-13 STA 182+00.00 OFF 70'LT
CONST MES(14"X23")
INDEX 272
INV EL 51.00

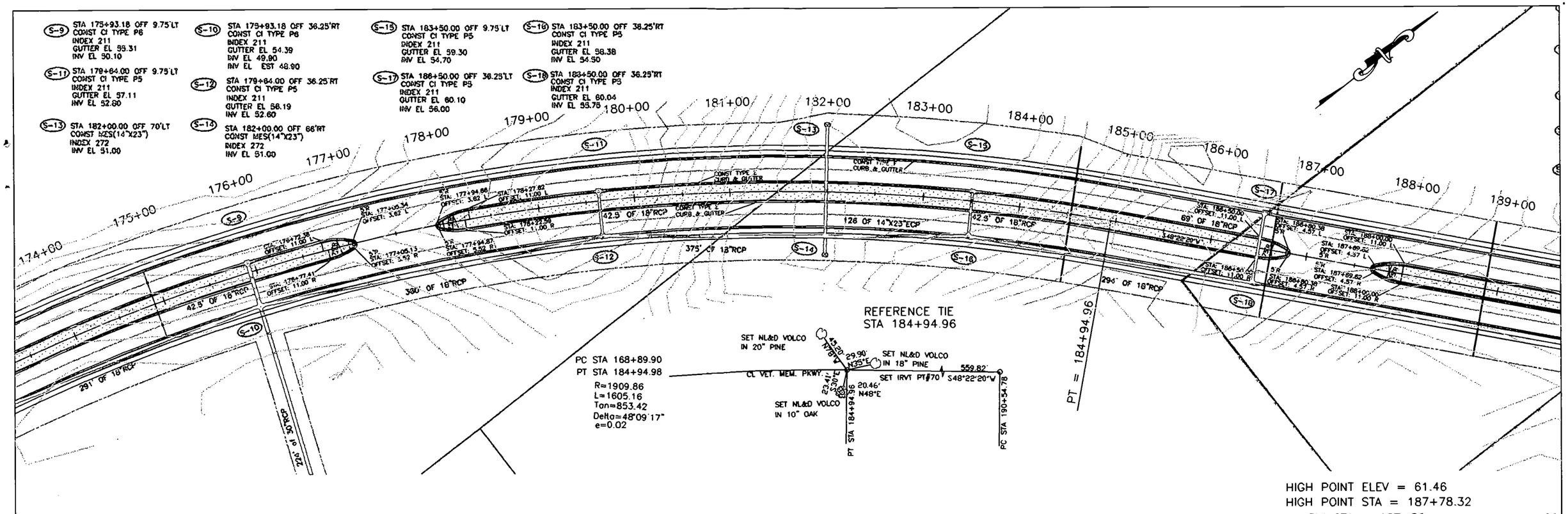
S-14 STA 182+00.00 OFF 66'RT
CONST MES(14"X23")
INDEX 272
INV EL 51.00

S-15 STA 183+50.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 59.30
INV EL 54.70

S-16 STA 183+50.00 OFF 38.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 58.38
INV EL 54.50

S-17 STA 186+50.00 OFF 38.25'LT
CONST CI TYPE P3
INDEX 211
GUTTER EL 60.10
INV EL 56.00

S-18 STA 183+50.00 OFF 38.25'RT
CONST CI TYPE P3
INDEX 211
GUTTER EL 60.04
INV EL 55.75



REFERENCE TIE
STA 184+94.96

PC STA 168+89.90
PT STA 184+94.98
R=1909.86
L=1605.16
Tan=853.42
Delta=48°09'17"
e=0.02

HIGH POINT ELEV = 61.46
HIGH POINT STA = 187+78.32
PVI STA = 187+50
PVI ELEV = 61.80
A.D = -0.95
K = 314.69
300.00' VC

LOW POINT ELEV = 55.55
LOW POINT STA = 175+93.18
PVI STA = 175+50
PVI ELEV = 55.00
A.D = 1.59
K = 188.51
300.00' VC

T.B.M.#2
STA 176+47.61 RT 129.29'
ELEV. 53.133
SET NAIL IN 18" PINE

T.B.M.#3
STA 184+87.64 RT 10.13'
ELEV. 59.876
SET NAIL & DISK VOLCO
IN 8" OAK

BVCS 174+00
BVCE 56.54
EVCS 177+00
EVCE 55.85
BVCS 186+00
BVCE 60.95
EVCS 189+00
EVCE 61.22
STA 184+92.96 BEGIN TRANSITION END FULL SUPER
FF STA 184+94.96
STA 186+82.96 END TRANSITION
STA 188+66.77 BEGIN TRANSITION
0.57%
291' of 18"RCP @ 0.93%
380' of 18"RCP @ 0.75%
375' of 18"RCP @ 0.90%
294' of 18"RCP @ 0.43%
ELEV. 49.90
STA 175+93.18 ELEV. 49.90
ELEV. 49.90
STA 179+64 ELEV. 52.60
STA 183+50 ELEV. 54.50
STA 186+50 ELEV. 55.75
STA 192+00 ELEV. 51.00

57.05 54.4 56.54 55.5 56.09 56.6 55.78 57.1 55.60 57.6 55.55 57.4 55.63 57.1 55.85 57.4 56.13 57.8 56.42 60.1 56.70 62.4 56.98 62.2 57.27 61.9 57.55 58.2 57.83 54.5 58.12 53.0 58.40 51.6 58.68 51.6 58.97 51.7 59.25 52.1 59.53 52.6 59.82 56.5 60.10 57.4 60.38 58.4 60.67 59.2 60.95 58.7 61.19 58.2 61.36 59.4 61.44 60.7 61.45 62.3 61.37 62.2 61.22 62.2

174+00 175+00 176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00 184+00 185+00 186+00 187+00 188+00 189+00

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD			CADD		8/01
CHECKED			CHECKED		
FIELD BOOK NO. PAGE TO			DESIGNED		8/01

Date: 8/01
SCALE: HORIZ 1"=50' VERT 1"=5'

VETERANS MEMORIAL PARKWAY EXT.
PLAN AND PROFILE
STA 174+00 TO STA 189+00

Proj. No: 4617
Draw No: 4617
Sheet No: E324 7 of 51

S-21 STA 192+50.00 OFF 9.75'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 59.63
INV EL 55.10

S-22 STA 192+50.00 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 58.71
INV EL 54.80

S-23 STA 193+00 OFF 64.2'RT
CONST MES(18")
INDEX 272
INV EL 54.50

S-24 STA 193+00 OFF 0
CONST MH
INDEX 200
INV EL 52.00

S-25 STA 193+00 OFF 66'LT
CONST MES(14"X23")
INDEX 272
INV EL 52.00

S-26 STA 195+50.00 OFF 9.75'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 58.47
INV EL 53.80

S-27 STA 195+50.00 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 57.55
INV EL 53.60

S-28 STA 198+50.00 OFF 9.75'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 57.31
INV EL 52.30

S-29 STA 198+50.00 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 56.39
INV EL 52.10

S-30 STA 201+50.00 OFF 9.75'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 56.12
INV EL 51.10

S-31 STA 201+50.00 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 55.19
INV EL 50.90

S-32 STA 204+50.00 OFF 1.56'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 53.22
INV EL 48.10

S-33 STA 204+50.00 OFF 34.77'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 52.55
INV EL 47.90

REFERENCE TIE
STA 190+54.78

SET NL&D VOLCO IN 10" OAK
SET NL&D VOLCO IN 15" PINE
SET NL&D VOLCO IN 9" PINE
BARB WIRE FENCE
559.82'
S48°22'20"W
S11°W
45.67'
6.86'
59.24'
N46°E
SET IRVT PT#71
CL VET. MEM. PKWY.
PC STA 190+54.78

STA 197+00 VETERAN'S MEMORIAL PKWY.=
STA 39+42.44 KENTUCKY AVE.

R=2038.09'
L=530.57'
Tan=266.79
Delta=14°54'57"

R=2019.06'
L=525.62'
T=264.30'
Delta=14°54'57"

PC = 190+54.78

291' OF 24"RCP
42.5' OF 18"RCP
60' OF 14"X23"ECP
CONST TYPE F CURB & GUTTER
57' OF 18"RCP
CONST TYPE P CURB & GUTTER

STA: 198+20.79 OFFSET: 11.00 L
STA: 196+62.12 OFFSET: 1.89 R
STA: 197+65.06 OFFSET: 1.00 R
STA: 197+65.06 OFFSET: 11.00 R
STA: 197+78.66 OFFSET: 39.00 R
STA: 198+37.59 OFFSET: 35.00 R
STA: 196+17.03 OFFSET: 39.00 R
STA: 198+59.28 OFFSET: 11.00 R
STA: 195+58.10 OFFSET: 35.00 R
STA: 201+84.54 OFFSET: 11.00 L
STA: 201+84.54 OFFSET: 1.00 R
STA: 201+84.54 OFFSET: 35.00 R
STA: 204+02.25 OFFSET: 0.54 L
STA: 204+02.25 OFFSET: 39.71 L

R=60'
38+51.15
38+30.33
PT = 39+03.65

PC STA 190+54.78
PT STA 206+81.73
R=1909.86
L=1626.95
Tan=866.52
Delta=48°48'31"
e=0.002

189+00 190+00 191+00 192+00 193+00 194+00 195+00 196+00 197+00 198+00 199+00 200+00 201+00 202+00 203+00 204+00

STA 188+88.77 BEGIN TRANSITION
PC STA 190+54.77
STA 190+96.77 END TRANSITION BEGIN FULL SUPER

EVCS: 189+00
EVCE: 61.22

TBM #4
STA 193+37.09 LT 39.39'
ELEV. 54.794
SET 60P VOLCO IN 15"PINE

-0.39%

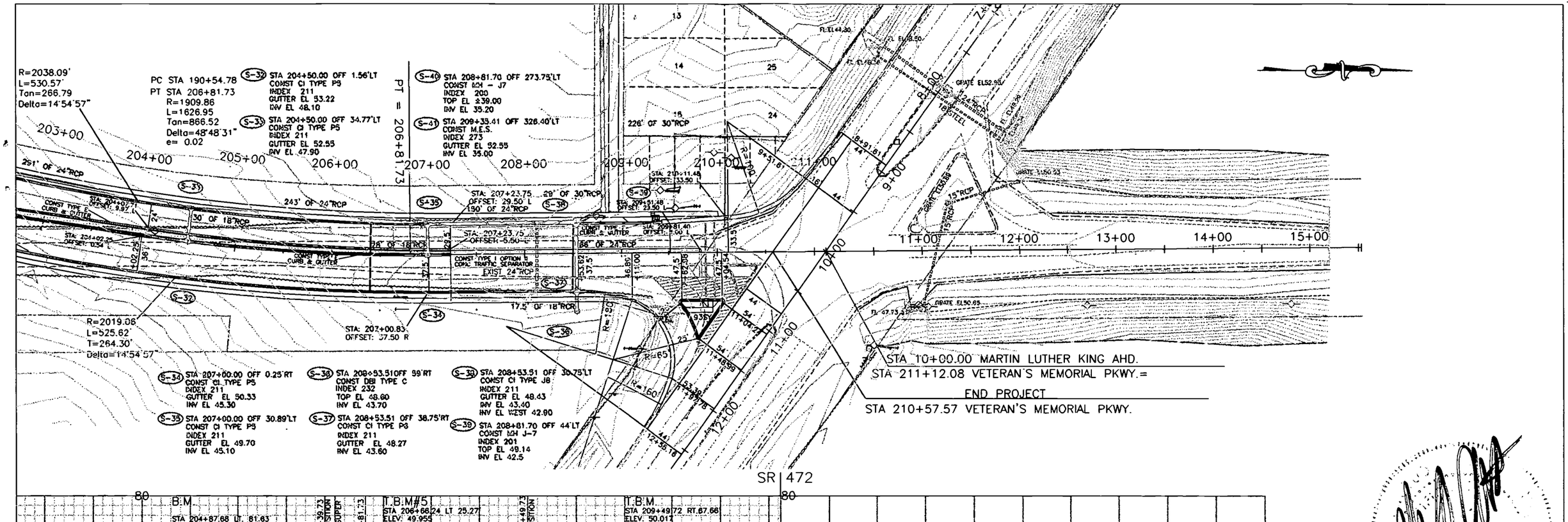
291' of 18"RCP @ 0.44%
291' of 24"RCP @ 0.34%
291' of 24"RCP @ 0.41%
291' of 24"RCP @ 1.63%

STA: 192+50 ELEV: 54.00
STA: 193+00 ELEV: 52.00
ELEV: 53.80
STA: 195+50 ELEV: 53.10
STA: 198+50 ELEV: 52.10
STA: 201+50 ELEV: 50.90
STA: 204+50 ELEV: 47.90

PVI STA = 202+50
PVI ELEV = 56.00
A.D. = -0.77
K = 387.28
300.00 VC

BVCS: 201+00
BVCE: 56.58
EVCS: 204+00
EVCE: 54.26

| | | |



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

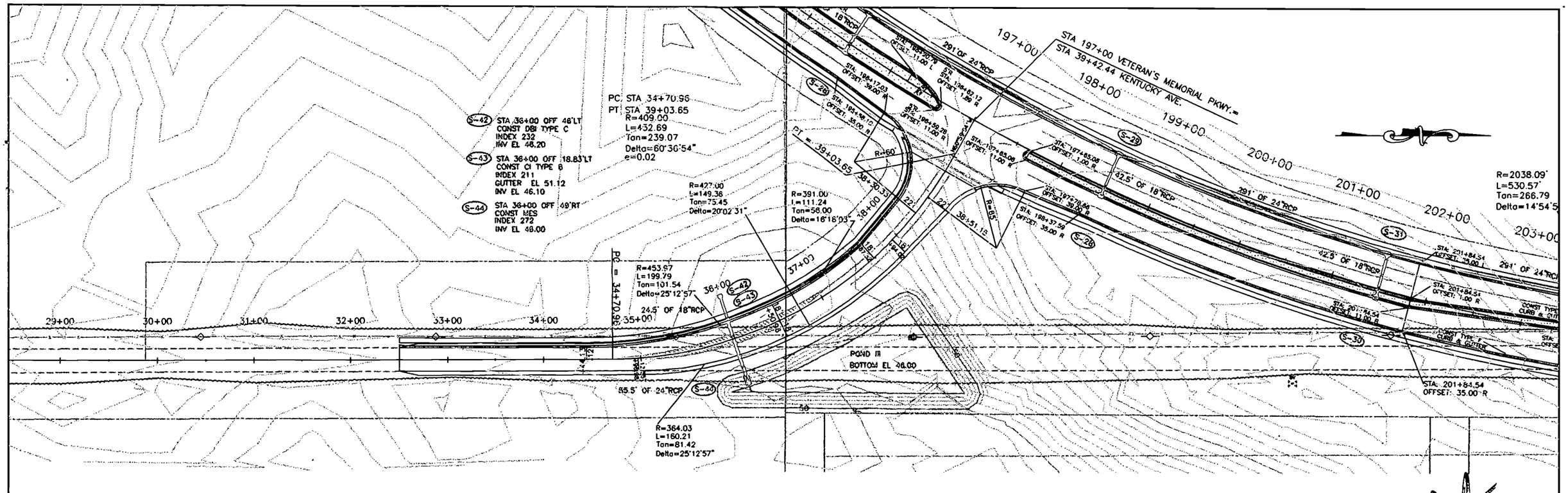
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

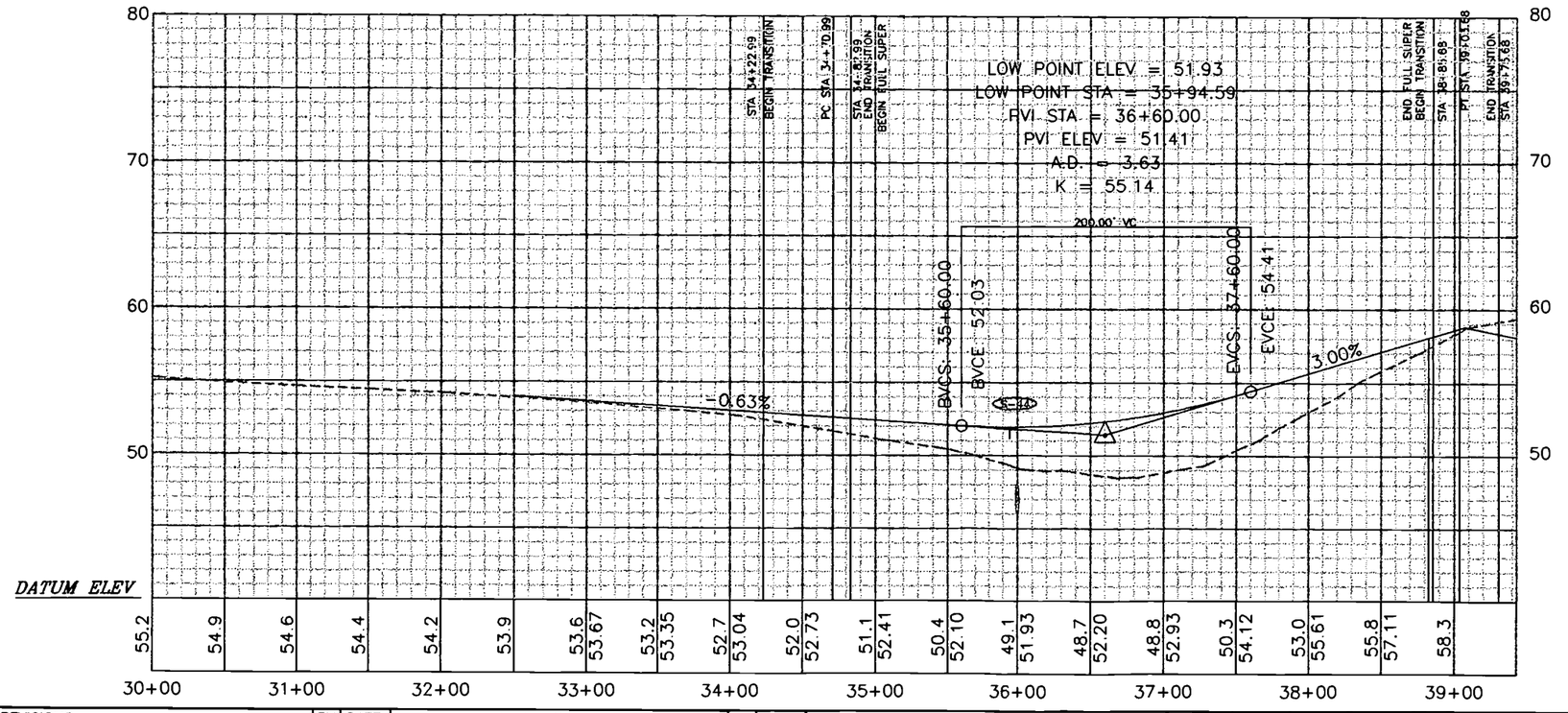
TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD			CADD	I.O	8/01
CHECKED			CHECKED		
FIELD BOOK NO. 404 PAGE TO			DESIGNED	I.O	8/01

Date: 8/01
SCALE: HORIZ 1"=50' VERT 1"=5'

VETERANS MEMORIAL PARKWAY EXT.
PLAN AND PROFILE
STA 204+00 TO STA 211+12.08

Proj. No: 4617
Draw No: 4617
Sheet No: E326 9 OF 51





REVISIONS	BY	DATE	REVISIONS	BY	DATE

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VOLUSIA COUNTY, FLORIDA

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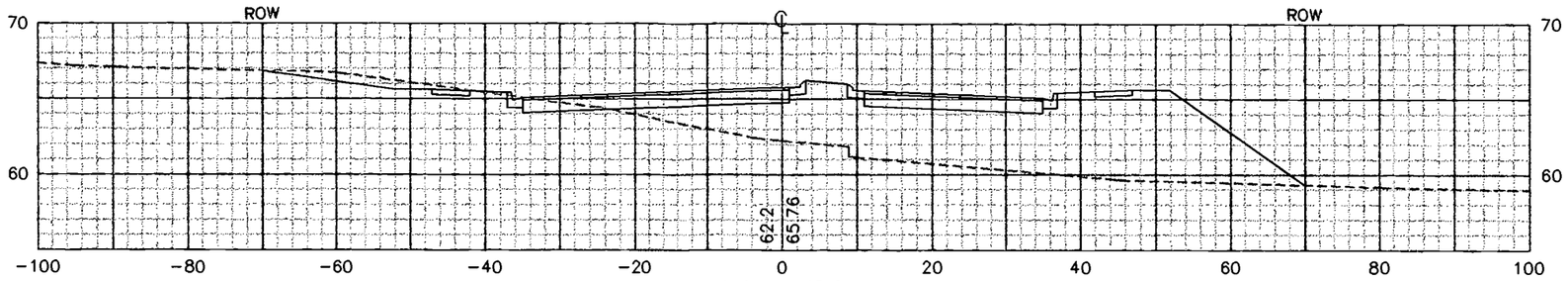
SCALE: HORIZ 1"=50' VERT 1"=5'

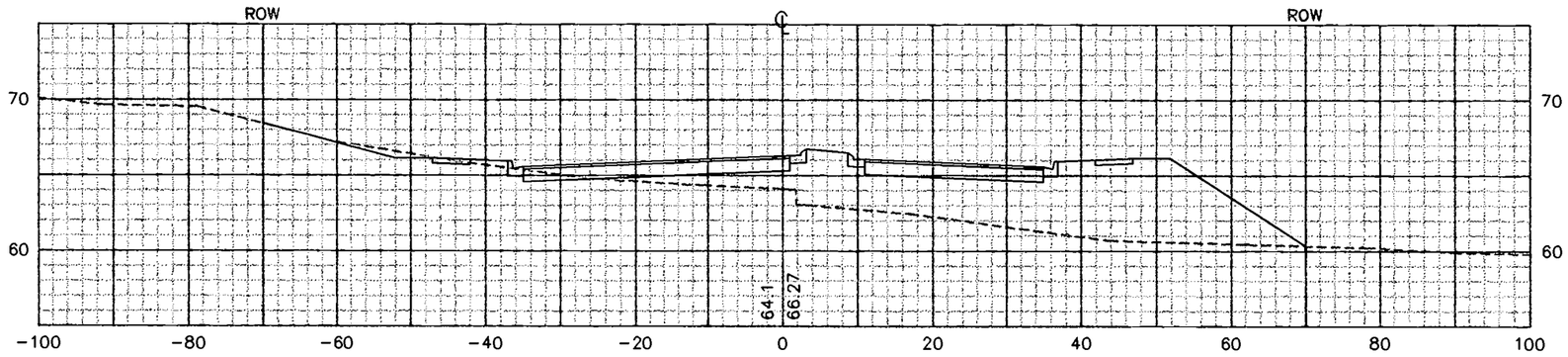
KENTUCKY AVE.
PLAN AND PROFILE
STA 26+00 TO STA 39+42.48

Proj. No: 4617
Draw No: 4617
Sheet No: E327 10 OF 51

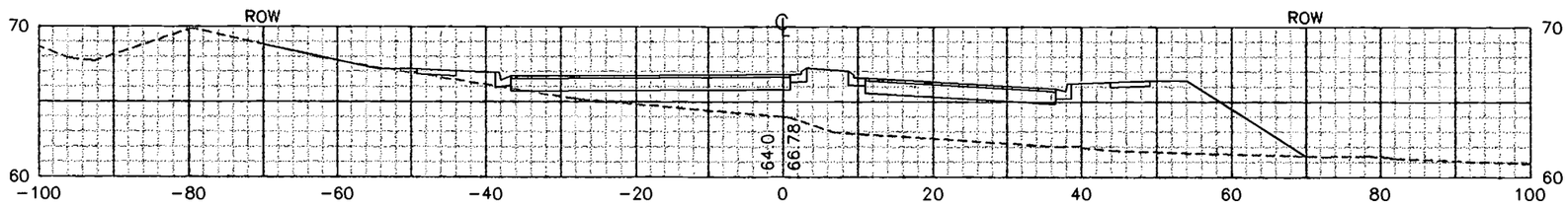
165+00



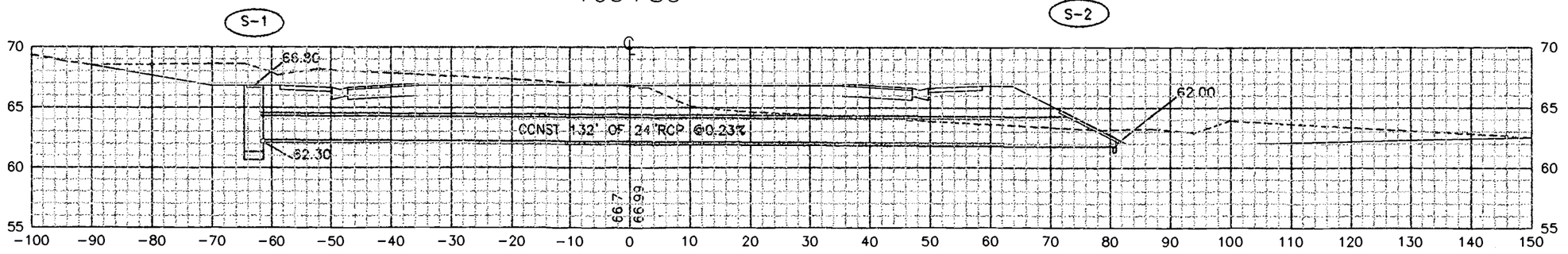
164+50



164+00



163+80



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ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

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FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

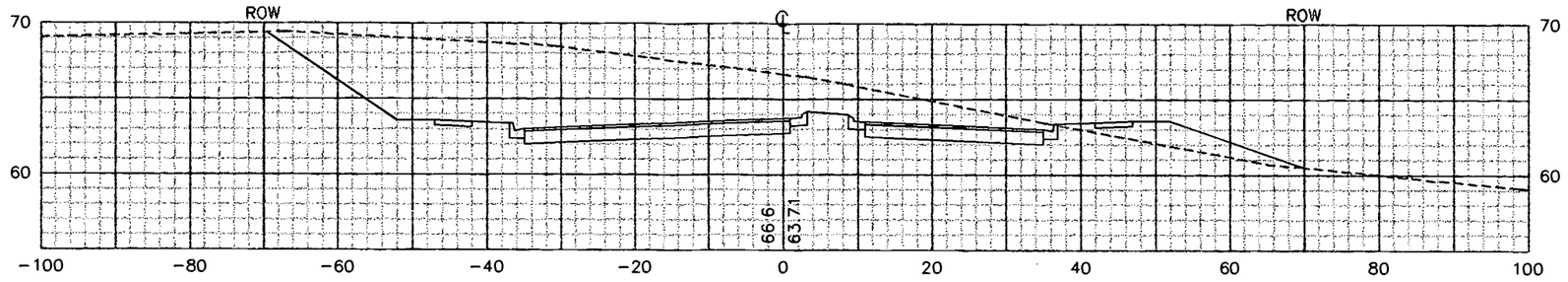
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

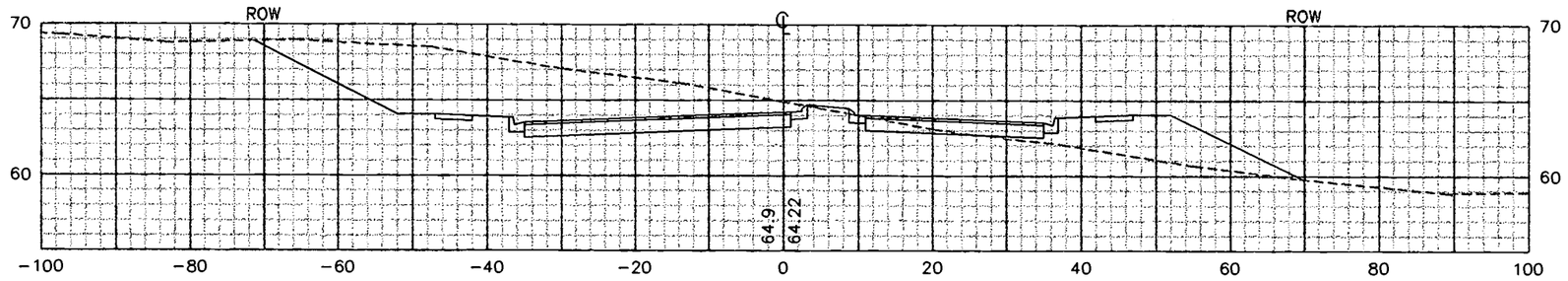
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 163+80 TO STA 165+00

Proj. No: 4617
Draw No: 4617
E328
Sheet No: 11 of 51

167+00

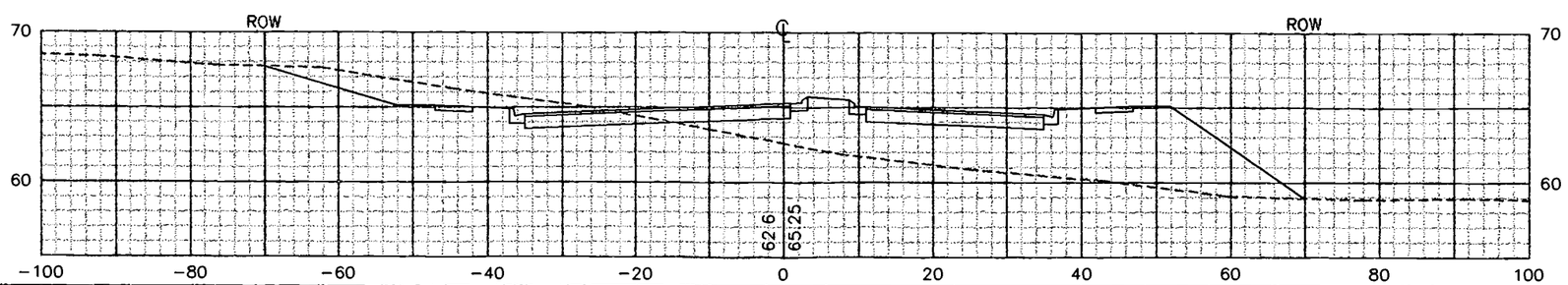


166+50



166+00

165+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

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FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

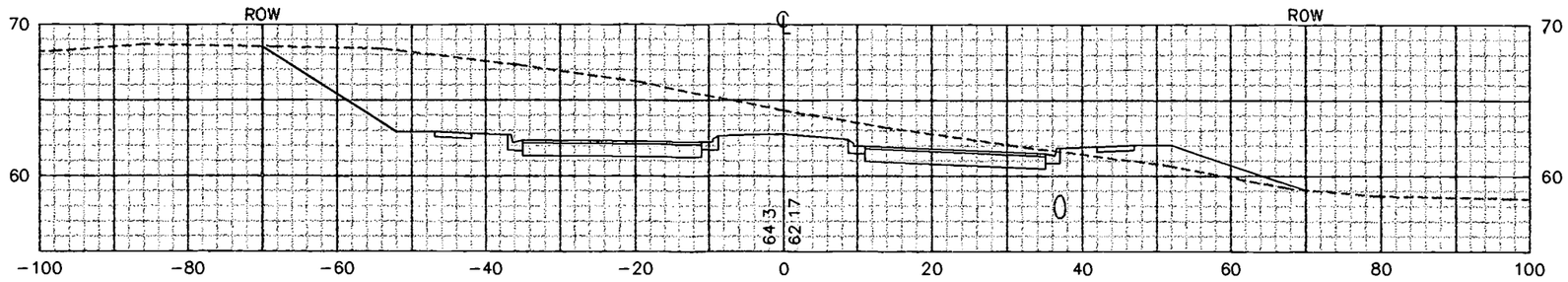
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

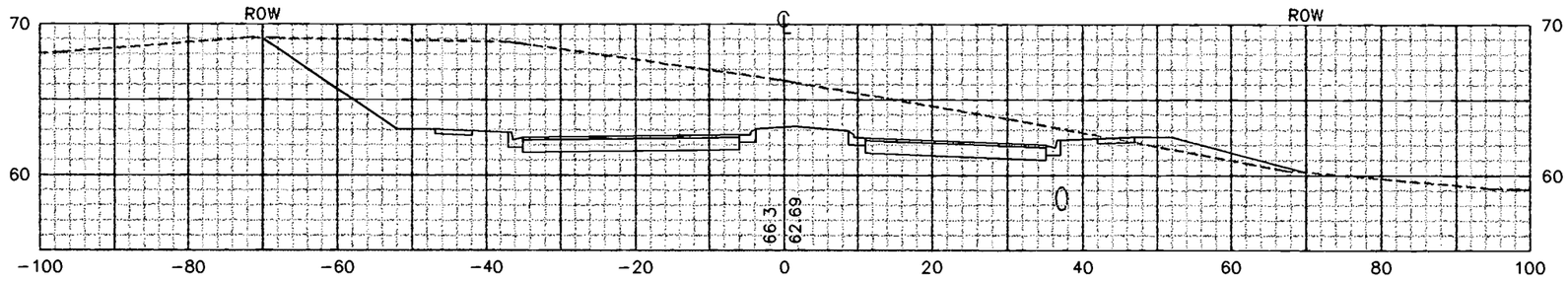
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 165+50 TO STA 167+00

Proj. No: 4617
Draw No: E4617g
Sheet No: 12 of 51

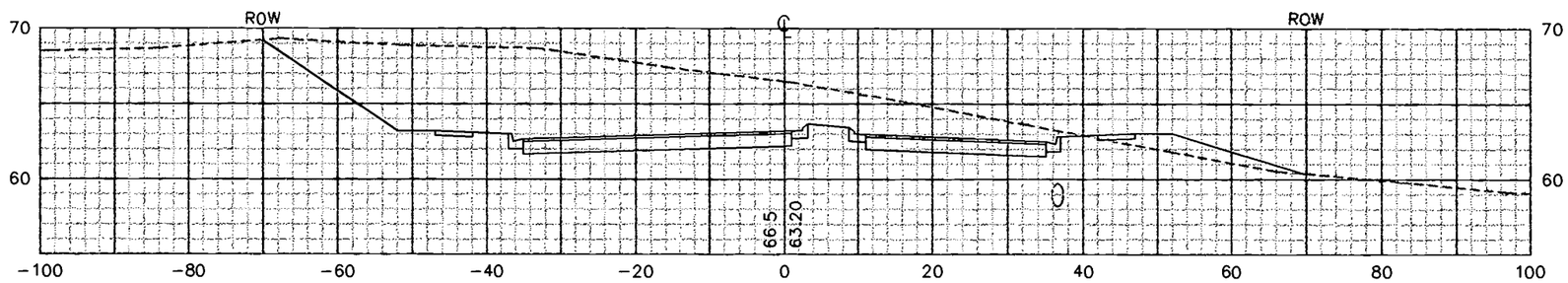
168+50



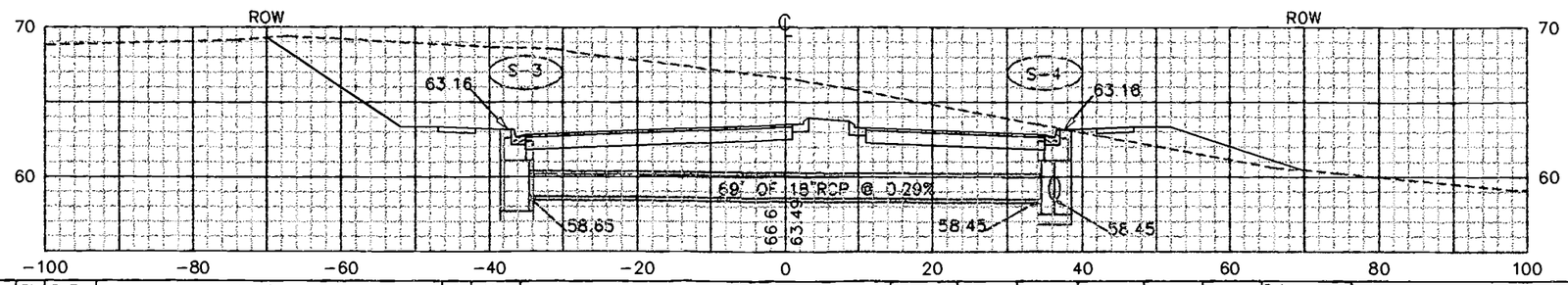
168+00



167+50



167+21.80



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

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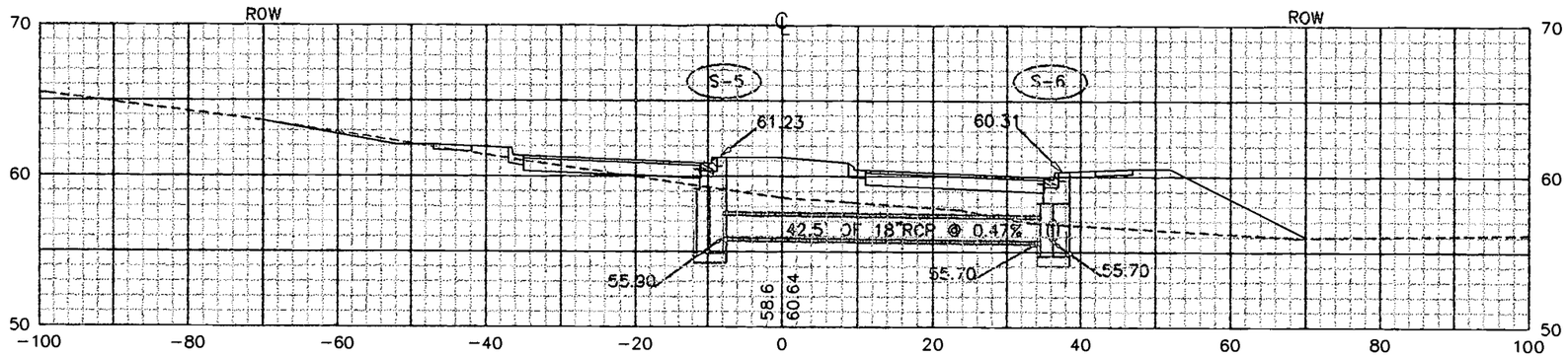
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

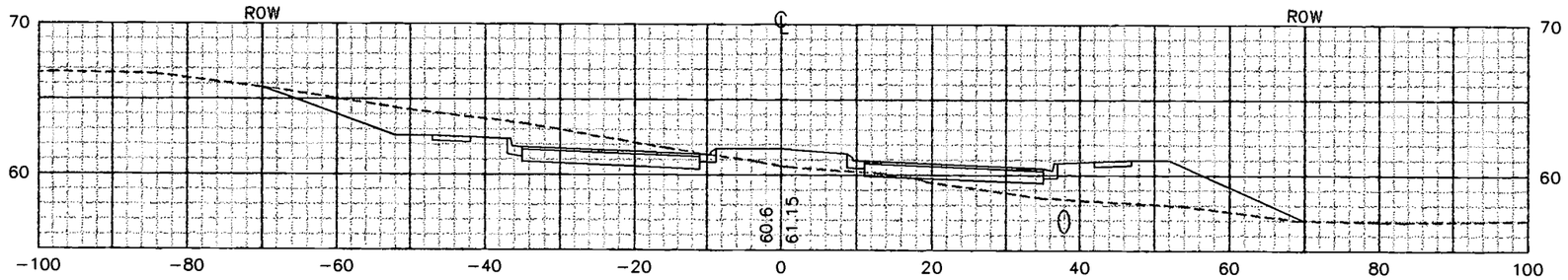
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 167+21.80 TO STA 168+50.00

Proj. No: 4617
Draw No: 4617 E330
Sheet No: 13 OF 51

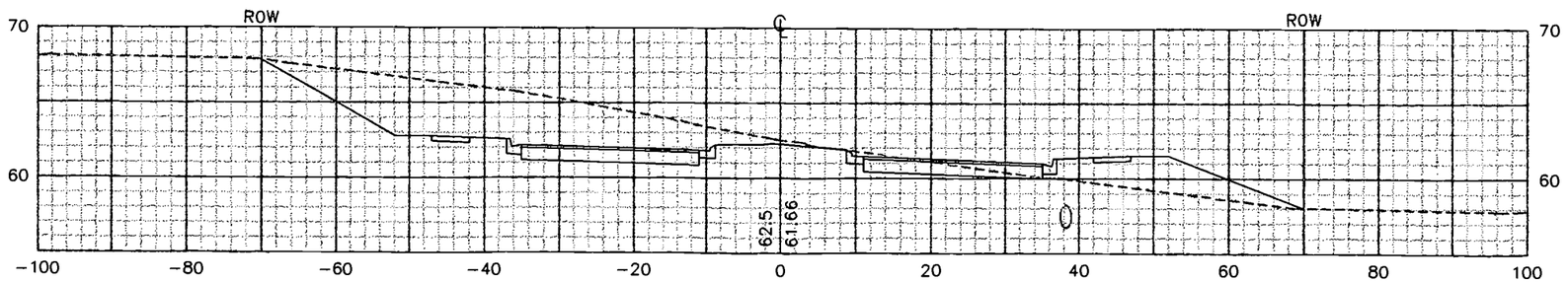
170+00



169+50



169+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

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ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

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FIELD BOOK NO. PAGE TO			DESIGNED	IO	8/2001

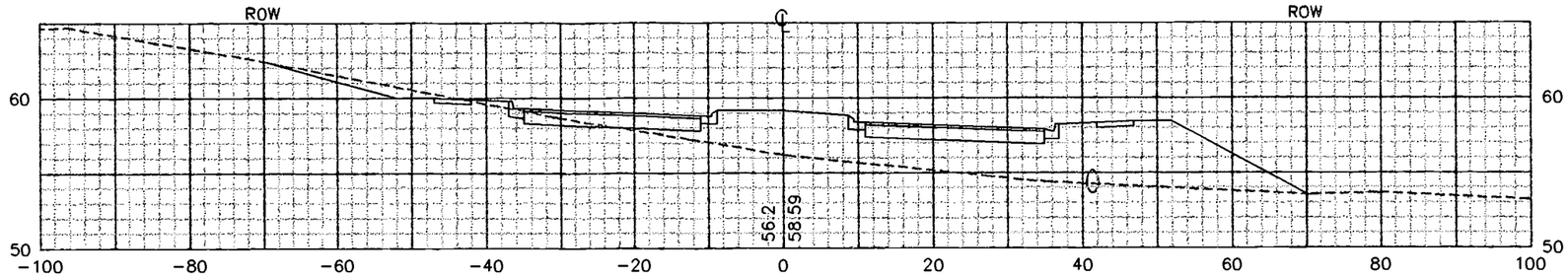
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

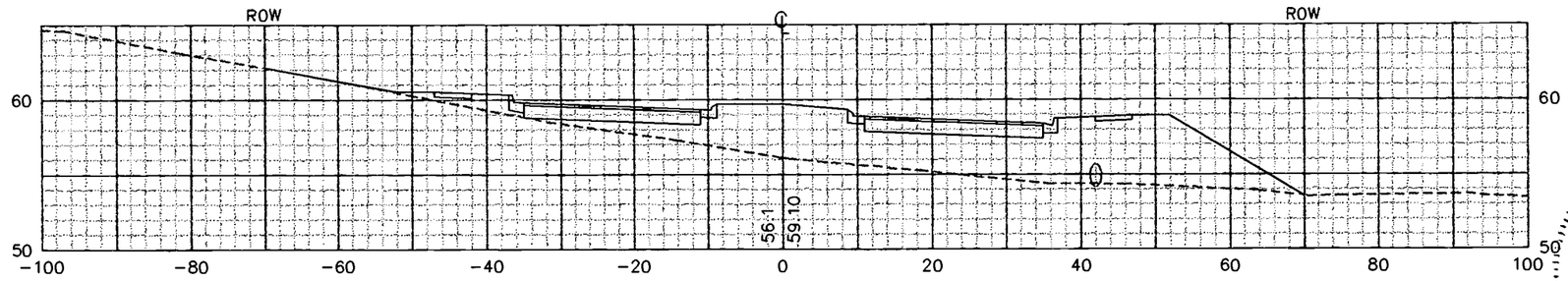
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 169+00 TO STA 170+00

Proj. No: 4617
Draw No: 4631
Sheet No: 14 of 51

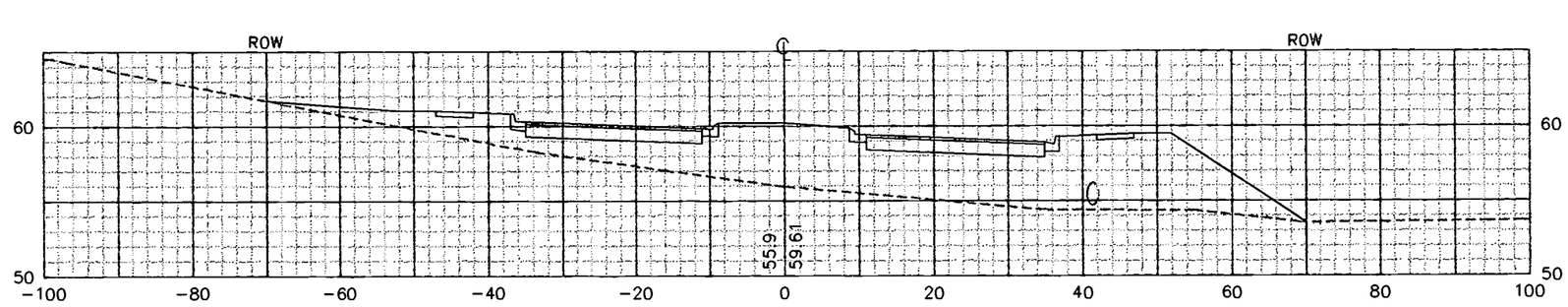
172+00



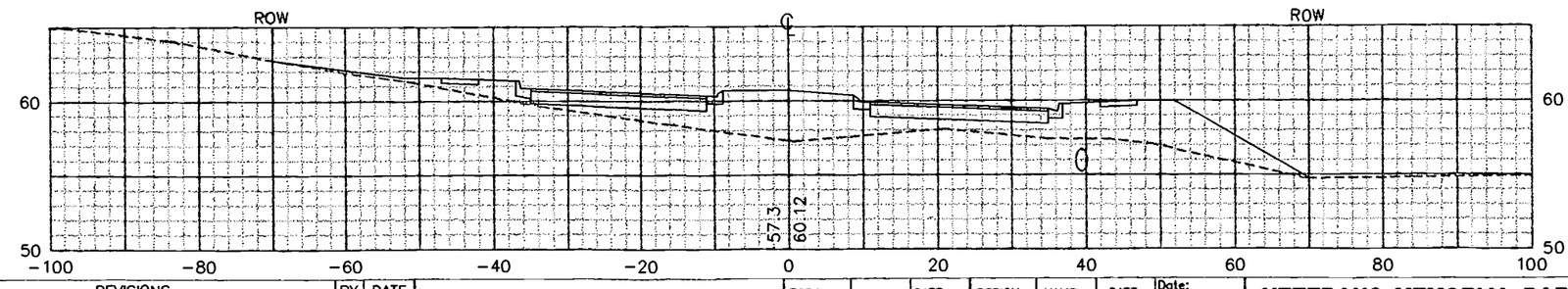
171+50



171+00



170+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

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VOLUSIA COUNTY, FLORIDA

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FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

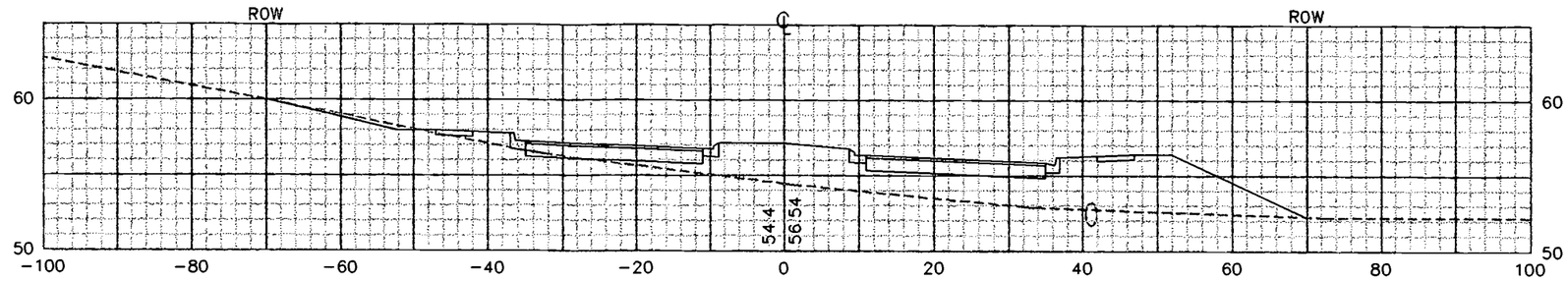
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

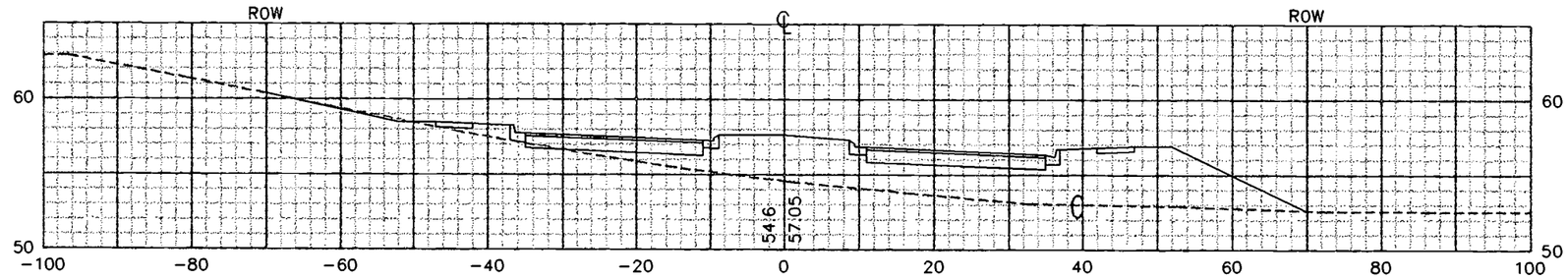
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 170+50 TO STA 172+00

Proj. No: 4617
Draw No: 4617-E332
Sheet No: 15 of 51

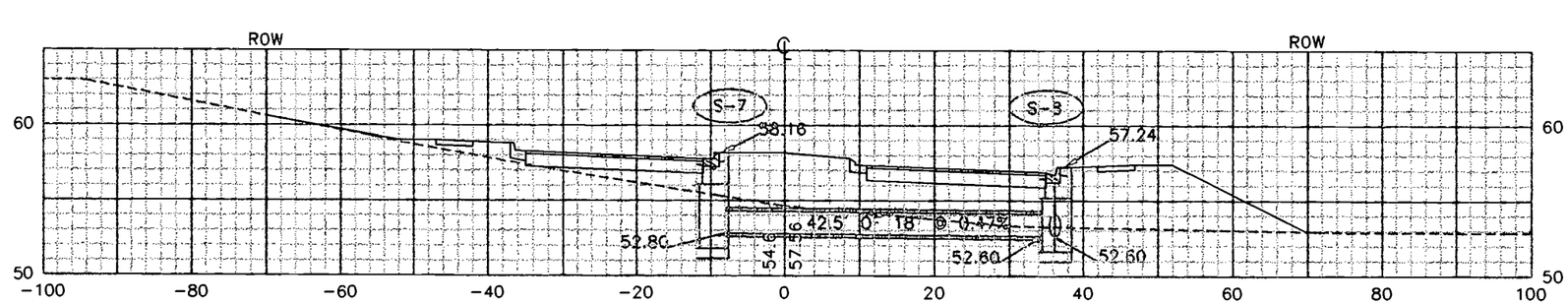
174+00



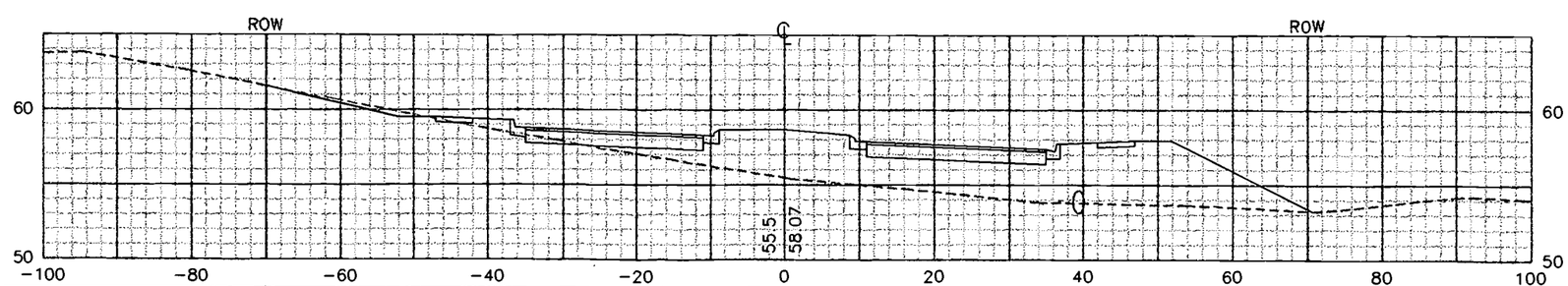
173+50



173+00



172+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

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VOLUSIA COUNTY, FLORIDA

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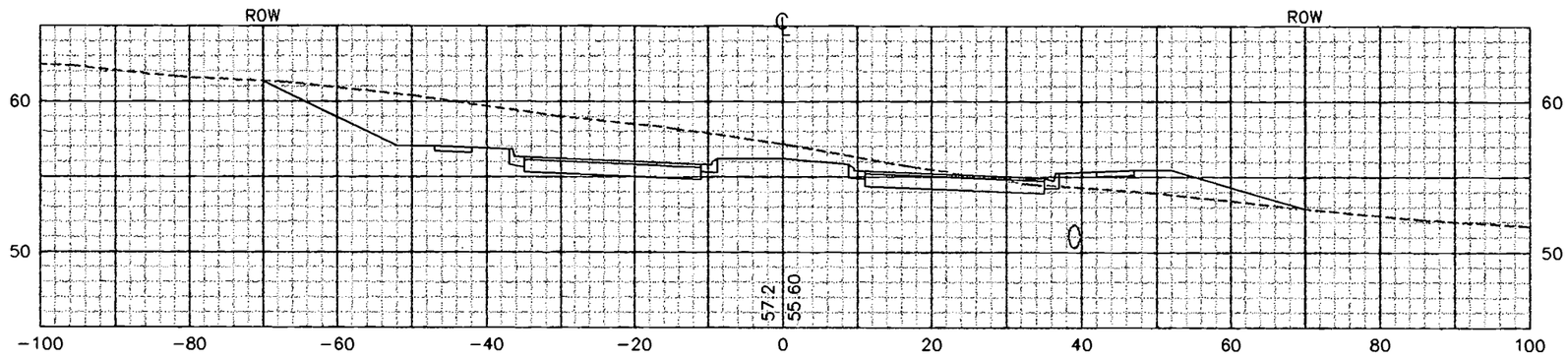
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

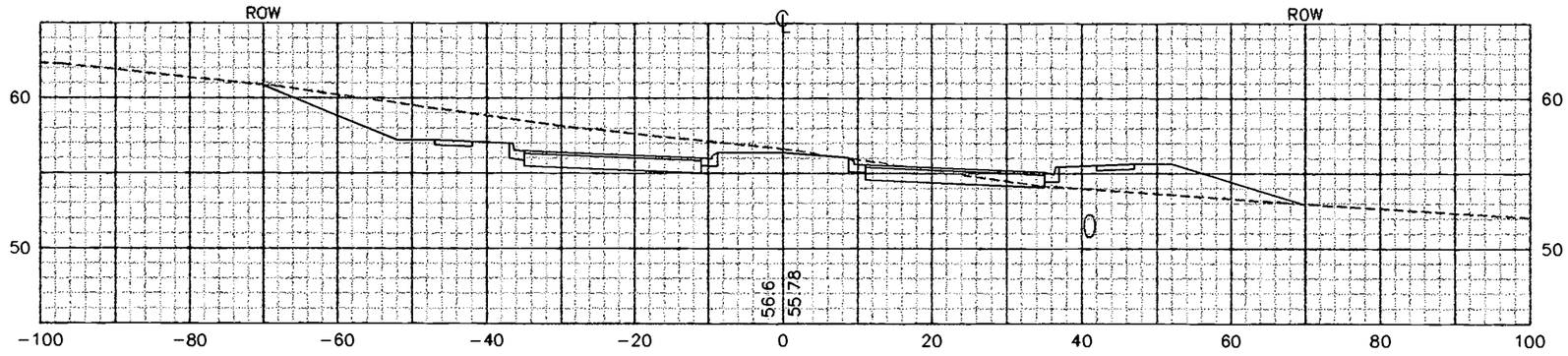
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 172+50 TO STA 174+00

Proj. No: 4617
Draw No: 4617
Sheet No: 16 of 51

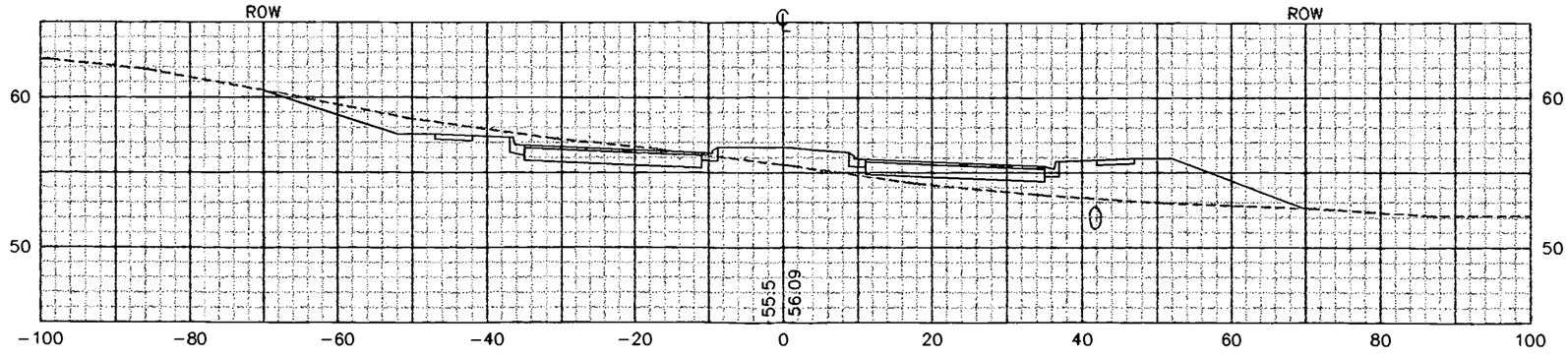
175+50



175+00



174+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

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VOLUSIA COUNTY, FLORIDA

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CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

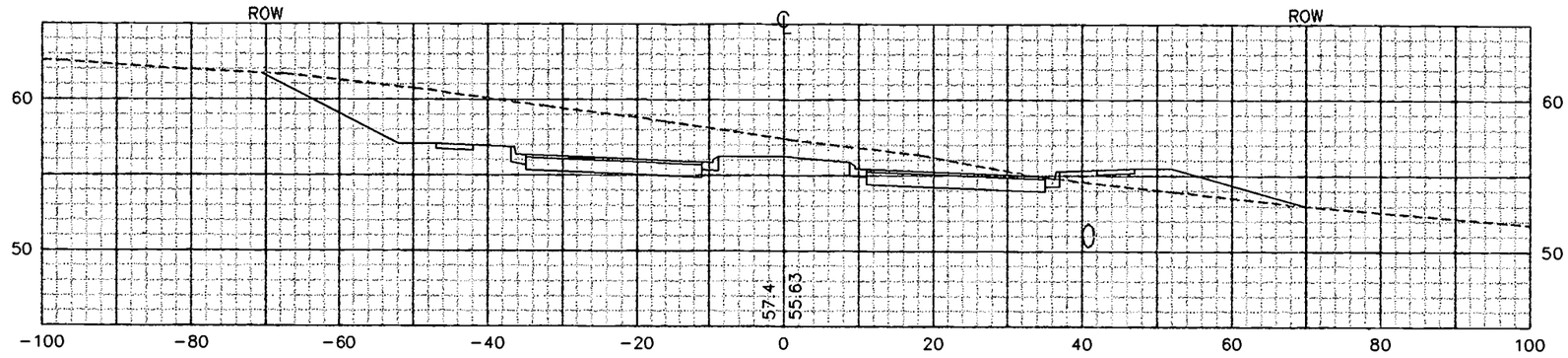
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

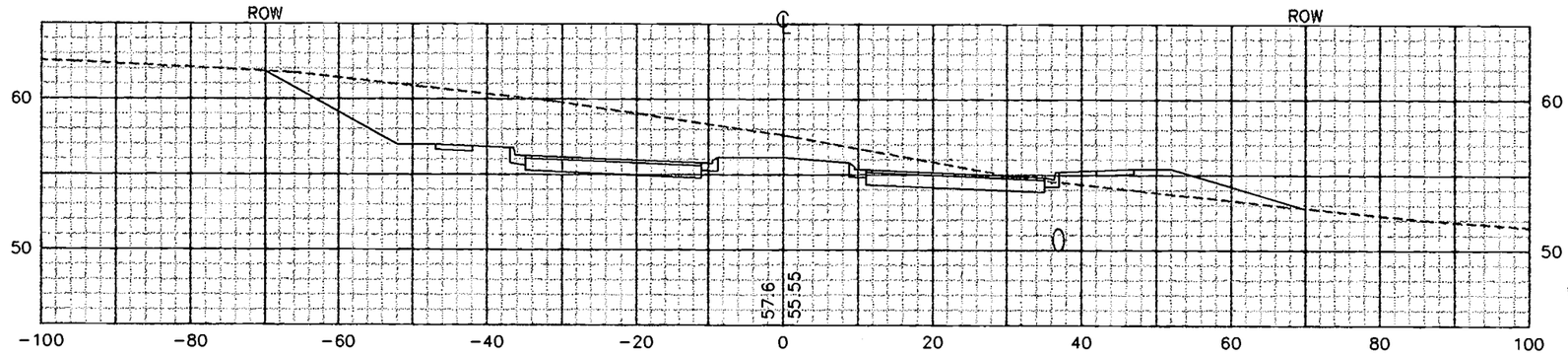
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 174+50 TO STA 175+50

Proj. No: 4617
Draw No: 4617
Sheet No: 17 of 51

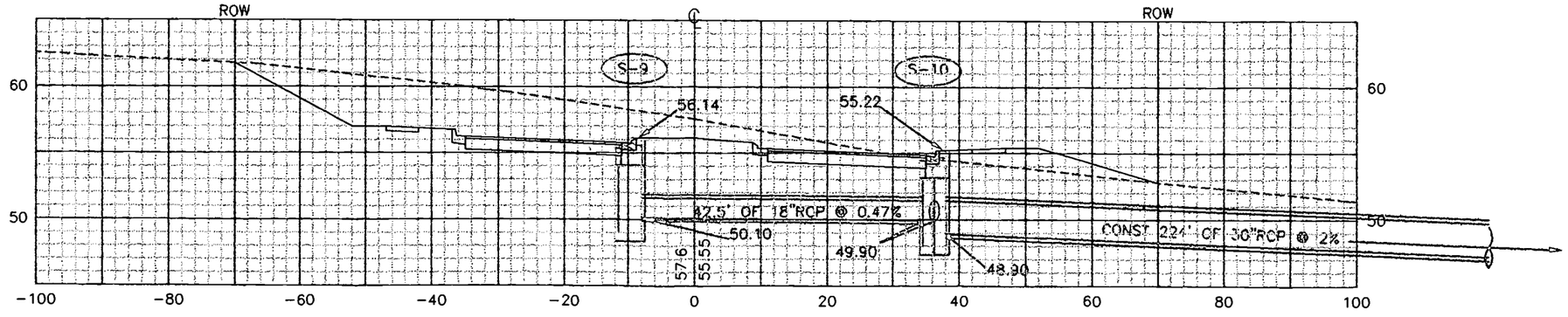
176+50



176+00



175+93.18



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

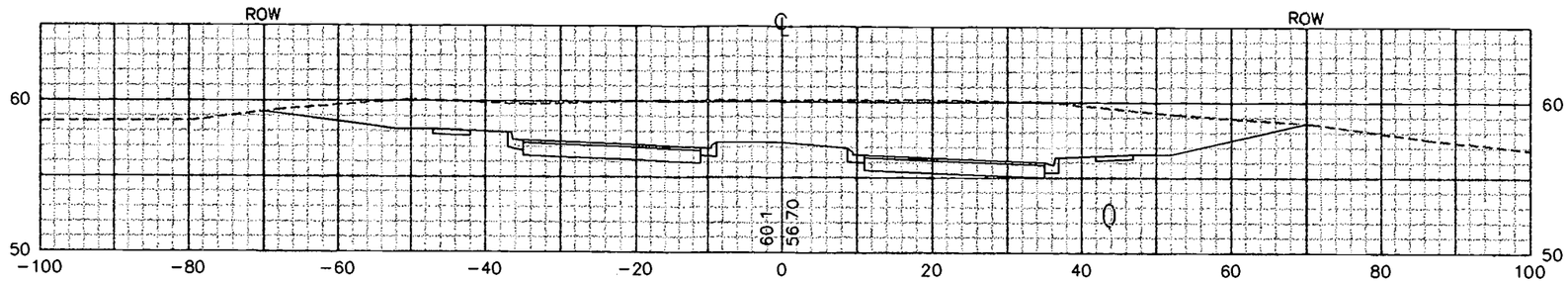
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	SCALE:
CHECKED			CHECKED			HORIZ 1"=10'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	VERT 1"=5'

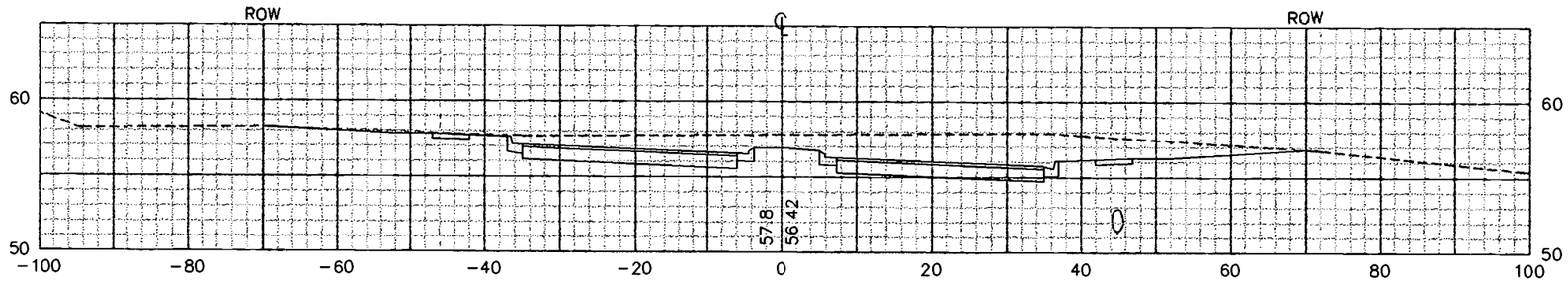
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 175+93.18 TO STA 176+50

Proj. No: 4617
Draw No: [illegible]35
Sheet No: 18 of 51

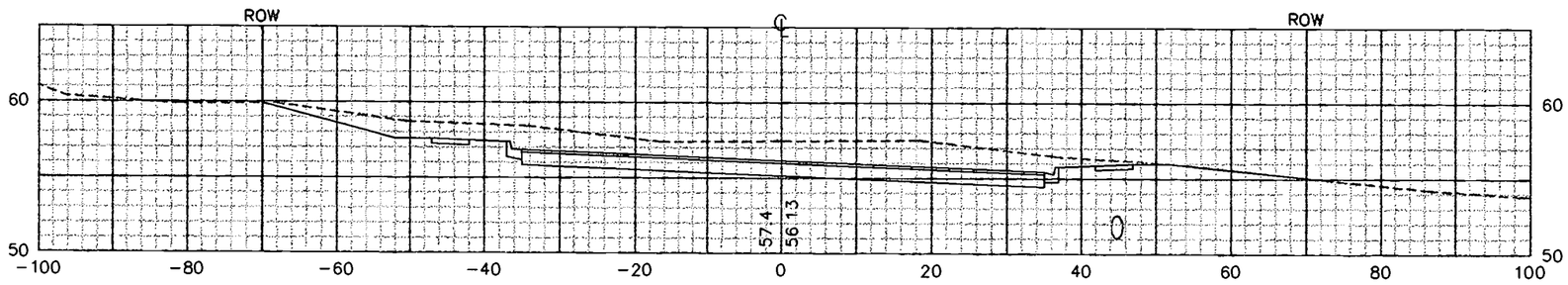
178+50



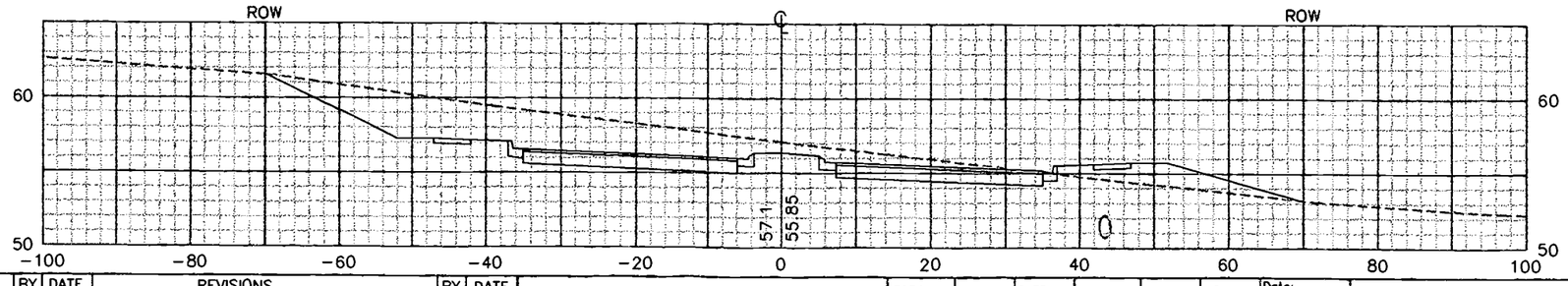
178+00



177+50



177+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

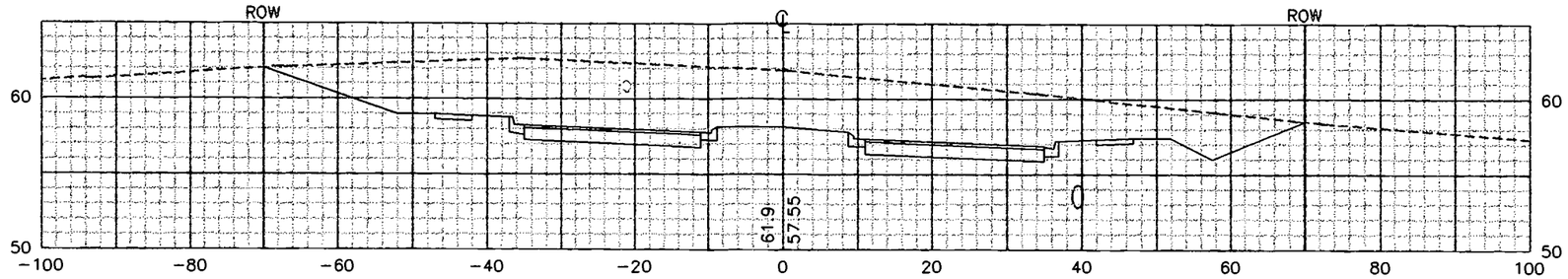
Date: 8/2001

SCALE: HORIZ 1"=10' VERT 1"=5'

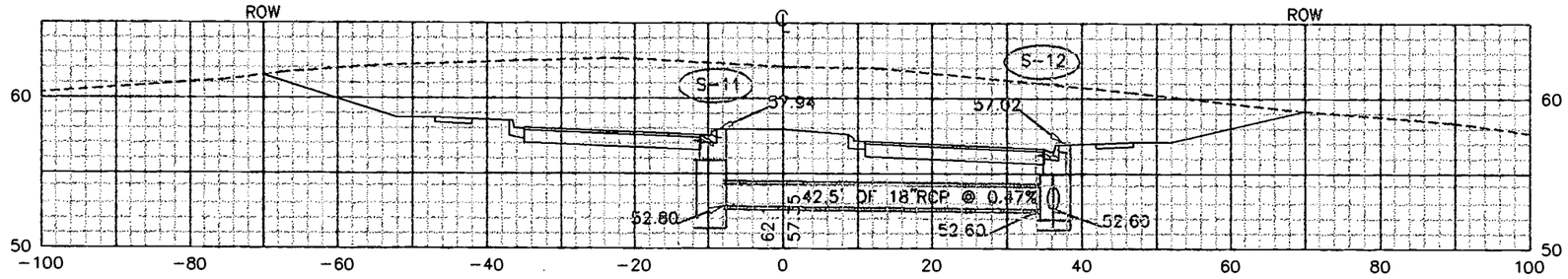
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 177+00 TO STA 178+50

Proj. No: 4617
Draw No: 4617 E336
Sheet No: 19 OF 51

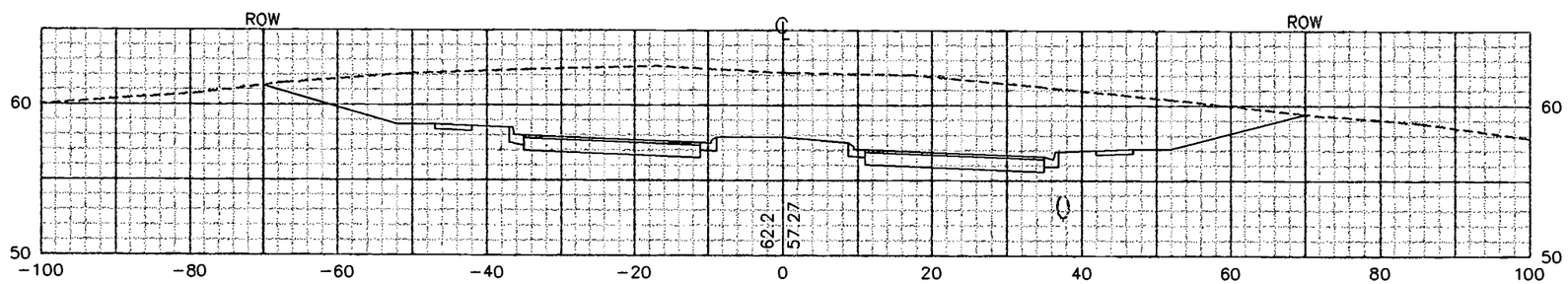
180+00



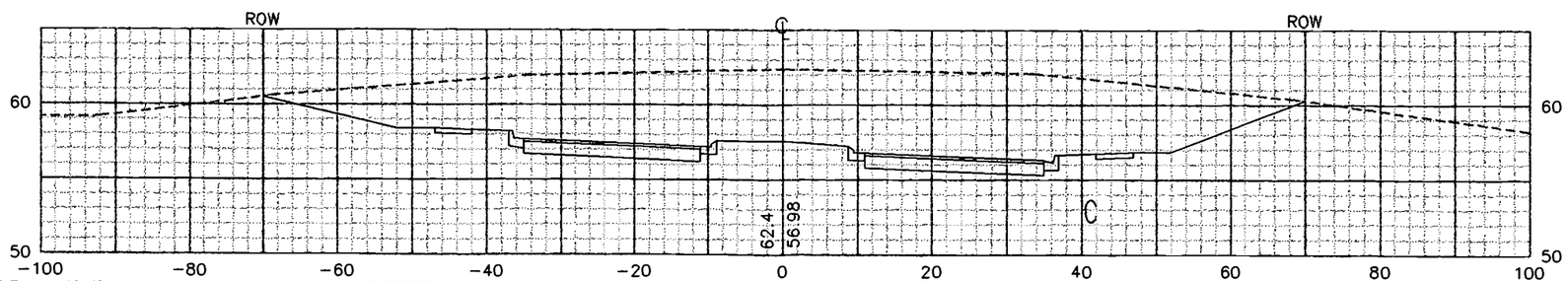
179+64



179+50



179+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

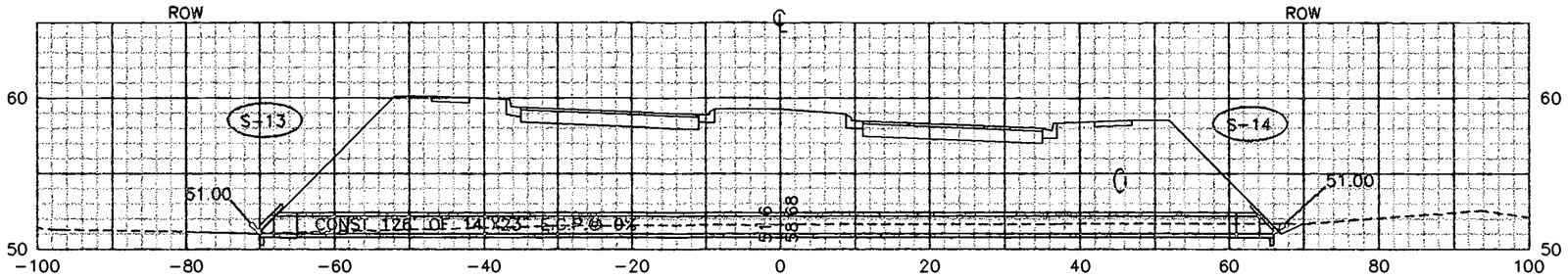
Date: 8/2001

SCALE: HORIZ 1"=10' VERT 1"=5'

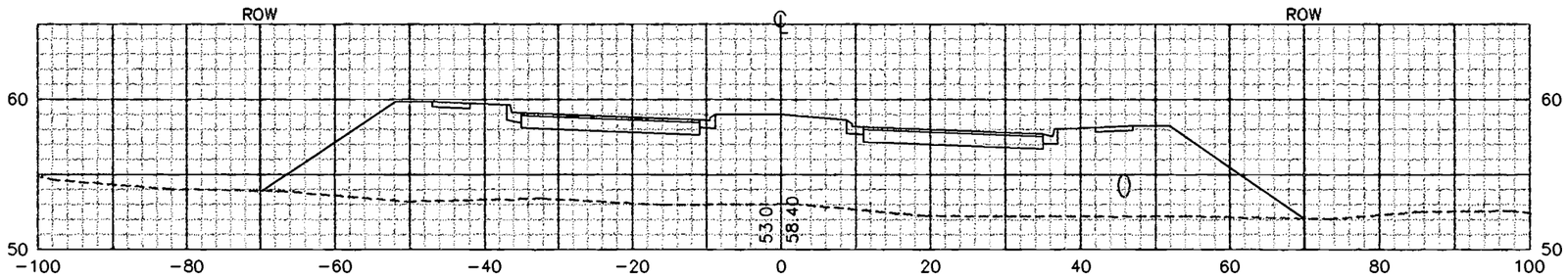
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 179+00 TO STA 180+00

Proj. No: 4617
Draw No: ~~4617~~ E337
Sheet No: 20 of 51

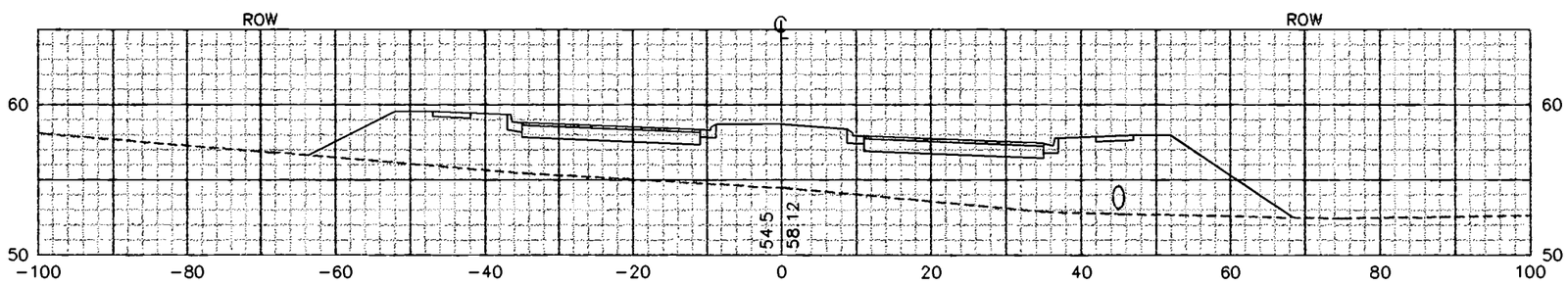
182+00



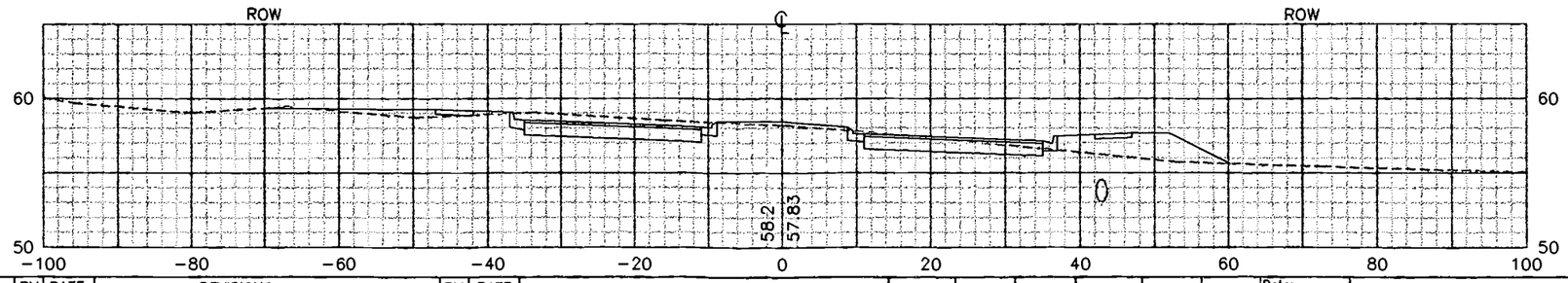
181+50



181+00



180+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

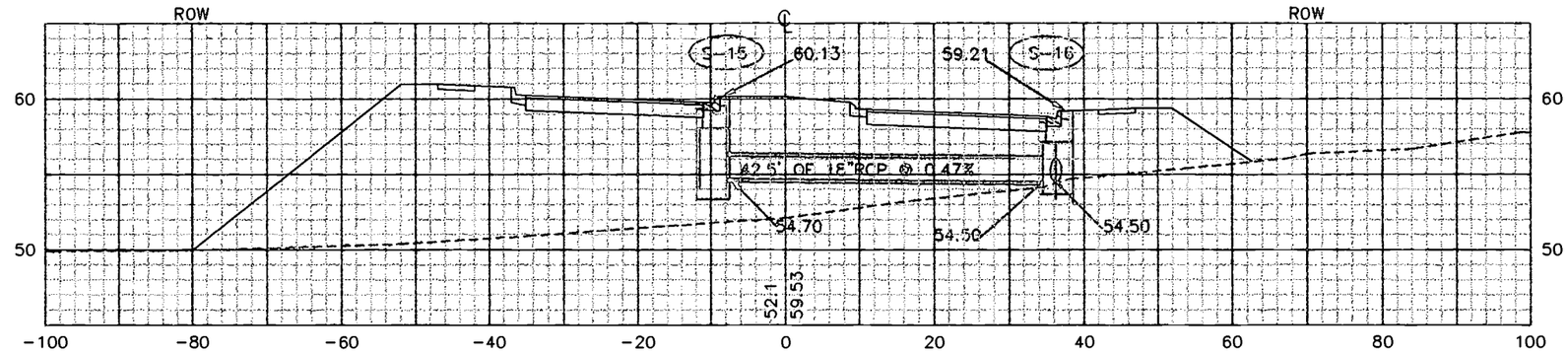
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

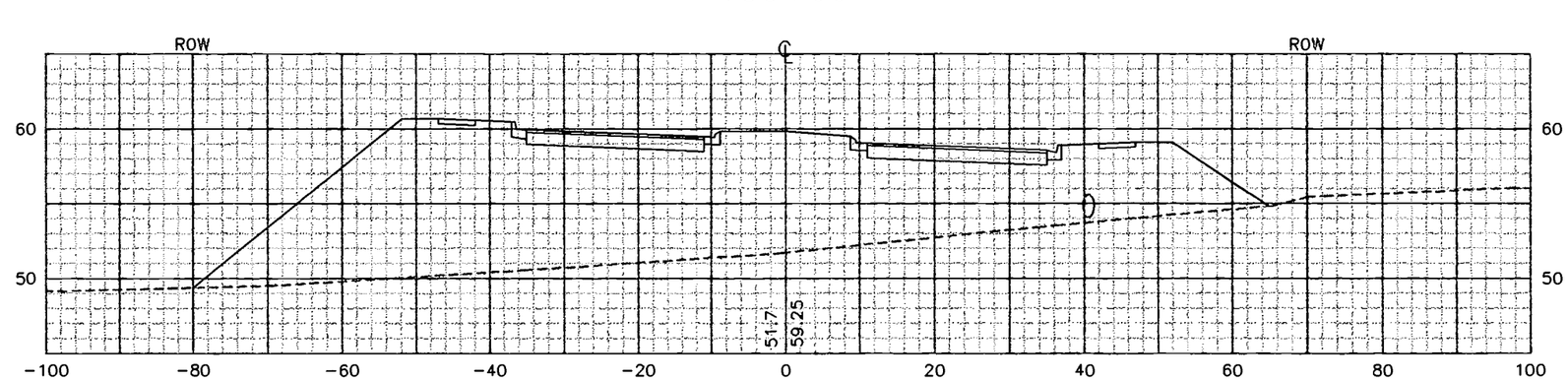
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 180+50 TO STA 182+00

Proj. No: 4617
Draw No: E938
Sheet No: 21 of 51

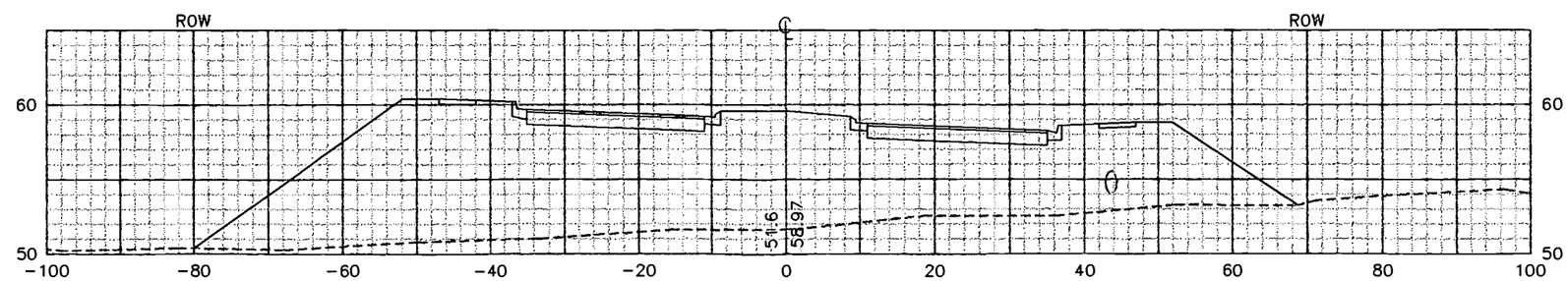
183+50



183+00



182+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

Date: 8/2001
SCALE: HORIZ 1"=10' VERT 1"=5'

VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 182+50 TO STA 183+50

Proj. No: 4617
Draw No: ~~4617~~ E339
Sheet No: 22 of 51

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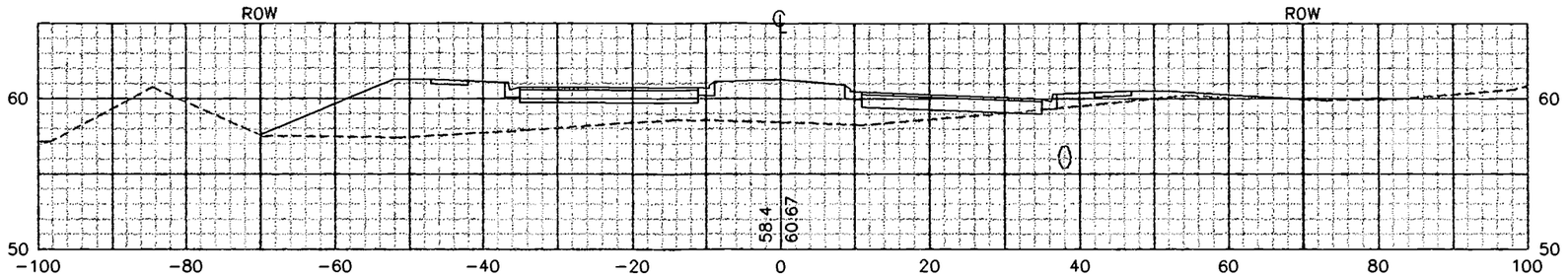
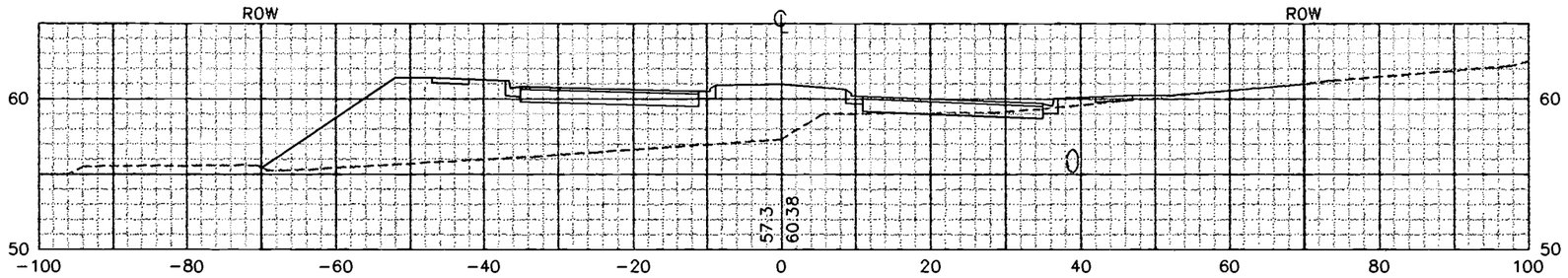
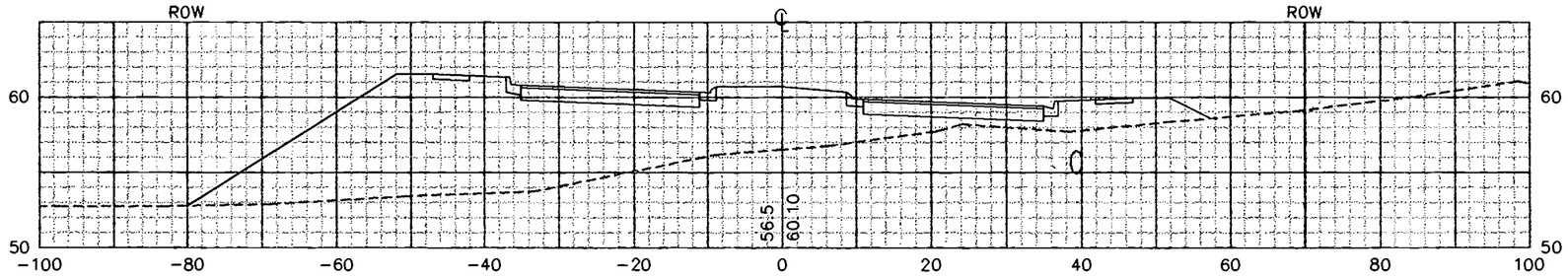
185+50



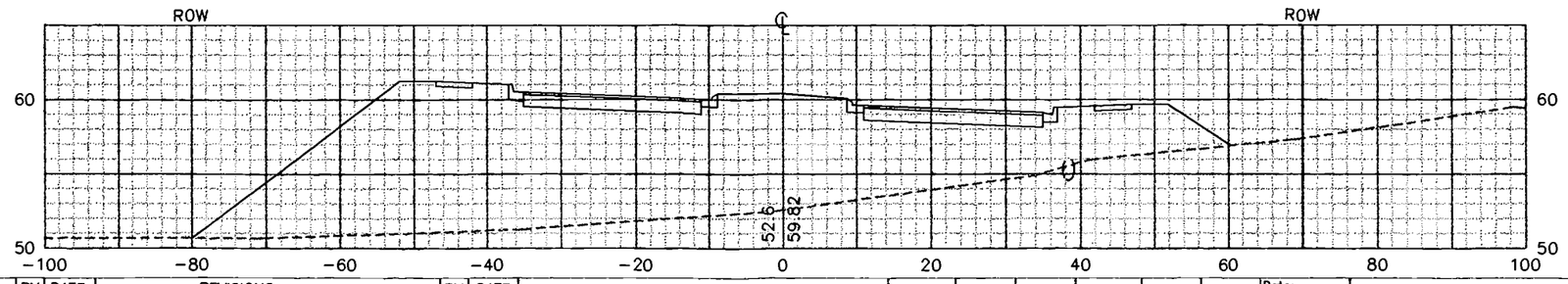
185+00



184+50



184+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 184+00 TO STA 185+50

Proj. No: 4617
Draw No: 4617
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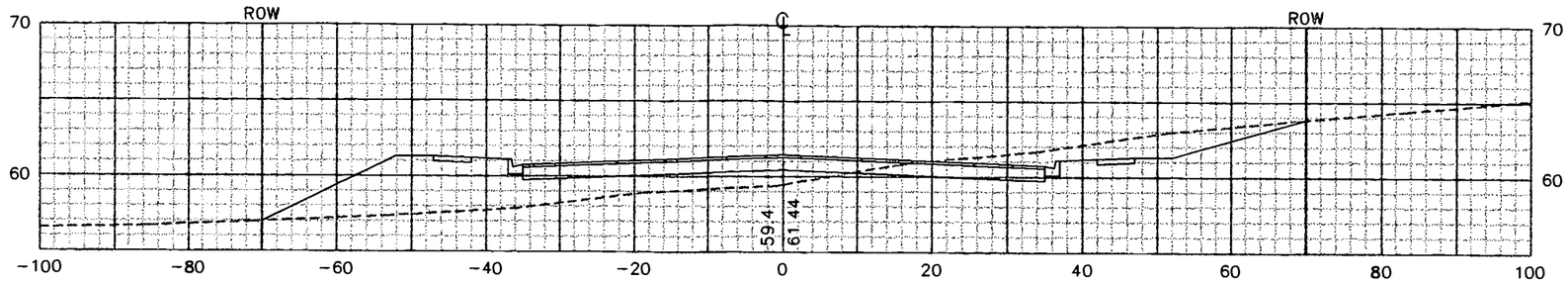
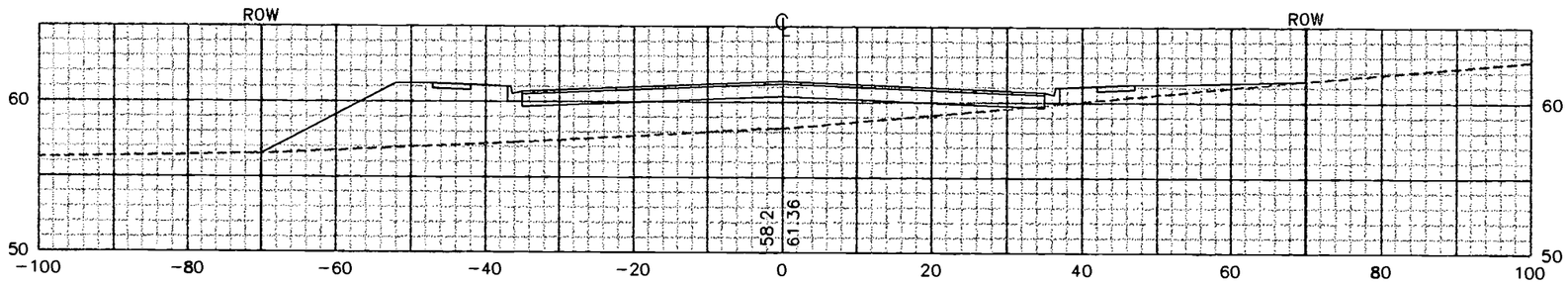
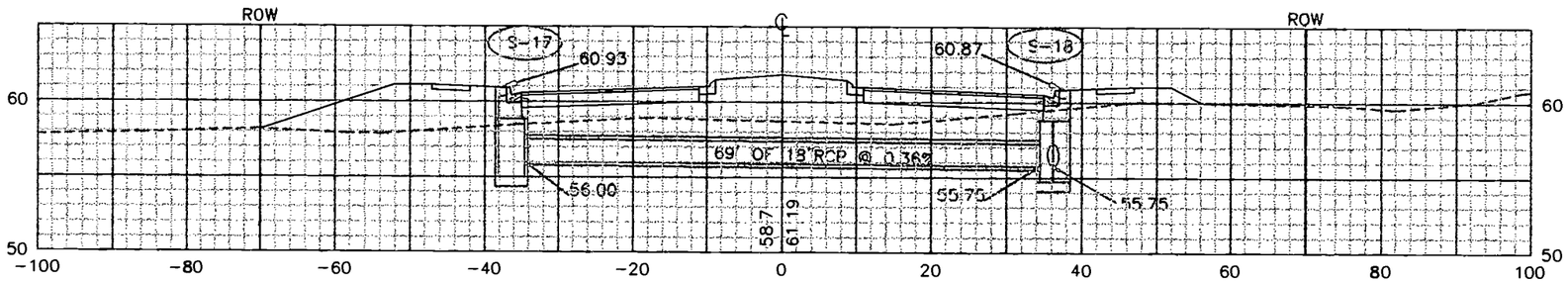
187+50



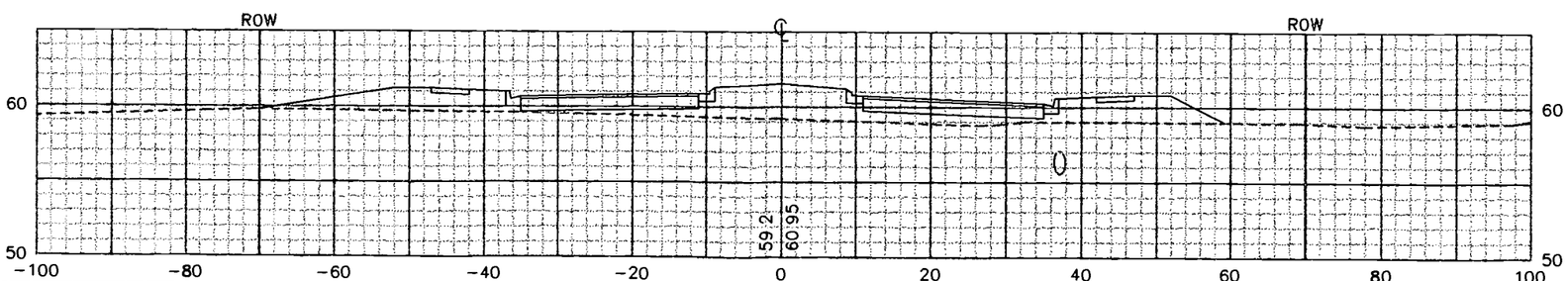
187+00



186+50



186+00



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REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

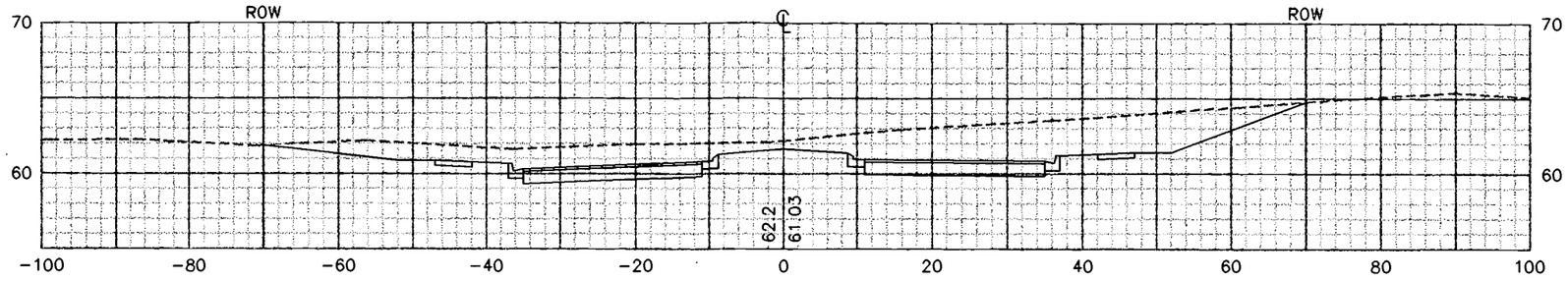
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE:
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	HORIZ 1"=10' VERT 1"=5'

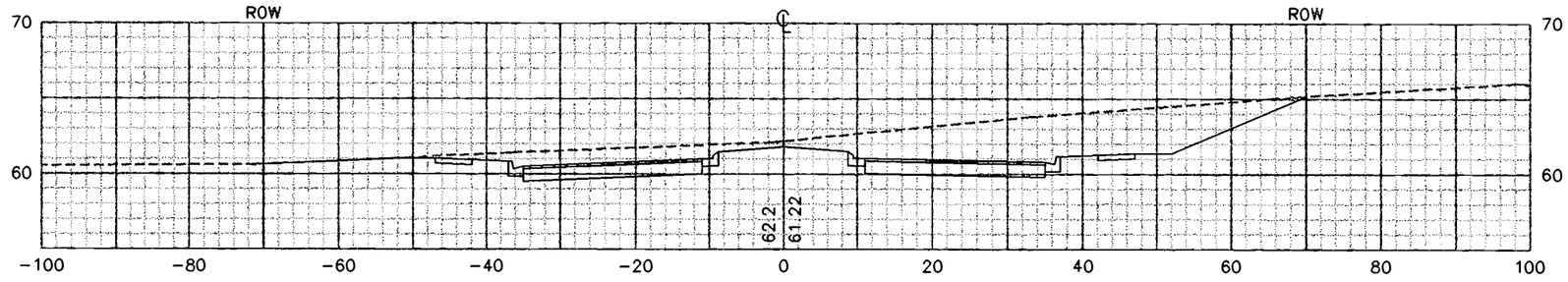
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 186+00 TO STA 187+50

Proj. No: 4617
Draw No: 4617
Sheet No: 24 of 51

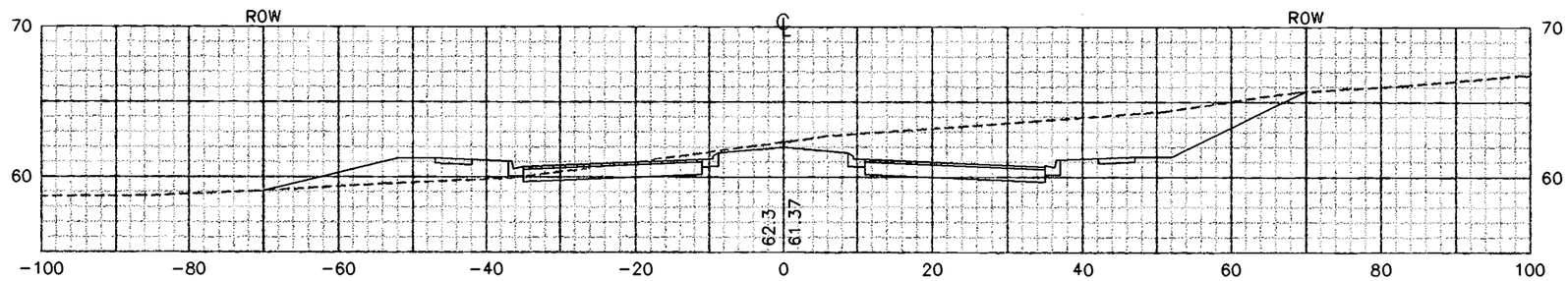
189+50



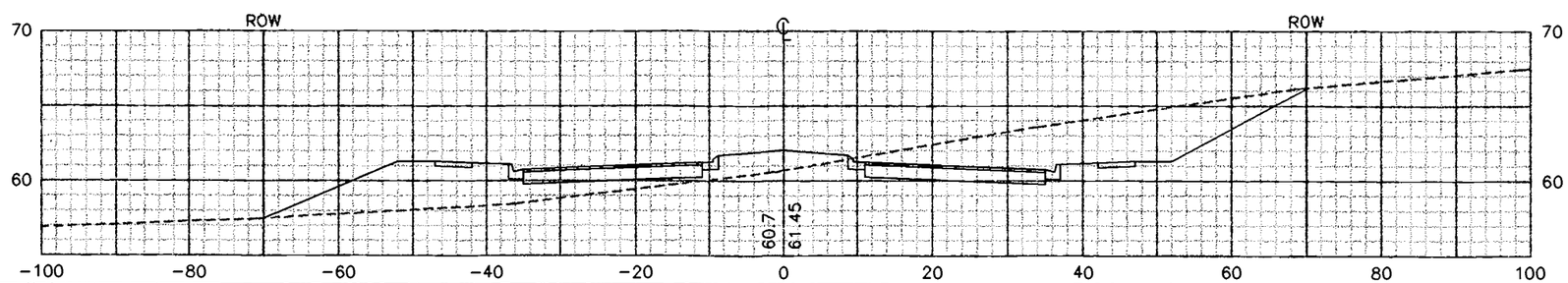
189+00



188+50



188+00



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REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

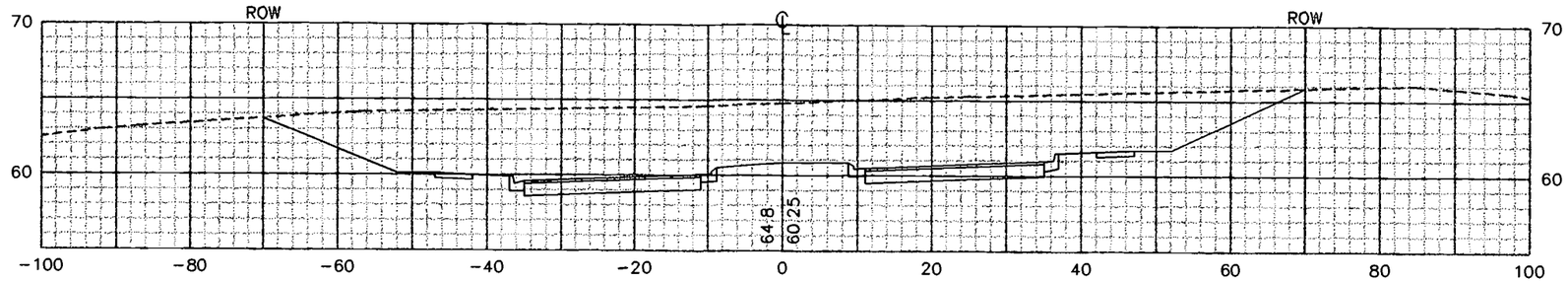
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

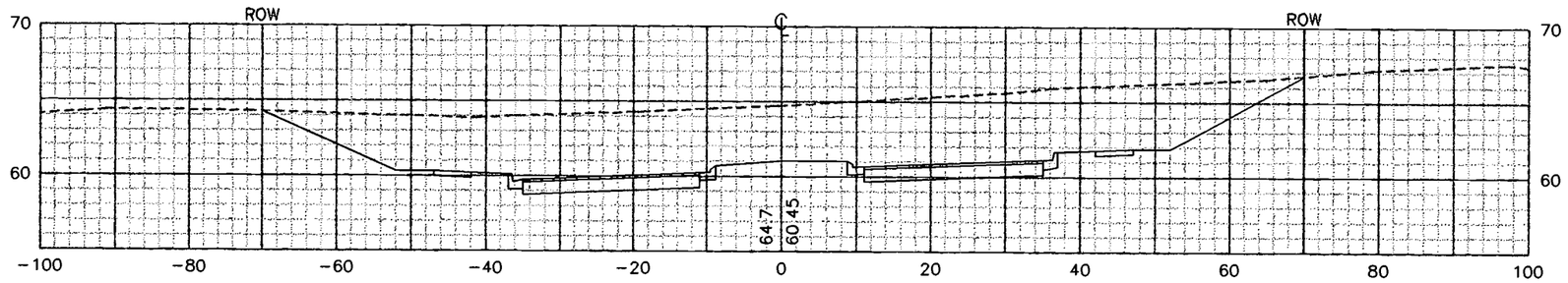
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 188+00 TO STA 189+50

Proj. No: 4617
Draw No: 4617
Sheet No: 25 of 51
E342

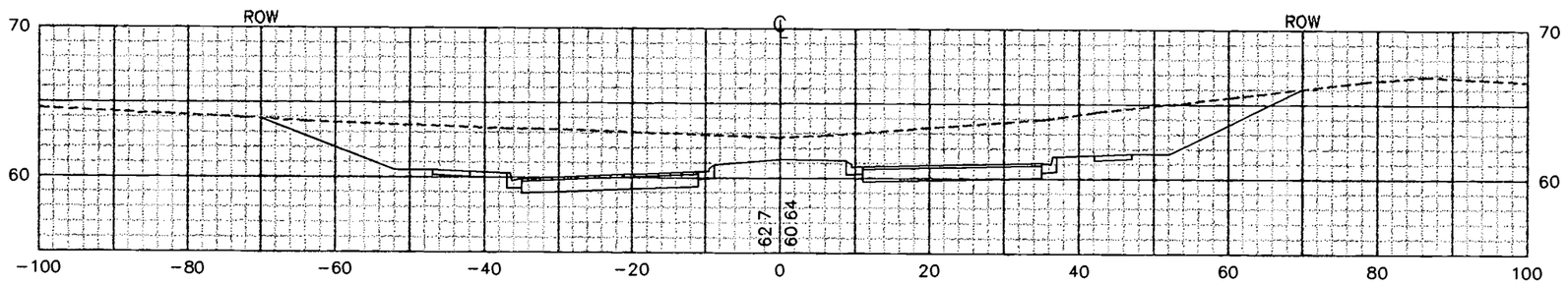
191+50



191+00



190+50



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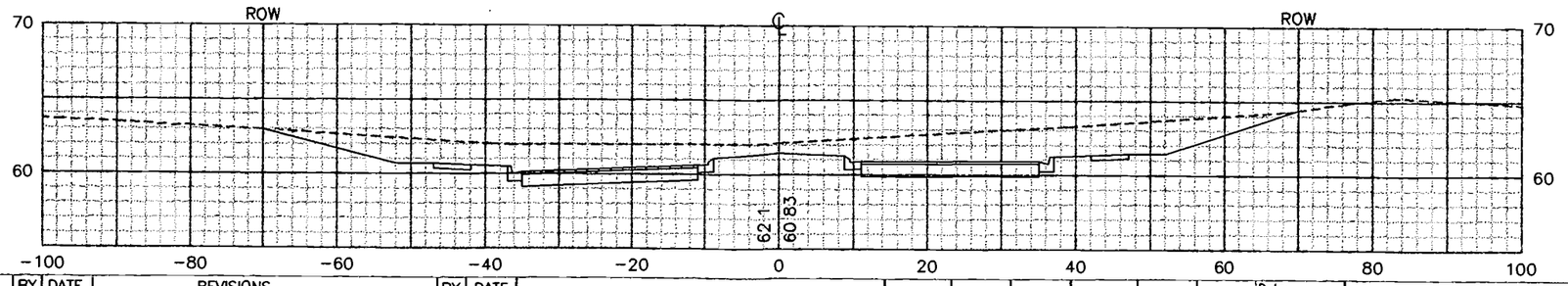

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REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

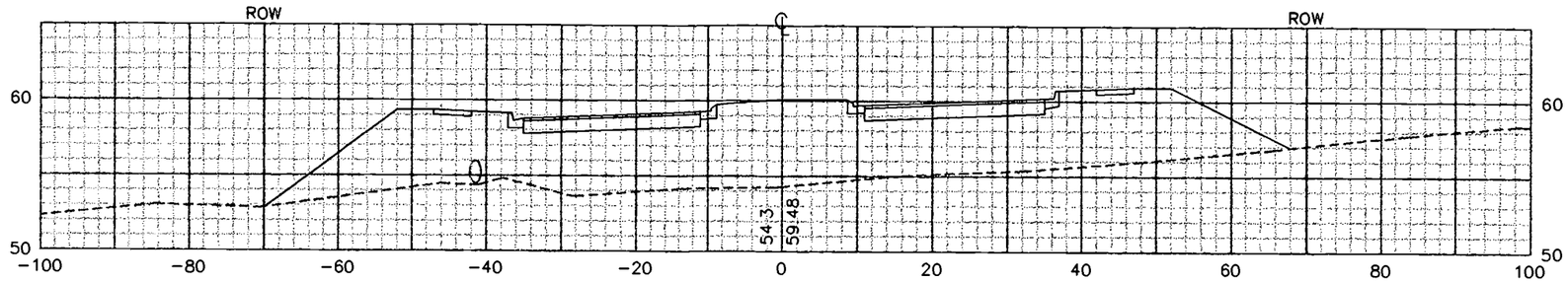
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	SCALE: HORIZ 1"=10'
CHECKED			CHECKED			VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

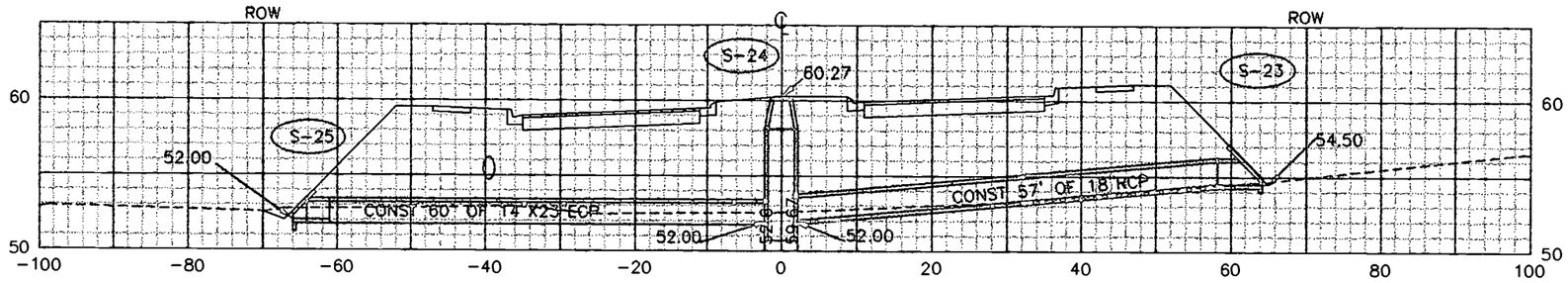
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 190+00 TO STA 191+50

Proj. No: 4617
Draw No: 4617
Sheet No: 26 of 51

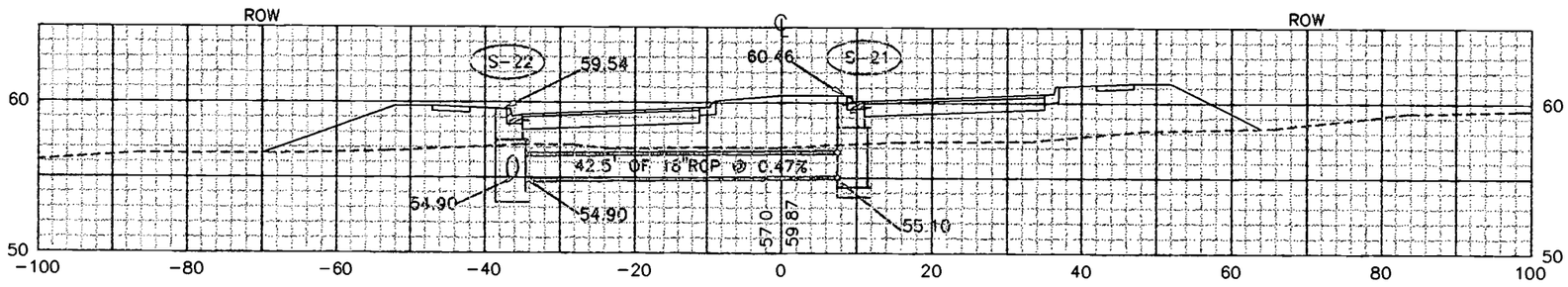
193+50



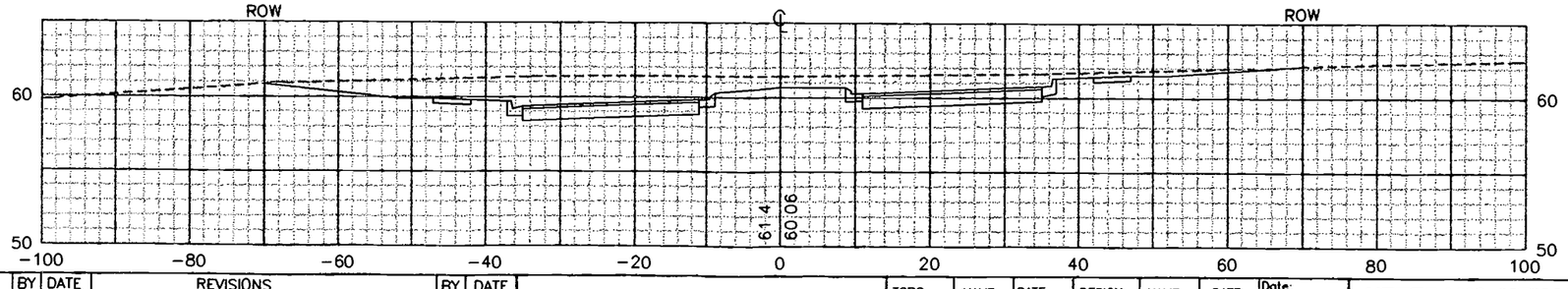
193+00



192+50



192+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

Date: 8/2001

SCALE: HORIZ 1"=10' VERT 1"=5'

VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 192+00 TO STA 193+50

Proj. No: 4617
Drow No: 4617
Sheet No: 27 of 51

E344

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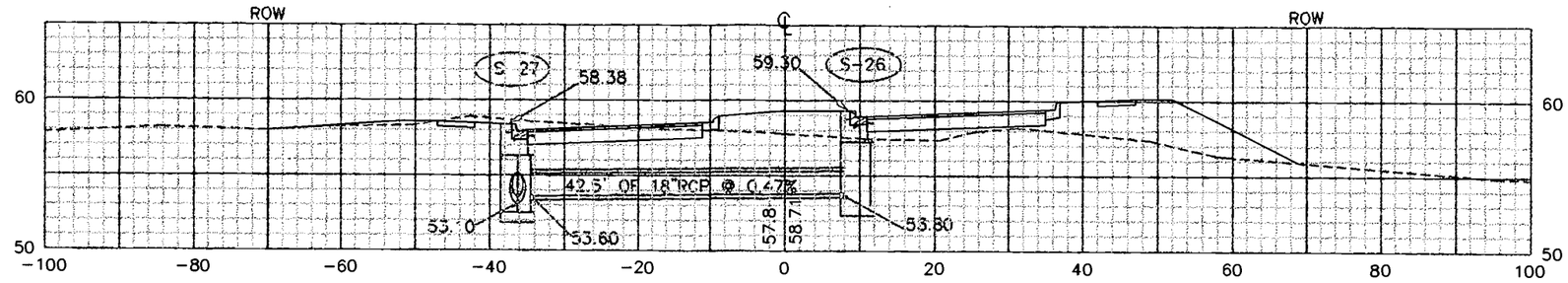
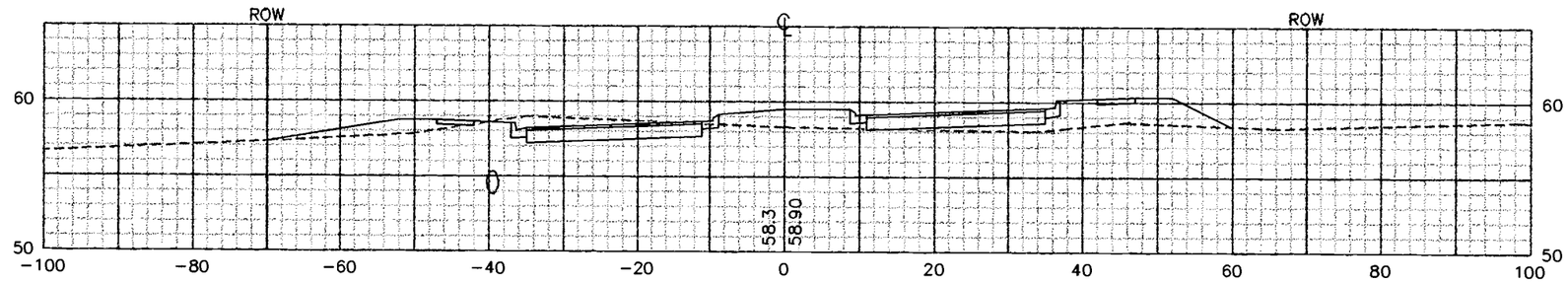
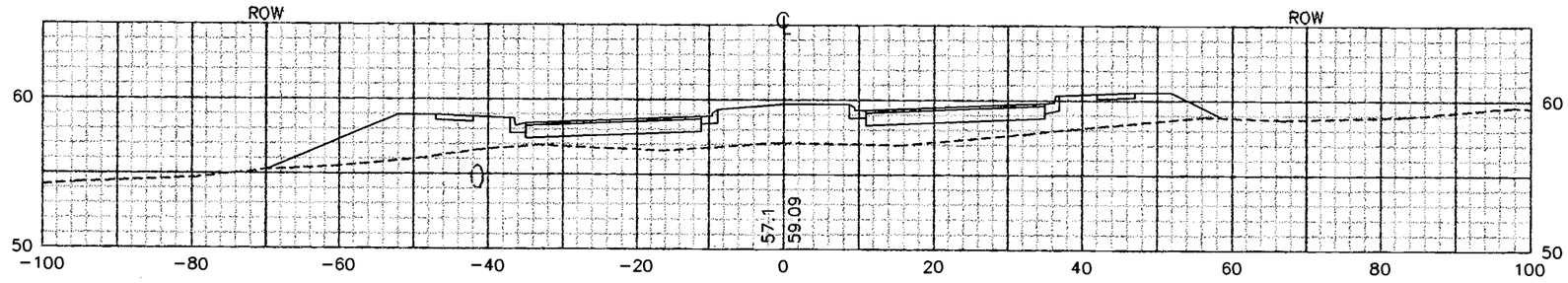
195+50



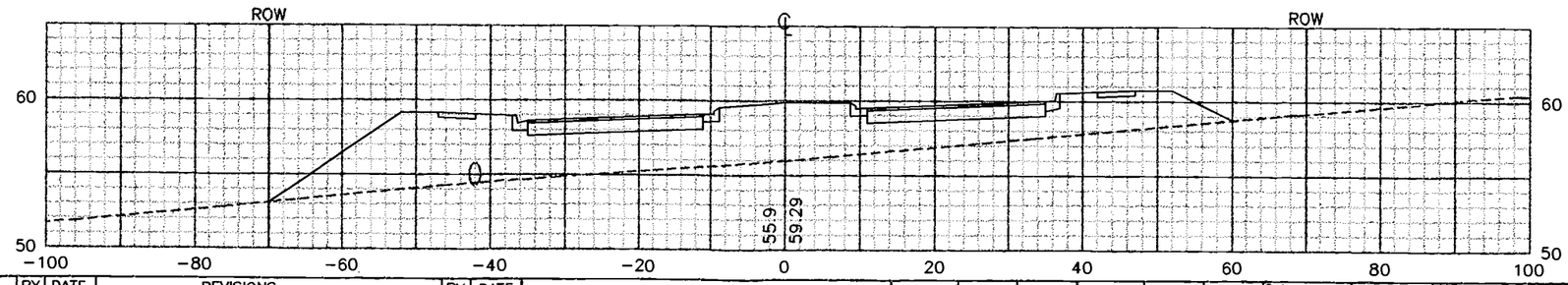
195+00



194+50



194+00



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REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE _____

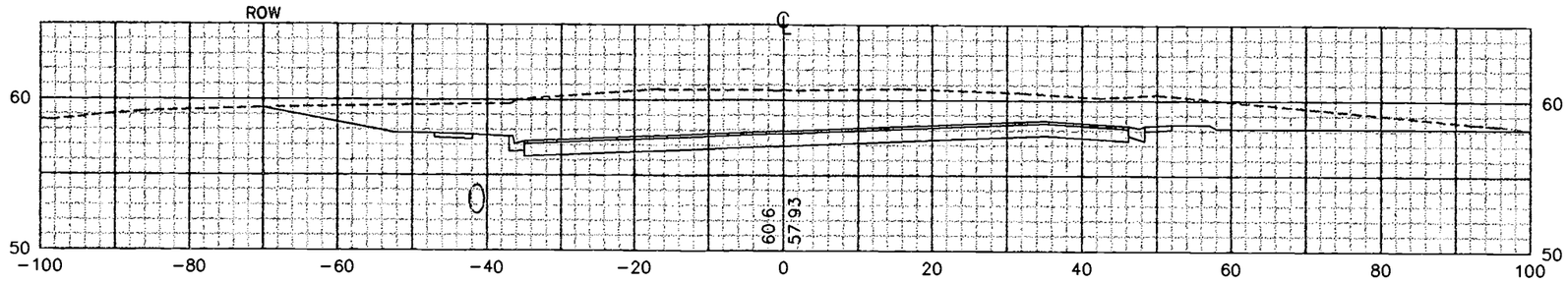
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

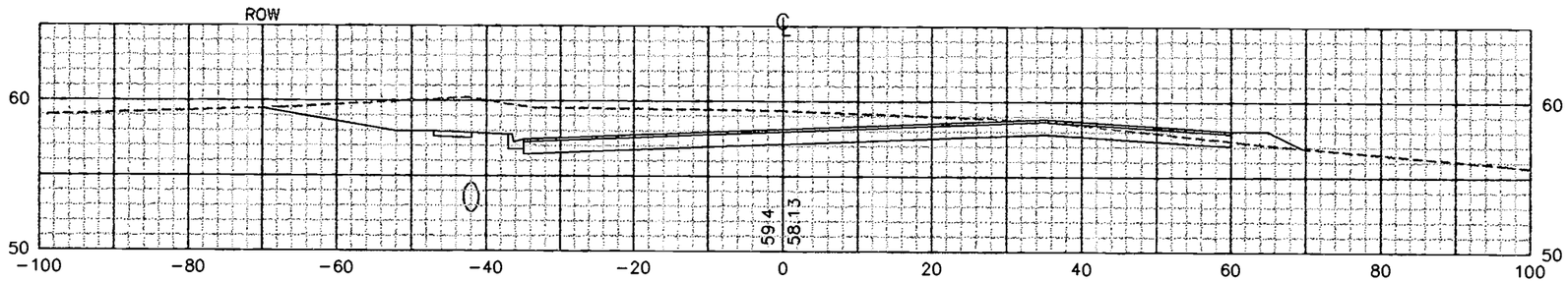
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 194+00 TO STA 195+50

Proj. No: 4617
Draw No: ~~4617~~ E345
Sheet No: 28 of 51

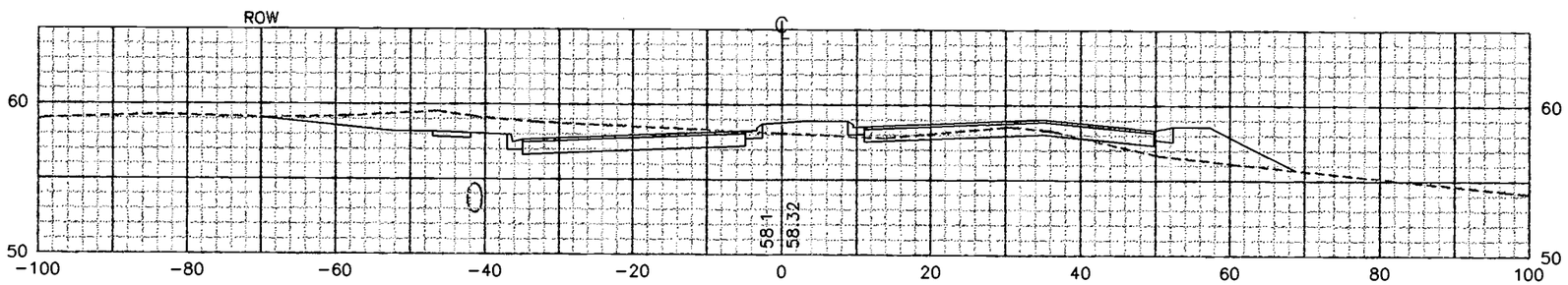
197+50



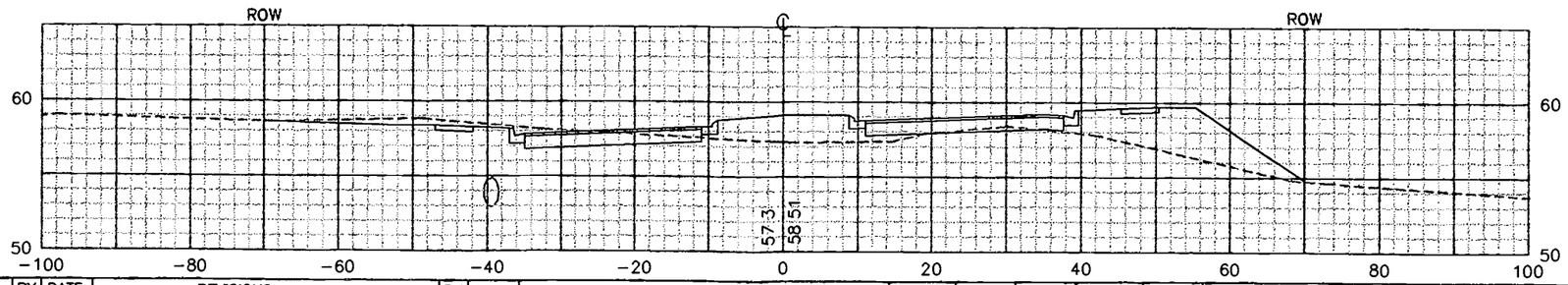
197+00



196+50



196+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

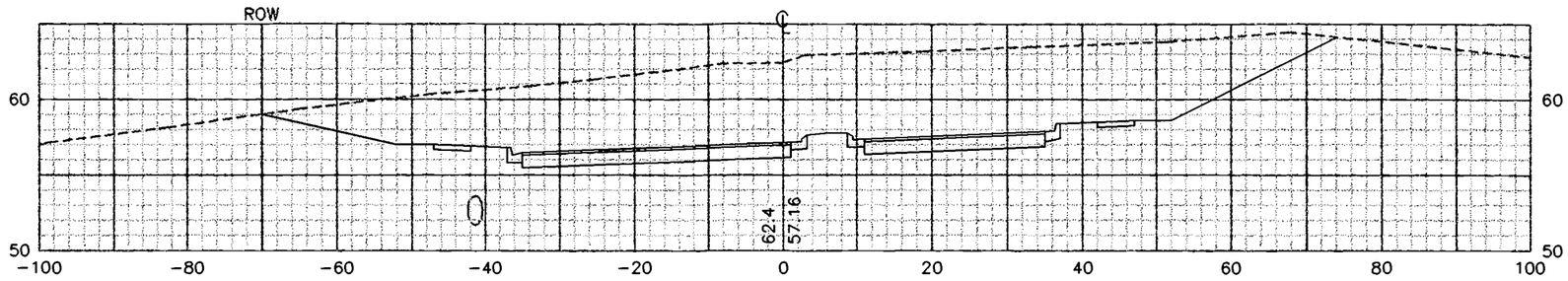
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	SCALE:
CHECKED			CHECKED			HORIZ 1"=10'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	VERT 1"=5'

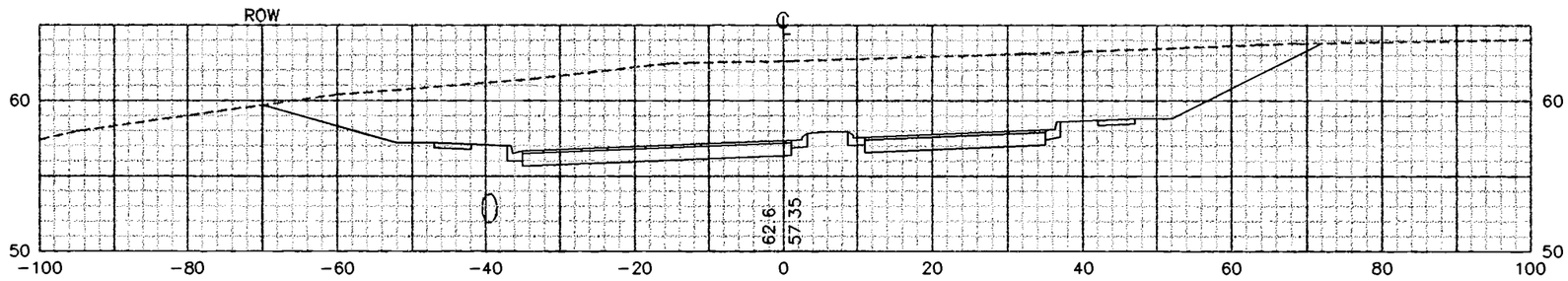
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 196+00 TO STA 197+50

Proj. No:	4617
Draw No:	E1476
Sheet No:	29 of 51

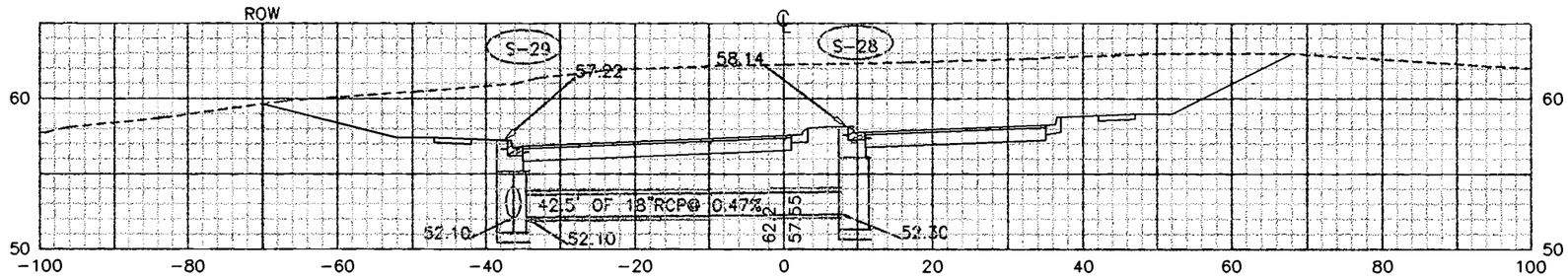
199+50



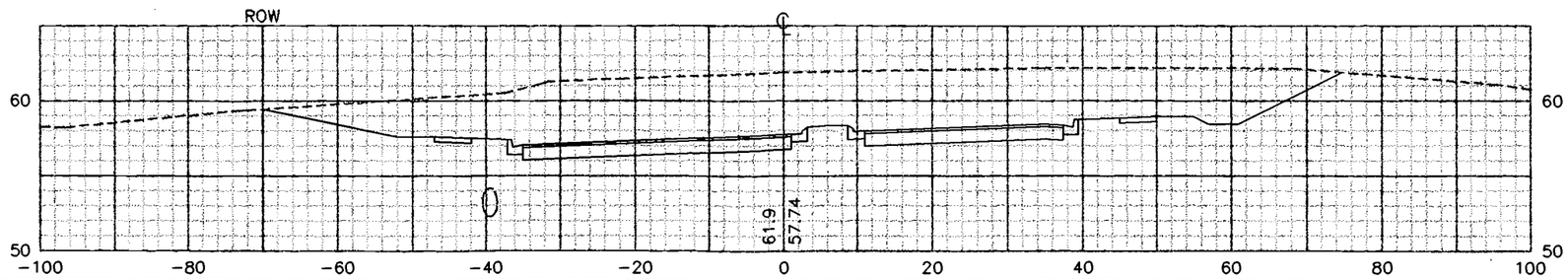
199+00



198+50



198+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

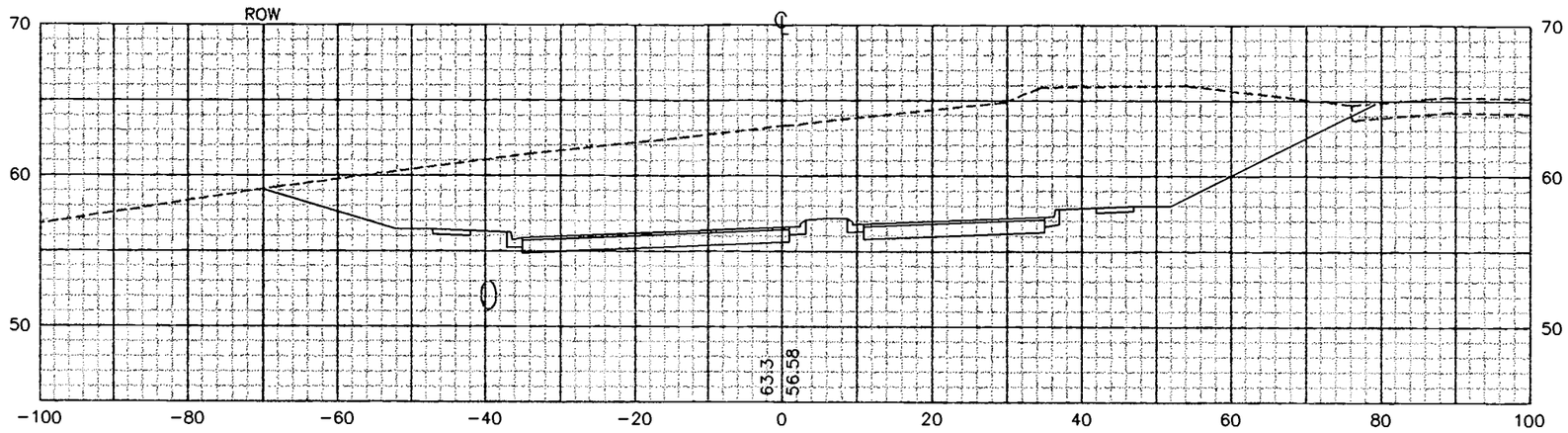
Date: 8/2001

SCALE:
HORIZ 1"=10'
VERT 1"=5'

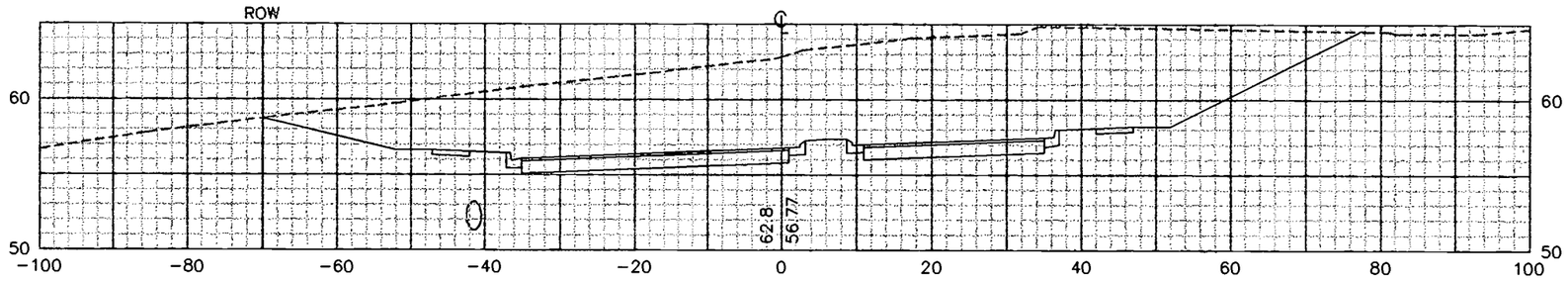
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 198+00 TO STA 199+50

Proj. No: 4617
Draw No: 4617
Sheet No: 30 OF 51

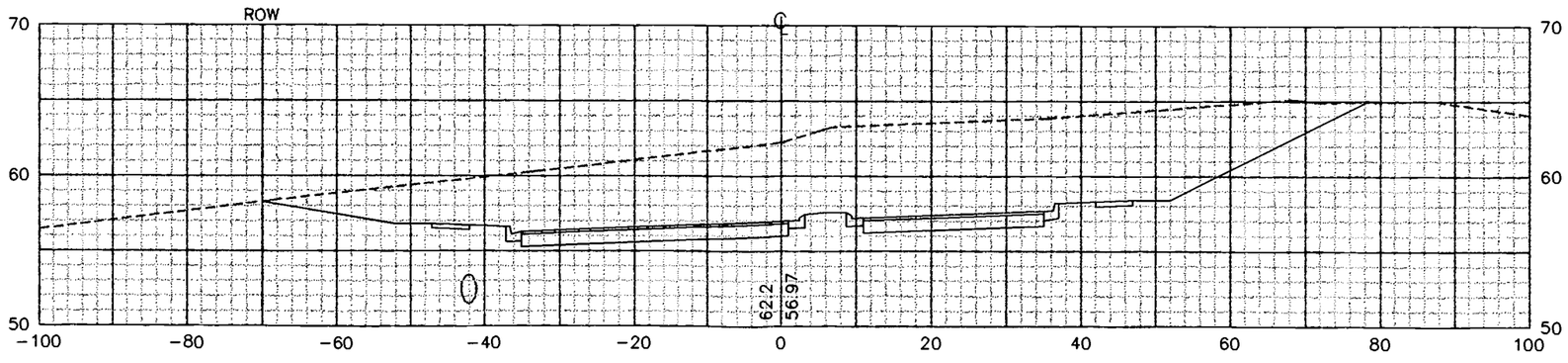
201+00



200+50



200+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE _____
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

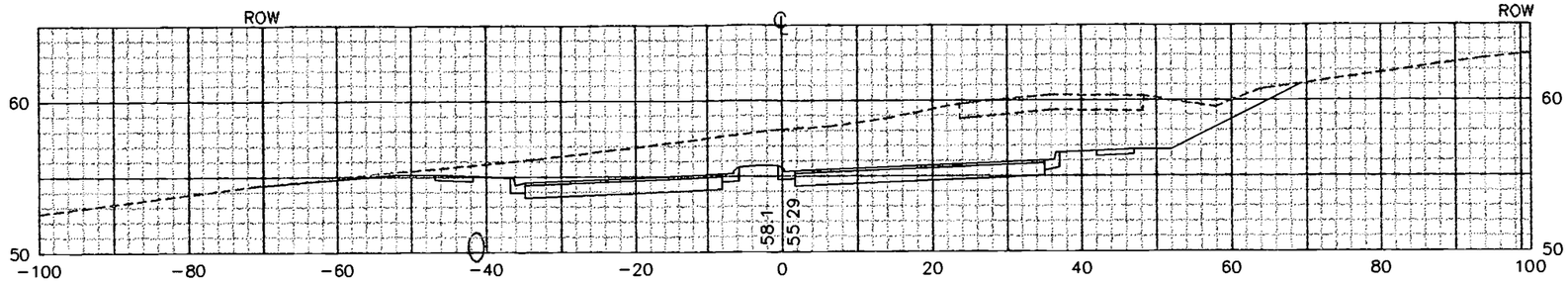
TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

Date: 8/2001
SCALE: HORIZ 1"=10' VERT 1"=5'

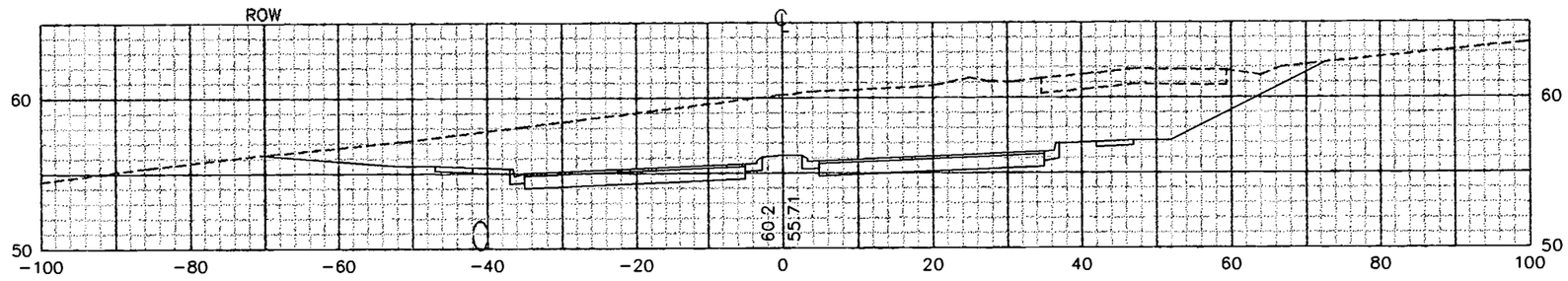
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 200+00 TO STA 201+00

Proj. No: 4617
Draw No: 4617
Sheet No: 31 of 51

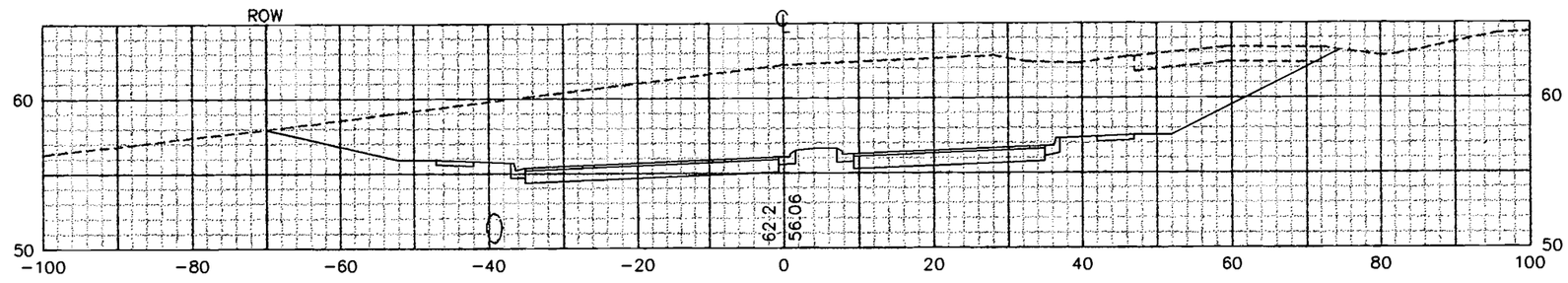
203+00



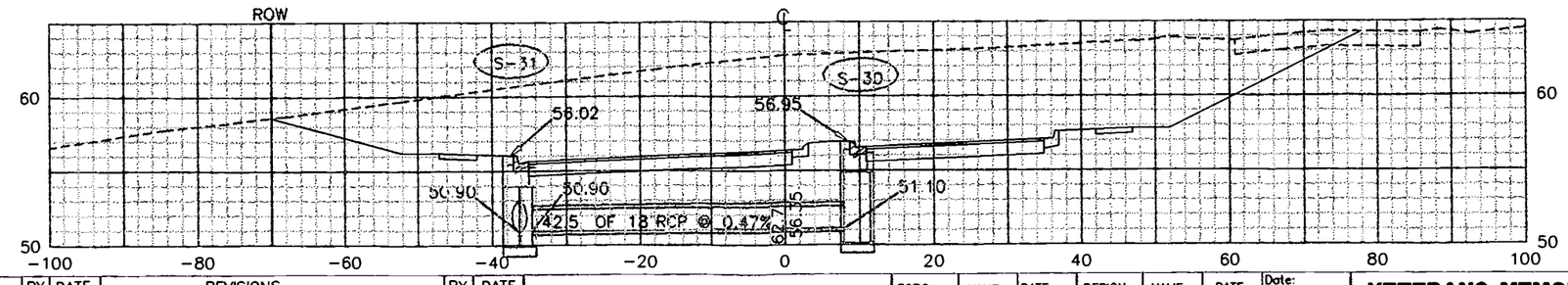
202+50



202+00



201+50



A-26-02

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

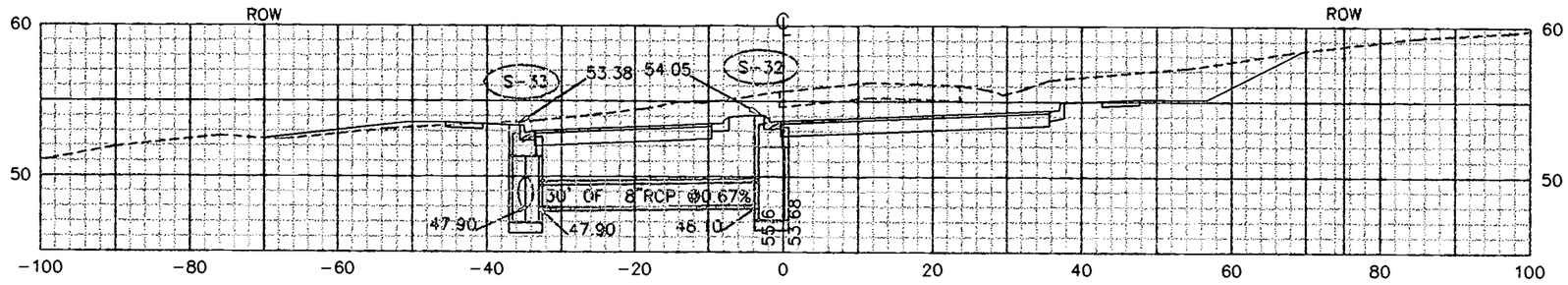
Date: 8/2001

SCALE: HORIZ 1"=10' VERT 1"=5'

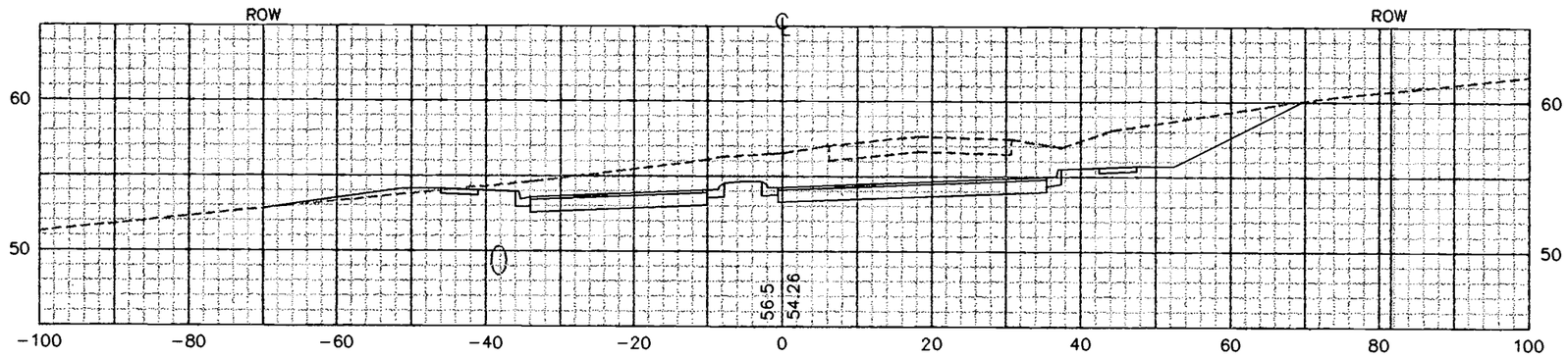
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 201+50 TO STA 203+00

Proj. No: 4617
Draw No: [illegible]349
Sheet No: 32 of 51

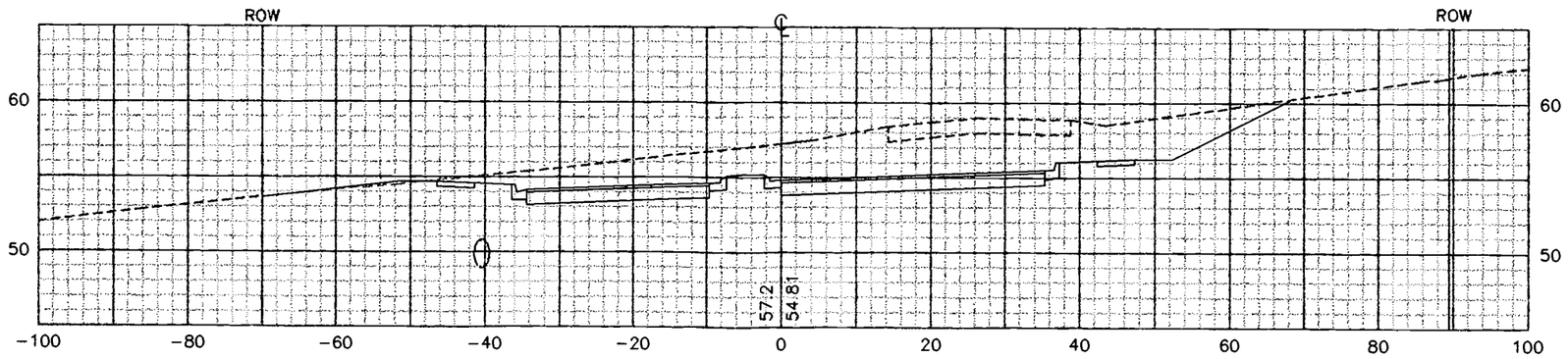
204+50



204+00



203+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

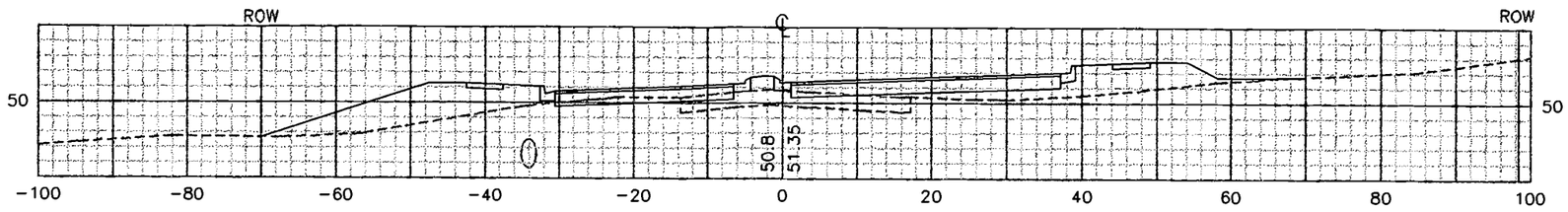
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

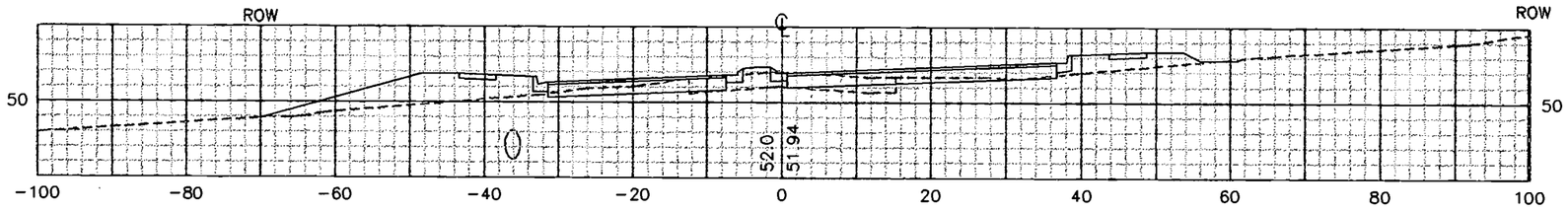
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 203+50 TO STA 204+50

Proj. No: 4617
Draw No: E050
Sheet No: 33 of 51

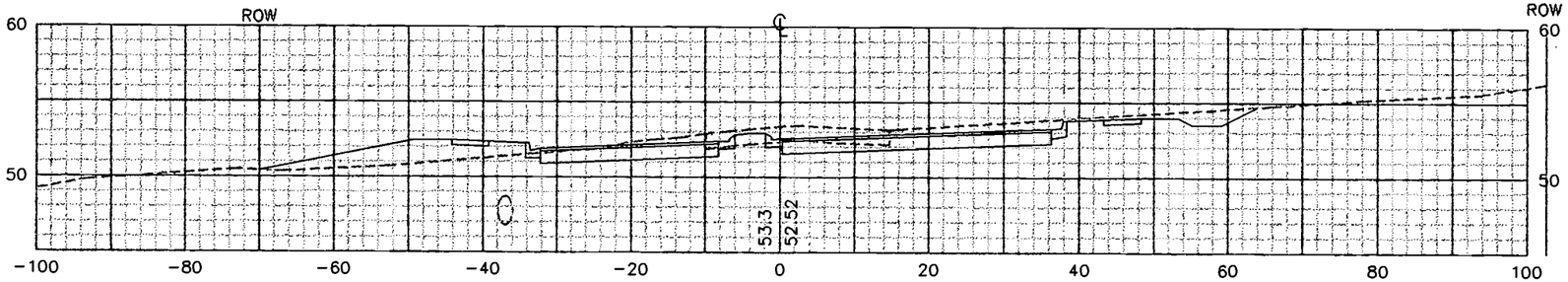
206+50



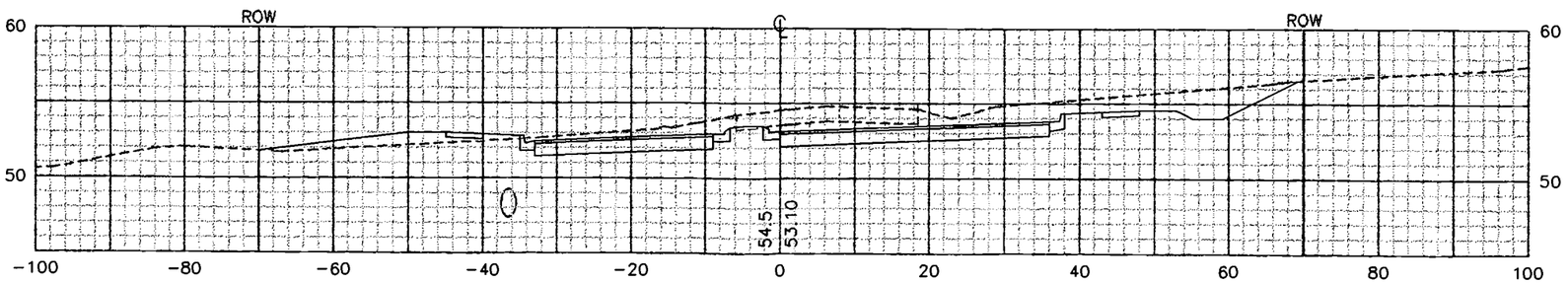
206+00



205+50



205+00



1-26-22

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

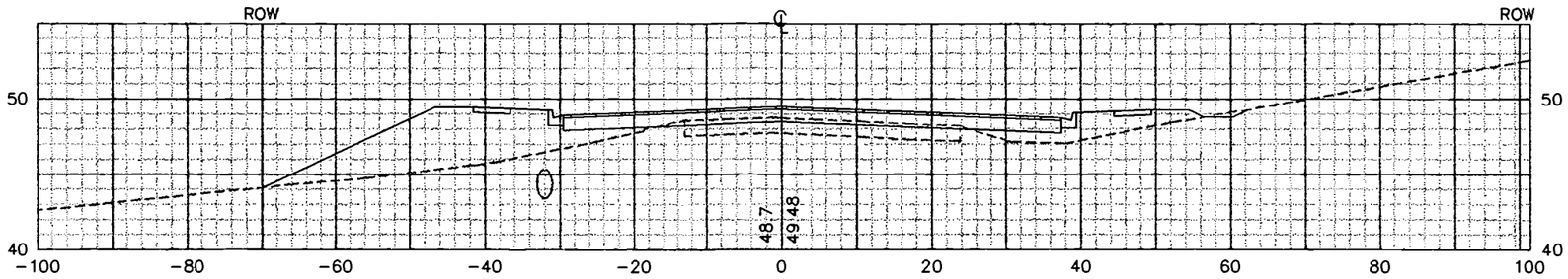
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

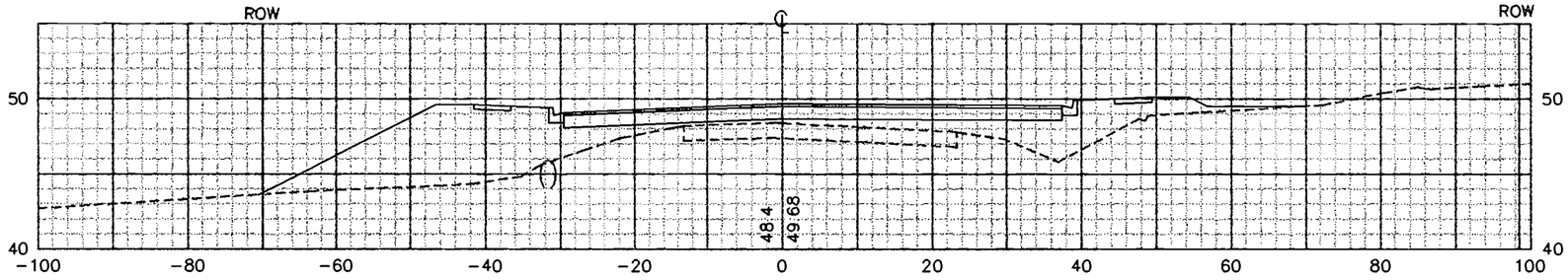
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 205+00 TO STA 206+50

Proj. No: 4617
Draw No: E351
Sheet No: 34 of 51

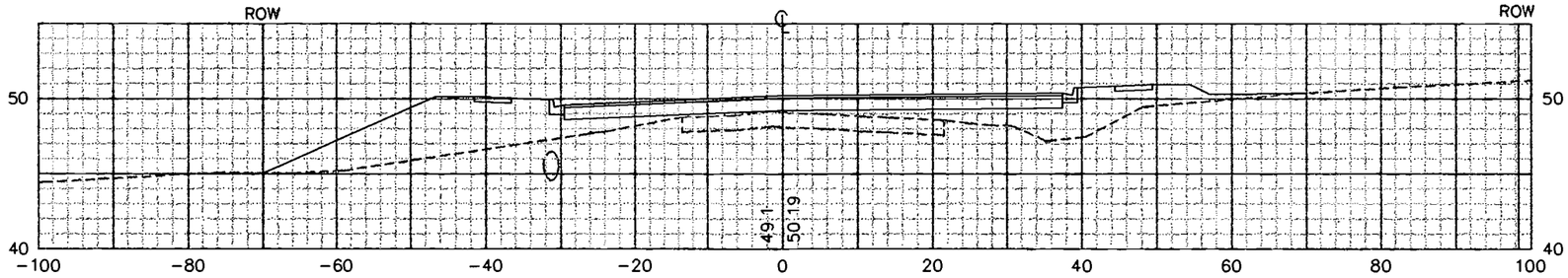
208+50



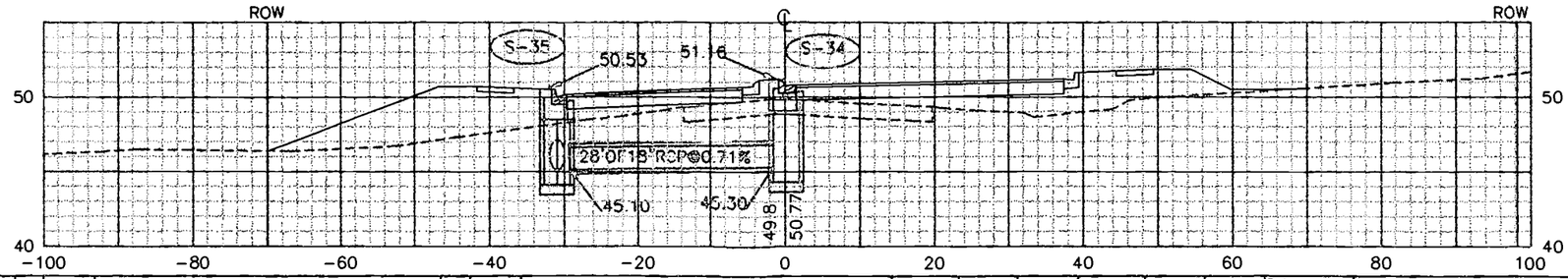
208+00



207+50



207+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	8/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001

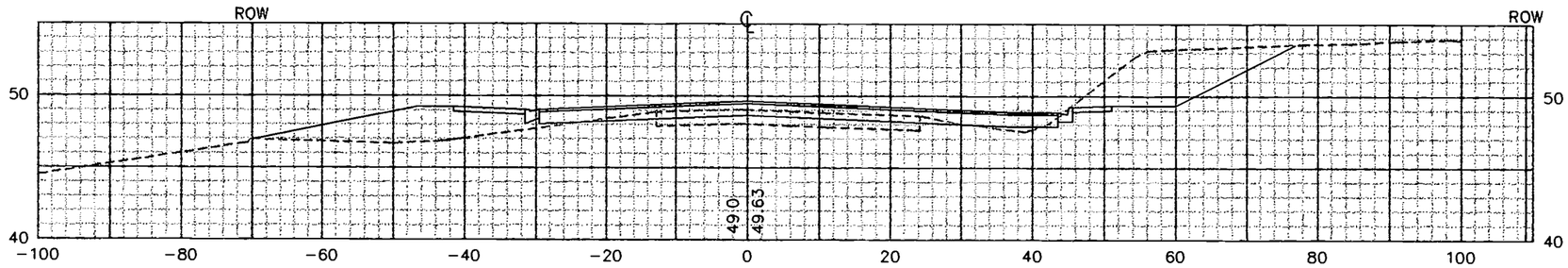
Date: 8/2001

SCALE: HORIZ 1"=10' VERT 1"=5'

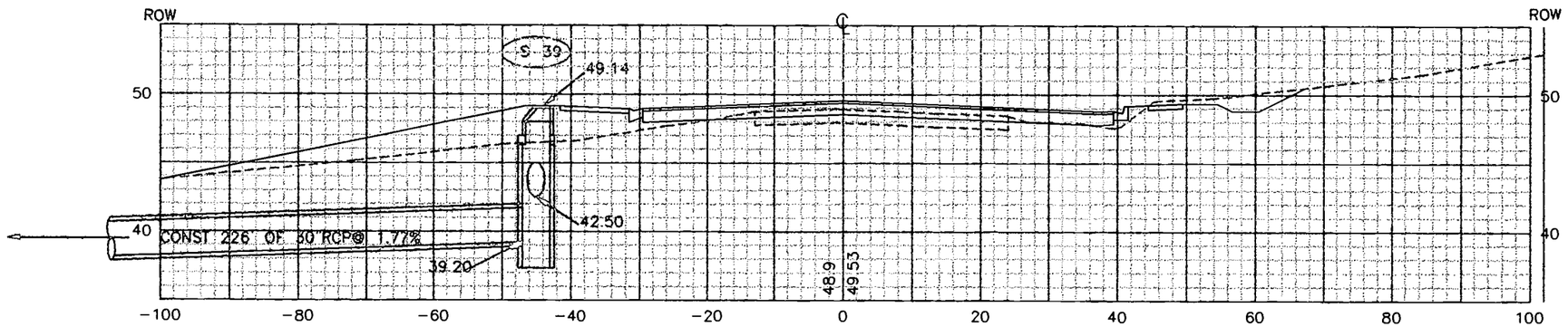
VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 207+00 TO STA 208+50

Proj. No: 4617
Draw No: 4617
Sheet No: 35 of 51

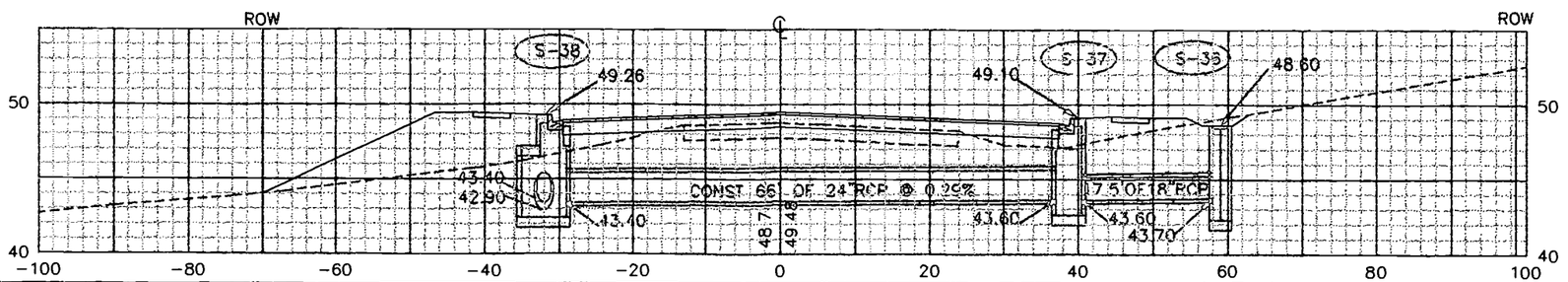
209+00



208+80.50



208+53.51



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

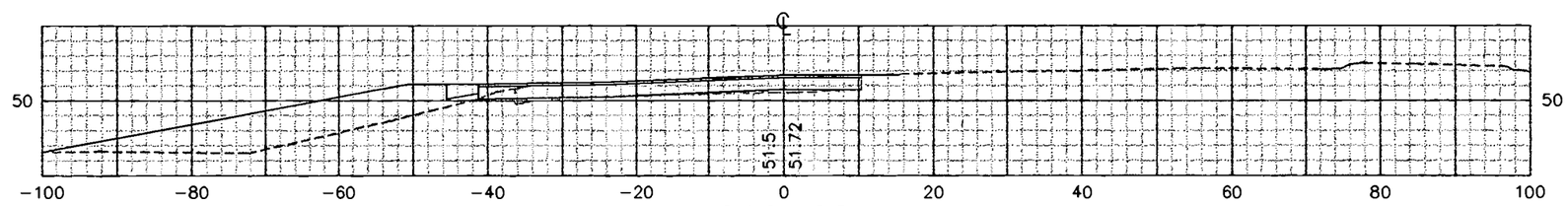
TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	8/2001	

VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 208+53.51 TO STA 209+00

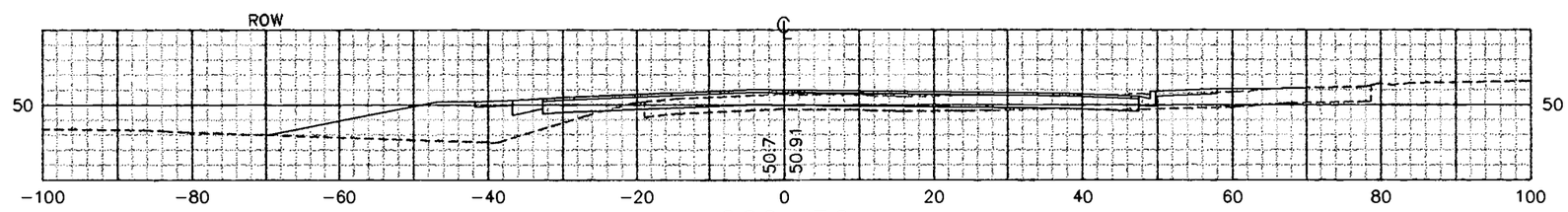
Proj. No: 4617
Draw No: 45353
Sheet No: 36 of 51

RDW. EXC.	33,620 CY
FILL	27,028 CY
FILL+40%	37,839 CY
BORROW EXC.	4,219 CY

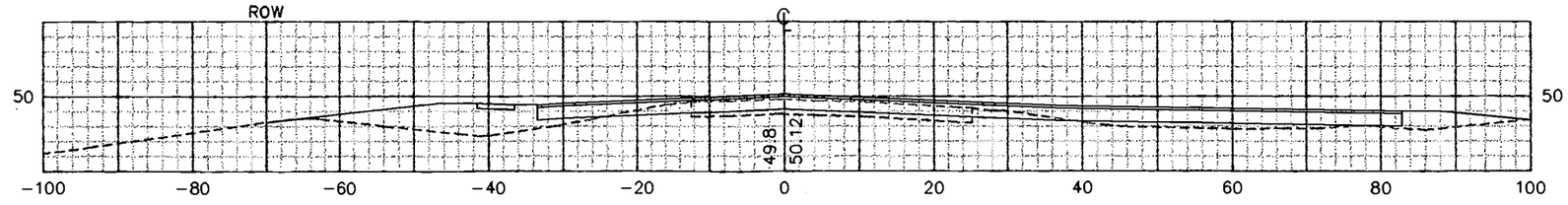
210+50



210+00



209+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

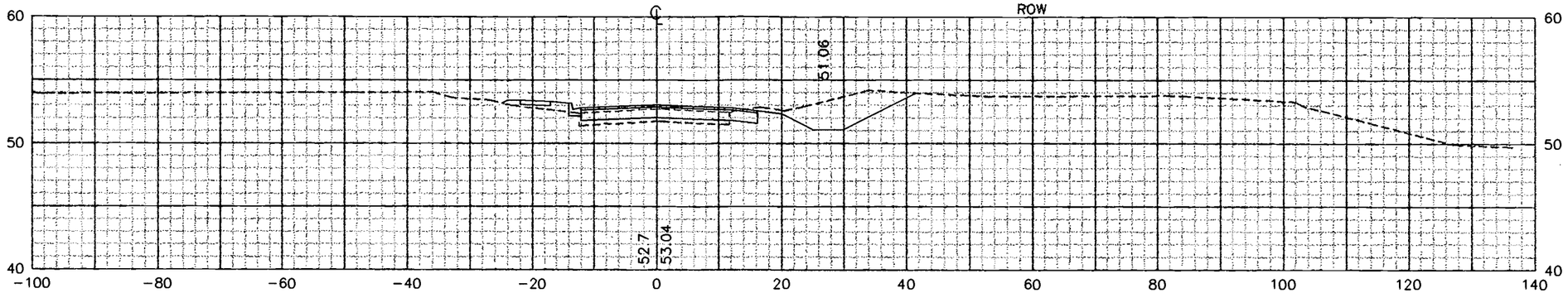
TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 8/2001
CADD	IO	3/2000	CADD	IO	8/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO. PAGE TO			DESIGNED	IO	8/2001	

VETERANS MEMORIAL PARKWAY EXT.
CROSS SECTIONS
STA 209+50 TO STA 210+50

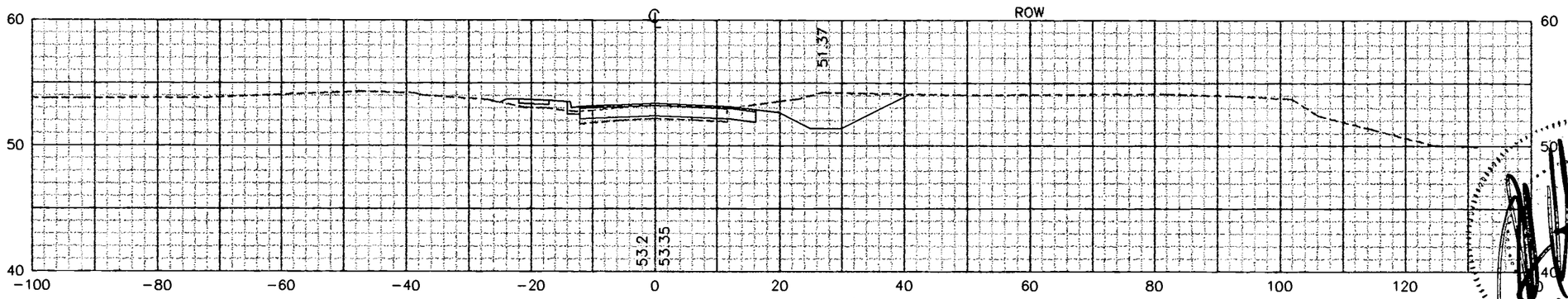
Proj. No: 4617
Draw No: 4617
Sheet No: 37 OF 51
E354

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
163+80	195.51	127.72	72.63	144.69	72.63	144.69
164+00	0.59	262.93	8.69	447.62	81.32	592.31
164+50	8.79	220.50	24.49	444.52	105.80	1036.83
165+00	17.65	259.59	68.60	449.84	174.41	1486.66
165+50	56.44	226.24	152.75	342.71	327.16	1829.37
166+00	108.54	143.89	317.37	195.24	644.53	2024.61
166+50	234.23	66.96	576.99	88.12	1221.53	2112.73
167+00	388.93	28.21	332.57	21.08	1554.10	2133.82
167+21.80	434.87	24.02	454.95	22.32	2009.05	2156.14
167+50	436.30	18.73	745.36	27.94	2754.40	2184.08
168+00	368.68	11.45	623.14	33.10	3377.54	2217.18
168+50	304.31	24.30	467.55	68.97	3845.10	2286.15
169+00	200.65	50.19	270.58	131.94	4115.68	2418.09
169+50	86.52	95.73	89.00	257.32	4204.68	2675.41
170+00	7.73	187.20	7.23	340.35	4211.91	3015.76
170+50	0.00	184.83	0.00	498.14	4211.91	3513.90
171+00	0.00	357.70	0.02	556.55	4211.93	4070.45
171+50	0.03	249.42	15.79	420.99	4227.72	4491.44
172+00	16.60	211.46	22.11	402.50	4249.83	4893.94
172+50	6.71	229.64	6.57	439.10	4256.40	5333.04
173+00	0.24	250.75	2.77	430.02	4259.16	5763.06
173+50	2.69	219.46	7.47	376.29	4266.63	6139.35
174+00	5.18	192.49	57.30	268.70	4323.93	6408.05
174+50	55.37	102.63	182.74	132.27	4506.66	6540.32
175+00	138.76	43.56	332.09	68.26	4838.75	6608.59
175+50	215.03	32.18	394.96	49.70	5233.71	6658.28
175+93.18	272.65	31.69	69.40	7.83	5303.11	6666.12
176+00	270.06	32.06	492.37	54.43	5795.48	6720.55
176+50	255.33	28.36	440.89	51.63	6236.37	6772.19
177+00	215.29	28.96	382.60	26.09	6618.97	6798.27
177+50	194.67	0.00	329.12	0.00	6948.09	6798.28
178+00	160.78	0.00	492.93	0.00	7441.02	6798.28
178+50	373.01	0.00	904.18	0.00	8345.20	6798.28
179+00	605.05	0.00	1084.85	0.00	9430.05	6798.28
179+50	567.70	0.00	289.41	0.00	9719.46	6798.28
179+64	548.30	0.00	689.81	0.00	10409.27	6798.28
180+00	484.99	0.00	507.15	35.80	10916.42	6834.07
180+50	61.13	38.93	56.70	392.87	10973.13	7226.94
181+00	0.00	388.86	0.00	941.71	10973.13	8168.65
181+50	0.00	628.66	1.33	1296.99	10974.46	9465.64
182+00	1.46	768.19	1.33	1509.96	10975.78	10975.60
182+50	0.00	853.79	0.00	1644.04	10975.78	12619.64
183+00	0.00	909.05	0.00	1660.90	10975.78	14280.54
183+50	0.00	870.20	0.00	1586.19	10975.78	15866.73
184+00	0.00	827.37	0.00	1246.36	10975.78	17113.09
184+50	0.00	502.77	4.66	741.24	10980.44	17854.34
185+00	5.07	285.81	5.18	456.33	10985.62	18310.66
185+50	0.53	207.02	0.49	315.05	10986.11	18625.71
186+00	0.00	133.23	0.00	305.26	10986.11	18930.97
186+50	0.00	196.45	0.13	398.26	10986.25	19329.23
187+00	0.14	233.68	61.15	348.72	11047.40	19677.96
187+50	65.90	142.94	203.50	240.44	11250.90	19918.40
188+00	153.88	116.74	325.65	140.30	11576.55	20058.70
188+50	197.82	34.79	395.74	32.21	11972.29	20090.91
189+00	229.58	0.00	423.19	0.00	12395.49	20090.91
189+50	227.47	0.00	450.58	0.00	12846.07	20090.91
190+00	259.16	0.00	596.51	0.00	13442.58	20090.91
190+50	385.07	0.00	876.01	0.00	14318.59	20090.91
191+00	560.68	0.00	1054.91	0.00	15373.50	20090.91
191+50	578.38	0.00	708.26	0.01	16081.75	20090.92
192+00	188.53	0.01	174.14	271.67	16255.90	20362.59
192+50	0.00	288.11	1.52	973.03	16257.41	21335.62
193+00	1.66	762.22	1.52	1218.42	16258.93	22554.05
193+50	0.00	553.72	0.00	844.32	16258.93	23398.36
194+00	0.00	361.26	0.00	525.91	16258.93	23924.28
194+50	0.00	209.52	32.11	263.38	16291.04	24187.65
195+00	34.91	74.46	60.59	170.91	16351.64	24358.56
195+50	31.46	107.97	59.11	195.33	16410.75	24553.90
196+00	33.38	99.33	113.93	132.72	16524.67	24686.62
196+50	91.50	41.11	285.12	45.37	16809.80	24731.99
197+00	219.61	6.55	572.28	6.16	17382.08	24738.16
197+50	399.74	0.00	868.74	0.00	18250.82	24738.16
198+00	535.98	0.00	1028.96	0.00	19279.78	24738.16
198+50	573.64	0.00	1136.55	0.00	20416.33	24738.16
199+00	652.86	0.00	1232.31	0.00	21648.63	24738.16
199+50	675.33	0.00	1273.31	0.00	22921.95	24738.16
200+00	694.23	0.00	1369.86	0.00	24291.81	24738.16
200+50	778.09	0.00	1550.77	0.00	25842.57	24738.16
201+00	889.06	0.00	1541.05	0.00	27383.62	24738.16
201+50	768.72	0.00	1378.39	0.00	28762.01	24738.16
202+00	715.47	0.00	1163.62	0.00	29925.63	24738.16
202+50	536.76	0.00	835.93	0.00	30761.55	24738.16
203+00	361.02	0.00	632.32	1.64	31393.87	24739.79
203+50	317.14	1.79	565.04	6.08	31958.91	24745.87
204+00	288.73	4.97	485.55	9.92	32444.46	24755.79
204+50	231.77	6.07	372.85	20.05	32817.32	24775.85
205+00	167.70	16.22	251.99	45.77	33069.30	24821.61
205+50	102.48	34.57	124.09	89.43	33193.40	24911.05
206+00	31.22	63.93	37.92	156.93	33231.32	25067.98
206+50	9.91	107.12	9.16	254.22	33240.48	25322.20
207+00	0.01	169.12	0.01	326.91	33240.49	25649.10
207+50	0.00	183.94	0.00	387.12	33240.49	26036.22
208+00	0.00	234.15	9.18	346.50	33249.67	26382.72
208+50	9.91	140.07	1.45	17.75	33251.12	26400.47
208+53.51	12.37	133.03	22.25	123.28	33273.36	26523.75
208+80.50	32.14	113.62	1.34	4.78	33274.70	26528.54
208+81.69	28.59	103.45	11.36	24.77	33286.06	26553.31
208+88.64	59.67	89.00	32.12	32.07	33318.18	26585.38
209+00	93.00	63.46	118.20	126.44	33436.38	26711.82
209+50	34.66	73.09	82.50	130.73	33518.88	26842.55
210+00	54.44	68.09	91.68	156.42	33610.56	26998.97
210+50	44.58	100.85	9.26	28.94	33619.82	27027.91
210+57.57	21.48	105.56	0.00	0.00	33619.82	27027.91

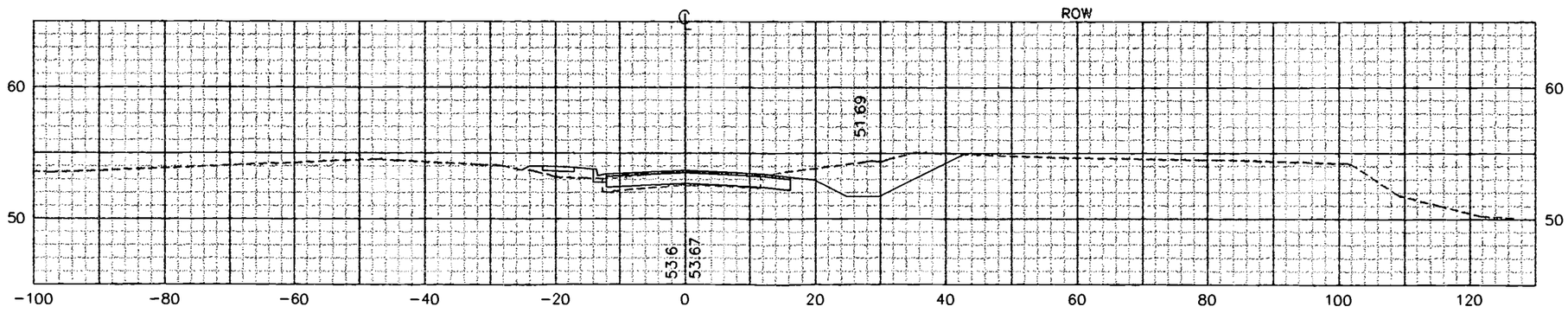
34+00



33+50



33+00



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	9/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	9/2001

Date: 3/02

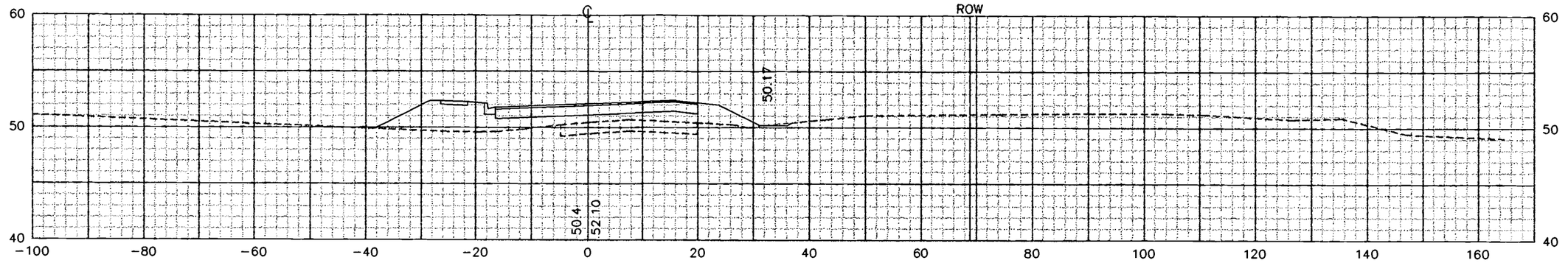
SCALE:
HORIZ 1"=10'
VERT 1"=5'

KENTUCY AVE
CROSS SECTIONS
STA 33+00 TO STA 34+00

Proj. No: 4617
Draw No: 4617
Sheet No: 38 of 51

4-26-02

35+50



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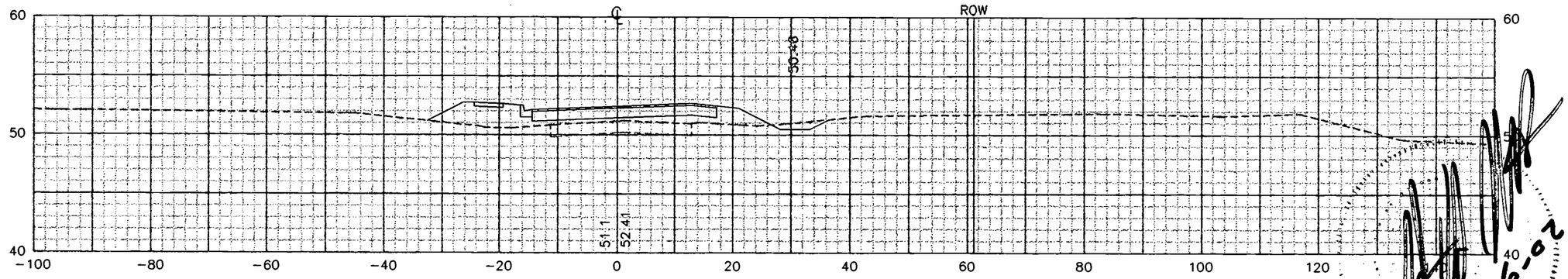
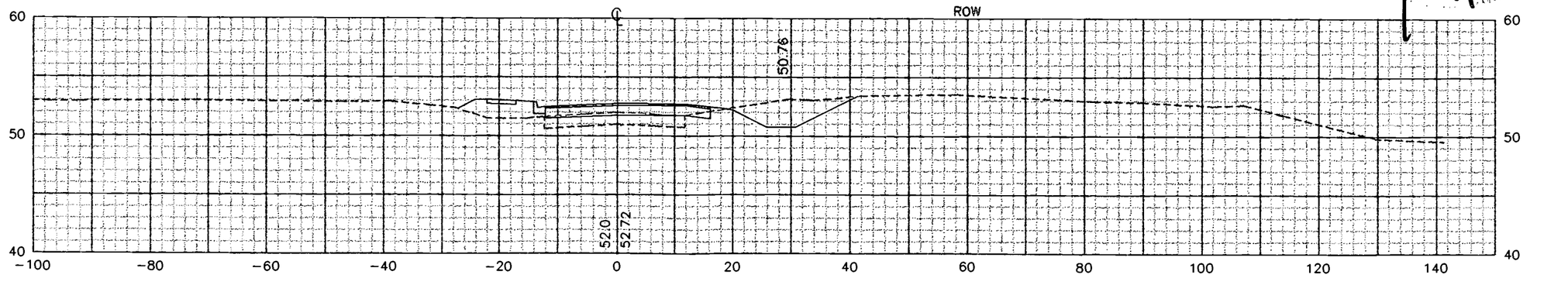


34+50



4-26-02

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	9/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	9/2001

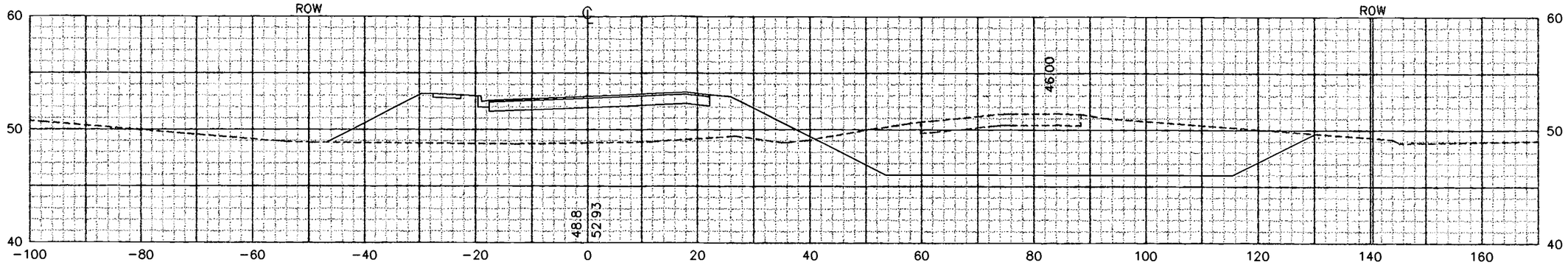
Date: 3/02

SCALE:
HORIZ 1"=10'
VERT 1"=5'

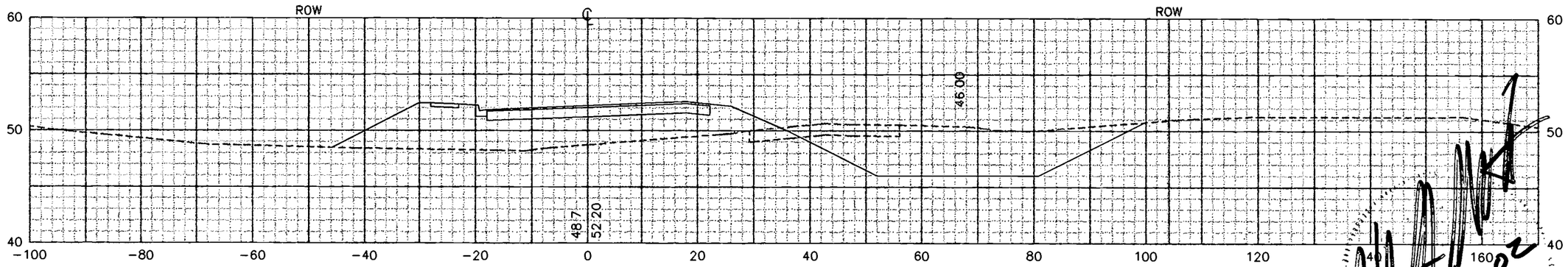
KENTUCY AVE
CROSS SECTIONS
STA 34+50 TO STA 35+00

Proj. No: 4617
Draw No: E2617 4617
Sheet No: 39 of 51

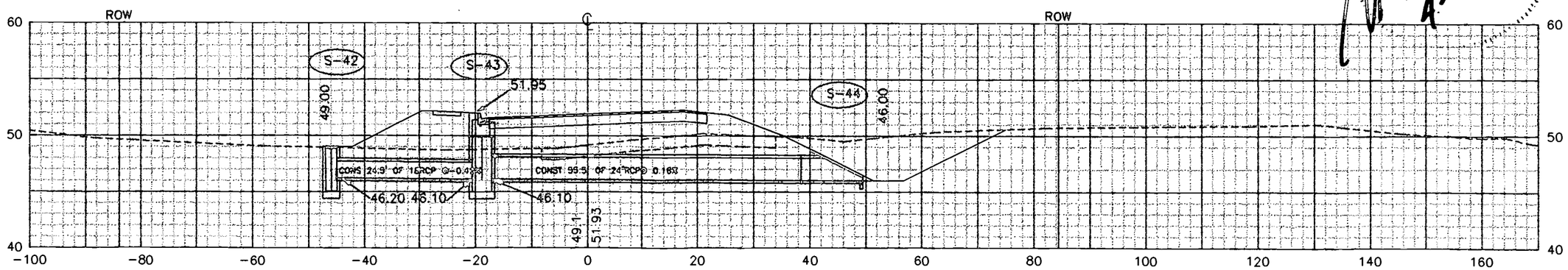
37+00



36+50



36+00



4/26/02

REVISIONS	BY	DATE	REVISIONS	BY	DATE

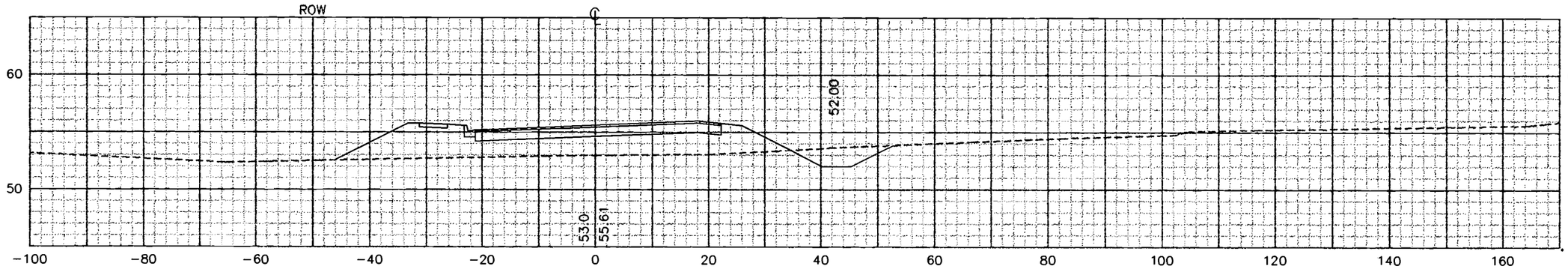
COUNTY ENGINEER DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 3/02
CADD	IO	3/2000	CADD	IO	9/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO. PAGE TO			DESIGNED	IO	9/2001	

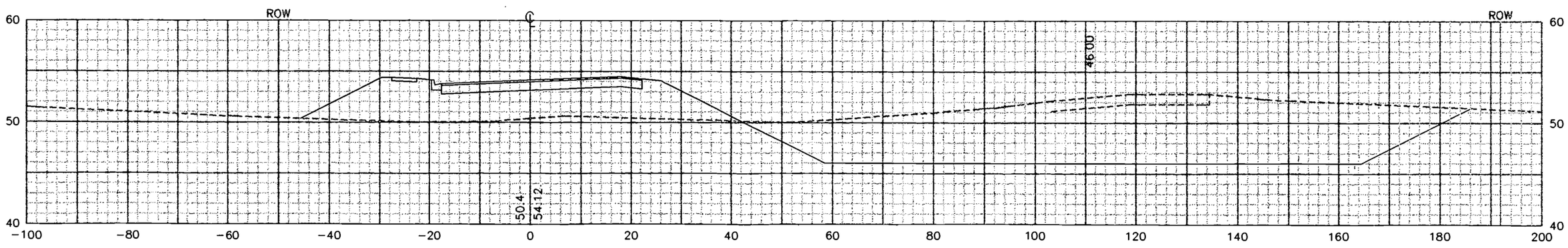
KENTUCY AVE
CROSS SECTIONS
STA 36+00 TO STA 37+00

Proj. No: 4617
Draw No: ~~4617~~ E538
Sheet No: 40 of 51

38+00



37+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE	Date: 3/02
CADD	IO	3/2000	CADD	IO	9/2001	
CHECKED			CHECKED			SCALE: HORIZ 1"=10' VERT 1"=5'
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	9/2001	

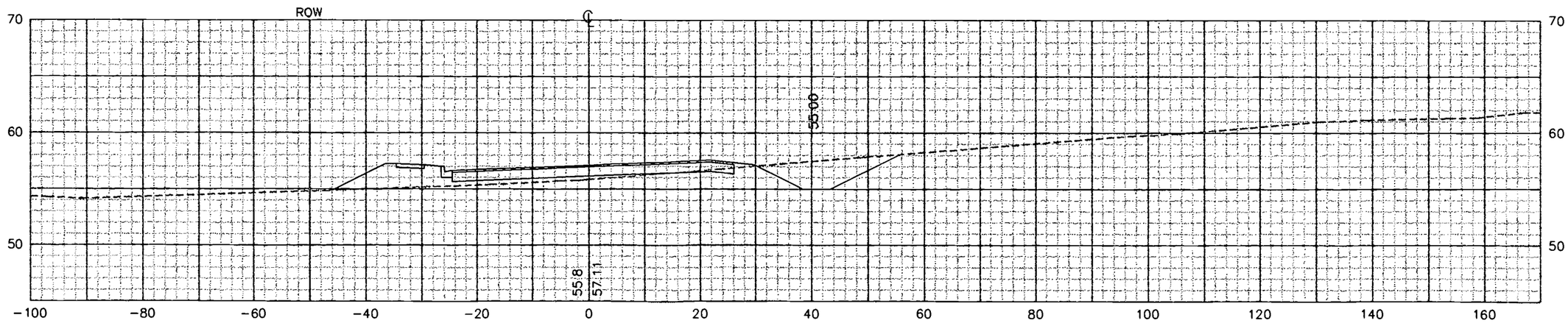
KENTUCY AVE
CROSS SECTIONS
STA 37+50 TO STA 38+00

Proj. No: 4617
Draw No: 4669
Sheet No: 41 of 51

STATION	AREAS Square Feet		VOLUMES Cubic Yards		CUMULATIVE VOLUMES Cubic Yards	
	CUT	FILL	CUT	FILL	CUT	FILL
32+00	0.00	0.00				
32+50	48.53	11.31	44.94	10.48	44.94	10.48
33+00	69.14	5.28	108.96	15.37	153.90	25.84
33+50	63.72	4.61	123.02	9.17	276.92	35.01
34+00	55.39	4.22	110.29	8.18	387.21	43.19
34+50	34.01	16.54	82.78	19.22	469.99	62.40
35+00	4.17	49.32	37.84	59.15	507.83	121.55
35+50	0.50	85.24	4.68	122.33	512.51	243.88
36+00	86.18	140.53	89.14	204.72	601.65	448.60
36+50	201.47	196.47	305.92	305.65	907.57	754.26
37+00	361.02	253.20	616.75	410.33	1524.32	1164.58
37+50	717.95	238.31	1245.23	451.29	2769.54	1615.87
38+00	18.92	144.31	816.02	349.93	3585.57	1965.80
38+50	39.96	43.40	60.17	166.93	3645.73	2132.74
			0.00	0.00	3645.73	2132.74

RDW. EXC.	3,646 CY
FILL	2,133 CY
FILL+40%	2,986 CY
EXCESS EXC.	660 CY

38+50



REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER DATE

ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	IO	3/2000	CADD	IO	9/2001
CHECKED			CHECKED		
FIELD BOOK NO.	PAGE	TO	DESIGNED	IO	9/2001

Date: 3/02
SCALE:
HORIZ 1"=10'
VERT 1"=5'

KENTUCY AVE
CROSS SECTIONS
STA 38+50

Proj. No: 4617
Draw No: 4617
Sheet No: 42 of 51

E360

SUMMARY OF EARTHWORK

ROADWAY:	TOTAL			BORROW	EXCESS
	EXC. C.Y.	FILL C.Y.	FILL +40%	C.Y.	C.Y.
VETERAN'S MEMORIAL PKWY.	33,620	27,028	37,839	4,219	–
KENTUCKY AVE	3,646	2,133	2,986	–	660
ROADWAY SUB TOTAL	37,266	29,161	40,825	3,559	–
RETENTION PONDS					
POND NO 1	293	1,789	2,505	2,212	
POND NO 2	10,375	250	350		10,025
RETENTION PONDS SUB TOTAL	10,668	2,039	2,855	–	7,813
TOTAL	47,934	31,200	43,680	–	4,254

S-3 STA 167+21.80 OFF 36.25'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 62.33
INV EL 58.65

S-4 STA 167+21.80 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 62.33
INV EL 58.45

S-5 STA 170+00.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 60.40
INV EL 55.90

S-6 STA 170+00.00 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 59.48
INV EL 55.70

S-7 STA 173+00.00 OFF 9.75'LT
CONST CI TYPE P5
INDEX 211
GUTTER EL 57.33
INV EL 52.80

S-8 STA 173+00.00 OFF 36.25'RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 56.41
INV EL 52.60

S-9 STA 175+93.18 OFF 9.75'LT
CONST CI TYPE P6
INDEX 211
GUTTER EL 55.31
INV EL 50.10

S-10 STA 175+93.18 OFF 36.25'RT
CONST CI TYPE P6
INDEX 211
GUTTER EL 54.39
INV EL 49.90

S-19 STA 175+93.18 OFF 263.50'RT
CONST DBI TYPE D
INDEX 232
TOP EL ±50.0
INV EL 42.80

S-20 STA 175+93.18 OFF 565.5'RT
CONST MES
INDEX 273
INV EL 26.00

175+00
170+00
42.5' OF 18"RCP
360' OF 18"RCP
291' OF 18"RCP
69' OF 18"RCP
224' of 30"RCP
288' OF 30"RCP
STA: 176+08.75
OFFSET: 70.00 R
STA: 175+77.61
OFFSET: 70.00 R
STA: 176+13.22
OFFSET: 480.37 R
INSTALL 660' OF TYPE III SILT FENCE
INSTALL 500' OF TYPE III SILT FENCE
INSTALL 500' OF TYPE III SILT FENCE
INSTALL 240' OF TYPE III SILT FENCE
INSTALL 240' OF TYPE III SILT FENCE
INSTALL 180' OF TYPE III SILT FENCE
INSTALL 180' OF TYPE III SILT FENCE
0.27 AC.
PC = 168+89.80
R=1909.86
L=1605.16
Tan=853.42
Delta=48°09'17"
S68°40'02"E 389.51'
410.39'
136.49'
S57°25'18"W
S57°25'18"W
276.38'
260.00'
S32°34'42"E
N32°34'42"W
N57°25'18"E
450.00'
SOD
TOP EL38.00
SOD
TOP EL38.00
R/W LINE
R/W LINE
4:1
4:1
4:1
4:1
20'
20'
0 50 100 150 200 250 300 350 400 450 500 550
40
30
20

4-26-22

REVISIONS	BY	DATE	REVISIONS	BY	DATE

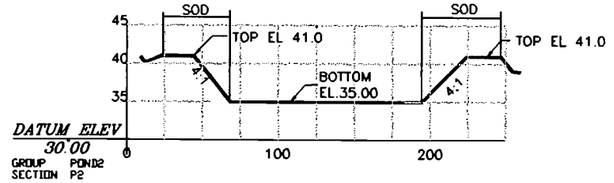
COUNTY ENGINEER _____ DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

TOPO	NAME	DATE	DESIGN	NAME	DATE
CADD	0	0	CADD	IO	3/02
CHECKED	0	0	CHECKED	SM	3/02
FIELD BOOK NO.	PAGE	TO	DESIGNED	TM	1/02

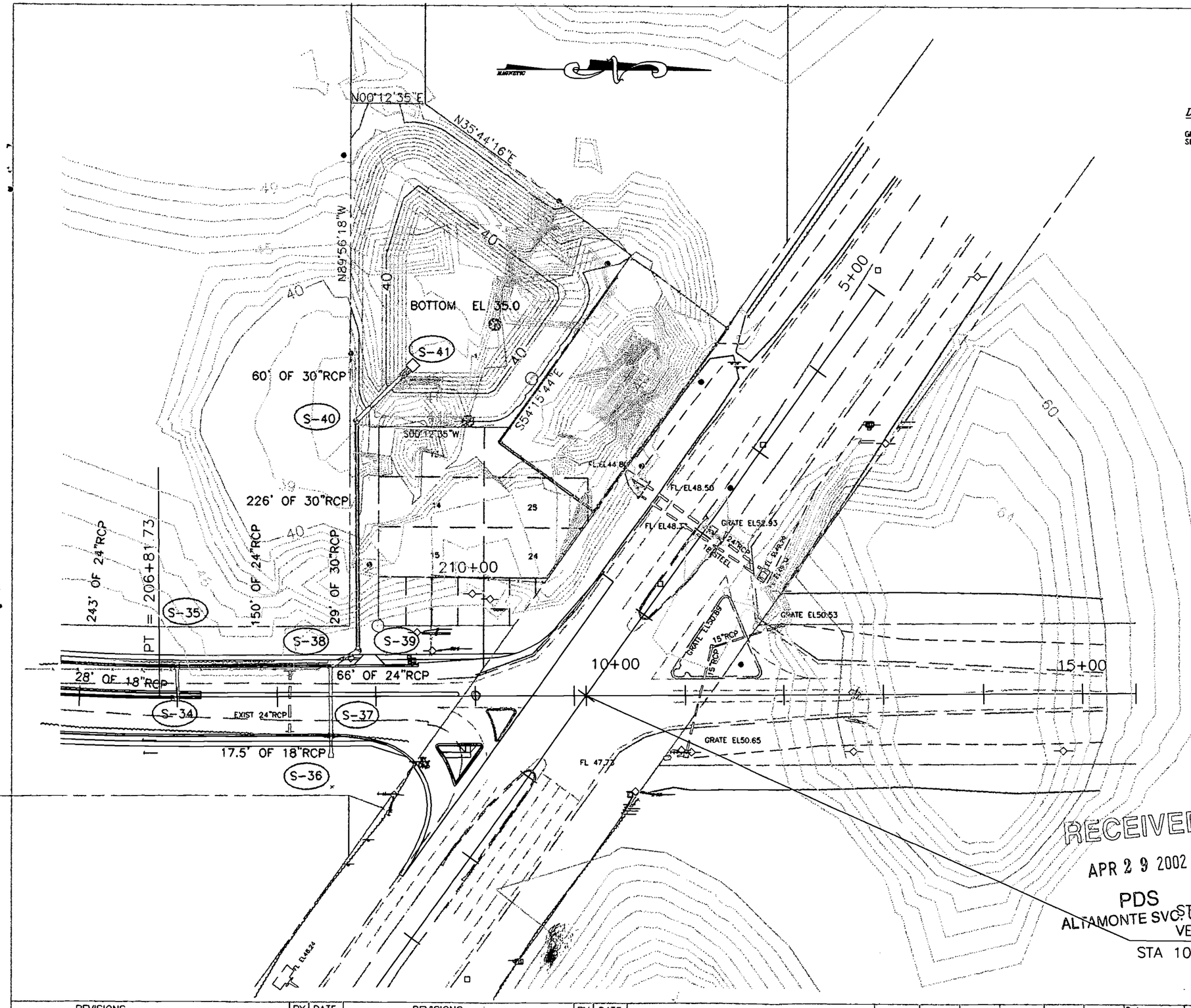
Date: 4/02
SCALE: HORIZ 1"=50' VERT 1"=10'

VETERAN MEMORIAL PARKWAY EXT.
POND 1

Proj. No: 4617
Draw No: 4617
Sheet No: 43 of 44



SECTION A–A



S-34 STA 207+00 OFF 0.25RT
CONST CI TYPE P5
INDEX 211
GUTTER EL 50.33
INV EL 45.30

S-35 STA 207+00 OFF 30.89'LT
CONST CI TYPE P5
GUTTER EL 49.70
INV EL 45.10

S-36 STA 208+53.51 OFF 59'RT
CONST DBI TYPE C
INDEX 232
TOP EL 48.60
INV EL 43.70

S-37 STA 208+53.51 OFF 38.75'RT
CONST CI TYPE P6
INDEX 211
GUTTER EL 48.27
INV EL 43.60

S-38 STA 208+53.51 OFF 30.75'LT
CONST CI TYPE J6
INDEX 211
GUTTER EL 48.43
INV EL 43.40
INV EL WEST 42.90

S-39 STA 208+81.70 OFF 44'LT
CONST MH TYPE J7
INDEX 201
TOP EL ±49.14
INV EL 42.5

S-40 STA 208+81.70 OFF 273.75'LT
CONST MH TYPE J7
INDEX 201
TOP EL ±39.0
INV EL 35.2

S-41 STA 209+35.41 OFF 328.60'LT
CONST MES
INDEX 273
INV EL 35.00

RECEIVED
APR 29 2002
PDS

STA 211+12.08
ALTAMONTE SVC. VETERAN'S MEMORIAL PKWY.=
STA 10+00.00 MARTIN LUTHER KING AHD.

REVISIONS	BY	DATE	REVISIONS	BY	DATE

COUNTY ENGINEER _____ DATE
ENGINEERING DEPARTMENT
VOLUSIA COUNTY, FLORIDA

	NAME	DATE		NAME	DATE
TOPO			DESIGN	IO	11/01
CADD			CADD		
CHECKED			CHECKED	SM	
FIELD BOOK NO.	PAGE	TO	DESIGNED	TM	

Date: 4/02
SCALE: HORIZ 1"=50' VERT 1"=10'

VETERAN MEMORIAL PARKWAY EXT.
POND # 2

Proj. No: 4617
Draw No: 4617 E363
Sheet No: 44 OF 44

Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut yards	Fill yards	Net yards		Method
pond1								
	vol1	total	pond1					
				305	1666	1361	(F)	Grid
				281	2014	1733	(F)	End area
				293	1689	1396	(F)	Prismoidal

Site Volume Table: Unadjusted

Site	Stratum	Surf1	Surf2	Cut yards	Fill yards	Net yards		Method
pond2								
	vol2	total	pond2					
				10093	63	10030	(C)	Grid
				10635	368	10267	(C)	End area
				10397	318	10079	(C)	Prismoidal

4-26-02

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22827-6
APR 29 2002
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ALTAMONTE SVC. CTR.

INDIVIDUAL ENVIRONMENTAL RESOURCE PERMIT
TECHNICAL STAFF REPORT
January 29, 2003
APPLICATION #: 4-127-22827-6

Applicant: Volusia County Government
C/O Scott H. Martin, P.R.
123 West Indiana Avenue
Deland, FL 32720-04262
(386) 736-5927

Project Name: Veterans Memorial Parkway Ext. (Graves Ave. to SR 472)
Acres Owned: 36.240
Project Acreage: 36.240
County: Volusia
Section(s): 1 **Township(s):** 18S **Range(s):** 30E

Authority: 40C-4.041(2)(b)2

Existing Land Use: Live Oak(4270)
Receiving Water Body: land-locked depressions **Class:** III Fresh.
Final O&M Entity: County of Volusia
ERP Conservation Easements/Restrictions: N/A
Interested Parties: No
Objectors: No

Authorization Statement

A Permit Authorizing:
Construction and operation of a surface water management system for the extension of Veterans Memorial Parkway from Graves Avenue northward approximately 0.9 miles to State Road 472 and the reconstruction of a portion of Kentucky Avenue at the State Road 472 intersection.

Staff Comments:

The northern portion of the West Volusia Beltline received a conceptual permit (4-127-0125GC) and an initial construction permit (4-127-0126G) from the District in December of 1988. The northern portion extends from the intersection of Kepler Road and State Road 44 southerly to the intersection of State Road 472 and Cassadaga Road. A modification of the original permit (4-127-0126GM) was issued in April of 1989 for the buildout of the northern portion to six lanes. A second modification (4-127-0126GM2) was issued in June of 1989 for changes in the stormwater management system. A third modification (4-127-0126GM3) was issued in October of 1992 for changes in the wetland mitigation plan. In November 1993 the District issued Permit Number 4-127-0126GM4 for the southern extension of the West Volusa Beltline from Saxon Boulevard to Graves Avenue. This application connects the southern and northern roadways.

The roadway corridor is located within rolling topography typical of western Volusa County. The corridor is well shaded by a mature canopy of upland mesic oak forest atop

coarse sands. The area is hilly with land-locked depressions among the hills. No wetlands or waters occur within the right-of-way.

The surface water management system for the proposed roadway extension includes the incorporation of an existing depressional area and the construction of another dry retention pond. The two retention systems provide sufficient storage to retain and percolate the total runoff volume from the proposed roadway and associated contributing drainage area based on the 25-year 96-hour storm event.

This application also includes the reconstruction of a portion of Kentucky Avenue at its current intersection at State Road 472. Stormwater runoff from the proposed reconstructed roadway will be retained within a proposed dry retention basin. The system is designed to retain and percolate the total runoff volume generated by the 25-year 96-hour storm event.

No wetlands or surface waters occur on or near the site and none will be affected by this project. Owing to the remoteness of the site relative to offsite wetlands or waters ($\geq$ 30 feet), no secondary impacts are likely to occur to offsite water resources. Offsite wetlands are sufficiently distant from project uplands to ensure that the project will not cause unacceptable adverse secondary or cumulative impacts to upland habitats required by "listed" wetland-dependent species. Thus, the proposed project is consistent with the wetland review criteria in sections 12.2 - 12.3.8, A.H./MSSW, ERP.

The applicant has provided assurance that this project, as proposed, is consistent with the design criteria and objectives of the District set forth in Chapters 40C-4 and 40C-42, F.A.C.

Wetland Summary Table

	Acres
Total Wetlands On-site	**0.000**
Total Surface Waters On-site	**0.000**
Impacts that Require Mitigation	**0.000**
Impacts that Require No Mitigation	**0.000**
Mitigation	**0.000**

Recommendation: Approval

Conditions for Application Number 4-127-22827-6:

ERP General Conditions by Rule (October 03, 1995):
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

ERP/MSSW/Stormwater Special Conditions (November 09, 1995):
1, 10, 13

Other Conditions:

1. The surface water management system must be constructed and operated in accordance with the plans received by the District on April 29, 2002.

2. The operation and maintenance entity shall inspect the stormwater or surface water management system once within two years after the completion of construction and every two years thereafter to determine if the system is functioning as designed and permitted. The operation and maintenance entity must maintain a record of each required inspection, including the date of the inspection, the name, address, and telephone number of the inspector, and whether the system was functioning as designed and permitted, and make such record available for inspection upon request by the District during normal business hours.

   If at any time the system is not functioning as designed and permitted, then within 14 days the entity shall submit an Exceptions Report on form number 40C-42.900(6), Exceptions Report for Stormwater Management Systems Out of Compliance.

3. Contained within the as-built report, the permittee must submit a soils analysis of the retention ponds verifying that the design permeability rates are provided. If the design permeability rates cannot be verified, the permittee must obtain a modification of this permit demonstrating that the design criteria and objectives of Chapter 40C-4 and 40C-42, F.A.C. are met.

Reviewers: Lee Kissick
Marjorie Cook

Permit No. 42-127-1035ANG

Normandy Boulevard Extension

APPLICATION
1719

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
P.O. Box 1429
Palatka, Florida 32178-1429

o 016797

DATE Apr. 28, 19 94

RECEIVED FROM The County of Volusia

THE SUM OF Nonandy Boulevard DOLLARS $ 300.00

FOR appl# 42-127-1093ANGE
42-127-1035 ANGE

AMOUNT OF ACCOUNT $ 300.00
AMOUNT PAID $ 300.00 Thank You!
BALANCE DUE $ -0-

☐ CASH ☑ CHECK ☐ M.O. ☐ CREDIT CARD BY Gillian Ogunedo E370

STORMWATER APPLICATION ASSIGNMENT SHEET

Office: ORLANDO Reviewer: OTTESEN MILLER

Date Received: 4/28/94 Date Processed: 4/29/94

Application Number: ~~42-127-1095ANGE~~ 42-127-1035ANGE

Owner: VOLUSIA COUNTY GOVERNMENT

Applicant: VOLUSIA COUNTY GOVERNMENT

Agent/Consultant: _____

Project Name: NORMANDY BOULEVARD

THE FOLLOWING INFORMATION IS NEEDED TO ADMINISTRATIVELY COMPLETE THIS APPLICATION:

RECEIVED
MAY 03 1994
PERMIT DATA SERVICES
Palatka

__ Signatures

__ Entity Responsible for Maintenance Statement

__ Plans (No. Received: 3)

__ Calculations (No. Received: 3)

__ Notice of Receipt of Application

__ Fee: 300.00 Receipt Number: 16797

Comments: REC'D NOTICE

Application is adminstratively complete? YES LO

****

Request of Additional Information or permit must be mailed by: 5/26/94

Comments: _____

County of Volusia

DEPARTMENT OF ENGINEERING
123 West Indiana Avenue • DeLand, Florida 32720-4262
Telephone (904) 736-5967 • 257-6067 • 423-3874 • FAX 822-5736

RECEIVED
APR 28 1994
~~42-127-1095-NG~~
RECORDS
ORLANDO

April 25, 1994

Rick Ottesen, Engineer
Department of Resource Management
St. Johns River Water Management District
618 East South Street
Orlando, Florida 32801

RE: Normandy Boulevard Extension
(From Firwood Dr. to Howland Blvd., Deltona, Florida)
Permit #42-127-1095NG (Expires May 29, 1994)

42-127-1035ANGE

Dear Mr. Ottesen:

The purpose of this letter and eight (8) copies of the attached information is to apply for a time extension on the above permit.

The proposed Normandy Boulevard extension is scheduled to begin construction in July of 1995. There are no wetlands, streams, lakes or positive outfalls from this project. A copy of the old permit is enclosed to assist you in issuing this time extension/permit issuance.

Should you have any questions, please feel free to call me at SUNCOM 377-2323.

Sincerely yours,

Scott H. Martin, P.E.
County Drainage Engineer
Construction Engineering Division

SHM:mb

Attachment
Enclosures

c: William G. Gray, County Engineer

VOLUSIA RECYCLES
Printed On Recycled Paper

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

RECEIVED
APR 2 9 1994
RECORDS
ORLANDO

MANAGEMENT AND STORAGE OF SURFACE WATERS (MSSW) PERMIT APPLICATION
CHAPTERS 40C-4, 40C-40, 40C-41, 40C-42, F.A.C.
(including stormwater management systems but excluding agricultural surface water management systems)

No construction (including land clearing) on the project shall begin until the appropriate permit is obtained. Failure to comply will result in the District pursuing enforcement action in accordance with section 373.129, Florida Statues. Issuance of a District permit does not preclude the responsibility of the applicant to obtain all other necessary federal, state, and/or local permits.

GENERAL INSTRUCTIONS: Please type or print. The following information must be provided with each permit application: a) 5 copies of the completed Notice of Application; b) the appropriate permit application fee (see the supplemental sheets for fees depending on application type); and c) 3 copies of the application form and all information listed on the appropriate supplemental sheet(s). Please submit the application to the appropriate District office as shown below:

Project Location (County)	District Office
Alachua, Flagler, Marion, Putnam	District Headquarters, P.O. Box 1429, Palatka, FL 32178-1429 (904) 329-4500
Baker, Bradford, Clay, Duval, Nassau, St. Johns	Jacksonville Field Office, 775 Baymeadows Way, Suite 102, Jacksonville, FL 32256 (904) 730-6270
Lake, Orange, Polk, Seminole, Volusia	Orlando Field Office, 618 E. South Street, Orlando, FL 32801 (407) 897-4300
Brevard, Indian River, Okeechobee, Osceola	Melbourne Field Office, 305 East Drive, Melbourne, FL 32904 (407) 984-4940

Permit applications for agricultural surface water management systems must use the appropriate forms 40C-1.181(9),(10), or (11).

PERMIT TYPE AND ACTIVITY

Indicate the type of permit for which you are applying by checking only one of the following and include supporting information as required on the Indicated supplemental sheets:

____ Individual MSSW permit (40C-4) -- include information requested on supplemental sheets A and B
____ General MSSW permit (40C-40) -- include information requested on supplemental sheets A and B
____ General Isolated wetland MSSW permit (40C-40) -- include information requested on supplemental sheets A and C
____ Conceptual MSSW approval (40C-4) -- include information requested on supplemental sheet D
_X_ Stormwater management system permit (40C-42) -- include information requested on supplemental sheet A

For District Use Only 42-127-1035 SNGE Project Use Codes: _____
Application Number: ~~42-127-1095 SNGE~~ Fee Received: _____
Date Received: _____ Assigned Reviewers: _____ Reviewer Numbers: _____

Indicate the type of activity for which you are applying by checking one of the following:

_____ Construction and operation of a new system
_____ Alteration and operation of an existing system not previously permitted by the District
_____ Modification of a system previously permitted by the District (check one of the boxes below)
  _____ Alteration and operation of an existing system previously permitted by the District
  _____ Construction and operation of additional phases of a system previously permitted by the District
  List all previously issued District surface water permit numbers: _____
_____ Removal of a system
_____ Abandonment of a system
_____ Re-application for a permit that has expired; please provide the latest permit number: _____
__X__ Extension of a permit prior to expiration; please provide the latest permit number: _____

OWNER

Name of Owner: Volusia County Government
Address: 123 W. Indiana Ave.
City: Deland
State: FL Zip Code: 32720-4262 Telephone No: Suncom 377-2323
Attn: Scott Martin

APPLICANT/ENTITY TO RECEIVE PERMIT

Name of Applicant: See owner
Attention: _____
Address: _____
City: _____
State: _____ Zip Code: _____ Telephone No: _____

AGENT, CONSULTING FIRM, SCS ENGINEER (if any)

Name of Firm: See owner
Name of Firm Contact: _____
Agent For: _____
Address: _____
City: _____
State: _____ Zip Code: _____ Telephone No: _____

ATTORNEY OF RECORD (if any)

Name of Firm: _____
Name of Firm Contact: _____
Attorney For: _____
Address: _____
City: _____
State: _____ Zip Code: _____ Telephone No: _____

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
MANAGEMENT AND STORAGE OF SURFACE WATERS PERMIT APPLICATION

Supplemental Sheet A: Stormwater Management System

GENERAL INSTRUCTIONS: Three copies of both page 1 of this form and the required technical information listed on pages 2-4 must be provided with all applications for stormwater management systems and for individual and general MSSW permits. The appropriate fee, as shown in Section 40C-1.603, F.A.C., must be provided with each stormwater management system permit application.

Project Name: Normandy Blvd. Extension (Firwood Dr. to Howland Blvd.)

County: Volusia

General Permit Category: Projects which meet one of the following performance criteria qualify for a general permit. If applicable, indicate the appropriate general permit category below:

X a) Systems which discharge into a stormwater management system which is permitted pursuant to Paragraphs 40C-42.024(2)(b), (c), or (d), F.A.C., or Subsection 40C-42.024(3), F.A.C., or which was previously approved pursuant to a noticed exemption under Section 17-25.030, F.A.C., where the appropriate treatment criteria specified in this chapter and applied to the permitted or exempt system are not exceeded by the discharge; or,

X b) Systems which meet the applicable design and performance standards of Section 40C-42.025, F.A.C., and which comply with any or more of the following:

1. filtration systems which serve projects less than 10 acres in size and which meet the criteria of Subsection 40C-42.026(1), F.A.C.;
2. retention systems which meet the criteria of Subsection 40C-42.026(2), F.A.C.;
3. underdrain systems which meet the criteria of Subsection 40C-42.026(3), F.A.C.;
4. underground exfiltration trench systems which meet the criteria of Subsection 40C-42.026(4), F.A.C.;
5. wet detention systems which meet the criteria of Subsection 40C-42.026(5), F.A.C.; or
6. swale systems which meet the criteria of Subsection 40C-42.026(6), F.A.C.; or,

_____ c) Systems that include a combination of management practices including but not limited to retention basins, swales, pervious pavement, landscape or natural retention storage that will provide for the percolation of the runoff from a three-year one-hour design storm; or,

_____ d) Modification or reconstruction by a city, county, state agency, or special district with drainage responsibility of an existing stormwater management system which is not intended to increase the original design capacity, and which will not increase pollution loading, or change points of discharge in a manner that would adversely affect the designated uses of waters of the State; or,

_____ e) Paving of existing public dirt roads if all of the following are met:

1. the road will not serve new development;
2. additional traffic lanes are not added to the road;
3. the traffic load is not expected to significantly increase;
4. the drainage system serving the road is not significantly altered;
5. erosion and sediment control measures are utilized to prevent turbidity during construction; and,
6. the project does not require a wetland resource management (dredge and fill) permit pursuant to Chapter 17-312, F.A.C.

Individual Permit Categories: If applicable, indicate the appropriate permit category below.

_____a) Wetlands stormwater management systems which meet the design and performance criteria in Sections 40C-42.025 and 40C-42.0265, F.A.C.; or,

_____b) Systems which employ a treatment methodology or device other than those described in Subsections 40C-42.024(2) or (3), F.A.C.; or,

_____c) Systems which do not meet the applicable design criteria of Sections 40C-42.025, 40C-42.026, or 40C-42.0265, F.A.C.

Will there be any dredge or fill activity in waters of the State:_____ yes ____X____ no

If yes, please be advised that unless exempt, dredging or filling in waters of the State requires a Wetland Resource Management (dredge and fill) permit (Chapter 17-312, F.A.C.). If a wetland resource management permit is required, contact the District for application forms and materials. If the construction of the stormwater management system requires dredge or fill in waters of the State, all requirements of Chapters 40C-42 and 17-25, F.A.C. will be reviewed as part of the wetland resource management permit application. In that case, you must provide all information on this application form as a part of a wetland resource management permit application.

NOTE: IF PROFESSIONAL ENGINEERING, GEOLOGY, OR LANDSCAPE ARCHITECTURE IS REQUIRED BY FLORIDA STATUTE FOR THE DESIGN OF THE PROPOSED STORMWATER MANAGEMENT SYSTEM, CONSTRUCTION PLANS AND CALCULATIONS MUST BE SIGNED AND SEALED BY AN APPROPRIATE PROFESSIONAL REGISTERED IN THE STATE OF FLORIDA.

Required Technical Information

All applicable technical information must be submitted with the completed application form. Failure to provide all required information will result in a delay in application processing and permit issuance.

A. General site conditions

1. Recent aerial photo of project site (no photocopies) - 1" to 400' scale maximum;
2. Map(s) or applicable construction plan(s) (no larger than 24" X 36") showing:
   a. General location of project shown on USGS quad map(s), including points of discharge;
   b. Project area boundary;
   c. Pre-development (existing) topography;
   d. Pre-development drainage patterns including points of discharge for existing site drainage and drainage basin boundaries;
   e. Off-site drainage area and flow patterns across project site;
   f. Location of existing drainage right-of-way or easements on-site;
   g. Location of private and public water supply wells on-site; and
   h. All wetlands on the site;
3. SCS soils map and report and/or soil boring data for treatment facility locations (borings should be a minimum 6 ft. depth below ground surface and 5 ft. below proposed treatment facility bottom);
4. Water table data

OPERATION AND MAINTENANCE ENTITY (entity proposed to operate and maintain the system after construction is complete and the permit becomes an operation permit)

Name of Entity #1: Volusia County Government- Dept. of Public Works
Name of Entity #1 Contact: George Flack- Director of Road and Bridge
Address: 2560 West State Road 44
City: Deland
State: FL Zip Code: 32720 Telephone No: (904) 822-6422
Part of System to be Operated and Maintained by Entity #1: All
Name of Entity #2 (If applicable): N/A
Name of Entity #2 Contact:
Address:
City:
State: Zip Code: Telephone No:
Part of System to be Operated and Maintained by Entity #2: N/A

PROJECT INFORMATION

Name of Project: Normandy Blvd. Extension (Firwood to Howland Blvd.)
Street Address: See name of Project
County: Volusia
Section/Township/Range: 07/T.18 S./R.30 E.
U.S.G.S. Topographic Quad Map: Orange City
Project Acreage: 18.4 Ac
Total Acreage Owned: 18.4 Ac
Project Description: Construct a 2-lane Road Extension from Firwood Drive to Howland Blvd. in ~~Deland~~ Deltona, FL.

Description of Proposed Surface Water Management System: Swale retention with weirs discharging to low areas. The low areas are uplands. Percolation and evapotranspiration treats stormwater.

Water Course/Water Body Most Affected: None
Class of Water Body: N/A
Date Construction Is Proposed to Commence/End: June 1995/ Dec. 1996
Other Permits Issued or Pending for Proposed Activities:
DEP N/A
SJRWMD 42-127-1035NG issued May 29,1989
COE N/A
Have you had a preapplication conference with District Staff? Yes X No
Date: 1989 With Whom? Don't remember.
Have any District staff previously visited the site? Yes No
Date(s): 1989 For What Purpose?
With whom?:

OPERATION AND MAINTENANCE ENTITY (entity proposed to operate and maintain the system after construction is complete and the permit becomes an operation permit)

Name of Entity #1: Volusia County Government- Dept. of Public Works
Name of Entity #1 Contact: George Flack- Director of Road and Bridge
Address: 2560 West State Road 44
City: Deland
State: FL Zip Code: 32720 Telephone No: (904) 822-6422
Part of System to be Operated and Maintained by Entity #1: All
Name of Entity #2 (if applicable): N/A
Name of Entity #2 Contact:
Address:
City:
State: Zip Code: Telephone No:
Part of System to be Operated and Maintained by Entity #2: N/A

PROJECT INFORMATION

Name of Project: Normandy Blvd. Extension (Firwood to Howland Blvd.)
Street Address: See name of Project
County: Volusia
Section/Township/Range: 07/T.18 S./R.30 E.
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Class of Water Body: N/A
Date Construction is Proposed to Commence/End: June 1995/ Dec. 1996
Other Permits Issued or Pending for Proposed Activities:
DEP N/A
SJRWMD 42-127-1035NG issued May 29,1989
COE N/A
Have you had a preapplication conference with District Staff? Yes X No
Date: 1989 With Whom? Don't remember.
Have any District staff previously visited the site? Yes No
Date(s): 1989 For What Purpose?
With whom?:

CERTIFICATION

By submitting this application form, I am applying, or I am applying on behalf of the applicant, for the permit identified above according to the supporting data and other incidental information filed with this application. I understand I may have to provide any additional information/data that may be necessary to complete this application. I am familiar with the information contained in this application, and to the best of my knowledge and belief, such information is true, complete and accurate. I understand that knowingly making any false statement or representation in this application is a violation of Chapters 373 and 837, F.S.

Scott H. Martin, P.E. — Signature of Applicant or Agent — 4-25-94

Type/Printed Name of Applicant or Agent — Date

County Drainage Engineer

(Corporate Title if applicable)

AN AGENT MAY SIGN ABOVE IF THE APPLICANT COMPLETES THE FOLLOWING:

I hereby designate and authorize the agent listed above to act on my behalf, or on behalf of my corporation, as my agent in the processing of this application for a permit indicated above and to furnish, on request, supplemental information in support of the application. In addition, I designate and authorize the above listed agent to bind me, or my corporation, to perform any requirement which may be necessary to procure the permit indicated above. I am familiar with the information contained in this application, and to the best of my knowledge and belief, such information is true, complete and accurate. I understand that knowingly making any false statement or representation in this application to a violation of Chapters 373 and 837, F.S.

Volusia County Government — Signature of Applicant — 4-25-94

Typed/Printed Name of Applicant — Date

(Corporate Title if applicable)

PERSON AUTHORIZING ACCESS TO THE PROPERTY MUST COMPLETE THE FOLLOWING:

I certify to the St. Johns River Water Management District that I either own the property described in this application or I have legal authori. to allow access to the property, and that I consent to any necessary site visits being made on the property. I authorize representatives or personnel from the District to enter the property as many times as may be necessary to make these site visits. I agree to indemnify and defend the District for all liability that may occur from accessing the property including, but not limited to, actions for trespass.

Scott H. Martin, P.E. — Signature — 4-25-94

Typed/Printed Name — Date

County Drainage Engineer

(Corporate Title if applicable)

OPERATION AND MAINTENANCE:

I agree, or I agree on behalf of my corporation, to operate and maintain the permitted system in compliance with the provisions of Chapters 40C-1, 40C-4, and 40C-42, F.A.C. Responsibility for maintenance and operation may be transferred to another entity acceptable to tho District upon written notice by the District that the requirements of Chapter 40C-1, F.A.C., have been met, and that the entity proposed to assume responsibility for maintenance and operation in compliance with Chapters 40C-1, 40C-4, and 40C-42, F.A.C., has accepted the permit and agrees to operate and maintain the permitted system.

George Flack — Signature of Applicant — For G. Flack 4-25-94

Typed/Printed Name of Applicant — Date

Director of Road and Bridge

(Corporate Title if applicable)

Form Number 40C-1.181(2) Effective Date: 2/27/94

I. PROJECT DESCRIPTION

This public works project has been designed for the County of Volusia by Glace & Radcliffe, Inc. It consists of the construction of Normandy Boulevard from its existing terminus at North Firwood Drive to Howland Boulevard, along with reconstruction of the existing road from Arlene Drive to North Firwood Drive. A two lane paved section will be provided for the improvement of traffic flow and public safety, as well as to minimize maintenance.

The proposed typical section for the roadway consists of two 12 ft. lanes with 4 ft. shoulders. The remainder of the proposed 100 ft. right-of-way will consist of retention swales, designed to treat the first flush of runoff from the pavement. Runoff exceeding the first flush criteria is diverted through a system of roadside swales and cross drains to one of several depressional "retention" areas that store excess runoff and allow time for infiltration.

The following sections provide pertinent information concerning the Stormwater Management System in support of the application to the St. Johns River Water Management District for compliance with FAC 40C-42 as well as the Volusia County Stormwater Ordinance. Completed permit application forms and calculations supporting the design of the Flood Protection and Water Quality Control Systems, are contained in the Appendices.

II. PROJECT SITE INFORMATION

A. Location

The portion of Normandy Boulevard to be constructed lies east of Orange City and north of Deltona in Volusia County, Florida. The project is located in Section 7 of Township 18S, Range 30E just east of Interstate 4. Location maps are shown in Figure 1 of the report and in the construction drawings. Except for the existing portion of Normandy Boulevard, from Arlene Drive to North Firwood Drive, the project corridor is presently undeveloped. The limits of construction are shown on the construction drawings. The total project area is 18.4 acres, of which 5.8 acres is impervious.

B. Topography

The topography along the Normandy Boulevard corridor can be considered "hilly", with elevations ranging from 92 ft. NGVD to 50 ft. NGVD. The area is characterized by high, sandy ridges and large, "bowl-like" depressions that retain stormwater runoff. A map of topography (source: USGS Quadrangle Orange City, Fla. 1964) is provided as Figure 2.

In order to properly design the roadway construction project, detailed topographic information was necessary for the area in close proximity to the limits of construction. Field surveys supplied that data. Detailed cross sections are shown in the construction drawings.

COUNTY OF VOLUSIA
JUN 0 1 1989
RECEIVED ENGINEERING

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

Henry Dean, Executive Director
Mildred G. Horton, Assistant Executive Director
John R. Wehle, Assistant Executive Director

POST OFFICE BOX 1429 • PALATKA, FLORIDA 32078-1429
904/328-8321

☐ 2133 N. Wickham Rd.
Melbourne, FL 32935-8109
(407) 254-1761

☐ 7775 Baymeadows Way
Suite 102
Jacksonville, FL 32256
(904) 730-6270

☐ 618 E. South St.
Orlando, FL 32801
(407) 894-5423

COUNTY OF VOLUSIA - PUBLIC WORKS
123 W. INDIANA AVE
DELAND, FL 32720

RE: Permit # 42-127-1035~~HG~~ ANGE

Proj # 1553 Normandy Blvd (Forward to Howland)

Enclosed is your stormwater permit as authorized by the staff of the St. Johns River Water Management District on MAY 29, 1989.

This permit is a legal document and should be kept with your other important documents. The attached Completion Report should be filled in and returned to the Palatka office within thirty days after the work is completed. By so doing, you will enable us to schedule a prompt inspection of the permitted activity.

In addition to the completion report, your permit also contains conditions which require submittal of additional information. All information submitted as compliance to permit conditions must be submitted to the Palatka office address.

Permit issuance does not relieve you from the responsibility of obtaining permits from any federal, state, and/or local agencies asserting concurrent jurisdiction for this work.

In the event you sell your property, the permit will be transferred to the new owner, if we are notified by you within ninety days of the sale. Please assist us in this matter so as to maintain a valid permit for the new property owner.

Thank you for your cooperation and if this office can be of any further assistance to you, please do not hesitate to contact us.

Sincerely,

Dannise Kemp

Dannise T. Kemp, Director
Division of Records

DTK:pb

Enclosures: Permit with Completion Report

cc: District Permit File
GLACE & RADCLIFFE, INC.
ATTN: CHARLES GREIF
800 SOUTH ORLANDO AVE
MAITLAND, FL 32751

JOHN L. MINTON, Chairman - Vero Beach
KELLEY R. SMITH, JR., Vice Chairman - Palatka
SAUNDRA H. GRAY, Secretary - DeBary
RALPH E. SIMMONS, Treasurer - Fernandina Beach
VAL M. STEELE, Melbourne Beach
THOMAS L. DURRANCE, Holly Hill
JOE E. HILL, Leesburg
SAM L. SWETT, Jacksonville
ALICE J. WEINBERG, Longwood

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

Post Office Box 1429
Palatka, Florida 32078-1429

PERMIT NO. 42-127-1035NG DATE ISSUED MAY 29, 1989

A PERMIT AUTHORIZING:

A NEW DISCHARGE FACILITY CONSISTING OF RETENTION AND SWALE TO SERVE NORMANDY BLVD.EXTENSION, A 18.4 ACRE PROJECT TO BE CONSTRUCTED AS PER PLANS RECEIVED BY THE DISTRICT ON 5/4/89.

LOCATION:

Section 07, Township 18 South, Range 30 East
Volusia County

ISSUED TO:
(owner)

COUNTY OF VOLUSIA - PUBLIC WORKS
123 W. INDIANA AVE
DELAND, FL 32720

Permittee agrees to hold and save the St. Johns River Water Management District and its successors harmless from any and all damages, claims, of liabilities which may arise from permit issuance. Said application, including all plans and specifications attached thereto, is by reference made a part hereof.

This permit does not convey to permittee any property rights nor any rights or privileges other than those specified herein, nor relieve the permittee from complying with any law, regulation or requirement affecting the rights of other bodies or agencies. All structures and works installed by permittee hereunder shall remain the property of the permittee.

This Permit may be revoked, modified or transferred at any time pursuant to the appropriate provisions of Chapter 373, Florida Statutes:

PERMIT IS CONDITIONED UPON:

See Conditions on Attached "Exhibit A", dated MAY 29, 1989

AUTHORIZED BY: St. Johns River Water Management District

Department of Resource Management Governing Board

"EXHIBIT A"

CONDITIONS FOR ISSUANCE OF PERMIT NUMBER 42-127-1035NG

COUNTY OF VOLUSIA - PUBLIC WORKS

DATED MAY 29, 1989

1. ALL SIDE SLOPES AND DISTURBED AREAS MUST BE SEEDED AND MULCHED OR SODDED WITHIN 30 DAYS OF CONSTRUCTION.

2. THOSE CONDITIONS AS AGREED UPON IN SECTION II OF THE APPLICATION.

3. THIS PERMIT FOR CONSTRUCTION WILL EXPIRE FIVE YEARS FROM THE DATE OF ISSUANCE.

4. THE PROPOSED STORMWATER MANAGEMENT SYSTEM MUST BE CONSTRUCTED AS PER PLANS RECEIVED BY THE DISTRICT ON 5/4/89.

5. ALL SWALE AND RETENTION BASIN SIDE SLOPES MUST BE SODDED OR SEEDED AND MULCHED WITHIN 30 DAYS FOLLOWING THEIR COMPLETION AND A SUBSTANTIAL VEGETATION COVER MUST BE ESTABLISHED WITHIN 30 DAYS OF SEEDING.

6. PERMANENT VEGETATIVE COVER MUST BE ESTABLISHED ON ALL EXPOSED LAND SURFACES WITHIN ONE YEAR FROM THE DATE OF THE CONSTRUCTION IS COMPLETE.

7. ALL STORMWATER TREATMENT FACILITIES AND ASSOCIATED CONTROL STRUCTURES MUST BE CONSTRUCTED PRIOR TO ANY STRUCTURAL BUILDING CONSTRUCTION OR PLACEMENT OF ANY PAVEMENT. ADEQUATE MEASURES MUST BE TAKEN DURING CONSTRUCTION TO PREVENT SILTATION OF THESE TREATMENT FACILITIES AND CONTROL STRUCTURES DURING CONSTRUCTION.

8. THE ISSUANCE OF THIS PERMIT DOES NOT RELIEVE THE APPLICANT OF THE RESPONSIBILITY TO OBTAIN ANY AND ALL OTHER REQUIRED LOCAL, STATE AND FEDERAL PERMITS.

9. THE PERMITTEE MUST REQUIRE THE CONTRACTOR TO REVIEW AND TO MAINTAIN IN GOOD CONDITION AT THE CONSTRUCTION SITE A COPY OF THIS PERMIT COMPLETE WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND PERMIT MODIFICATIONS ISSUED FOR THIS PERMIT. THE COMPLETE PERMIT COPY MUST BE AVAILABLE FOR REVIEW UPON REQUEST BY DISTRICT REPRESENTATIVES.

10. ALL CONSTRUCTION, OPERATION AND MAINTENANCE SHALL BE AS SET FORTH IN THE PLANS, SPECIFICATIONS AND PERFORMANCE CRITERIA AS APPROVED BY THIS PERMIT.

11. DISTRICT AUTHORIZED STAFF, UPON PROPER IDENTIFICATION, WILL HAVE PERMISSION TO ENTER, INSPECT AND OBSERVE THE SYSTEM TO INSURE CONFORMITY WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE PERMIT.

TURBIDITY BARRIERS MUST BE INSTALLED AT ALL LOCATIONS WHERE THE POSSIBILITY OF TRANSFERRING SUSPENDED SOLIDS INTO THE RECEIVING WATERBODY EXISTS DUE TO THE PROPOSED WORK. TURBIDITY BARRIERS MUST REMAIN IN PLACE AT ALL LOCATIONS UNTIL CONSTRUCTION IS COMPLETED AND SOILS ARE STABILIZED AND VEGETATION HAS BEEN ESTABLISHED. THEREAFTER THE PERMITTEE WILL BE RESPONSIBLE FOR THE REMOVAL OF THE BARRIERS.

13. THE OPERATION PHASE OF THE PERMIT SHALL NOT BECOME EFFECTIVE UNTIL A FLORIDA REGISTERED PROFESSIONAL ENGINEER CERTIFIEDS THAT ALL FACILITIES HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE DISTRICT. WITHIN 30 DAYS AFTER COMPLETION OF CONSTRUCTION OF THE SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL SUBMIT THE CERTIFICATION OR ONE SET OF PLANS WHICH REFLECT THE SURFACE WATER MANAGEMENT SYSTEM AS ACTUALLY CONSTRUCTED AND NOTIFY THE DISTRICT THAT THE FACILITIES ARE READY FOR INSPECTION AND APPROVAL. UPON APROVAL OF THE COMPLETED SURFACE WATER MANAGEMENT SYSTEM, THE PERMITTEE SHALL REQUEST TRANSFER OF THE PERMIT TO THE RESPONISBLE ENTITY APPROVED BY THE DISTRICT.

14. IF ANY OTHER REGULATORY AGENCY SHOULD REQUIRE REVISIONS OR MODIFICATION TO THE PERMITTED PROJECT, THE DISTRICT IS TO BE NOTIFIED OF THE REVISIONS SO THAT A DETERMINATION CAN BE MADE WHETHER A PERMIT MODIFICATION IS REQUIRED.

15. WITHIN THIRTY (30) DAYS AFTER SALE OR CONVEYANCE OF THE PERMITTED SURFACE WATER MANAGEMENT SYSTEM OR THE LAND ON WHICH THE SYSTEM IS LOCATED, THE OWNER IN WHOSE NAME THE PERMIT WAS GRANTED SHALL NOTIFY THE DISTRICT OF SUCH CHANGE OF OWNERSHIP. TRANSFER OF THIS PERMIT SHALL BE IN ACCORDANCE WITH THE PROVISIONS OF CHAPTER 373, FLORIDA STATUTUES, AND CHAPTERS 40C-4, 40C-40, AND 40C-41, FLORIDA ADMINISTRATIVE CODE. ALL TERMS AND CONDITIONS OF THIS PERMIT SHALL BE BINDING UPON THE TRANSFEREE.

fal

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
NOTICE OF RECEIPT OF APPLICATION

Pursuant to Section 373.413, Florida Statutes, and Chapter 40C-4, Florida Administrative Code, the applicant is required to provide the following information for the purpose of public notice. **Failure to provide all information will result in an incomplete application. This information is in addition to that required in other portions of the application form. Five** copies of this form and all attachments must be submitted.

This section to be completed by the applicant:

RECEIVED
APR 28 1994
RECORDS
ORLANDO

Project Name: Normandy Blvd. Extension (Firwood Dr. to Howland Blvd.)

County: Volusia County

Owner: Volusia County Government

Applicant: See owner

Applicant's Address: Dept. of Engineering 123 W. Indiana Ave., Deland, FL 32720-4262
Attn: Scott Martin

1. Attach a location map, showing the boundary of the proposed activity and its relationship to any other portions of the project. Map size must be no larger than 11" by 17" referenced to Section, Township, and Range. Map scale must be 1"=2000' (plot on USGS quad maps).
   Attach multiple sheets, if necessary.
2. Attach a depiction (plan) of the work, works, dams, impoundments, stormwater management systems, or other regulated facilities proposed to be constructed under the permit. Depiction size must be no larger than 11" by 17". Depiction scale should be sufficient to show location and type of works (at least 1"=2000', plot on USGS quad). Attach multiple sheets, if necessary.
3. Specify acreage of wetlands, if any, that are proposed to be disturbed, filled, excavated, or otherwise impacted by the proposed surface water management system: N/A
4. Provide a brief statement describing any wetland mitigation proposed to be undertaken (attach additional sheets it necessary): N/A
5. Provide the names of all streams, lakes, wetlands, or other watercourses that are proposed to be impounded, diverted, drained, discharged into (either directly or indirectly), or otherwise impacted by the proposed activity:
   N/A
6. Indicate the source of any water to be contained on site: Stormwater from Road R/W
   the volume of water to be contained on site: 26.89 (acre-feet);
   the use to be made of the water and any other limitation thereon: Percolation and evapotranspiration. No outfall.

This section will be completed by the District. (94)

Application Number: 42-127 ~~1035~~ ANBE

Date of hearing, if any: N/A

Earliest possible date for agency action: 5-26-94

Date to be posted: 5-3-94 Date to be removed: 5-17-94

Written objections must be filed by: May 17, 1994

Persons interested in the above described application should contact the St. Johns River Water Management District at P. O. Box 1429, Palatka, Florida 32178-1429, or in person at its office on State Highway 100 West, Palatka, Florida, 904/329-4500. Written objections to the application may be made no later than the date specified above. Written objections should identify the objector by name and address, and fully describe the nature of the objection to the application. All timely filed written objections will be presented to the Board for consideration prior to the Board taking action on the application. Filing a written objection does not entitle one to a Chapter 120, Florida Statutes, administrative hearing. Only those persons whose substantial interests are affected by the application and who file a petition meeting the District's requirements after receipt of notice of intended action or final action may obtain an administrative hearing (see Section 40C-1.511, F.A.C.). The requirements relating to timing and content of such petitions are set forth in Chapter 40C-1, F.A.C., Parts I and V.

Form Number 40C-1.181(2) Effective Date: 2/27/94

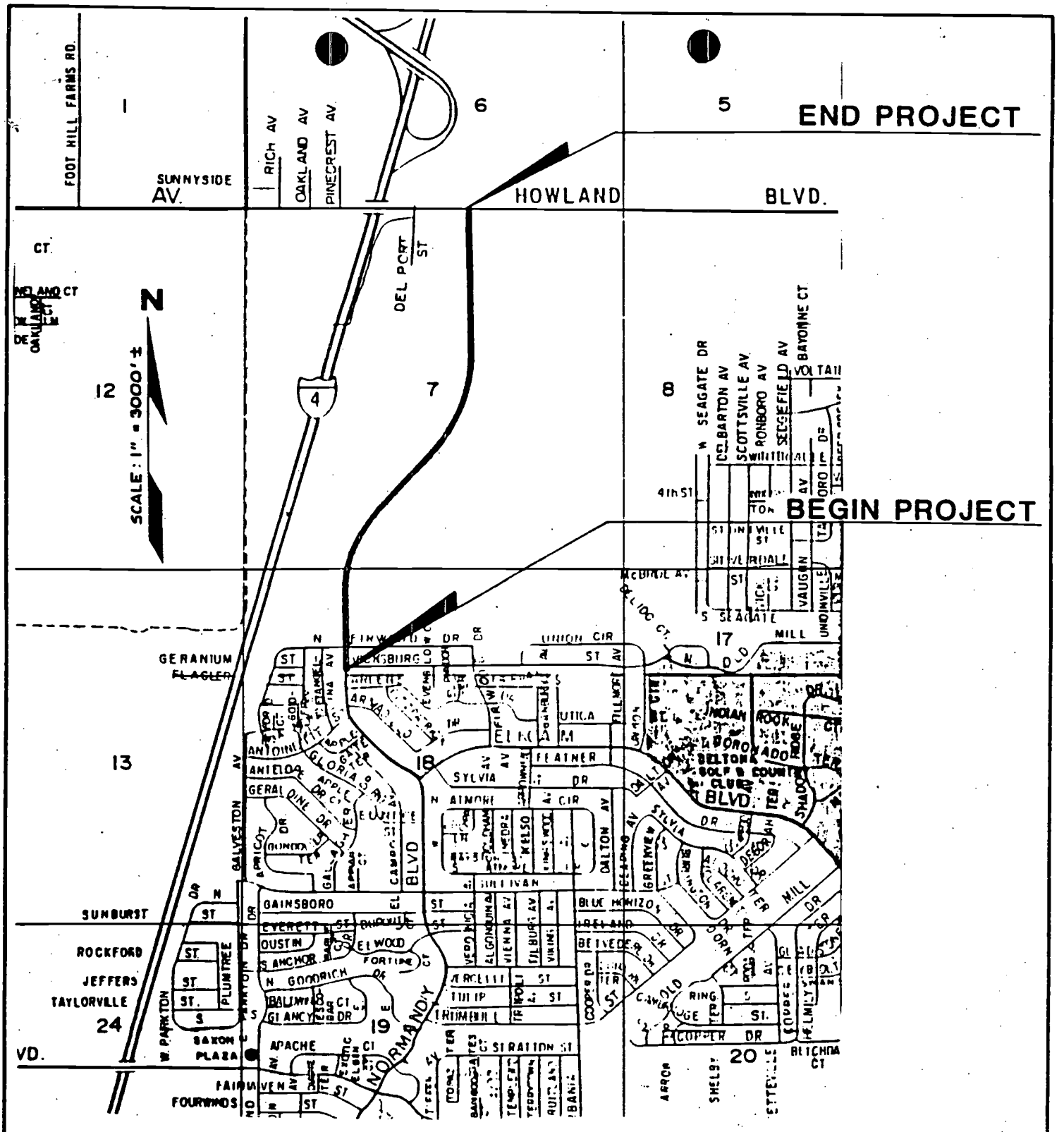


FIGURE 1

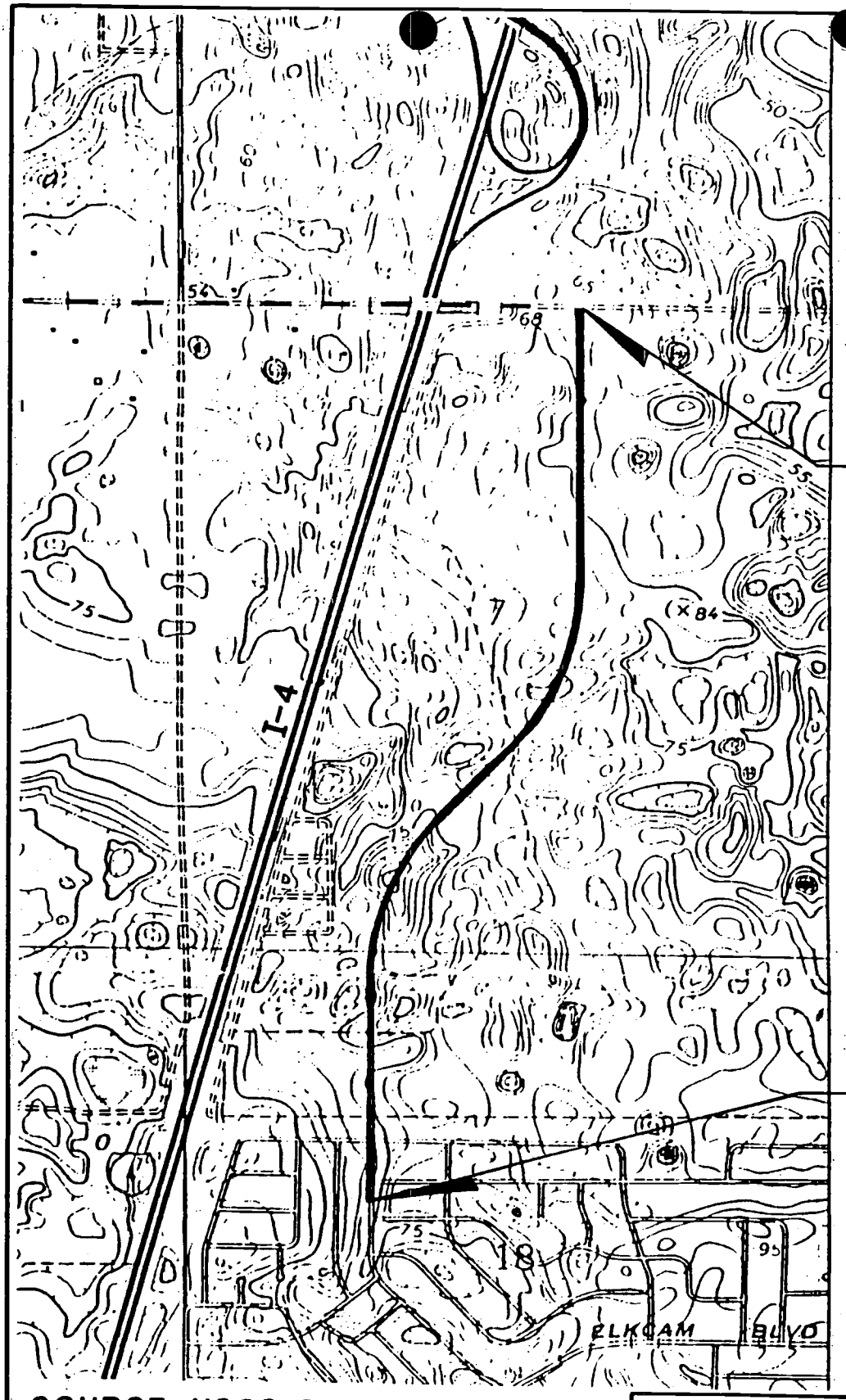
LOCATION MAP

NORMANDY BOULEVARD

VOLUSIA COUNTY, FLORIDA

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

E386



SOURCE: USGS QUADRANGLE
ORANGE CITY, FLORIDA 1964

FIGURE 2

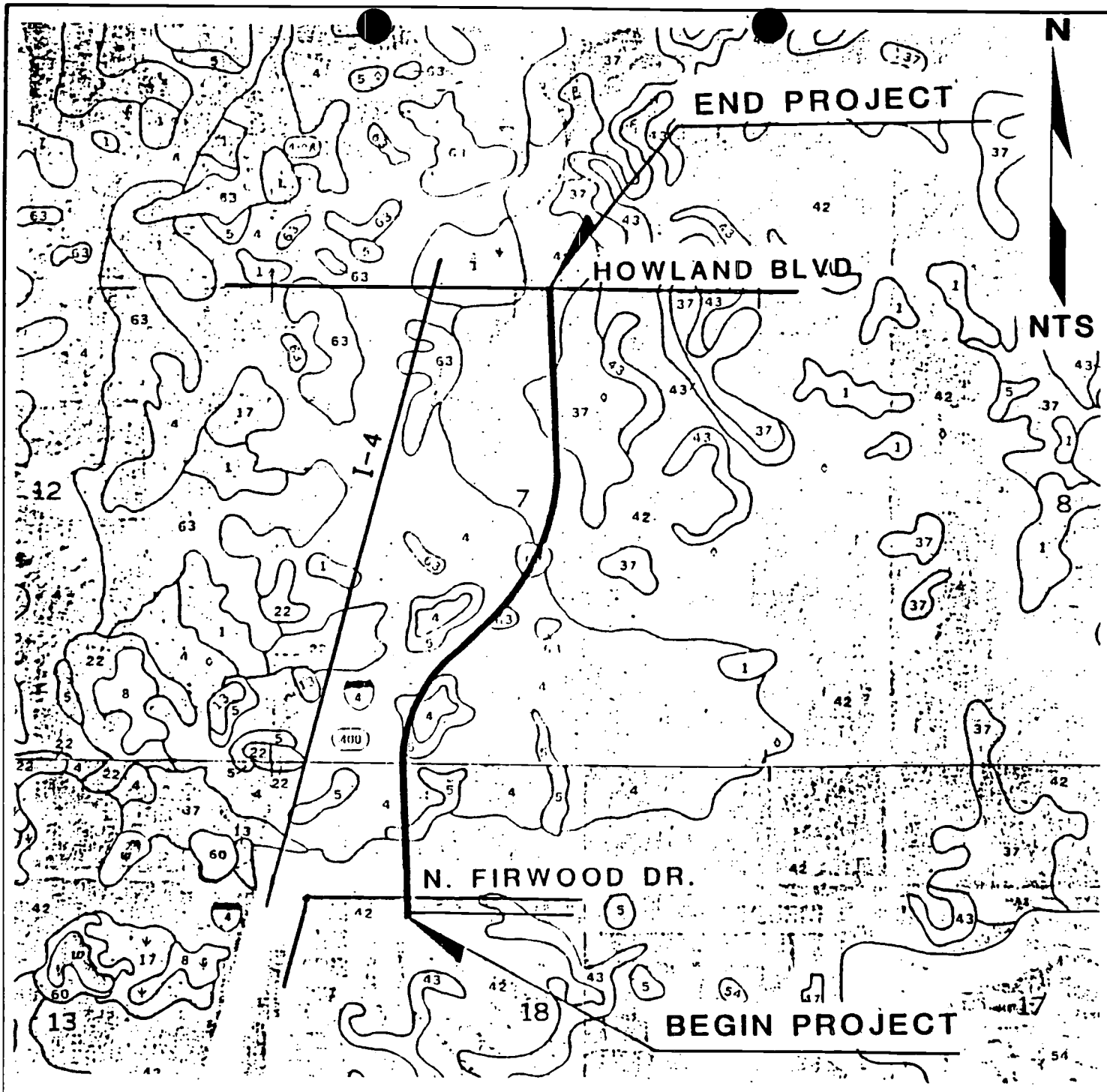
TOPOGRAPHIC MAP

NORMANDY BOULEVARD

VOLUSIA COUNTY, FLORIDA

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

E387



LEGEND

4-ASTATULA FINE SAND (0-8% SLOPES)
5-ASTATULA FINE SAND (8-17% SLOPES)
37-ORSINO FINE SAND (0-5% SLOPES)
42-PAOLA FINE SAND (0-8% SLOPES)
63-TAVARES FINE SAND(0-5% SLOPES)

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

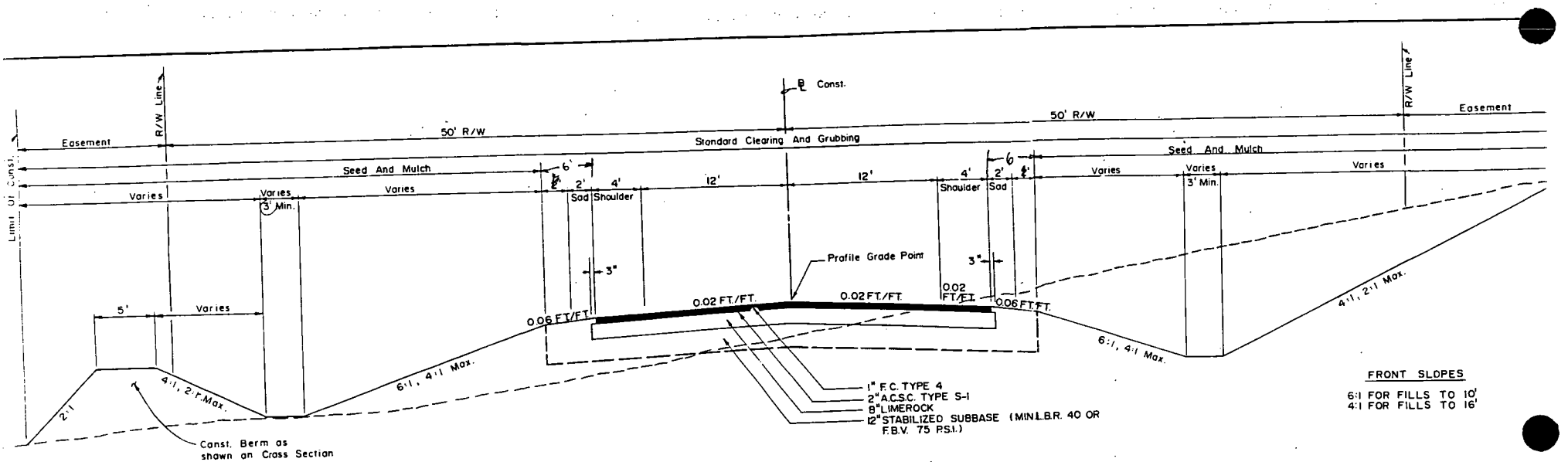
FIGURE 3

SOILS MAP

NORMANDY BOULEVARD

VOLUSIA COUNTY, FLORIDA

E388



FRONT SLOPES

6:1 FOR FILLS TO 10'
4:1 FOR FILLS TO 16'

TYPICAL SECTION

NORMANDY BOULEVARD

ADMINISTRATIVE APPLICATION PROCESSING SHEET

Application Number: ~~42-127-1095ANGE~~ 42-127-1035ANGE Reviewer(s): OTTESEN MILLER

Date Received: 4/28/94

Applicant: VOLUSIA COUNTY GOVERNMENT

APPLICATION DATA ENTRY INFORMATION:

FILE	DATE	INITIALS
Main	5/6	JB
Address		
Fee **		

COMMENTS: _____

** Fee is entered during the Electronic Assignment Sheet Process.

APPLICATION
1719

R.BROWN G.COOK R.OTTESEN L.GORE C.PONTELLO D. DYCUS

A. BAGGETT F. ZANGANEH W. PACHECO P. JENNINGS B. PURCELL

APPLICATION ASSIGNMENT SHEET

DATE APPLICATION RECEIVED: 5/3/89 DATE: 5/5/89

APPLICATION NUMBER: 42-124.1035-ANC

OWNER: Co of Volusia Public Works

CONSULTANT/ENGINEER: Glace & Radcliffe, Inc.

PROJECT NAME: Normandy Blvd. Ext.

TYPE OF APPLICATION: ✓ GENERAL _____ INDIVIDUAL

✓ New ____ Modification(M) ____ Extension ____ Expired(F)

THE FOLLOWING INFORMATION IS NEEDED TO ADMINISTRATIVELY COMPLETE THIS APPLICATION:

____ SIGNATURE

____ STATEMENT ENUMERATING ENTITY RESPONSIBLE FOR MAINTENANCE A40C-42.027U

____ BLUEPRINT(S) WITH PROFESSIONAL ENGINEER SEAL
INDIVIDUAL REQUIRES FOUR (4) BLUEPRINTS (3) REC'D

____ DESIGN CALCULATIONS 3 REC'D
INDIVIDUAL REQUIRES FOUR (4) SETS DESIGN CALCULATIONS

____ WRITTEN CONSENT FROM OWNER OF THE PERMITTED OR EXEMPT SYSTEM IF AN EXISTING SYSTEM IS TO BE USED A40C-42.035(1)(a)U

____ ADEQUATE MAP COORDINATES

FEE: $100.00 (LESS 1 ACRE) $250.000 (MORE 1 ACRE)

RECEIPT # NR

COMMENTS: Janet brought this from Melbourne

APPLICATION IS ADMINISTRATIVELY COMPLETE/INCOMPLETE.

REQUEST FOR ADDITIONAL INFORMATION MUST BE MAILED BY 5/31/89

IF THIS APPLICATION IS DETERMINED TO BE COMPLETE, THE PERMIT MUST BE ISSUED NO LATER THAN: 5/31/89.

RESPONSE: (RETURN TO SENIOR RECORD TECHNICIAN)

DATE APPLICATION WAS TECHNICALLY COMPLETE: _____

IF THIS APPLICATION IS AN INDIVIDUAL SCHEDULE FOR _____ REGULATORY MEETING AS AN APPROVAL/DENIAL.

COMMENTS: _____

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
800 S. Orlando Ave. Maitland, FL 32751 (407) 647-6623
Mail To: P.O. Box 1180 Winter Park, FL 32790-1180
(407) 647-6623
FAX #(407) 539-0575

LETTER OF TRANSMITTAL

RECEIVED
MAY 03 1989
42-127-1035AWG
RECORDS
MELBOURNE

DATE	JOB NO.
5/1/89	87524

ATTENTION Perry Jennings

Normandy Boulevard

TO Perry Jennings
2133 Wickham Road
Melbourne, Florida 32935-8109

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☒ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☒ Drainage Calcs & Permit Applications

COPIES	DATE	NO.	DESCRIPTION
3 sets			Prints
3 sets			Drainage Calculations
3 sets			SJRWMD Permit Applications

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19_____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED: A. Clint T. Hormis

E393

PRODUCT 240-3 NEBS Inc., Groton, Mass. 01471.

If enclosures are not as noted, kindly notify us at once. Al Hormis, E.I.

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

RECEIVED
MAY 03 1989
RECORDS
MELBOURNE

MAIL TO:
ST. JOHNS RIVER WATER MGT. DIST.
RECORDS DIVISION
PO BOX 1429
PALATKA, FL 32078-1429

APPLICATION NO. 42-127-1035ANG
FEE RECEIVED N/R
ASSIGNED REVIEWER

Please type or print. Read ALL instructions on the back of this sheet.

OWNER

(1) NAME OF OWNER County of Volusia - Public Works
ADDRESS 123 W. Indiana Avenue
CITY DeLand COUNTY Volusia
STATE FL ZIP CODE 32720-4262 TELEPHONE NO. (904) 736-2700

APPLICANT

(2) NAME OF APPLICANT Same as No. 1
ADDRESS
CITY COUNTY
STATE ZIP CODE TELEPHONE NO. ( )

CONSULTANT OR ENGINEER

(3) NAME OF FIRM GLACE & RADCLIFFE, INC.
NAME OF FIRM CONTACT Charles E. Greif, P.E.
ADDRESS 800 South Orlando Avenue
CITY Maitland COUNTY Orange
STATE FL ZIP CODE 32751 TELEPHONE NO. (407) 647-6623

PROJECT INFORMATION

(4) COUNTY Volusia SECTION 7 TOWNSHIP 18S RANGE 30E
USGS TOPO QUAD MAP Orange City
ACREAGE OWNED OR CONTROLLED PROJECT ACREAGE
NAME OF PROJECT Normandy Boulevard Extension
DESCRIPTION OF PROJECT Construction of new 2 lane roadway from N. Firwood Drive to Howland Boulevard.
NAME(S) OF SURFACE WATERS INTO WHICH STORMWATER WILL BE DISCHARGED
N/A

(5) THE DISCHARGE FACILITY IS:
X A NEW STORMWATER DISCHARGE FACILITY
____ A NEW DISCHARGE POINT FROM AN EXISTING STORMWATER DISCHARGE FACILITY.
____ PART OF AN ENLARGEMENT OR OTHER MODIFICATION OF AN EXISTING STORMWATER DISCHARGE FACILITY-PERMIT/FILE NO.
____ A NEW REGIONAL STORMWATER DISCHARGE FACILITY

(6) DER PERMITS FOR THIS PROJECT HAVE BEEN:
DENIED N/A DER NO. DATE
ISSUED N/A DER NO. DATE
PENDING N/A DER NO. DATE
EXEMPT N/A DER NO. DATE

GENERAL

7. INDICATE BELOW THE TYPE OF DEVELOPMENT PROPOSED AND PERCENTAGE OF IMPERVIOUS AREA.

	ACRES	%IMPERVIOUS
____ RESIDENTIAL	____	____
____ RECREATIONAL	____	____
____ COMMERCIAL	____	____
____ INDUSTRIAL	____	____
____ AGRICULTURAL	____	____
____ OTHER	____	____

8. TYPE OF TREATMENT PROPOSED (CHECK MORE THAN ONE IF APPLICABLE)

X RETENTION
____ RETENTION WITH FILTRATION
____ EXFILTRATION TRENCH
____ UNDERDRAIN
____ SWALES
____ OTHER:

E394

9. ON-SITE AREA CONTRIBUTING RUNOFF _____ 10. OFF-SITE AREA CONTRIBUTING RUNOFF _____ 11. POST-DEVELOPMENT RUNOFF COEFFICIENT _____ 12. WATER TABLE ELEVATIONS: SEASONAL HIGH _____ SEASONAL LOW _____ 13. PERMEABILITY ON IN-SITU SOILS 47-57 ft/day 14. PERMEABILITY WAS OBTAINED FROM WHAT METHOD OR SOURCE?
Field vertical permeability tests

EXCAVATION & FILLING

15. TRENCH WIDTH N/A LENGTH N/A DEPTH N/A 16. PIPE DIAMETER N/A
17. FILLABLE POROSITY OF TRENCH BACK FILL N/A
18. TIME TO RECOVER TRENCH VOLUME N/A (PROVIDE DRAWDOWN CALCULATIONS)
19. DOES THIS SYSTEM INCLUDE (CHECK IF APPROPRIATE):
____ a) TRENCHES ONLY (NO OUTFALL)
____ b) TRENCHES WITH EVENTUAL OUTFALL. CONTROL ELEVATION _____
____ c) TRENCHES OUTFALLING TO RETENTION/DETENTION PONDS
____ d) INLET SUMPS
20. DESCRIBE MAINTENANCE: N/A

UNDERDRAINS

21. PIPE LENGTH N/A SLOPE N/A DIAMETER N/A MIN. INVERT N/A
22. ATTACH A FILTER MEDIA GRADATION AND UNDERDRAIN DETAIL. 23. PERMEABILITY OF FILTER MEDIA N/A 24. UNIFORMITY COEFFICIENT OF FILTER MEDIA N/A 25. EFFECTIVE GRAIN SIZE DIAMETER ($0.2mm < D_{10} < 0.55mm$) N/A 26. MAXIMUM FLOW IN PIPE N/A 27. TAILWATER ELEVATION N/A
28. DRAWDOWN TIME N/A (ATTACH CALCULATIONS)
29. DESCRIBE MAINTENANCE: N/A

SWALES

30. SWALE LENGTH varies WIDTH 18 ft. DEPTH 1.5 ft. SIDESLOPES 6:1 Front 4:1 Back
31. SWALES ARE ____ OPEN x SEGMENTED BY SWALE BLOCKS.
32. TIME OF CONCENTRATION N/A 33. RAINFALL INTENSITY FOR 3-YEAR, 1-HOUR STORM N/A OBTAINED FROM WHAT SOURCE? N/A
34. VOLUME OF INFLOW 1.67 cf/1.f 35. PEAK RATE OF INFLOW N/A
36. RATE OF PERCOLATION 26 ft/day 37. TIME TO PERCOLATE 80% OF 3-YEAR, 1-HOUR RUNOFF VOLUME N/A (ATTACH CALCULATIONS).

POND SYSTEMS

38. ATTACH INCREMENTAL STAGE-STORAGE TABULATION FOR ALL PONDS.
39. Swales ~~PONDS~~ ARE ____ DETENTION x RETENTION ____ RETENTION/DETENTION
40. CONTROL ELEVATION Varies 41. SKIMMER PROVIDED? No
42. BOTTOM ELEVATION OR DESIGN NORMAL WATER Varies
43. PONDS ARE DESIGNED FOR _____ YEAR, _____ HOUR STORM.
44. FREEBOARD PROVIDED _____ FOR DESIGN STORM. 45. IF NO UNDERDRAINS, DRAWDOWN TIME FOR NATURAL PERCOLATION Varies, See calculations Appendix B (ATTACH CALCULATIONS).

MAINTENANCE

46. DESCRIBE OVERALL MAINTENANCE AND OPERATION SCHEDULE FOR THE PROPOSED STORMWATER TREATMENT FACILITY: County Maintenance; when swales show signs of standing water, backflush with cleanouts. Remove debris from culvert entrances.

CHAPTER 40C-42 STORMWATER MANAGEMENT

I. GENERAL PERMIT CATAGORY (CHECK ONE)

A.____ Facilities which discharge into a stormwater discharge facility which is permitted pursuant to Section 40C-42.041 or Section 40C-42.035 (1)(b) or (d), F.A.C., or which was previously approved pursuant to a noticed exemption under Section 17-25.03 where the appropriate treatment criteria specified in this Chapter and applied to the permitted or exempt facility are not exceeded by the discharge;

B.✓ Facilities which provide retention, or detention with filtration, of the runoff from the first one inch of rainfall; or, as an option, for projects or project subunits which consist of less than 80% impervious surface with drainage areas less than 100 acres, facilities which provide retention, or detention with filtration, of the first one-half inch of runoff. However, facilities which directly discharge to Class I, Class II or Outstanding Florida Waters shall provide additional treatment pursuant to Section 40C-42.025(10), F.A.C., or,

C.____ Modification or reconstruction by a city, county, state agency or special district with drainage responsibility of an existing stormwater management system which is not intended to serve new development, and which will not increase pollution loading, or change points of discharge in a manner that would adversely affect the designated uses of waters of the state; or,

D.____ Factilities of stormwater management systems that include a combination of management practices including but not limited to retention that will provide for the percolation of the runoff from a three-year, one-hour design storm.

II. STATEMENTS BY APPLICANT

APPLICATION IS MADE FOR A PERMIT TO AUTHORIZE THE ACTIVITIES DESCRIBED HEREIN.

A. I understand I may have to provide any additional information/data that may be necessary to provide reasonable assurance or evidence to show that the proposed project will comply with the applicable State Water Quality Standards or other environmental standards both before construction and after the project is completed.

B. In addition, I agree to provide entry to the project site for inspectors with proper identification or documents as required by law from the environmental agencies for the purpose of making preliminary analysis of the site. Further, I agree to provide entry to the project site for such inspectors to monitor permitted work if a permit is granted.

C. Further, I hereby acknowledge the obligation and responsiblity for obtaining all of the required, state, federal, or local permits before commencement of construction activities.

D. The undersigned agrees to retain the design engineer registered in Florida, to conduct on-site observations of construction to ensure that the facility is constructed in accordance with the plans submitted to and approved by the St. Johns River Water Management District (District).

E. The operation phase of the permits shall not become effective until a Florida Registered Professional Engineer certifies that all facilities have been constructed in accordance with the design approved by the District. Within 30 days after completion of construction of the surface water management system, the permittee shall submit the certification or one set of plans which reflect the surface water management system as actually constructed and notify the District that the facilities are ready for inspection and approval. Upon approval of the completed surface water management system, the permittee shall request transfer of the permit to the responsible entity approved by the District.

I certifiy that I am familiar with the information contained in this application, and that to the best of my knowledge and belief such information is true, complete and accurate. I further certify that I possess the authority to undertake the proposed activities.

Thomas M. McClelland — Signature of Applicant

24 APR 89 — Date

NOTE: THIS APPLICATION MUST BE SIGNED by the person who desires to undertake the proposed activity or by an authorized agent. If an agent is applying on behalf of the applicant, attach proof or authority for the agent to sign and bind the applicant.

III. STATEMENT BY PERSON RESPONSIBLE FOR MAINTENANCE

The undersigned agrees to maintain and operate the discharge facilities in such a manner as to comply with the provisions of Chapter 40C-42, F.A.C.. Responsibility for maintenance and operation may be transferred to another entity upon written notice to the District from the undersigned and the entity assuming responsibility, certifying that the transfer of responsibility for maintenance and operation in compliance with Chapter 40C-42, F.A.C. has been accepted.

Thomas M. McClelland
Signature of the entity responsible for maintenance

THOMAS M.MCCLELLAND,ASSISTANT COUNTY MANAGER FOR PUBLIC WORKS
Name and Title (Please type)

123 W. INDIANA AVE,DELAND, FL.32720-4262
Address

24 APR 89
Date

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APPENDIX A	SUBSURFACE INVESTIGATION & EVALUATION
APPENDIX B	WATER QUANTITY CALCULATIONS
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APPENDIX D	SPECIFICATIONS FOR WATER QUALITY PROTECTION MEASURES DURING CONSTRUCTION

E398

E399

I. PROJECT DESCRIPTION

This public works project has been designed for the County of Volusia by Glace & Radcliffe, Inc. It consists of the construction of Normandy Boulevard from its existing terminus at North Firwood Drive to Howland Boulevard, along with reconstruction of the existing road from Arlene Drive to North Firwood Drive. A two lane paved section will be provided for the improvement of traffic flow and public safety, as well as to minimize maintenance.

The proposed typical section for the roadway consists of two 12 ft. lanes with 4 ft. shoulders. The remainder of the proposed 100 ft. right-of-way will consist of retention swales, designed to treat the first flush of runoff from the pavement. Runoff exceeding the first flush criteria is diverted through a system of roadside swales and cross drains to one of several depressional "retention" areas that store excess runoff and allow time for infiltration.

The following sections provide pertinent information concerning the Stormwater Management System in support of the application to the St. Johns River Water Management District for compliance with FAC 40C-42 as well as the Volusia County Stormwater Ordinance. Completed permit application forms and calculations supporting the design of the Flood Protection and Water Quality Control Systems, are contained in the Appendices.

II. PROJECT SITE INFORMATION

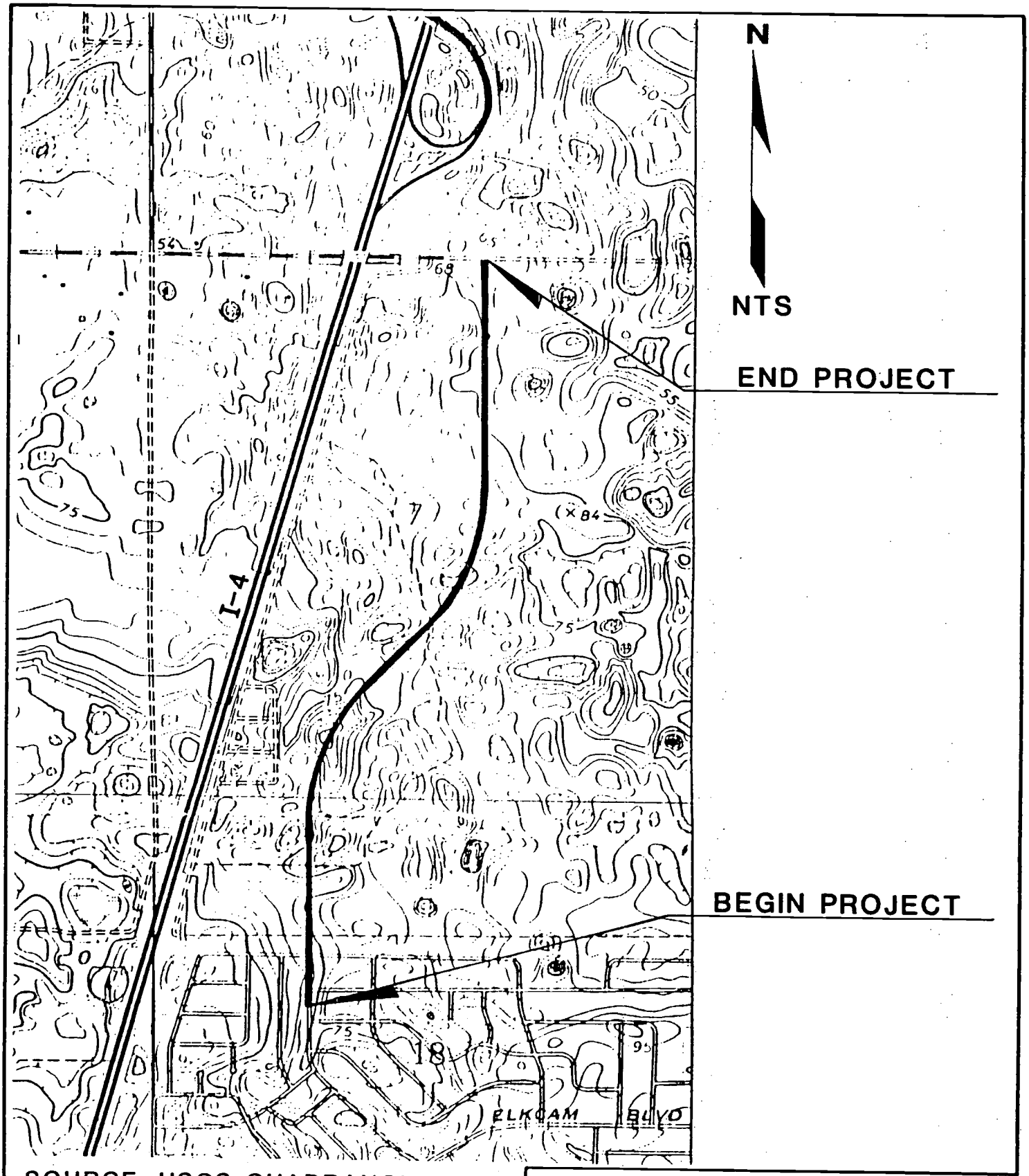
A. Location

The portion of Normandy Boulevard to be constructed lies east of Orange City and north of Deltona in Volusia County, Florida. The project is located in Section 7 of Township 18S, Range 30E just east of Interstate 4. Location maps are shown in Figure 1 of the report and in the construction drawings. Except for the existing portion of Normandy Boulevard, from Arlene Drive to North Firwood Drive, the project corridor is presently undeveloped. The limits of construction are shown on the construction drawings. The total project area is 18.4 acres, of which 5.8 acres is impervious.

B. Topography

The topography along the Normandy Boulevard corridor can be considered "hilly", with elevations ranging from 92 ft. NGVD to 50 ft. NGVD. The area is characterized by high, sandy ridges and large, "bowl-like" depressions that retain stormwater runoff. A map of topography (source: USGS Quadrangle Orange City, Fla. 1964) is provided as Figure 2.

In order to properly design the roadway construction project, detailed topographic information was necessary for the area in close proximity to the limits of construction. Field surveys supplied that data. Detailed cross sections are shown in the construction drawings.



SOURCE: USGS QUADRANGLE
ORANGE CITY, FLORIDA 1964

FIGURE 2

TOPOGRAPHIC MAP

NORMANDY BOULEVARD

VOLUSIA COUNTY, FLORIDA

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

E400

C. Soils

Surface soils of any particular area influence runoff rates and groundwater tables. The soils of the project area were field investigated in August, 1988. Profiles of soil borings and groundwater are depicted on sheet 24 of the construction Plans. Those borings indicate surface soils are composed mainly of gray and brown fine sands. The complete Subsurface Investigation & Evaluation: Proposed Normandy Boulevard Extension is included as Appendix A.

The soil borings are in agreement with the Volusia Soil Survey. A soils map, indicating the majority of soils are Paola fine sands and Astatula fine sands, is provided as Figure 3. These soils are excessively drained and occur on nearly level to sloping sandhills.

D. Vegetation

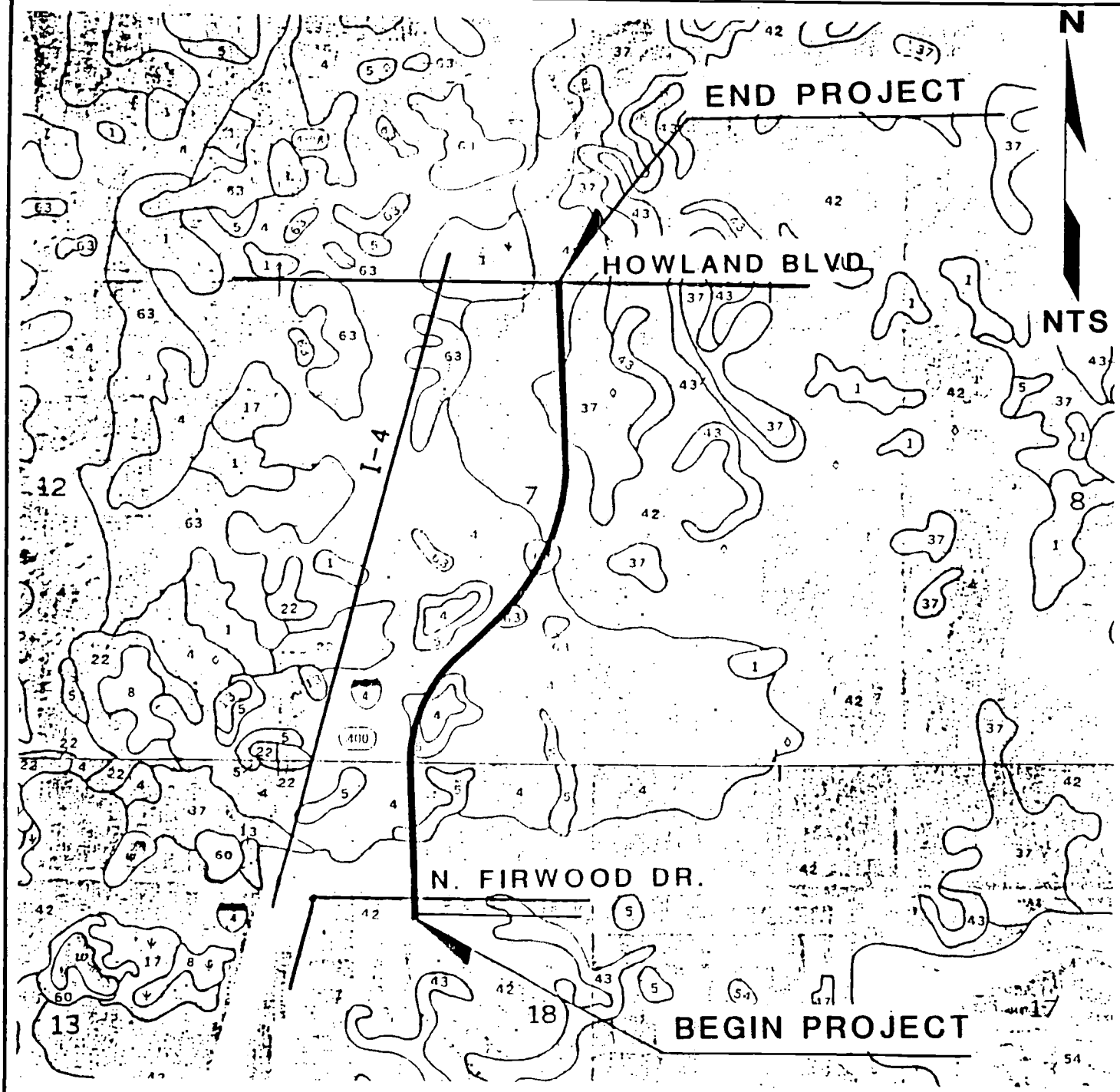
The vegetation along the Normandy Boulevard corridor, which may be characterized as xeric in nature, consists primarily of upland scrub oak, palmetto and short leaf pine stands. The southern portion of the project is dominated by short leaf pine stands, with a shallow undergrowth of palmetto. The northern portion of the project, near Howland Boulevard, contains a thick undergrowth of palmetto and scattered upland scrub oak. No wetlands of any type are found within this corridor due to the low groundwater levels found in this area.

III. EXISTING HYDROLOGIC CONDITIONS

A small portion of the project is located within a residential subdivision. There are no water quality features associated with this subdivision. Stormwater runoff is collected in existing catch basins and diverted westward towards Interstate 4. The remainder of the project is located in an undeveloped, wooded corridor. The rolling topography of this corridor creates many small drainage basins. Under major storm events, runoff waters are collected in isolated "bowl-like" depressions. In many cases, stormwater runoff does not leave these drainage basins, as the depressions provide sufficient storage for the most extreme storm events. If stormwater runoff does leave the drainage basin, it generally sheetflows along the relatively steep slopes found within the corridor. Runoff potential is also reduced by the high permeability rates associated with the soils of this region.

IV. PROJECT CONDITION STORMWATER MANAGEMENT SYSTEM

The proposed roadway construction will provide a stormwater management system in compliance with FAC 40C-42, the Volusia County Stormwater Ordinance and standard engineering practices. A system of roadside swales will be constructed for water quality enhancement of the first flush of roadway runoff. Although this report refers to the water quality enhancement system as roadside swales, they are actually roadside retention basins, and have been designed utilizing the 40C-42 criteria for Retention Systems. Due to the existing topography, a system of ditch weirs will be utilized to retain the first flush volume and allow time for infiltration. Runoff exceeding the water quality volume overtops this system of ditch weirs and progresses to its appropriate outfall. The following sections describe the design methodologies utilized to ensure adequate water quality treatment and flood control.



LEGEND

4-ASTATULA FINE SAND (0-8% SLOPES)
5-ASTATULA FINE SAND (8-17% SLOPES)
37-ORSINO FINE SAND (0-5% SLOPES)
42-PAOLA FINE SAND (0-8% SLOPES)
63-TAVARES FINE SAND(0-5% SLOPES)

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

FIGURE 3

SOILS MAP

NORMANDY BOULEVARD

VOLUSIA COUNTY, FLORIDA

E402

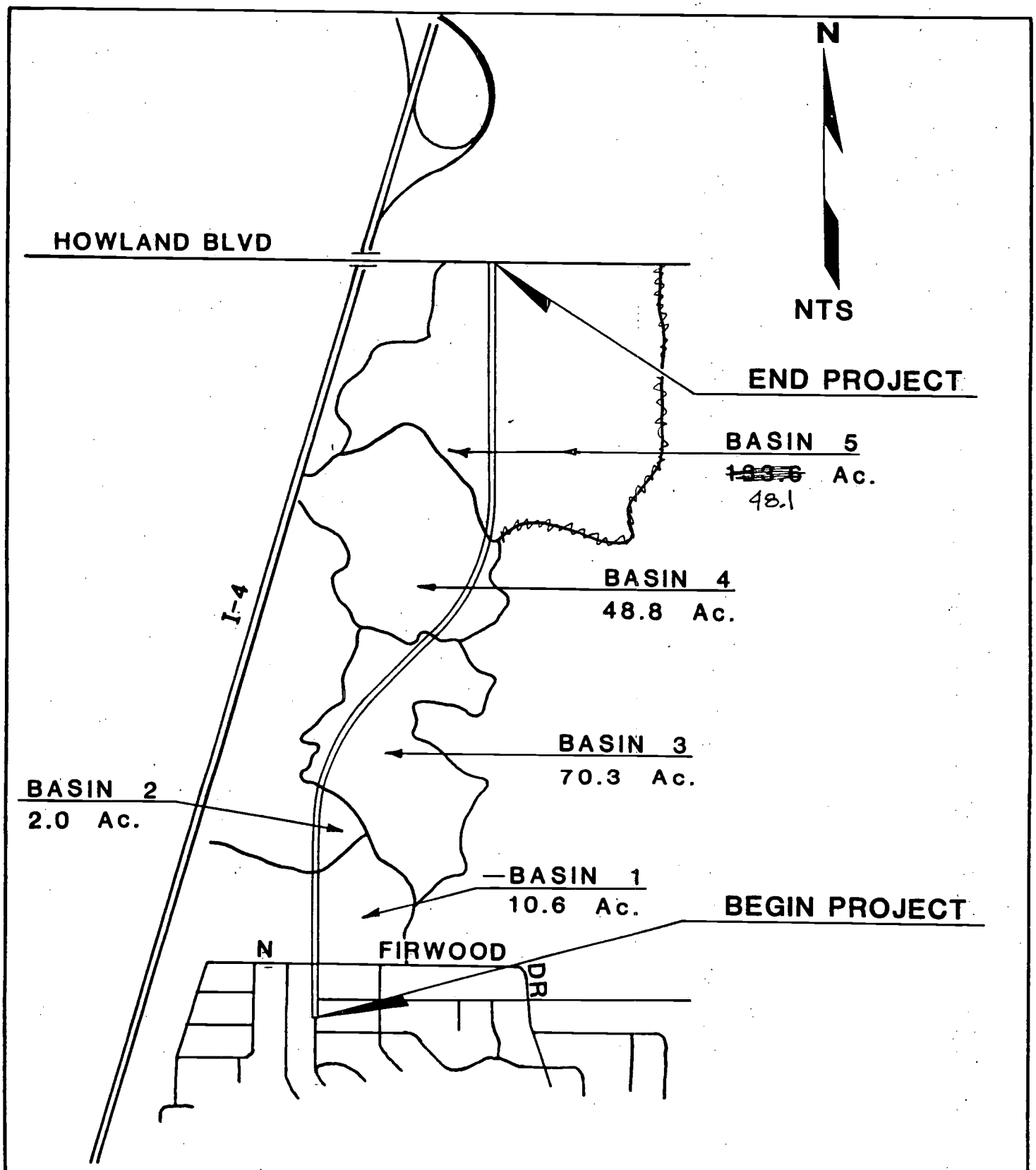


FIGURE 4

EXISTING DRAINAGE BASINS

NORMANDY BOULEVARD

VOLUSIA COUNTY, FLORIDA

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

E403

A. Water Quality Enhancement System

The design of the roadside swales for water quality retention were constrained by several factors. The first constraint was that the swales provide 100% storage for the first 1" of rainfall or the first 1/2" of runoff, from the project. Typical sections provided unit runoff volumes that were used to calculate the required storage for a particular roadway segment. Another constraint on the design was that the storage depth was not to exceed 1.5 ft. Therefore, under the ideal first flush rainfall event, the water depth in these swales ranges from 1.5 ft., near ditch weirs, to 0 ft. at points upgrade from the weir. Swale cross-sectional area was also constrained since the typical section dictates a front slope of 6:1 and a back slope of 4:1. The back of sidewalk profile also controlled the design, since these elevations cannot be below the overflow elevation of the ditch weir for that particular segment. Otherwise, runoff exceeding the first flush volume will leave the right-of-way before overtopping the weir. The design calculations for water quality presented in Appendix B show the required storage and available storage for particular swale segments, which are separated by ditch weirs or high points along the swale profile. Some segments have a surplus of storage, and others have a deficit. The swale segments with storage deficits are designed to overtop the weir and allow excess runoff to be stored in the downstream swales that have extra volume. The swale system as a whole provides 19,668 cubic ft. of storage over and above the first flush volume. A final constraint on the roadside retention swales was that they again provide the capacity for the design treatment volume within 72 hours following a storm event. These calculations are also presented in Appendix B.

B. Flood Protection and Offsite Drainage

The Normandy Boulevard corridor can be divided into five (5) small drainage basins. In order to determine the effect of the proposed roadway on these basins, a hydrologic analysis was performed for each basin. The Volusia County Stormwater Ordinance requires that the discharge hydrograph produced for the developed site not exceed, in terms of peak flow and total volume, the hydrograph produced under existing conditions conditions for the twenty five (25) year frequency. It also requires that the peak discharge resulting from a twenty four (24) hour, one hundred (100) year frequency storm on the developed site not exceed the peak discharge for the existing conditions. Calculations showing that this stormwater management system is in compliance with this criteria are presented in Appendix C, and a brief description of each watershed under project conditions is presented below. The results are summarized in Table 2.

Basin #1 contains approximately 10.6 acres, and runoff waters presently sheetflow from east to west, passing through the project corridor. Under project conditions, this offsite runoff enters the roadway swale system and passes through a 24" R.C.P. This offsite runoff is diverted northward into the isolated depression of Basin #3, where it is completely retained.

Basin #2 has the same characteristics on Basin #1, but only contains 2.0 acres. Runoff waters presently sheetflow to the west, crossing the project corridor. Under project conditions, this offsite runoff will be collected in the roadside swale system and diverted northward into the isolated depression of Basin #3.

Basin #3 contains approximately 70.3 acres, and stormwater runoff is presently collected in a large, isolated depression. Construction of this portion of Normandy Boulevard will divide this large basin into two (2) smaller basins. An equalizer culvert will be placed near the bottom of this depression to allow hydraulic movement between the basins under major events. Since roadway fill will encroach upon portions of this depression, flood routings for both existing and project conditions were analyzed. Under the existing conditions, runoff from the entire 70.3 acre basin will be stored in this depression. The water surface elevation in this depression must exceed elevation 65.0 ft. NGVD before discharge, overland to the west, will occur. Under project conditions, some of this storage is removed, raising the water surface elevations in the depression. However, even under the 100 year, 24 hour storm event of 11 inches, the water surface elevation does not exceed the overflow of 65.0 ft. NGVD. Therefore, for the design storms considered, no runoff leaves the basin under project conditions. Purchase of sufficient right of way near this depression will be required to prevent future development below the design high water elevations established under project conditions.

Basin #4 contains approximately 48.8 acres, and runoff waters sheetflow easterly from Interstate 4 to Normandy Boulevard. Like Basin #3, this basin discharges into an existing isolated depression. Under existing conditions, stormwater runoff from major events is completely retained. However, construction of Normandy Boulevard will remove some of this existing storage, creating offsite discharge under project conditions. A small portion of Basin #4 (3.83 acres) to the east of the roadway will be isolated by the roadway berm. In order to allow stormwater runoff from this offsite area to be collected in the swale system, an 18" R.C.P. will be constructed. As for the western side of the basin, an overflow berm will be constructed to allow excessive offsite runoff to enter the proposed swale system. Upon entering the swales, runoff is diverted northward into Basin #5, where a positive outfall is provided.

Basin #5 is bounded on the west by Interstate 4, on the east by the proposed Normandy Boulevard, and on the north by Howland Boulevard. It contains 48.1 acres, and stormwater runoff sheetflows east to west under existing conditions. Under project conditions, this runoff is collected in the swale system and diverted northward. At the intersection of Normandy Boulevard and Howland Boulevard, a 30" R.C.P. provides a positive outfall for this stormwater runoff.

V. WATER QUALITY PROTECTION MEASURES DURING CONSTRUCTION

The contractor, during construction of this roadway, will be contractually required to provide erosion control and water quality protection, as set forth by the latest edition of the Florida Department of Transportation's Roadway and Traffic Design Standards and the contract Technical Provisions.

Those requirements will include, but not be limited to hay bales and silt curtains as well as dust and erosion control. Copies of the pertinent Technical Provision and Standard Specifications are contained in Appendix D. Those documents are part of the contractual obligations and, as such, will be strictly enforced by the Volusia County inspectors.

VI. OPERATION AND MAINTENANCE

The Stormwater Management System has been designed to be self operating with no moving parts and to require only minimum maintenance. The system will require periodic inspection of the culverts for blockage removal and cleaning, if necessary. The maintenance function will continue to remain the responsibility of Volusia County.

VII. INTERAGENCY COORDINATION

On Tuesday, August 16, 1988, a meeting was held in the Orlando offices of the St. Johns River Water Management District. Members of its staff and personnel from Glace & Radcliffe, Inc. met to review the District's permitting requirements for road construction. During this meeting, the conceptual drainage plan was reviewed. The proposed swale retention system was discussed, with respect to design requirements for compliance with Chapter 40C-42.

A 60% Review meeting for this project was held at the Volusia County Engineering Department on Thursday, October 13, 1988. The overall Stormwater Management System for the roadway was discussed, particularly the effects of this project on the offsite drainage areas. The requirements for compliance with the Volusia County Stormwater Ordinance were discussed, along with the final outfall locations for each drainage basin. The comments made during this meeting have been addressed in the stormwater calculations that follow.

TABLE 1

NORMANDY BOULEVARD WATER QUALITY SUMMARY

Basin	Begin	End	Side	Volume Required (CF)	Volume Available (CF)
1	12+00	19+00	Left	1134	5260
1	12+00	19+00	Right	1320	4946
2	19+00	24+00	Left	771	2891
2	19+00	27+00	Right	1939	1896
3	24+00	47+00	Left	3612	4813
3	27+00	48+00	Right	4993	5574
4	47+00	63+00	Left	4400	5320
4	48+00	63+00	Right	2130	3184
5	63+00	83+00	Left	3644	5317
5	63+00	83+00	Right	3270	7680
			TOTAL	27,213	46,881

TABLE 2

NORMANDY BOULEVARD FLOOD PROTECTION SUMMARY

Basin	Area (Acres)	25 Year Storm Discharge (cfs)		100 Year Storm Discharge (cfs)	
		Existing	Project	Existing	Project
1	10.6	10.05	0	19.55	0
2	2.0	2.67	0	5.04	0
3	70.3	0	0	0	0
4	48.8	0	0	0	0
5	48.1	30.13	33.11	57.70	63.07

APPENDIX B

WATER QUALITY CALCULATIONS

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

BY MJ DATE 9/88
CHKD. BY ____ DATE ____

SUBJECT Normandy Boulevard
Volume Requirements for
Water Quality Swales

SHEET NO. 1 OF 9
JOB NO. 87524

VOLUME REQUIRED PER SWALE

I) Typical Section

A) First 1" of Rainfall

$$\forall = 16'(0.98) + 4'(0.7') + 30'(0.05) \times 1"$$

OR

$$\forall = 1.67\ ^{CF}/_{LF}$$

B) First $\frac{1}{2}$" of Runoff

$$\forall = \tfrac{1}{2}"(50') = 2.08\ ^{CF}/_{LF}$$

USE $1.67\ ^{CF}/_{LF}$

II) Superelevation towards swale

A) First 1" of Rainfall

$$\forall = 32'(0.98) + 4'(0.7) + 30'(0.05) \times 1"$$

$$\forall = 2.97\ ^{CF}/_{LF}$$

B) First $\frac{1}{2}$" of Runoff

$$\forall = \tfrac{1}{2}"(66') = 2.75\ ^{CF}/_{LF}$$

USE $2.75\ ^{CF}/_{LF}$

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
PLANNERS - SURVEYORS
P.O. BOX 1180 • WINTER PARK, FLORIDA 32790 / (407) 647-6623

Subject NORMANDY BLVD. EXTENSION
Job 87524 Sheet 2 of 9
Calculated by AL HORMIS Date 11-17-1988
Checked by _____ Date _____
Scale _____

III) Superelevation away from swale

A) First 1" of Rainfall

$$\forall = [30'(0.05) + 2'(0.7)]\,1''$$

$$\forall = 0.24 \text{ CF/LF}$$

B) First $\frac{1}{2}$" of Runoff

$$\forall = \tfrac{1}{2}''(34) = 1.42 \text{ CF/LF}$$

USE 1.42 CF/LF

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

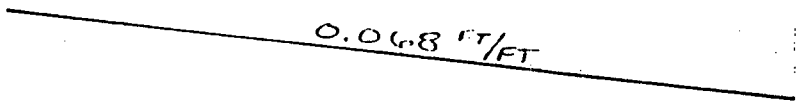
BY JET DATE 9/88
CHKD BY ____ DATE ____

SUBJECT SUPERELEVATION
NORMANDY BLVD

SHEET NO. 3 OF 9
JOB NO. 87524

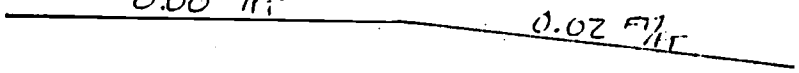
STA 11+15.99

LEFT LANE LEVEL



FULL SUPER

STA 13+39.96

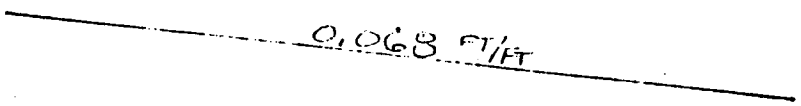


LEFT LANE LEVEL

TYPICAL SECTION

STA 21+42.19

LEFT LANE LEVEL



FULL SUPEE

STA 41+77.25

LEFT LANE LEVEL

TYPICAL SECTION

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

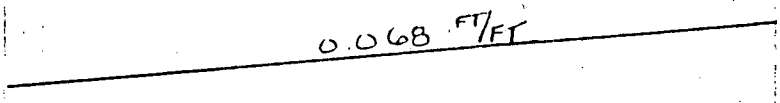
BY JET DATE 9/88
CHKD. BY ____ DATE ____

SUBJECT SUPERELEVATION
NORMANDY BLVD

SHEET NO. 4 OF 9
JOB NO. 87524

STA 45+00.31

RIGHT LANE LEVEL



FULL SUPER

STA 65+81.11

RIGHT LANE LEVEL

TYPICAL SECTION

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Subject NORMANDY BLVD.
Job 87524 Sheet 5 of 9
Calculated by AL HORMIS Date 4-18-89
Checked by _____ Date _____
Scale _____

BEGIN STATION : 12+00 SIDE : LEFT & RIGHT

END STATION : 49+00 WEIR ELEV. : N/A

REQUIRED VOLUME

SUPERELEVATION AWAY FROM SWALE :-

(13+39.96) - (12+00.00) = 139.96 FT.

(41+77.25) - (21+42.19) = 2,035.06 FT.

(49+00.00) - (45+00.31) = 399.69 FT.

TOTAL = (139.96 + 2,035.06 + 399.69) x 1.42 CF/LF = 3,656.09 C.F.

SUPERELEVATION TOWARDS SWALE :-

(13+39.96) - (12+00.00) = 139.96 FT.

(41+77.25) - (21+42.19) = 2,035.06 FT.

(49+00.00) - (45+00.31) = 399.69 FT.

TOTAL = (139.96 + 2,035.06 + 399.69) x 2.75 CF/LF = 7,080.45 C.F.

TYPICAL SECTION :-

(21+42.19) - (13+39.96) = 802.23 FT.

(45+00.31) - (41+77.25) = 323.06 FT.

TOTAL = (802.23 + 323.06) x 1.67 CF/LF = 1,879.23 C-F.

TOTAL VOLUME REQUIRED = 3,656.09 + 7,080.45 + 1,879.23

= 12,615.77 C-F.

AVAILABLE VOLUME

PURCHASE & USE EXISTING DEPRESSION AS A RETENTION AREA TO EL. 65.0 A VOLUME OF 1,124,501.40 C-F. IS AVAILABLE

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CONSULTING ENGINEERS
PLANNERS - SURVEYORS

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Subject NORMANDY BLVD.
Job 87524 Sheet 6 of 9
Calculated by AL HORMIS Date 4-18-89
Checked by _____ Date _____
Scale _____

BEGIN STATION : 49+00 SIDE : RIGHT

END STATION : 55+00 WEIR ELEV. : N/A

REQUIRED VOLUME

SUPERELEVATION AWAY FROM SWALE :

(55+00) - (49+00) = 600 FT. X 1.42 CF/LF = 852 C.F.

AVAILABLE VOLUME

NO VOLUME AVAILABLE AS WATER DISCHARGE TO EXIST. DEPRESSION

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Subject NORMANDY BLVD.
Job 87524 Sheet 7 of 9
Calculated by AL HORMIS Date 4-18-89
Checked by _____ Date _____
Scale _____

BEGIN STATION : 49+00 SIDE : LEFT

END STATION : 63+00 WEIR ELEV. : 75.0

REQUIRED VOLUME

SUPERELEVATION TOWARDS SWALE :-

(63+00) - (49+00) = 1,400 L.F. x 2.75 CF/L.F = 3,850 C.F.

AVAILABLE VOLUME

INVERT	STA.	AREA (S.F.)	AVE. AREA (S.F.)	VOLUME (C.F)
73.5	63+00	15.0		
			7.5	900 C.F.
75.0	61+80	0		- 2,950 C.F.

BEGIN STATION : 63+00 SIDE : LEFT

END STATION : 67+00 WEIR ELEV. : 70.2

REQUIRED VOLUME

SUPERELEVATION TOWARDS SWALE :-

(65+81.11) - (63+00) = 281.11 L.F. x 2.75 CF/LF = 773.05 C.F.

TYPICAL SECTION :-

(67+00) - (65+81.11) = 118.89 L.F. X 1.67 CF/LF = 198.55 C.F.

TOTAL = 773.05 + 198.55 = 971.60 C.F.

AVAILABLE VOLUME

INVERT	STA.	AREA (S.F.)	AVE. AREA (S.F.)	VOLUME (C.F.)
68.7	67+00	12.0		
			6.0	720 C.F.
70.2	65+80	0		- 251.60 C.F.

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Subject NORMANDY BLVD.
Job 87524 Sheet 8 of 9
Calculated by AL HORMIS Date 4-18-89
Checked by _____ Date _____
Scale _____

BEGIN STATION : 67+00 SIDE : LEFT

END STATION : 81+00 WEIR ELEV. = 64.8

REQUIRED VOLUME

TYPICAL SECTION :-

(81+00) - (67+00) = 1,400 L.F. x 1.67 CF/L.F. = 2,338.0 C.F.

AVAILABLE VOLUME

INVERT	STA.	AREA (S.F.)	AVE. AREA (S.F.)	VOLUME (C.F.)
63.3	81+00	20.0		
			19.0	1,900
63.3	80+00	18.0		
			16.0	800
63.5	79+50	14.0		
			7.0	875
64.8	78+25	0		

+1,237 C.F. TOTAL 3,575 C.F.

BEGIN STATION : 81+00 SIDE : LEFT

END STATION : 83+50 WEIR ELEV. = N/A

REQUIRED VOLUME

TYPICAL SECTION :-

(83+50) - (81+00) = 250 L.F. x 1.67 CF/L.F = 417.50 C.F.

AVAILABLE VOLUME

NO VOLUME AVAILABLE

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Subject NORMANDY BLVD.
Job 87524 Sheet 9 of 9
Calculated by AL HOLMES Date 4-18-89
Checked by _____ Date _____
Scale _____

BEGIN STATION : 55+00 SIDE : RIGHT

END STATION : 82+50 WEIR ELEV. : 65.0

REQUIRED VOLUME

SUPERELEVATION AWAY FROM SWALE :-

(65+81.11) - (55+00) = 1,081.11 L.F x 1.42 CF/L.F. = 1,535.18 C.F.

TYPICAL SECTION :-

(82+50) - (65+81.11) = 1,668.89 L.F. x 1.67 CF/L.F. = 2,787.05 C.F.

TOTAL = 1,535.18 + 2,787.05 = 4,322.23 C.F.

AVAILABLE VOLUME

INVERT	STA.	AREA (S.F.)	AVE. AREA (S.F.)	VOLUME (C.F.)
63.5	82+50	17.0		
			16.0	5,600
63.6	79+00	15.0		
			8.0	400
64.9	78+50	1.0		
			0.5	75
65.0	77+00	0		
			3.5	350
63.5	76+00	7.0		
			3.5	490
65.0	74+60	0		

TOTAL = 6,915 C.F.

+ 2,592.77 C.F.

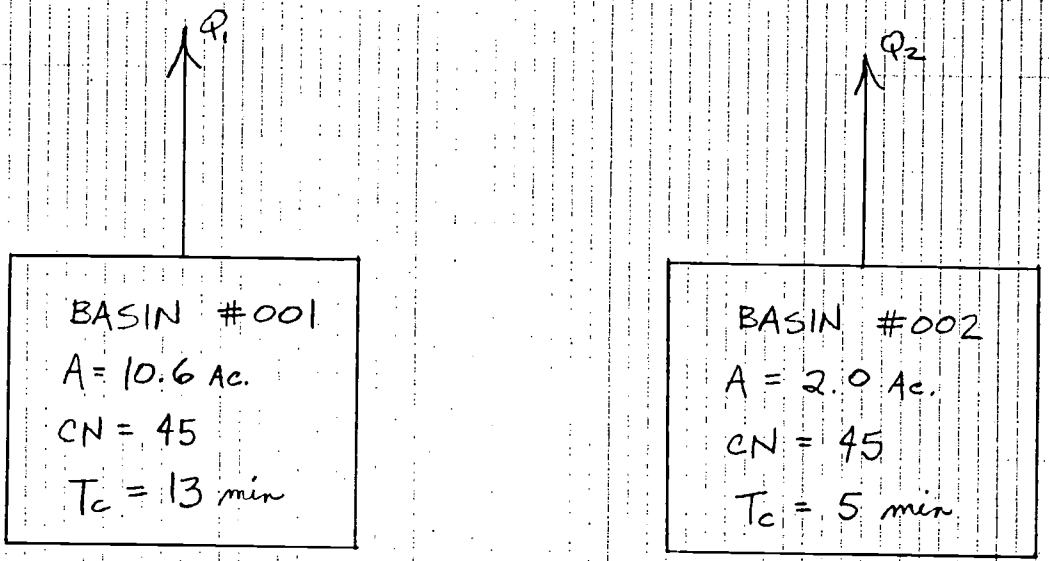
APPENDIX C

OFFSITE DRAINAGE CALCULATIONS

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
PLANNERS - SURVEYORS
P.O. BOX 1180 • WINTER PARK, FLORIDA 32790 / (407) 647-6823

Subject Normandy Boulevard
Job 87524 Sheet ____ of ____
Calculated by MJ Date 10/88
Checked by ____ Date ____
Scale ____

BASINS 1 & 2 EXISTING CONDITIONS



BASIN	FREQUENCY	DURATION	EXISTING PEAK DISCHARGE (cfs)
001	25 YR	24 HR	10.05
	100 YR	24 HR	19.55
002	25 YR	24 HR	2.67
	100 YR	24 HR	5.04

15.00	DISCHG	.26	.25	.25	.25	.25	.25	.23	.22	.22	.22
16.00	DISCHG	.22	.21	.21	.20	.20	.20	.20	.19	.19	.19
17.00	DISCHG	.19	.19	.19	.19	.19	.19	.17	.16	.16	.16
18.00	DISCHG	.16	.17	.17	.17	.18	.18	.16	.15	.14	.14

END OF LISTING
1

EXECUTIVE CONTROL OPERATION INCREM RECORD ID
+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION LIST RECORD ID

LISTING OF CURRENT DATA

TIME INCREMENT
4 DIMHYD .0200

8	.0000	.1500	.3000	.5900	.9500
8	1.0000	.9600	.8800	.7800	.6800
8	.6000	.5200	.4700	.4300	.3900
8	.3500	.3200	.2900	.2600	.2300
8	.2200	.2000	.1800	.1700	.1600
8	.1500	.1400	.1300	.1200	.1100
8	.1000	.0900	.0850	.0800	.0750
8	.0700	.0600	.0500	.0450	.0400
8	.0350	.0300	.0220	.0160	.0100
8	.0050	.0040	.0030	.0020	.0016
8	.0000	.0000	.0000	.0000	.0000

9 ENDTBL

COMPUTED PEAK RATE FACTOR = 256.00

TABLE NO. TIME INCREMENT
5 RAINFL 1 .5000

8	.0000	.0060	.0120	.0190	.0250
8	.0320	.0390	.0470	.0540	.0620
8	.0710	.0800	.0890	.0990	.1100
8	.1220	.1340	.1460	.1640	.1810

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 37.75 CFS-HRS, 3.12 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 2
OUTPUT HYDROGRAPH= 1
AREA= .00 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .08 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0111 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.99	5.04	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS			TIME INCREMENT = .10 HOURS				DRAINAGE AREA = .00 SQ.MI.		
10.00	DISCHG	.00	.00	.00	.00	.00	.00	.01	.02	.04	.05
11.00	DISCHG	.07	.11	.15	.19	.23	.26	1.28	2.41	3.39	4.27
12.00	DISCHG	5.02	3.72	2.93	2.62	2.49	2.48	1.69	1.22	1.02	.93
13.00	DISCHG	.90	.79	.72	.70	.63	.68	.61	.57	.56	.55
14.00	DISCHG	.55	.51	.49	.49	.48	.48	.45	.43	.42	.41
15.00	DISCHG	.41	.40	.39	.39	.39	.39	.37	.35	.35	.34
16.00	DISCHG	.34	.33	.32	.32	.32	.32	.31	.30	.30	.30
17.00	DISCHG	.30	.30	.30	.30	.30	.30	.27	.26	.25	.25
18.00	DISCHG	.25	.26	.27	.27	.27	.27	.25	.23	.22	.22
19.00	DISCHG	.22	.23	.24	.25	.25	.25	.24	.23	.22	.22
20.00	DISCHG	.22	.21	.20	.20	.20	.20	.20	.20	.20	.20
21.00	DISCHG	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
22.00	DISCHG	.20	.20	.20	.20	.20	.20	.19	.18	.17	.17
23.00	DISCHG	.17	.17	.17	.17	.17	.17	.16	.15	.15	.14
24.00	DISCHG	.14	.07	.03	.01	.00					

RUNOFF VOLUME ABOVE BASEFLOW = 3.51 WATERSHED INCHES, 7.03 CFS-HRS, .58 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
+ COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID
1

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1 STORM 1													
+													
XSECTION 1	RUNOFF	.02	1	2	.10	.0	8.50	24.00	2.01	---	12.11	10.05	605.1
XSECTION 2	RUNOFF	.00	1	2	.10	.0	8.50	24.00	2.00	---	12.00	2.67	862.9
ALTERNATE 2 STORM 2													
+													
XSECTION 1	RUNOFF	.02	1	2	.10	.0	11.00	24.00	3.52	---	12.09	13.55	1172.7

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CONSULTING ENGINEERS
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Subject Normandy Retention Area
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date NOV 8 1988
Scale ____

BASIN 3 EXISTING CONDITIONS

AREA = 70.3 acres
CN = 45

FREQUENCY	PRECIP (in)	RUNOFF (in)	RUNOFF (acre-ft)
25 YR	8.5	2.01	11.78
100 YR	11.0	3.52	20.62

STAGE VS. STORAGE FOR AN IRREGULAR SHAPED POND

BASIN 3 EXISTING STORAGE @ DEPRESSION

ELEVATION (FT. NGVD)	AREA (SF.)	STORAGE (CU. FT.)	(ACRE-FT.)
47.00	500.0	0.00	0.000
49.00	2200.0	2700.00	0.062
51.00	10001.0	14901.00	0.342
53.00	43900.0	68802.00	1.579
55.00	75500.0	188202.00	4.321
57.00	110100.0	373802.00	8.581
59.00	148700.0	632602.00	14.523
61.00	188200.0	969502.00	22.257
63.00	226700.0	1384402.00	31.781
65.00	276300.0	1887402.00	43.329

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Subject Normandy Retention Area
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

BASINS 1, 2 & 3 PROJECT CONDITION

BASIN	AREA
1	10.6
2	2.0
3	70.3

TOTAL = 82.9 ACRES

ROADWAY AREA
12+50 → 45+50 Left
12+50 → 48+00 Right

Surface	Area	CN	25 YR. Volume	100 YR. Volume
Asphalt	2.52	98	1.73	2.26
Stabilized	0.63	77	0.30	0.42
Sod	4.72	39	0.54	1.04
Offsite	72.83	45	12.20	21.36
TOTAL	82.9		14.77 acre feet	25.08 acre feet

VOLUME AVAILABLE IN SWALES = 19,421 CF = 0.45 acre ft

N

FIELD SURVEY

BASIN 3 DEPRESSION

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Subject Normandy Blvd. Retention Area
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

BASIN 3 RETENTION AREA
PROJECT CONDITIONS W/ NO EXCAVATION

ELEVATION	STORAGE (ACRE-FT.)
51	.1910
53	.5460
55	1.1820
57	2.8340
59	5.9930
61	10.7270
63	17.1690
65	25.8150

25.8150 × 43,560 = 1,124,501.40 C.F.

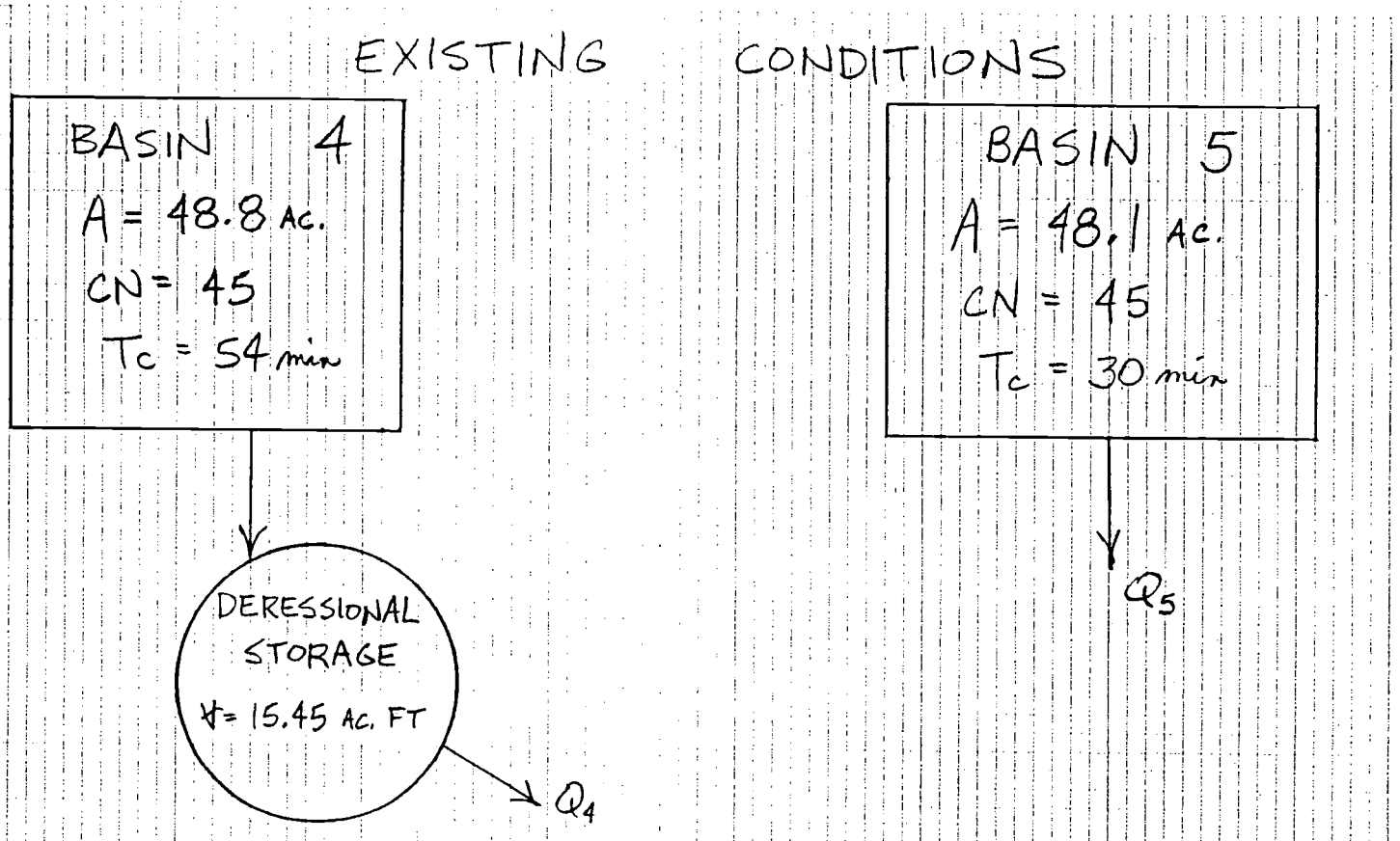
∴ PURCHASE R/W UP TO 65.0 CONTOUR

TRIANGLE REPROGRAPHICS INCORPORATED
ORLANDO FL FORM 101

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
PLANNERS - SURVEYORS
P.O. BOX 1180 • WINTER PARK, FLORIDA 32790 / (407) 647-6623

Subject Normandy Boulevard
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

EXISTING CONDITIONS



BASIN	RUNOFF VOLUME (Ac.-Ft.)		AVAILABLE STORAGE (Ac.-Ft.)	PEAK DISCHARGE (cfs)	
	25 YR	100 YR		25 YR	100 YR
4	8.16	14.31	15.45	0	0
5	8.06	14.11	0	30.13	57.7

EXECUTIVE CONTROL OPERATION LIST RECORD ID

LISTING OF CURRENT DATA

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	4			
8		72.00	.00	.00
8		73.00	.01	.18
8		74.00	.02	.74
8		75.00	.03	1.65
8		76.00	.04	3.09
8		77.00	.05	5.18
8		78.00	.06	7.94
8		79.00	.07	11.40
8		80.00	.08	15.50
8		80.10	30.00	15.60
8		80.20	68.00	15.70
9 ENDTBL				

	TIME INCREMENT				
4 DIMHYD		.0200			
8	.0000	.1500	.3000	.5900	.9500
8	1.0000	.9600	.8800	.7800	.6800
8	.6000	.5200	.4700	.4300	.3900
8	.3500	.3200	.2900	.2600	.2390
8	.2200	.2000	.1800	.1700	.1600
8	.1500	.1400	.1300	.1200	.1100
8	.1000	.0900	.0850	.0800	.0750
8	.0700	.0600	.0500	.0450	.0400
8	.0350	.0300	.0220	.0160	.0100
8	.0050	.0040	.0030	.0020	.0016
8	.0000	.0000	.0000	.0000	.0000
9 ENDTBL					

COMPUTED PEAK RATE FACTOR = 256.00

	TABLE NO.	TIME INCREMENT			
5 RAINFL 1		.5000			
8	.0000	.0060	.0120	.0190	.0250
8	.0320	.0390	.0470	.0540	.0620
8	.0710	.0800	.0890	.0990	.1100
8	.1220	.1340	.1480	.1640	.1810
8	.2010	.2260	.2580	.3000	.6070
8	.7190	.7570	.7850	.8070	.8260
8	.8420	.8570	.8700	.8820	.8930
8	.9040	.9130	.9230	.9310	.9400
8	.9480	.9550	.9620	.9690	.9760
8	.9830	.9890	.9950	1.0000	1.0000
9 ENDTBL					

INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 72.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.20	.06	78.04

0 STANDARD CONTROL INSTRUCTIONS

```
 6 RUNOFF 1   4      1       .0763     45.0000      .90001 1 0 1 0 1
 6 RESVOR 2    4 1   2     72.0000                    1 1 1 1 0 1
 6 RUNOFF 1   5      3       .0752     45.0000      .50001 1 0 1 0 1
   ENDATA

 END OF LISTING
1
```


EXECUTIVE CONTROL OPERATION INCREM RECORD ID
+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID
+ FROM XSECTION 4
+ TO XSECTION 5
STARTING TIME = .00 RAIN DEPTH = 8.50 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 1 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 4
OUTPUT HYDROGRAPH= 1
AREA= .08 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .90 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .1000 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.81	22.77	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

11.00	DISCHG	.00	.00	.00	.00	.00	.01	.16	.60	1.54	3.23
12.00	DISCHG	5.93	9.15	12.68	16.06	18.74	20.52	21.69	22.46	22.77	22.55
13.00	DISCHG	21.87	21.07	20.27	19.50	18.75	18.02	17.33	16.68	16.09	15.51
14.00	DISCHG	14.94	14.41	13.92	13.49	13.06	12.66	12.30	11.98	11.68	11.37
15.00	DISCHG	11.05	10.76	10.47	10.20	9.93	9.68	9.44	9.23	9.02	8.79
16.00	DISCHG	8.56	8.32	8.08	7.86	7.64	7.43	7.21	7.00	6.78	6.56
17.00	DISCHG	6.36	6.16	5.98	5.83	5.69	5.57	5.46	5.35	5.25	5.14
18.00	DISCHG	5.04	4.93	4.84	4.77	4.70	4.66	4.62	4.58	4.53	4.47
19.00	DISCHG	4.39	4.32	4.26	4.20	4.16	4.13	4.11	4.09	4.07	4.04
20.00	DISCHG	4.00	3.96	3.91	3.87	3.81	3.76	3.70	3.65	3.61	3.57
21.00	DISCHG	3.53	3.50	3.47	3.44	3.42	3.39	3.37	3.35	3.34	3.32
22.00	DISCHG	3.31	3.30	3.29	3.28	3.27	3.26	3.25	3.24	3.22	3.19
23.00	DISCHG	3.16	3.13	3.09	3.06	3.04	3.01	2.99	2.96	2.93	2.89
24.00	DISCHG	2.85	2.78	2.70	2.60	2.45	2.27	2.09	1.92	1.76	1.61
25.00	DISCHG	1.47	1.35	1.25	1.15	1.06	.98	.90	.83	.77	.71
26.00	DISCHG	.65	.60	.56	.52	.47	.44	.40	.37	.34	.31

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 173.49 CFS-HRS, 14.34 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 4
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 72.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.30	.08	79.69

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

11.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01
11.00	ELEV	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.53	72.88
12.00	DISCHG	.01	.01	.02	.02	.03	.03	.03	.03	.04	.04
12.00	ELEV	73.15	73.43	73.81	74.17	74.50	74.86	75.15	75.40	75.65	75.89
13.00	DISCHG	.04	.04	.04	.05	.05	.05	.05	.05	.05	.05
13.00	ELEV	76.09	76.25	76.40	76.55	76.68	76.82	76.94	77.05	77.14	77.22
14.00	DISCHG	.05	.05	.05	.06	.06	.06	.06	.06	.06	.06
14.00	ELEV	77.30	77.38	77.45	77.53	77.60	77.66	77.73	77.79	77.85	77.91
15.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
15.00	ELEV	77.97	78.02	78.07	78.11	78.15	78.19	78.23	78.26	78.30	78.34
16.00	DISCHG	.06	.06	.06	.06	.06	.07	.07	.07	.07	.07
16.00	ELEV	78.37	78.40	78.44	78.47	78.50	78.53	78.56	78.58	78.61	78.64
17.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
17.00	ELEV	78.66	78.68	78.71	78.73	78.75	78.77	78.79	78.81	78.83	78.85
18.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
18.00	ELEV	78.87	78.89	78.91	78.93	78.94	78.96	78.98	79.00	79.01	79.02
19.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
19.00	ELEV	79.04	79.05	79.07	79.08	79.09	79.10	79.12			
20.00	DISCHG	.07	.07								
20.00	DISCHG	3.70	3.66	3.60	3.53	3.47	3.41	3.36	3.32	3.29	3.26
21.00	DISCHG	3.24	3.22	3.20	3.19	3.18	3.17	3.16	3.15	3.15	3.14
22.00	DISCHG	3.14	3.13	3.13	3.13	3.13	3.13	3.12	3.09	3.05	3.00
23.00	DISCHG	2.95	2.92	2.89	2.87	2.85	2.83	2.81	2.76	2.71	2.64
24.00	DISCHG	2.59	2.49	2.32	2.02	1.73	1.48	1.26	1.09	.94	.81
25.00	DISCHG	.70	.61	.52	.45	.39	.34	.29	.24	.20	.17
26.00	DISCHG	.14	.11	.09	.07	.05	.04	.02	.01	.01	.00

RUNOFF VOLUME ABOVE BASEFLOW = 2.01 WATERSHED INCHES, 97.36 CFS-HRS, 8.05 ACRE-FEET; BASEFLOW = .00 CFS

RECORD ID

EXECUTIVE CONTROL OPERATION ENDCMP
COMPUTATIONS COMPLETED FOR PASS 1
+

1

TR20 XEQ 11-01-88 09:20 NORMANDY BLVD. BASINS 4 & 5 EXISTING CONDITIONS
REV PC 09/83(.2)

RECORD ID

EXECUTIVE CONTROL OPERATION INCREM
MAIN TIME INCREMENT = .10 HOURS
+

RECORD ID

EXECUTIVE CONTROL OPERATION COMPUT
FROM XSECTION 4
+ TO XSECTION 5
+ STARTING TIME = .00 RAIN DEPTH = 11.00 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 2 STORM NO.= 2 MAIN TIME INCREMENT = .10 HOURS

13.00	DISCHG	42.28	39.27	36.64	34.27	32.09	30.28	28.62	27.05	25.51	24.09
14.00	DISCHG	22.81	21.65	20.49	19.28	18.12	17.10	16.13	15.17	14.23	13.43
15.00	DISCHG	12.79	12.25	11.77	11.36	11.02	10.76	10.52	10.26	9.98	9.73
16.00	DISCHG	9.51	9.31	9.12	8.92	8.74	8.59	8.45	8.30	8.14	7.99
17.00	DISCHG	7.87	7.76	7.67	7.60	7.54	7.49	7.42	7.30	7.12	6.95
18.00	DISCHG	6.79	6.68	6.62	6.61	6.61	6.62	6.59	6.51	6.37	6.22
19.00	DISCHG	6.08	5.99	5.94	5.94	5.96	5.97	5.97	5.94	5.87	5.80
20.00	DISCHG	5.74	5.67	5.59	5.48	5.37	5.28	5.20	5.14	5.09	5.05
21.00	DISCHG	5.01	4.97	4.95	4.92	4.91	4.89	4.88	4.86	4.85	4.84
22.00	DISCHG	4.84	4.83	4.83	4.82	4.82	4.82	4.80	4.76	4.69	4.61
23.00	DISCHG	4.54	4.49	4.44	4.40	4.37	4.34	4.31	4.24	4.15	4.06
24.00	DISCHG	3.97	3.82	3.55	3.10	2.65	2.27	1.94	1.67	1.44	1.25
25.00	DISCHG	1.08	.93	.80	.70	.60	.52	.44	.37	.31	.26
26.00	DISCHG	.21	.17	.13	.10	.07	.05	.04	.02	.01	.01
27.00	DISCHG	.00									

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 170.96 CFS-HRS, 14.13 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP

\+ COMPUTATIONS COMPLETED FOR PASS 2 RECORD ID

EXECUTIVE CONTROL OPERATION ENDJOB

1 RECORD ID

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1 STORM 1													
XSECTION 4	RUNOFF	.08	1	2	.10	.0	8.50	24.00	2.01	---	12.81	22.77	298.4
STRUCTURE 4	RESVOR	.08	1	2	.10	.0	8.50	24.00	.02	78.04	28.20?	.06?	.8
XSECTION 5	RUNOFF	.08	1	2	.10	.0	8.50	24.00	2.01	---	12.56	30.13	400.7
ALTERNATE 2 STORM 2													
XSECTION 4	RUNOFF	.08	1	2	.10	.0	11.00	24.00	3.52	---	12.74	43.47	569.7
STRUCTURE 4	RESVOR	.08	1	2	.10	.0	11.00	24.00	.02	79.69	28.30?	.08?	1.0
XSECTION 5	RUNOFF	.08	1	2	.10	.0	11.00	24.00	3.52	---	12.32	57.70	767.4

1

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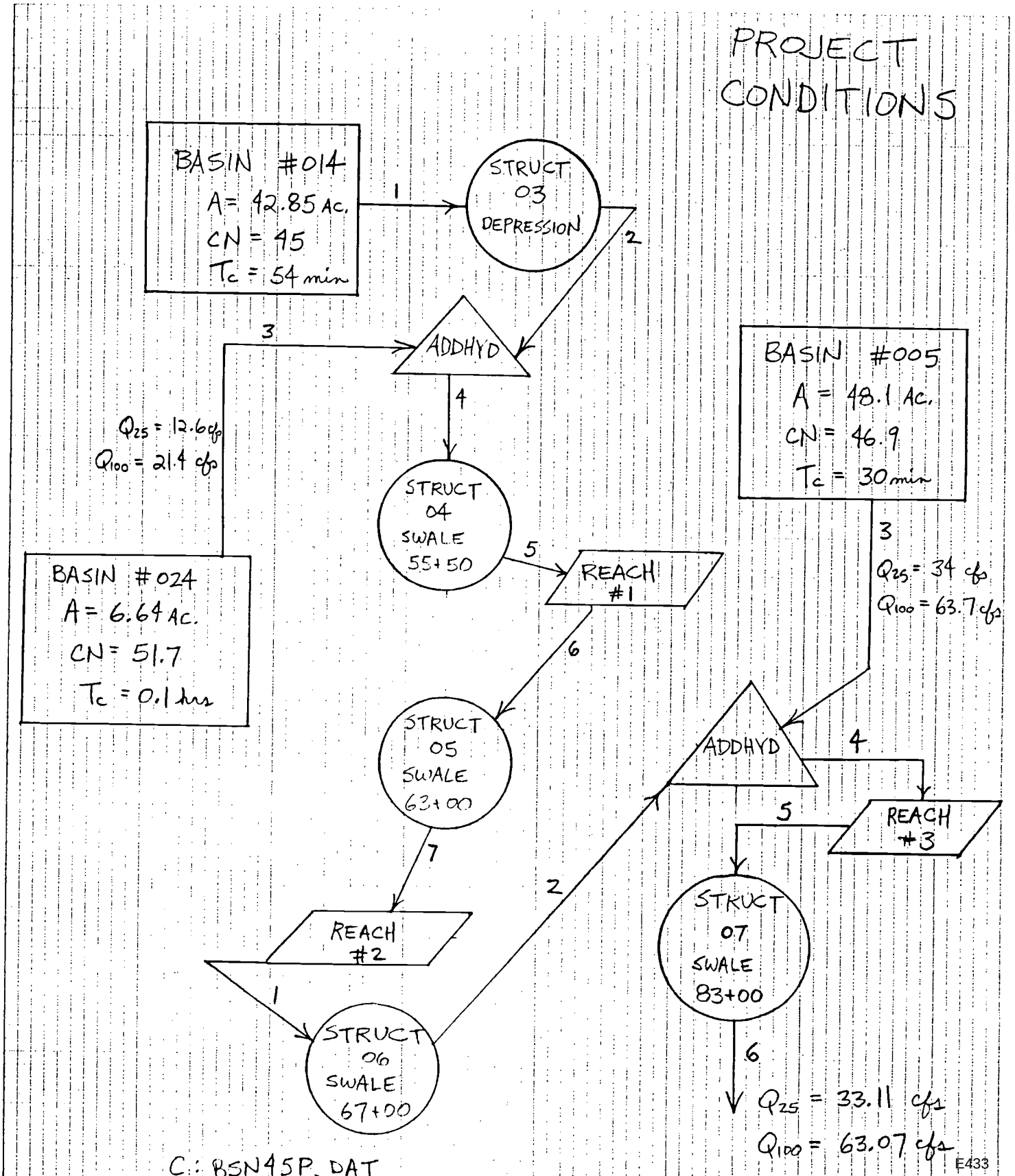
Subject Normandy Boulevard
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

PROJECT CONDITIONS



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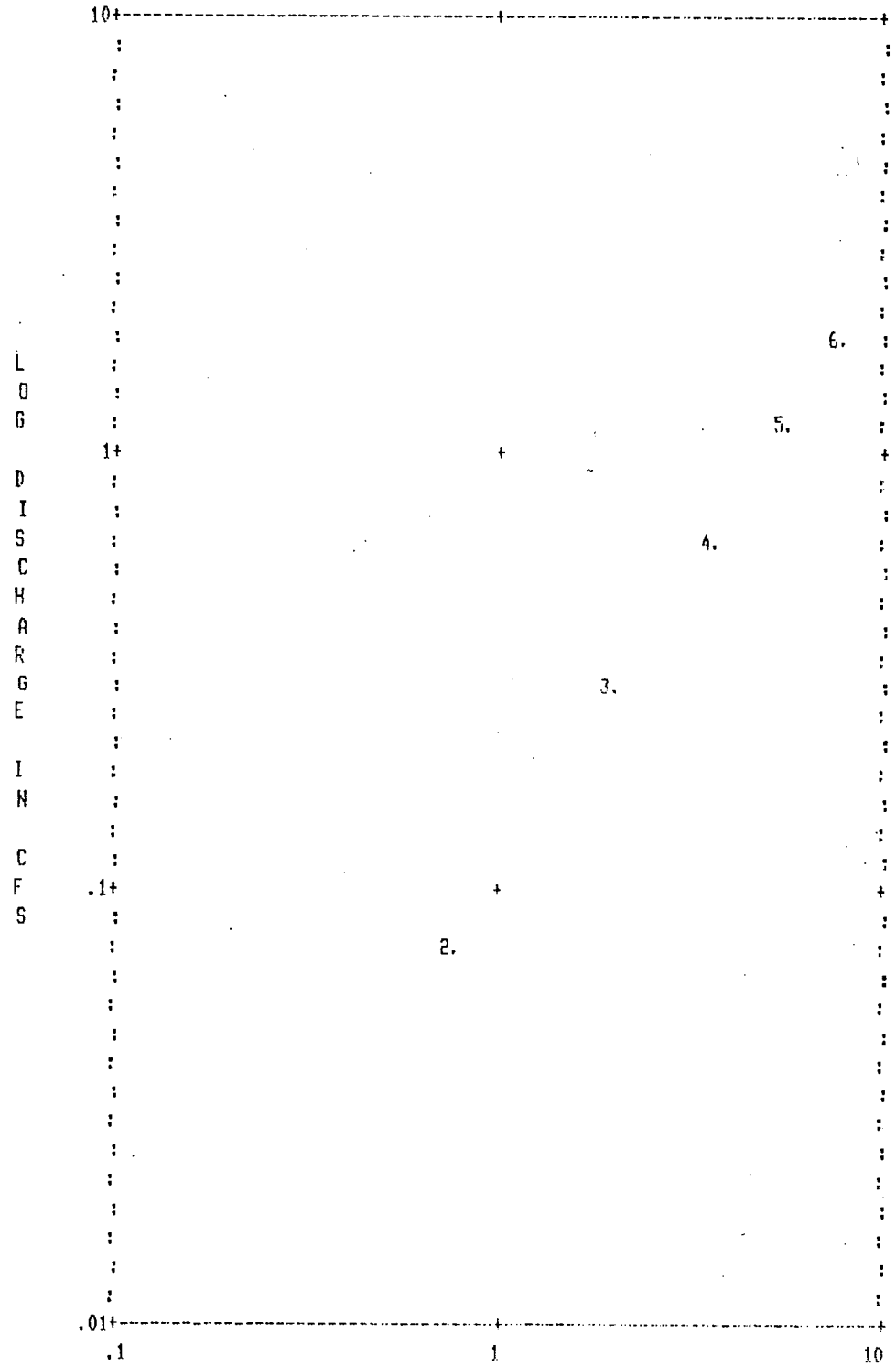
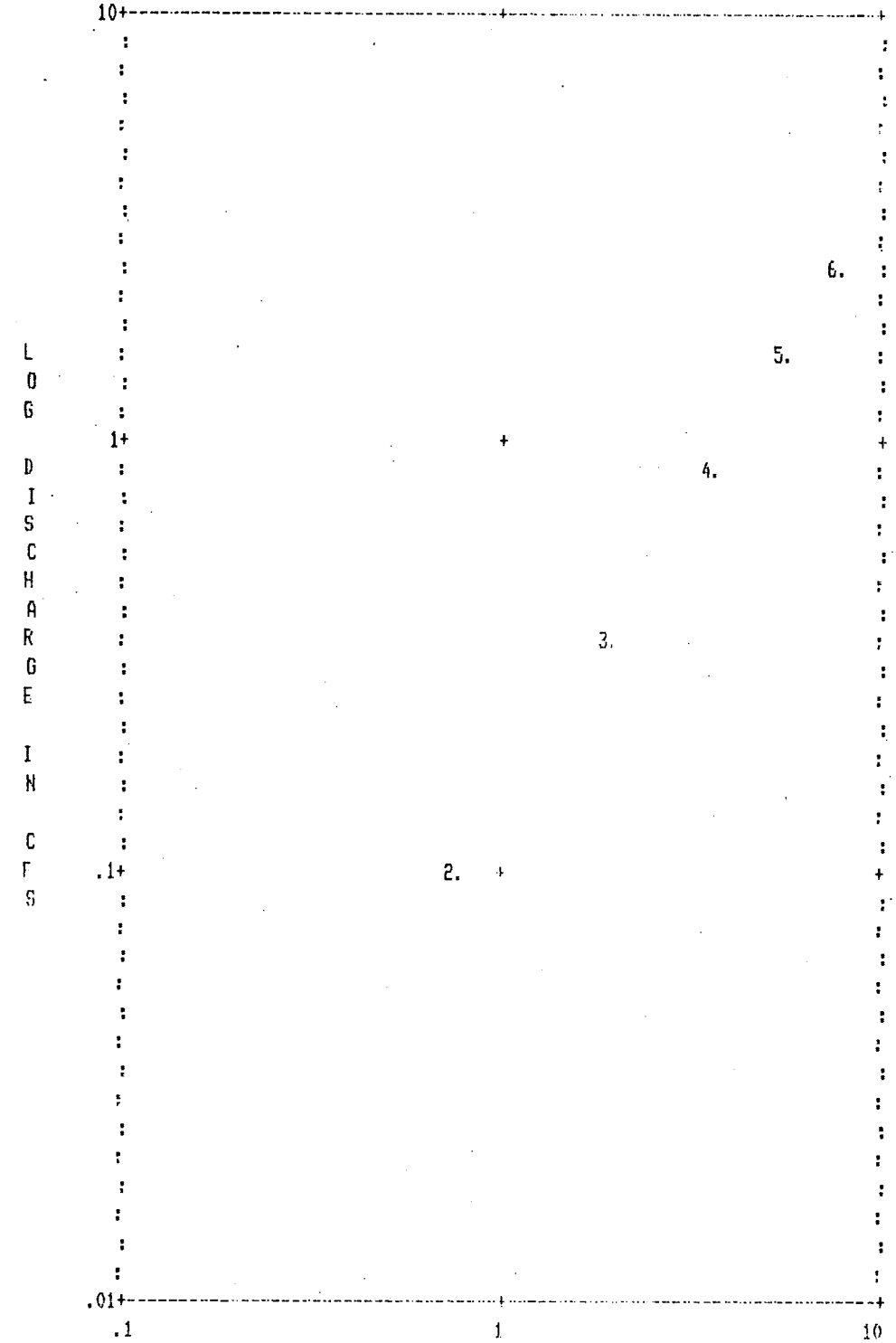


CROSS SECTION 1 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.42
2	.07	.80	1.42
3	.28	2.00	1.42
4	.62	3.60	1.40
5	1.14	5.60	1.39
6	1.83	8.00	1.37

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

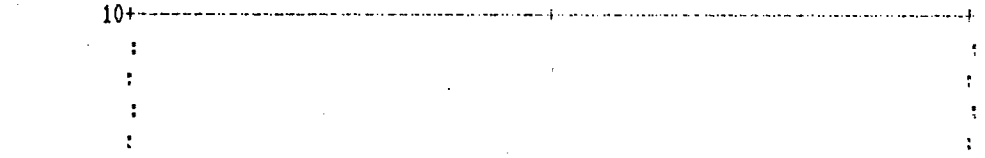


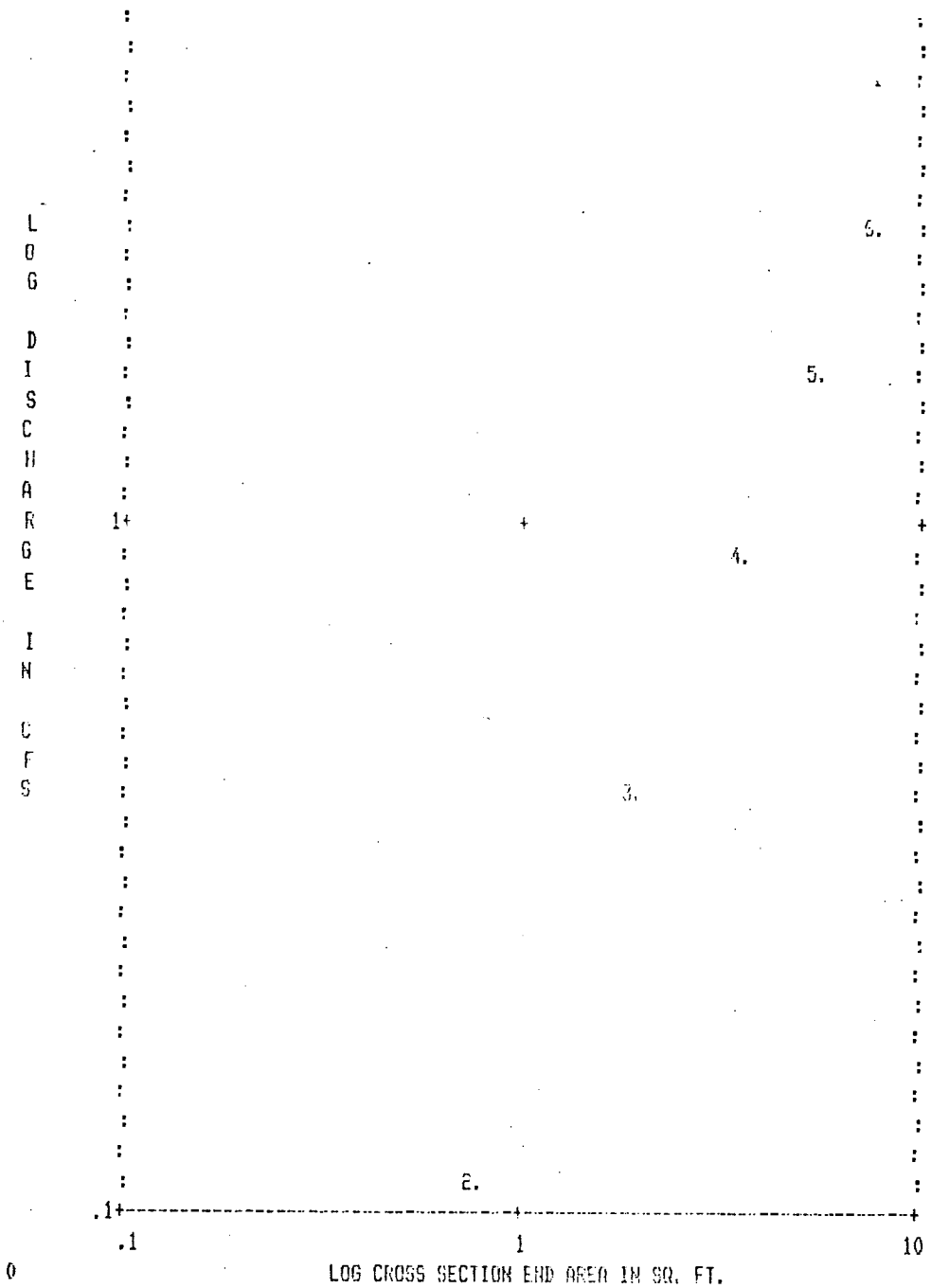
CROSS SECTION 2 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.42
2	.10	.80	1.42
3	.36	2.00	1.42
4	.81	3.60	1.40
5	1.48	5.60	1.30
6	2.40	8.00	1.37

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS





REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.41
2	.11	.80	1.41
3	.41	2.00	1.41
4	.92	3.60	1.39
5	1.69	5.60	1.38
6	2.73	8.00	1.37

EXECUTIVE CONTROL OPERATION LIST RECORD ID

LISTING OF CURRENT DATA

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	1	.0773

ELEVATION DISCHARGE SUB AREA

8	73.70	.97	.80
8	73.90	3.56	2.00
8	74.10	8.03	3.60
8	74.30	14.70	5.60
8	74.50	23.70	8.00

9 ENDTBL

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	2	.0773

	ELEVATION	DISCHARGE	END AREA
8	69.20	.00	.00
8	69.40	1.27	.80
8	69.60	4.67	2.00
8	69.80	10.50	3.60
8	70.00	19.20	5.60
8	70.20	31.10	8.00

9 ENDTBL

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	3	.1526

	ELEVATION	DISCHARGE	END AREA
8	62.50	.00	.00
8	62.70	.74	.80
8	62.90	2.69	2.00
8	63.10	6.06	3.60
8	63.30	11.10	5.60
8	63.50	17.90	8.00

9 ENDTBL

1

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	3			
8		75.00	.00	.00
8		76.00	.01	1.97
8		77.00	.02	3.94
8		78.00	.03	5.91
8		79.00	.04	7.87
8		79.10	30.40	7.89
8		79.20	85.90	7.89
8		79.30	158.00	7.90
8		79.40	243.00	7.91

9 ENDTBL

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	4			
8		77.10	.00	.00
8		78.60	.00	.11
8		78.70	1.88	.11
8		78.80	5.15	.11
8		78.90	9.46	.11
8		79.00	14.69	.11

9 ENDTBL

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	5			
8		73.50	.00	.00
8		75.00	.00	.02
8		75.10	1.82	.02
8		75.20	5.15	.02
8		75.30	9.46	.02
8		75.40	14.60	.02
9 ENDTBL				

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	6			
8		68.70	.00	.00
8		70.20	.00	.02
8		70.30	1.82	.02
8		70.40	5.15	.02
8		70.50	9.46	.02
8		70.60	14.60	.02
9 ENDTBL				

1

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	7			
8		62.00	.00	.00
8		63.50	.00	.10
8		63.60	1.82	.10
8		63.70	5.15	.10
8		63.80	9.46	.10
8		63.90	14.60	.10
9 ENDTBL				

	TIME INCREMENT				
4 DIMHYD		.0200			
8	.0000	.1500	.3000	.5900	.9500
8	1.0000	.9600	.8800	.7800	.6800
8	.6000	.5200	.4700	.4300	.3900
8	.3500	.3200	.2900	.2600	.2300
8	.2200	.2000	.1800	.1700	.1600
8	.1500	.1400	.1300	.1200	.1100
8	.1000	.0900	.0850	.0800	.0750
8	.0700	.0600	.0500	.0450	.0400
8	.0350	.0300	.0220	.0160	.0100
8	.0050	.0040	.0030	.0020	.0016
8	.0000	.0000	.0000	.0000	.0000
9 ENDTBL					

COMPUTED PEAK RATE FACTOR = 256.00

	TABLE NO.	TIME INCREMENT			
5 RAINFL 1		.5000			
8	.0000	.0060	.0120	.0190	.0250
8	.0320	.0390	.0470	.0540	.0620

```
8              .1220      .1340      .1480      .1640      .1810
8              .2010      .2260      .2580      .3080      .6070
8              .7190      .7570      .7850      .8070      .8260
8              .8420      .8570      .8700      .8820      .8930
8              .9040      .9130      .9230      .9310      .9400
8              .9480      .9550      .9620      .9690      .9760
8              .9830      .9890      .9950     1.0000     1.0000
9 ENDTBL
1
```



```
    TABLE NO.      TIME INCREMENT
5 RAINFL 2                2.0000

8              .0000      .0600      .1200      .1800      .2400
8              .3000      .3600      .4200      .4800      .5400
8              .6000      .6600      .7100      .8500      .9300
8             1.1400     1.2800     1.4200     1.5600     1.7000
8             1.8400     1.9900     2.1300     2.2700     2.4100
8             2.6000     2.8200     3.0900     3.4300     3.9500
8             8.0500     9.3800     9.8900    10.2000    10.5100
8            10.7100    10.9100    11.0200    11.1300    11.2400
8            11.3400    11.4500    11.5500    11.6600    11.7600
8            11.8700    11.9800    12.0900    12.1900    12.1900
9 ENDTBL

    TABLE NO.      TIME INCREMENT
5 RAINFL 3                 .5000

8              .0000      .0100      .0220      .0360      .0510
8              .0670      .0830      .0990      .1160      .1350
8              .1560      .1790      .2040      .2330      .2680
8              .3100      .4250      .4800      .5200      .5500
8              .5770      .6010      .6230      .6440      .6640
8              .6830      .7010      .7190      .7360      .7530
8              .7690      .7850      .8000      .8150      .8300
8              .8440      .8580      .8710      .8840      .8960
8              .9080      .9200      .9320      .9440      .9560
8              .9670      .9780      .9890     1.0000     1.0000
9 ENDTBL

    TABLE NO.      TIME INCREMENT
5 RAINFL 4                 .5000

8              .0000      .0040      .0080      .0120      .0160
8              .0200      .0250      .0300      .0350      .0400
8              .0450      .0500      .0550      .0600      .0650
8              .0700      .0750      .0810      .0870      .0930
8              .0990      .1050      .1110      .1180      .1250
8              .1320      .1400      .1480      .1560      .1650
8              .1740      .1840      .1950      .2070      .2200
8              .2360      .2550      .2770      .3030      .4030
8              .5150      .5490      .5830      .6050      .6240
8              .6400      .6550      .6690      .6820      .6940
8              .7050      .7160      .7270      .7380      .7480
8              .7580      .7670      .7760      .7840      .7920
1
```

8	.8000	.8080	.8160	.8230	.8300
8	.8370	.8440	.8510	.8580	.8640
8	.8700	.8760	.8820	.8880	.8940
8	.9000	.9060	.9110	.9160	.9210
8	.9260	.9310	.9360	.9410	.9460
8	.9510	.9560	.9610	.9660	.9710
8	.9760	.9800	.9840	.9880	.9920
8	.9960	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT
5 RAINFL 5	.5000

8	.0000	.0020	.0050	.0080	.0110
8	.0140	.0170	.0200	.0230	.0260
8	.0290	.0320	.0350	.0380	.0410
8	.0440	.0470	.0510	.0550	.0590
8	.0630	.0670	.0710	.0750	.0790
8	.0840	.0890	.0940	.0990	.1040
8	.1090	.1140	.1200	.1260	.1330
8	.1400	.1470	.1540	.1620	.1710
8	.1810	.1920	.2040	.2170	.2330
8	.2520	.2770	.3100	.6300	.6980
8	.7290	.7520	.7700	.7850	.7980
8	.8090	.8190	.8290	.8380	.8460
8	.8540	.8610	.8680	.8740	.8800
8	.8860	.8920	.8970	.9020	.9070
8	.9120	.9170	.9210	.9250	.9290
8	.9330	.9370	.9410	.9450	.9490
8	.9530	.9570	.9600	.9630	.9660
8	.9690	.9720	.9750	.9780	.9810
8	.9840	.9870	.9900	.9930	.9960
8	.9980	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

TABLE NO.	TIME INCREMENT
5 RAINFL 6	.0200

8	.0000	.0080	.0162	.0246	.0333
8	.0425	.0524	.0630	.0743	.0863
8	.0990	.1124	.1265	.1420	.1595
8	.1800	.2050	.2550	.3450	.4370
8	.5300	.6030	.6330	.6600	.6840
8	.7050	.7240	.7420	.7590	.7750
8	.7900	.8043	.8180	.8312	.8439
8	.8561	.8678	.8790	.8898	.9002
8	.9103	.9201	.9297	.9391	.9483

1

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8	.9573	.9661	.9747	.9832	.9916
8	1.0000	1.0000	1.0000	1.0000	1.0000

9 ENDTBL

1

0 STANDARD CONTROL INSTRUCTIONS

```
 6 RUNOFF 1  14       1       .0670     45.0000       .99001 1 0 1 0 1
 6 RESVOR 2     3 1   2     75.0000                       1 0 0 1 0 0
 6 RUNOFF 1  24       3       .0104     51.7000       .10001 1 0 1 0 1
 6 ADDHYD 4   4   2 3 4                                   1 0 0 1 0 0
 6 RESVOR 2     4 4   5     77.1000                       1 0 0 1 0 0
 6 REACH  3   1   5   6    750.0000       .0000       .00001 0 0 1 0 0
 6 RESVOR 2     5 6   7     73.5000                       1 0 0 1 0 0
 6 REACH  3   2   7   1    400.0000       .0000       .00001 0 0 1 0 0
 6 RESVOR 2     6 1   2     68.7000                       1 0 0 1 0 0
 6 RUNOFF 1   5       3       .0752     46.3000       .50001 1 0 1 0 1
 6 ADDHYD 4   6   2 3 4                                   1 0 0 1 0 0
 6 REACH  3   3   4   5   1600.0000       .0000       .00001 0 0 1 0 0
 6 RESVOR 2     7 5   6     62.0000                       1 1 0 1 0 1
   ENDATA
```

END OF LISTING

1

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REV PC 09/83(.2) PAGE

EXECUTIVE CONTROL OPERATION INCREM RECORD ID

\+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID

\+ FROM XSECTION 14

\+ TO STRUCTURE 7

STARTING TIME = .00 RAIN DEPTH = 8.50 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 1 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 14
OUTPUT HYDROGRAPH= 1
AREA= .07 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .90 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .1000 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.81	19.99	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA = .07 SQ.MI.		
11.00	DISCHG	.00	.00	.00	.00	.00	.01	.14	.53	1.35	2.84
12.00	DISCHG	5.20	8.03	11.14	14.10	16.46	18.02	19.05	19.72	19.99	19.80
13.00	DISCHG	19.21	18.51	17.80	17.13	16.47	15.82	15.21	14.65	14.13	13.62
14.00	DISCHG	13.12	12.65	12.23	11.85	11.47	11.12	10.80	10.52	10.26	9.98
15.00	DISCHG	9.71	9.45	9.20	8.95	8.72	8.50	8.29	8.10	7.92	7.72
16.00	DISCHG	7.52	7.31	7.10	6.90	6.71	6.52	6.33	6.14	5.95	5.76
17.00	DISCHG	5.58	5.41	5.25	5.12	5.00	4.89	4.79	4.70	4.61	4.52
18.00	DISCHG	4.42	4.33	4.25	4.18	4.13	4.09	4.06	4.02	3.98	3.92
19.00	DISCHG	3.86	3.79	3.74	3.69	3.65	3.63	3.61	3.59	3.57	3.54
20.00	DISCHG	3.51	3.47	3.44	3.39	3.35	3.30	3.25	3.21	3.17	3.13

22.00	DISCHG	2.91	2.90	2.89	2.88	2.87	2.86	2.86	2.84	2.83	2.80
23.00	DISCHG	2.77	2.75	2.72	2.69	2.67	2.64	2.62	2.60	2.57	2.54
24.00	DISCHG	2.50	2.45	2.37	2.28	2.15	2.00	1.84	1.68	1.54	1.41
25.00	DISCHG	1.29	1.19	1.09	1.01	.93	.86	.79	.73	.67	.62
26.00	DISCHG	.57	.53	.49	.45	.42	.38	.35	.32	.30	.27
27.00	DISCHG	.25	.22	.20	.18	.16	.15	.13	.12	.10	.09
28.00	DISCHG	.08	.07	.06	.05	.04	.03	.03	.02	.02	.01
29.00	DISCHG	.01	.01	.00							

RUNOFF VOLUME ABOVE BASEFLOW = 2.01 WATERSHED INCHES, 86.76 CFS-HRS, 7.17 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 3
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 75.00

*** WARNING-NO PEAK FOUND, MAXIMUM DISCHARGE = .04 CFS.

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.50	.04	78.62

1

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RUNOFF VOLUME ABOVE BASEFLOW = .01 WATERSHED INCHES, .50 CFS-HRS, .04 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 24
OUTPUT HYDROGRAPH= 3
AREA= .01 SQ MI INPUT RUNOFF CURVE= 52. TIME OF CONCENTRATION= .10 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0133 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.00	12.61	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .01 SQ.MI.

10.00	DISCHG	.00	.00	.00	.00	.00	.01	.03	.06	.10	.14
11.00	DISCHG	.18	.28	.40	.49	.59	.69	2.91	5.74	8.26	10.56
12.00	DISCHG	12.61	10.17	8.08	7.21	6.77	6.58	4.76	3.49	2.90	2.58
13.00	DISCHG	2.42	2.11	1.93	1.85	1.81	1.79	1.64	1.52	1.48	1.45
14.00	DISCHG	1.44	1.36	1.30	1.28	1.27	1.26	1.18	1.12	1.10	1.09
15.00	DISCHG	1.08	1.05	1.03	1.03	1.02	1.02	.97	.93	.91	.90
16.00	DISCHG	.90	.87	.85	.84	.84	.83	.81	.79	.78	.77
17.00	DISCHG	.77	.77	.77	.77	.78	.78	.72	.68	.66	.65
18.00	DISCHG	.64	.67	.69	.70	.71	.71	.66	.61	.59	.58
19.00	DISCHG	.58	.61	.63	.64	.65	.65	.62	.60	.59	.59
20.00	DISCHG	.58	.55	.53	.52	.51	.51	.51	.51	.51	.51
21.00	DISCHG	.51	.51	.51	.51	.52	.52	.52	.52	.52	.52
22.00	DISCHG	.52	.52	.52	.52	.52	.52	.49	.47	.46	.45
23.00	DISCHG	.45	.45	.45	.45	.45	.45	.42	.40	.38	.38
24.00	DISCHG	.38	.22	.10	.05	.02	.01	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 2.75 WATERSHED INCHES, 18.44 CFS-HRS, 1.52 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 4
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.00	12.61	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = .38 WATERSHED INCHES, 18.94 CFS-HRS, 1.57 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 4
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
SURFACE ELEVATION= 77.10
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.92	14.09	78.99
12.08	13.28	78.97
12.30	9.53	78.90
12.49	8.44	78.88
12.68	4.93	78.79
12.90	3.61	78.75
13.10	2.87	78.73

RUNOFF VOLUME ABOVE BASEFLOW = .37 WATERSHED INCHES, 18.55 CFS-HRS, 1.53 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 1
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
LENGTH = 750.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 1 BY 12.0 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .13 M= 1.31
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .21 PEAK TRAVEL TIME = .50 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.58	7.00	75.98
12.40	7.10	76.01

RUNOFF VOLUME ABOVE BASEFLOW = .35 WATERSHED INCHES, 17.48 CFS-HRS, 1.44 ACRE-FEET; BASEFLOW = .00 CFS.

OPERATION RESVOR STRUCTURE 5
INPUT HYDROGRAPH= 6 OUTPUT HYDROGRAPH= 7
SURFACE ELEVATION= 73.50

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.12	7.62	75.26
12.31	8.53	75.28
12.50	8.31	75.27
12.69	7.63	75.26
12.89	6.20	75.22
13.09	4.97	75.19
13.29	3.98	75.16
13.49	3.26	75.14

RUNOFF VOLUME ABOVE BASEFLOW = .36 WATERSHED INCHES, 18.08 CFS-HRS, 1.49 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 1
LENGTH = 400.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 2 BY 6.1 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .15 M= 1.34
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .40 PEAK TRAVEL TIME = .50 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.96	6.08	71.00
12.80	6.72	71.14

RUNOFF VOLUME ABOVE BASEFLOW = .34 WATERSHED INCHES, 17.13 CFS-HRS, 1.42 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 6
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 68.70

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(5.53) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 6 %.
+ STRUCTURE 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	5.53	70.41
12.52	6.80	70.44
12.70	7.25	70.45
12.89	6.87	70.44
13.08	5.95	70.42
13.28	4.94	70.39
13.48	4.04	70.37

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

12.00	DISCHG	.00	.00	.00	5.19	4.14	6.75	5.37	7.25	5.69	6.86
13.00	DISCHG	5.13	5.91	4.31	4.90	3.54	4.00	2.91	3.31	2.45	2.79
14.00	DISCHG	2.09	2.38	1.83	2.09	1.65	1.84	1.53	1.64	1.44	1.49
15.00	DISCHG	1.34	1.37	1.26	1.27	1.20	1.20	1.15	1.14	1.11	1.09
16.00	DISCHG	1.06	1.04	1.01	1.00	.97	.96	.94	.92	.91	.89
17.00	DISCHG	.88	.86	.85	.84	.83	.82	.82	.81	.81	.79
18.00	DISCHG	.78	.76	.75	.73	.73	.72	.72	.72	.72	.71
19.00	DISCHG	.70	.69	.67	.66	.66	.66	.65	.66	.66	.66
20.00	DISCHG	.65	.65	.64	.63	.62	.61	.60	.59	.58	.57
21.00	DISCHG	.57	.56	.56	.55	.55	.55	.55	.55	.55	.55
22.00	DISCHG	.55	.55	.55	.55	.55	.55	.55	.55	.55	.54
23.00	DISCHG	.53	.53	.52	.51	.51	.50	.50	.49	.49	.48
24.00	DISCHG	.47	.46	.45	.44	.40	.36	.31	.27	.23	.19
25.00	DISCHG	.16	.14	.11	.10	.08	.07	.07	.06	.05	.05
26.00	DISCHG	.05	.04	.04	.04	.04	.04	.04	.04	.04	.04
27.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
28.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
29.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04

RUNOFF VOLUME ABOVE BASEFLOW = .35 WATERSHED INCHES, 17.54 CFS-HRS, 1.45 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 5
OUTPUT HYDROGRAPH= 3
AREA= .08 SQ MI INPUT RUNOFF CURVE= 47. TIME OF CONCENTRATION= .50 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0667 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	34.04	(RUNOFF)
19.55	4.08	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA =		.08 SQ.MI.
11.00	DISCHG	.00	.00	.01	.05	.14	.36	1.02	3.10	7.12	13.28
12.00	DISCHG	20.65	27.51	32.46	33.60	33.90	34.04	33.95	32.88	30.73	28.31
13.00	DISCHG	26.17	24.33	22.84	21.42	20.13	19.07	18.09	17.16	16.24	15.39
14.00	DISCHG	14.64	13.95	13.26	12.53	11.84	11.23	10.64	10.04	9.45	8.94
15.00	DISCHG	8.53	8.19	7.88	7.61	7.39	7.22	7.07	6.90	6.72	6.55
16.00	DISCHG	6.40	6.28	6.15	6.02	5.90	5.80	5.71	5.61	5.51	5.41
17.00	DISCHG	5.33	5.26	5.20	5.15	5.11	5.08	5.04	4.95	4.84	4.72
18.00	DISCHG	4.62	4.55	4.50	4.50	4.50	4.51	4.49	4.44	4.34	4.24
19.00	DISCHG	4.15	4.09	4.05	4.06	4.07	4.08	4.08	4.06	4.01	3.97
20.00	DISCHG	3.92	3.88	3.82	3.75	3.68	3.62	3.56	3.52	3.49	3.46
21.00	DISCHG	3.43	3.41	3.39	3.38	3.37	3.36	3.35	3.34	3.33	3.33
22.00	DISCHG	3.32	3.32	3.32	3.31	3.31	3.31	3.30	3.27	3.22	3.17
23.00	DISCHG	3.13	3.09	3.06	3.03	3.01	2.99	2.97	2.92	2.86	2.80
24.00	DISCHG	2.74	2.63	2.45	2.14	1.83	1.56	1.33	1.15	.99	.86
25.00	DISCHG	.74	.64	.55	.48	.41	.36	.30	.26	.22	.18
26.00	DISCHG	.15	.12	.09	.07	.05	.04	.02	.02	.01	.00

RUNOFF VOLUME ABOVE BASEFLOW = 2.21 WATERSHED INCHES, 107.47 CFS-HRS, 8.88 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 6
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.52	40.84	(NULL)
12.67	40.35	(NULL)
19.55	4.74	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = 1.27 WATERSHED INCHES, 125.01 CFS-HRS, 10.33 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 3
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
LENGTH = 1600.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 3 BY 38.1 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .22 M= 1.28
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .18 PEAK TRAVEL TIME = .53 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.04	31.90	69.14

RUNOFF VOLUME ABOVE BASEFLOW = 1.26 WATERSHED INCHES, 124.45 CFS-HRS, 10.28 ACRE-FEET; BASEFLOW = .00 CFS
1

OPERATION RESVOR STRUCTURE 7
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
SURFACE ELEVATION= 62.00

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(14.32) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 9 %.
+ STRUCTURE 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.24	14.32	63.89
12.83	21.74	64.23
13.01	33.11	64.26
13.19	32.54	64.25
13.38	30.90	64.22
13.56	28.70	64.17
13.75	26.35	64.13

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .15 SQ.MI.

12.00	DISCHG	.00	.00	13.05	11.97	20.80	20.16	27.17	26.29	31.50	29.90
13.00	DISCHG	33.10	30.75	32.52	29.90	30.79	28.16	28.50	26.05	26.08	23.86
14.00	DISCHG	23.68	21.70	21.43	19.69	19.35	17.81	17.43	16.08	15.68	14.49
15.00	DISCHG	14.08	13.05	12.69	11.83	11.52	10.81	10.56	9.98	9.78	9.31
16.00	DISCHG	9.13	8.73	8.57	8.24	8.10	7.81	7.68	7.45	7.33	7.13
17.00	DISCHG	7.02	6.84	6.74	6.59	6.51	6.39	6.32	6.22	6.16	6.05
18.00	DISCHG	5.97	5.86	5.77	5.67	5.60	5.53	5.48	5.42	5.38	5.32
19.00	DISCHG	5.26	5.18	5.11	5.04	4.99	4.94	4.90	4.87	4.84	4.81
20.00	DISCHG	4.78	4.74	4.70	4.66	4.61	4.56	4.50	4.44	4.38	4.33
21.00	DISCHG	4.27	4.22	4.18	4.14	4.10	4.07	4.04	4.01	3.99	3.97
22.00	DISCHG	3.95	3.94	3.92	3.91	3.90	3.90	3.89	3.88	3.87	3.85
23.00	DISCHG	3.83	3.80	3.77	3.73	3.70	3.67	3.64	3.60	3.57	3.53
24.00	DISCHG	3.49	3.44	3.38	3.29	3.17	3.00	2.81	2.61	2.40	2.19
25.00	DISCHG	1.99	1.80	1.62	1.45	1.30	1.15	1.03	.91	.81	.71
26.00	DISCHG	.62	.55	.48	.42	.36	.31	.27	.23	.20	.17
27.00	DISCHG	.15	.13	.11	.10	.09	.08	.07	.06	.06	.05
28.00	DISCHG	.05	.05	.04	.04	.04	.04	.04	.04	.04	.04
29.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04

RUNOFF VOLUME ABOVE BASEFLOW = 1.24 WATERSHED INCHES, 122.18 CFS-HRS, 10.10 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
+ COMPUTATIONS COMPLETED FOR PASS 1

1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 PAS
REV PC 09/83(.2) PAG

EXECUTIVE CONTROL OPERATION INCREM RECORD ID
+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID
+ FROM XSECTION 14
+ TO STRUCTURE 7
STARTING TIME = .00 RAIN DEPTH = 11.00 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 2 STORM NO.= 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 14
OUTPUT HYDROGRAPH= 1
AREA= .07 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .90 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .1000 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.74	38.17	(RUNOFF)

10.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.01	.03	.07
11.00	DISCHG	.13	.22	.35	.52	.74	1.02	1.70	2.96	5.14	8.65
12.00	DISCHG	13.75	19.34	25.05	30.17	33.97	36.20	37.47	38.11	38.06	37.27
13.00	DISCHG	35.88	34.36	32.86	31.45	30.09	28.78	27.54	26.39	25.34	24.33
14.00	DISCHG	23.35	22.43	21.60	20.87	20.14	19.47	18.87	18.32	17.80	17.27
15.00	DISCHG	16.74	16.24	15.76	15.30	14.85	14.43	14.04	13.69	13.33	12.95
16.00	DISCHG	12.55	12.16	11.77	11.40	11.04	10.69	10.34	9.99	9.64	9.29
17.00	DISCHG	8.96	8.66	8.38	8.15	7.94	7.76	7.59	7.43	7.28	7.12
18.00	DISCHG	6.97	6.82	6.69	6.58	6.49	6.42	6.36	6.30	6.23	6.14
19.00	DISCHG	6.03	5.93	5.84	5.76	5.71	5.67	5.63	5.60	5.56	5.52
20.00	DISCHG	5.47	5.41	5.35	5.28	5.21	5.13	5.05	4.98	4.92	4.86
21.00	DISCHG	4.81	4.76	4.72	4.68	4.64	4.61	4.58	4.56	4.53	4.51
22.00	DISCHG	4.49	4.47	4.46	4.45	4.43	4.42	4.40	4.38	4.36	4.32
23.00	DISCHG	4.27	4.23	4.18	4.14	4.10	4.07	4.03	3.99	3.95	3.90
24.00	DISCHG	3.84	3.76	3.65	3.50	3.31	3.07	2.82	2.59	2.37	2.17
25.00	DISCHG	1.99	1.83	1.68	1.55	1.43	1.32	1.22	1.12	1.04	.96
26.00	DISCHG	.88	.81	.75	.69	.64	.59	.54	.50	.46	.42
27.00	DISCHG	.38	.34	.31	.28	.25	.23	.20	.18	.16	.14
28.00	DISCHG	.12	.10	.09	.07	.06	.05	.04	.03	.02	.02
29.00	DISCHG	.01	.01	.01	.00						

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 152.35 CFS-HRS, 12.59 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 3
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 75.00

1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 PAS
REV PC 09/83(.2) PAG

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
15.90	20.16	79.07
16.10	17.40	79.06
16.30	15.21	79.05
16.50	13.46	79.04
16.70	12.00	79.04
16.90	10.76	79.04
17.10	9.73	79.03
17.30	8.92	79.03
17.50	8.33	79.03
19.65	5.62	79.02

RUNOFF VOLUME ABOVE BASEFLOW = 1.36 WATERSHED INCHES, 58.84 CFS-HRS, 4.86 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 24
OUTPUT HYDROGRAPH= 3
AREA= .01 SQ MI INPUT RUNOFF CURVE= 52. TIME OF CONCENTRATION= .10 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0133 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.99	21.39	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .01 SQ.MI.

9.00	DISCHG	.00	.00	.00	.01	.02	.04	.06	.09	.11	.14
10.00	DISCHG	.16	.21	.26	.31	.35	.39	.48	.56	.64	.70
11.00	DISCHG	.76	1.03	1.27	1.45	1.60	1.76	6.43	11.45	15.33	18.59
12.00	DISCHG	21.34	16.88	13.17	11.56	10.72	10.32	7.43	5.42	4.49	3.99
13.00	DISCHG	3.72	3.24	2.96	2.84	2.77	2.74	2.49	2.32	2.25	2.21

15.00	DISCHG	1.63	1.58	1.55	1.54	1.54	1.53	1.45	1.39	1.36	1.35
16.00	DISCHG	1.34	1.30	1.27	1.26	1.25	1.25	1.20	1.17	1.16	1.15
17.00	DISCHG	1.15	1.15	1.15	1.15	1.15	1.15	1.07	1.01	.98	.96
18.00	DISCHG	.95	.99	1.03	1.04	1.05	1.06	.97	.91	.88	.86
19.00	DISCHG	.85	.90	.93	.95	.96	.96	.92	.89	.87	.86
20.00	DISCHG	.86	.81	.78	.77	.76	.76	.75	.75	.76	.76
21.00	DISCHG	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76
22.00	DISCHG	.76	.76	.76	.76	.76	.76	.72	.69	.67	.66
23.00	DISCHG	.66	.66	.66	.66	.66	.66	.61	.58	.56	.56
24.00	DISCHG	.55	.32	.15	.08	.03	.01	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 4.50 WATERSHED INCHES, 30.23 CFS-HRS, 2.50 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 4
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4
1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 PAS
REV PC 09/83(.2) PAG

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.99	21.39	(NULL)
15.90	21.51	(NULL)
16.10	18.70	(NULL)
16.30	16.46	(NULL)
16.50	14.71	(NULL)
16.70	13.17	(NULL)
16.90	11.91	(NULL)
17.10	10.88	(NULL)
17.30	10.08	(NULL)
17.49	9.48	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = 1.78 WATERSHED INCHES, 89.07 CFS-HRS, 7.36 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 4
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
SURFACE ELEVATION= 77.10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.95	20.83	79.12
12.27	12.94	78.97
12.48	11.49	78.94
15.91	21.13	79.13
16.11	17.31	79.05
16.31	14.55	79.00
16.50	12.56	78.96
16.77	11.37	78.94
16.99	10.96	78.93
17.19	10.53	78.92

RUNOFF VOLUME ABOVE BASEFLOW = 1.74 WATERSHED INCHES, 86.86 CFS-HRS, 7.18 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 1
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
LENGTH = 750.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 1 BY 19.3 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .14 M= 1.28
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .23 PEAK TRAVEL TIME = .40 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	13.38	77.82
18.76	7.83	76.22

RUNOFF VOLUME ABOVE BASEFLOW = 1.72 WATERSHED INCHES, 86.15 CFS-HRS, 7.12 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 5
1

INPUT HYDROGRAPH= 6 OUTPUT HYDROGRAPH= 7
SURFACE ELEVATION= 73.50

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(9.01) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 5 %.
+ STRUCTURE 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.03	9.01	75.29
12.22	14.03	75.39
12.40	14.72	75.40
12.59	13.67	75.38
12.78	12.14	75.35
12.97	9.55	75.30
13.18	7.45	75.25
13.38	5.85	75.22
13.58	4.72	75.19
17.95	9.14	75.29

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA =		.08 SQ.MI.
11.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.00	.77
12.00	DISCHG	8.51	6.92	13.76	11.37	14.72	11.33	13.65	10.63	12.03	8.59
13.00	DISCHG	9.41	6.57	7.36	5.12	5.80	4.08	4.70	3.45	3.94	2.96
14.00	DISCHG	3.33	2.61	2.93	2.30	2.60	2.19	2.36	2.06	2.19	1.92
15.00	DISCHG	2.01	1.81	1.88	1.74	1.77	1.67	1.69	1.63	1.63	1.56
16.00	DISCHG	2.50	6.66	7.46	9.35	10.01	10.62	11.18	11.09	11.55	11.07
17.00	DISCHG	11.43	10.79	11.05	10.37	10.56	9.92	10.05	9.50	9.57	9.09
18.00	DISCHG	9.09	8.70	8.65	8.35	8.29	8.07	8.00	7.85	7.75	7.62
19.00	DISCHG	7.50	7.40	7.27	7.19	7.07	7.01	6.90	6.87	6.77	6.73
20.00	DISCHG	6.63	6.61	6.51	6.48	6.37	6.33	6.21	6.17	6.06	6.01
21.00	DISCHG	5.91	5.86	5.77	5.74	5.66	5.62	5.56	5.53	5.47	5.45
22.00	DISCHG	5.40	5.38	5.34	5.33	5.29	5.28	5.25	5.24	5.21	5.18
23.00	DISCHG	5.14	5.11	5.07	5.03	4.98	4.94	4.90	4.86	4.81	4.76
24.00	DISCHG	4.70	4.65	4.53	4.40	4.32	4.16	3.97	3.77	3.56	3.34
25.00	DISCHG	3.12	2.90	2.70	2.50	2.31	2.14	1.98	1.83	1.70	1.56
26.00	DISCHG	1.45	1.33	1.23	1.14	1.05	.97	.90	.83	.76	.70
27.00	DISCHG	.65	.59	.55	.50	.46	.42	.38	.34	.31	.28
28.00	DISCHG	.25	.23	.20	.18	.16	.14	.12	.11	.09	.08
29.00	DISCHG	.07	.06	.06	.05	.05	.05	.04	.04	.04	.04

RUNOFF VOLUME ABOVE BASEFLOW = 1.70 WATERSHED INCHES, 84.94 CFS-HRS, 7.02 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 1
LENGTH = 400.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 2 BY 12.3 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .16 M= 1.33
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .45 PEAK TRAVEL TIME = .30 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.86	12.00	72.29
17.25	11.07	72.08
12.70	12.62	72.42

RUNOFF VOLUME ABOVE BASEFLOW = 1.72 WATERSHED INCHES, 86.04 CFS-HRS, 7.11 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 6
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 68.70

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(8.88) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 5 %.
+ STRUCTURE 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	8.88	70.49
12.42	12.94	70.57
12.61	14.12	70.59
12.80	13.73	70.58
12.99	12.18	70.55
13.18	9.98	70.51
13.38	7.97	70.47
13.58	6.35	70.43
13.79	5.14	70.40
17.10	11.21	70.53

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

12.00	DISCHG	.00	.00	8.46	6.06	12.78	9.64	14.11	10.48	13.72	10.04
13.00	DISCHG	12.12	8.42	9.90	6.68	7.90	5.23	6.30	4.16	5.12	3.47
14.00	DISCHG	4.24	2.96	3.58	2.61	3.11	2.35	2.75	2.16	2.48	2.03
15.00	DISCHG	2.27	1.90	2.08	1.80	1.94	1.72	1.82	1.67	1.72	1.63
16.00	DISCHG	1.64	1.95	4.00	5.58	7.20	8.50	9.40	10.23	10.58	11.03
17.00	DISCHG	11.04	11.21	11.03	11.02	10.76	10.64	10.36	10.18	9.92	9.72
18.00	DISCHG	9.49	9.27	9.06	8.84	8.66	8.46	8.33	8.15	8.05	7.89
19.00	DISCHG	7.79	7.64	7.55	7.41	7.32	7.20	7.13	7.02	6.96	6.87
20.00	DISCHG	6.81	6.73	6.68	6.60	6.55	6.47	6.40	6.32	6.25	6.17
21.00	DISCHG	6.09	6.01	5.94	5.87	5.81	5.74	5.69	5.63	5.58	5.54
22.00	DISCHG	5.49	5.46	5.42	5.39	5.36	5.33	5.31	5.29	5.26	5.24
23.00	DISCHG	5.21	5.18	5.15	5.12	5.07	5.04	4.99	4.95	4.91	4.87
24.00	DISCHG	4.82	4.77	4.71	4.66	4.58	4.47	4.33	4.17	4.00	3.81
25.00	DISCHG	3.60	3.39	3.18	2.96	2.76	2.56	2.38	2.20	2.04	1.89
26.00	DISCHG	1.75	1.62	1.49	1.38	1.27	1.18	1.08	1.00	.92	.85
27.00	DISCHG	.79	.72	.67	.61	.56	.52	.47	.43	.39	.36
28.00	DISCHG	.32	.29	.26	.24	.21	.19	.17	.15	.13	.11
29.00	DISCHG	.10	.08	.07	.07	.06	.05	.05	.05	.05	.04

RUNOFF VOLUME ABOVE BASEFLOW = 1.69 WATERSHED INCHES, 84.46 CFS-HRS, 6.98 ACRE-FEET; BASEFLOW = .00 CFS
1

OPERATION RUNOFF CROSS SECTION 5
OUTPUT HYDROGRAPH= 3
AREA= .08 SQ MI INPUT RUNOFF CURVE= 47. TIME OF CONCENTRATION= .50 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0667 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.30	63.72	(RUNOFF)
19.53	6.25	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA = .08 SQ.MI.		
10.00	DISCHG	.00	.00	.00	.02	.05	.12	.22	.36	.55	.77
11.00	DISCHG	1.01	1.32	1.73	2.30	2.93	3.75	5.64	10.71	19.59	31.47
12.00	DISCHG	44.51	55.66	63.04	63.72	63.05	62.22	61.13	58.58	54.36	49.83
13.00	DISCHG	45.81	42.48	39.60	36.99	34.59	32.60	30.77	29.04	27.36	25.80
14.00	DISCHG	24.40	23.12	21.85	20.52	19.26	18.15	17.09	16.05	15.04	14.18
15.00	DISCHG	13.49	12.92	12.41	11.96	11.60	11.32	11.07	10.80	10.50	10.23
16.00	DISCHG	9.99	9.78	9.58	9.37	9.18	9.02	8.87	8.71	8.54	8.39
17.00	DISCHG	8.25	8.14	8.05	7.97	7.91	7.85	7.78	7.65	7.46	7.28
18.00	DISCHG	7.12	7.00	6.93	6.92	6.92	6.93	6.90	6.81	6.66	6.51
19.00	DISCHG	6.37	6.27	6.22	6.22	6.23	6.25	6.24	6.21	6.14	6.06
20.00	DISCHG	6.00	5.93	5.84	5.73	5.61	5.52	5.44	5.37	5.32	5.27
21.00	DISCHG	5.23	5.20	5.17	5.14	5.12	5.11	5.09	5.08	5.07	5.06
22.00	DISCHG	5.05	5.04	5.04	5.03	5.03	5.03	5.01	4.96	4.89	4.81
23.00	DISCHG	4.74	4.68	4.63	4.59	4.56	4.53	4.49	4.42	4.33	4.23
24.00	DISCHG	4.14	3.98	3.71	3.33	2.77	2.36	2.02	1.74	1.50	1.30
25.00	DISCHG	1.12	.97	.84	.73	.62	.54	.46	.39	.33	.27
26.00	DISCHG	.22	.18	.14	.11	.08	.06	.04	.02	.01	.01
27.00	DISCHG	.00									

RUNOFF VOLUME ABOVE BASEFLOW = 3.80 WATERSHED INCHES, 104.63 CFS-HRS, 15.26 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 6
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.24	72.92	(NULL)
12.41	75.80	(NULL)
12.59	75.34	(NULL)
17.07	19.37	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = 2.73 WATERSHED INCHES, 269.10 CFS-HRS, 22.24 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 3
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
LENGTH = 1600.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 3 BY 73.1 CFS
1

0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .24 M= 1.26
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .20 PEAK TRAVEL TIME = .50 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.93	61.92	74.91
17.56	10.46	66.53

RUNOFF VOLUME ABOVE BASEFLOW = 2.74 WATERSHED INCHES, 270.23 CFS-HRS, 22.33 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 7
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
SURFACE ELEVATION= 62.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.94	11.55	63.84
12.91	63.07	64.84
13.08	61.88	64.82
17.53	18.47	63.98

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .15 SQ.MI.

11.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.19	10.77
12.00	DISCHG	8.98	21.45	23.43	37.47	40.06	50.80	51.88	59.45	58.84	63.03
13.00	DISCHG	60.35	61.74	57.91	57.72	53.56	52.54	48.51	47.17	43.50	42.06
14.00	DISCHG	38.80	37.37	34.55	33.21	30.74	29.45	27.29	26.11	24.24	23.14
15.00	DISCHG	21.52	20.57	19.22	18.44	17.34	16.71	15.85	15.36	14.68	14.27
16.00	DISCHG	13.71	13.36	12.96	13.13	13.44	14.07	14.72	15.47	16.13	16.77
17.00	DISCHG	17.27	17.71	18.01	18.26	18.38	18.46	18.45	18.41	18.27	18.11
18.00	DISCHG	17.87	17.63	17.35	17.08	16.81	16.57	16.32	16.11	15.87	15.64
19.00	DISCHG	15.39	15.15	14.89	14.67	14.46	14.28	14.11	13.96	13.81	13.67
20.00	DISCHG	13.52	13.38	13.23	13.09	12.93	12.78	12.62	12.46	12.31	12.16
21.00	DISCHG	12.01	11.87	11.74	11.61	11.49	11.38	11.27	11.17	11.08	10.99
22.00	DISCHG	10.91	10.84	10.77	10.70	10.65	10.59	10.55	10.50	10.45	10.39
23.00	DISCHG	10.32	10.24	10.17	10.09	10.01	9.94	9.86	9.78	9.70	9.61
24.00	DISCHG	9.51	9.40	9.27	9.10	8.86	8.56	8.21	7.84	7.45	7.06
25.00	DISCHG	6.67	6.27	5.89	5.51	5.15	4.80	4.45	4.13	3.82	3.53
26.00	DISCHG	3.25	2.99	2.75	2.53	2.32	2.12	1.94	1.78	1.63	1.49
27.00	DISCHG	1.36	1.25	1.14	1.05	.96	.88	.81	.74	.68	.62
28.00	DISCHG	.57	.52	.47	.43	.39	.35	.32	.29	.26	.23
29.00	DISCHG	.21	.19	.16	.15	.13	.11	.10	.09	.08	.07

RUNOFF VOLUME ABOVE BASEFLOW = 2.74 WATERSHED INCHES, 270.26 CFS-HRS, 22.33 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
+ COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID
1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 SUM
REV PC 09/83(.2) PAG

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	AMTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE R (C
ALTERNATE 1 STORM 1													
XSECTION 14	RUNOFF	.07	1	2	.10	.0	8.50	24.00	2.01	---	12.81	19.99	2
XSECTION 24	RUNOFF	.01	1	2	.10	.0	8.50	24.00	2.75	---	12.00	12.61	12

STRUCTURE	7	RESVOR	.15	1	2	.10	.0	8.50	24.00	1.24	64.26	[illegible]	[illegible]	[illegible]

ALTERNATE 2 STORM 2

XSECTION	14	RUNOFF	.07	1	2	.10	.0	11.00	24.00	3.52	---	12.74	38.17	56
XSECTION	24	RUNOFF	.01	1	2	.10	.0	11.00	24.00	4.50	---	11.99	21.39	20
XSECTION	5	RUNOFF	.08	1	2	.10	.0	11.00	24.00	3.80	---	12.30	63.72	84
STRUCTURE	7	RESVOR	.15	1	2	.10	.0	11.00	24.00	2.74	64.84	12.91	63.07	4

1

SUMMARY TABLE 2 - SELECTED MODIFIED ATT-KIN REACH ROUTINGS IN ORDER OF STANDARD EXECUTIVE CONTROL INSTRUCTIONS
(A STAR(*) AFTER VOLUME ABOVE BASE(IN) INDICATES A HYDROGRAPH TRUNCATED AT A VALUE EXCEEDING BASE + 10% OF PE
A QUESTION MARK(?) AFTER COEFF.(C) INDICATES PARAMETERS OUTSIDE ACCEPTABLE LIMITS, SEE PREVIOUS WARNINGS)

		HYDROGRAPH INFORMATION							ROUTING PARAMETERS									PE
						OUTFLOW+			VOLUME	MAIN	ITER-	Q AND A			PEAK	S/Q	ATT-	TRAVEL
XSEC	REACH	INFLOW		OUTFLOW		INTERV.AREA		BASE-	ABOVE	TIME	ATION	EQUATION		LENGTH	RATIO	@PEAK	KIN	STOR-
ID	LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	FLOW (CFS)	BASE (IN)	INCR (HR)	#	COEFF (X)	POWER (M)	FACTOR (K*)	O/I (Q*)	(K) (SEC)	COEFF (C)	AGE (HR)
ALTERNATE 1 STORM 1																		
1	750	14	11.9	7	12.4	---	---	0	.37	.10	2	.126	1.31	.310	.512	1506	.21	.50
2	400	9	12.3	7	12.8	---	---	0	.36	.10	1	.150	1.34	.062	.790	714	.40	.50
3	1600	41	12.5	32	13.0	---	---	0	1.27	.10	1	.217	1.28	.140	.783	1848	.18	.50
ALTERNATE 2 STORM 2																		
1	750	21	15.9	13	12.3	---	---	0	1.74	.10	1	.142	1.28	.065	.630	1377	.23	.30
2	400	15	12.4	13	12.7	---	---	0	1.70	.10	1	.157	1.33	.014	.857	625	.45	.30
3	1600	76	12.4	62	12.9	---	---	0	2.73	.10	1	.245	1.26	.098	.815	1604	.20	.50

1

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

STRUCTURE ID		AREA (SQ MI)	RETURN NUMBERS..... 1	2
0 STRUCTURE	7	.15		
+				
ALTERNATE	1		33.11	.00
ALTERNATE	2		.00	63.07
0 XSECTION	5	.08		
+				
ALTERNATE	1		34.04	.00
ALTERNATE	2		.00	63.72
0 XSECTION	14	.07		
+				
ALTERNATE	1		19.99	.00
ALTERNATE	2		.00	38.17
0 XSECTION	24	.01		
+				
ALTERNATE	1		12.61	.00
ALTERNATE	2		.00	21.39

1END OF 1 JOBS IN THIS RUN

PROJECT: Normandy Blvd.

DESIGNER: MJ

DATE: 10/31/88

HYDROLOGIC AND CHANNEL INFORMATION

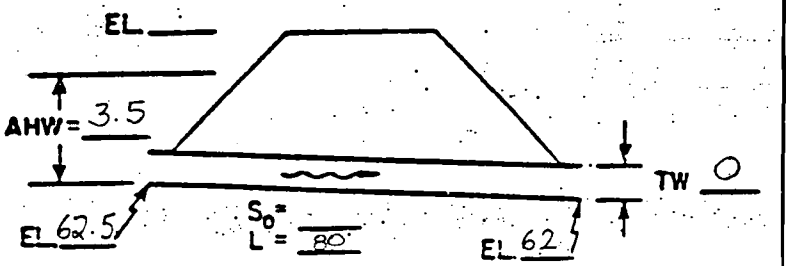
Q_1 = 35 cfs TW_1 = ____

Q_2 = ____ TW_2 = ____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

STATION: 83+50



MEAN STREAM VELOCITY = ____

MAX. STREAM VELOCITY = ____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING H.W.	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.		OUTLET CONTROL HW = H + h_o − LS_o											
			$\frac{HW}{D}$	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW				
R.C.P. w/M.E.S.	35	24"	2.5	5.0	0.5	4.5	2.36	2.18		2.18	0.5	6.18	5.0			
R.C.P. w/ M.E.S.	35	30"	1.32	3.3	0.5	1.65	2.1	2.3		2.3	0.5	3.45	3.45			

SUMMARY & RECOMMENDATIONS:

Use 30" R.C.P. (must be Class IV)

5-18

Figure 7

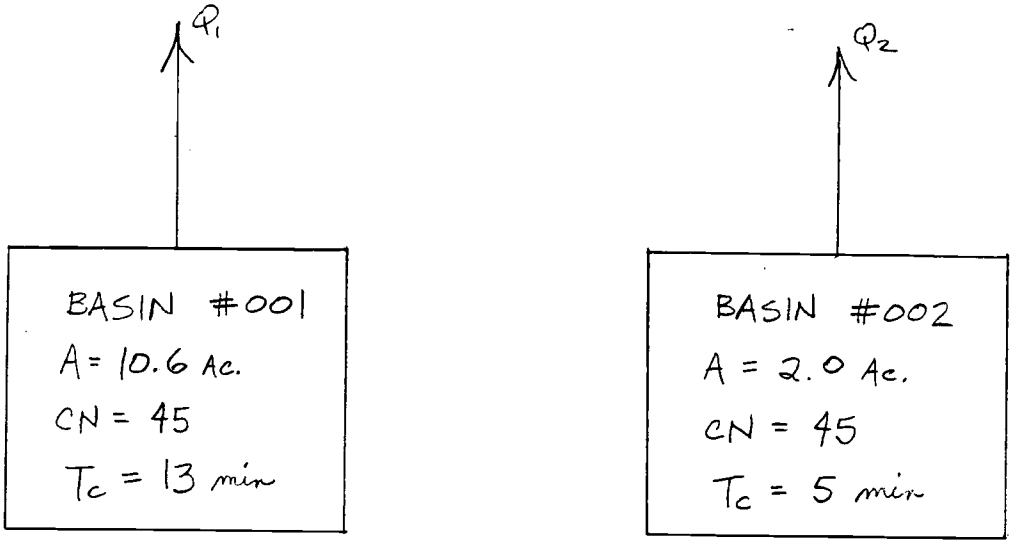
APPENDIX C

OFFSITE DRAINAGE CALCULATIONS

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
PLANNERS - SURVEYORS
P.O. BOX 1180 • WINTER PARK, FLORIDA 32790 / (407) 647-6623

Subject Normandy Boulevard
Job 87524 Sheet ____ of ____
Calculated by MJ Date 10/88
Checked by ____ Date ____
Scale ____

BASINS 1 & 2 EXISTING CONDITIONS



BASIN	FREQUENCY	DURATION	EXISTING PEAK DISCHARGE (cfs)
001	25 YR	24 HR	10.05
	100 YR	24 HR	19.55
002	25 YR	24 HR	2.67
	100 YR	24 HR	5.04

EXECUTIVE CONTROL OPERATION LIST RECORD ID

LISTING OF CURRENT DATA

		TIME INCREMENT				
4 DIMHYD		.0200				
8	.0000	.1500	.3000	.5900	.9500	
8	1.0000	.9600	.8800	.7800	.6800	
8	.6000	.5200	.4700	.4300	.3900	
8	.3500	.3200	.2900	.2600	.2300	
8	.2200	.2000	.1800	.1700	.1600	
8	.1500	.1400	.1300	.1200	.1100	
8	.1000	.0900	.0850	.0800	.0750	
8	.0700	.0600	.0500	.0450	.0400	
8	.0350	.0300	.0220	.0160	.0100	
8	.0050	.0040	.0030	.0020	.0016	
8	.0000	.0000	.0000	.0000	.0000	
9 ENDTBL						

COMPUTED PEAK RATE FACTOR = 256.00

	TABLE NO.	TIME INCREMENT				
5 RAINFL 1		.5000				
8	.0000	.0060	.0120	.0190	.0250	
8	.0320	.0390	.0470	.0540	.0620	
8	.0710	.0800	.0890	.0990	.1100	
8	.1220	.1340	.1480	.1640	.1810	
8	.2010	.2260	.2580	.3080	.6070	
8	.7190	.7570	.7850	.8070	.8260	
8	.8420	.8570	.8700	.8820	.8930	
8	.9040	.9130	.9230	.9310	.9400	
8	.9480	.9550	.9620	.9690	.9760	
8	.9830	.9890	.9950	1.0000	1.0000	
9 ENDTBL						

0 STANDARD CONTROL INSTRUCTIONS

```
6 RUNOFF 1   1      1       .0166     45.0000      .21701 1 0 1 0 1
6 RUNOFF 1   2      1       .0031     45.0000      .08301 1 0 1 0 1
  ENDATA
```

END OF LISTING
1

EXECUTIVE CONTROL OPERATION INCREM RECORD ID
+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID
+ FROM XSECTION 1
+ TO XSECTION 2
STARTING TIME = .00 RAIN DEPTH = 6.50 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 1 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1
OUTPUT HYDROGRAPH= 1
AREA= .02 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .22 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0289 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.11	10.05	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA =		.02 SQ.MI.
11.00	DISCHG	.00	.00	.00	.00	.01	.04	.41	1.81	3.90	6.32
12.00	DISCHG	8.85	10.04	9.13	8.55	8.36	8.33	7.78	6.42	5.42	4.72
13.00	DISCHG	4.20	3.73	3.25	2.92	2.70	2.54	2.30	2.18	2.06	1.99
14.00	DISCHG	1.94	1.88	1.79	1.73	1.70	1.67	1.63	1.55	1.50	1.47
15.00	DISCHG	1.44	1.42	1.39	1.36	1.35	1.34	1.32	1.27	1.23	1.21
16.00	DISCHG	1.20	1.18	1.15	1.13	1.12	1.11	1.09	1.06	1.05	1.03
17.00	DISCHG	1.03	1.02	1.02	1.02	1.02	1.02	1.00	.95	.92	.89
18.00	DISCHG	.88	.88	.90	.91	.92	.92	.91	.86	.83	.81
19.00	DISCHG	.80	.80	.82	.83	.84	.84	.84	.82	.80	.79
20.00	DISCHG	.79	.77	.75	.73	.71	.70	.70	.69	.69	.69
21.00	DISCHG	.68	.68	.68	.68	.68	.69	.69	.69	.69	.69
22.00	DISCHG	.69	.69	.69	.69	.69	.69	.68	.66	.64	.63
23.00	DISCHG	.62	.61	.61	.61	.60	.60	.59	.56	.54	.53
24.00	DISCHG	.52	.46	.32	.23	.16	.12	.08	.06	.04	.03
25.00	DISCHG	.01	.01	.00							

RUNOFF VOLUME ABOVE BASEFLOW = 2.01 WATERSHED INCHES, 21.50 CFS-HRS, 1.78 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 2
OUTPUT HYDROGRAPH= 1
AREA= .00 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .08 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0111 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.00	2.67	(RUNOFF)
12.45	1.53	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA =		.00 SQ.MI.
11.00	DISCHG	.00	.00	.00	.00	.01	.02	.32	.89	1.51	2.12
12.00	DISCHG	2.67	2.05	1.66	1.52	1.46	1.48	1.01	.74	.62	.56
13.00	DISCHG	.55	.48	.44	.43	.42	.42	.38	.36	.35	.34
14.00	DISCHG	.34	.32	.31	.30	.30	.30	.28	.27	.26	.26

15.00	DISCHG	.26	.25	.25	.25	.25	.25	.23	.22	.22	.22
16.00	DISCHG	.22	.21	.21	.20	.20	.20	.20	.19	.19	.19
17.00	DISCHG	.19	.19	.19	.19	.19	.19	.17	.16	.16	.16
18.00	DISCHG	.16	.17	.17	.17	.18	.18	.16	.15	.14	.14
19.00	DISCHG	.14	.15	.16	.16	.16	.16	.15	.15	.15	.14
20.00	DISCHG	.14	.14	.13	.13	.13	.13	.13	.13	.13	.13
21.00	DISCHG	.13	.13	.13	.13	.13	.13	.13	.13	.13	.13
22.00	DISCHG	.13	.13	.13	.13	.13	.13	.12	.12	.11	.11
23.00	DISCHG	.11	.11	.11	.11	.11	.11	.10	.10	.10	.09
24.00	DISCHG	.09	.05	.02	.01	.00					

RUNOFF VOLUME ABOVE BASEFLOW = 2.00 WATERSHED INCHES, 4.01 CFS-HRS, .33 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID

\+ COMPUTATIONS COMPLETED FOR PASS 1

1

TR20 XER 11-01-88 08:17 NORMANDY BLVD. BASINS 1 AND 2 EXISTING CONDITIONS JOB 1 PASS 2
REV PC 09/83(.2) PAGE 8

EXECUTIVE CONTROL OPERATION INCREM RECORD ID

\+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID

\+ FROM XSECTION 1

\+ TO XSECTION 2

STARTING TIME = .00 RAIN DEPTH = 11.00 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 2 STORM NO.= 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 1
OUTPUT HYDROGRAPH= 1
AREA= .02 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .22 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0289 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.09	19.55	(RUNOFF)
22.45	1.07	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .02 SQ.MI.

10.00	DISCHG	.00	.00	.00	.00	.00	.00	.01	.05	.10	.15
11.00	DISCHG	.22	.32	.49	.66	.84	1.04	2.37	6.01	10.11	14.19
12.00	DISCHG	18.13	19.53	17.33	15.87	15.17	14.82	13.64	11.17	9.32	8.03
13.00	DISCHG	7.06	6.21	5.38	4.80	4.42	4.15	3.87	3.54	3.34	3.21
14.00	DISCHG	3.13	3.03	2.88	2.79	2.72	2.68	2.60	2.48	2.39	2.34
15.00	DISCHG	2.30	2.26	2.20	2.17	2.14	2.13	2.09	2.01	1.95	1.92
16.00	DISCHG	1.89	1.86	1.81	1.78	1.76	1.74	1.72	1.67	1.64	1.62
17.00	DISCHG	1.61	1.60	1.60	1.59	1.59	1.59	1.56	1.48	1.43	1.40
18.00	DISCHG	1.37	1.37	1.40	1.42	1.43	1.44	1.41	1.34	1.29	1.26
19.00	DISCHG	1.24	1.24	1.27	1.29	1.30	1.31	1.30	1.26	1.24	1.23
20.00	DISCHG	1.22	1.20	1.15	1.12	1.10	1.09	1.07	1.07	1.06	1.06
21.00	DISCHG	1.06	1.06	1.05	1.05	1.06	1.06	1.06	1.06	1.06	1.06
22.00	DISCHG	1.06	1.06	1.06	1.06	1.06	1.07	1.05	1.01	.98	.96
23.00	DISCHG	.95	.94	.94	.93	.93	.92	.90	.86	.84	.82
24.00	DISCHG	.80	.79	.50	.35	.25	.18	.13	.09	.06	.04
25.00	DISCHG	.02	.01	.00							

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 37.75 CFS-HRS, 3.12 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 2
OUTPUT HYDROGRAPH= 1
AREA= .00 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .08 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0111 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.99	5.04	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA = .00 SQ.MI.		
10.00	DISCHG	.00	.00	.00	.00	.00	.00	.01	.02	.04	.05
11.00	DISCHG	.07	.11	.15	.19	.23	.26	1.28	2.41	3.39	4.27
12.00	DISCHG	5.02	3.72	2.93	2.62	2.49	2.48	1.69	1.22	1.02	.93
13.00	DISCHG	.90	.79	.72	.70	.69	.68	.61	.57	.56	.55
14.00	DISCHG	.55	.51	.49	.49	.48	.48	.45	.43	.42	.41
15.00	DISCHG	.41	.40	.39	.39	.39	.39	.37	.35	.35	.34
16.00	DISCHG	.34	.33	.32	.32	.32	.32	.31	.30	.30	.30
17.00	DISCHG	.30	.30	.30	.30	.30	.30	.27	.26	.25	.25
18.00	DISCHG	.25	.26	.27	.27	.27	.27	.25	.23	.22	.22
19.00	DISCHG	.22	.23	.24	.25	.25	.25	.24	.23	.22	.22
20.00	DISCHG	.22	.21	.20	.20	.20	.20	.20	.20	.20	.20
21.00	DISCHG	.20	.20	.20	.20	.20	.20	.20	.20	.20	.20
22.00	DISCHG	.20	.20	.20	.20	.20	.20	.19	.18	.17	.17
23.00	DISCHG	.17	.17	.17	.17	.17	.17	.16	.15	.15	.14
24.00	DISCHG	.14	.07	.03	.01	.00					

RUNOFF VOLUME ABOVE BASEFLOW = 3.51 WATERSHED INCHES, 7.03 CFS-HRS, .58 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
+ COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID
1

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1 STORM 1													
XSECTION 1	RUNOFF	.02	1	2	.10	.0	8.50	24.00	2.01	---	12.11	10.05	605.1
XSECTION 2	RUNOFF	.00	1	2	.10	.0	8.50	24.00	2.00	---	12.00	2.67	862.9
ALTERNATE 2 STORM 2													
XSECTION 1	RUNOFF	.02	1	2	.10	.0	11.00	24.00	3.52	---	12.09	19.55	1177.7
XSECTION 2	RUNOFF	.00	1	2	.10	.0	11.00	24.00	3.51	---	11.99	5.04	1624.2

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
PLANNERS - SURVEYORS
P.O. BOX 1180 • WINTER PARK, FLORIDA 32790 / (407) 647-6623

Subject Normandy Retention Area
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date NOV 8 1988
Scale ____

BASIN 3 EXISTING CONDITIONS

AREA = 70.3 acres

CN = 45

FREQUENCY	PRECIP (in)	RUNOFF (in)	RUNOFF (acre·ft)
25 YR	8.5	2.01	11.78
100 YR	11.0	3.52	20.62

STAGE VS. STORAGE FOR AN IRREGULAR SHAPED POND

BASIN 3 EXISTING STORAGE @ DEPRESSION

ELEVATION (FT. NGVD)	AREA (SF.)	STORAGE (CU. FT.)	(ACRE-FT.)
47.00	500.0	0.00	0.000
49.00	2200.0	2700.00	0.062
51.00	10001.0	14901.00	0.342
53.00	43900.0	68802.00	1.579
55.00	75500.0	188202.00	4.321
57.00	110100.0	373802.00	8.581
59.00	148700.0	632602.00	14.523
61.00	188200.0	969502.00	22.257
63.00	226700.0	1384402.00	31.781
65.00	276300.0	1887402.00	43.329

E464

N

FIELD SURVEY

BASIN 3 DEPRESSION

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PLANNERS - SURVEYORS
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Subject Normandy Retention Area
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

BASINS 1, 2 & 3 PROJECT CONDITION

BASIN	AREA
1	10.6
2	2.0
3	70.3

TOTAL = 82.9 ACRES

ROADWAY AREA 12+50 → 45+50 Left
12+50 → 48+00 Right

Surface	Area	CN	25 YR. Volume	100 YR. Volume
Asphalt	2.52	98	1.73	2.26
Stabilized	0.63	77	0.30	0.42
Sod	4.72	39	0.54	1.04
Offsite	72.83	45	12.20	21.36
TOTAL	82.9		14.77 acre feet	25.08 acre feet

VOLUME AVAILABLE IN SWALES = 19,421 CF = 0.45 acre-ft

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Subject Normandy Blvd. Retention Area
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

BASIN 3 RETENTION AREA
PROJECT CONDITIONS W/ NO EXCAVATION

ELEVATION	STORAGE (ACRE-FT.)
51	.1910
53	.5460
55	1.1820
57	2.8340
59	5.9930
61	10.7270
63	17.1690
65	25.8150

∴ PURCHASE R/W UP TO 65.0 CONTOUR

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CONSULTING ENGINEERS
PLANNERS - SURVEYORS
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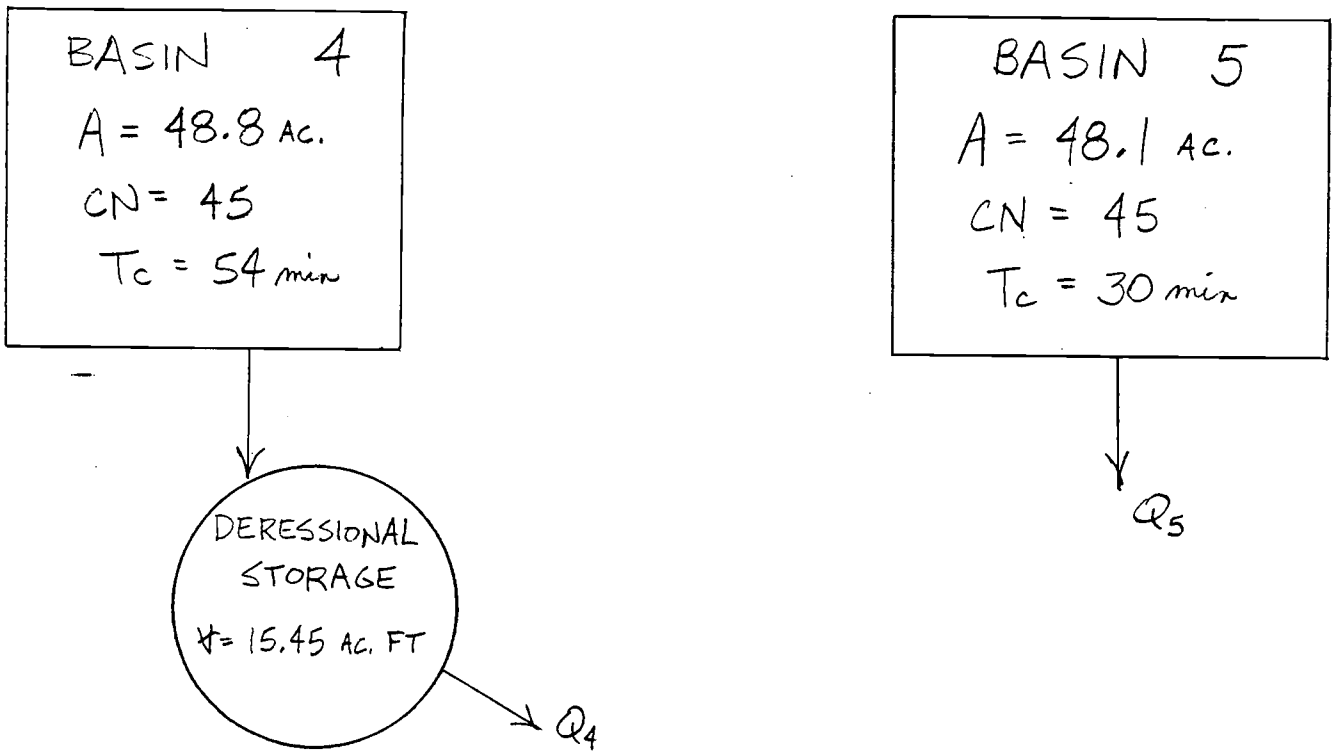
Subject Normandy Boulevard
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

EXISTING CONDITIONS



BASIN	RUNOFF VOLUME (Ac.-FT.)		AVAILABLE STORAGE (Ac.-FT.)	PEAK DISCHARGE (cfs)	
	25 YR	100 YR		25 YR	100 YR
4	8.16	14.31	15.45	0	0
5	8.06	14.11	0	30.13	57.7

EXECUTIVE CONTROL OPERATION LIST RECORD ID

LISTING OF CURRENT DATA

	STRUCT NO.	ELEVATION	DISCHARGE	STORAGE
3 STRUCT	4			
8		72.00	.00	.00
8		73.00	.01	.18
8		74.00	.02	.74
8		75.00	.03	1.65
8		76.00	.04	3.09
8		77.00	.05	5.18
8		78.00	.06	7.94
8		79.00	.07	11.40
8		80.00	.08	15.50
8		80.10	30.00	15.60
8		80.20	68.00	15.70
9 ENDTBL				

	TIME INCREMENT				
4 DIMHYD		.0200			
8	.0000	.1500	.3000	.5900	.9500
8	1.0000	.9600	.8800	.7800	.6800
8	.6000	.5200	.4700	.4300	.3900
8	.3500	.3200	.2900	.2600	.2300
8	.2200	.2000	.1800	.1700	.1600
8	.1500	.1400	.1300	.1200	.1100
8	.1000	.0900	.0850	.0800	.0750
8	.0700	.0600	.0500	.0450	.0400
8	.0350	.0300	.0220	.0160	.0100
8	.0050	.0040	.0030	.0020	.0016
8	.0000	.0000	.0000	.0000	.0000
9 ENDTBL					

COMPUTED PEAK RATE FACTOR = 256.00

	TABLE NO.	TIME INCREMENT			
5 RAINFL 1		.5000			
8	.0000	.0060	.0120	.0190	.0250
8	.0320	.0390	.0470	.0540	.0620
8	.0710	.0800	.0890	.0990	.1100
8	.1220	.1340	.1480	.1640	.1810
8	.2010	.2260	.2580	.3080	.6070
8	.7190	.7570	.7850	.8070	.8260
8	.8420	.8570	.8700	.8820	.8930
8	.9040	.9130	.9230	.9310	.9400
8	.9480	.9550	.9620	.9690	.9760
8	.9830	.9890	.9950	1.0000	1.0000
9 ENDTBL					

```
0                    STANDARD CONTROL INSTRUCTIONS


 6 RUNOFF 1   4       1        .0763     45.0000       .90001 1 0 1 0 1
 6 RESVOR 2     4 1   2      72.0000                        1 1 1 1 0 1
 6 RUNOFF 1   5       3        .0752     45.0000       .50001 1 0 1 0 1
   ENDATA


 END OF LISTING
1
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```
 EXECUTIVE CONTROL OPERATION INCREM                                                    RECORD ID
+                                  MAIN TIME INCREMENT =   .10 HOURS


 EXECUTIVE CONTROL OPERATION COMPUT                                                    RECORD ID
+                                  FROM XSECTION   4
+                                                  TO XSECTION   5
        STARTING TIME =   .00    RAIN DEPTH =  8.50    RAIN DURATION=  1.00    RAIN TABLE NO.= 1    ANT. MOIST. COND= 2
       ALTERNATE NO.= 1          STORM NO.= 1    MAIN TIME INCREMENT =   .10 HOURS


 OPERATION RUNOFF   CROSS SECTION   4
           OUTPUT HYDROGRAPH=  1
           AREA=    .08 SQ MI   INPUT RUNOFF CURVE= 45.    TIME OF CONCENTRATION=   .90 HOURS
            INTERNAL HYDROGRAPH TIME INCREMENT=  .1000 HOURS

           PEAK TIME(HRS)              PEAK DISCHARGE(CFS)          PEAK ELEVATION(FEET)
              12.81                          22.77                       (RUNOFF)

TIME(HRS)        FIRST HYDROGRAPH POINT =   .00 HOURS     TIME INCREMENT =  .10 HOURS     DRAINAGE AREA =    .08 SQ.MI.
  11.00    DISCHG       .00      .00      .00      .00      .00      .01      .16      .60     1.54     3.23
  12.00    DISCHG      5.93     9.15    12.68    16.06    18.74    20.52    21.69    22.46    22.77    22.55
  13.00    DISCHG     21.87    21.07    20.27    19.50    18.75    18.02    17.33    16.68    16.09    15.51
  14.00    DISCHG     14.94    14.41    13.92    13.49    13.06    12.66    12.30    11.98    11.68    11.37
  15.00    DISCHG     11.05    10.76    10.47    10.20     9.93     9.68     9.44     9.23     9.02     8.79
  16.00    DISCHG      8.56     8.32     8.08     7.86     7.64     7.43     7.21     7.00     6.78     6.56
  17.00    DISCHG      6.36     6.16     5.98     5.83     5.69     5.57     5.46     5.35     5.25     5.14
  18.00    DISCHG      5.04     4.93     4.84     4.77     4.70     4.66     4.62     4.58     4.53     4.47
  19.00    DISCHG      4.39     4.32     4.26     4.20     4.16     4.13     4.11     4.09     4.07     4.04
  20.00    DISCHG      4.00     3.96     3.91     3.87     3.81     3.76     3.70     3.65     3.61     3.57
  21.00    DISCHG      3.53     3.50     3.47     3.44     3.42     3.39     3.37     3.35     3.34     3.32
  22.00    DISCHG      3.31     3.30     3.29     3.28     3.27     3.26     3.25     3.24     3.22     3.19
  23.00    DISCHG      3.16     3.13     3.09     3.06     3.04     3.01     2.99     2.96     2.93     2.89
  24.00    DISCHG      2.85     2.78     2.70     2.60     2.45     2.27     2.09     1.92     1.76     1.61
  25.00    DISCHG      1.47     1.35     1.25     1.15     1.06      .98      .90      .83      .77      .71
  26.00    DISCHG       .65      .60      .56      .52      .47      .44      .40      .37      .34      .31
  27.00    DISCHG       .28      .26      .23      .21      .19      .17      .15      .13      .12      .10
  28.00    DISCHG       .09      .08      .07      .05      .05      .04      .03      .02      .02      .01
  29.00    DISCHG       .01      .01      .00

  RUNOFF VOLUME ABOVE BASEFLOW =  2.01 WATERSHED INCHES,     98.80 CFS-HRS,     8.17 ACRE-FEET;   BASEFLOW =    .00 CFS


 OPERATION RESVOR   STRUCTURE  4
```

INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 72.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.20	.06	78.04

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA =		.08 SQ.MI.
12.00	DISCHG	.00	.01	.01	.01	.02	.02	.02	.02	.02	.03
12.00	ELEV	72.00	72.72	73.07	73.29	73.55	73.84	74.09	74.29	74.50	74.70
13.00	DISCHG	.03	.03	.03	.03	.03	.04	.04	.04	.04	.04
13.00	ELEV	74.90	75.06	75.18	75.29	75.40	75.51	75.61	75.71	75.80	75.89
14.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
14.00	ELEV	75.98	76.04	76.10	76.15	76.21	76.26	76.31	76.35	76.40	76.44
15.00	DISCHG	.04	.05	.05	.05	.05	.05	.05	.05	.05	.05
15.00	ELEV	76.49	76.53	76.57	76.61	76.65	76.69	76.73	76.77	76.80	76.84
16.00	DISCHG	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
16.00	ELEV	76.87	76.91	76.94	76.97	77.00	77.02	77.04	77.06	77.09	77.11
17.00	DISCHG	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
17.00	ELEV	77.12	77.14	77.16	77.18	77.20	77.21	77.23	77.24	77.26	77.28
18.00	DISCHG	.05	.05	.05	.05	.05	.05	.05	.05	.05	.05
18.00	ELEV	77.29	77.31	77.32	77.33	77.35	77.36	77.38	77.39	77.40	77.42
19.00	DISCHG	.05	.05	.05	.05	.05	.05	.06	.06	.06	.06
19.00	ELEV	77.43	77.44	77.45	77.47	77.48	77.49	77.50	77.52	77.53	77.54
20.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
20.00	ELEV	77.55	77.56	77.58	77.59	77.60	77.61	77.62	77.63	77.64	77.65
21.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
21.00	ELEV	77.66	77.67	77.68	77.69	77.70	77.71	77.72	77.73	77.74	77.75
22.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
22.00	ELEV	77.76	77.77	77.78	77.79	77.80	77.81	77.82	77.83	77.84	77.85
23.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
23.00	ELEV	77.86	77.87	77.88	77.89	77.90	77.90	77.91	77.92	77.93	77.94
24.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
24.00	ELEV	77.95	77.96	77.96	77.97	77.98	77.99	77.99	78.00	78.00	78.01
25.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
25.00	ELEV	78.01	78.01	78.02	78.02	78.02	78.02	78.03	78.03	78.03	78.03
26.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
26.00	ELEV	78.03	78.03	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04
27.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
27.00	ELEV	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04
28.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
28.00	ELEV	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04
29.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
29.00	ELEV	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04	78.04

RUNOFF VOLUME ABOVE BASEFLOW = .02 WATERSHED INCHES, .94 CFS-HRS, .08 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 5
OUTPUT HYDROGRAPH= 3
AREA= .08 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .50 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0667 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.56	30.13	(RUNOFF)
19.55	3.84	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS				TIME INCREMENT = .10 HOURS			DRAINAGE AREA =		.08 SQ.MI.
11.00	DISCHG	.00	.00	.00	.00	.01	.07	.44	1.93	5.08	10.32
12.00	DISCHG	16.85	23.14	27.82	29.11	29.62	29.96	30.06	29.25	27.42	25.31
13.00	DISCHG	23.44	21.89	20.54	19.30	18.16	17.23	16.38	15.57	14.76	14.01
14.00	DISCHG	13.35	12.76	12.15	11.51	10.90	10.36	9.84	9.30	8.77	8.31
15.00	DISCHG	7.94	7.63	7.34	7.10	6.89	6.74	6.60	6.45	6.28	6.12
16.00	DISCHG	5.99	5.87	5.75	5.63	5.52	5.43	5.35	5.26	5.16	5.07
17.00	DISCHG	4.99	4.93	4.88	4.84	4.80	4.77	4.73	4.65	4.54	4.44
18.00	DISCHG	4.34	4.27	4.23	4.23	4.23	4.24	4.22	4.17	4.08	3.99
19.00	DISCHG	3.90	3.85	3.82	3.82	3.83	3.84	3.84	3.82	3.79	3.74

20.00	DISCHG	3.70	3.66	3.60	3.53	3.47	3.41	3.36	3.32	3.29	3.26
21.00	DISCHG	3.24	3.22	3.20	3.19	3.18	3.17	3.16	3.15	3.15	3.14
22.00	DISCHG	3.14	3.13	3.13	3.13	3.13	3.13	3.12	3.09	3.05	3.00
23.00	DISCHG	2.95	2.92	2.89	2.87	2.85	2.83	2.81	2.76	2.71	2.64
24.00	DISCHG	2.59	2.49	2.32	2.02	1.73	1.48	1.26	1.09	.94	.81
25.00	DISCHG	.70	.61	.52	.45	.39	.34	.29	.24	.20	.17
26.00	DISCHG	.14	.11	.09	.07	.05	.04	.02	.01	.01	.00

RUNOFF VOLUME ABOVE BASEFLOW = 2.01 WATERSHED INCHES, 97.36 CFS-HRS, 8.05 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID

\+ COMPUTATIONS COMPLETED FOR PASS 1

1

TR20 XEQ 11-01-88 09:20 NORMANDY BLVD. BASINS 4 & 5 EXISTING CONDITIONS JOB 1 PASS 2
REV PC 09/83(.2) PAGE 9

EXECUTIVE CONTROL OPERATION INCREM RECORD ID

\+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID

\+ FROM XSECTION 4

\+ TO XSECTION 5

STARTING TIME = .00 RAIN DEPTH = 11.00 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 2 STORM NO.= 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 4
OUTPUT HYDROGRAPH= 1
AREA= .08 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .90 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .1000 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.74	43.47	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

10.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.02	.04	.08
11.00	DISCHG	.15	.25	.40	.59	.84	1.16	1.94	3.37	5.85	9.86
12.00	DISCHG	15.66	22.03	28.53	34.36	38.68	41.23	42.67	43.40	43.34	42.45
13.00	DISCHG	40.86	39.13	37.42	35.81	34.27	32.78	31.37	30.06	28.86	27.71
14.00	DISCHG	26.59	25.55	24.60	23.77	22.94	22.17	21.48	20.86	20.27	19.67
15.00	DISCHG	19.07	18.50	17.95	17.42	16.91	16.44	15.99	15.59	15.18	14.75
16.00	DISCHG	14.30	13.85	13.40	12.98	12.58	12.18	11.78	11.37	10.97	10.58
17.00	DISCHG	10.20	9.86	9.55	9.28	9.04	8.84	8.64	8.46	8.29	8.11
18.00	DISCHG	7.93	7.77	7.62	7.49	7.39	7.32	7.25	7.17	7.09	6.99
19.00	DISCHG	6.87	6.76	6.65	6.56	6.50	6.45	6.41	6.38	6.34	6.29
20.00	DISCHG	6.23	6.16	6.09	6.01	5.93	5.84	5.75	5.67	5.60	5.53
21.00	DISCHG	5.47	5.42	5.37	5.33	5.29	5.25	5.22	5.19	5.16	5.14
22.00	DISCHG	5.12	5.10	5.08	5.06	5.05	5.03	5.02	4.99	4.96	4.92
23.00	DISCHG	4.87	4.81	4.76	4.72	4.67	4.63	4.59	4.55	4.50	4.44
24.00	DISCHG	4.37	4.28	4.15	3.99	3.77	3.49	3.21	2.95	2.70	2.47
25.00	DISCHG	2.26	2.08	1.91	1.76	1.63	1.50	1.38	1.28	1.18	1.09
26.00	DISCHG	1.00	.93	.86	.79	.73	.67	.62	.57	.52	.47
27.00	DISCHG	.43	.39	.35	.32	.29	.26	.23	.20	.18	.16
28.00	DISCHG	.14	.12	.10	.08	.07	.06	.05	.04	.03	.02
29.00	DISCHG	.01	.01	.01	.00						

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 173.49 CFS-HRS, 14.34 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 4
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 72.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.30	.08	79.69

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

11.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.01	.01
11.00	ELEV	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.00	72.53	72.88
12.00	DISCHG	.01	.01	.02	.02	.03	.03	.03	.03	.04	.04
12.00	ELEV	73.15	73.43	73.81	74.17	74.50	74.86	75.15	75.40	75.65	75.89
13.00	DISCHG	.04	.04	.04	.05	.05	.05	.05	.05	.05	.05
13.00	ELEV	76.09	76.25	76.40	76.55	76.68	76.82	76.94	77.05	77.14	77.22
14.00	DISCHG	.05	.05	.05	.06	.06	.06	.06	.06	.06	.06
14.00	ELEV	77.30	77.38	77.45	77.53	77.60	77.66	77.73	77.79	77.85	77.91
15.00	DISCHG	.06	.06	.06	.06	.06	.06	.06	.06	.06	.06
15.00	ELEV	77.97	78.02	78.07	78.11	78.15	78.19	78.23	78.26	78.30	78.34
16.00	DISCHG	.06	.06	.06	.06	.06	.07	.07	.07	.07	.07
16.00	ELEV	78.37	78.40	78.44	78.47	78.50	78.53	78.56	78.58	78.61	78.64
17.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
17.00	ELEV	78.66	78.68	78.71	78.73	78.75	78.77	78.79	78.81	78.83	78.85
18.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
18.00	ELEV	78.87	78.89	78.91	78.93	78.94	78.96	78.98	79.00	79.01	79.02
19.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
19.00	ELEV	79.04	79.05	79.07	79.08	79.09	79.10	79.12	79.13	79.14	79.16
20.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
20.00	ELEV	79.17	79.18	79.19	79.20	79.22	79.23	79.24	79.25	79.26	79.27
21.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
21.00	ELEV	79.28	79.30	79.31	79.32	79.33	79.34	79.35	79.36	79.37	79.38
22.00	DISCHG	.07	.07	.07	.07	.07	.07	.07	.07	.07	.07
22.00	ELEV	79.39	79.40	79.41	79.42	79.43	79.44	79.45	79.46	79.47	79.48
23.00	DISCHG	.07	.07	.08	.08	.08	.08	.08	.08	.08	.08
23.00	ELEV	79.49	79.50	79.51	79.52	79.53	79.54	79.54	79.55	79.56	79.57
24.00	DISCHG	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
24.00	ELEV	79.58	79.59	79.60	79.61	79.61	79.62	79.63	79.63	79.64	79.64
25.00	DISCHG	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
25.00	ELEV	79.65	79.65	79.66	79.66	79.66	79.67	79.67	79.67	79.67	79.68
26.00	DISCHG	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
26.00	ELEV	79.68	79.68	79.68	79.68	79.68	79.69	79.69	79.69	79.69	79.69
27.00	DISCHG	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
27.00	ELEV	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69
28.00	DISCHG	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
28.00	ELEV	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69
29.00	DISCHG	.08	.08	.08	.08	.08	.08	.08	.08	.08	.08
29.00	ELEV	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69	79.69

RUNOFF VOLUME ABOVE BASEFLOW = .02 WATERSHED INCHES, 1.22 CFS-HRS, .10 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 5
OUTPUT HYDROGRAPH= 3
AREA= .08 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .50 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0667 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.32	57.70	(RUNOFF)
19.54	5.97	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

10.00	DISCHG	.00	.00	.00	.00	.00	.00	.01	.05	.13	.26
11.00	DISCHG	.42	.64	.95	1.39	1.90	2.59	4.19	8.56	16.36	27.09
12.00	DISCHG	39.11	49.62	56.74	57.67	57.33	56.82	56.03	53.83	50.05	45.92

13.00	DISCHG	42.28	39.27	36.64	34.27	32.09	30.28	28.62	27.05	25.51	24.09
14.00	DISCHG	22.81	21.65	20.49	19.28	18.12	17.10	16.13	15.17	14.23	13.43
15.00	DISCHG	12.79	12.25	11.77	11.36	11.02	10.76	10.52	10.26	9.98	9.73
16.00	DISCHG	9.51	9.31	9.12	8.92	8.74	8.59	8.45	8.30	8.14	7.99
17.00	DISCHG	7.87	7.76	7.67	7.60	7.54	7.49	7.42	7.30	7.12	6.95
18.00	DISCHG	6.79	6.68	6.62	6.61	6.61	6.62	6.59	6.51	6.37	6.22
19.00	DISCHG	6.08	5.99	5.94	5.94	5.96	5.97	5.97	5.94	5.87	5.80
20.00	DISCHG	5.74	5.67	5.59	5.48	5.37	5.28	5.20	5.14	5.09	5.05
21.00	DISCHG	5.01	4.97	4.95	4.92	4.91	4.89	4.88	4.86	4.85	4.84
22.00	DISCHG	4.84	4.83	4.83	4.82	4.82	4.82	4.80	4.76	4.69	4.61
23.00	DISCHG	4.54	4.49	4.44	4.40	4.37	4.34	4.31	4.24	4.15	4.06
24.00	DISCHG	3.97	3.82	3.55	3.10	2.65	2.27	1.94	1.67	1.44	1.25
25.00	DISCHG	1.08	.93	.80	.70	.60	.52	.44	.37	.31	.26
26.00	DISCHG	.21	.17	.13	.10	.07	.05	.04	.02	.01	.01
27.00	DISCHG	.00									

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 170.96 CFS-HRS, 14.13 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID

\+ COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID

1

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM)
ALTERNATE 1 STORM 1													
XSECTION 4	RUNOFF	.08	1	2	.10	.0	8.50	24.00	2.01	---	12.81	22.77	298.4
STRUCTURE 4	RESVOR	.08	1	2	.10	.0	8.50	24.00	.02	78.04	28.20?	.06?	.8
XSECTION 5	RUNOFF	.08	1	2	.10	.0	8.50	24.00	2.01	---	12.56	30.13	400.7
ALTERNATE 2 STORM 2													
XSECTION 4	RUNOFF	.08	1	2	.10	.0	11.00	24.00	3.52	---	12.74	43.47	569.7
STRUCTURE 4	RESVOR	.08	1	2	.10	.0	11.00	24.00	.02	79.69	28.30?	.08?	1.0
XSECTION 5	RUNOFF	.08	1	2	.10	.0	11.00	24.00	3.52	---	12.32	57.70	767.4

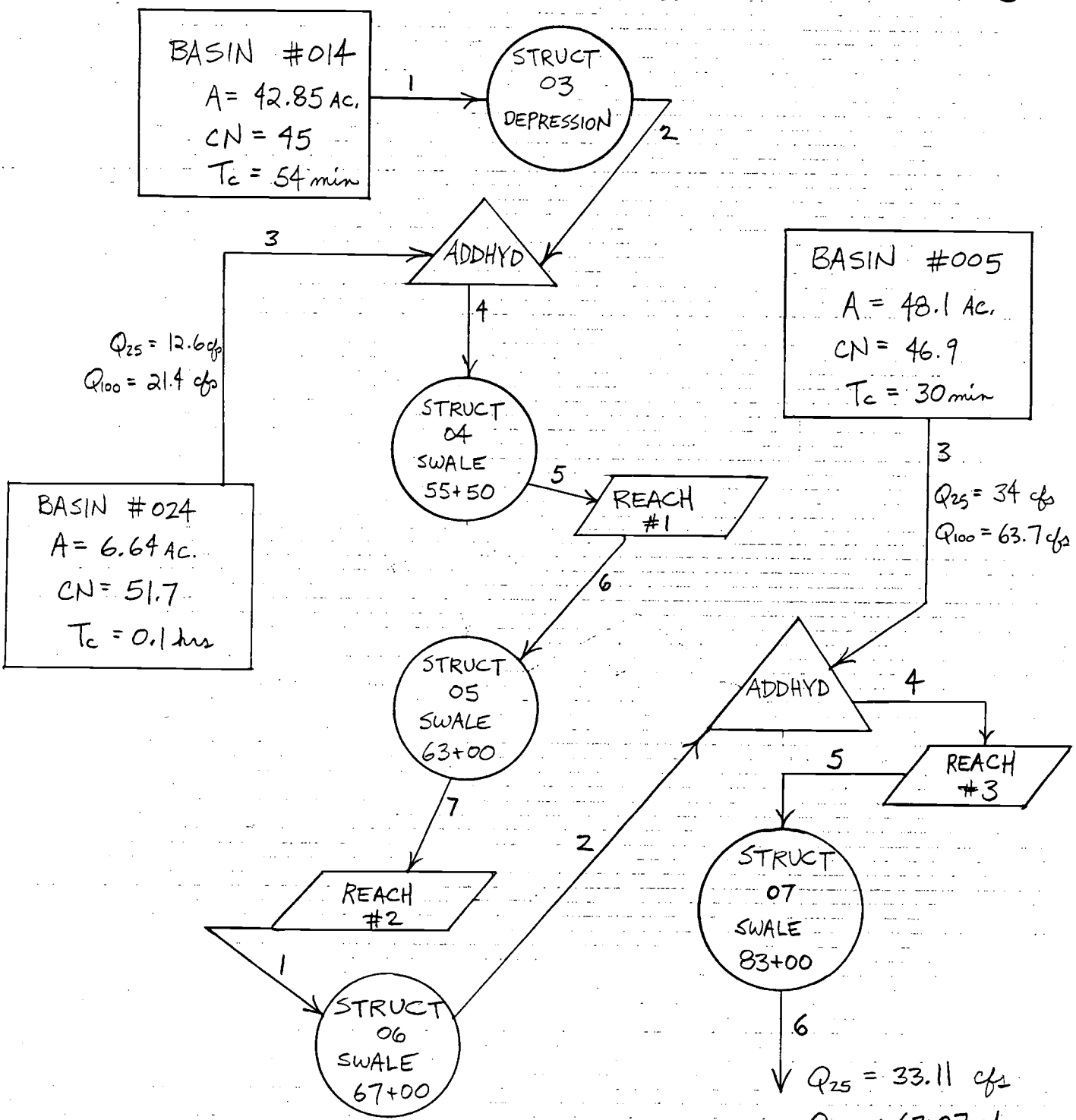
1

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
PLANNERS - SURVEYORS
P.O. BOX 1180 • WINTER PARK, FLORIDA 32790 / (407) 647-6623

Subject Normandy Bouleyard
Job 87524 Sheet ____ of ____
Calculated by MJ Date 11/88
Checked by ____ Date ____
Scale ____

PROJECT CONDITIONS



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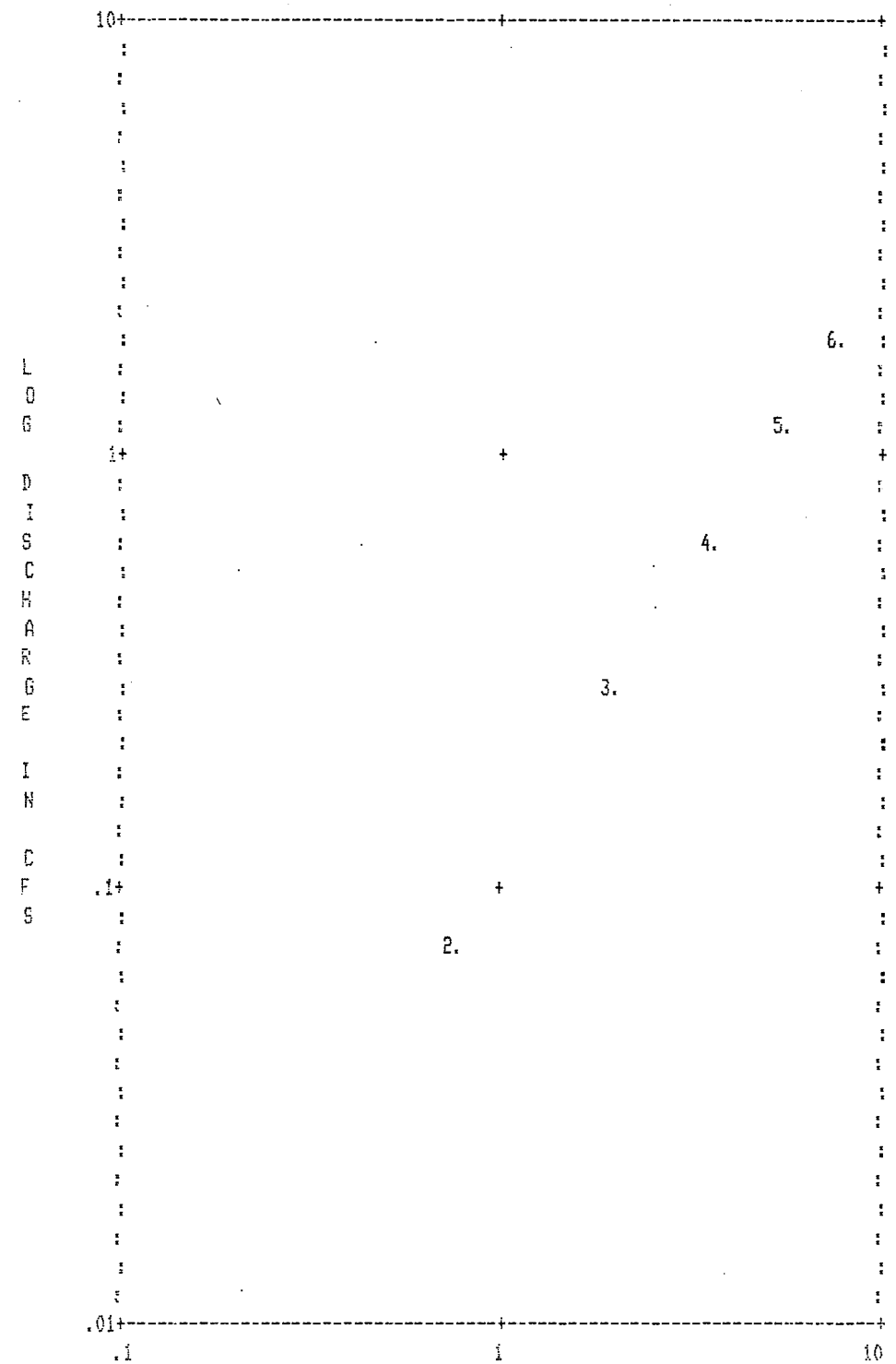
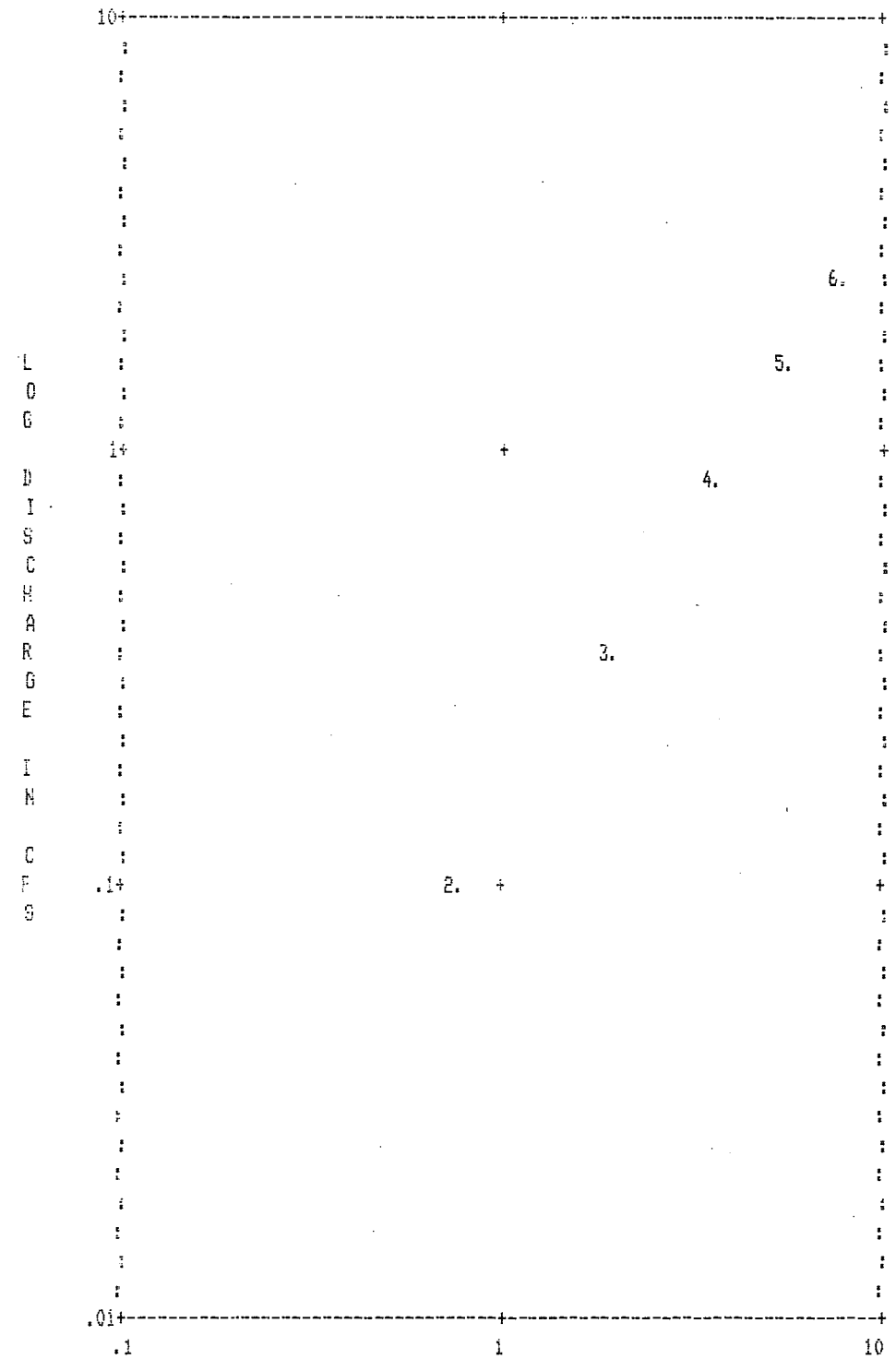


CROSS SECTION 1 END AREA VS DISCHARGE

REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.42
2	.07	.80	1.42
3	.28	2.00	1.42
4	.62	3.60	1.40
5	1.14	5.60	1.39
6	1.83	8.00	1.37

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

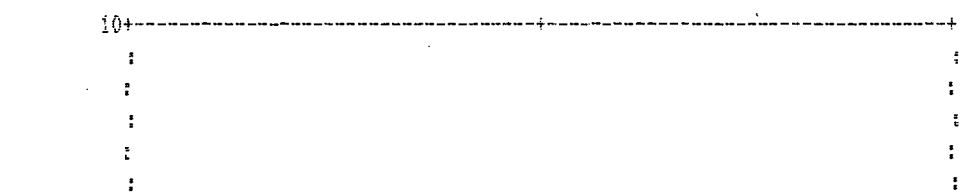


CROSS SECTION 2 END AREA VS DISCHARGE

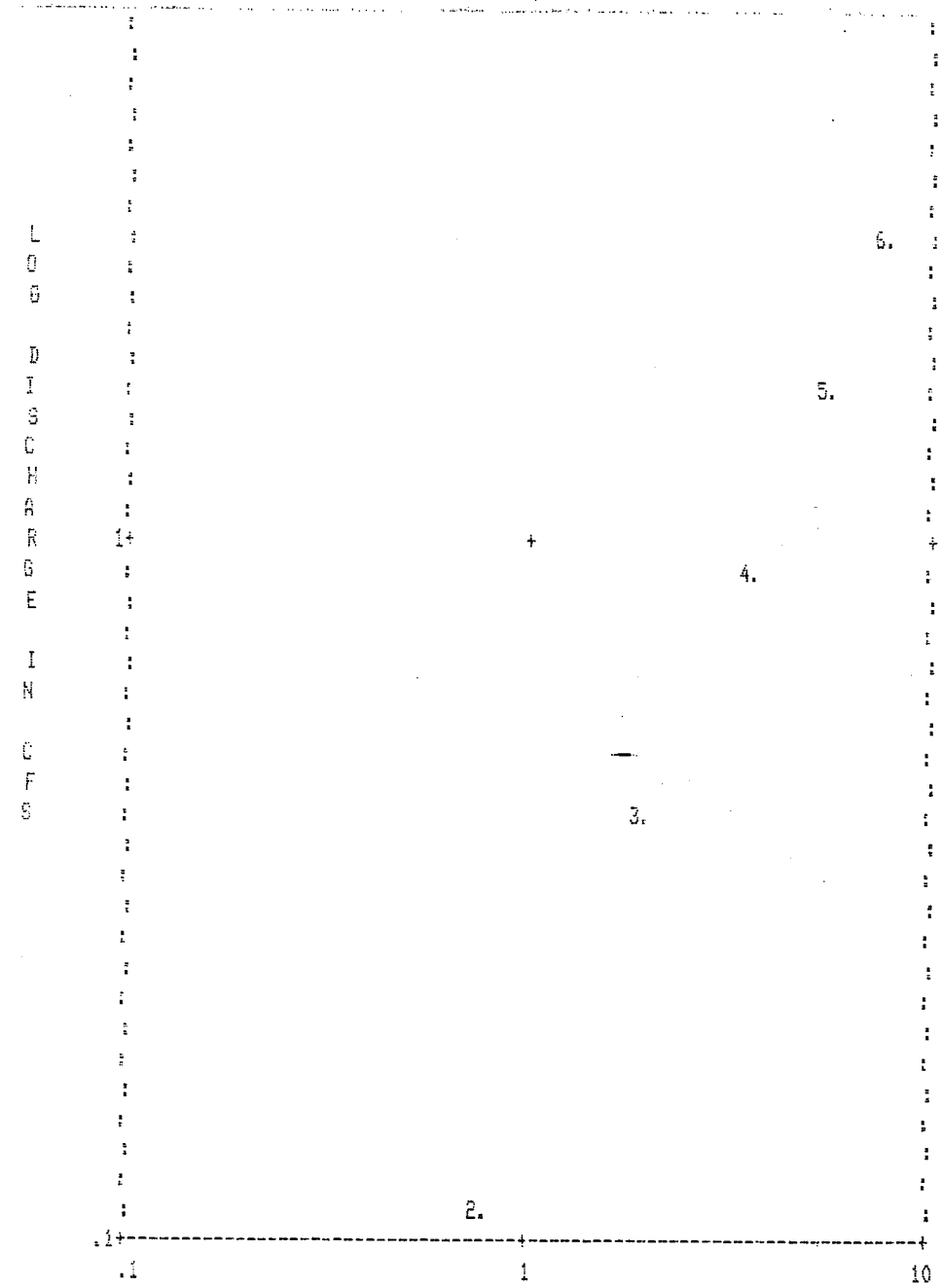
REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	M
1	.00	.00	1.42
2	.10	.80	1.42
3	.36	2.00	1.42
4	.81	3.60	1.40
5	1.48	5.60	1.38
6	2.40	8.00	1.37

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS



CROSS SECTION 3 END AREA VS DISCHARGE



REFERENCE NO'S	DISCHARGE (CFS)	END AREA (SQ.FT.)	N
1	.00	.00	1.41
2	.11	.80	1.41
3	.41	2.00	1.41
4	.92	3.60	1.39
5	1.69	5.60	1.38
6	2.73	8.00	1.37

LEGEND

+ = GRID REFERENCE
. = LOCATION OF PLOTTED VALUE
3 = REFERENCE NO. OF PLOTTED VALUE
X = MULTIPLE REFERENCE NUMBERS
B = BANKFULL RELATION SHOWN ON AXIS

0
1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 PASS
REV PC 09/83(.2) PAGE

EXECUTIVE CONTROL OPERATION LIST RECORD ID

LISTING OF CURRENT DATA

	XSECTN NO.	DRAINAGE AREA
2 XSECTN	1	.0773

	ELEVATION	DISCHARGE	END AREA
8	73.50	.00	.00

```
8                          73.70         .97         .80
8                          73.90        3.56        2.00
8                          74.10        8.03        3.60
8                          74.30       14.70        5.60
8                          74.50       23.70        8.00
9 ENDTBL


         XSECTN NO.      DRAINAGE AREA
2 XSECTN     2                .0773

                          ELEVATION   DISCHARGE    END AREA
8                            69.20         .00         .00
8                            69.40        1.27         .80
8                            69.60        4.67        2.00
8                            69.80       10.50        3.60
8                            70.00       19.20        5.60
8                            70.20       31.10        8.00
9 ENDTBL


         XSECTN NO.      DRAINAGE AREA
2 XSECTN     3                .1526

                          ELEVATION   DISCHARGE    END AREA
8                            62.50         .00         .00
8                            62.70         .74         .80
8                            62.90        2.69        2.00
8                            63.10        6.06        3.60
8                            63.30       11.10        5.60
8                            63.50       17.90        8.00
9 ENDTBL
1


TR20 XEQ 11-03-88  13:43       NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS                    JOB  1   PASS
     REV PC 09/83(.2)                                                                             PAGE


          STRUCT NO.     ELEVATION   DISCHARGE     STORAGE
3 STRUCT      3

8                            75.00         .00         .00
8                            76.00         .01        1.97
8                            77.00         .02        3.94
8                            78.00         .03        5.91
8                            79.00         .04        7.87
8                            79.10       30.40        7.88
8                            79.20       85.90        7.89
8                            79.30      158.00        7.90
8                            79.40      243.00        7.91
9 ENDTBL

          STRUCT NO.     ELEVATION   DISCHARGE     STORAGE
3 STRUCT      4

8                            77.10         .00         .00
8                            78.60         .00         .11
8                            78.70        1.82         .11
8                            78.80        5.15         .11
8                            78.90        9.46         .11
8                            79.00       14.60         .11
9 ENDTBL
```

```
                STRUCT NO.      ELEVATION   DISCHARGE     STORAGE
 3 STRUCT        5

 8                               73.50         .00          .00
 8                               75.00         .00          .02
 8                               75.10        1.82          .02
 8                               75.20        5.15          .02
 8                               75.30        9.46          .02
 8                               75.40       14.60          .02
 9 ENDTBL

                STRUCT NO.      ELEVATION   DISCHARGE     STORAGE
 3 STRUCT        6

 8                               68.70         .00          .00
 8                               70.20         .00          .02
 8                               70.30        1.82          .02
 8                               70.40        5.15          .02
 8                               70.50        9.46          .02
 8                               70.60       14.60          .02
 9 ENDTBL
 1
```



```
                STRUCT NO.      ELEVATION   DISCHARGE     STORAGE
 3 STRUCT        7

 8                               62.00         .00          .00
 8                               63.50         .00          .10
 8                               63.60        1.82          .10
 8                               63.70        5.15          .10
 8                               63.80        9.46          .10
 8                               63.90       14.60          .10
 9 ENDTBL

                     TIME INCREMENT
 4 DIMHYD                      .0200

 8                .0000       .1500       .3000       .5900       .9500
 8               1.0000       .9600       .8800       .7800       .6800
 8                .6000       .5200       .4700       .4300       .3900
 8                .3500       .3200       .2900       .2600       .2300
 8                .2200       .2000       .1800       .1700       .1600
 8                .1500       .1400       .1300       .1200       .1100
 8                .1000       .0900       .0850       .0800       .0750
 8                .0700       .0600       .0500       .0450       .0400
 8                .0350       .0300       .0220       .0160       .0100
 8                .0050       .0040       .0030       .0020       .0016
 8                .0000       .0000       .0000       .0000       .0000
 9 ENDTBL

  COMPUTED PEAK RATE FACTOR =  256.00


     TABLE NO.       TIME INCREMENT
 5 RAINFL 1                  .5000

 8                .0000       .0060       .0120       .0190       .0250
 8                .0320       .0390       .0470       .0540       .0620
 8                .0710       .0800       .0890       .0990       .1100
```

```
 8                .1220       .1340       .1480       .1640       .1810
 8                .2010       .2260       .2580       .3080       .6070
 8                .7190       .7570       .7850       .8070       .8260
 8                .8420       .8570       .8700       .8820       .8930
 8                .9040       .9130       .9230       .9310       .9400
 8                .9480       .9550       .9620       .9690       .9760
 8                .9830       .9890       .9950      1.0000      1.0000
 9 ENDTBL
1
```



```
     TABLE NO.       TIME INCREMENT
 5 RAINFL 2                 2.0000

 8                .0000       .0600       .1200       .1800       .2400
 8                .3000       .3600       .4200       .4800       .5400
 8                .6000       .6600       .7100       .8500       .9900
 8               1.1400      1.2800      1.4200      1.5600      1.7000
 8               1.8400      1.9900      2.1300      2.2700      2.4100
 8               2.6000      2.8200      3.0900      3.4300      3.9500
 8               8.0500      9.3800      9.8900     10.2000     10.5100
 8              10.7100     10.9100     11.0200     11.1300     11.2400
 8              11.3400     11.4500     11.5500     11.6600     11.7600
 8              11.8700     11.9800     12.0900     12.1900     12.1900
 9 ENDTBL

     TABLE NO.       TIME INCREMENT
 5 RAINFL 3                  .5000

 8                .0000       .0100       .0220       .0360       .0510
 8                .0670       .0830       .0990       .1160       .1350
 8                .1560       .1790       .2040       .2330       .2680
 8                .3100       .4250       .4800       .5200       .5500
 8                .5770       .6010       .6230       .6440       .6640
 8                .6830       .7010       .7190       .7360       .7530
 8                .7690       .7850       .8000       .8150       .8300
 8                .8440       .8580       .8710       .8840       .8960
 8                .9080       .9200       .9320       .9440       .9560
 8                .9670       .9780       .9890      1.0000      1.0000
 9 ENDTBL

     TABLE NO.       TIME INCREMENT
 5 RAINFL 4                  .5000

 8                .0000       .0040       .0080       .0120       .0160
 8                .0200       .0250       .0300       .0350       .0400
 8                .0450       .0500       .0550       .0600       .0650
 8                .0700       .0750       .0810       .0870       .0930
 8                .0990       .1050       .1110       .1180       .1250
 8                .1320       .1400       .1480       .1560       .1650
 8                .1740       .1840       .1950       .2070       .2200
 8                .2360       .2550       .2770       .3030       .4090
 8                .5150       .5490       .5830       .6050       .6240
 8                .6400       .6550       .6690       .6820       .6940
 8                .7050       .7160       .7270       .7380       .7480
 8                .7580       .7670       .7760       .7840       .7920
1
```

```
8                .8000       .8080       .8160       .8230       .8300
8                .8370       .8440       .8510       .8580       .8640
8                .8700       .8760       .8820       .8880       .8940
8                .9000       .9060       .9110       .9160       .9210
8                .9260       .9310       .9360       .9410       .9460
8                .9510       .9560       .9610       .9660       .9710
8                .9760       .9800       .9840       .9880       .9920
8                .9960      1.0000      1.0000      1.0000      1.0000
9 ENDTBL

     TABLE NO.       TIME INCREMENT
5 RAINFL 5                   .5000

8                .0000       .0020       .0050       .0080       .0110
8                .0140       .0170       .0200       .0230       .0260
8                .0290       .0320       .0350       .0380       .0410
8                .0440       .0470       .0510       .0550       .0590
8                .0630       .0670       .0710       .0750       .0790
8                .0840       .0890       .0940       .0990       .1040
8                .1090       .1140       .1200       .1260       .1330
8                .1400       .1470       .1540       .1620       .1710
8                .1810       .1920       .2040       .2170       .2330
8                .2520       .2770       .3180       .6380       .6980
8                .7290       .7520       .7700       .7850       .7980
8                .8090       .8190       .8290       .8380       .8460
8                .8540       .8610       .8680       .8740       .8800
8                .8860       .8920       .8970       .9020       .9070
8                .9120       .9170       .9210       .9250       .9290
8                .9330       .9370       .9410       .9450       .9490
8                .9530       .9570       .9600       .9630       .9660
8                .9690       .9720       .9750       .9780       .9810
8                .9840       .9870       .9900       .9930       .9960
8                .9980      1.0000      1.0000      1.0000      1.0000
9 ENDTBL

     TABLE NO.       TIME INCREMENT
5 RAINFL 6                   .0200

8                .0000       .0080       .0162       .0246       .0333
8                .0425       .0524       .0630       .0743       .0863
8                .0990       .1124       .1265       .1420       .1595
8                .1800       .2050       .2550       .3450       .4370
8                .5300       .6030       .6330       .6600       .6840
8                .7050       .7240       .7420       .7590       .7750
8                .7900       .8043       .8180       .8312       .8439
8                .8561       .8678       .8790       .8898       .9002
8                .9103       .9201       .9297       .9391       .9483
1
```



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8                .9573       .9661       .9747       .9832       .9916
8               1.0000      1.0000      1.0000      1.0000      1.0000
9 ENDTBL
1
```

0 STANDARD CONTROL INSTRUCTIONS

```
 6 RUNOFF 1  14       1       .0670     45.0000      .90001 1 0 1 0 1
 6 RESVOR 2     3 1   2     75.0000                      1 0 0 1 0 0
 6 RUNOFF 1  24       3       .0104     51.7000      .10001 1 0 1 0 1
 6 ADDHYD 4   4   2 3 4                                  1 0 0 1 0 0
 6 RESVOR 2     4 4   5     77.1000                      1 0 0 1 0 0
 6 REACH  3   1   5   6    750.0000       .0000      .00001 0 0 1 0 0
 6 RESVOR 2     5 6   7     73.5000                      1 0 0 1 0 0
 6 REACH  3   2   7   1    400.0000       .0000      .00001 0 0 1 0 0
 6 RESVOR 2     6 1   2     68.7000                      1 0 0 1 0 0
 6 RUNOFF 1   5       3       .0752     46.9000      .50001 1 0 1 0 1
 6 ADDHYD 4   6   2 3 4                                  1 0 0 1 0 0
 6 REACH  3   3   4   5   1600.0000       .0000      .00001 0 0 1 0 0
 6 RESVOR 2     7 5   6     62.0000                      1 1 0 1 0 1
   ENDATA
```

END OF LISTING

1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 PASS
REV PC 09/83(.2) PAGE

EXECUTIVE CONTROL OPERATION INCREM RECORD ID

\+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID

\+ FROM XSECTION 14

\+ TO STRUCTURE 7

STARTING TIME = .00 RAIN DEPTH = 8.50 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 1 STORM NO.= 1 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 14
OUTPUT HYDROGRAPH= 1
AREA= .07 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .90 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .1000 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.81	19.99	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS			TIME INCREMENT = .10 HOURS				DRAINAGE AREA = .07 SQ.MI.		
11.00	DISCHG	.00	.00	.00	.00	.00	.01	.14	.53	1.35	2.84
12.00	DISCHG	5.20	8.03	11.14	14.10	16.46	18.02	19.05	19.72	19.99	19.80
13.00	DISCHG	19.21	18.51	17.80	17.13	16.47	15.82	15.21	14.65	14.13	13.62
14.00	DISCHG	13.12	12.65	12.23	11.85	11.47	11.12	10.80	10.52	10.26	9.98
15.00	DISCHG	9.71	9.45	9.20	8.95	8.72	8.50	8.29	8.10	7.92	7.72
16.00	DISCHG	7.52	7.31	7.10	6.90	6.71	6.52	6.33	6.14	5.95	5.76
17.00	DISCHG	5.58	5.41	5.25	5.12	5.00	4.89	4.79	4.70	4.61	4.52
18.00	DISCHG	4.42	4.33	4.25	4.18	4.13	4.09	4.06	4.02	3.98	3.92
19.00	DISCHG	3.86	3.79	3.74	3.69	3.65	3.63	3.61	3.59	3.57	3.54
20.00	DISCHG	3.51	3.47	3.44	3.39	3.35	3.30	3.25	3.21	3.17	3.13
21.00	DISCHG	3.10	3.07	3.04	3.02	3.00	2.98	2.96	2.95	2.93	2.92

22.00	DISCHG	2.91	2.90	2.89	2.88	2.87	2.86	2.86	2.84	2.83	2.80
23.00	DISCHG	2.77	2.75	2.72	2.69	2.67	2.64	2.62	2.60	2.57	2.54
24.00	DISCHG	2.50	2.45	2.37	2.28	2.15	2.00	1.84	1.68	1.54	1.41
25.00	DISCHG	1.29	1.19	1.09	1.01	.93	.86	.79	.73	.67	.62
26.00	DISCHG	.57	.53	.49	.45	.42	.38	.35	.32	.30	.27
27.00	DISCHG	.25	.22	.20	.18	.16	.15	.13	.12	.10	.09
28.00	DISCHG	.08	.07	.06	.05	.04	.03	.03	.02	.02	.01
29.00	DISCHG	.01	.01	.00							

RUNOFF VOLUME ABOVE BASEFLOW = 2.01 WATERSHED INCHES, 86.76 CFS-HRS, 7.17 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 3
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 75.00

*** WARNING-NO PEAK FOUND, MAXIMUM DISCHARGE = .04 CFS.

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
28.50	.04	78.62

1

TR20 XEQ 11-03-88 13:43 NORMANDY BLVD. BASINS 4 & 5 PROJECT CONDITIONS JOB 1 PASS
REV PC 09/83(.2) PAGE

RUNOFF VOLUME ABOVE BASEFLOW = .01 WATERSHED INCHES, .50 CFS-HRS, .04 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 24
OUTPUT HYDROGRAPH= 3
AREA= .01 SQ MI INPUT RUNOFF CURVE= 52. TIME OF CONCENTRATION= .10 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0133 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.00	12.61	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .01 SQ.MI.

10.00	DISCHG	.00	.00	.00	.00	.00	.01	.03	.06	.10	.14
11.00	DISCHG	.18	.28	.40	.49	.59	.69	2.91	5.74	8.26	10.56
12.00	DISCHG	12.61	10.17	8.08	7.21	6.77	6.58	4.76	3.49	2.90	2.58
13.00	DISCHG	2.42	2.11	1.93	1.85	1.81	1.79	1.64	1.52	1.48	1.45
14.00	DISCHG	1.44	1.36	1.30	1.28	1.27	1.26	1.18	1.12	1.10	1.09
15.00	DISCHG	1.08	1.05	1.03	1.03	1.02	1.02	.97	.93	.91	.90
16.00	DISCHG	.90	.87	.85	.84	.84	.83	.81	.79	.78	.77
17.00	DISCHG	.77	.77	.77	.77	.78	.78	.72	.68	.66	.65
18.00	DISCHG	.64	.67	.69	.70	.71	.71	.66	.61	.59	.58
19.00	DISCHG	.58	.61	.63	.64	.65	.65	.62	.60	.59	.59
20.00	DISCHG	.58	.55	.53	.52	.51	.51	.51	.51	.51	.51
21.00	DISCHG	.51	.51	.51	.51	.52	.52	.52	.52	.52	.52
22.00	DISCHG	.52	.52	.52	.52	.52	.52	.49	.47	.46	.45
23.00	DISCHG	.45	.45	.45	.45	.45	.45	.42	.40	.38	.38
24.00	DISCHG	.38	.22	.10	.05	.02	.01	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 2.75 WATERSHED INCHES, 18.44 CFS-HRS, 1.52 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 4
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.00	12.61	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = .38 WATERSHED INCHES, 18.94 CFS-HRS, 1.57 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 4
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
SURFACE ELEVATION= 77.10
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.92	14.09	78.99
12.08	13.28	78.97
12.30	9.53	78.90
12.49	8.44	78.88
12.68	4.93	78.79
12.90	3.61	78.75
13.10	2.87	78.73

RUNOFF VOLUME ABOVE BASEFLOW = .37 WATERSHED INCHES, 18.55 CFS-HRS, 1.53 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 1
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
LENGTH = 750.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 1 BY 12.0 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .13 M= 1.31
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .21 PEAK TRAVEL TIME = .50 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.58	7.00	75.98
12.40	7.10	76.01

RUNOFF VOLUME ABOVE BASEFLOW = .35 WATERSHED INCHES, 17.48 CFS-HRS, 1.44 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 5
INPUT HYDROGRAPH= 6 OUTPUT HYDROGRAPH= 7
SURFACE ELEVATION= 73.50

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.12	7.62	75.26
12.31	8.53	75.28
12.50	8.31	75.27
12.69	7.63	75.26
12.89	6.20	75.22
13.09	4.97	75.19
13.29	3.98	75.16
13.49	3.26	75.14

RUNOFF VOLUME ABOVE BASEFLOW = .36 WATERSHED INCHES, 18.08 CFS-HRS, 1.49 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 1
LENGTH = 400.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 2 BY 6.1 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .15 M= 1.34
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .40 PEAK TRAVEL TIME = .50 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.96	6.08	71.00
12.80	6.72	71.14

RUNOFF VOLUME ABOVE BASEFLOW = .34 WATERSHED INCHES, 17.13 CFS-HRS, 1.42 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 6
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 68.70

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(5.53) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 6 %.
+ STRUCTURE 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	5.53	70.41
12.52	6.80	70.44
12.70	7.25	70.45
12.89	6.87	70.44
13.08	5.95	70.42
13.28	4.94	70.39
13.48	4.04	70.37

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

12.00	DISCHG	.00	.00	.00	5.19	4.14	6.75	5.37	7.25	5.69	6.86
13.00	DISCHG	5.13	5.91	4.31	4.90	3.54	4.00	2.91	3.31	2.45	2.79
14.00	DISCHG	2.09	2.36	1.83	2.09	1.65	1.84	1.53	1.64	1.44	1.49
15.00	DISCHG	1.34	1.37	1.26	1.27	1.20	1.20	1.15	1.14	1.11	1.09
16.00	DISCHG	1.06	1.04	1.01	1.00	.97	.96	.94	.92	.91	.89
17.00	DISCHG	.88	.86	.85	.84	.83	.82	.82	.81	.81	.79
18.00	DISCHG	.78	.76	.75	.73	.73	.72	.72	.72	.72	.71
19.00	DISCHG	.70	.69	.67	.66	.66	.66	.65	.66	.66	.66
20.00	DISCHG	.65	.65	.64	.63	.62	.61	.60	.59	.58	.57
21.00	DISCHG	.57	.56	.56	.55	.55	.55	.55	.55	.55	.55
22.00	DISCHG	.55	.55	.55	.55	.55	.55	.55	.55	.55	.54
23.00	DISCHG	.53	.53	.52	.51	.51	.50	.50	.49	.49	.48
24.00	DISCHG	.47	.46	.45	.44	.40	.36	.31	.27	.23	.19
25.00	DISCHG	.16	.14	.11	.10	.08	.07	.07	.06	.05	.05
26.00	DISCHG	.05	.04	.04	.04	.04	.04	.04	.04	.04	.04
27.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
28.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04
29.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04

RUNOFF VOLUME ABOVE BASEFLOW = .35 WATERSHED INCHES, 17.54 CFS-HRS, 1.45 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 5
OUTPUT HYDROGRAPH= 3
AREA= .08 SQ MI INPUT RUNOFF CURVE= 47. TIME OF CONCENTRATION= .50 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0667 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.51	34.04	(RUNOFF)
19.55	4.08	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

11.00	DISCHG	.00	.00	.01	.05	.14	.36	1.02	3.10	7.12	13.28
12.00	DISCHG	20.65	27.51	32.46	33.60	33.90	34.04	33.95	32.88	30.73	28.31
13.00	DISCHG	26.17	24.39	22.84	21.42	20.13	19.07	18.09	17.16	16.24	15.39
14.00	DISCHG	14.64	13.95	13.26	12.53	11.84	11.23	10.64	10.04	9.45	8.94
15.00	DISCHG	8.53	8.19	7.88	7.61	7.39	7.22	7.07	6.90	6.72	6.55
16.00	DISCHG	6.40	6.28	6.15	6.02	5.90	5.80	5.71	5.61	5.51	5.41
17.00	DISCHG	5.33	5.26	5.20	5.15	5.11	5.08	5.04	4.95	4.84	4.72
18.00	DISCHG	4.62	4.55	4.50	4.50	4.50	4.51	4.49	4.44	4.34	4.24
19.00	DISCHG	4.15	4.09	4.05	4.06	4.07	4.08	4.08	4.06	4.01	3.97
20.00	DISCHG	3.92	3.88	3.82	3.75	3.68	3.62	3.56	3.52	3.49	3.46
21.00	DISCHG	3.43	3.41	3.39	3.38	3.37	3.36	3.35	3.34	3.33	3.33
22.00	DISCHG	3.32	3.32	3.32	3.31	3.31	3.31	3.30	3.27	3.22	3.17
23.00	DISCHG	3.13	3.09	3.06	3.03	3.01	2.99	2.97	2.92	2.86	2.80
24.00	DISCHG	2.74	2.63	2.45	2.14	1.83	1.56	1.33	1.15	.99	.86
25.00	DISCHG	.74	.64	.55	.48	.41	.36	.30	.26	.22	.18
26.00	DISCHG	.15	.12	.09	.07	.05	.04	.02	.02	.01	.00

RUNOFF VOLUME ABOVE BASEFLOW = 2.21 WATERSHED INCHES, 107.47 CFS-HRS, 0.08 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 6
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.52	40.84	(NULL)
12.67	40.35	(NULL)
19.55	4.74	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = 1.27 WATERSHED INCHES, 125.01 CFS-HRS, 10.33 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 3
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
LENGTH = 1600.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 3 BY 38.1 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .22 M= 1.28
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .18 PEAK TRAVEL TIME = .53 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
13.04	31.98	69.14

RUNOFF VOLUME ABOVE BASEFLOW = 1.26 WATERSHED INCHES, 124.45 CFS-HRS, 10.28 ACRE-FEET; BASEFLOW = .00 CFS
1

OPERATION RESVOR STRUCTURE 7
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
SURFACE ELEVATION= 62.00

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(14.32) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 9 %.
+ STRUCTURE 7

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.24	14.32	63.89
12.83	31.74	64.23
13.01	33.11	64.26
13.19	32.54	64.25
13.38	30.90	64.22
13.56	28.70	64.17
13.75	26.35	64.13

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .15 SQ.MI.

12.00	DISCHG	.00	.00	13.05	11.97	20.80	20.16	27.17	26.29	31.50	29.90
13.00	DISCHG	33.10	30.75	32.52	29.90	30.79	28.16	28.50	26.05	26.08	23.86
14.00	DISCHG	23.68	21.70	21.43	19.69	19.35	17.81	17.43	16.08	15.68	14.49
15.00	DISCHG	14.08	13.05	12.69	11.83	11.52	10.81	10.56	9.98	9.78	9.31
16.00	DISCHG	9.13	8.73	8.57	8.24	8.10	7.81	7.68	7.45	7.33	7.13
17.00	DISCHG	7.02	6.84	6.74	6.59	6.51	6.39	6.32	6.22	6.16	6.05
18.00	DISCHG	5.97	5.86	5.77	5.67	5.60	5.53	5.48	5.42	5.38	5.32
19.00	DISCHG	5.26	5.18	5.11	5.04	4.99	4.94	4.90	4.87	4.84	4.81
20.00	DISCHG	4.78	4.74	4.70	4.66	4.61	4.56	4.50	4.44	4.38	4.33
21.00	DISCHG	4.27	4.22	4.18	4.14	4.10	4.07	4.04	4.01	3.99	3.97
22.00	DISCHG	3.95	3.94	3.92	3.91	3.90	3.90	3.89	3.88	3.87	3.85
23.00	DISCHG	3.83	3.80	3.77	3.73	3.70	3.67	3.64	3.60	3.57	3.53
24.00	DISCHG	3.49	3.44	3.38	3.29	3.17	3.00	2.81	2.61	2.40	2.19
25.00	DISCHG	1.99	1.80	1.62	1.45	1.30	1.15	1.03	.91	.81	.71
26.00	DISCHG	.62	.55	.48	.42	.36	.31	.27	.23	.20	.17
27.00	DISCHG	.15	.13	.11	.10	.09	.08	.07	.06	.06	.05
28.00	DISCHG	.05	.05	.04	.04	.04	.04	.04	.04	.04	.04
29.00	DISCHG	.04	.04	.04	.04	.04	.04	.04	.04	.04	.04

RUNOFF VOLUME ABOVE BASEFLOW = 1.24 WATERSHED INCHES, 122.18 CFS-HRS, 10.10 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
+ COMPUTATIONS COMPLETED FOR PASS 1

1

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EXECUTIVE CONTROL OPERATION INCREM RECORD ID
+ MAIN TIME INCREMENT = .10 HOURS

EXECUTIVE CONTROL OPERATION COMPUT RECORD ID
+ FROM XSECTION 14
+ TO STRUCTURE 7
STARTING TIME = .00 RAIN DEPTH = 11.00 RAIN DURATION= 1.00 RAIN TABLE NO.= 1 ANT. MOIST. COND= 2
ALTERNATE NO.= 2 STORM NO.= 2 MAIN TIME INCREMENT = .10 HOURS

OPERATION RUNOFF CROSS SECTION 14
OUTPUT HYDROGRAPH= 1
AREA= .07 SQ MI INPUT RUNOFF CURVE= 45. TIME OF CONCENTRATION= .90 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .1000 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.74	38.17	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .07 SQ.MI.

10.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.01	.03	.07
11.00	DISCHG	.13	.22	.35	.52	.74	1.02	1.70	2.96	5.14	8.65
12.00	DISCHG	13.75	19.34	25.05	30.17	33.97	36.20	37.47	38.11	38.06	37.27
13.00	DISCHG	35.88	34.36	32.86	31.45	30.09	28.78	27.54	26.39	25.34	24.33
14.00	DISCHG	23.35	22.43	21.60	20.87	20.14	19.47	18.87	18.32	17.80	17.27
15.00	DISCHG	16.74	16.24	15.76	15.30	14.85	14.43	14.04	13.69	13.33	12.95
16.00	DISCHG	12.55	12.16	11.77	11.40	11.04	10.69	10.34	9.99	9.64	9.29
17.00	DISCHG	8.96	8.66	8.38	8.15	7.94	7.76	7.59	7.43	7.28	7.12
18.00	DISCHG	6.97	6.82	6.69	6.58	6.49	6.42	6.36	6.30	6.23	6.14
19.00	DISCHG	6.03	5.93	5.84	5.76	5.71	5.67	5.63	5.60	5.56	5.52
20.00	DISCHG	5.47	5.41	5.35	5.28	5.21	5.13	5.05	4.98	4.92	4.86
21.00	DISCHG	4.81	4.76	4.72	4.68	4.64	4.61	4.58	4.56	4.53	4.51
22.00	DISCHG	4.49	4.47	4.46	4.45	4.43	4.42	4.40	4.38	4.36	4.32
23.00	DISCHG	4.27	4.23	4.18	4.14	4.10	4.07	4.03	3.99	3.95	3.90
24.00	DISCHG	3.84	3.76	3.65	3.50	3.31	3.07	2.82	2.59	2.37	2.17
25.00	DISCHG	1.99	1.83	1.68	1.55	1.43	1.32	1.22	1.12	1.04	.96
26.00	DISCHG	.88	.81	.75	.69	.64	.59	.54	.50	.46	.42
27.00	DISCHG	.38	.34	.31	.28	.25	.23	.20	.18	.16	.14
28.00	DISCHG	.12	.10	.09	.07	.06	.05	.04	.03	.02	.02
29.00	DISCHG	.01	.01	.01	.00						

RUNOFF VOLUME ABOVE BASEFLOW = 3.52 WATERSHED INCHES, 152.35 CFS-HRS, 12.59 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 3
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 75.00

1

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PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
15.90	20.16	79.07
16.10	17.40	79.06
16.30	15.21	79.05
16.50	13.46	79.04
16.70	12.00	79.04
16.90	10.76	79.04
17.10	9.73	79.03
17.30	8.92	79.03
17.50	8.33	79.03
19.65	5.62	79.02

RUNOFF VOLUME ABOVE BASEFLOW = 1.36 WATERSHED INCHES, 58.84 CFS-HRS, 4.86 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RUNOFF CROSS SECTION 24
OUTPUT HYDROGRAPH= 3
AREA= .01 SQ MI INPUT RUNOFF CURVE= 52. TIME OF CONCENTRATION= .10 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0133 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.99	21.39	(RUNOFF)

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .01 SQ.MI.

9.00	DISCHG	.00	.00	.00	.01	.02	.04	.06	.09	.11	.14
10.00	DISCHG	.16	.21	.26	.31	.35	.39	.48	.56	.64	.70
11.00	DISCHG	.76	1.03	1.27	1.45	1.60	1.76	6.43	11.45	15.33	18.59
12.00	DISCHG	21.34	16.88	13.17	11.56	10.72	10.32	7.43	5.42	4.49	3.99
13.00	DISCHG	3.72	3.24	2.96	2.84	2.77	2.74	2.49	2.32	2.25	2.21
14.00	DISCHG	2.19	2.06	1.97	1.94	1.92	1.91	1.78	1.70	1.66	1.64

15.00	DISCHG	1.63	1.58	1.55	1.54	1.54	1.53	1.45	1.39	1.36	1.35
16.00	DISCHG	1.34	1.30	1.27	1.26	1.25	1.25	1.20	1.17	1.16	1.15
17.00	DISCHG	1.15	1.15	1.15	1.15	1.15	1.15	1.07	1.01	.98	.96
18.00	DISCHG	.95	.99	1.03	1.04	1.05	1.06	.97	.91	.88	.86
19.00	DISCHG	.85	.90	.93	.95	.96	.96	.92	.89	.87	.86
20.00	DISCHG	.86	.81	.78	.77	.76	.76	.75	.75	.76	.76
21.00	DISCHG	.76	.76	.76	.76	.76	.76	.76	.76	.76	.76
22.00	DISCHG	.76	.76	.76	.76	.76	.76	.72	.69	.67	.66
23.00	DISCHG	.66	.66	.66	.66	.66	.66	.61	.58	.56	.56
24.00	DISCHG	.55	.32	.15	.08	.03	.01	.00			

RUNOFF VOLUME ABOVE BASEFLOW = 4.50 WATERSHED INCHES, 30.23 CFS-HRS, 2.50 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 4
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4
1

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PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.99	21.39	(NULL)
15.90	21.51	(NULL)
16.10	18.70	(NULL)
16.30	16.46	(NULL)
16.50	14.71	(NULL)
16.70	13.17	(NULL)
16.90	11.91	(NULL)
17.10	10.88	(NULL)
17.30	10.08	(NULL)
17.49	9.48	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = 1.78 WATERSHED INCHES, 89.07 CFS-HRS, 7.36 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 4
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
SURFACE ELEVATION= 77.10

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.95	20.83	79.12
12.27	12.94	78.97
12.48	11.49	78.94
15.91	21.13	79.13
16.11	17.31	79.05
16.31	14.55	79.00
16.50	12.56	78.96
16.77	11.37	78.94
16.99	10.96	78.93
17.19	10.53	78.92

RUNOFF VOLUME ABOVE BASEFLOW = 1.74 WATERSHED INCHES, 86.86 CFS-HRS, 7.18 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 1
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
LENGTH = 750.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 1 BY 19.3 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .14 M= 1.28
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .23 PEAK TRAVEL TIME = .40 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.33	13.38	77.82
16.76	7.83	76.22

RUNOFF VOLUME ABOVE BASEFLOW = 1.72 WATERSHED INCHES, 86.15 CFS-HRS, 7.12 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 5
1

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INPUT HYDROGRAPH= 6 OUTPUT HYDROGRAPH= 7
SURFACE ELEVATION= 73.50

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(9.01) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 5 %.
+ STRUCTURE 5

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.03	9.01	75.29
12.22	14.03	75.39
12.40	14.72	75.40
12.59	13.67	75.38
12.78	12.14	75.35
12.97	9.55	75.30
13.18	7.45	75.25
13.38	5.85	75.22
13.58	4.72	75.19
17.95	9.14	75.29

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

11.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.00	.77
12.00	DISCHG	8.51	6.92	13.76	11.37	14.72	11.33	13.65	10.63	12.03	8.59
13.00	DISCHG	9.41	6.57	7.36	5.12	5.80	4.08	4.70	3.45	3.94	2.96
14.00	DISCHG	3.33	2.61	2.93	2.38	2.60	2.19	2.36	2.06	2.19	1.92
15.00	DISCHG	2.01	1.81	1.88	1.74	1.77	1.67	1.69	1.63	1.63	1.56
16.00	DISCHG	2.50	6.66	7.46	9.35	10.01	10.62	11.18	11.09	11.55	11.07
17.00	DISCHG	11.43	10.79	11.05	10.37	10.56	9.92	10.05	9.50	9.57	9.09
18.00	DISCHG	9.09	8.70	8.65	8.35	8.29	8.07	8.00	7.85	7.75	7.62
19.00	DISCHG	7.50	7.40	7.27	7.19	7.07	7.01	6.90	6.87	6.77	6.73
20.00	DISCHG	6.63	6.61	6.51	6.48	6.37	6.33	6.21	6.17	6.06	6.01
21.00	DISCHG	5.91	5.86	5.77	5.74	5.66	5.62	5.56	5.53	5.47	5.45
22.00	DISCHG	5.40	5.38	5.34	5.33	5.29	5.28	5.25	5.24	5.21	5.18
23.00	DISCHG	5.14	5.11	5.07	5.03	4.98	4.94	4.90	4.86	4.81	4.76
24.00	DISCHG	4.70	4.65	4.59	4.48	4.32	4.16	3.97	3.77	3.56	3.34
25.00	DISCHG	3.12	2.90	2.70	2.50	2.31	2.14	1.98	1.83	1.70	1.56
26.00	DISCHG	1.45	1.33	1.23	1.14	1.05	.97	.90	.83	.76	.70
27.00	DISCHG	.65	.59	.55	.50	.46	.42	.38	.34	.31	.28
28.00	DISCHG	.25	.23	.20	.18	.16	.14	.12	.11	.09	.08
29.00	DISCHG	.07	.06	.06	.05	.05	.05	.04	.04	.04	.04

RUNOFF VOLUME ABOVE BASEFLOW = 1.70 WATERSHED INCHES, 84.94 CFS-HRS, 7.02 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 2
INPUT HYDROGRAPH= 7 OUTPUT HYDROGRAPH= 1
LENGTH = 400.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 2 BY 12.3 CFS
0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .16 M= 1.33
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .45 PEAK TRAVEL TIME = .30 HOURS
1

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.86	12.00	72.29
17.25	11.07	72.08
12.70	12.62	72.42

RUNOFF VOLUME ABOVE BASEFLOW = 1.72 WATERSHED INCHES, 86.04 CFS-HRS, 7.11 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 6
INPUT HYDROGRAPH= 1 OUTPUT HYDROGRAPH= 2
SURFACE ELEVATION= 68.70

*** WARNING-MAIN TIME INCREMENT MAY BE TOO LARGE.
COMPUTED PEAK(8.88) AT EXCEEDS MAX. ADJACENT HYDROGRAPH COORDINATE BY 5 %.
+ STRUCTURE 6

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.23	8.88	70.49
12.42	12.94	70.57
12.61	14.12	70.59
12.80	13.73	70.58
12.99	12.18	70.55
13.18	9.98	70.51
13.38	7.97	70.47
13.58	6.35	70.43
13.79	5.14	70.40
17.10	11.21	70.53

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .08 SQ.MI.

12.00	DISCHG	.00	.00	8.46	6.06	12.78	9.64	14.11	10.48	13.72	10.04
13.00	DISCHG	12.12	8.42	9.90	6.68	7.90	5.23	6.30	4.16	5.12	3.47
14.00	DISCHG	4.24	2.96	3.58	2.61	3.11	2.35	2.75	2.16	2.48	2.03
15.00	DISCHG	2.27	1.90	2.08	1.80	1.94	1.72	1.82	1.67	1.72	1.63
16.00	DISCHG	1.64	1.95	4.00	5.58	7.20	8.50	9.40	10.23	10.58	11.03
17.00	DISCHG	11.04	11.21	11.03	11.02	10.76	10.64	10.36	10.18	9.92	9.72
18.00	DISCHG	9.49	9.27	9.06	8.84	8.66	8.46	8.33	8.15	8.05	7.89
19.00	DISCHG	7.79	7.64	7.55	7.41	7.32	7.20	7.13	7.02	6.96	6.87
20.00	DISCHG	6.81	6.73	6.68	6.60	6.55	6.47	6.40	6.32	6.25	6.17
21.00	DISCHG	6.09	6.01	5.94	5.87	5.81	5.74	5.69	5.63	5.58	5.54
22.00	DISCHG	5.49	5.46	5.42	5.39	5.36	5.33	5.31	5.29	5.26	5.24
23.00	DISCHG	5.21	5.18	5.15	5.12	5.07	5.04	4.99	4.95	4.91	4.87
24.00	DISCHG	4.82	4.77	4.71	4.66	4.58	4.47	4.33	4.17	4.00	3.81
25.00	DISCHG	3.60	3.39	3.18	2.96	2.76	2.56	2.38	2.20	2.04	1.89
26.00	DISCHG	1.75	1.62	1.49	1.38	1.27	1.18	1.08	1.00	.92	.85
27.00	DISCHG	.79	.72	.67	.61	.56	.52	.47	.43	.39	.36
28.00	DISCHG	.32	.29	.26	.24	.21	.19	.17	.15	.13	.11
29.00	DISCHG	.10	.08	.07	.07	.06	.05	.05	.05	.05	.04

RUNOFF VOLUME ABOVE BASEFLOW = 1.69 WATERSHED INCHES, 84.46 CFS-HRS, 6.98 ACRE-FEET; BASEFLOW = .00 CFS
1

OPERATION RUNOFF CROSS SECTION 5
OUTPUT HYDROGRAPH= 3
AREA= .08 SQ MI INPUT RUNOFF CURVE= 47. TIME OF CONCENTRATION= .50 HOURS
INTERNAL HYDROGRAPH TIME INCREMENT= .0667 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.30	63.72	(RUNOFF)
19.53	6.25	(RUNOFF)

TIME(HRS)		FIRST HYDROGRAPH POINT = .00 HOURS			TIME INCREMENT = .10 HOURS				DRAINAGE AREA = .08 SQ.MI.		
10.00	DISCHG	.00	.00	.00	.02	.05	.12	.22	.36	.55	.77
11.00	DISCHG	1.01	1.32	1.73	2.30	2.93	3.75	5.64	10.71	19.59	31.47
12.00	DISCHG	44.51	55.66	63.04	63.72	63.05	62.22	61.13	58.58	54.36	49.83
13.00	DISCHG	45.81	42.48	39.60	36.99	34.59	32.60	30.77	29.04	27.36	25.80
14.00	DISCHG	24.40	23.12	21.85	20.52	19.26	18.15	17.09	16.05	15.04	14.18
15.00	DISCHG	13.49	12.92	12.41	11.96	11.60	11.32	11.07	10.80	10.50	10.23
16.00	DISCHG	9.99	9.78	9.58	9.37	9.18	9.02	8.87	8.71	8.54	8.39
17.00	DISCHG	8.25	8.14	8.05	7.97	7.91	7.85	7.78	7.65	7.46	7.28
18.00	DISCHG	7.12	7.00	6.93	6.92	6.92	6.93	6.90	6.81	6.66	6.51
19.00	DISCHG	6.37	6.27	6.22	6.22	6.23	6.25	6.24	6.21	6.14	6.06
20.00	DISCHG	6.00	5.93	5.84	5.73	5.61	5.52	5.44	5.37	5.32	5.27
21.00	DISCHG	5.23	5.20	5.17	5.14	5.12	5.11	5.09	5.08	5.07	5.06
22.00	DISCHG	5.05	5.04	5.04	5.03	5.03	5.03	5.01	4.96	4.89	4.81
23.00	DISCHG	4.74	4.68	4.63	4.59	4.56	4.53	4.49	4.42	4.33	4.23
24.00	DISCHG	4.14	3.98	3.71	3.23	2.77	2.36	2.02	1.74	1.50	1.30
25.00	DISCHG	1.12	.97	.84	.73	.62	.54	.46	.39	.33	.27
26.00	DISCHG	.22	.18	.14	.11	.08	.06	.04	.02	.01	.01
27.00	DISCHG	.00									

RUNOFF VOLUME ABOVE BASEFLOW = 3.80 WATERSHED INCHES, 184.63 CFS-HRS, 15.26 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION ADDHYD CROSS SECTION 6
INPUT HYDROGRAPHS= 2,3 OUTPUT HYDROGRAPH= 4

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.24	72.92	(NULL)
12.41	75.88	(NULL)
12.59	75.34	(NULL)
17.07	19.37	(NULL)

RUNOFF VOLUME ABOVE BASEFLOW = 2.73 WATERSHED INCHES, 269.10 CFS-HRS, 22.24 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION REACH CROSS SECTION 3
INPUT HYDROGRAPH= 4 OUTPUT HYDROGRAPH= 5
LENGTH = 1600.00 FEET INPUT = RATING CURVE REPRESENTATIVE OF REACH
0 *** WARNING - INFLOW EXCEEDED MAX.FLOW IN XSECTN TABLE 3 BY 73.1 CFS
1

0 COEFFICIENTS USED IN ROUTING RELATED TO CROSS SECTION AREA, X= .24 M= 1.26
0 MODIFIED ATT-KIN ROUTING COEFFICIENT = .20 PEAK TRAVEL TIME = .50 HOURS

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
12.93	61.92	74.91
17.56	18.46	66.53

RUNOFF VOLUME ABOVE BASEFLOW = 2.74 WATERSHED INCHES, 270.23 CFS-HRS, 22.33 ACRE-FEET; BASEFLOW = .00 CFS

OPERATION RESVOR STRUCTURE 7
INPUT HYDROGRAPH= 5 OUTPUT HYDROGRAPH= 6
SURFACE ELEVATION= 62.00

PEAK TIME(HRS)	PEAK DISCHARGE(CFS)	PEAK ELEVATION(FEET)
11.94	11.55	63.84
12.91	63.07	64.84
13.08	61.88	64.82
17.53	18.47	63.98

TIME(HRS) FIRST HYDROGRAPH POINT = .00 HOURS TIME INCREMENT = .10 HOURS DRAINAGE AREA = .15 SQ.MI.

11.00	DISCHG	.00	.00	.00	.00	.00	.00	.00	.00	.19	10.77
12.00	DISCHG	8.98	21.45	23.43	37.47	40.06	50.80	51.88	59.45	58.84	63.03
13.00	DISCHG	60.35	61.74	57.91	57.72	53.56	52.54	48.51	47.17	43.50	42.06
14.00	DISCHG	38.80	37.37	34.55	33.21	30.74	29.45	27.29	26.11	24.24	23.14
15.00	DISCHG	21.52	20.57	19.22	18.44	17.34	16.71	15.85	15.36	14.68	14.27
16.00	DISCHG	13.71	13.36	12.96	13.13	13.44	14.07	14.72	15.47	16.13	16.77
17.00	DISCHG	17.27	17.71	18.01	18.26	18.38	18.46	18.45	18.41	18.27	18.11
18.00	DISCHG	17.87	17.63	17.35	17.08	16.81	16.57	16.32	16.11	15.87	15.64
19.00	DISCHG	15.39	15.15	14.89	14.67	14.46	14.28	14.11	13.96	13.81	13.67
20.00	DISCHG	13.52	13.38	13.23	13.09	12.93	12.78	12.62	12.46	12.31	12.16
21.00	DISCHG	12.01	11.87	11.74	11.61	11.49	11.38	11.27	11.17	11.08	10.99
22.00	DISCHG	10.91	10.84	10.77	10.70	10.65	10.59	10.55	10.50	10.45	10.39
23.00	DISCHG	10.32	10.24	10.17	10.09	10.01	9.94	9.86	9.78	9.70	9.61
24.00	DISCHG	9.51	9.40	9.27	9.10	8.86	8.56	8.21	7.84	7.45	7.06
25.00	DISCHG	6.67	6.27	5.89	5.51	5.15	4.80	4.45	4.13	3.82	3.53
26.00	DISCHG	3.25	2.99	2.75	2.53	2.32	2.12	1.94	1.78	1.63	1.49
27.00	DISCHG	1.36	1.25	1.14	1.05	.96	.88	.81	.74	.68	.62
28.00	DISCHG	.57	.52	.47	.43	.39	.35	.32	.29	.26	.23
29.00	DISCHG	.21	.19	.16	.15	.13	.11	.10	.09	.08	.07

RUNOFF VOLUME ABOVE BASEFLOW = 2.74 WATERSHED INCHES, 270.26 CFS-HRS, 22.33 ACRE-FEET; BASEFLOW = .00 CFS

EXECUTIVE CONTROL OPERATION ENDCMP RECORD ID
+ COMPUTATIONS COMPLETED FOR PASS 2

EXECUTIVE CONTROL OPERATION ENDJOB RECORD ID
1

SUMMARY TABLE 1 - SELECTED RESULTS OF STANDARD AND EXECUTIVE CONTROL INSTRUCTIONS IN THE ORDER PERFORMED
(A STAR(*) AFTER THE PEAK DISCHARGE TIME AND RATE (CFS) VALUES INDICATES A FLAT TOP HYDROGRAPH
A QUESTION MARK(?) INDICATES A HYDROGRAPH WITH PEAK AS LAST POINT.)

SECTION/ STRUCTURE ID	STANDARD CONTROL OPERATION	DRAINAGE AREA (SQ MI)	RAIN TABLE #	ANTEC MOIST COND	MAIN TIME INCREM (HR)	PRECIPITATION BEGIN (HR)	PRECIPITATION AMOUNT (IN)	PRECIPITATION DURATION (HR)	RUNOFF AMOUNT (IN)	PEAK DISCHARGE ELEVATION (FT)	PEAK DISCHARGE TIME (HR)	PEAK DISCHARGE RATE (CFS)	PEAK DISCHARGE RATE (CSM
ALTERNATE 1 STORM 1													
XSECTION 14	RUNOFF	.07	1	2	.10	.0	8.50	24.00	2.01	---	12.81	19.99	290.
XSECTION 24	RUNOFF	.01	1	2	.10	.0	8.50	24.00	2.75	---	12.00	12.61	1212.
XSECTION 5	RUNOFF	.08	1	2	.10	.0	8.50	24.00	2.21	---	12.51	34.04	452.

STRUCTURE 7	RESVOR	.15	1	2	.10	.0	8.50	24.00	1.24	64.26	13.01	33.11	217.

ALTERNATE 2 STORM 2

XSECTION 14	RUNOFF	.07	1	2	.10	.0	11.00	24.00	3.52	---	12.74	38.17	569.
XSECTION 24	RUNOFF	.01	1	2	.10	.0	11.00	24.00	4.50	---	11.99	21.39	2056
XSECTION 5	RUNOFF	.08	1	2	.10	.0	11.00	24.00	3.80	---	12.30	63.72	847.
STRUCTURE 7	RESVOR	.15	1	2	.10	.0	11.00	24.00	2.74	64.84	12.91	63.07	413.

1

SUMMARY TABLE 2 - SELECTED MODIFIED ATT-KIN REACH ROUTINGS IN ORDER OF STANDARD EXECUTIVE CONTROL INSTRUCTIONS
(A STAR(*) AFTER VOLUME ABOVE BASE(IN) INDICATES A HYDROGRAPH TRUNCATED AT A VALUE EXCEEDING BASE + 10% OF PEAK
A QUESTION MARK(?) AFTER COEFF.(C) INDICATES PARAMETERS OUTSIDE ACCEPTABLE LIMITS, SEE PREVIOUS WARNINGS)

		HYDROGRAPH INFORMATION							ROUTING PARAMETERS									PEAK
						OUTFLOW+			VOLUME	MAIN	ITER-	Q AND A			PEAK	S/Q	ATT-	TRAVEL TI
XSEC	REACH	INFLOW		OUTFLOW		INTERV.	AREA	BASE-	ABOVE	TIME	ATION	EQUATION		LENGTH	RATIO	@PEAK	KIN	STOR- KIN
ID	LENGTH (FT)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	PEAK (CFS)	TIME (HR)	FLOW (CFS)	BASE (IN)	INCR (HR)	#	COEFF (X)	POWER (M)	FACTOR (K*)	O/I (O*)	(K) (SEC)	COEFF (C)	AGE (HR)	MAT (H
ALTERNATE 1 STORM 1																		
1	750	14	11.9	7	12.4	---	---	0	.37	.10	2	.126	1.31	.310	.512	1506	.21	.50
2	400	9	12.3	7	12.8	---	---	0	.36	.10	1	.150	1.34	.062	.790	714	.40	.50
3	1600	41	12.5	32	13.0	---	---	0	1.27	.10	1	.217	1.28	.140	.783	1848	.18	.50
ALTERNATE 2 STORM 2																		
1	750	21	15.9	13	12.3	---	---	0	1.74	.10	1	.142	1.28	.065	.630	1377	.23	.30
2	400	15	12.4	13	12.7	---	---	0	1.70	.10	1	.157	1.33	.014	.857	625	.45	.30
3	1600	76	12.4	62	12.9	---	---	0	2.73	.10	1	.245	1.26	.098	.615	1604	.20	.50

1

SUMMARY TABLE 3 - DISCHARGE (CFS) AT XSECTIONS AND STRUCTURES FOR ALL STORMS AND ALTERNATES

XSECTION/ DRAINAGE

```
 STRUCTURE                AREA        STORM NUMBERS.....
   ID                   (SQ MI)          1         2

0 STRUCTURE   7           .15
+-------------------------------
    ALTERNATE    1                    33.11       .00
    ALTERNATE    2                      .00     63.07
0 XSECTION    5           .08
+-------------------------------
    ALTERNATE    1                    34.04       .00
    ALTERNATE    2                      .00     63.72
0 XSECTION   14           .07
+-------------------------------
    ALTERNATE    1                    19.99       .00
    ALTERNATE    2                      .00     38.17
0 XSECTION   24           .01
+-------------------------------
    ALTERNATE    1                    12.61       .00
    ALTERNATE    2                      .00     21.39
1END OF  1 JOBS IN THIS RUN
```

PROJECT: Normandy Blvd.

DESIGNER: MJ

DATE: 10/31/88

HYDROLOGIC AND CHANNEL INFORMATION

Q_1 = 35 cfs

Q_2 = _____

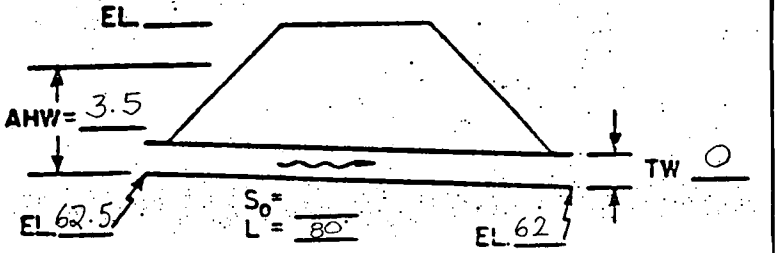
TW_1 = _____

TW_2 = _____

(Q_1 = DESIGN DISCHARGE, SAY Q_{25}
Q_2 = CHECK DISCHARGE, SAY Q_{50} OR Q_{100})

SKETCH

STATION: 83+50



MEAN STREAM VELOCITY = _____

MAX. STREAM VELOCITY = _____

CULVERT DESCRIPTION (ENTRANCE TYPE)	Q	SIZE	HEADWATER COMPUTATION										CONTROLLING HW	OUTLET VELOCITY	COST	COMMENTS
			INLET CONT.		OUTLET CONTROL HW = H + h_o − LS_o											
			HW/D	HW	K_e	H	d_c	$\frac{d_c+D}{2}$	TW	h_o	LS_o	HW				
R.C.P. w/M.E.S.	35	24"	2.5	5.0	0.5	4.5	2.36	2.18		2.18	0.5	6.18	5.0			
R.C.P. w/ M.E.S.	35	30"	1.32	3.3	0.5	1.65	2.1	2.3		2.3	0.5	3.45	3.45			

SUMMARY & RECOMMENDATIONS:

Use 30" R.C.P. (must be Class IV)

Figure 7

APPENDIX A

SUBSURFACE INVESTIGATION AND EVALUATION
PROPOSED NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA
87-009.23

Michael D. Sims & Associates, Inc.
Consulting Engineers in the Earth Sciences, Geotechnology,
Hydrogeology and Construction Materials Testing

(407) 297-0292

August 31, 1988

Glace & Radcliffe, Inc.
800 South Orlando Avenue
Maitland, Florida 32751

Attention: Mr. John Morrison, P.E.

SUBJECT: SUBSURFACE INVESTIGATION AND EVALUATION, PROPOSED ROADWAY, NORMANDY BOULEVARD EXTENSION, VOLUSIA COUNTY, FLORIDA (PN 87-009.23)

Dear Mr. Morrison:

As requested and upon your authorization, we have completed a subsurface investigation for the project referenced above. The purpose of this investigation was to provide input data as to the existing subsurface soil and groundwater table conditions along the proposed roadway alignment. The following report presents the results of our field and laboratory testing and provides our evaluation of the suitability of the existing soils to provide support for the proposed roadway. In order to meet project schedule, the enclosed data was presented verbally to you by telephone in mid-August, 1988.

We trust that the information provided in this report satisfies your present requirements. Should there be any questions with regards to the enclosed data, please do not hesitate to contact our office. We have appreciated the opportunity of assisting you on this project and look forward to helping you in the future.

Sincerely,

MICHAEL D. SIMS & ASSOCIATES, INC.

Andre M. Gallet, M.E., E.I.
Project Engineer

Stephen W. Berry, P.E.
Vice President
Florida Registration No. 31053

Enclosure:

AMG/ah

SUBSURFACE INVESTIGATION AND EVALUATION
PROPOSED NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PROJECT AND SITE DESCRIPTION

The proposed Normandy Boulevard extension will be a two lane roadway, approximately 1.6 miles in length and is located just east of Interstate 4 (I-4), extending from North Firwood Drive to Howland Boulevard. The site is located in Section 7, Township 18 South, Range 30 East of Volusia County. The vicinity and general configuration of the proposed roadway alignment is illustrated on the 1964 (Photo Revised 1980) "Orange City" U.S.G.S. Quadrangle map, as shown on the Vicinity Map on Sheet 1. According to the quadrangle map and the supplied topographic information along the proposed roadway, the existing ground surface elevations generally range from +65 to +92 feet MSL with depressions extending to an elevation of +50 feet MSL, while the proposed roadway elevations range from approximately +66 to +86 feet MSL. These elevations result in maximum cuts on the order of 10 feet and fills on the order of 20 feet. The depressions along the roadway alignment usually occur over a karst topography. However, stability analysis of these formations was beyond the scope of work.

The U.S.D.A. Soil Conservation Service (SCS) has mapped the soils along the proposed alignment. The predominant soil types are Astatula Fine Sand, Orsino Fine Sand, Paola Fine Sand and Tavares Fine Sand. These soil types generally occur on moderately high to high sand hills with the exception of the Orsino Fine Sand, which occurs on low, flat ridges between the higher ridges. These soil types are considered to me moderately well drained to excessively drained.

FIELD INVESTIGATION

TEST BORINGS

The field investigation for this project consisted of performing thirty-six auger borings at approximate 200 foot intervals along the proposed roadway. Twenty-six (26) of the borings were performed using hand auger equipment to depths ranging from 7 to 10 feet below the existing grade, while the remaining ten (10) borings were performed to depths ranging from 15 to 25 feet using a power rotary drill rig. The subsoil sampling and identification method was accomplished in general accordance with the ASTM D-1452 Standard.

In addition to the auger borings, a total of three (3) Bulk Samples of in-place soil materials were obtained between the depth interval of 1 to 2 feet below the existing grade and returned to our laboratory for Limestone Bearing Ratio (LBR) tests. Furthermore, three (3) undisturbed samples were retrieved between the depth interval of 2 to 2.5 feet below grade at various locations along the roadway alignment. These samples were returned to our laboratory for subsequent Vertical Permeability Tests.

The locations of all borings performed and of all LBR test samples obtained are shown on the Location Plan on Sheet 1. The results of the auger borings are shown in the form of Soil Profiles with an attendant Soil Legend on Sheets 2 and 3. The AASHTO Classification for the encountered subsoils are provided on the Soil Legend. In addition, the results of the Vertical Permeability tests are shown on Sheets 1 and 2, near the Soil Profile of their adjacent soil borings, at their corresponding depths.

LABORATORY TESTING

CLASSIFICATION TESTS

A representative portion of each recovered sample was sealed in glass jars and transported to our laboratory for further visual and laboratory examination. Selected samples retrieved from the borings were tested for Index Properties, such as Moisture Content and Percent Fines (percent passing the U.S. No. 200 Sieve) to aid in the soil classification. The AASHTO Classification for each of the soil layers are provided on the Legend on Sheets 2 and 3. The results of the laboratory testing are shown on Sheets 2 and 3, adjacent to the soil profiles, at the corresponding sample depth.

LIMESTONE BEARING RATIO TESTS

Three (3) Limestone Bearing Ratio tests were performed as part of our scope of services on this project. All samples were obtained at a depth interval from 1 to 2 feet below present grade and within the proximity of the centerline of the proposed roadway alignment. The results of the LBR tests, performed on samples prepared at the Maximum Modified Proctor Density (AASHTO T-180), ranged from 12 to 32. The results of the individual tests, including the Maximum Modified Proctor Densities, are shown on Plates 1 through 3.

PERMEABILITY TESTS

In order to estimate the infiltration capacity of the existing soils, three (3) Vertical Permeability tests were conducted in the laboratory on undisturbed soil samples retrieved between the depth interval of 2 to 2.5 feet. Based on our evaluation of the test results, the coefficient of vertical permeability of the Strata 2 and 3 soils ranges between 47 and 57 feet per day. The test results are shown on Sheets 2 and 3.

SUBSURFACE CONDITIONS

SOIL CONDITIONS

The subsoil stratigraphy, as encountered in the soil borings, was found to be relatively consistent in the upper profile, along the proposed roadway alignment. In general, the shallow auger borings encountered 1 foot or less of gray fine sand with roots (topsoil); underlain by varying layer thicknesses of relatively clean, light brown to light gray fine sand (Stratum 2); yellow brown fine sand (Stratum 3); and/or dark brown to reddish brown fine sand (Stratum 4) to their termination depth of 7 or 10 feet below the existing grade.

The deeper borings were performed in areas of significant depressions along the roadway alignment. Again, a topsoil layer of 1 foot or less was encountered, underlain by the relatively clean fine sands (Strata 2 and 3). In the southern portion of the alignment, at Stations 16+00, 28+00 and 30+00, the clean fine sands extended to their termination depth of 25 feet below the existing grade (a minimum termination elevation of approximately +35 feet MSL). Towards the center of the alignment, at Stations 34+00, 36+00 52+00 and 54+00, the clean fine sands (Strata 2 and 3) were terminated at relatively shallow depths ranging from 6 to 11 feet below the existing grade. At those depths, the soil profile generally consisted of varying layer thicknesses of slightly silty to slightly clayey to silty fine sands (Strata 5, 6 and 7) to their termination depths of 20 to 25 feet below the existing grade. In addition, at Station 34+00, an orangish brown to gray, mottled, sandy clay (Stratum 8) was encountered from 18 to 21 feet below the existing grade.

GROUNDWATER TABLE CONDITIONS

Measurements of the depth below the existing ground surface to the shallow groundwater table were attempted immediately after the completion of each boring and approximately 24 hours later. However, the shallow groundwater table was only encountered within the deeper borings where the significant depressions occur. Water levels were encountered at depths ranging from 10.5 to 22.5 feet below the existing grade.

It must be noted that the groundwater table in this area will fluctuate in response to local variations of precipitation. Based on the review of the U.S.D.A./S.C.S. soils maps for the site as well as the antecedent rainfall conditions, it is our opinion that the normal seasonal high groundwater level will occur 12 to 18 inches above the existing groundwater levels during the peak of the normal rainy season, or at depths greater than 10 feet below the proposed final pavement grades throughout the roadway alignment.

DISCUSSION AND CONCLUSIONS

ROADWAY SUPPORT

Based on the results of this investigation and with the exception of the encountered topsoil layer, it is our opinion that the soil materials present along the proposed roadway alignment are suitable for the support of a flexible or semi-flexible pavement section. The topsoil identified in the borings was essentially 1 foot or less in thickness and should be removed in its entirety from the roadway area. The majority of the natural soils in the upper profile are predominantly clean fine sands (AASHTO Group A-3); thus, it is our opinion that the subsoil conditions along the proposed right-of-way alignment for the Normandy Boulevard Extension would not adversely effect roadway design. Based on the results of the LBR tests, clayey sand will have to be added to the natural subgrade soils to increase stability to the project requirements of LBR of 40.

It is anticipated that various areas along the roadway will need significant fill, on the order of 15 to 20 feet in height, to elevate existing depressed areas to finished subgrade elevation. Thus, the fill should consist of clean granular soils (less than 15 percent passing the U.S. No. 200 Sieve),

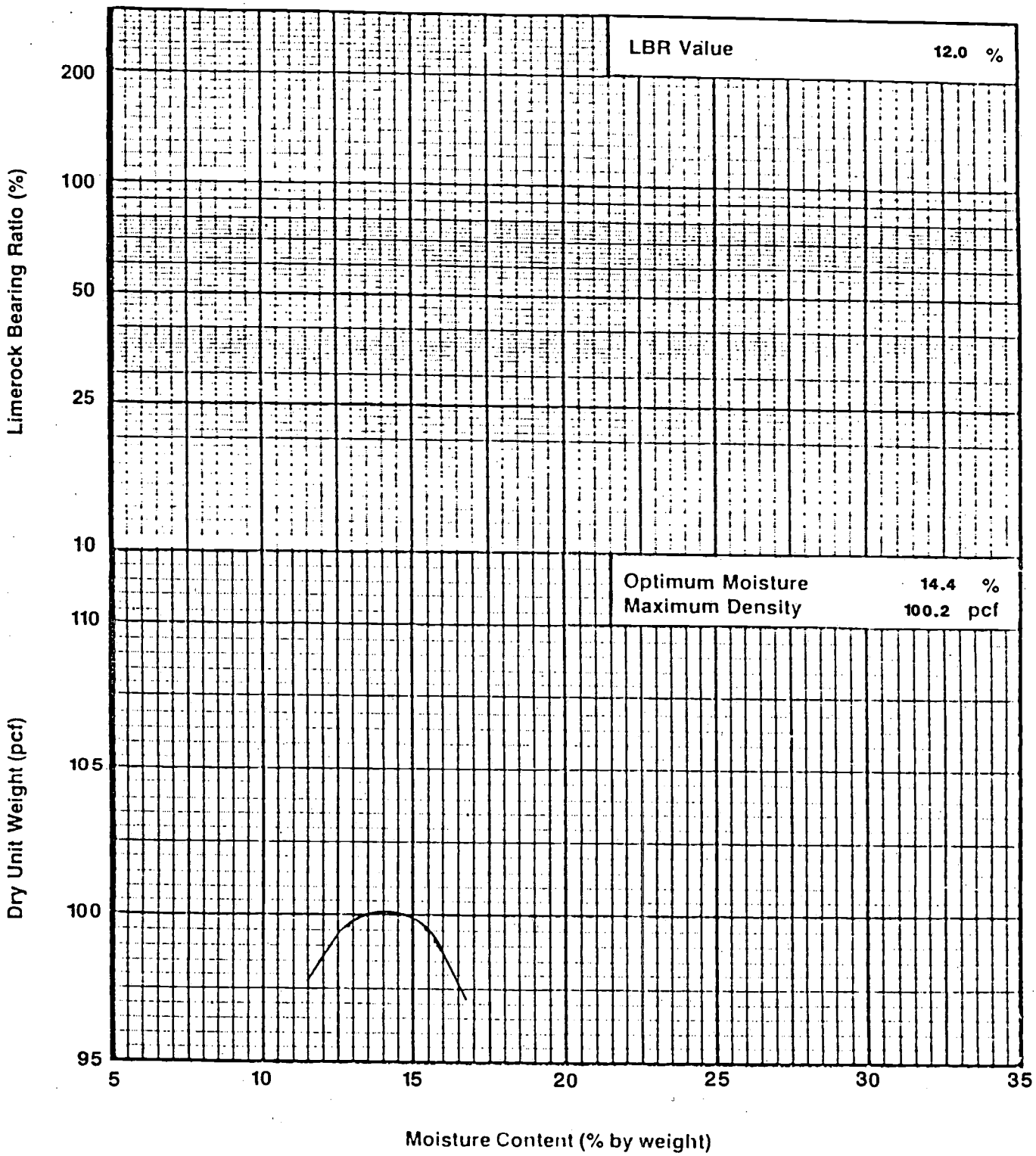
placed in level lifts not exceeding 12 inches in loose thickness and compacted to 95 percent of the Maximum Modified Proctor Density (AASHTO T-180).

The proposed swales adjacent to the roadway alignment are anticipated to vary in depth form approximately 1 to 22 feet below edge of pavement. The resulting earthwork shall include maximum cuts on the order of 11 feet and fills on the order of 20 feet. It is anticipated that the cuts will result in adequate fill material. The slopes should consist of the clean granular soils prepared as previously mentioned and compacted to the above criteria. Assuming sufficient erosion control, the slopes should be installed at 4 : 1 ratio, or flatter. Any steeper slopes shall be reviewed by Michael D. Sims & Associates.

As discussed previously, we estimate the normal seasonal high groundwater elevation will be 10 feet or more below the final pavement grades. Thus, we do not believe the position of the groundwater table will influence pavement design or the selection of the base course.

STORMWATER MANAGEMENT

It is our understanding that swales will be installed adjacent to the proposed roadway alignment. As indicated by the results of the permeability tests, the majority of the near surface soils are highly permeable with an average coefficient of vertical permeability on the order of 50 feet per day. Based on these values and our experience with these soil conditions, it is our opinion that the proposed swales will provide sufficient drainage. Thus, individual retention areas will not be required along the right-of-way limits.



Sample No.
Location: STA. 20+00

Soil Description:

Project Requirement:

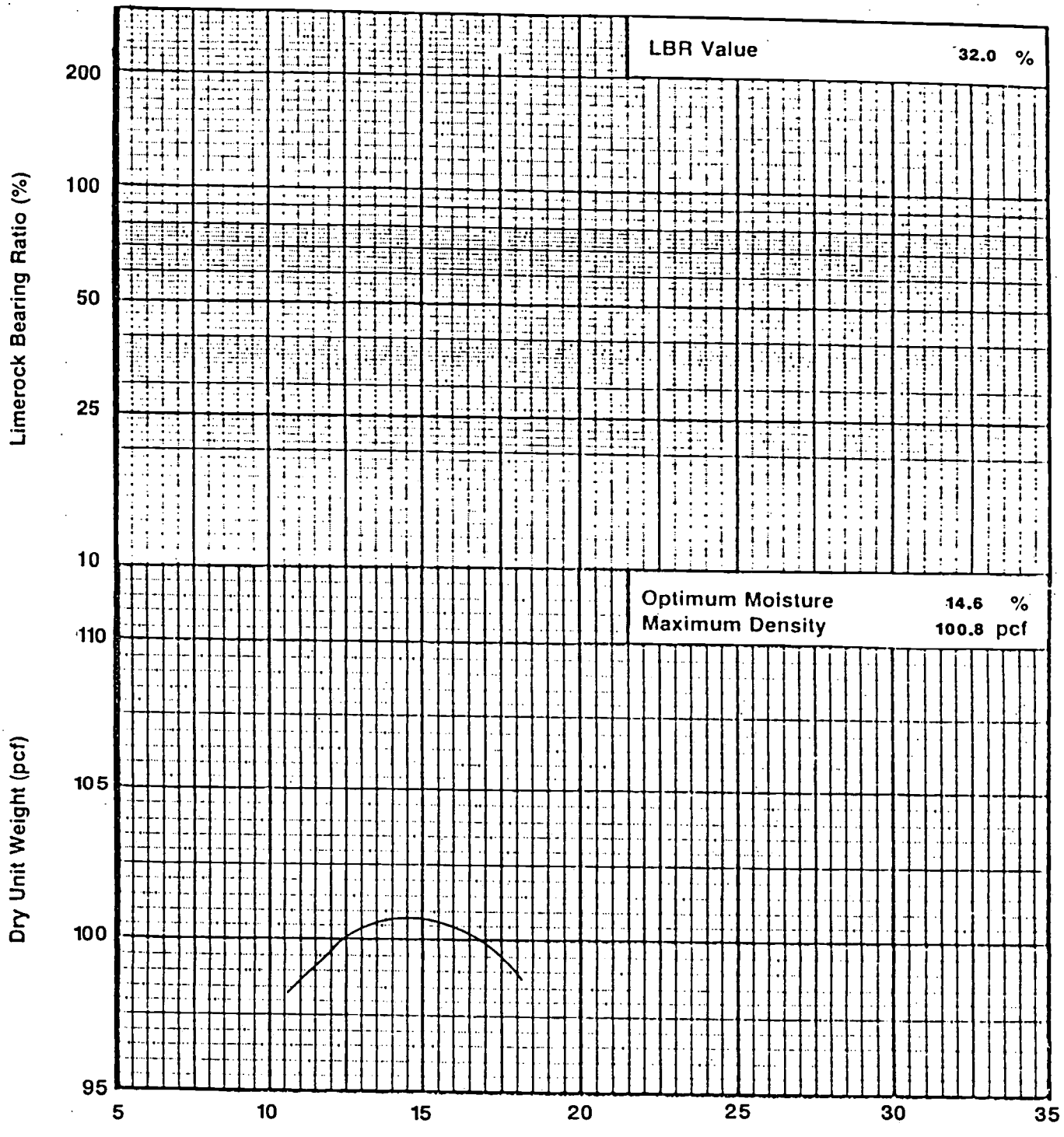
NORMANDY BOULEVARD

LIMEROCK BEARING RATIO

Michael D. Sims & Associates, Inc.
Consulting Engineers in the Earth Sciences, Geotechnology, Hydrogeology and Construction Materials Testing

Tested by: SWB II	Date: 9-2-88	Project No. 87-009.23
Checked by: SWB	Date: 9-6-88	PLATE 1

E504



Sample No.
Location: STA. 43+50

Soil Description:

Project Requirement:

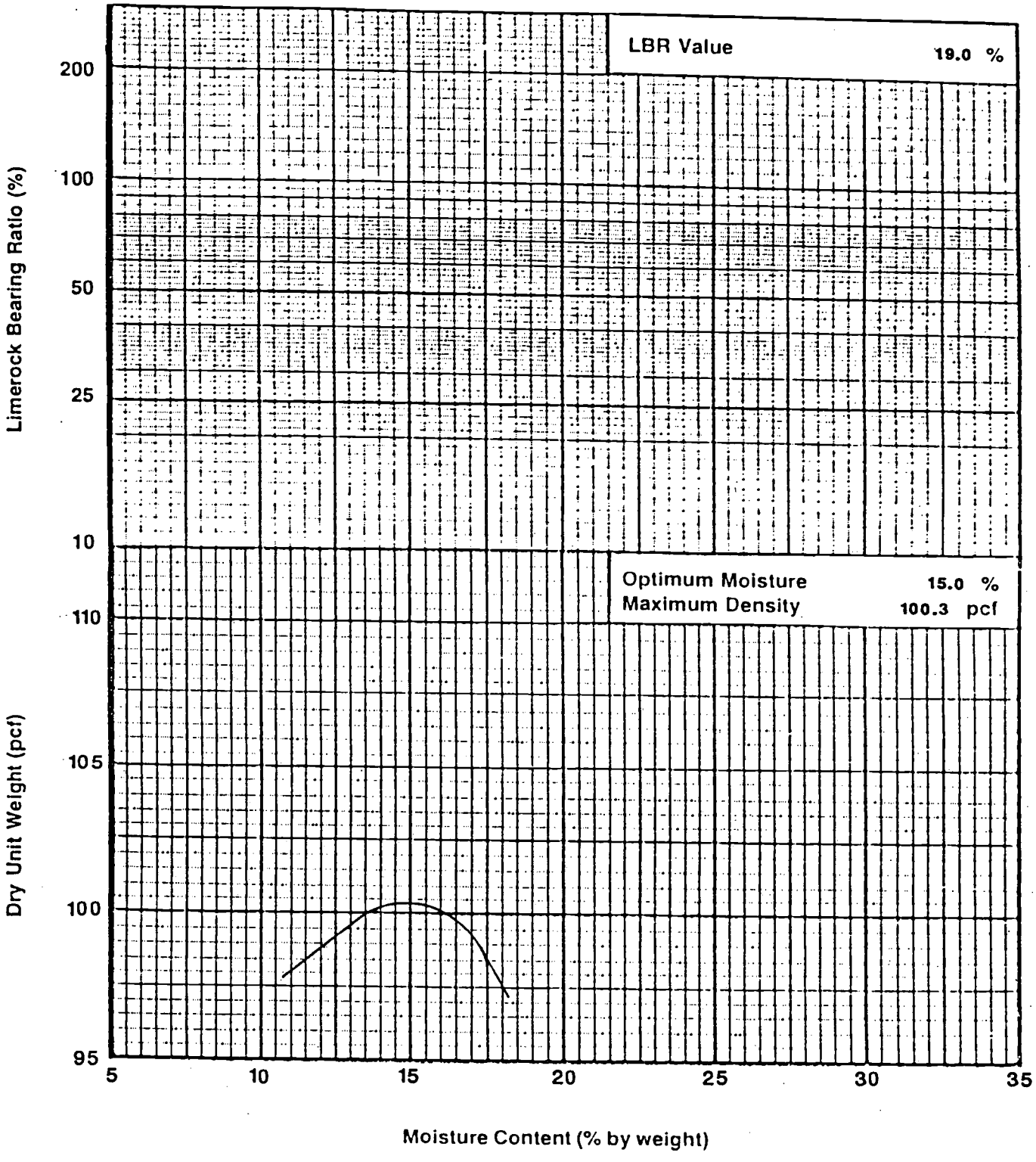
NORMANDY BOULEVARD

LIMEROCK BEARING RATIO

Michael D. Sims & Associates, Inc.
Consulting Engineers in the Earth Sciences, Geotechnology, Hydrogeology and Construction Materials Testing

Tested by: SWB II	Date: 9-2-88	Project No. 87-009.23
Checked by: SWB	Date: 9-6-88	PLATE 2

E505



Sample No.
Location: STA. 79+00

Soil Description:

Project Requirement:

NORMANDY BOULEVARD

LIMEROCK BEARING RATIO

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Tested by: SWB II	Date: 9-2-88	Project No. 87-009.23
Checked by: SWB	Date: 9-6-88	PLATE 3

E506

APPENDIX D

SPECIFICATIONS FOR WATER QUALITY PROTECTION MEASURES DURING CONSTRUCTION

SECTION 2

TECHNICAL PROVISIONS

TP 104

PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION

Prevention, control and abatement of erosion and water pollution shall conform to the requirements of Section 104 of the "Standard Specifications", and shall produce end results as required by the rules of the Department of Environmental Regulations.

The contractor is required to present his schedules for construction of the project at the preconstruction conference as required by Article 104-5 of the "Standard Specifications". This schedule shall include a complete outline for the proposed construction of any and/or all of the pollution control and erosion abatement items detailed in Section 104 of the "Standard Specifications". The Contractor is responsible for the implementation of the Schedule after approval by the Engineer.

Method of Measurement

The quantity to be paid for under this Section shall be one lump sum quantity which shall include all items of work required for complete prevention, control and abatement of erosion and water pollution.

Basis of Payment

Payment for prevention, control and abatement of erosion and water pollution shall be made under:

Item No. 104-2 - Prevention, Control and Abatement of Erosion and Water Pollution - Lump Sum

When such item is included in the proposal, payment will be made under:

Item No. 102-1—Maintenance of Traffic—lump sum.

102-7.2 Special Detours:

When a detour facility is specifically detailed in the plans, or is otherwise described or detailed as a special item, and an item for separate payment is included in the proposal. the work of constructing. maintaining and subsequently removing such detour facilities will be paid for separately.

The contract lump sum price for each such detour shall be full compensation for providing all detour facilities shown on the plans and all costs incurred in carrying out all requirements of this Section for general maintenance of traffic within the limits of the detour. as shown on the plans. When the plans show more than one detour. each detour shall be paid for separately. at the contract lump sum price for each.

Where a separate item for a specific detour facility is included in the proposal. payment therefor will be made under:

Item No. 102-2—Special Detour—lump sum.

102-7.3 Commercial Materials for Driveway Maintenance:

The quantity of this material to be paid for shall be the volume. in cubic yards. of all commercial materials authorized. acceptably placed and maintained for driveway maintenance. The quantity of the material shall be determined by truck measurement. loose volume after the material has been loaded and struck-off to uniform depth. The quantity of this material which is authorized to be reused and which is acceptably salvaged. placed and maintained in other designated driveways. will be measured in truck bodies and included again for payment.

Payment will be made under:

Item No. 102-3—Commercial Materials for Driveway Maintenance-cubic yard.

102-7.4 Calcium Chloride for Dust Control:

The quantity to be paid for under this item shall be the weight. in tons. of calcium chloride authorized and acceptably spread on the road. within the limits specified by the Engineer. Such quantity shall be determined from scales. certified freight bills or other sources. the accuracy of which can be authenticated. Quantities of material which are unauthorized, wasted or not applied shall not be included.

The contract unit price per ton for Calcium Chloride for Dust Control shall be full compensation for all work and materials specified for this item. and shall include specifically all required shaping and maintenance of the treated area and all water furnished and applied to the area.

Payment shall be made under:

Item No. 102-4—Calcium Chloride for Dust Control—per ton.

SECTION 104
PREVENTION, CONTROL, AND ABATEMENT OF EROSION AND WATER POLLUTION

104-1 Description.

The work specified in this Section consists of measures required to control erosion on the project and in areas outside the right of way where work is accomplished in conjunction with the project. so as to prevent pollution of water. detrimental effects of public or private property adjacent to the project right of way and damage to work on the project. These measures will consist of construction and maintenance of temporary erosion control features or. where practical. the construction and maintenance of permanent erosion control features as shown in the plans or as may be directed by the Engineer.

104-2 General.

The installation of temporary erosion control features shall be coordinated with the construction of the permanent erosion control features to the extent necessary to assure economical. effective and continuous control of erosion and water pollution throughout the life of the contract.

Due to unanticipated conditions. the Engineer may direct the use of control features or methods other than those included in the original Contract. In such event this additional work will be paid for as extra work.

104-3 Control of Contractor's Operations Which May Result in Water Pollution.

The Contractor shall take sufficient precautions to prevent pollution of streams. canals, lakes, reservoirs, and other water impoundments. with fuels. oils, bitumens. calcium chloride. or other harmful materials. Also. he shall conduct and schedule his operations so as to avoid or otherwise minimize pollution or siltation of such streams. etc., and to avoid interference with movement of migratory fish. No residue from dust collectors or washers shall be dumped into any live stream.

Construction operations in rivers, streams, lakes, tidal

waters. reservoirs. canals, and other impoundments shall be restricted to those areas where it is necessary to perform filling or excavation to accomplish the work shown in the plans and to those areas which must be entered to construct temporary or permanent structures. As soon as conditions permit. rivers. streams, and impoundments shall be promptly cleared of all obstructions placed therein or caused by construction operations.

Frequent fording of live streams with construction equipment will not be permitted. Wherever an appreciable number of stream crossings are necessary at any one location, a temporary bridge or other structure shall be used.

Except as necessary for construction. excavated material shall not be deposited in rivers. streams. canals. or impoundments. or in a position close enough thereto, to be washed away by high water or runoff.

Where pumps are used to remove highly turbid waters from enclosed construction areas such as cofferdams or forms. the water shall be treated by one or more of the following methods prior to discharge into State waters: pumping into grassed swales or appropriate vegetated areas. sediment basins. or confined by an appropriate enclosure such as siltation curtains when other methods are not considered appropriate.

The Contractor shall not disturb lands or waters outside the limits of construction as staked. except as may be found necessary and authorized by the Engineer.

The location of. and method of operation in. borrow pits. material pits. and disposal areas furnished by the Contractor for waste material from the project (other than commercially operated sources) shall meet the approval of the Engineer as being such that erosion during and after completion of the work will not result in probability of detrimental siltation or water pollution.

104-4 Materials for Temporary Erosion Control.

No testing of materials used in construction of temporary erosion control features will be required other than provided for geotextile fabric in 985-3 unless such material is to be incorporated into the completed project. Acceptance will be on the basis of visual inspection by the Engineer when no testing is required.

Materials used for the construction of temporary silt fence. staked silt barriers and floating silt barrier not to be incorporated into the completed project may be new or used.

104-5 Preconstruction Conference.

At the preconstruction conference the Contractor shall present his proposed plans and schedules for construction of

the project in accordance with the requirements of this Section. The schedule shall be based on an analysis of project conditions and shall be in written form except for projects on which it is readily apparent that control of erosion is of a minor significance. This schedule shall specifically indicate the sequence of clearing and grubbing, earthwork operations and construction of permanent erosion control features. and the proposed uses of temporary erosion control features. It shall also include proposed methods to prevent pollution of streams. lakes. tidal waters. reservoirs. canals. and other impoundments. as the result of construction operations. The Contractor shall also outline his proposed methods of controlling erosion and preventing pollution on haul roads and in borrow pits. material pits. and areas used for disposal of waste materials from the project.

No work shall be started until the afroementioned plans and scheduled have been accepted by the Engineer. The Contractor will be responsible for accomplishment of the work in accordance with the accepted plans and schedules. The Engineer may approve changes made necessary by unforeseen circumstances which are beyond the control of the Contractor.

104-6 Construction Requirements.

104-6.1 Limitation of Exposure of Erodible Earth:

The Engineer may limit the surface areas of unprotected erodible earth exposed by clearing and grubbing. excavation or filling operations and may direct the Contractor to provide immediate permanent or temporary erosion or pollution control measures to prevent contamination of any river. stream. lake. tidal waters, reservoir, canal. or other impoundment or to prevent detrimental effects on property outside the project right of way and damage to the project. The limitation of area in which excavation and filling operations may be underway shall be commensurate with the Contractor's capability and progress in keeping the finish grading, grassing. sodding, and other such permanent erosion control measures current in accordance with the accepted schedule.

Under no conditions shall the surface area of erodible earth exposed by clearing and grubbing operations or by excavation and filling operations exceed 750.000 square feet without specific prior approval by the Engineer. This limitation applies separately to clearing and grubbing operations and excavation and filling operations.

The Engineer may increase or decrease the amount of surface area allowed to be exposed at any one time, on the basis of his analysis of conditions on the project.

104-6.2 Incorporation of Erosion Control Features:

Permanent erosion control features shall be incorporated into the project at the earliest practical time. Use of temporary erosion control features will be authorized to correct conditions that develop during construction which were not foreseen at the time of design, to control erosion prior to the time it is practical to construct permanent control features, or to provide immediate temporary control of erosion that develops during normal construction operations but is not associated with permanent erosion control features on the project.

Temporary erosion control features may be authorized for use in controlling erosion in areas where stage construction or other conditions not under the control of the Contractor, preclude completion of a section of roadway in a continuous manner and in areas where construction operations which must be performed subsequently, will cause damage to permanent erosion control features constructed.

When the item of Topsoil or Muck Blanket is included in the contract, the rate of construction of these items may be limited by the availability of topsoil or muck from the normal grading operations. The existence of this condition will be considered as precluding completion of a section or roadway in a continuous manner, and use of temporary erosion control features may be authorized in areas so affected.

104-6.3 Scheduling of Successive Operations:

The Contractor shall schedule his operations such that the area of unprotected erodible earth exposed at any one time is not larger than the minimum area necessary for efficient construction operations, and the duration of exposed, uncompleted construction to the elements shall be as short as practicable.

Clearing and grubbing shall be so scheduled and performed that grading operations can follow immediately thereafter, and grading operations shall be so scheduled and performed that permanent erosion control features can follow immediately thereafter if conditions on the project permit.

104-6.4 Details for Temporary Erosion Control Features:

104-6.4.1 General: Temporary erosion control features shall consist of, but not be limited to, temporary grassing, temporary sodding, temporary mulching, sandbagging, slope drains, sediment basins, artificial coverings, berms, baled hay or straw, floating silt barrier and staked silt barrier. Design details for some of these items may be found in the Water Quality Section of the applicable edition of the Department's Roadway and Traffic Design Standards. The Engineer may

direct use of temporary erosion control features or methods other than those included in the original contract.

104-6.4.2 Temporary Grassing: Certain areas of Grassing constructed in accordance with Section 570 may be designated by the Engineer as temporary erosion control features. The Engineer may direct that permanent type grass seed be omitted from Grassing and the specified rate of spread for fertilizer used in conjunction with grassing operations be reduced when such work is designated as a temporary erosion control feature.

104-6.4.3 Temporary Sod:

This work shall consist of furnishing and placing sod in accordance with Section 575 within areas designated by the Engineer, in order to temporarily control erosion. If the sod is determined to be of a temporary nature, at the discretion of the Engineer the requirements for fertilizer and lime may be eliminated. The sod shall be kept in a moist condition in order to insure growth. Any watering required will be paid for under Item No. 570-9.

104-6.4.4 Temporary Mulching: This work shall consist of furnishing and applying a two-inch to four-inch thick blanket of straw or hay mulch to designated areas and then mixing or forcing the mulch into the top two inches of the soil in order to temporarily control erosion. Only undecayed straw or hay, which can readily be cut into the soil, shall be used. Other measures for temporary erosion control such as hydromulching, chemical adhesive soil stabilizers, etc., may be substituted for mulching with straw or hay if approved by the Engineer. When permanent grassing operations begin, temporary mulch materials shall be plowed under in conjunction with preparation of the ground.

104-6.4.5 Sandbagging: This work shall consist of furnishing and placing sandbags in configurations, so as to control erosion and siltation.

104-6.4.6 Slope Drains: This work shall consist of constructing slope drains, utilizing pipe, fiber mats, rubble, cement concrete, asphaltic concrete plastic sheeting, or other acceptable materials, in acordance with the details shown in the plans, the Department's Roadway and Traffic Design Standards or as may be approved as suitable to adequately perform the intended function.

104-6.4.7 Sediment Basins: Sediment basins shall be constructed in accordance with the details shown in the plans, the Department's Roadway and Traffic Design Standards or as may be approved as suitable to adequately perform the intended function. Sediment basins shall be cleaned out as necessary in accordance with plan details or as directed.

104-6.4.8 Artificial Coverings: This work shall consist of

furnishing and applying fiber mats, netting, plastic sheeting, or other approved covering to the earth surfaces.

104-6.4.9 Berms: This work shall consist of construction of temporary earth berms to divert the flow of water from an erodible surface.

104-6.4.10 Baled Hay or Straw:

This work shall consist of construction of baled hay or straw dams to protect against downstream accumulations of silt. The baled hay or straw dams shall be constructed in accordance with the details shown in the plans or the Department's Roadway and Traffic Design Standards.

The dam shall be placed so as to effectively control silt dispersion under conditions present on this project. Alternate solutions and usage of materials may be used if approved.

104-6.4.11 Temporary Silt Fences and Staked Silt Barriers:

(1) Description:

This work shall consist of furnishing, installing, maintaining and removing temporary silt fences, and staked silt barriers in accordance with the manufacturer's directions, these specifications, the details as shown on the plans and the Department's Roadway and Traffic Design Standards.

(2) Materials:

(a) Temporary Silt Fence:

The geotextile fabric shall be a woven or nonwoven fabric. The fabric shall conform to the physical requirements of Section 985 according to those applications for erosion control.

Posts for temporary silt fence shall be a minimum length of five feet rough or finished four-inch by four-inch wood, three-inch minimum diameter wood or steel at least 1.33 pounds per linear foot.

Wire fence reinforcement for temporary silt fence shall be poultry mesh, a minimum height of 36 inches, 20 gauge wire minimum with a mesh spacing of one inch. As an alternate, Type A Fence conforming to Section 966 may be used.

(b) Staked Silt Barrier:

In addition to the requirements of (a) above, the fabric used for staked silt barrier shall have a double stitched hem at the top of the fabric into which has been sewn a braided nylon cord with a minimum diameter of ⅛ inch running the full length of that section of fabric.

Supports for staked silt barriers shall be a minimum length of three feet seasoned two-inch by four-inch wood, 2½ inch minimum diameter wood, or steel at least 1.33 pounds per linear foot.

(3) Installation:

(a) Temporary Silt Fence:

Temporary Silt Fence shall be erected at locations as shown on the plans or as approved by the Engineer. The filter fabric shall be reinforced with wire fence, and the post spacings shall not exceed ten feet. The wire fence reinforcement shall be installed so that the filter fabric is on the upstream side of the fence, and both the wire fence and the filter fabric are on the upstream side of the posts. Posts shall be uniformly installed with approximately 20 degrees inclination toward the potential silt load (upstream) area. The attachment of fence to existing trees will not be permitted unless approved by the Engineer. The silt fence shall be maintained in an effective condition at all times while in use.

Filter fabric shall be a minimum of 45 inches wide and shall be secured to the post or fence by suitable staples, tie wire or hog rings in such a manner as to prevent tearing of the fabric. The bottom of the filter fabric shall be entrenched into the ground a minimum of eight inches to prevent water from flowing under the fence. Filter fabric shall be spliced together only at support posts with a minimum six-inch overlap and securely sealed.

(b) Staked Silt Barrier:

Staked Silt Barrier shall be securely fastened to wood or steel supports which are spaced at maximum intervals of six feet and driven a minimum of 12 inches into the ground. A minimum of three supports shall be used. The bottom of the fabric shall be entrenched into the existing ground a minimum of eight inches. The staked silt barrier shall be a minimum of 15 inches in height and shall not exceed 18 inches in height.

The support line sewn in the top hem of the filter fabric shall be used at each post location to secure the fabric to the post at an appropriate height.

Staked silt barriers shall be installed across ditch lines and at temporary locations as shown on the plans or approved by the Engineer where continuous construction activities change the natural contour and drainage runoff.

(4) Inspection and Maintenance:

The Contractor shall inspect all temporary silt fences and staked silt barriers immediately after each rainfall and at least daily during prolonged rainfall. Any deficiencies shall be immediately corrected by the Contractor. In addition, the Contractor shall make a daily review of the location of silt fences and staked silt barriers in areas where construction activities have changed the natural contour and drainage runoff to ensure that the silt fences or staked silt barriers are properly located for effectiveness. Where deficiencies exist, additional silt fences or staked silt barriers shall be installed as directed.

Sediment deposits shall be removed when the deposit reaches approximately one-half of the volume capacity of the temporary silt fence or staked silt barrier as directed. Any sediment deposits remaining in place after the temporary silt fence or staked silt barrier is no longer required shall be dressed to conform with the finished grade, prepared and seeded in accordance with Section 570.

104-6.4.12 Floating Silt Barriers:

This work shall consist of installing, maintaining, and removal of floating silt barriers to contain turbidity that may occur as the result of dredging, filling, or other construction activities in waters of the State. The barriers will be installed in accordance with the details shown in the plans or as approved by the Engineer. The type barrier used, the deployment and maintenance of the barrier will be such as to minimize dispersion of turbid waters from the construction site. Alternate methods or materials may be approved provided that compliance with applicable permit conditions and State water quality standards are maintained.

104-6.5 Removal of Temporary Erosion Control Features: In general, any temporary erosion control features existing at the time of construction of the permanent erosion control features in an area of the project shall be removed or incorporated into the soil in such a manner that no detrimental effect will result. The Engineer may direct that temporary features be left in place.

104-7 Maintenance of Erosion Control Features.

104-7.1 General: The Contractor shall, at his expense, provide routine maintenance of permanent and temporary erosion control features until the project is completed and accepted. If such erosion control features must be reconstructed due to the Contractor's negligence or carelessness or, in the case of temporary erosion control features, failure by the Contractor to install permanent erosion control features as scheduled, such replacement shall be at the Contractor's expense. If reconstruction of permanent or temporary erosion control features is necessary due to factors beyond the control of the Contractor, payment for replacement will be made under the appropriate contract pay item or items.

104-7.2 Mowing: The Engineer may direct mowing of areas of permanent or temporary grass constructed on the project. The Contractor shall mow these designated areas within seven days of receiving such order. Mowing of slopes which are steeper than four horizontal to one vertical will not be required.

104-8 Protection During Suspension of Contract Time.

In the event that it is necessary that the construction operations be suspended for any appreciable length of time, the Contractor shall shape the top of the earthwork in such a manner as to permit runoff of rainwater and shall construct earth berms along the top edges of embankments to intercept runoff water. Temporary slope drains shall be provided to carry runoff from cuts and embankments which are located in the vicinity of rivers, streams, canals, lakes, and impoundments. The slope drains shall be located at intervals of approximately 500 feet and shall be stabilized by paving or by covering with waterproof materials. Should such preventive measures fail, the Contractor shall immediately take such other action as necessary to effectively prevent erosion and siltation. The Engineer may direct the Contractor to perform, during such suspensions of time, any other erosion control work deemed necessary.

104-9 Superseding Requirements.

In the event of differences between these requirements and pollution control laws, rules or regulations of other State, Federal, or local agencies, the more restrictive laws, rules, or regulations shall apply.

104-10 Method of Measurement.

When separate items for temporary erosion control features are included in the contract, the quantities to be paid for under this Section shall be (1) the areas, in square yards, of Artificial Coverings, measured in accordance with 9-1.3.1; (2) the area, in acres, of Mowing, measured in accordance with 9-1.3.1; (3) the volume, in cubic yards, of Sandbagging, measured in accordance with 530-4.1; (4) the length, in feet, of Slope Drains (Temporary), measured along the surface of the work constructed; (5) the number of Sediment Basins acceptably constructed; (6) the number of Sediment Basin Cleanouts acceptably accomplished; (7) the weight, in tons, of Baled Hay or Straw; (8) the length, in feet, of Floating Silt Barrier; (9) the length, in feet, of Staked Silt Barrier; (10) the length, in feet, of Staked Silt Fence; and (11) seeding materials in accordance with Section 570.

104-11 Basis of Payment

Temporary erosion and pollution control work required, which is not attributable to the Contractor's negligence, carelessness, or failure to install permanent erosion controls, and which falls within the specifications for a temporary

erosion control feature as described herein, shall be paid for under the applicable pay items listed below. The quantities of such pay items, determined as provided in 104-10, shall be paid for at the applicable contract unit price for each of such items. The length of Floating Silt Barrier, Staked Silt Barrier and Staked Silt Fence to be paid for shall be the total length, in feet, for each authorized silt barrier or fence furnished, installed and accepted at a new location, regardless of whether materials are new, or used or relocated from a previous installation on the project. Additional temporary erosion control features constructed as directed by the Engineer, shall be paid for as extra work. Such prices and payments shall be full compensation for construction and routine maintenance of temporary erosion control features and for mowing, as specified in this Section.

Any additional costs resulting from compliance with the requirements of this Section, other than construction, routine maintenance and removal of temporary erosion control features and mowing, shall be included in the contract unit prices for the item or items to which such costs are related. The work of Grassing or Sodding designated as a temporary erosion control feature in accordance with 104-6.4.2 or 104-6.4.3 shall be paid for under the appropriate pay items specified in Sections 570 and 575.

The cost of constructing temporary earth berms along the edges of the roadways to prevent erosion during grading and subsequent operations will not be paid for separately but shall be included in the contract prices for grading items. The cost of erosion control measures required in borrow or material pits, or in disposal areas furnished by the Contractor, when such work is directed by the Engineer, will be paid for at the appropriate contract prices.

In case of repeated failure on the part of the Contractor to control erosion, pollution, or siltation, the Engineer reserves the right to employ outside assistance or to use the Department's own forces to provide the necessary corrective measures. Any such costs incurred, including engineering costs, will be charged to the Contractor and appropriate deductions made from the monthly progress estimate.

Payment for temporary erosion control items shall be made under:

Item No. 104-1 —Artificial Coverings—per square yard.
Item No. 104-4 —Mowing—per acre.
Item No. 104-5 —Sandbagging—per cubic yard.
Item No. 104-6 —Slope Drains (Temporary)—per linear foot.
Item No. 104-7 —Sediment Basins—each.
Item No. 104-9 —Sediment Basin Cleanouts—per cleanout.

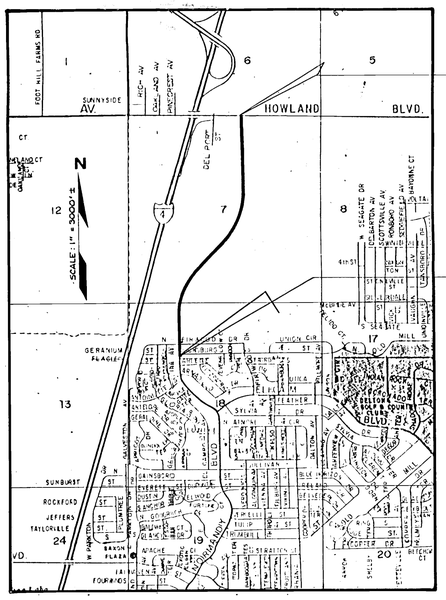
Item No. 104-10—Baled Hay or Straw—per ton.
Item No. 104-11—Floating Silt Barrier—per linear foot.
Item No. 104-12—Staked Silt Barrier—per linear foot.
Item No. 104-13—Staked Silt Fence—per linear foot.

CONSTRUCTION PLANS
FOR

NORMANDY BOULEVARD EXTENSION

(NORTH FIRWOOD DRIVE TO HOWLAND BOULEVARD)

VOLUSIA COUNTY, FLORIDA



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS WHICH ARE CONSIDERED A PART OF THESE PLANS.

ROADWAY AND TRAFFIC DESIGN STANDARDS (BOOKLET DATED JANUARY, 1988)

INDEX NO.	STANDARD DRAWINGS
001	STANDARD ABBREVIATIONS
002	STANDARD SYMBOLS
100	TEMPORARY SLOPE DRAIN AND SOD FLUME
101	TRASH RETAINER AND SEDIMENT BASIN
102	BALED HAY OR STRAW BARRIERS AND SILT FENCES
103	TURBIDITY BARRIERS
104	EROSION CONTROL FOR PERMANENT CONSTRUCTION
105	SHOULDER SODDING AND REWORKING ON EXISTING FACILITIES
200	STRUCTURE BOTTOMS - TYPE J AND P
201	SUPPLEMENTARY DETAILS FOR MANHOLES AND INLETS
205	COVER HEIGHT
210	CURB INLET TOPS TYPES 1, 2, 3, & 4
231	DITCH BOTTOM INLET TYPE B
272	CROSS DRAIN MITERED END SECTION
280	MISCELLANEOUS DRAINAGE DETAILS
281	DITCH PAVEMENT & SODDING
300	CURB & CURB AND GUTTER
500	EXCAVATION, EMBANKMENT & GRADING
505	EMBANKMENT UTILIZATION
510	SUPERELEVATION
511	SUPERELEVATION - MUNICIPAL CONSTRUCTION
515	TURNOUTS
17346	TRAFFIC - SPECIAL MARKING AREAS
17352	TRAFFIC - TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS IN THERMOPLASTIC

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2	TYPICAL SECTION
3 - 5	SOIL BORINGS
6 - 7	DRAINAGE MAPS
8	SUMMARY OF PAY ITEMS
9	SUMMARY OF DRAINAGE STRUCTURES
10-16	PLAN & PROFILE SHEETS
17	INTERSECTION DETAIL
18-63	CROSS SECTION SHEETS
64-65	PAVEMENT MARKINGS

COUNTY COUNCIL

CLAY HENDERSON - AT LARGE
BIG JOHN - AT LARGE
ALICE CYCLER - DISTRICT #1
VICKY JACKSON - DISTRICT # 2
ROBERT E. TUTTLE - DISTRICT # 3
DEANIE LOWE - DISTRICT # 4
ROY SCHLEICHER - DISTRICT #5

COUNTY MANAGER

THOMAS C. KELLY

PUBLIC WORKS DIRECTOR

THOMAS M. Mc CLELLAND

CONSTRUCTION ENGINEER

WILLIAM G. GRAY, P.E.

UTILITY COMPANIES

UTILITY	OWNER	TELEPHONE NUMBER
Power	Florida Power	(904) 734-3770
	Florida Power & Light Co.	1-(800) 226-6543
Telephone	United Telephone	(407) 830-3442
Water	Deltona Utilities	(407) 574-6689

42-127-1035 DNC

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
MAITLAND, FLA. ST. PETERSBURG, FLA.

ED DOUGHERTY
FLORIDA REGISTRATION NO. 9187

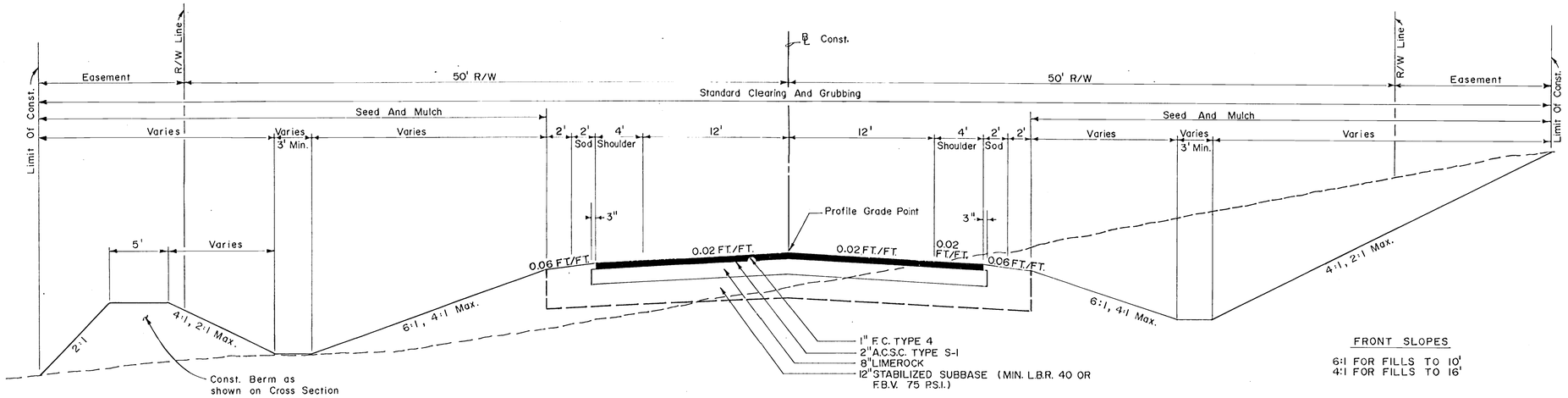
100% SUBMITTAL

VOLUSIA CO. PROJECT NO. 1553

G. & R. NO. 87524
JUNE 1988

FOR AGENCY REVIEW ONLY

E515



FRONT SLOPES

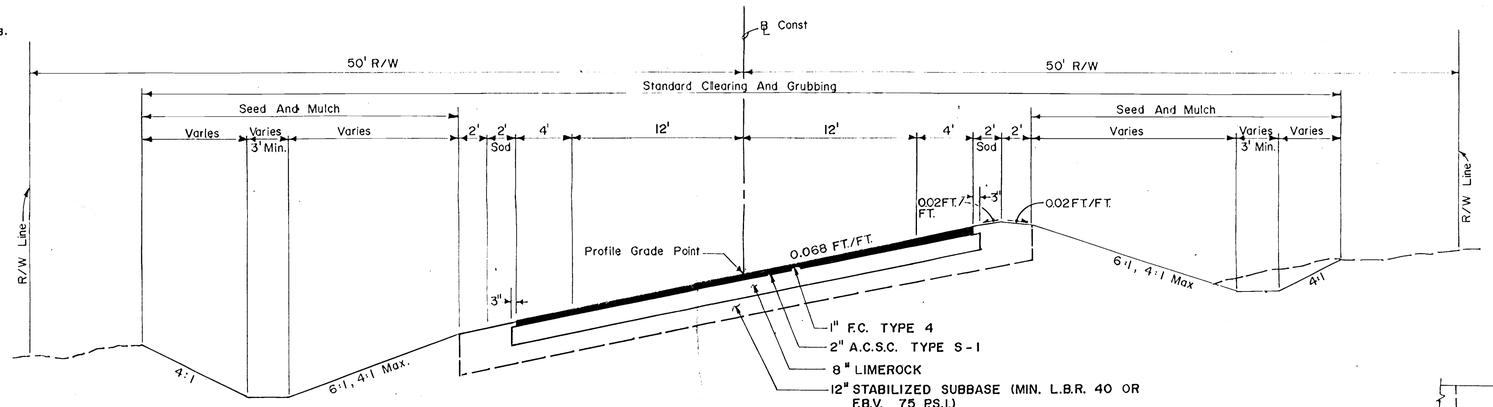
6:1 FOR FILLS TO 10'
4:1 FOR FILLS TO 16'

NOTES:

1. DITCH WEIR TO BE PAID FOR UNDER CONTRACT UNIT PRICE FOR DITCH WEIRS (EA.) PAY ITEM NO. 449.
2. COST FOR GEOTEXTILE FABRIC AND SODDING TO BE INCLUDED IN THE CONTRACT UNIT PRICE FOR DITCH WEIRS.
3. DITCH WEIR SHALL BE COMPACTED TO A MINIMUM OF 100% OF MAXIMUM DENSITY AS DETERMINED BY AASHTO T-99.
4. GEOTEXTILE FABRIC SHALL CONFORM TO SECTION 985 OF THE STANDARD SPECIFICATIONS.
5. SOD FRONT SLOPES 3:1 OR GREATER. SOD DITCH BOTTOMS WITH GRADES GREATER THAN 0.75%. SEE INDEX 100, 101.

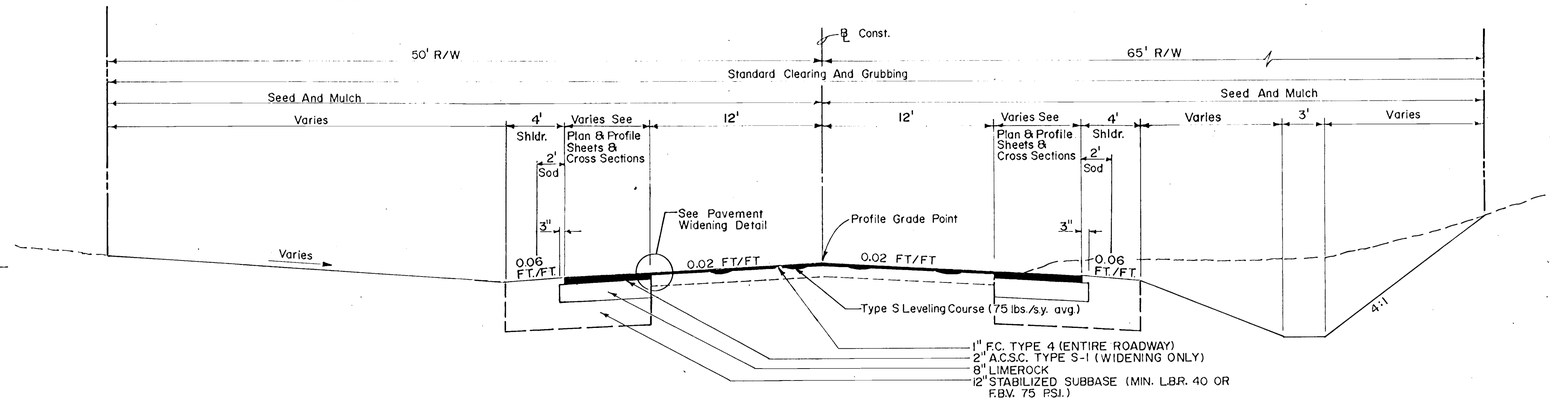
TYPICAL SECTION

NORMANDY BOULEVARD
55 MPH



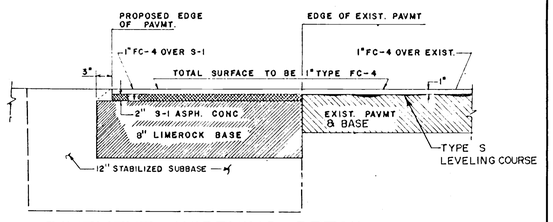
TYPICAL SECTION AT FULL SUPERELEVATION

NORMANDY BOULEVARD
55 MPH

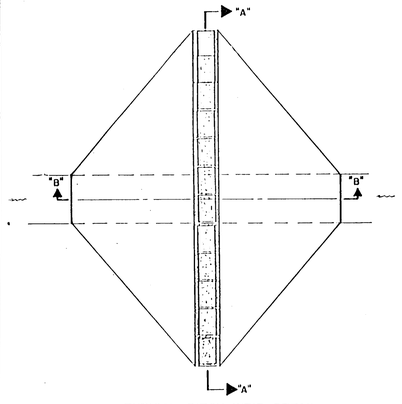


TYPICAL SECTION

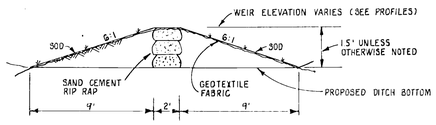
HOWLAND BOULEVARD



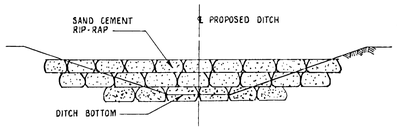
PAVEMENT WIDENING DETAIL



TYPICAL DITCH WEIR DETAIL



SECTION "B-B"



SECTION "A-A"

NO.	BY	REVISIONS	DATE				
				DESIGNED	ATH	DATE	8/88
				DRAWN	JAL	DATE	8/88
				CHECKED	CEG	DATE	11/88
				APPROVED	ELD	DATE	11/88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

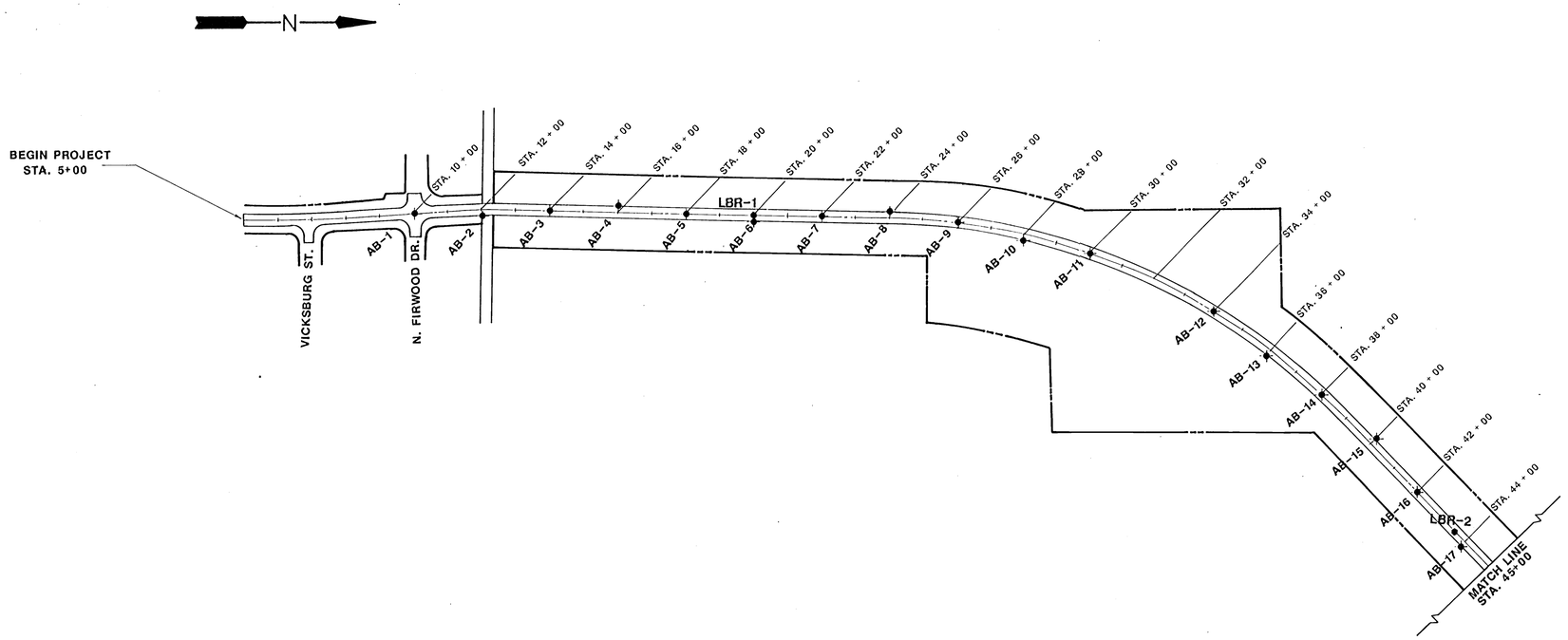
NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

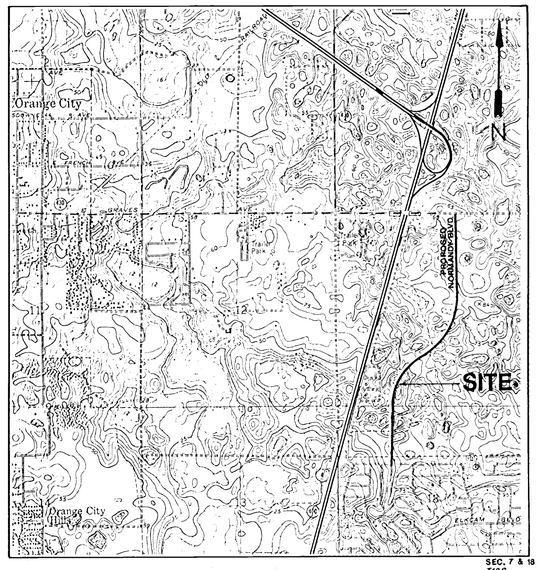
TYPICAL SECTIONS

SCALE	SHEET NO.
N.T.S.	2
JOB NO. 87524	OF G5

555-77044

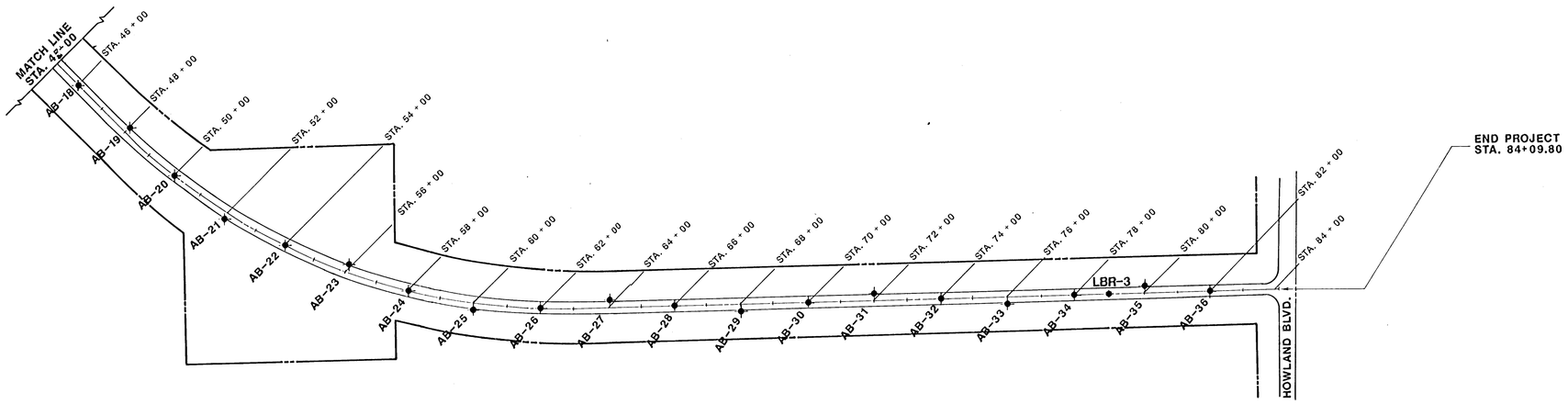
FOR AGENCY REVIEW ONLY





VICINITY MAP

NTS



LEGEND

- LOCATION OF AUGER BORING
- LOCATION OF LIMEROCK BEARING RATIO SAMPLES

LOCATION PLAN

SCALE : 1" = 200'

Michael D. Sims & Associates, Inc.
Consulting Engineers in the Earth Sciences, Geotechnical, Hydrology and Construction Materials Testing

42-127-1035ANC

NO.	BY	REVISIONS	DATE

DESIGNED | DATE
DRAWN | DATE
CHECKED | DATE
APPROVED | DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

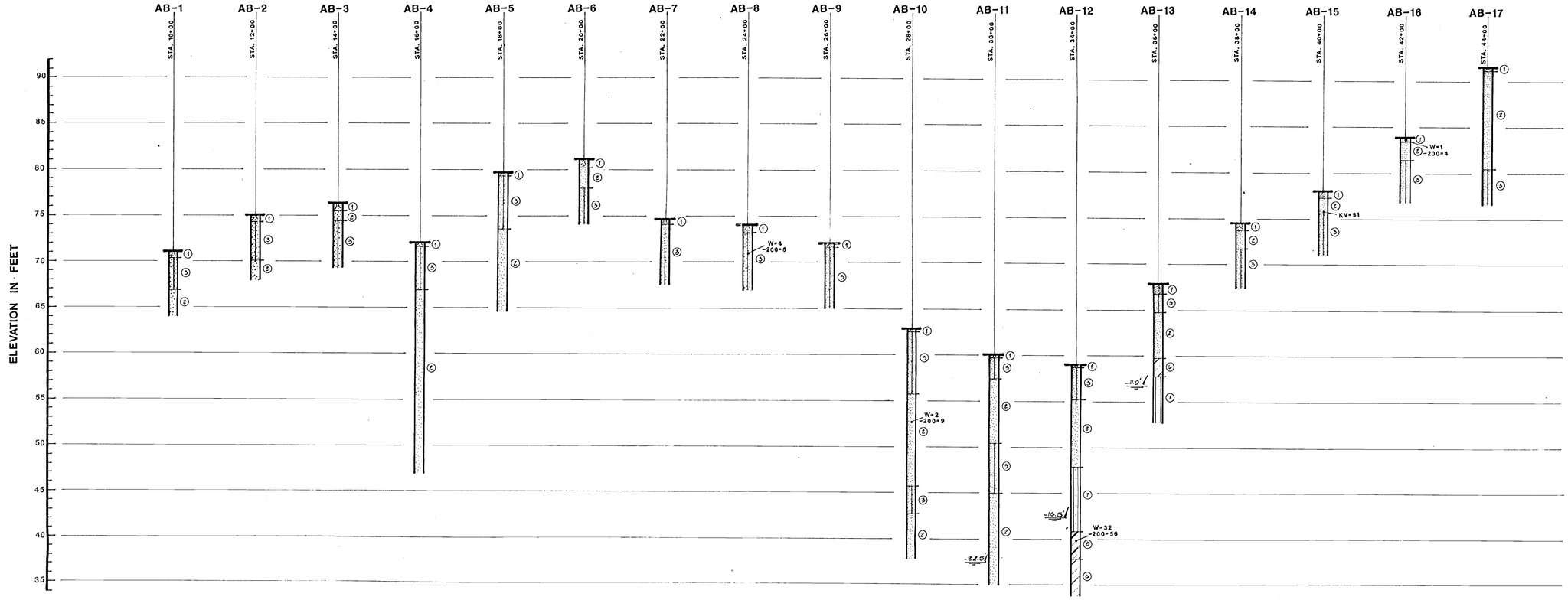
NORMANDY BOULEVARD
EXTENSION
VOLUSIA COUNTY, FLORIDA

SOIL BORINGS
LOCATION PLAN

SCALE: AS NOTED
JOB NO.: 87524
SHEET NO.: 3
OF 65

FOR AGENCY REVIEW ONLY

555-77044



SOIL PROFILES

VERT. SCALE: 1" = 6'

LEGEND

①	GRAY FINE SAND WITH ROOTS	(A-3)
②	LT. BROWN TO LT. GRAY FINE SAND	(A-3)
③	YELLOWISH BROWN FINE SAND	(A-3)
④	DK.-BROWN TO REDDISH BROWN FINE SAND	(A-3)
⑤	DK. REDDISH TO REDDISH BROWN SLIGHTLY SILTY FINE SAND	(A-3)(A-2-4)
⑥	GRAYISH BROWN TO ORANGISH BROWN SLIGHTLY CLAYEY FINE SAND	(A-2-6)
⑦	LT. GRAYISH BROWN SILTY FINE SAND	(A-2-4)
⑧	ORANGISH BROWN TO GRAY MOTTLED SANDY CLAY	(A-6)
(A-3)	AASHTO SOIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL EXAMINATION	
W	NATURAL MOISTURE CONTENT IN PERCENT	
-200	PERCENT OF FINES PASSING THE NO. 200 SIEVE	
KV	COEFFICIENT OF VERTICAL PERMEABILITY IN FEET PER DAY	
-11.0'	DEPTH TO GROUNDWATER LEVEL: MEASURED 08-88	

Michael D. Sims & Associates, Inc.
Consulting Engineers in the Earth Sciences, Geotechnology, Hydrogeology and Construction Materials Testing

NO.	BY	REVISIONS	DATE

DESIGNED — DATE
DRAWN — DATE
CHECKED — DATE
APPROVED — DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

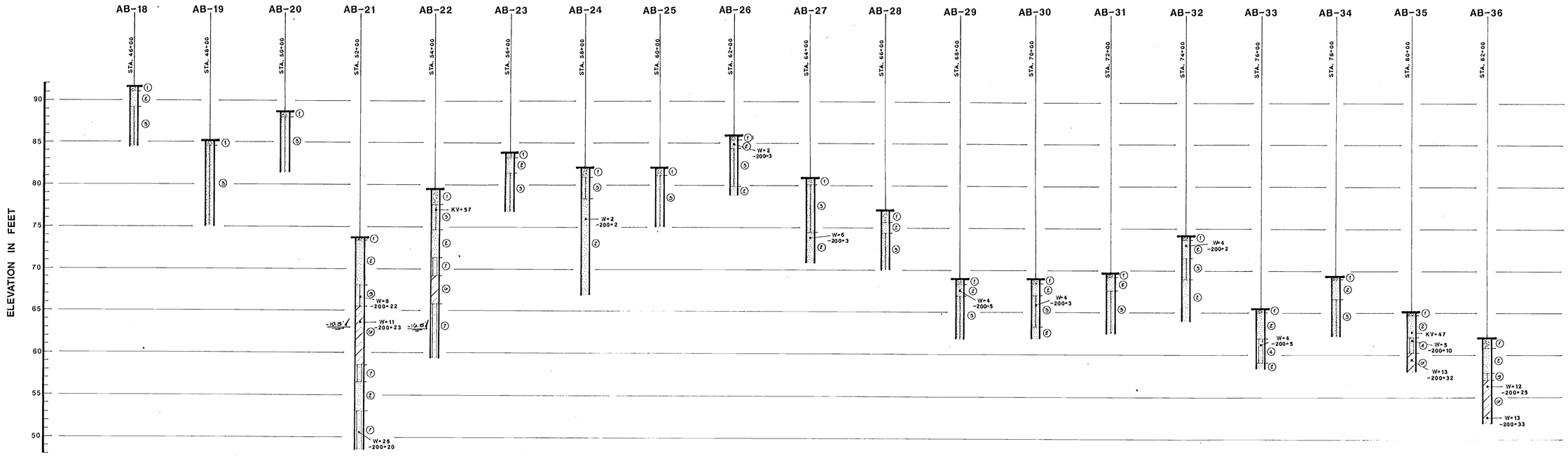
SOIL BORINGS
SOIL PROFILES

SCALE: AS NOTED
JOB NO.: 87524
SHEET NO.: 4
OF 65

FOR AGENCY REVIEW ONLY

555-77044

E518



SOIL PROFILES

VERT. SCALE : 1" = 6'

LEGEND

①		GRAY FINE SAND WITH ROOTS (A-3)
②		LT. BROWN TO LT. GRAY FINE SAND (A-3)
③		YELLOWISH BROWN FINE SAND (A-3)
④		DK. BROWN TO REDDISH BROWN FINE SAND (A-3)
⑤		DK. REDDISH TO REDDISH BROWN SLIGHTLY SILTY FINE SAND (A-3)(A-2-4)
⑥		GRAYISH BROWN TO ORANGISH BROWN SLIGHTLY CLAYEY FINE SAND (A-2-6)
⑦		LT. GRAYISH BROWN SILTY FINE SAND (A-2-4)
⑧		ORANGISH BROWN TO GRAY MOTTLED SANDY CLAY (A-6)
	(A-3)	AASHTO SOIL CLASSIFICATION GROUP SYMBOL AS DETERMINED BY VISUAL EXAMINATION
	W	NATURAL MOISTURE CONTENT IN PERCENT
	-200	PERCENT OF FINES PASSING THE NO. 200 SIEVE
	KV	COEFFICIENT OF VERTICAL PERMEABILITY IN FEET PER DAY
	-10.8'	DEPTH TO GROUNDWATER LEVEL : MEASURED 08-88

Michael D. Sims & Associates, Inc.
Geotechnical Engineering Earth Sciences, Consultants, Hydrogeology and Construction Materials Testing

NO.	BY	REVISIONS	DATE

DESIGNED DATE
DRAWN DATE
CHECKED DATE
APPROVED DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

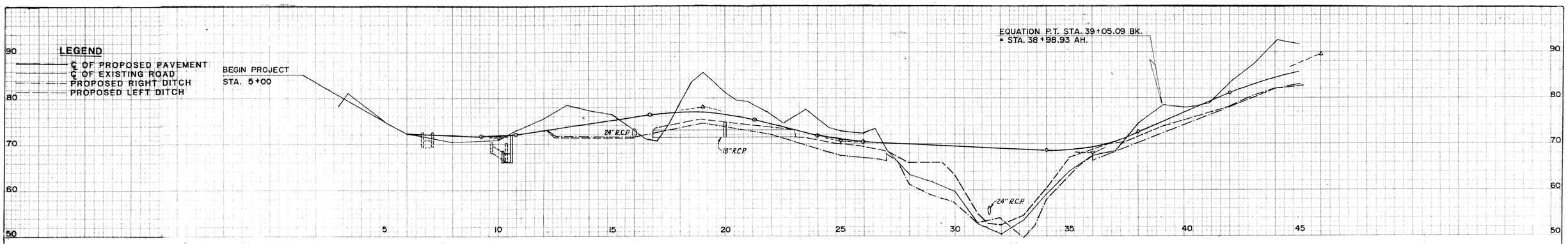
NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

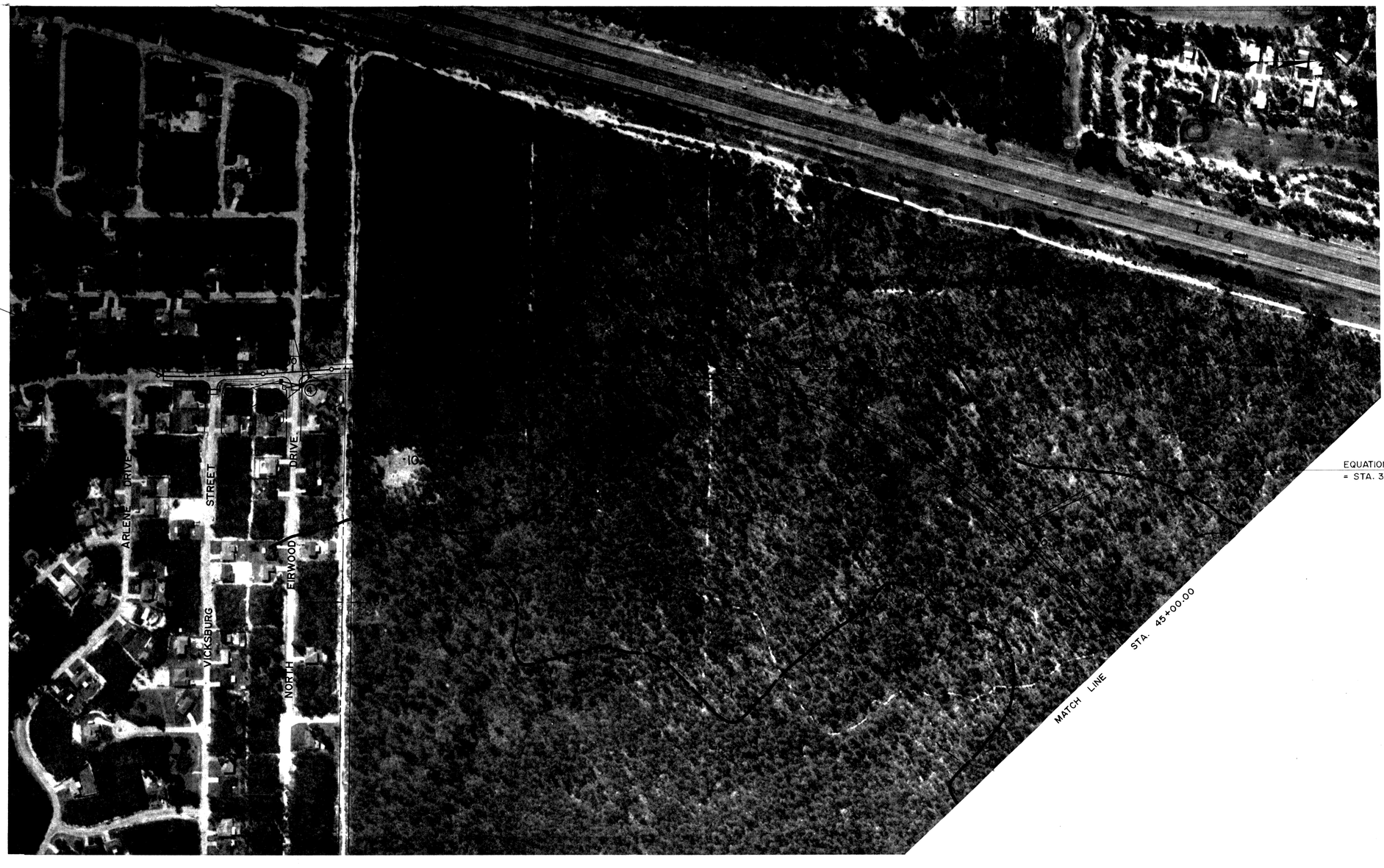
SOIL BORINGS
SOIL PROFILES

SCALE AS NOTED
JOB NO. 87524
SHEET NO. 5
OF 65

FOR AGENCY REVIEW ONLY

553-77044
E519





① 18" C.M.P.
INLET
GRATE 72.63
INV. 69.37

② CONC. HEADWALL
FL. TOP OF HEADWALL 72.63
INV. 69.37

③ 18" CMP
INLET
GRATE 70.11
INVERT 68.12

④ 18" CMP
INLET
GRATE 70.27
INVERT 66.00

⑤ CONC. HEADWALL
FL. TOP OF HEADWALL 70.00
INV. 65.50

⑥ 24" C.I.P.
INV. E. 66.80
INV. W. 66.70

⑦ 30" R.C.P.
FL. E. 35.00
FL. W. 20.20

NO.	BY	REVISIONS	DATE

DESIGNED	MAJ	DATE	10-88
DRAWN	NJH	DATE	10-88
CHECKED	CEG	DATE	11-88
APPROVED	ELD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

DRAINAGE MAP

SCALE 1" = 200' HORZ. 1" = 10' VERT.	SHEET NO. 6
JOB NO. 87524	OF 65

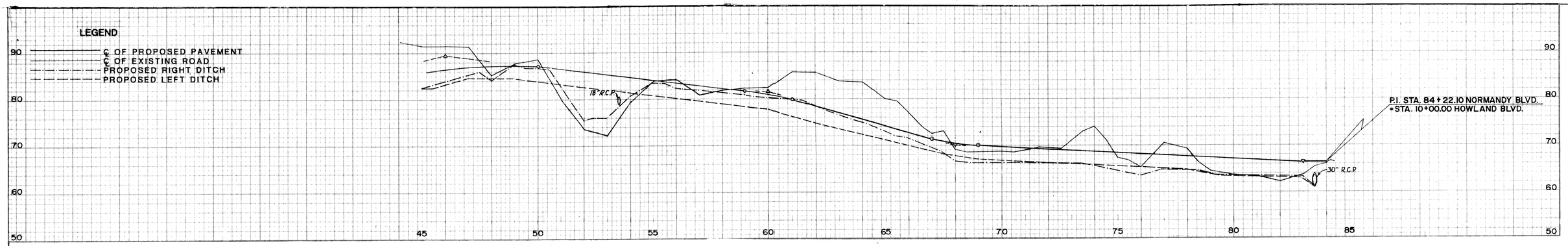
FOR AGENCY REVIEW ONLY

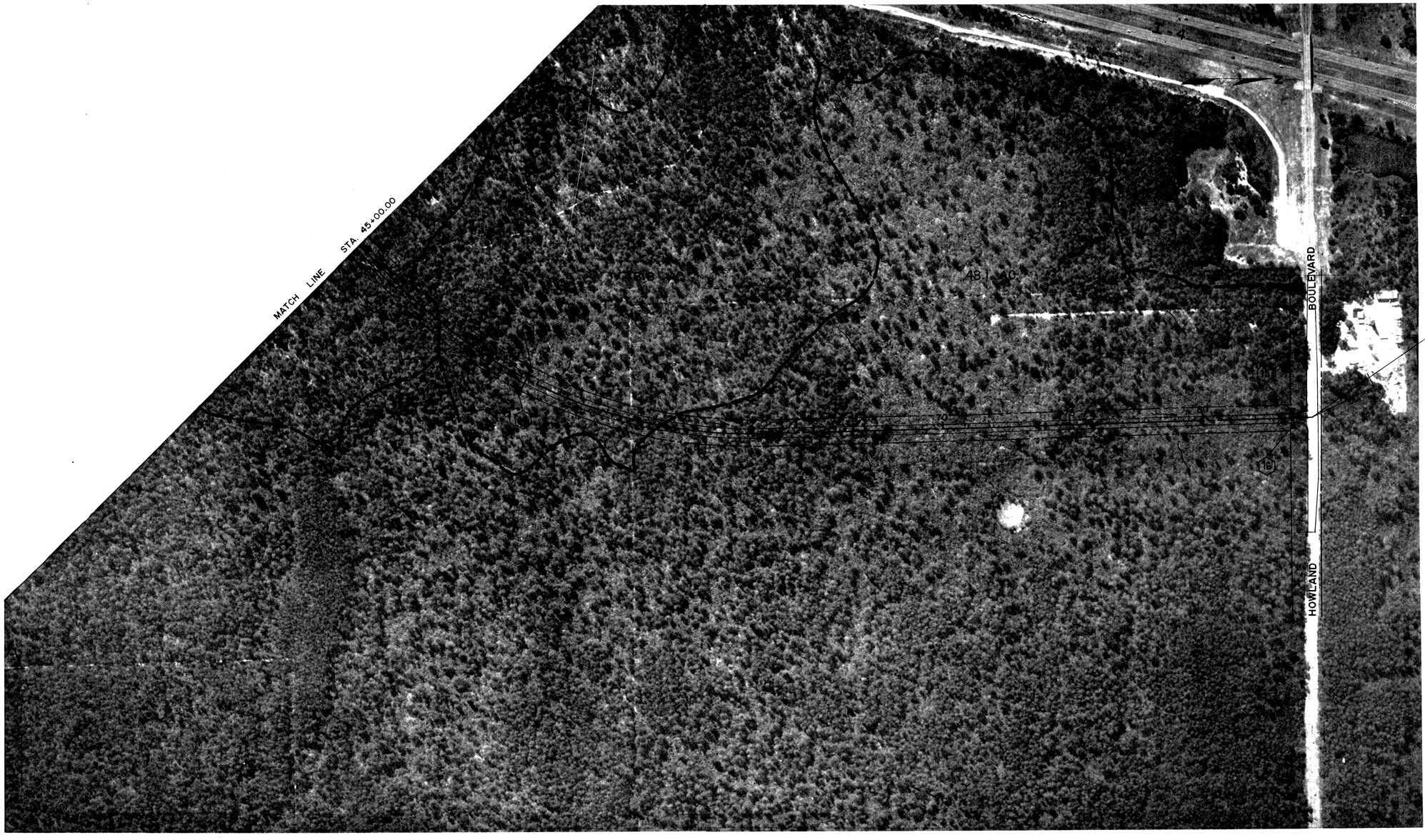
S55-77044

E520

LEGEND

℄ OF PROPOSED PAVEMENT
℄ OF EXISTING ROAD
PROPOSED RIGHT DITCH
PROPOSED LEFT DITCH





NO.	BY	REVISIONS	DATE

DESIGNED	MAJ	DATE	10-88
DRAWN	NJH	DATE	10-88
CHECKED	CEG	DATE	11-88
APPROVED	ELD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION

VOLUSIA COUNTY, FLORIDA

DRAINAGE MAP

SCALE	SHEET NO.
1"= 200' HORZ. 1"= 10' VERT.	1
JOB NO. 87524	OF 65

FOR AGENCY REVIEW ONLY

S55+7044

E521

SUMMARY OF PAY ITEMS

REF. NO.	ITEM NO.	ITEM NAME	UNIT	QUANT. TOTAL
1.	102-1	MAINTENANCE OF TRAFFIC	L.S.	1
2.	104-2	PREVENTION, CONTROL AND ABATEMENT OF EROSION AND WATER POLLUTION	L.S.	1
3.	110-1	CLEARING AND GRUBBING	L.S.	1
4.	120-1	REGULAR EXCAVATION	L.S.	1
5.	120-6	EMBANKMENT	L.S.	1
6.	160-4	TYPE "B" STABILIZATION 12"	S.Y.	38,330
7.	290-70-2	LIMEROCK SUBBASE 8"	S.Y.	30,852
8.	5331-72-20	TYPE S-1 ASPHALTIC CONCRETE (2" MIN)	S.Y.	30,444
9.	5337-1-4	TYPE FC-4 ASPHALTIC CONCRETE (FRICTION COURSE 1" MIN.)	S.Y.	33,395
10.	350-1	PLAIN CEMENT CONCRETE PAVEMENT (DRIVEWAYS 6" THICK)	S.Y.	50
11.	425-1-321	INLET CURB TYPE P-2	EA.	1
12.	425-1-521	INLET DITCH BOTTOM TYPE C	EA.	4
13.	430-12-325	CONCRETE PIPE CULVERT (18" CLASS III)	L.F.	725
14.	430-12-329	CONCRETE PIPE CULVERT (24" CLASS III)	L.F.	421
15.	430-12-333	CONCRETE PIPE CULVERT (30" CLASS III)	L.F.	80
16.	430-982-225	MITERED END SECTION CROSS DRAIN SINGLE 18"	EA.	2
17.	430-982-229	MITERED END SECTION CROSS DRAIN SINGLE 24"	EA.	4
18.	430-982-233	MITERED END SECTION CROSS DRAIN SINGLE 30"	EA.	2
19.	430-984-225	MITERED END SECTION SIDE DRAIN SINGLE 18"	EA.	2
20.	430-984-229	MITERED END SECTION SIDE DRAIN SINGLE 24"	EA.	1
21.	449	DITCH WEIRS	EA.	11
22.	520-1-10	STANDARD CURB AND GUTTER (TYPE F)	L.F.	412
23.	570-2	GRASSING (BY SEEDING AND MULCHING)	S.Y.	56,660
24.	575-1-1	SODDING	S.Y.	3,891
25.	706-1-12	REFLECTIVE PAVEMENT MARKERS	E.A.	336
26.	711-2	SKIP TRAFFIC STRIPE THERMOPLASTIC	L.F.	1,710
27.	711-4	DIRECTIONAL ARROWS THERMOPLASTIC	EA.	8
28.	711-6-41	SOLID TRAFFIC STRIPE THERMOPLASTIC 4"	L.F.	22,634
29.	711-6-181	SOLID TRAFFIC STRIPE THERM 18"	L.F.	94
30.	711-6-241	STOP BAR (WHITE) THERMOPLASTIC 24"	L.F.	24

PAY ITEM NOTES

ITEM NO. 350-1	INCLUDES WIRE REINFORCEMENT, FORMS, AND JOINT CONSTRUCTION.
ITEM NO. 570-2	INCLUDES 4" TOPSOIL OR MUCK BLANKET, FERTILIZER (2 APPLICATIONS), SEED, WATER, AND MAINTENANCE.
ITEM NO. 575-1-1	INCLUDES 4" TOPSOIL OR MUCK BLANKET
ITEM NO. 449	INCLUDES ALL SOD, GEOTEXTILE FABRIC, SAND CEMENT RIP-RAP, EXCAVATION & BACKFILLING.

SUMMARY OF EARTHWORK

	TOTAL (C.Y.)
ROADWAY / SWALE EXCAVATION	63,517
ROADWAY FILL + 40% SHRINKAGE	63,517

GENERAL NOTES

1. B.M. DATA IS VOLUSIA COUNTY.
2. ALL CONSTRUCTION CONTROL POINTS SHALL BE REPLACED BY THE CONTRACTOR AFTER CONSTRUCTION. ANY N.G.S. MONUMENT WITHIN THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED. IF IN DANGER OF DAMAGE THE CONTRACTOR SHALL NOTIFY:

   THE DIRECTOR, NATIONAL GEODETIC SURVEY
   6001 EXECUTIVE CENTER
   ATTN: C 113
   ROCKVILLEL, MARYLAND 20852
   TELEPHONE NUMBER: (301) 496-8141

3. THE CONTRACTOR SHALL PROTECT AND/OR SUPPORT ANY WALLS OR OTHER STRUCTURES WHICH COULD BE DAMAGED BY CONSTRUCTION.
4. ALL TREES AND/OR SHRUBS WITHIN PROPOSED RIGHT-OF-WAY TO BE REMOVED UNLESS NOTED OTHERWISE.
5. IF THE TOP OF PROPOSED REINFORCED CONCRETE PIPE IS IN THE STABILIZED SUBBASE, THE PIPE SHALL BE CLASS IV AND CONSTRUCT EXTRA BASE AROUND THE PIPE AS REQUIRED BY D.O.T. INDEX NO. 205.
6. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE FLORIDA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND SUPPLEMENTS THERETO.
7. THE INFORMATION SHOWN ON THESE DRAWINGS CONCERNING TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES IS BASED ON AVAILABLE RECORDS AND IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATION AS TO THE TYPE AND LOCATION OF UNDERGROUND AND OTHER UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO AND IS RESPONSIBLE FOR THE COORDINATION OF UTILITY RELOCATION.
8. UTILITIES TO BE ADJUSTED BY OTHERS OR AS DIRECTED BY THE ENGINEER.
9. ALL (P.R.M.'S) IRONS AND MONUMENTS SHOWN ON PLANS, OR FOUND, SHALL BE PRESERVED. THOSE SHOWN IN PROPOSED PAVEMENT SHALL BE PROTECTED WITH A CAST IRON VALVE BOX.
10. ANY PUBLIC LAND CORNER WITHIN THE LIMITS OF CONSTRUCTION IS TO BE PROTECTED. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLY REFERENCED, THE PROJECT ENGINEER SHOULD NOTIFY THE COUNTY SURVEYOR WITHOUT DELAY BY TELEPHONE.
11. ALL PERSONAL PROPERTY, EXCEPT MAIL BOXES, WITHIN THE RIGHT-OF-WAY SHALL BE RELOCATED BY THE OWNER OR IT SHALL BE REMOVED BY THE CONTRACTOR AS NECESSARY TO CONSTRUCT THE PROJECT IN ACCORDANCE WITH THE PLANS.
12. THE DISPOSAL OF EXCESS EARTHWORK MATERIAL SHALL BE RESPONSIBILITY OF THE CONTRACTOR. APPROVALS OF DISPOSAL SITE SHALL BE OBTAINED FROM VOLUSIA COUNTY PRIOR TO DISPOSAL. ALL EXCESS MATERIAL IS THE PROPERTY OF THE CONTRACTOR.
13. ALL PERMANENT GRASS AREAS ARE TO RECEIVE A 4" MUCK BLANKET OR TOPSOIL TREATMENT.
14. FOR STABILIZATION AND TURNOUTS AND GRADED CONNECTIONS SEE STANDARD INDEX NO. 515 AND TYPICAL SECTIONS FOR DEPTH AND LBR.
15. GRADES SHOWN ARE TO TOP OF STRUCTURE COURSE, EXCEPT AS NOTED.
16. ANY EXISTING TRAFFIC CONTROL SIGN WHICH MUST BE RELOCATED SHALL BE APPROVED BY THE TRAFFIC ENGINEER OR HIS REPRESENTATIVE. ANY EXISTING SIGN WHICH WILL NO LONGER BE APPLICABLE, SHALL BE RETURNED TO THE COUNTY OF VOLUSIA IN GOOD REPAIR.

NO.	BY	REVISIONS	DATE

DESIGNED — DATE
DRAWN — DATE
CHECKED — DATE
APPROVED — DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY FLORIDA

SUMMARY OF PAY ITEMS

SCALE: NONE
JOB NO. 87524
SHEET NO. 8
OF 65

205665

E522

NORMANDY BOULEVARD EXTENSION

SHEET NO.

SUMMARY OF DRAINAGE STRUCTURES

QUANTITY	STR NO.	INDEX NO.	STATION	SIDE	TYPE	SIZE	LENGTH	REINFORCED CONC. PIPE 18"	REINFORCED CONC. PIPE 24"	REINFORCED CONC. PIPE 30"	INLET P-2	DBI TYPE C	CROSS DRAIN M.E.S. 18"	CROSS DRAIN M.E.S. 24"	CROSS DRAIN M.E.S. 30"	SIDE DRAIN M.E.S. 18"	SIDE DRAIN M.E.S. 24"	SIDE DRAIN M.E.S. 30"	COMMENTS
	1	232	9+50	RT.	D.B.I. & PIPE	18"	75'	75'				1							
	2	232	10+28	RT.	D.B.I. & PIPE	24"	48'		48'			1							W/3" THICK CONC. DITCH PAVEMENT
	3	200 & 210	10+55	RT.	INLET & PIPE	24"	80'		80'		1								
	4	232	9+40 (N. FIRWOOD DR.)	LT.	D.B.I & PIPE	24"	50'		50'			1								
	5	273	8+90 (N. FIRWOOD DR.)	LT.	M.E.S.	24"											1			
	6	272	16+00	LT.	M.E.S. & PIPE	18"	68'	68'					1						
	7	272	16+00	RT.	M.E.S.	18"							1						
	8	273	17+00	LT.	M.E.S. & PIPE	18"	291'	291'								1			
	9	232	20+00	LT.	D.B.I. & PIPE	18"	291'	291'				1							
	10	273	23+00	LT.	M.E.S.	18"										1			
	11	272	31+50	LT.	M.E.S. & PIPE	24"	136'		136'					1					
	12	272	31+50	RT.	M.E.S.	24"								1					
	13	272	52+00	LT.	M.E.S. & PIPE	24"	107'		107'					1					
	14	272	52+00	RT.	M.E.S.	24"								1					
	15	272	83+50	LT.	M.E.S. & PIPE	30"	80'			80'					1				
	16	272	83+50	RT.	M.E.S.	30"									1				
			TOTALS					725'	421'	80'	1	4	2	4	2	2	1		

NO.	BY	REVISIONS	DATE

DESIGNED	ATH	DATE	11-19-88
DRAWN	NJH	DATE	11-19-88
CHECKED	CEG	DATE	11-88
APPROVED	ELD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
FLORIDA

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

SUMMARY OF DRAINAGE STRUCTURES

SCALE	SHEET NO.
NONE	9
JOB NO. 87524	OF 65

POLYTRACE 033
17296
STATLER SERVICE & SUPPLY INC.
E523

PLAN	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK ALIGNMENT CHECKED.		
NO. RT. OF WAY CHECKED.		

5 10 15

1 STY. C.B. HOUSE
W.MTR. C.B. O.P.P.
℄ CONST., ℄ SURVEY N.&D. N 00°08'10" W
MAILBOX W.MTR. E.W.V.
2 STY. C.B. HOUSE
WOOD FENCE POSTS
ARMADILLO DRIVE
ARLENE DRIVE
18" C.M.P.
(0.00') OFFSET FROM ℄ SURVEY (TYP.)
P.C. STA. 4+94.13
STA. 5+00.00 BEGIN TAPER & RESURFACING, MATCH EXIST. PAVM'T.
RESURFACING SEE TYP. SEC. FOR DETAIL
BT (50 PR) WM SIGN TEL. RISER
STA. 6+00.00 END TAPER & RESURFACING BEGIN TYPICAL SECTION
G" PVC /OR A.C. WATER MAIN
EXIST. R/W
R&C
CONST. SWALE (SEE CROSS SECTIONS FOR ELEVATION)
EXIST. R/W
STA. 10+70 MATCH EXIST. PAVM'T.
BT (25 PR)
VICKSBURG STREET
N 89°51'50"E
STA. 6+00 TO STA. 11+70 REMOVE EXIST. PAVEMENT

① ℄ CONST. CURVE DATA
P.I. STA. 6+88.80
Δ = 3°53'31"
D = 1°00'00"
T = 194.67
L = 389.13
R = 5729.58
℄ = N.C.
P.C. STA. 4+94.13
P.T. STA. 8+83.32
D.S. = 30 MPH

FF EL. 71.22
+41.94 PROP. R/W
+33.46
P.T. STA. 8+83.33
STA 9+20 MATCH EXIST. PAVM'T
CONST. SWALE @ 0.36% (SEE CROSS SECTIONS FOR ELEVATIONS)
REMOVE EXIST. 24" C.M.P. & HEADWALL
REMOVE EXIST. 18" C.M.P. & C.B.'S
CONST. 15"~18" R.C.P.
STA. 10+70 MATCH EXIST. PAVM'T.
4" P.V.C. /OR A.C. WATER MAIN
CONST. SWALE @ 0.15% (SEE CROSS SECTIONS FOR DETAILS)
1 STY. BRICK
+66.23
+59.71
+46.17
+63.74
+27.38
EXIST. R/W
1 STY. C.B. HOUSE FF EL. 71.38
+58.06
+65.30
P.C. STA. 11+45.38
P.P. 11G15
6" PVC /OR A.C. WATER MAIN
CONST. 50"~24" R.C.P.
REMOVE EXIST. CONC. DRIVE & CONST. 25 S.Y. OF 6" CONC. DRIVE
P.I. STA. 6+88.81 NORMANDY BOULEVARD = STA. 10+00.00 VICKSBURG
CONST. 50"~24" R.C.P.
REMOVE EXIST. 24" C.M.P.
EXIST. R/W
STA. 9+99.38 NORMANDY BOULEVARD = STA. 10+00.00 FIRWOOD DRIVE
STA. 10+45.38 BEGIN SUPERELEVATION TRANSITION (SOUTH BOUND)
REMOVE EXIST. CONC. DRIVE & CONST. 25 S.Y. 6" CONC. DRIVE
SCREEN PORCH
1 STY. C.B. HOUSE FF EL. 71.82
EXIST. 60' FLORIDA POWER R/W
CONST. 80'~24" R.C.P.
6" PVC /OR A.C.
CURB & GUTTER CONST.
STA. 12+00.00 END CURB & GUTTER CONST.
N 12°00'00" W
R=80.18
N 89°51'50"E
N 89°55'50"E
N 00°41'41" W
N 00°55'39" E
N 00°08'10" W ℄ SURVEY
R&C
PROP. R/W
EXIST. 60' FLORIDA POWER R/W
HEAVILY WOODED
STA. 13+10.57 END SUPER-ELEVATION TRANSITION (SOUTH BOUND)
MATCH LINE STA. 15+00
50'
4' 12' 4'
10" MAPLE
1" SYCAMORE
3" CHERRY
11" OAK
13" PALM
6" OAK
3" MAPLE
CONST. 48"~24" R.C.P.
CONST. 6" FLARED END (TYP.)
CONST. CURB & GUTTER TYPE "F"
P.P. 11G16
EXIST. R/W
N 89°55'50"E
FIRWOOD DRIVE
MAILBOX
CONST. ADDITIONAL 3" THICK CONC. DITCH PAVM'T. TO DRIVEWAY AS REQUIRED AND APPROVED BY THE ENGINEER (TO PREVENT EROSION)
STA. 11+46.60 ~ BEGIN SUPER-ELEVATION TRANSITION (NORTH BOUND)
STA. 11+80.38 END SUPERELEVATION (N. & S. BOUND) BEGIN FULL SUPERELEVATION (N. & S. BOUND)
STA. 12+95.57 END FULL SUPERELEVATION (N. & S. BOUND)
STA. 13+03.35 END SUPERELEVATION TRANSITION (NORTH BOUND)
P.T. STA. 13+10.57

② ℄ CONST. CURVE DATA
Δ = 4°51'20"
D = 3°00'00"
T = 82.65'
L = 165.19'
R = 1909.86'
e = 0.029 FT/FT
P.C. STA. 11+45.38
P.T. STA. 13+10.57
P.I. STA. 12+28.03
D.S. = 40 MPH

(14.25') (21.04') (27.83') (33.89') (35.41') (35.24') (31.56')

B.M.
STA. 10+00 ~ ℄ SURVEY
R.R. SPIKE EL. 71.41

PROFILE

	DATE	BY
SURVEYED		
PLOTTED		
GRADES CHECKED.		
NOTE BOOK 13-14 NOTES		
NO. STRUCTURE NOTATNS CHKD		

85 80 75 70 65 60 55 50 45

STA. 5+00.00 BEGIN RESURFACING
STA. 6+00.00 END RESURFACING BEGIN TYPICAL SECTION EL. 72.08
150' V.C.
EXIST. GRADE
CONST. 50"~24" R.C.P. @ 0.15%
-0.22%
EXIST. 6" PVC /OR A.C. WATER MAIN
EXIST. C.B. 18" C.M.P. & HDWL TO REMAIN
EXIST. 18" C.M.P. & CATCH BASINS TO BE REMOVED
CONST. 80"~24" R.C.P. @ 0.15%
CONST. 48"~24" R.C.P. @ 0.15%
+0.16%
PROPOSED GRADE
-0.09%
-0.09%
D.P.I. RT. 71.8
D.P.I. LT. 71.6
P.I. STA. 10+00 EL. 71.22
72.02
75.0
71.37 71.34 71.39 71.61 71.78

STA. 9+50 ~ 40' RT.
CONST. D.B.I. TYPE "C"
D.O.T. INDEX NO. 232
GRATE EL. 69.00
FL. 66.59
CONST. 15"~18" R.C.P. @ 0.15%

STA. 9+40 ~ 200' LT. N. FIRWOOD DR.
CONST. D.B.I. TYPE "C"
D.O.T. INDEX NO. 232
GRATE EL. 68.50
FL. N.E. & W. 66.29

STA. 8+80 ~ 20' LT. N. FIRWOOD DR.
CONST. SIDE DRAIN M.E.S. FOR 24" RCP.
D.O.T. INDEX NO. 273
FL. 66.20

STA. 10+55 ~ 17.50' RT.
CONST. CURB INLET TYPE P-2
D.O.T. INDEX NO'S 200 & 210
TOP EL. 71.78
FL. S.E. & S.W. 66.41

STA. 10+28 ~ 41' RT.
CONST. D.B.I. TYPE "C"
D.O.T. INDEX NO. 232
GRATE EL. 71.00
FL. S. & N.W. 66.48

STATIONS REFER TO BASELINE CONST.

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

NO.	BY	REVISIONS	DATE

DESIGNED	ATH	DATE	11-88	GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS	NORMANDY BOULEVARD EXTENSION VOLUSIA COUNTY, FLORIDA
DRAWN	JAL	DATE	11-88		
CHECKED	CEG	DATE	11-88		PLAN & PROFILE
APPROVED	ELD	DATE	11-88		

SCALE 1" = 5' VERT. 1" = 50' HORZ. | JOB NO. 87524 | SHEET NO. 10 OF 65

SSS-60046 UPC

FOR AGENCY REVIEW ONLY

PLAN
SURVEYED
PLOTTED
GRADES CHECKED
ALIGNMENT CHECKED
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
ALIGNMENT CHECKED
NOTE BOOK
NO.
BY
DATE
STRUCTURE NOTATNS CHKD

15 20 25 30

MATCH LINE STA. 15+00

50' 50'

4' 12'12" 4'

PROP. 5' CONST. EASEMENT

CONST. 29'~ 18" R.C.P.

PROP. R/W

STA. 20+34.19 BEGIN SUPERELEVATION TRANSITION (NORTH BOUND)

HEAVILY WOODED

CONST. 29'~ 18" R.C.P.

STA. 25+09.38 END SUPERELEVATION TRANSITION, BEGIN FULL SUPERELEVATION (NORTH & SOUTH BOUND)

N48°59'30"W 87.38' OR &C.

R.&C.

S39°01'00"W 108.33'

PROP. DRAINAGE EASEMENT

CONST. 68'~ 18" R.C.P.

℄ CONST. N. 00°55'39"E

℄ SURVEY N 00°08'10" W

I. & T.C.

121.16' S35°00'00"E

BM 40d NAIL IN 24" PINE EL. 78.91

PROP. 10' CONST. EASEMENT

R.&C.

PROP. 5' CONST. EASEMENT

PROP. 20' CONST. EASEMENT

STA. 22+50.19 BEGIN SUPER-ELEVATION TRANSITION (SOUTH BOUND)

P.C. STA. 23+93.40 ℄ SURVEY

P.C. STA. 24+14.35 ℄ CONST.

HEAVILY WOODED

PROP. DRAINAGE EASEMENT

MATCH LINE ℄ STA. 30+00 SURVEY

(31.56') OFFSET FROM ℄ SURVEY (TYP)

(29.70') (27.84') (25.97') (24.13') (22.28') (20.42') (18.56') (16.71') (14.83') (14.03') (13.20') (12.32') (11.42') (10.48') (9.52')

③ ℄ SURVEY CURVE DATA
P.I. STA. 31+99.88
Δ = 45°47'10"
D = 3°00'00"
T = 806.48
L = 1526.20
R = 1909.86
e = 0.068'/FT.
P.C. STA. 23+93.40
P.T. STA. 39+19.60

④ ℄ CONST. CURVE DATA
P.I. STA. 32+00.02
Δ = 44° 43' 20"
D = 3° 00' 00"
T = 785.67
L = 1490.74
R = 1909.86
e = 0.068'/FT.
P.C. STA. 24+14.35
P.T. STA. 39+05.09
D.S. 55 MPH

N

85 80 75 70 65 60 55 50 45

75.02 76.00

EXIST. GRADE

P.V.I. STA. 19+00.00 EL. 78.08

+0.16%

-0.09%

-0.09% D.P.I. LT. 71.3

-1.0% D.P.I. RT. 71.5

-10.14%

D.P.I. LT. 78.5

F.C. +1.0%

D.P.I. RT. 74.5

CONST. 29'~ 18" R.C.P. @ 0.00%

-0.30%

-0.83%

CONST. 29'~ 18" R.C.P. @ 0.00%

+1.22%

D.P.I. RT. 72.00

D.P.I. LT. 71.4

-0.20%

-1.50%

-1.16%

D.P.I. LT. 70.3

D.P.I. RT. 67.50

-0.53%

D.P.I. LT. 69.5

-1.08%

-0.50%

D.P.I. RT. 66.5

D.P.I. LT. 68.5

-0.24%

200' V.C.

450' V.C.

P.V.I. STA. 25+00 EL. 70.74

STA. 21+00 END DITCH CONST. LT. & RT. MATCH EXIST. EL. 68.50 LT. EL. 66.50 RT.

69.55 69.2

71.97 71.42 71.00 70.69 70.61

STA. 16+00~44' LT. CONST. CROSS DRAIN M.E.S. FOR 24" R.C.P. D.O.T. INDEX NO. 272 FL. EL. 71.30

STA. 16+00~42' RT. CONST. CROSS DRAIN M.E.S. FOR 24" R.C.P. D.O.T. INDEX NO. 272 FL. EL. 71.50

STA. 17+00~41' LT. CONST. SIDE DRAIN M.E.S FOR 18" R.C.P. D.O.T. INDEX NO 273 FL. EL. 71.5

STA. 20+00~39.5' LT. CONST. D.B.I. TYPE "C" D.O.T. INDEX NO. 232 GRATE EL. 75.00 FL. 71.50 W&S

STA 23+00~32' LT. CONST. SIDE DRAIN M.E.S. FOR 18" R.C.P. D.O.T. INDEX NO. 273 FL. EL. 71.50

STA. 19+00 END DITCH CONST. LT. & RT. MATCH EXIST. EL. 68.50 LT. EL. 66.50 RT.

76.35 76.53 76.80 76.96 77.01 76.95 76.78 76.50 76.11 75.61 76.32

15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30

STATIONS REFER TO BASELINE CONST.

NO.	BY	REVISIONS	DATE

DESIGNED	ATH	DATE	11-88	SCALE	SHEET NO.
DRAWN	JAL	DATE	11-88	1" = 5' VERT. 1" = 50' HORZ.	11
CHECKED	CEG	DATE	11-88	JOB NO. 87524	OF 65
APPROVED	ELD	DATE	11-88		

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

FOR AGENCY REVIEW ONLY

SUS-1004M WPC

E525

PLAN
SURVEYED
PLOTTED
DRAWN
CHECKED
NOTE BOOK
NO.
BY
DATE
RT. OF WAY CHECKED

PROFILE
SURVEYED
PLOTTED
DRAWN
CHECKED
NOTE BOOK
NO.
BY
DATE
B.M.'s NOTED
STRUCTURE NOTATNS CHKD

30 35 40 45

HEAVILY WOODED

PK. & DISK IN 10" BLACK JACK OAK

N83°10'00"W 98.21

BM PK. & DISK IN 8" BLACK JACK OAK EL. 65.66

BM 404 NAIL & DISK IN 15" PINE EL. 74.42

PROP. DRAINAGE EASEMENT

STA. 38+10.05 END FULL SUPERELEV. BEGIN SUPERELEV. TRANSITION (NORTH & SOUTH BOUND)

STA. 39+19.60 P.T. SURVEY ℄

PROP. R/W

STA. 42+85.25 END SUPERELEV. TRANSITION (NORTH BOUND)

BM 404 NAIL IN 20" PINE EL. 86.89

N83°00'00"W 172.50

N

℄ CONST. & SURVEY N 45°38'59" E

R&C.

I. & T.C.

4' 12' 12' 4'

50' 50'

MATCH LINE STA. 45+00

T. & T.C.

SURVEY ℄

R&C. SAWCUT'S 38.39'

EQUATION AT STA. 39+05.09 BK. = STA. 38+98.93 AH ℄ CONST.

SAWCUT'S 101.58' R&C.

DITCH WEIR (TYP)

PROP. R/W

PROP. 5' CONST. EASEMENT

MATCH LINE STA. 30+00

CONST. 136'-24" R.C.P.

PROPOSED DRAINAGE EASEMENT

STA. 43+92.31 BEGIN SUPERELEVATION TRANSITION (SOUTH BOUND)

STA. 40+69.25 END SUPERELEVATION TRANSITION (SOUTH BOUND)

(9.52') OFFSET ℄ FROM SURVEY (TYP.)

(8.53) (7.62) (6.48) (5.43) (4.37) (3.29) (2.20) (1.11) (0.00)

HEAVILY WOODED

69.55 68.58 68.54 68.44 68.89 69.30 69.85 70.55 71.41 72.41 85.94

400' V.C.

STA. 35+00.00 BEGIN DITCH CONST. RT. MATCH EXIST. EL. 66.5

STA. 36+50.00 BEGIN DITCH CONST. LT. MATCH EXIST. 70.5

EXIST. GRADE

-0.24%

+2.15%

+1.50%

+2.00%

+0.40%

+1.90%

+2.00%

+1.50%

+3.00%

+2.00%

+1.10%

+0.40%

+1.60%

D.P.I. LT. 70.3

D.P.I. LT. 70.5

D.P.I. LT. 73.5

D.P.I. RT. 66.5

D.P.I. RT. 76.0

D.P.I. LT. 78.0

D.P.I. RT. 79.5

D.P.I. RT. 80.5

D.P.I. LT. & RT. 82.0

D.P.I. LT. & RT. 82.2

D.P.I. RT. 83.1

D.P.I. LT. 83.0

DITCH WEIR LT. & RT.

DITCH WEIR (TYP.)

PROPOSED GRADE

DITCH WEIR LT. & RT.

87.02 83.26 83.01 83.87 84.64 85.33 85.94

800' V.C.

STATIONS REFER TO BASELINE CONST.

CONST. 136'-24" R.C.P. @ 0.00%

STA. 31+50 - 83' LT. CONST CROSS DRAIN M.E.S. FOR 24" R.C.P. D.O.T. INDEX NO. 272 FL. EL. 59.50

STA. 31+50 - 75' RT. CONST CROSS DRAIN M.E.S. FOR 24" R.C.P. D.O.T. INDEX NO. 272 FL. 55.50

P.U. STA. 32+00.20 EL. 68.10

60.2

90 85 80 75 70 65 60 55 50

30 31 32 33 34 35 36 37 38 3939 40 41 42 43 44 45

NO.	BY	REVISIONS	DATE

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CHECKED	CEG	DATE	11-88
APPROVED	ELD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87524
SHEET NO. 12
OF 65

FOR AGENCY REVIEW ONLY

SSS-00088 (HC)

E526

45 50 55 60

N

MATCH LINE STA. 45+00

MATCH LINE STA. 60+00

STA. 46+08.31 BEGIN SUPERELEVATION TRANSITION (NORTH BOUND)

STA. 48+67.51 END SUPERELEVATION TRANSITION BEGIN FULL SUPERELEV. (NORTH & SOUTH BOUND)

50'

50'

4' 12' 12' 4'

N 45°38'59"E

P.C. STA. 47+72.47

R & C.

R & C.

110.74'
S0°00'00"W

PROP. 5' CONST. EASEMENT

PROP. R/W

Symmetrical Fillet

13

14

PROP. 15' CONST. EASEMENT

℄ CONST. & SURVEY

℄ CONST. & SURVEY

(5) CURVE DATA

P.I. STA. 55+85.02
Δ = 46°05'40"
D = 3°00'
T = 812.55
L = 1536.48
R = 1909.86
e = 0.068'/FT.
P.C. STA. 47+72.47
P.T. STA. 63+08.95
D.S. 55 MPH

HEAVILY WOODED

HEAVILY WOODED

CONST. 10'T~24" R.C.P. @ 0.00%

CONST. 10'T~24" R.C.P. @ 0.00%

I & T.C.
N45°00'00"E
89.82'
S45°00'00"E
54.77'

P.K. & DISK IN 10" PINE

BM
P.K. & DISK IN 10" PINE
EL. 87.89

I & T.C.
31.83'
N90°00'00"E
51.50'

P.K. & DISK IN 8" PINE

BM
40d NAIL IN 10" PINE
EL. 82.52

PROFILE

EXIST. GRADE

PROPOSED GRADE

D.P.I. LT. 83.0

D.P.I. LT. 83.0

0.00%

+1.20%

+1.00%

D.P.I. LT. 84.5

D.P.I. RT. 86.1

0.00%

D.P.I. RT. 87.5

D.P.I. RT. 86.9

D.P.I. RT. 86.8

D.P.I. RT. 86.4

-1.20%

-0.20%

-0.80%

D.P.I. LT. 84.5

P.I. STA. 46+00.00 EL. 83.44

STA. 47+50 END DITCH CONST. RT. MATCH EXIST EL. 86.1

STA. 49+00 BEGIN DITCH CONST LT. MATCH EXIST. EL. 87.5

STA. 50+50 END DITCH CONST. RT. MATCH EXIST. EL. 86.4

-0.80%

-0.60%

D.P.I. RT. 83.5

D.P.I. RT. 83.4

-0.20%

-1.80%

D.P.I. RT. 82.5

-0.50%

-1.40%

D.P.I. RT. 81.0

D.P.I. RT. 80.3

-0.20%

D.P.I. LT. 77.9

P.I. STA. 60+00.00 EL. 81.24

STA. 55+00 BEGIN DITCH CONST RT. MATCH EXIST EL. 83.5

STA. 52+00 ~ 64' LT.
CONST. CROSS DRAIN M.E.S.
FOR 24" R.C.P.
D.O.T. INDEX NO. 272
FL. 75.50

STA. 52+00 ~ 61' RT.
CONST. CROSS DRAIN M.E.S.
FOR 24" R.C.P.
D.O.T. INDEX NO. 272
FL. 75.50

800' V.C.

200' V.C.

85.94 86.45 86.89 87.23 87.49 87.66 87.75 87.75 87.67 87.50 87.24 81.84 81.49 81.04

90 85 80 75 70 65 60 55 50

45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

STATIONS REFER TO BASELINE CONST.

PLAN

SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
NOTE BOOK
NO.
BY
DATE

PROFILE

SURVEYED
PLOTTED
GRADES CHECKED
B.M.'s NOTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

NO.	BY	REVISIONS	DATE

DESIGNED	ATH	DATE	11-88	
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APPROVED	ELD	DATE	11-88	

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION

VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87524
SHEET NO. 13
OF 65

FOR AGENCY REVIEW ONLY

E527

SSS-60068 BPC

PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
R.P.M.'s PLOTTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

60 65 70 75

N

MATCH LINE STA. 60+00

50'
12'
4'

P.T. STA. 63+08.95

STA. 64+73.11 END SUPERELEVATION TRANSITION (NORTH BOUND)

HEAVILY WOODED

PROP. 20' CONSTRUCTION EASEMENT

R&C SUPERVISION 1.4x11

R&C SUPERVISION SR3-46

R&C

PROP. R/W

PROP. 5' CONST. EASEMENT

℄ CONST. & SURVEY N 00°26'41" W

PROP. R/W

PROP. 5' CONST. EASEMENT

MATCH LINE STA. 75+00

STA. 62+13.91 END FULL SUPERELEVATION BEGIN SUPERELEVATION TRANSITION (NORTH & SOUTH BOUND)

STA. 66+89.11 END SUPERELEV TRANSITION (SOUTH BOUND)

HEAVILY WOODED

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
R.P.M.'s PLOTTED
STRUCTURE NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

90 85 80 75 70 65 60 55 50

P.V.I. STA. 60+00.00
EL. 81.24

D.P.I. LT. 17.9 -2.20%
D.P.I. LT. 16.8 -1.40%
D.P.I. RT. 19.9 -0.20%
D.P.I. RT. 17.5 -2.40%
D.P.I. LT. 14.7
D.P.I. RT. 15.5 -2.00%
D.P.I. RT. 15.0 -1.40%
-1.00%
-1.20%
-2.00%
D.P.I. RT. 12.0
D.P.I. RT. 11.5
-1.00%
-2.00%
D.P.I. RT. 68.5
D.P.I. LT. 68.1 -4.20%
-0.73%
-0.20%
D.P.I. RT. 66.4
D.P.I. RT. 66.3
D.P.I. LT. 67.0
-0.40%
D.P.I. LT. 66.8
0.00%
D.P.I. RT. 66.3
-0.20%
D.P.I. RT. 66.2
-0.20%
0.00%
-0.24%
D.P.I. RT. 66.2
-1.10%

EXIST. GRADE
PROPOSED GRADE
DITCH WEIR (TYP)

200' V.C.
200' V.C.

71.44 70.81 70.33 69.99 69.80 68.36

8.04 60.49 79.84

P.V.I. STA. 69+00.00
EL. 70.04

224 672

STATIONS REFER TO BASELINE CONST.

60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75

NO.	BY	REVISIONS	DATE

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CHECKED	CEG	DATE	11-88	
APPROVED	ELD	DATE	11-88	

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE
1"=5' VERT.
1"=50' HORZ.
JOB NO.
87524

SHEET NO.
14
OF 65

FOR AGENCY REVIEW ONLY

E528

SSS-60068 WPC

75

80

MATCH LINE STA. 75+00

50'

50'

4'

12'

12'

4'

PROP. R/W

℄ CONST. & SURVEY

N. 00°26'41" W

I. & T.C.

PROP. R/W

S60°00'00"E 144.92'

THROUGH EDGE 12.72'

REBAR

BM REBAR EL. 68.60

STA. 79+03.01 BEGIN TAPER ~ RT.

12'

PROP. 20' CONST. EASEMENT

24'

DITCH WEIR (TYP.)

STA. 81+53.01 END TAPER ~ RT.

HEAVILY WOODED

HEAVILY WOODED

PROP. 10' CONST. EASEMENT

CONST. 80'~30" R.C.P.

15

16

50'R

50'R

89°09'33"

8'

8'

S. 89° 36' 14" E.

BT (50 PR)

BT (50 PR)

HOWLAND BOULEVARD

BT (50 PR)

BT (50 PR)

12'

N

RESURFACING SEE TYPICAL SECTION FOR DETAIL

P.I. STA. 84+22.10 NORMANDY BOULEVARD

= STA. 10+00.00 HOWLAND BOULEVARD

FOR INTERSECTION DETAIL SEE SHEET No. 17

PLAN

SURVEYED BY
PLOTTED
ALIGNMENT CHECKED
R/T. OF WAY CHECKED
NOTE BOOK NO.
DATE

PROFILE

SURVEYED BY
PLOTTED
GRADES CHECKED
R/W LINE
STRUCTURE NO'S
ATHS CHKD
DATE

80

75

70

65

60

55

50

45

40

68.36

67.2

66.75

-1.10%

-0.20%

+1.60%

-0.07%

-0.24%

-1.00%

-2.60%

-0.40%

0.00%

0.00%

-0.53%

-3.07%

-3.34%

-0.05%

D.P.I. LT. 63.6

D.P.I. RT. 63.6

D.P.I. LT. 65.0

D.P.I. RT. 65.0

D.P.I. LT. 63.9

D.P.I. RT. 63.6

D.P.I. LT. 63.5

D.P.I. LT. 63.3

D.P.I. LT. 63.3

D.P.I. RT. 63.5

D.P.I. LT. 62.8

P.V.I. STA. 83+00 EL. 66.44

P.V.I. STA. 84+04.10 EL. 66.39

DITCH WEIR (TYP.)

CONST. 80'~30" R.C.P. @ 0.00%

STA. 83+50~48' LT. CONST. CROSS DRAIN M.E.S. FOR SINGLE 30" R.C.P. D.O.T. INDEX No. 272 FL. EL. 61.00

STA. 83+50~58' RT. CONST. CROSS DRAIN M.E.S. FOR SINGLE 30" R.C.P. D.O.T. INDEX No. 272 FL. EL. 61.00

15

16

75 76 77 78 79 80 81 82 83 84

STATIONS REFER TO BASELINE CONST.

NO.	BY	REVISIONS	DATE

DESIGNED	ATH	DATE	11-88
DRAWN	JAL	DATE	11-88
CHECKED	CEG	DATE	11-88
APPROVED	ELD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION

VOLUSIA COUNTY, FLORIDA

PLAN & PLOT

SCALE 1"=5' VERT. 1"=50' HORZ.

JOB NO. 87524

SHEET NO. 15 OF 65

SSS-60086 BPC

FOR AGENCY REVIEW ONLY

E529

PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
R/W OR MAT CHECKED
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
R.W. NOTED
STRUCTURES NOTATNS CHKD
NOTE BOOK
NO.
BY
DATE

5 10 15

N

STA. 4+50 BEGIN RESURFACING & WIDENING MATCH EXIST. PAVM'T.

STA. 12+40 ± LT. & RT. BEGIN TAPER

STA. 14+50 END RESURFACING & WIDENING MATCH EXIST. PAVM'T.

P.I. STA. 10+00 HOWLAND BLVD. = STA. 84+22.10 NORMANDY BLVD.

RESURFACING SEE TYPICAL SECTION FOR DETAIL

℄ SURVEY S 89°36'14"E

83°09'33"

50'R

30'

19'

19'

15

16

CONST. 80' ~ 30" R.C.P. SEE SHEET No. 15

PROP. 10' CONST. EASEMENT

PROP. 20' CONST. EASEMENT

NORMANDY BLVD.

HOWLAND BLVD.

STA. 8+00 END TAPER

EXIST. GRADE

PROPOSED GRADE

+0.29%

-0.27%

-1.00%

-0.20%

-2.00%

-0.31%

-1.14%

0.00%

-1.49%

-1.80%

PROP. DITCH RT.

D.P.I. RT. 61.0

D.P.I. RT. 65.5

CONST. 80' ~ 30" R.C.P. SEE SHEET NO. 15

STA. 4+50.00 BEGIN CONST. MATCH EXIST. PAVEMENT

P.I. STA. 5+00 EL. 67.39

STA. 6+00 BEGIN DITCH CONST.

P.I. STA. 7+00 EL. 67.45

P.I. STA. 9+50 EL. 66.36

P.I. STA. 11+50 EL. 66.35

P.I. STA. 12+50 EL. 65.21

STA. 13+50 END DITCH CONST. RT. MATCH EXIST.

P.I. STA. 14+00 EL. 63.04

STA. 14+50.00 END CONST. MATCH EXIST. PAVEMENT

67.85 67.86 67.72 67.69 67.33 67.25 67.16 67.06 66.81 66.66 66.50 65.78 64.49 63.76

85 80 75 70 65 60 55 50 45 40

3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

NO.	BY	REVISIONS	DATE

DESIGNED	ATH	DATE	11-88	GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS	
DRAWN	NJH	DATE	11-88		
CHECKED	CEG	DATE	11-88		
APPROVED	ELD	DATE	11-88		

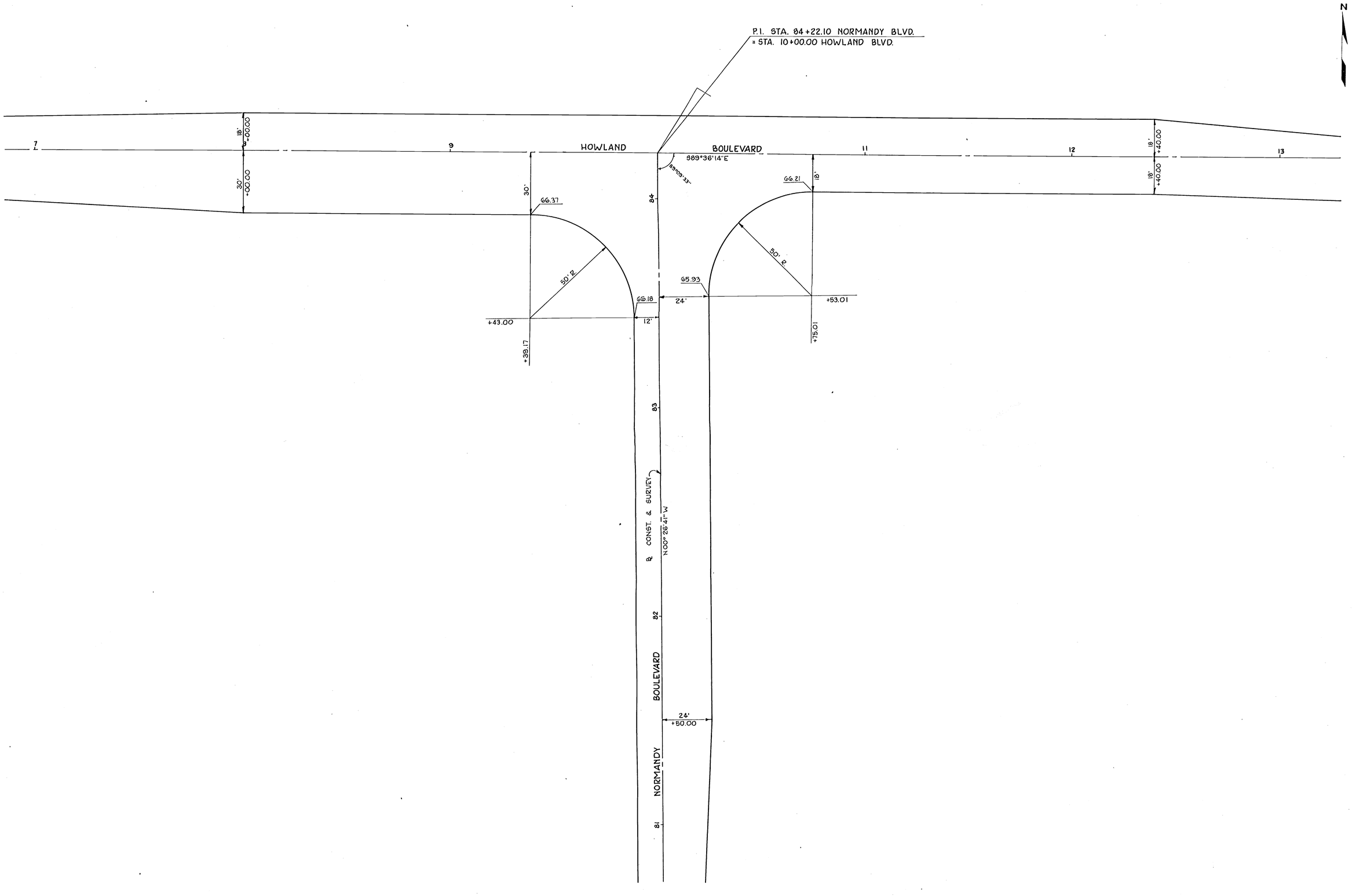
NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE
HOWLAND BOULEVARD

SCALE 1" = 5' VERT. 1" = 50' HORZ.
JOB NO. 87524
SHEET NO. 16 OF

FOR AGENCY REVIEW ONLY

SSR-60088 SPC



NO.	BY	REVISIONS	DATE				
				DESIGNED	ATH	DATE	11-88
				DRAWN	JAL	DATE	11-88
				CHECKED	CEG	DATE	11-88
				APPROVED	ELD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY FLORIDA

INTERSECTION DETAIL
NORMANDY BOULEVARD & HOWLAND BOULEVARD

SCALE	SHEET NO.
1"=20'	17
JOB NO. 87524	OF 65

FOR AGENCY REVIEW ONLY

552-72044

E531

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	1060		13
69.5		3	
	111		4
50.5		1	
	53		1
7		0	
	6		0
0		0	

6+50.00

EXIST. R/W

EXIST. R/W

71.0

71.73

71.97

2.04'

71.73

71.0

2:1

EXIST 6" PVC / OR A.C. WATER MAIN

6+48.77

6+00.00

71.3

71.5

71.84

72.08

0.38'

71.84

2:1

5+98.79

72.6

73.0

5+50.00

0.26'

5+18.83

74.2

75.1

.002'

EXIST. 6" P.V.C. / OR A.C. WATER MAIN

5+00.00

THIS STATIONING REFERS TO ℄ SURVEY

4+98.8

THIS STATIONING REFERS TO ℄ CONST.

FINAL SURVEY — NOTE BOOK NO. — SURVEYED / PLOTTED / TEMPLATE / AREAS / AREAS CHECKED — BY / DATE

ORIGINAL SURVEY — NOTE BOOK NO. — SURVEYED / PLOTTED / TEMPLATE / AREAS / AREAS CHECKED — BY / DATE

TELEDYNE POST N36823

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE 1/78	SCALE NOTED
DRAWN	JAL	DATE 1/78	SHEET NO. 18
CHECKED	CES	DATE 1/78	JOB NO. 37524
APPROVED	GED	DATE 1/78	OF 65

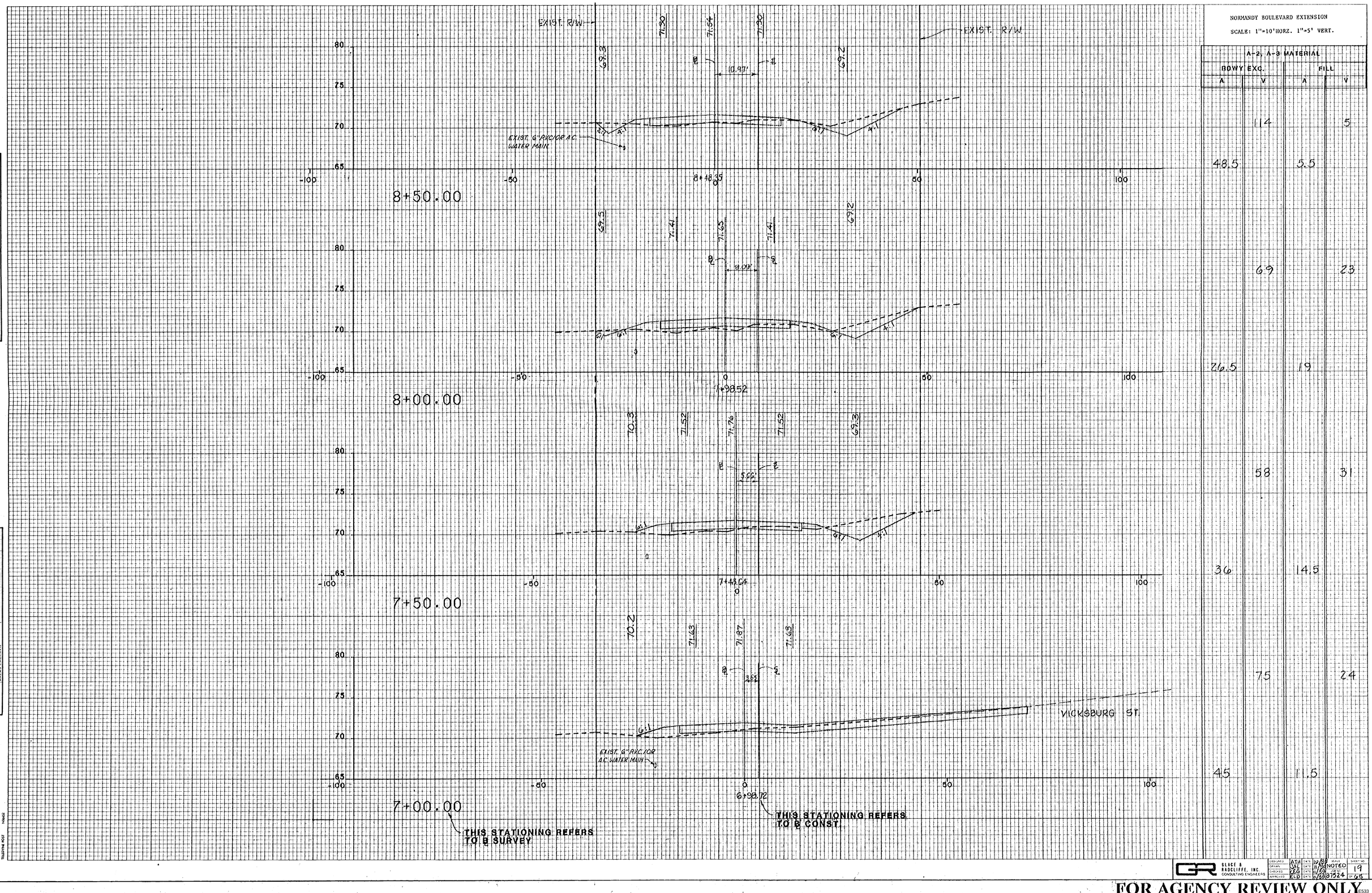
FOR AGENCY REVIEW ONLY

E532

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

	A-2, A-3 MATERIAL			
	RDWY EXC.		FILL	
	A	V	A	V
8+50.00		114		5
	48.5		5.5	
8+00.00		69		23
	26.5		19	
7+50.00		58		31
	36		14.5	
7+00.00		75		24
	45		11.5	



FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE — NOTE BOOK NO.

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE — NOTE BOOK NO.

TELEPHONE POST HOUSE

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE	10/68	SHEET NO.	
DRAWN	VAE	DATE	11/68	NOTES	19
CHECKED	CEG	DATE	11/68	JOB NO.	
APPROVED	ELD	DATE	11/68	81524	OF 45

FOR AGENCY REVIEW ONLY

E533

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	35		27
15		26	
	125		24
120		0	
	203		0
99		0	
	116		0
74.5		0	

EXIST. R/W

EXIST. R/W

PROP. R/W

80
75
70
65
60

-100 -50 0 50 100

10+50.00

10+47.83

10+00.00

9+97.71

9+50.00

9+98.06

9+00.00

8+98.17

24.43'

21.04'

17.55'

14.25'

CONST 60'-24" RCP @ 0.5% → TO STRUCTURE # 4

EXIST. 6" R.V.C./C.I.P. A.C. WATER MAIN

TO STRUCTURE #2

STA. 10+55 ~ 17.50' RT.
CONST. CURB INLET TYPE P-2
D.O.T. INDEX No. 200 & 210
TOP EL. 71.79 FL. S.E. & S.W. 66.41

TO STRUCTURE #3 →

STA. 9+10 ~ 80' LT. N. FIRWOOD DR.
CONST. D.I.A. TYPE "C" D.O.T. INDEX No. 232
GRATE EL. 68.50
FL. IN E. & W. 65.29

N. FIRWOOD DRIVE

CONST. 50'-24" R.C.P. @ 0.15%

STA. 9+80 ~ 80' LT. N. FIRWOOD DR.
CONST. SIDE DRAIN INL. S. FOR 24" R.C.P.
D.O.T. INDEX No. 215
FL. 66.20

TO STRUCTURE #3

CONST. 48'-24" R.C.P. @ 0.15%

EXIST. 4" P.V.C. FOR A.C. WATER MAIN

18" R.C.P.

STA. 10+28 ~ 41' RT.
CONST. D.I.A. TYPE "C"
D.O.T. INDEX No. 232
GRATE EL. 71.00
FL. S & N.W. 66.48

N. FIRWOOD DRIVE

18" R.C.P.

STA. 9+50 ~ 40' RT.
CONST. D.I.A. TYPE "C"
D.O.T. INDEX No. 232
GRATE EL. 69.00 FL. EL. 66.59

EXIST. 6" R.V.C./C.I.P. A.C. WATER MAIN

THIS STATIONING REFERS TO ℄ SURVEY

THIS STATIONING REFERS TO ℄ CONST.

FINAL SURVEY — SURVEYED, PLOTTED, TRACED, NOTE BOOK, NO., AREAS, AREAS CHECKED, BY, DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TRACED, NOTE BOOK, NO., AREAS, AREAS CHECKED

TELEDYNE POST H-6402

GRACE & RADCLIFFE, INC. CONSULTING ENGINEERS

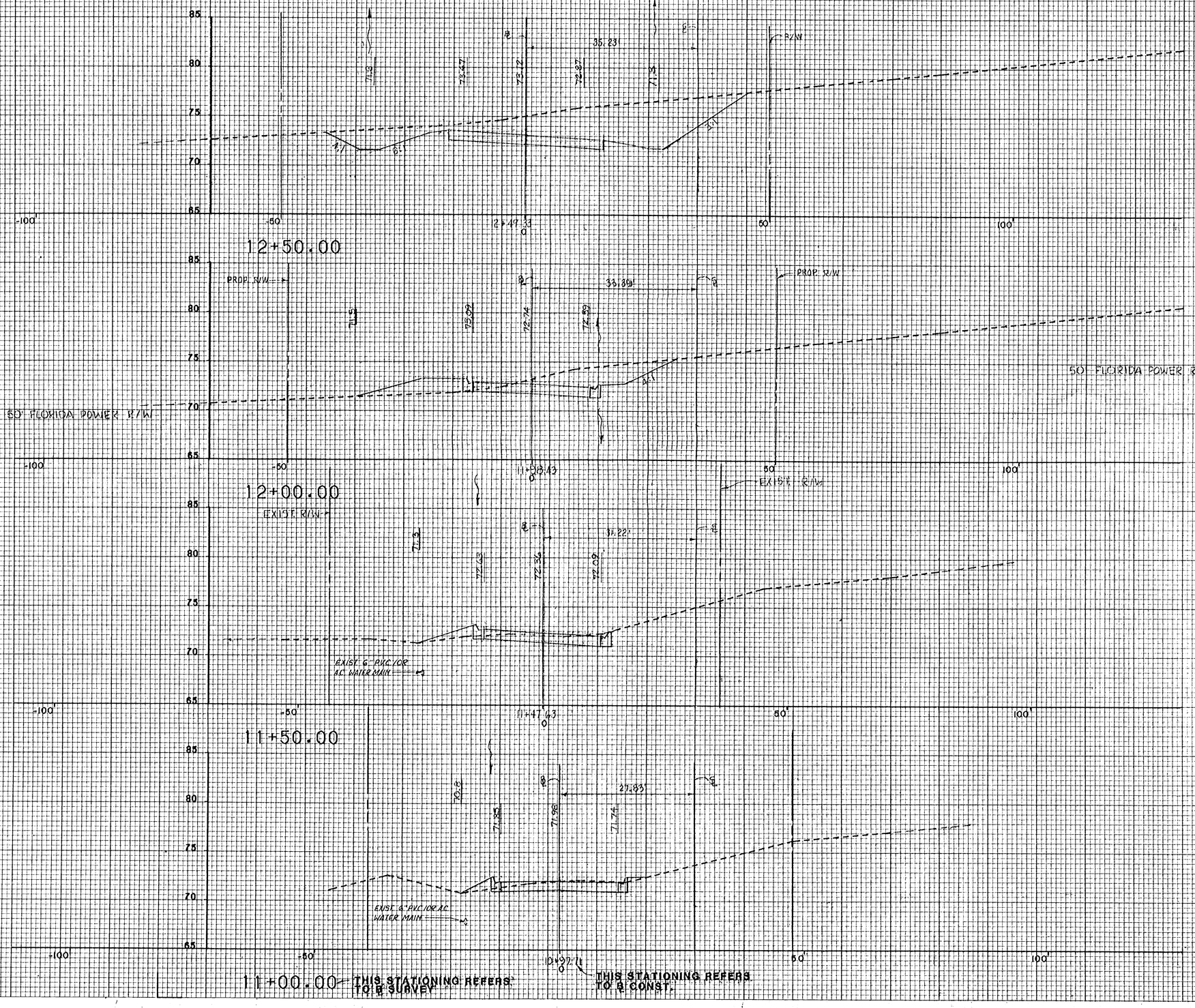
DESIGNED	ATH	DATE	11/73	SCALE	SHEET NO.
DRAWN	AGL	DATE	11/73	NOTED	20
CHECKED	KCG	DATE	11/73	JOB NO.	OF
APPROVED	GLD	DATE	11/73	87524	65

FOR AGENCY REVIEW ONLY

E534

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	536		0
207.5		0	
	257		20
70.5		21.5	
	85		26
21		6	
	40		9
225		3.5	

FINAL SURVEY
BY DATE
SURVEYED
PLOTTED
TEMPLATE
NOTE BOOK
AREAS
NO. AREAS CHECKED

ORIGINAL SURVEY
BY DATE
SURVEYED
PLOTTED
TEMPLATE
NOTE BOOK
AREAS
NO. AREAS CHECKED

TELEDYNE POST 960682

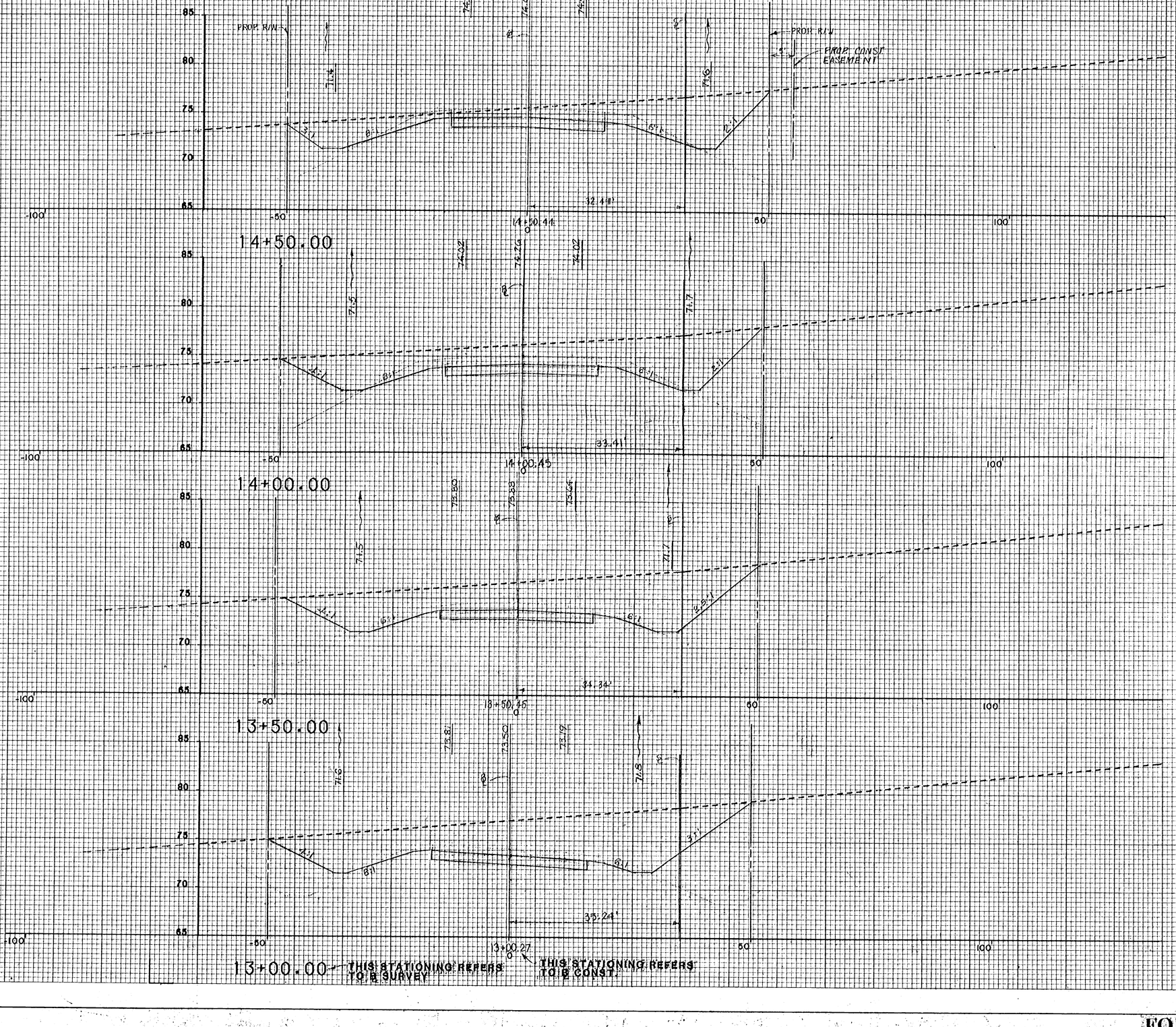
GBRA GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE 5/83	SCALE NOTED
DRAWN	JRC	DATE 5/83	SHEET NO. 21
CHECKED	JRB	DATE 5/83	JOB NO. 81524
APPROVED	EJD	DATE 5/83	DWG. NO. -05

FOR AGENCY REVIEW ONLY

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL

RDWY EXC.		FILL	
A	V	A	V
	380		0
242.5		0	
	195		0
291.5		0	
	574		0
328.75		0	
	618		0
371		0	

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — NOTE BOOK NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — NOTE BOOK NO. — BY — DATE

TELSTYK POST P24602

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE 1/78	SCALE
DRAWN	DA	DATE 5/83	NOTED
CHECKED	CGS	DATE 7/83	APPD
APPROVED	EEL	DATE 11/83	07524

SHEET NO. 22 OF 65

FOR AGENCY REVIEW ONLY

E536

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	5		734
3		370	
	32		479
29.5		147	
	92		1664
70		30	
	220		28
168		0	

16+50.00

STA. 16+00 = 44' LT.
CONST. CROSS DRAINAGE FOR 18" R.C.P. DOT INDEX NO. 271
EL. EL. 71.30

STA. 16+00 = 92' LT.
CONST. CROSS DRAINAGE FOR 18" R.C.P.
DOT INDEX No. 272
EL. EL. 71.80

16+00.00

15+50.00

15+00.00 THIS STATIONING REFERS TO ℄ SURVEY

THIS STATIONING REFERS TO ℄ CONST.

FINAL SURVEY — SURVEYED, PLOTTED, TRAVERSE, NOTE BOOK, NO., AREAS, AREAS CHECKED, BY, DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TRAVERSE, NOTE BOOK, NO., AREAS, AREAS CHECKED, BY, DATE

TELEPHONE POST NO.6622

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE	11/80	NOTED	SHEET NO
DRAWN	JAL	DATE	11/80		23
CHECKED	CEG	DATE	11/80	JOB NO.	365
APPROVED	ELD	DATE	7/30/81	87524	

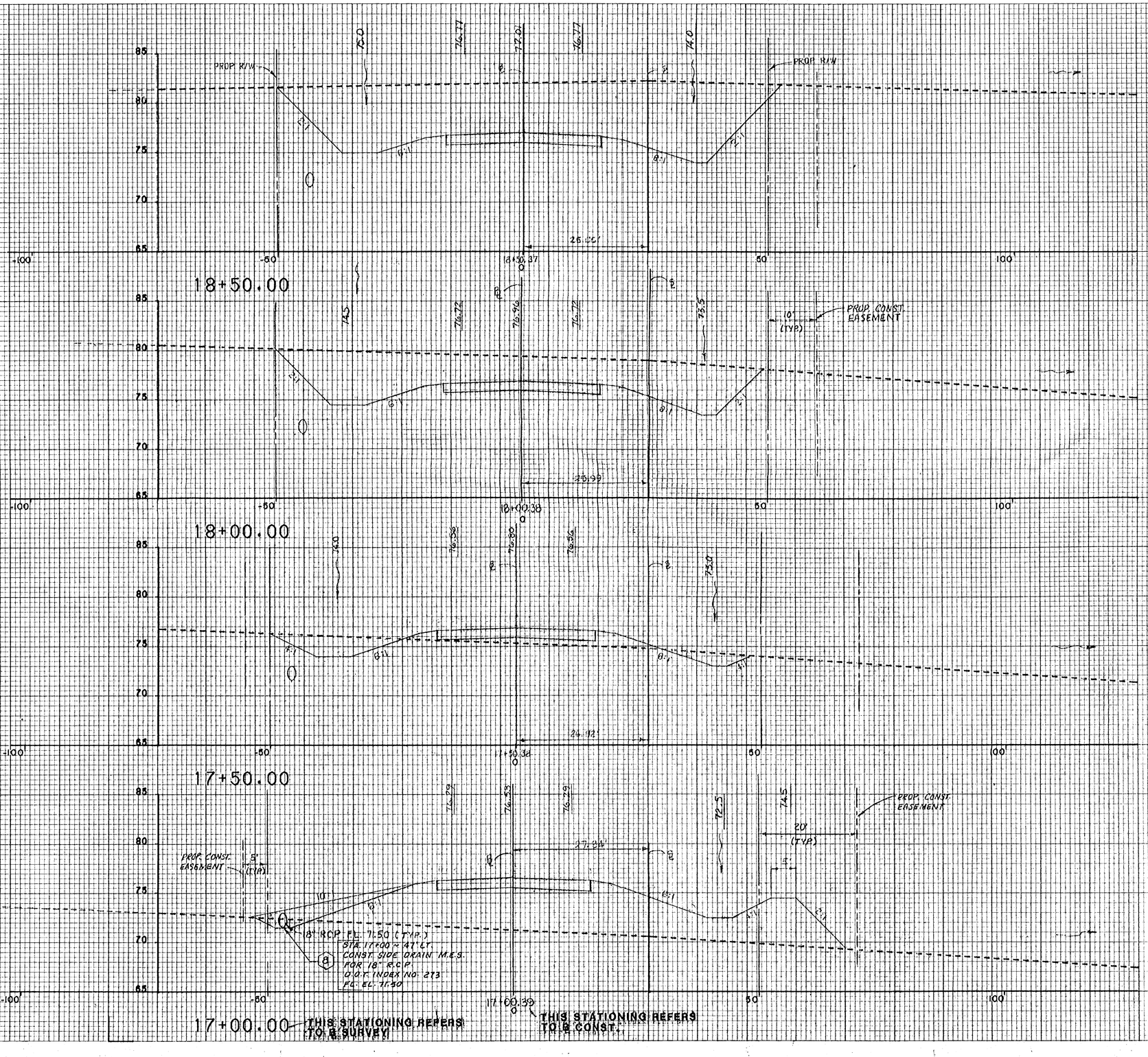
FOR AGENCY REVIEW ONLY

E537

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	1163		0
505		0	
	747		0
302		0	
	326		32
505		35	
	47		424
0		423	



FINAL SURVEY — BY — DATE
SURVEYED
PLOTTED
NOTE BOOK — TEMPLATE
NO. — AREAS
AREAS CHECKED

ORIGINAL SURVEY — BY — DATE
SURVEYED — * 50.00' SKA. 'S' INTERSECTIONS
PLOTTED
NOTE BOOK — TEMPLATE
NO. — AREAS
AREAS CHECKED

TELEPHONE ROOT — NO8620

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ADV	DATE	1/83	SCALE	SHEET NO
DRAWN	LDL	DATE	1/83	NOTED	24
SPECIFIED	CEG	DATE	1/83	CHECKED	
APPROVED	RLD	DATE	1/83	21524-85	

FOR AGENCY REVIEW ONLY

E538

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10'HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	612		19
405.5		4	
	918		4
535.5		0	
	1238		0
751		0	

FINAL SURVEY
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
NOTE BOOK
NO.
BY
DATE

ORIGINAL SURVEY
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
NOTE BOOK
NO.
BY
DATE
+20.60 SEA.'S MADE/APPLIED

20+00.00

PROP. R/W

76.0 75.0 76.26 76.50 76.26 73.1

5:1 6:1 6:1 5:1

22.18'

STA. 20+00 = 39.5' Lt.
CONST. D. & I. TYPE 'C'
D.O.T. INDEX NO. 232
GRATE EL. 75.00
FL. 71.50 N. & S.

75.2 76.54 76.78 76.54 74.1

19+50.00

PROP. R/W

76.26 76.50 76.26 73.1

5:1 6:1 6:1 5:1

23.21'

19+50.35 = 0

19+00.00

PROP. R/W

76.5 76.71 76.95 76.71 74.5

5:1 6:1 6:1 5:1

10' (TYP.)

PROP. CONST. EASEMENT

24.13'

18" RCP EL. 71.50 (TYP.)

19+00.36 = 0

THIS STATIONING REFERS TO R/W SURVEY.

THIS STATIONING REFERS TO R CONST.

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

SURVEYED	ATH	DATE	1/83	SCALE	SHEET NO
DRAWN	DAL	DATE	1/83	NONE	25
CHECKED	EEG	DATE	1/83	JOB NO.	OF 65
APPROVED	EEG	DATE	1/83	81524	

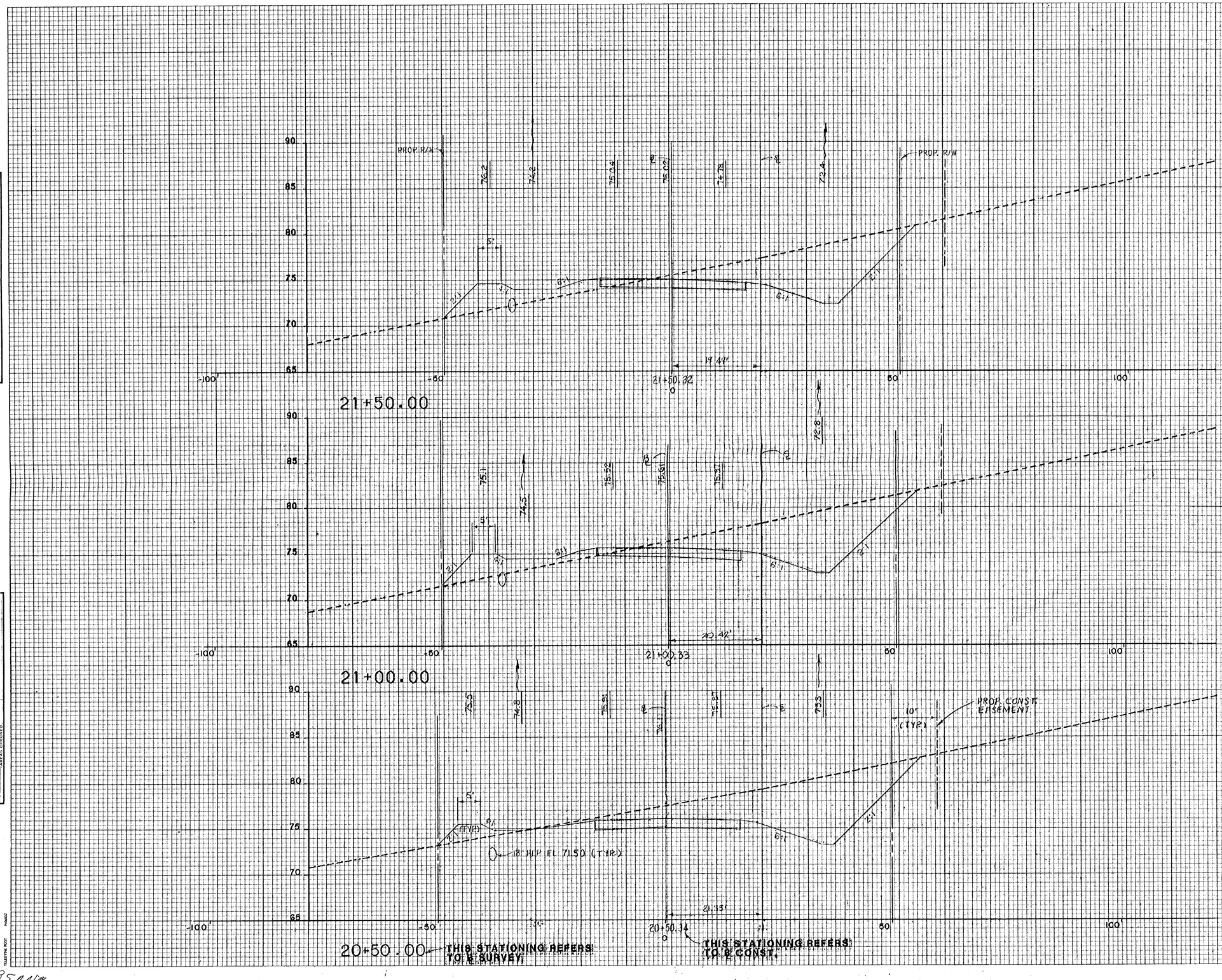
FOR AGENCY REVIEW ONLY

E539

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
		393	109
221			535
		408	94
219			46
		439	58
		255	17



FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE — NOTE BOOK — NO.

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE — NOTE BOOK — NO. — 60.00 STA'S WERE PLOTTED

TELLTALE POST

42-127-1035ANB

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

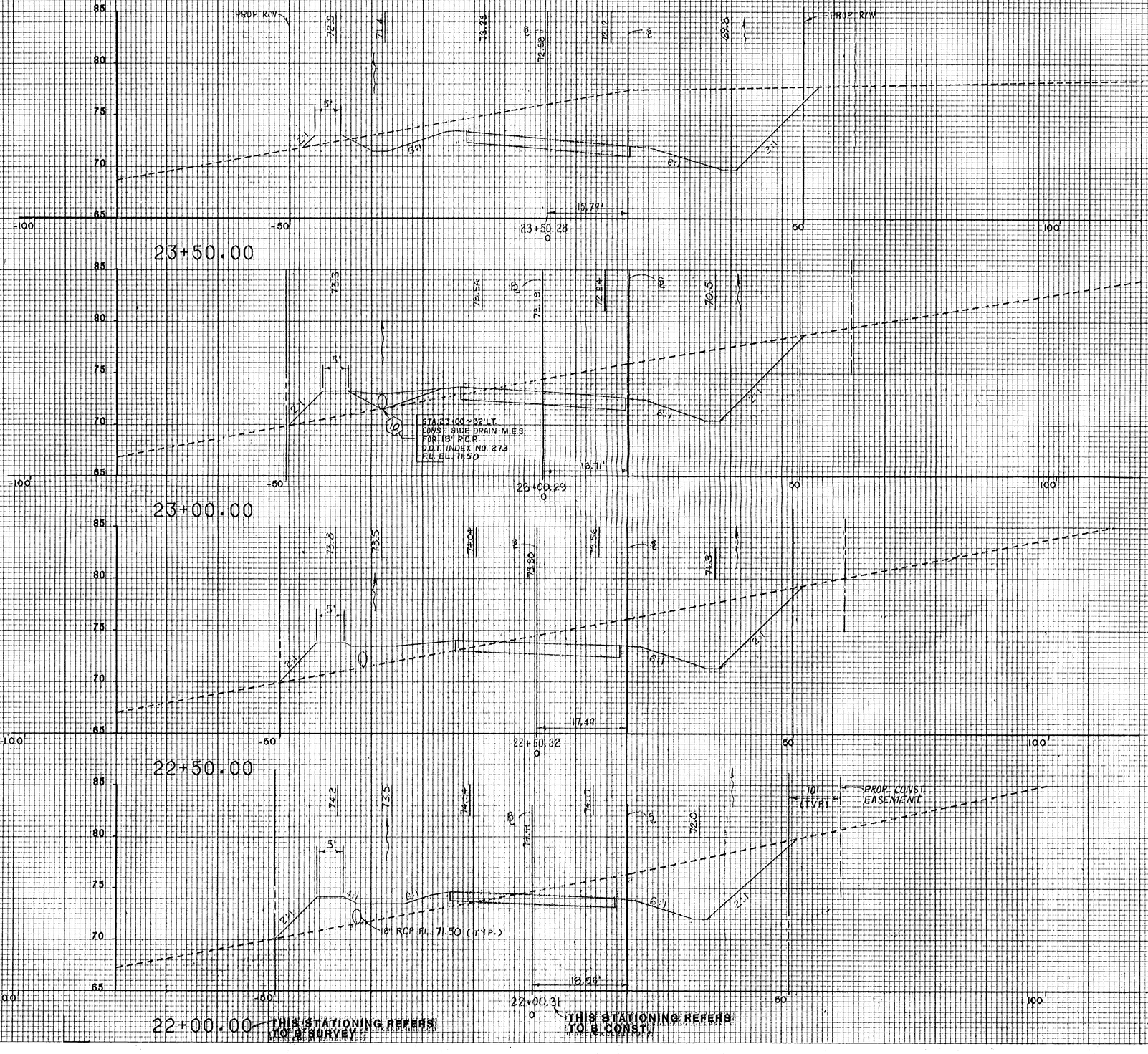
DESIGNED	ATH	DATE	11/73	SCALE	SHEET NO.
DRAWN	DJK	DATE	11/73	AS NOTED	20
CHECKED	REB	DATE	11/73	JOB NO.	OF 25
APPROVED	REB	DATE	11/73	10524	

FOR AGENCY REVIEW ONLY

E530

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	606		5
375		5	
	560		53
230		52	
	398		103
200		59	
	379		112
209		62	

FINAL SURVEY — NOTE BOOK — NO. — BY — DATE — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED

ORIGINAL SURVEY — NOTE BOOK — NO. — BY — DATE — SURVEYED — PLOTTED — ± 50.00 STA.'S INTERPOLATED — TEMPLATE — AREAS — AREAS CHECKED

TELEPHONE POST — MANHOLE

GRACE & HADDLEFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE 1/88	SCALE	SHEETING
DRAWN	ANC	DATE 1/88	NOTED	27
CHECKED	EEG	DATE 1/88	1" = 10'	
APPROVED	EJD	DATE 11/88	1524	of 45

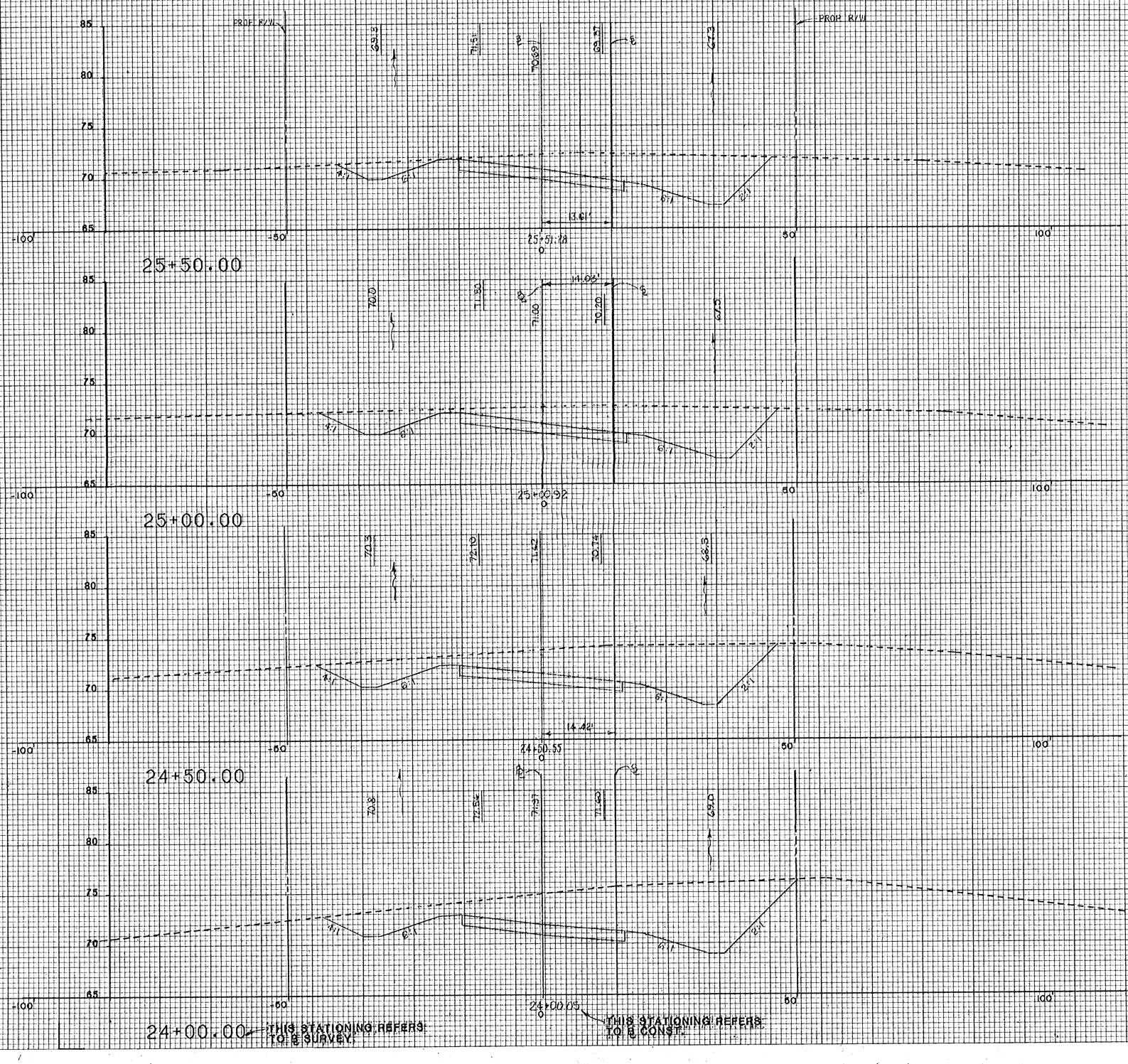
FOR AGENCY REVIEW ONLY

E541

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	36		0
231		0	
	419		0
231		0	
	472		0
276.5		0	
	557		0
323		0	



FINAL SURVEY — BY — DATE — SURVEYED — PLOTTED — TEMPLATE — NOTE BOOK — AREAS — NO. — AREAS CHECKED

ORIGINAL SURVEY — BY — DATE — SURVEYED — PLOTTED — 24+00.00 STA. 'S' INTERPOLATED — NOTE BOOK — TEMPLATE — AREAS — NO. — AREAS CHECKED

TELESPAN POST N-662

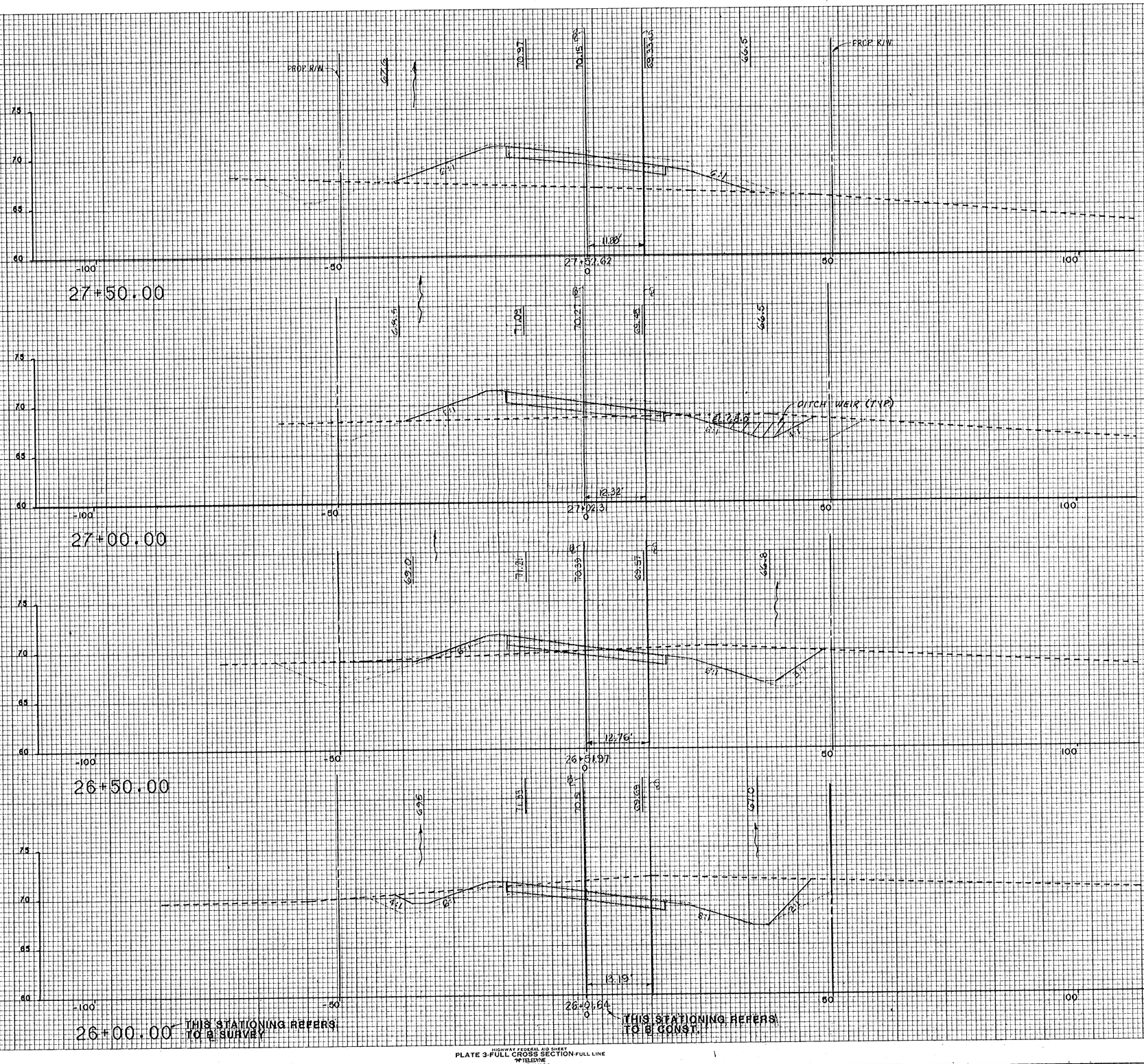
GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATL	DATE	1/68	SCALE	SHEET NO.
DRAWN	VAL	DATE	11/68	NOTED	23
CHECKED	SES	DATE	11/68	JOB NO.	
APPROVED	REB	DATE	11/68	3152	

FOR AGENCY REVIEW ONLY

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



THIS STATIONING REFERS TO B SURVEY

THIS STATIONING REFERS TO B CONST.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	0		604
0			95.5
	10		260
43			85.5
119			96
86			18
235			17
167.5			0

FINAL SURVEY — SURVEYED, PLOTTED, NOTE BOOK, NO., TEMPLATE, AREAS, AREAS CHECKED, BY, DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, NOTE BOOK, NO., TEMPLATE, AREAS, AREAS CHECKED, 100' STATIONS INTERPOLATED, BY, DATE

HIGHWAY FEDERAL AID SHEET
PLATE 3-FULL CROSS SECTION-FULL LINE
TRUESDINE
PRINTED IN U.S.A.

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

SHEET NO. 29 OF 65

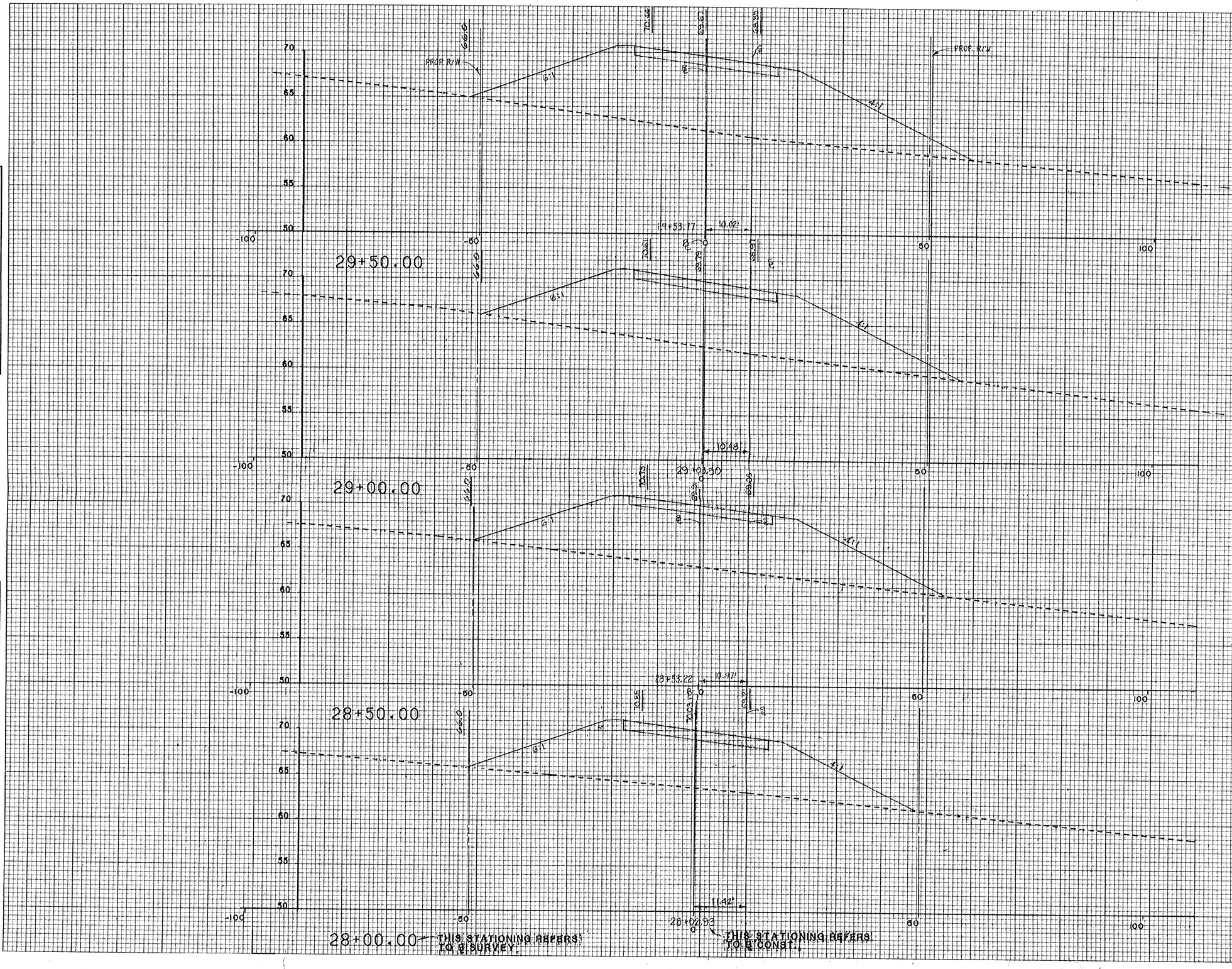
FOR AGENCY REVIEW ONLY

E543

NORMANDY BOULEVARD EXIENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	2		1429
0			711
	0		1241
0			629
	0		1113
0			572.5
	0		953
0			457



FINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — AREAS — NOTE BOOK — NO. — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — AREAS — NOTE BOOK — NO. — AREAS CHECKED — BY — DATE — 29+00 STA'S INTERPOLATED

TELEDYNE POST

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED — DRAWN — CHECKED — APPROVED — DATE 6/83 — SCALE AS NOTED — SHEET NO 30 OF 95

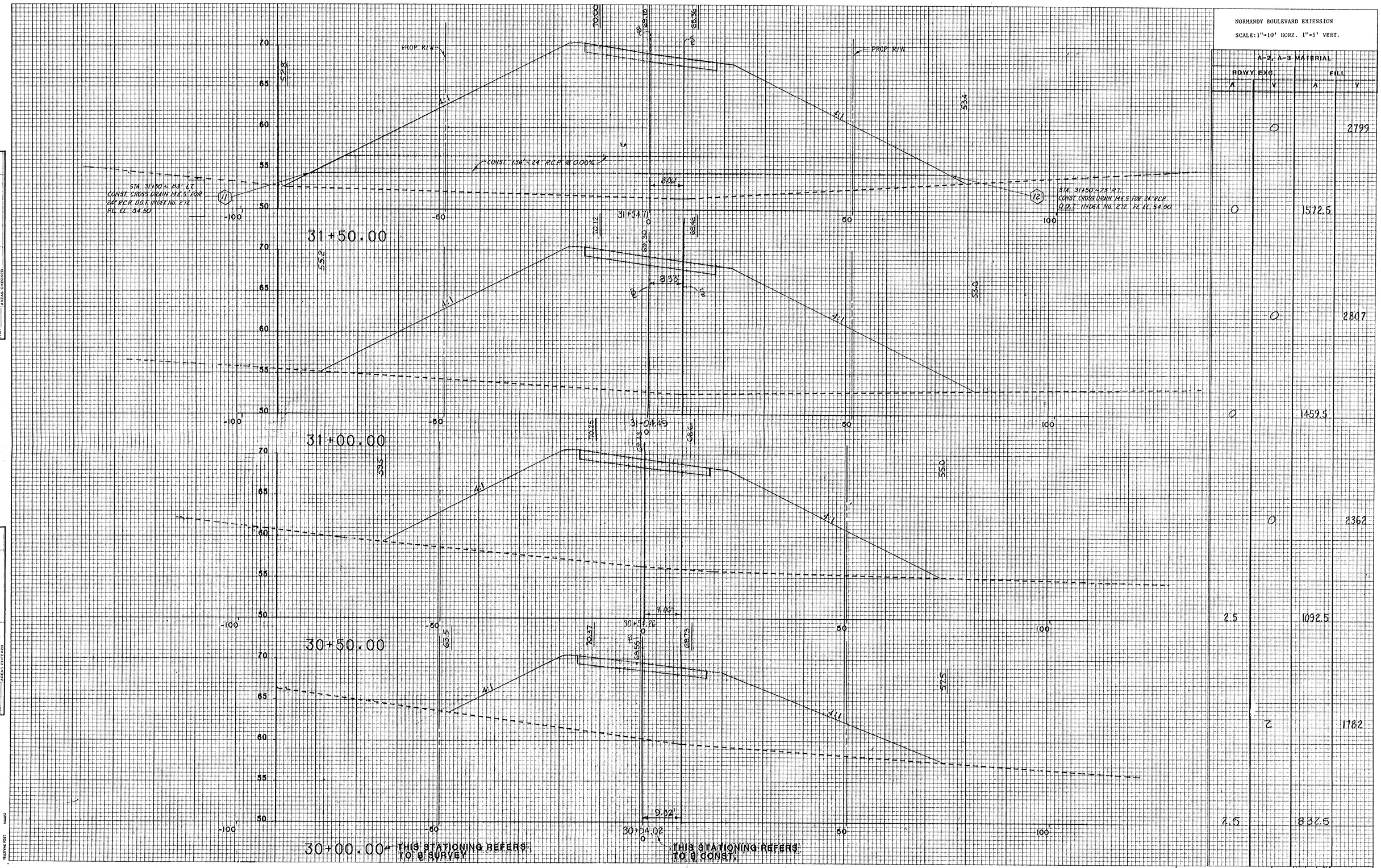
FOR AGENCY REVIEW ONLY

E544

NORMANDY BOULEVARD EXIENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	0		2799
0			1572.5
	0		2807
0			1452.5
	0		2362
2.5			1092.5
	2		1782
2.5			832.5



THIS STATIONING REFERS TO @ SURVEY

THIS STATIONING REFERS TO @ CONSTR.

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, CROSS CHECKED, NOTE BOOK, NO., BY, DATE

ORIGINAL SURVEY — SURVEYED ±20.00 DATA'S PLOTTED AS SHOWN, TEMPLATE, AREAS, CROSS CHECKED, NOTE BOOK, NO., BY, DATE

TELDYNE POST 76682

GRACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	AEP	DATE	1-83	SCALE	SHEETING
DRAWN	JNC	DATE	11-83	NOTED	31
CHECKED	RCS	DATE	11-83	HOR.	
APPROVED	EGB	DATE	11-83	VER.	

FOR AGENCY REVIEW ONLY

E545

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	0		1784
0			1185
	0		2469
0			1501
	0		2678
0			1391.5
	0		2631
0			1450

33+50.00

32+50.00

33+00.00

32+00.00

THIS STATIONING REFERS TO R SURVEY

THIS STATIONING REFERS TO R CONST.

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY, DATE — NOTE BOOK, NO.

ORIGINAL SURVEY — SURVEYED ◆20.00 STA'S INTERPOLATED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY, DATE — NOTE BOOK, NO.

TELEPHONE POST NO653

GLADE & HADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	RT	DATE	1/83	SCALE	SHEETNO
DRAWN	VW	DATE	11/83	NOTED	32
CHECKED	CTG	DATE	11/83	JOB NO.	80332-1
APPROVED	FJD	DATE	11/83		

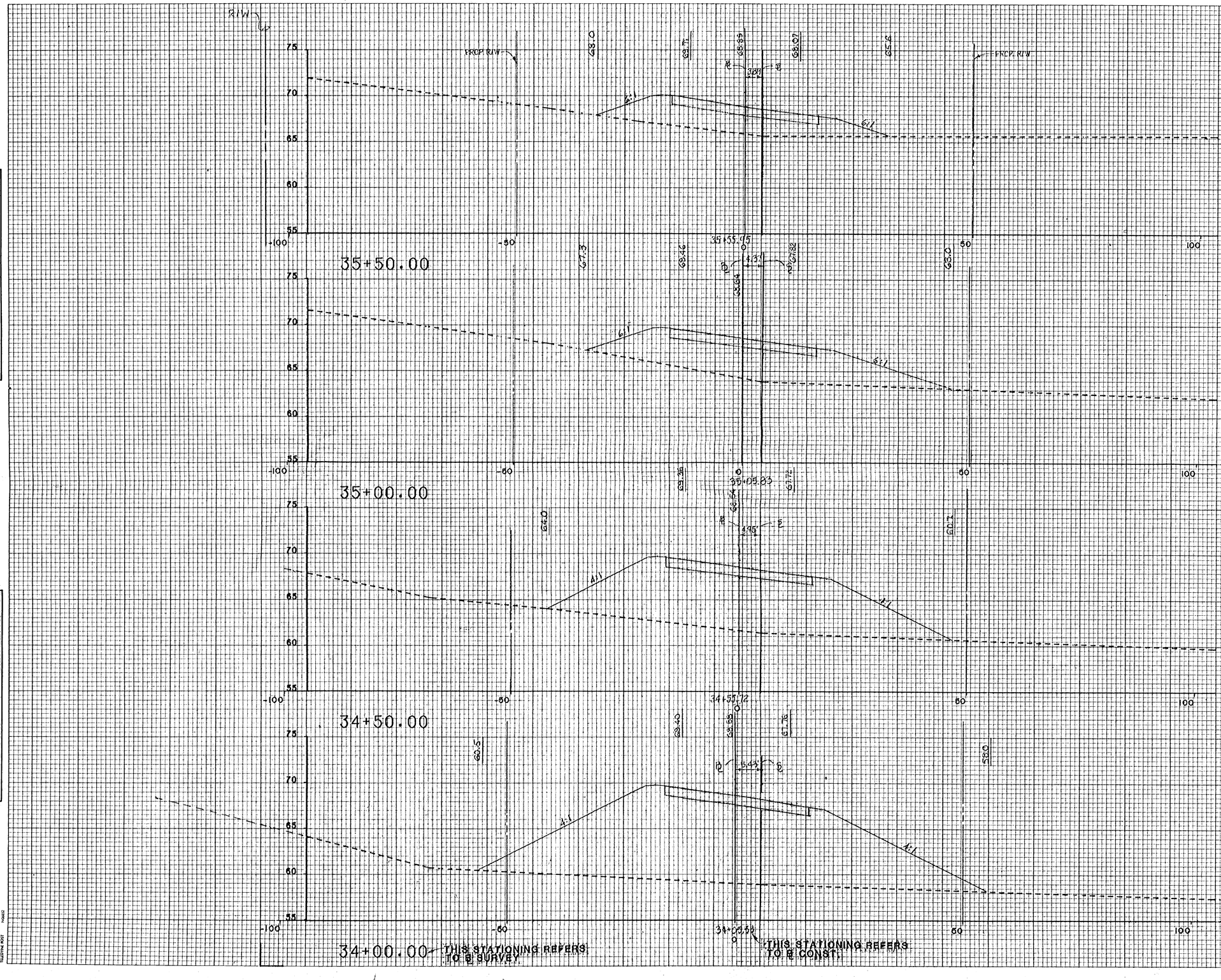
FOR AGENCY REVIEW ONLY

E546

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	19		129
0		104	
	0		287
0		205.5	
	0		631
0		476	
	0		1146
0		762	



FINAL SURVEY — SURVEYED BY; PLOTTED; TEMPLATE; AREAS; AREAS CHECKED; NOTE BOOK NO.; DATE

ORIGINAL SURVEY — SURVEYED; PLOTTED; TEMPLATE; AREAS; AREAS CHECKED; NOTE BOOK NO.; BY; DATE; 1-30-06 SEA'S INTERPOLATED

TELEDYNE POST N9602

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

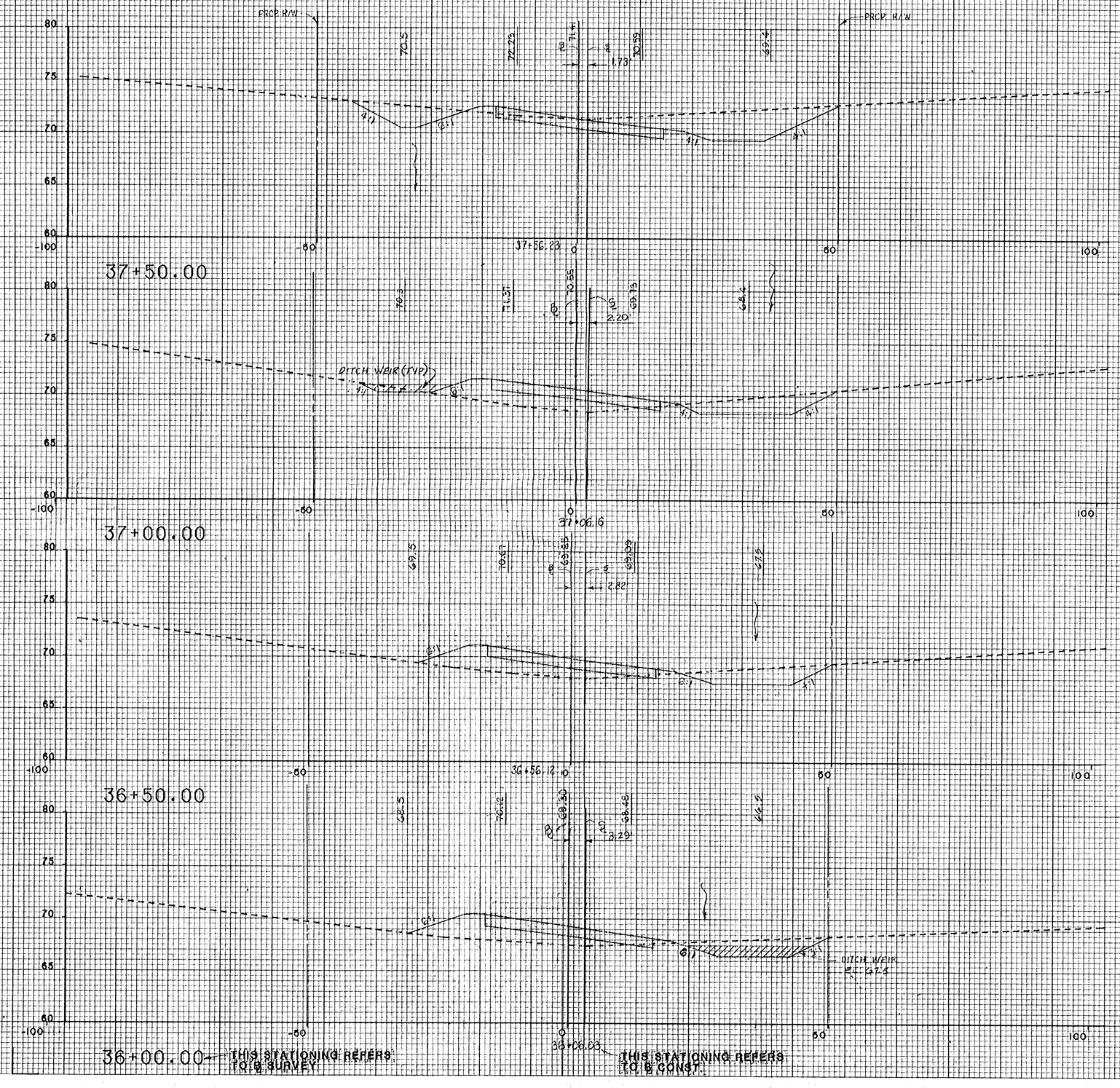
DESIGNED	AT	DATE	1/33	SCALE
DRAWN	JVC	DATE	1/33	NOTED
CHECKED	RES	DATE	1/33	DWG NO. 33
APPROVED	ELD	DATE	1/33	SHEET NO. 31524 OF 205

FOR AGENCY REVIEW ONLY

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	398		14
136		15.5	
	173		56
50.5		45.5	
	79		85
35		46	
	51		75
20		35	



FINAL SURVEY — BY: — DATE: — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — NOTE BOOK — NO.

ORIGINAL SURVEY — BY: — DATE: — SURVEYED — PLOTTED — ± 50.00 S.F.A.'S INTERPOLATED — TEMPLATE — AREAS — AREAS CHECKED — NOTE BOOK — NO.

TELEPEN 4051 74662

BLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

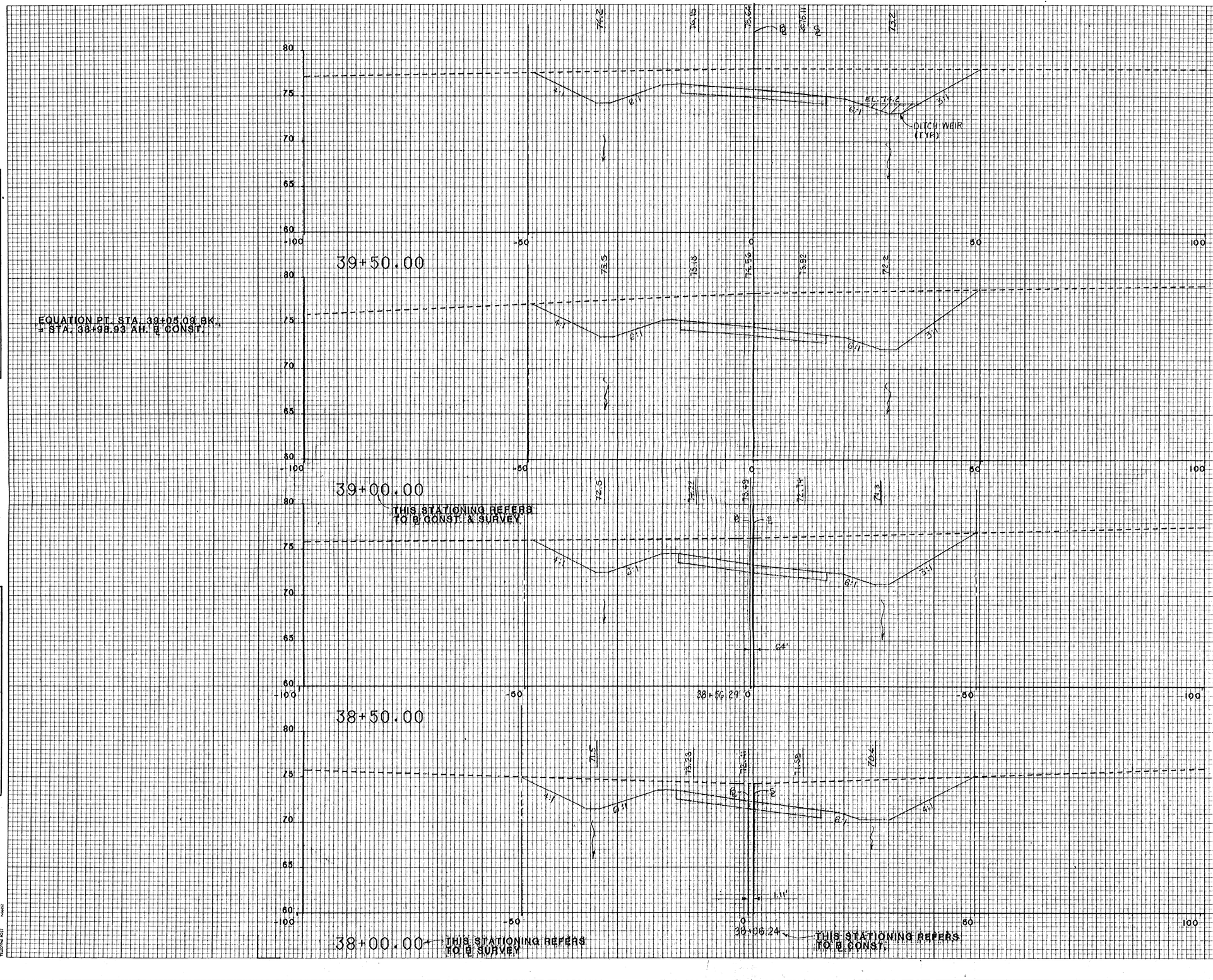
DESIGNED ATH — DRAWN SAV — CHECKED EJD — APPROVED — DATE 11/73 — SCALE NOTED — SHEET NO. 34

FOR AGENCY REVIEW ONLY

E548

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	476		0
283		0	
	936		0
399		0	
	661		0
318		0	
	567		0
291		0	

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE — NOTE BOOK — NO.

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED — BY — DATE — NOTE BOOK — NO. — X-90.00 STA'S INTERPOLATED

TELEPHONE POST — TELEGRAPH POST

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	KTC	DATE	
DRAWN	JHS	DATE	
CHECKED	CBS	DATE	
APPROVED	EDJ	DATE	

SCALE: AS NOTED — JOB NO. 3232.5 — SHEET NO. 35 OF 63

FOR AGENCY REVIEW ONLY

E549

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	615		0
271.5		0	
	378		3
	136.5		3.5
	281		3
	167.5		0
	365		0
	276.5		0

FINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED ± 20.00 STA'S INTERPOLATED — TEMPLATE — AREAS — AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

TELEPHONE POST 768-5

41+50.00

41+00.00

40+50.00

40+00.00 — THIS STATIONING REFERS TO E CONST. & SURVEY

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATH	DATE	1/72	SCALE	SHEET NO.
DRAWN	LMK	DATE	11/72	NONE	36
CHECKED	CEG	DATE	11/72	JOB NO.	OF 65
APPROVED	CED	DATE	1/73	21934	

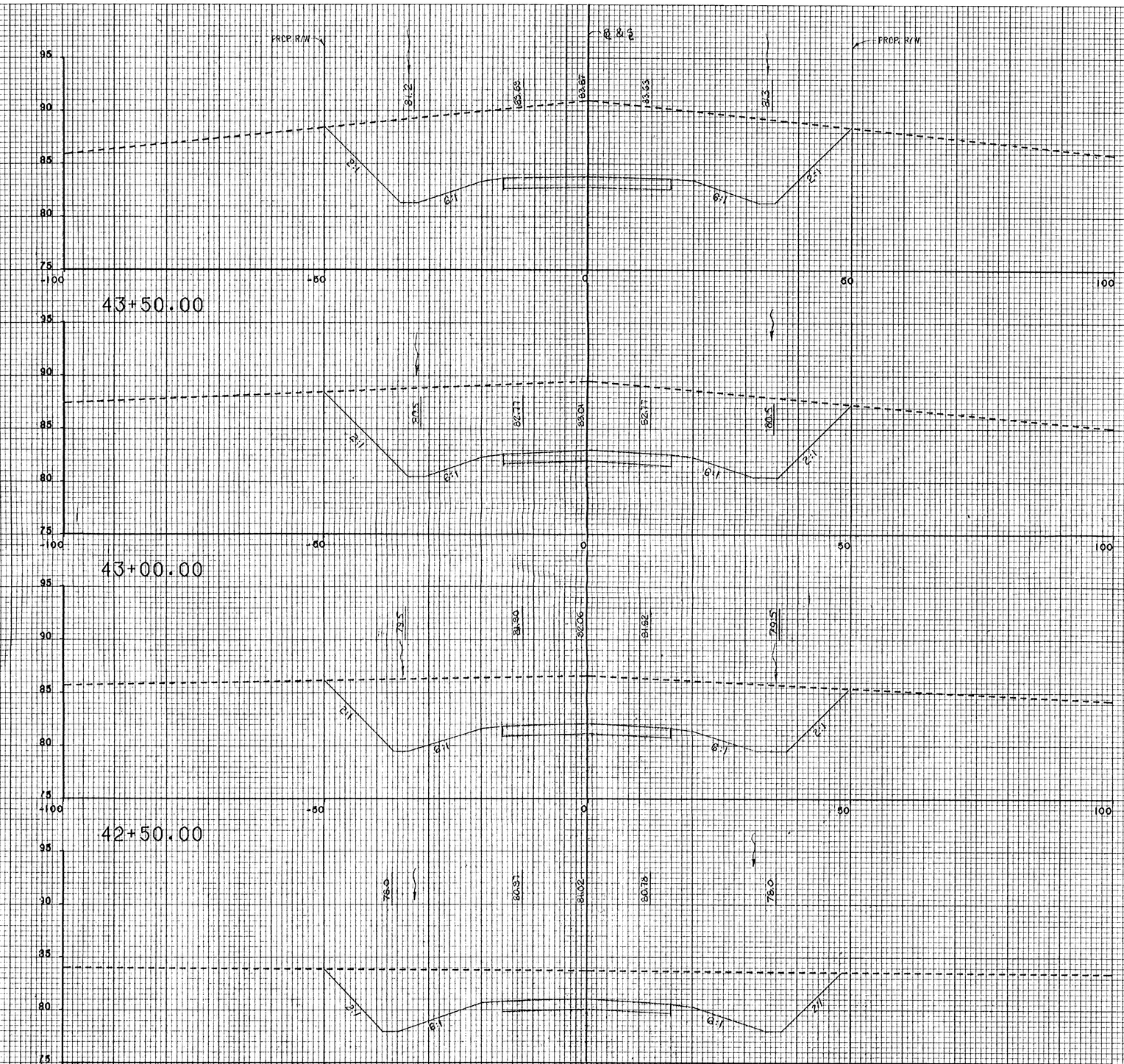
FOR AGENCY REVIEW ONLY

E550

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
BDWY EXC.		FILL	
A	V	A	V
	1732		0
1180		0	
	2169		0
1163		0	
	1528		0
437		0	
	814		0
392.5		0	



THIS STATIONING REFERS TO E. CONST. & SURVEY

FINAL SURVEY
SURVEYED BY
PLOTTED DATE
TEMPLATE
NOTE BOOK
NO. AREAS CHECKED

ORIGINAL SURVEY
SURVEYED ±50.00 STA.'S INTERPOLATED
PLOTTED
TEMPLATE
NOTE BOOK
NO. AREAS CHECKED

TELEPHONE POST MONUMENT

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ATA	DATE	1/33	SCALE	SHEET NO
DRAWN	CAC	DATE	1/33	N.A.S.	37
CHECKED	LCO	DATE	1/33	JOB NO.	OF 64
APPROVED	R.C.D	DATE	1/33	27824	

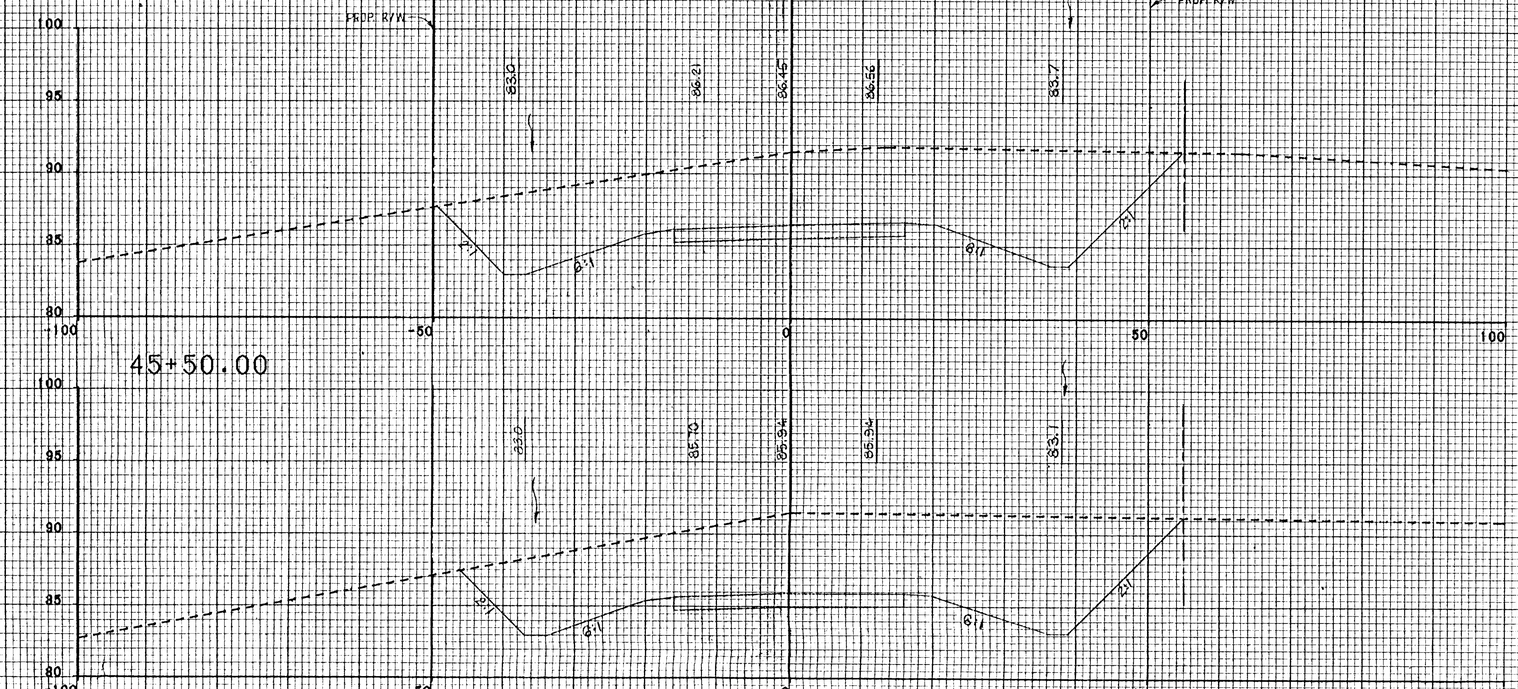
FOR AGENCY REVIEW ONLY

ES51

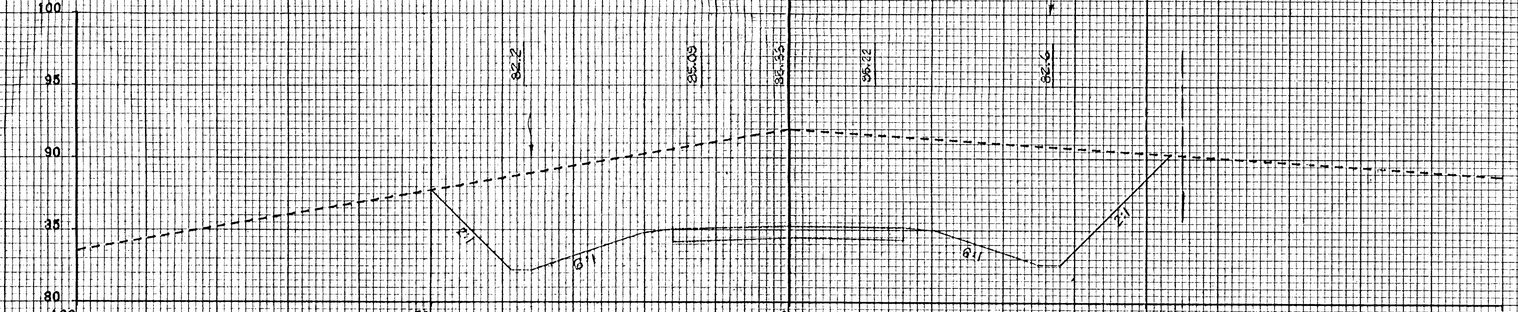
NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

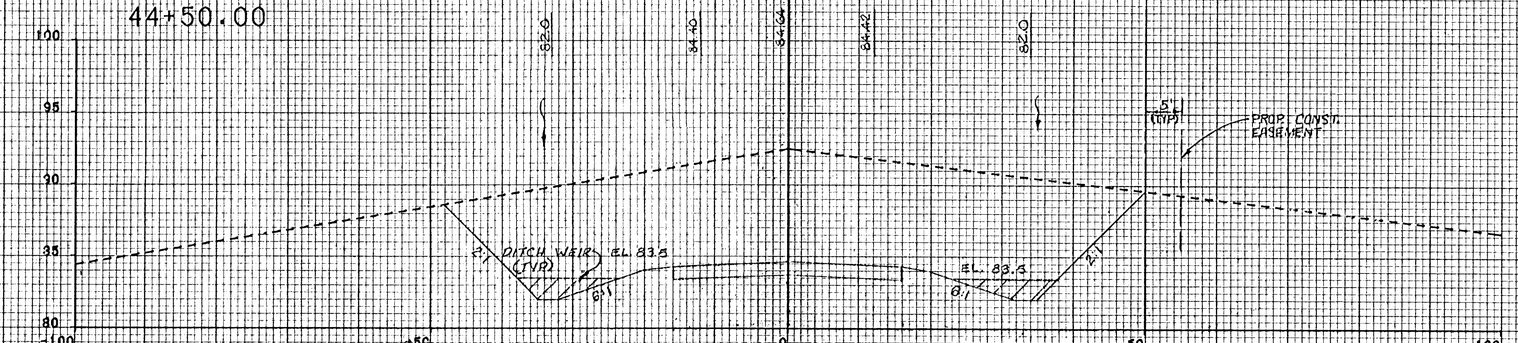
45+50.00



45+00.00



44+50.00



44+00.00 THIS STATIONING REFERS TO R CONST. & SURVEY

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	1049		0
553.5		0	
	1029		0
557.5		0	
	1063		0
590		0	
	1136		0
690.5		0	

FINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED ±50.00 STA'S INTERPOLATED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — NOTE BOOK — NO. — BY — DATE

TELEPHONE POST

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

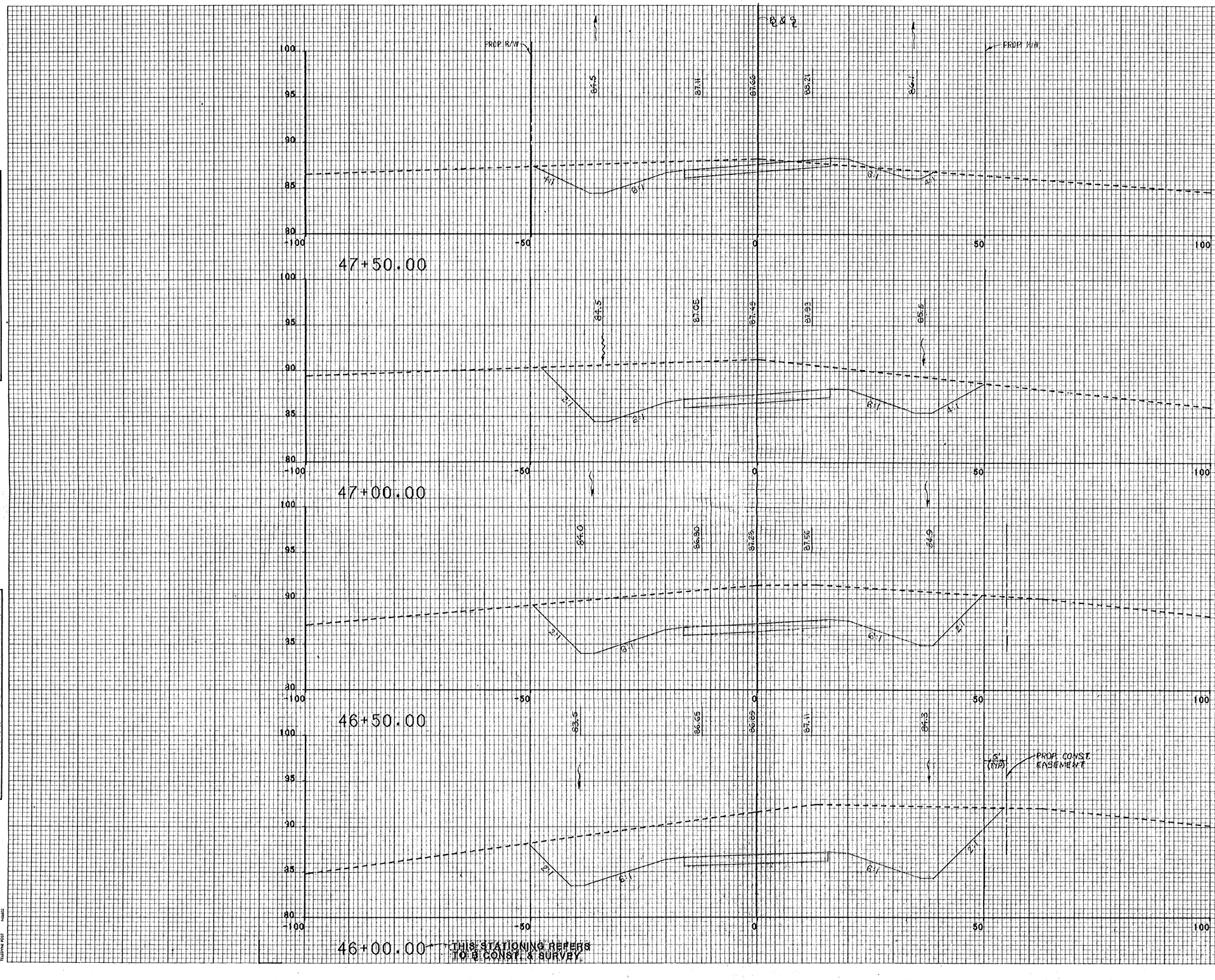
DESIGNED	APA	DATE	11-73	SCALE	SHEET NO
DRAWN	JAC	DATE	11-73	HORIZ.	NOTED
CHECKED	RG	DATE	11-73	VERT.	38
APPROVED	RG	DATE	11-73	3/524	55

FOR AGENCY REVIEW ONLY

E552

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	102		164
108		1.5	
	463		1
392.5		0	
	757		0
425		0	
	930		0
579.5		0	

FINAL SURVEY
SURVEYED
PLOTTED
TEMPLATE
AREAS
NOTE BOOK
NO.
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
SURVEYED
PLOTTED
TEMPLATE
AREAS
NOTE BOOK
NO.
AREAS CHECKED
BY
DATE
@ 50.00 SAA'S INTERPOLATED

THIS STATIONING REFERS TO E CONST. & SURVEY

TELEDYNE POST

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

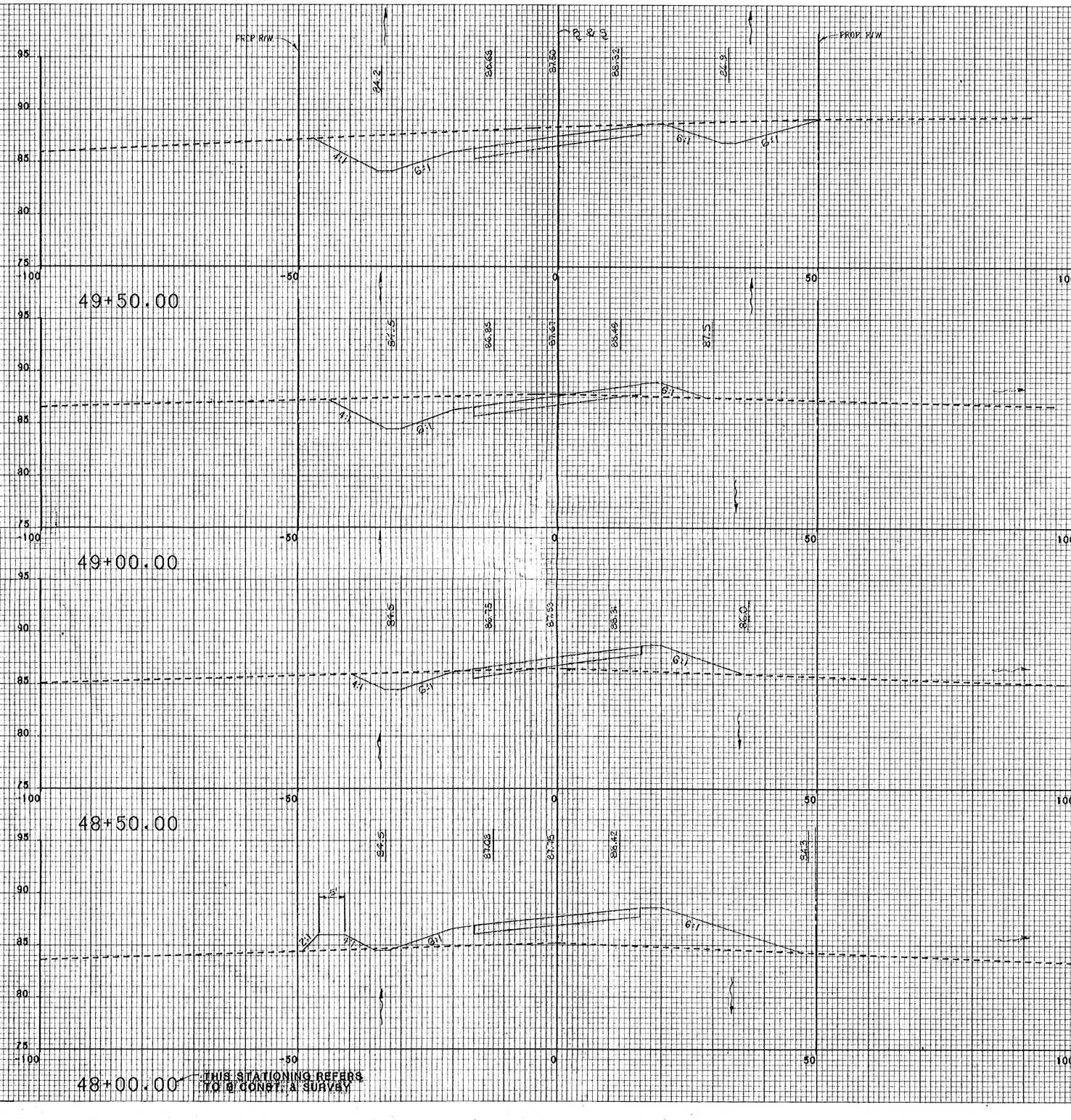
DESIGNED	ATH	DATE	11/83	SCALE	SHEET NO
DRAWN	JWL	DATE	11/83	NOTED	37
CHECKED	SGS	DATE	11/83	JOB NO	OF 65
APPROVED	R.D	DATE	11/83	837525	

FOR AGENCY REVIEW ONLY

E553

NORMANDY BOULEVARD EXIENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A=2, A-3 MATERIAL

RDWY EXC.		FILL	
A	V	A	V
	406		0
1875		0	
	269		13
103		13.5	
	144		53
53		44	
	51		203
2.5		115.5	

FINAL SURVEY
SURVEYED BY
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
NOTE BOOK NO.
DATE

ORIGINAL SURVEY
SURVEYED +50.00 STA'S INTERPOLATED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
NOTE BOOK NO.
BY
DATE

TELEDYNE POST N9602

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

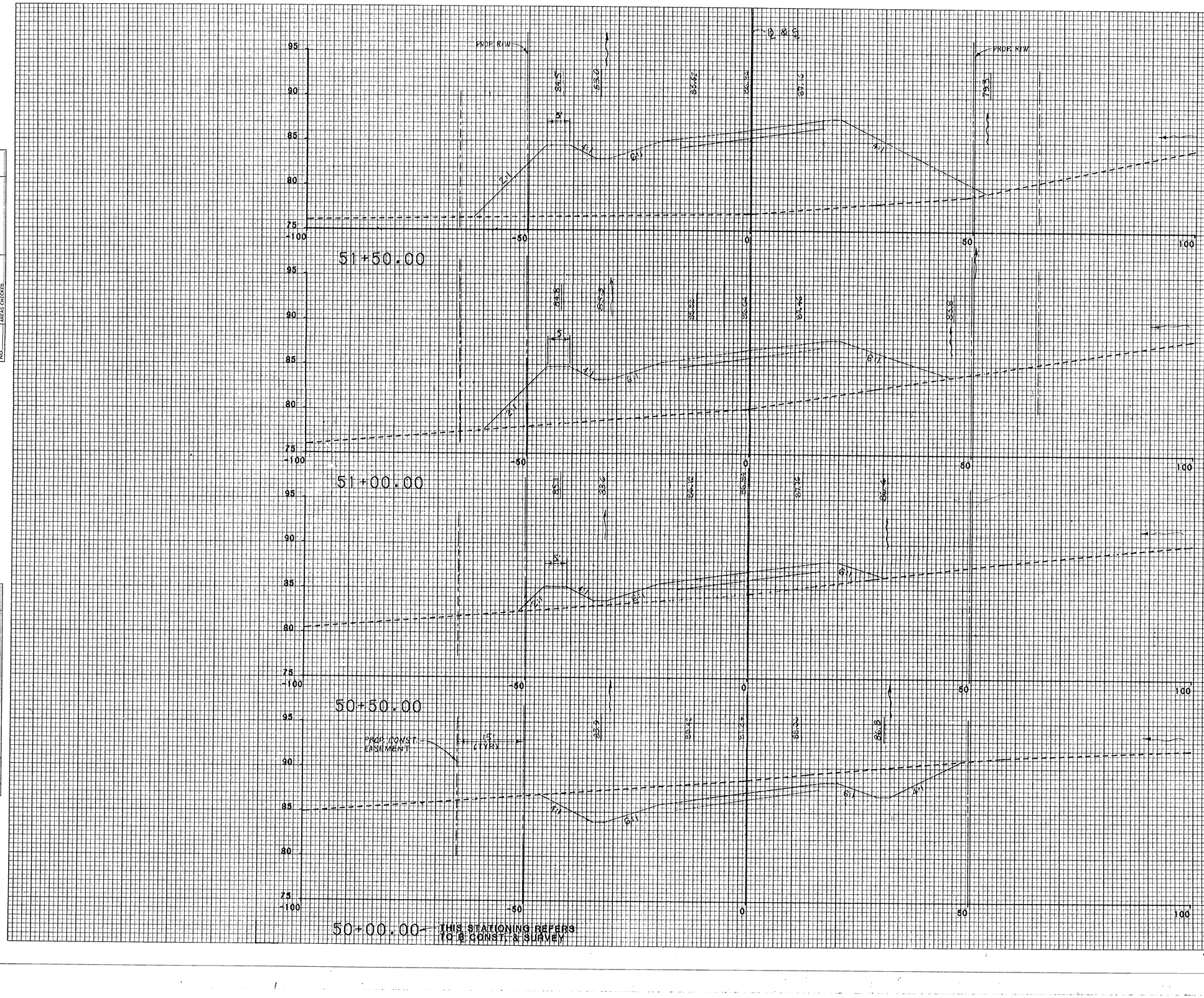
DESIGNED	ATF	DATE 6-33	SCALE NOTED
DRAWN	JJC	DATE 6/35	SHEET NO 40
CHECKED	EEG	DATE 11/02	JOB NO 81524
APPROVED	ELD	DATE 11/20	65

FOR AGENCY REVIEW ONLY

ES54

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



	A-2, A-3 MATERIAL			
	ROWY EXC.		FILL	
	A	V	A	V
		Q		1696
		Q		762
		Q		1161
		0		495
		0		569
		0		123.5
		232		114
		251		0

FINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK — NO. — SURVEYED — PLOTTED +50.00 — TEMPLATE — AREAS — AREAS CHECKED — BY S.A.'S INTERPOLATED — DATE

42-127-1035 ANC

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS ST. PETERSBURG & MAITLAND, FLORIDA

DESIGNED	ATH	DATE	11/83
DRAWN	JAL	DATE	11/83
CHECKED	CEG	DATE	11/83
APPROVED	ELD	DATE	11/21/83

SCALE: HORIZ. 1"=10' VERT. 1"=5' — SHEET NO. 41 OF 65

FOR AGENCY REVIEW ONLY

ATLER SERVICE & SUPPLY 665-5113

E555

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROVVY EXC.		FILL	
A	V	A	V
	0		1051
0		1275	
	0		1269
	0	1074.5	
	0		2026
	0	1018	
	0		2026
	0	1070	

53+50.00

53+00.00

52+50.00

52+00.00

PROP. R/W

PROP. CONST. EASEMENT

CONST. 101' x 24" R.C.P. @ 0.00% ↓

STA. 52+00.00 ℄ CONST. CROSS DRAIN PIPES FOR 24" RCP DOT INDEX NO. 272 FL. EL. 73.50

STA. 52+00.00 ℄ CONST. CROSS DRAIN PIPES FOR 24" RCP DOT INDEX NO. 272 FL. EL. 73.50

THIS STATIONING REFERS TO ℄ CONST. & SURVEY

ORIGINAL SURVEY — SURVEYED — PLOTTED — NOTE BOOK — NO. — DATE — BY — *50.00 STA.'S INTERPOLATED — TEMPLATE — AREAS — AREAS CHECKED

FINAL SURVEY — SURVEYED — PLOTTED — NOTE BOOK — NO. — DATE — BY — TEMPLATE — AREAS — AREAS CHECKED

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS ST. PETERSBURG — MARTLAND — FLORIDA

DESIGNED	ATH	DATE	5/83	SCALE	SHEET NO
DRAWN	JAC	DATE	11/83	NOTED	42
CHECKED	SGS	DATE	11/83	JOB NO.	
APPROVED	ELD	DATE	11/83	81524	OF 65

ATLER SERVICE & SUPPLY 868-5113

FOR AGENCY REVIEW ONLY

E556

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
		300	6
52			5
		204	2
68			3
		66	156
		3	61
		3	627
0			408

FINAL SURVEY
SURVEYED BY
PLOTTED
NOTE BOOK TEMPLATE
AREAS
NO. AREAS CHECKED
DATE

ORIGINAL SURVEY
SURVEYED
PLOTTED +50.00 STA.'S INTERPOLATED
NOTE BOOK TEMPLATE
AREAS
NO. AREAS CHECKED
BY
DATE

55+50.00

55+00.00

54+50.00

54+00.00 THIS STATIONING REFERS TO R CONST. & SURVEY

PROP. R/W

PROP. CONST. EASEMENT

15' (TYP.)

PROP. CONST. EASEMENT

90 85 80 75 -100 -50 0 50 100

ATLER SERVICE & SUPPLY 865-5113

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS ST. PETERSBURG & MAITLAND, FLORIDA

DESIGNED	AEH	DATE	11/85
DRAWN	WL	DATE	11/85
CHECKED	ECD	DATE	11/85
APPROVED	ECD	DATE	11/85

SCALE NOTED
JOB NO. 21524
SHEET NO. 43 OF 95

FOR AGENCY REVIEW ONLY

E557

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

	A-2, A-3 MATERIAL			
	ROWY EXC.		FILL	
	A	V	A	V
		118		50
	10.5		36	
		56		101
	20.5		79.5	
		48		92
	3E		20	
		188		20
	72		1.5	

FINAL SURVEY
NOTE BOOK
NO.
SURVEYED BY
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED +20.00 STA.'S INTERPOLATED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

57+50.00

57+00.00

56+50.00

56+00.00 THIS STATIONING REFERS TO R CONST. & SURVEY

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND FLORIDA

DESIGNED	ATH	DATE 1/73	SCALE Noted
DRAWN	JAL	DATE 1/73	SHEET NO 44
CHECKED	VEG	DATE 1/73	JOB NO 21524
APPROVED	ELD	DATE 1/73	OF 65

FOR AGENCY REVIEW ONLY

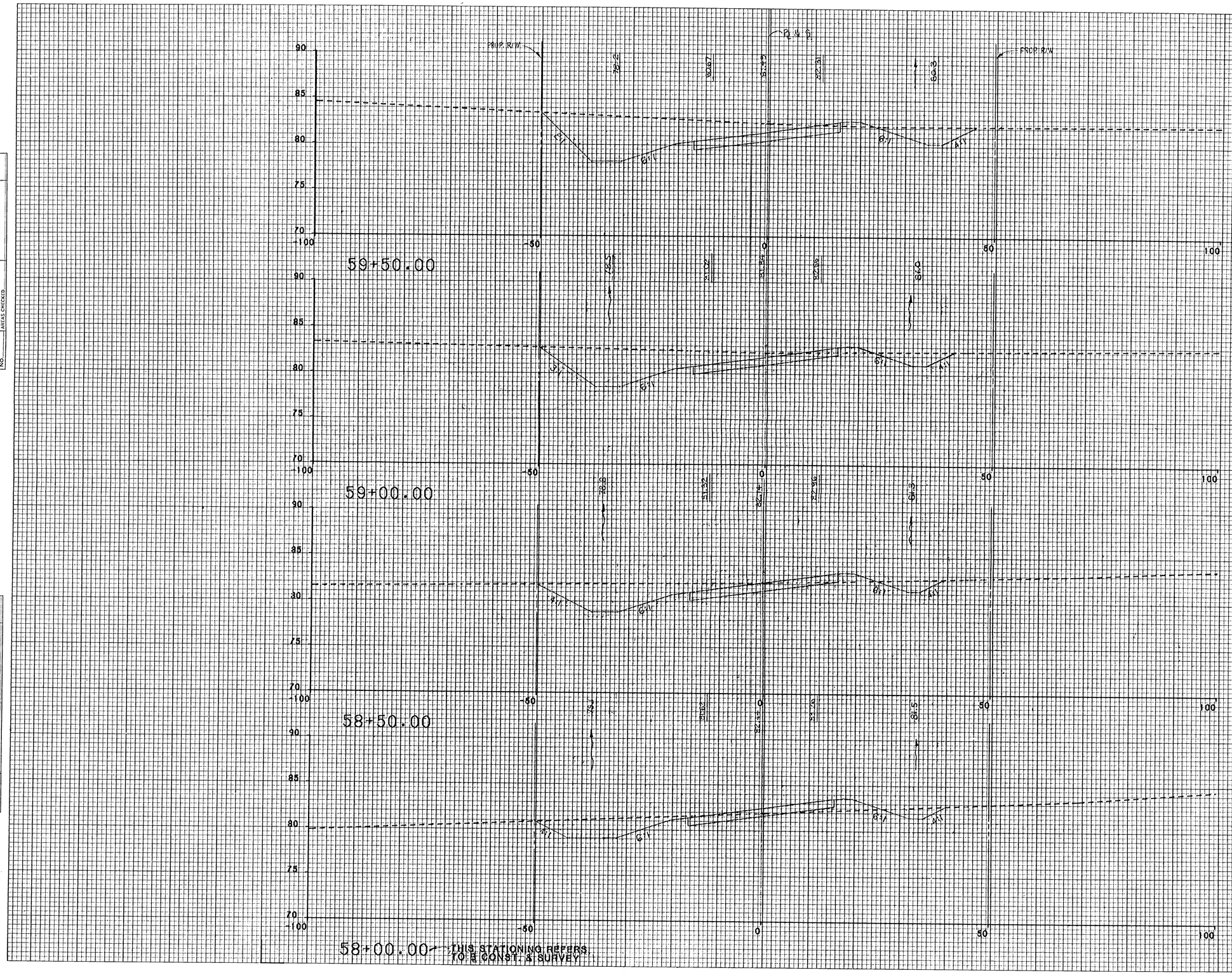
SERVICE & SUPPLY 888-5113

E558

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	150		6
228.5		5	
	353		1
153		2.5	
	245		9
	112		7.5
	181		24
	865		18.5



FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED +50.00 STA'S INTERPOLATED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

DESIGNED	ATH	DATE	6/33	SCALE	SHEET NO
DRAWN	JAL	DATE	11/33	NOTED	45
CHECKED	EGS	DATE	11/33	JOB NO	
APPROVED	E.G.D	DATE	11/33	3524	65

FOR AGENCY REVIEW ONLY

SERVICE & SUPPLY 885-5113

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

	A-2, A-3 MATERIAL			
	HOWY EXC.		FILL	
	A	V	A	V
61+50.00	415	C		
	737.5	C		
61+00.00	1330	C		
	698.5	C		
60+50.00	1118	C		
	504.5	C		
60+00.00	709	I		
	252.5	I.5		

61+50.00

PROP R/W

PROP R/W

61+00.00

60+50.00

PROP CONST EASEMENT

20' (TYP.)

60+00.00 THIS STATIONING REFERS TO B CONST. & SURVEY

FINAL SURVEY

	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

ORIGINAL SURVEY

	BY	DATE
SURVEYED		
PLOTTED	±50.00 STA.'S INTERPOLATED	
NOTE BOOK	TEMPLATE	
NO.	AREAS	
	AREAS CHECKED	

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
MAITLAND, FLORIDA
ST. PETERSBURG

DESIGNED	ATH	DATE 1-79	SCALE NOTED
DRAWN	JAC	DATE 11-78	JOB NO.
CHECKED	RCG	DATE 11-78	791524
APPROVED	RCG	DATE 11-78	

SHEET NO. 46 OF 65

FOR AGENCY REVIEW ONLY

SERVICE & SUPPLY 865-5113

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
HOWY EXC.		FILL	
A	V	A	V
1188			D
664			D
1310			D
751			D
1414			D
776			D
1450			D
720.5			D

63+50.00

63+00.00

62+50.00

62+00.00 — THIS STATIONING REFERS TO PROPOSED CONST. & SURVEY

PROP. R/W

PROP. CONST. EASEMENT (TYP.)

DITCH WEIR (TYP.) ELEV. 7.10

FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED +50.00 STA.'S INTERPOLATED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & WESTLAND, FLORIDA

DESIGNED	JAF	DATE	10/55
DRAWN	JAC	DATE	11/55
CHECKED	JAG	DATE	11/55
APPROVED	ECG	DATE	11/55

SCALE
FOR
FOR

SHEET NO 47
OF 65

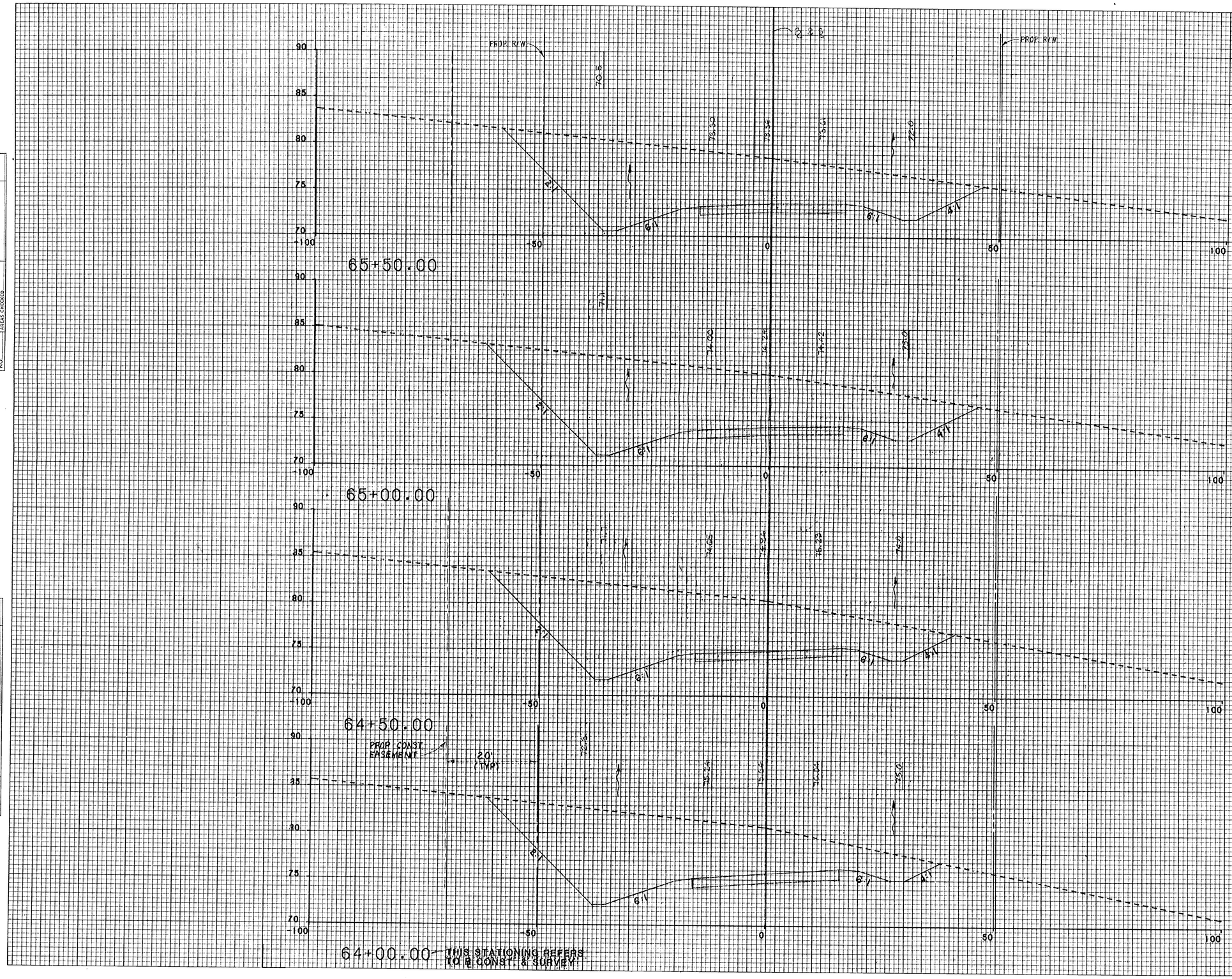
FOR AGENCY REVIEW ONLY

E561

STATLER SERVICE & SUPPLY 865-5113

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	1097		0
644.5	0		
	1261		0
	717		0
	1273		0
	658		0
	1138		0
	619		0

FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED +50.00 STA. TO STA. INTERPOLATED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

DESIGNED	AVT	DATE	11/83	SCALE	SHEET NO
DRAWN	JJC	DATE	11/83	None	48
CHECKED	EGC	DATE	11/83	JOB NO	
APPROVED	ELD	DATE	11/83	81524-65	

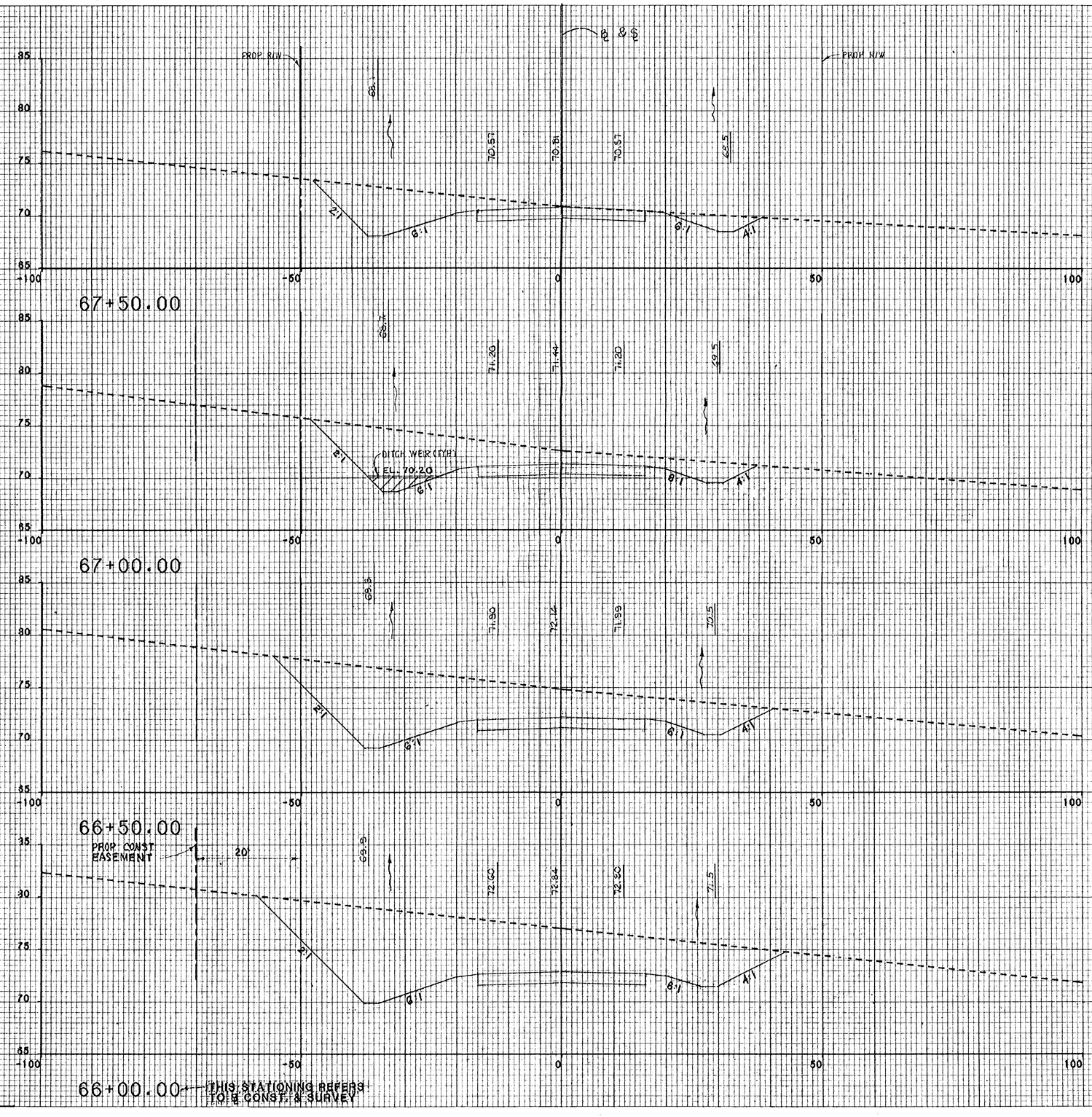
FOR AGENCY REVIEW ONLY

SERVICE & SUPPLY 888-5113

E562

NORMANDY BOULEVARD EXIENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	276		13
168.5		0	
	413		0
277		0	
	632		0
105.5		0	
	876		0
540.5		0	

FINAL SURVEY — NOTE BOOK NO. ___ — SURVEYED — PLOTTED — TOPO. AC. — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED #50.00 SEALS INTERPOLATED — TOPO. AC. — AREAS — AREAS CHECKED — NOTE BOOK NO. ___ — BY — DATE

TRACING POST — MYLAR

GLACE & RADCLIFFEE, INC. CONSULTING ENGINEERS

DESIGNED	A.T.	DATE	11/83	SCALE	SHEET NO.
DRAWN	JK	DATE	11/83	NOTED	49
CHECKED	JK	DATE	11/83	JOB NO.	
APPROVED	ECD	DATE	11/83	375-84	

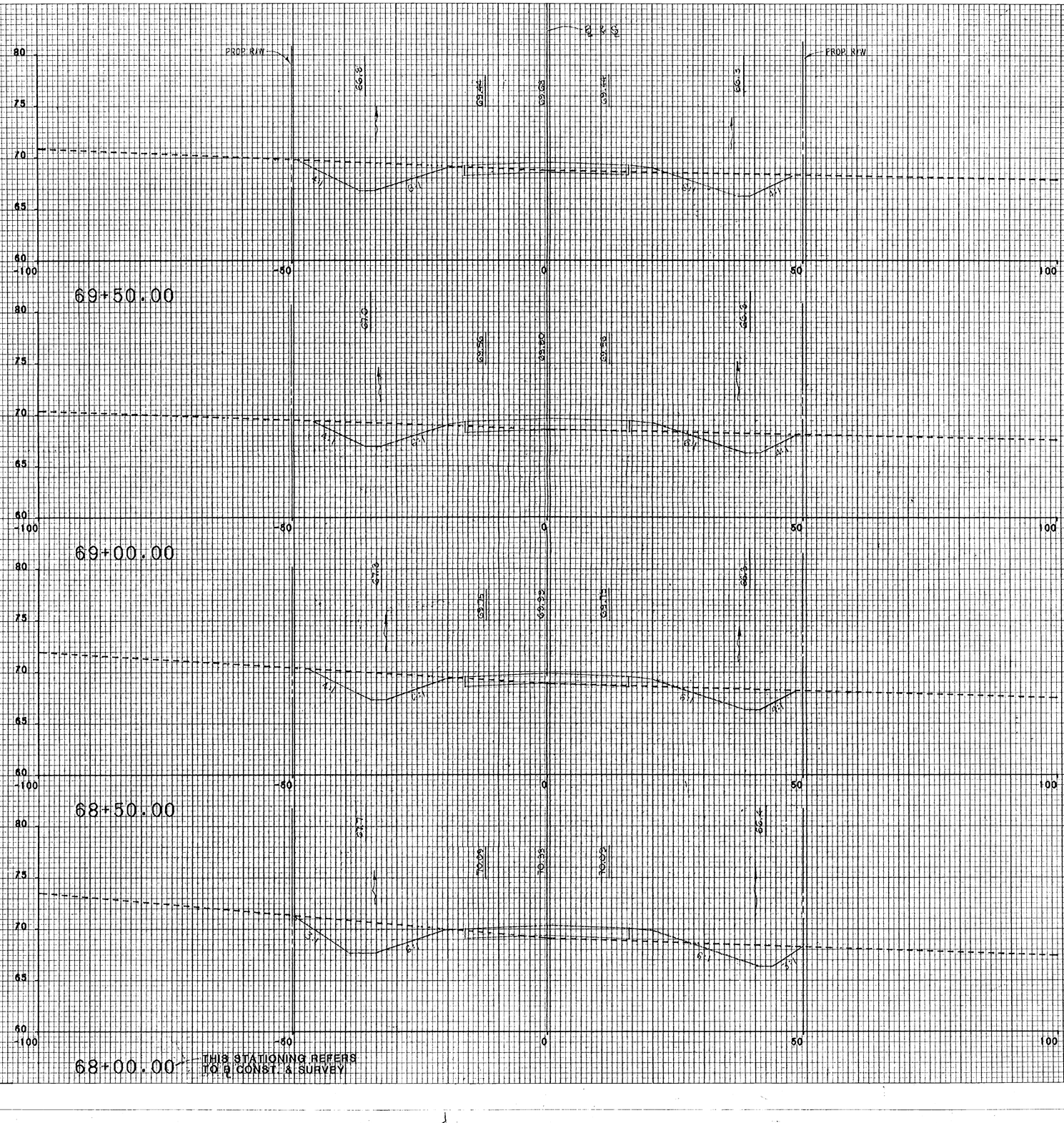
FOR AGENCY REVIEW ONLY

E563

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	177		7
91		4	
	146		9
66.5		6	
	133		11
77.5		5.5	
	154		18
88.5		13.5	



THIS STATIONING REFERS TO Ø CONST. & SURVEY

FINAL SURVEY
SURVEYED
PLOTTED
NOTE BOOK
TEMPLATE
AREAS
NO.
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
SURVEYED
PLOTTED +50.00 STA'S INTERPOLATED
NOTE BOOK
TEMPLATE
AREAS
NO.
AREAS CHECKED
BY
DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS
ST. PETERSBURG & MAITLAND, FLORIDA

DESIGNED	AJH	DATE	10/21
DRAWN	JJC	DATE	11/21
CHECKED	EEG	DATE	11/21
APPROVED	EEG	DATE	11/21

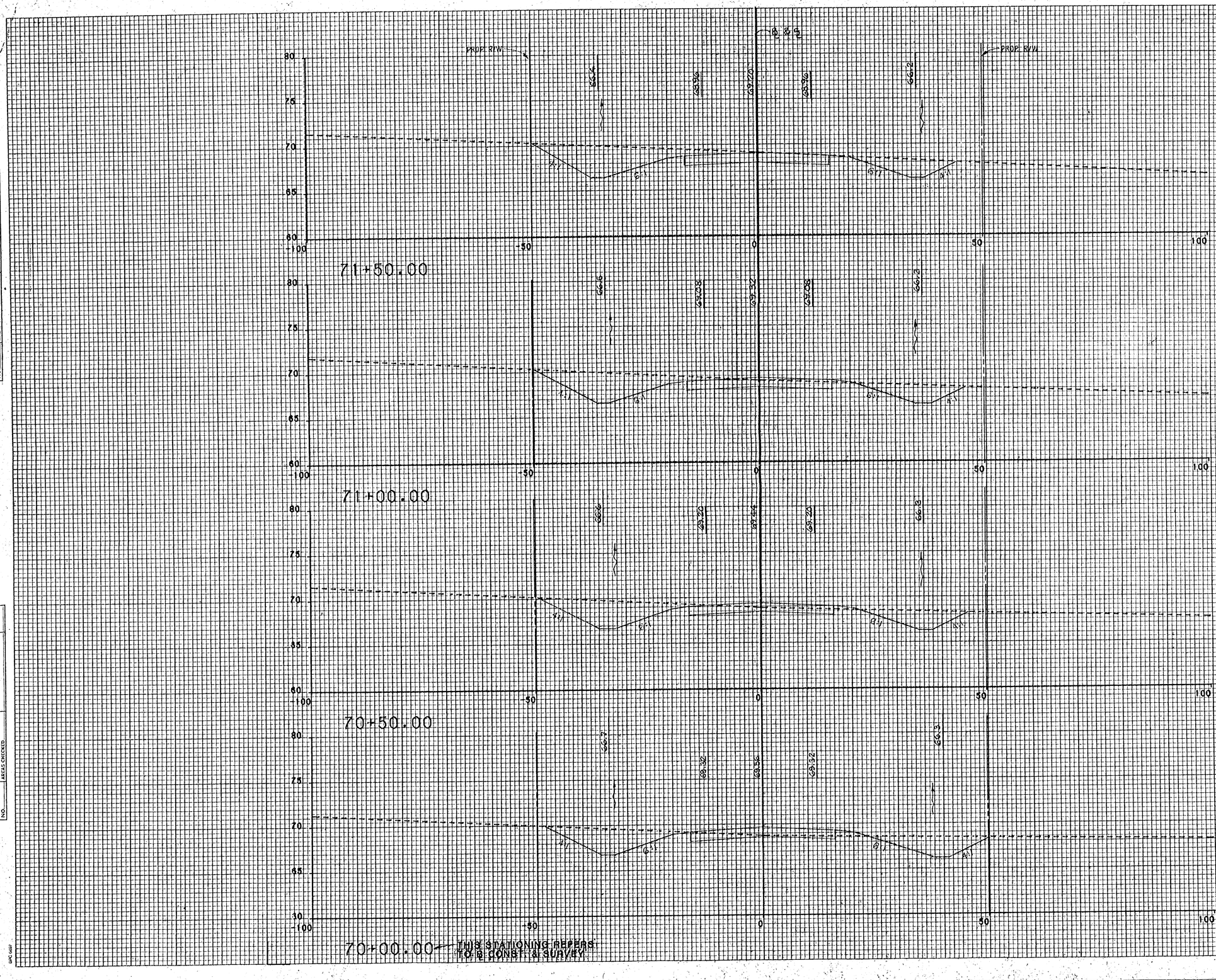
SCALE: AS NOTED
SHEET NO. 50
JOB NO. 27524.05

FOR AGENCY REVIEW ONLY

STATLER SERVICE & SUPPLY 885-5113

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	275		0
149		0	
	259		0
13		0	
	227		1
114		1.5	
	199		5
160.5		3.5	

FINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED		
NOTE BOOK		
NO.		

ORIGINAL SURVEY	DATE	BY
SURVEYED		
PLOTTED 450.00 SQ. IN. UNDESCRIBED		
NOTE BOOK TEMPLATE		
NO. ITEMS AREAS CHECKED		

GPC 668

GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS

DESIGNED	ABL	DATE	10/63
DRAWN	LAL	DATE	11/63
CHECKED	CEG	DATE	11/63
APPROVED	R.L.	DATE	11/63

SCALE: NOTED

SHEET NO. 31

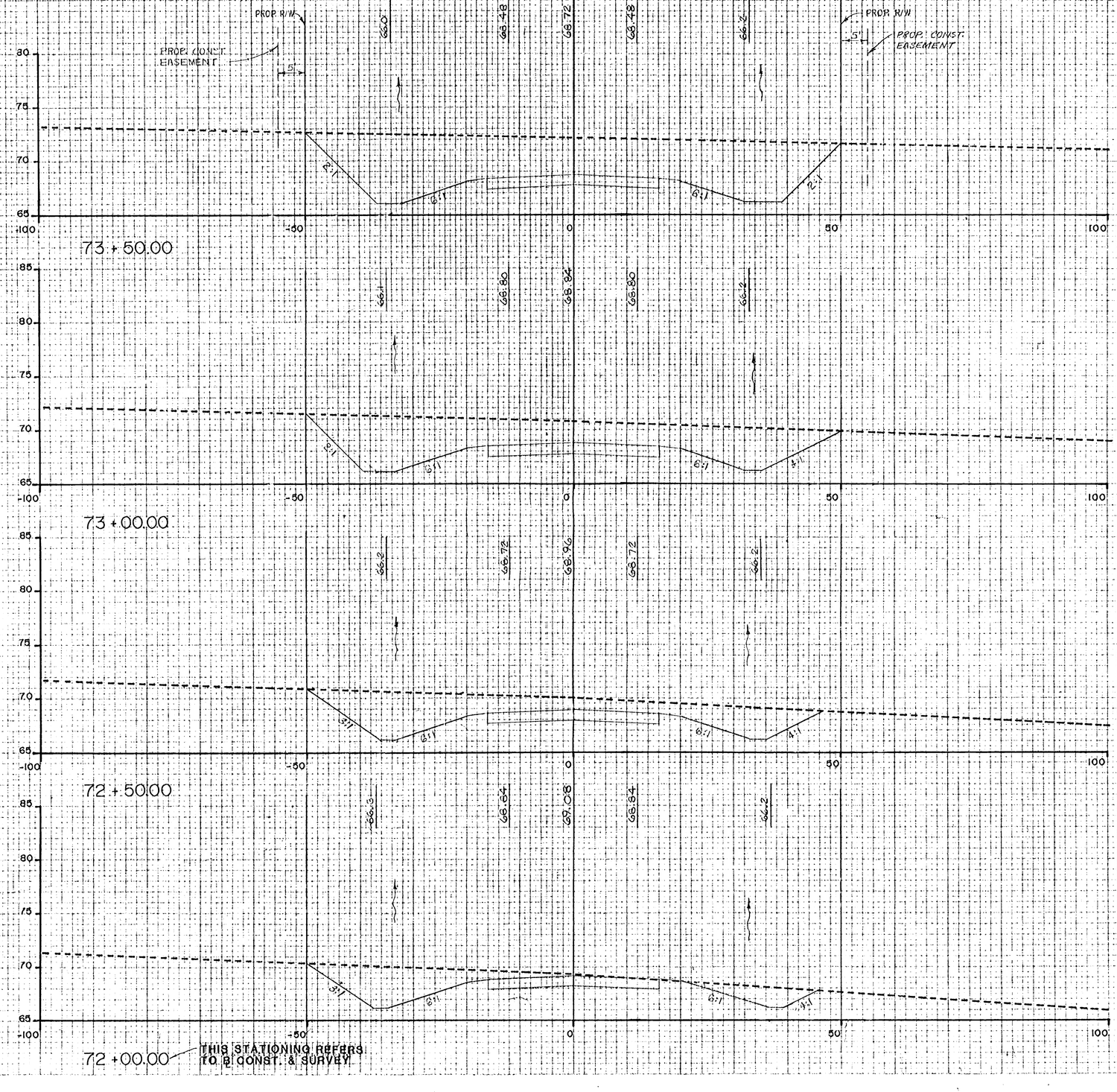
0+00 31+75.65

FOR AGENCY REVIEW ONLY

E565

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.



A-2, A-3 MATERIAL			
RDWY. EXC.		FILL	
A	V	A	V
	1104		0
507.5		0	
	713		0
333		0	
	503		0
232		0	
	351		0
147.5		0	

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE DOOR		
AREAS		
NO	AREAS CHECKED	

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
NOTE DOOR		
AREAS		
NO	AREAS CHECKED	

GLACE & MIDDLEFFE INC

DES	
DR	
CK	
ENGR	

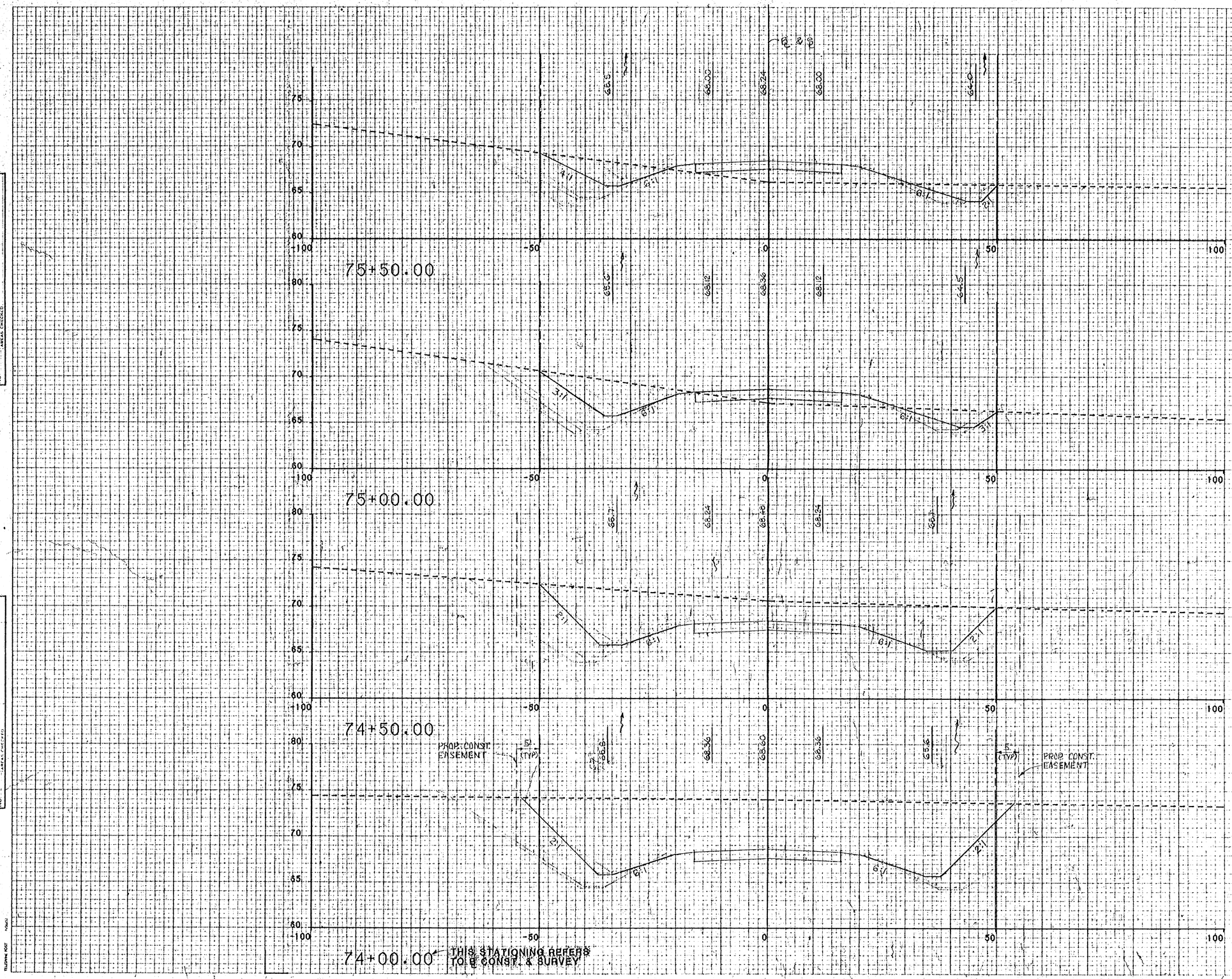
VOL NOTES 52
VOL 3737524 65

FOR AGENCY REVIEW ONLY

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	101		126
63.5		53	
	154		67
102.5		19.5	
	430		18
362		0	
	969		0
685		0	



TINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — NOTE BOOK — AREAS CHECKED — NO — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — NOTE BOOK — AREAS CHECKED — NO — BY — DATE — 10000 STAKES INTERPOLATED

PLACE & HAECKERFERR INC

ATH	PROB	NOTED	33
DES	WSB		
ECO	WSB		65

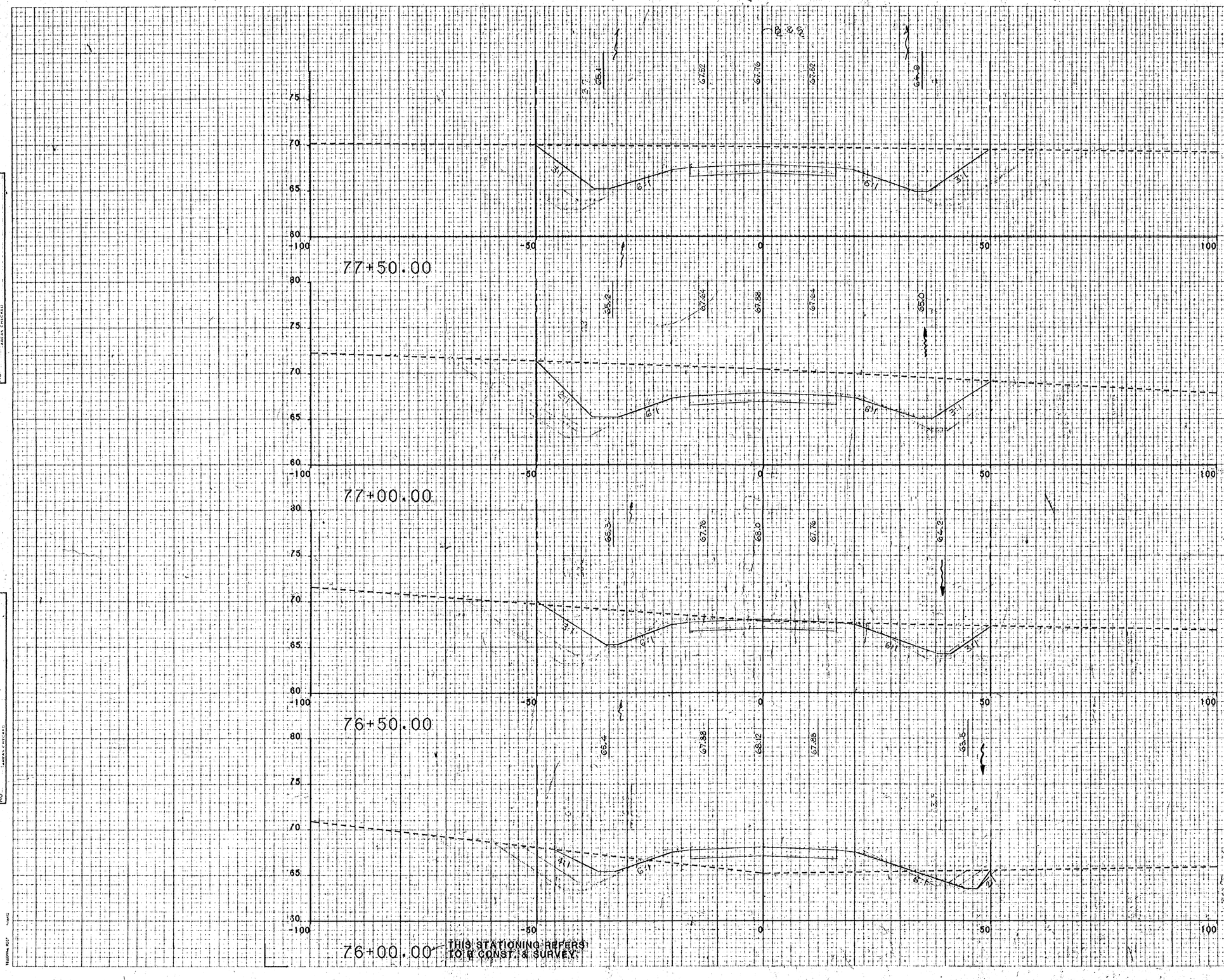
FOR AGENCY REVIEW ONLY

E567

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	553		0
	315		0
	621		0
	355.5		0
	487		0
	170		0
	200		43
	46		82.5



FINAL SURVEY — SURVEYED — PLOTTED — NOTE BOOK — TEMPLATE — AREAS — CHECKED — BY — DATE — NO

ORIGINAL SURVEY — SURVEYED IN PART — PLOTTED +50.00 STA'S INTERPOLATED — NOTE BOOK — TEMPLATE — AREAS — CHECKED — BY — DATE — NO

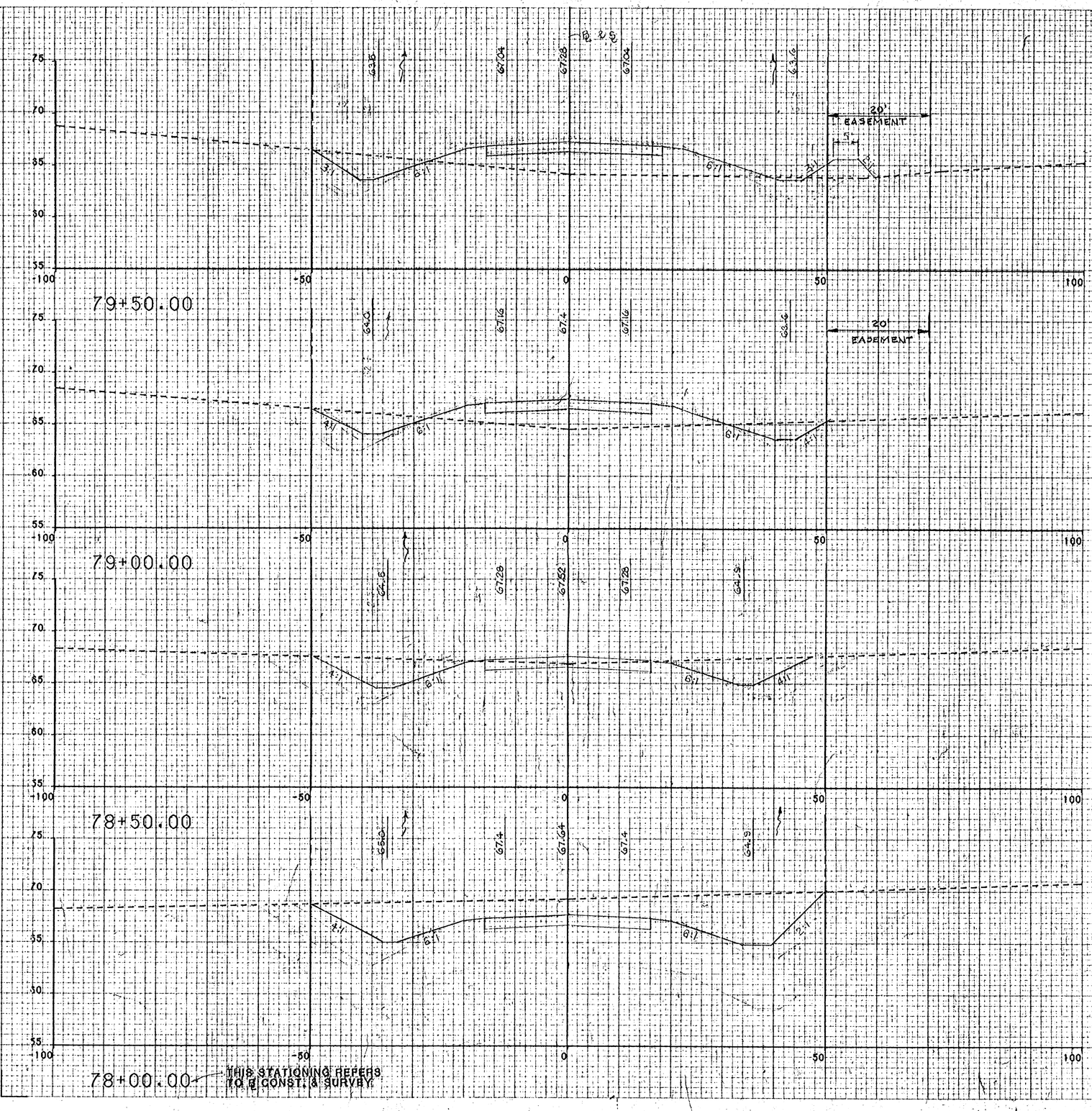
GRACE & CASSELLE INC. CONSULTING ENGINEERS

FOR AGENCY REVIEW ONLY

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	50		289
20		116	
	61		184
46		82.5	
152		76	
118		0	
	370		0
282		0	



FINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — AERIAL PHOTO — NOTE BOOK — NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — AERIAL PHOTO — NOTE BOOK — NO. — BY — DATE — 1"=50.00' STRAIGHT LINE INTERPOLATED

GLACE & RADCLIFFE INC. CONSULTING ENGINEERS

ATE	STR	NOTED	55
CLE	RWY		65
ELD	TWY	81524	

FOR AGENCY REVIEW ONLY

E569

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	4		460
4			220.5
	12		364
9			173
	27		353
20			208
	50		372
34			198.5

81+50.00

81+00.00

80+50.00

80+00.00 THIS STATIONING REFERS TO ℄ CONST. & SURVEY

DITCH W/ER (TYP.)
ELEV. 64.8

20' EASEMENT

20' EASEMENT (TYP.)

FINAL SURVEY — SURVEYED — PLOTTED — NOTE BOOK — PAGE — NO — BY — DATE — AS-BUILT CHECKED

ORIGINAL SURVEY — SURVEYED — PLOTTED — NOTE BOOK — PAGE — NO — BY — DATE

BLACK & MACKLEFFE INC.

NOTED

FOR AGENCY REVIEW ONLY

-E570-

NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
		65	33
70			35
		65	188
0			168
		0	373
		0	234.5
		0	482
		0	286.5

83+50.00

83+00.00

82+50.00

82+00.00 (THIS STATIONING REFERS TO R. CONST. & SURVEY)

10' EASEMENT

20' EASEMENT

STA. 83+50 ~ 48' LT.
CONST CROSS DRAIN M.E.S.
FOR SINGLE 30" R.C.P.
D.O.T. INDEX No. 272
FL. EL. 61.00

STA. 83+50 ~ 58' RT.
CONST CROSS DRAIN M.E.S.
FOR SINGLE 30" R.C.P.
D.O.T. INDEX No. 272
FL. EL. 61.00

CONST. 80' ~ 30" R.C.P. @ 0.00%

DITCH WEIR (TYP.)

EL. 45.0

FINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — NOTE BOOK — AREA CHECKED — NO. — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED — TEMPLATE — NOTE BOOK — AREA CHECKED — NO. — BY — DATE — 99.00 STA. IS INTERPOLATED

ELACK & RADCLIFFE, INC.

FOR AGENCY REVIEW ONLY

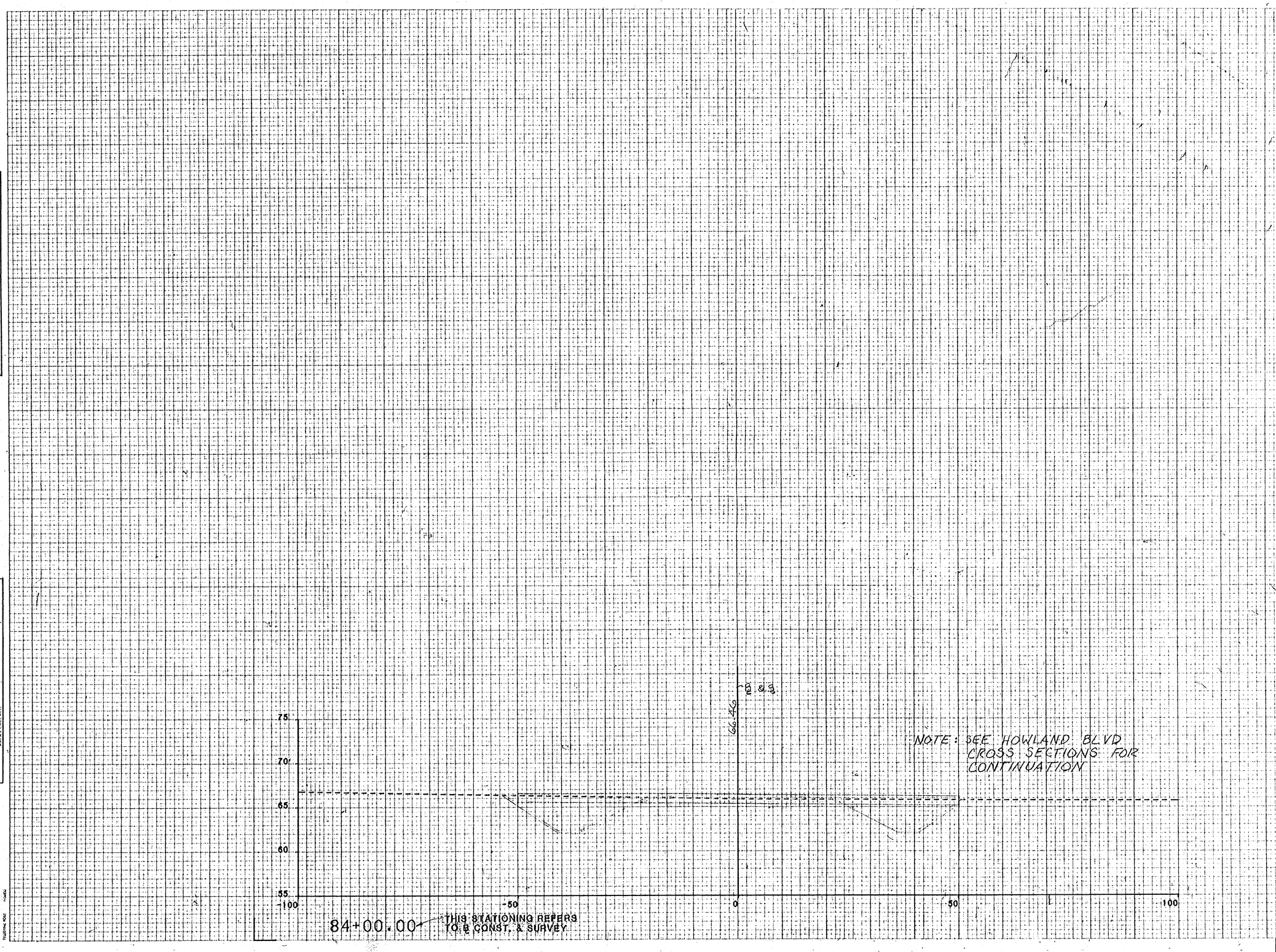
NORMANDY BOULEVARD EXTENSION

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, NOTE BOOK, NO., AREAS, AREAS CHECKED, BY, DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, NOTE BOOK, NO., AREAS, AREAS CHECKED, BY, DATE



GLACE & RANDLEIFFE, INC. CONSULTING ENGINEERS

APP.	10/78			
DWN.	8/78	NOTED	58	
DES.	8/78			
CHD.	8/78	31324	25	

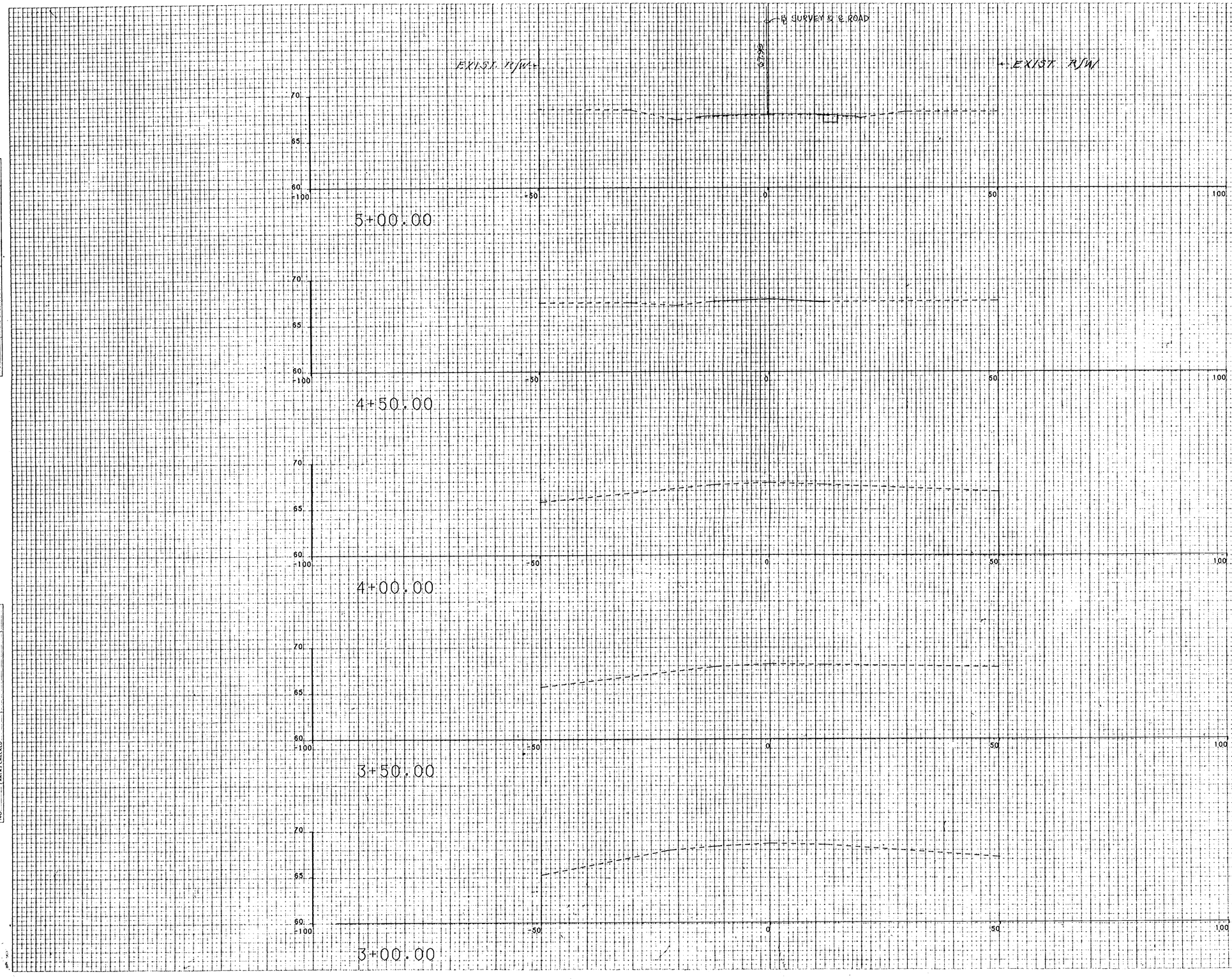
FOR AGENCY REVIEW ONLY

E572

HOWLAND BOULEVARD

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
ROWY EXC.		FILL	
A	V	A	V
	9		0
3		0	
	3		0
0		0	
	0		0
	0		0



FINAL SURVEY
NOTE BOOK
NO.
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

ORIGINAL SURVEY
NOTE BOOK
NO.
SURVEYED 87524EH
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
BY
DATE

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

ATH 11/83
DAC 11/83
GEG 11/83
EAD 11/83

NOTES 59
87524 65

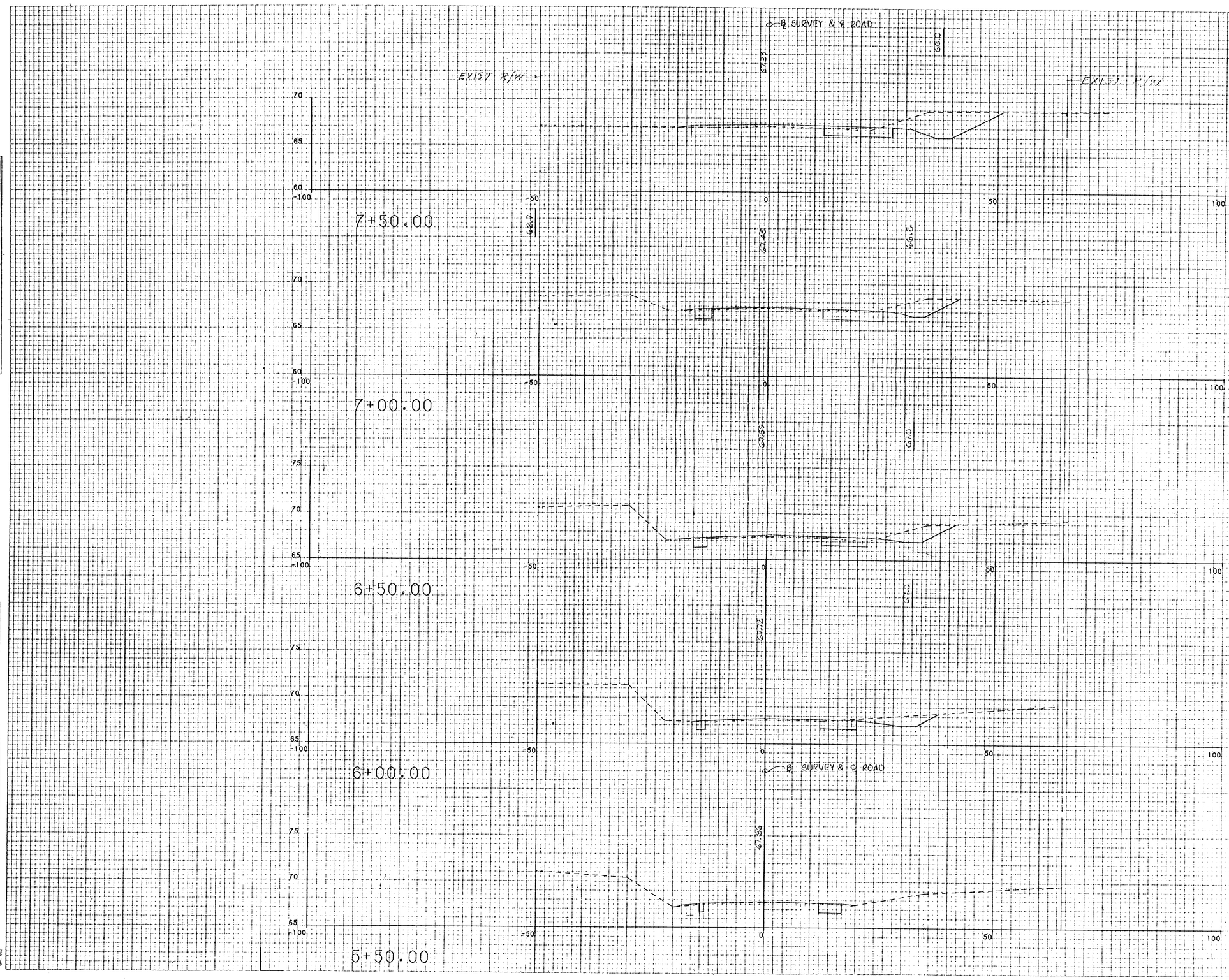
FOR AGENCY REVIEW ONLY

SS-60001

E573

FINAL SURVEY	SURVEYED	BY	DATE
NOTE BOOK	PLOTTED		
NO.	TEMPLATE		
	AREAS		
	AREAS CHECKED		

ORIGINAL SURVEY	SURVEYED 8/12/61	BY	DATE
NOTE BOOK	PLOTTED		
NO.	TEMPLATE		
	AREAS		
	AREAS CHECKED		



HOWLAND BOULEVARD

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	109		0
62.5		0	
	91		0
35.5		0	
	61		0
30		0	
	48		0
21.5		0	
	26		0
6.5		0	

GLACE & RADCLIFFE INC. CONSULTING ENGINEERS

APP.		W33	NOTES
DATE		W34	
SCALE		W35	87524

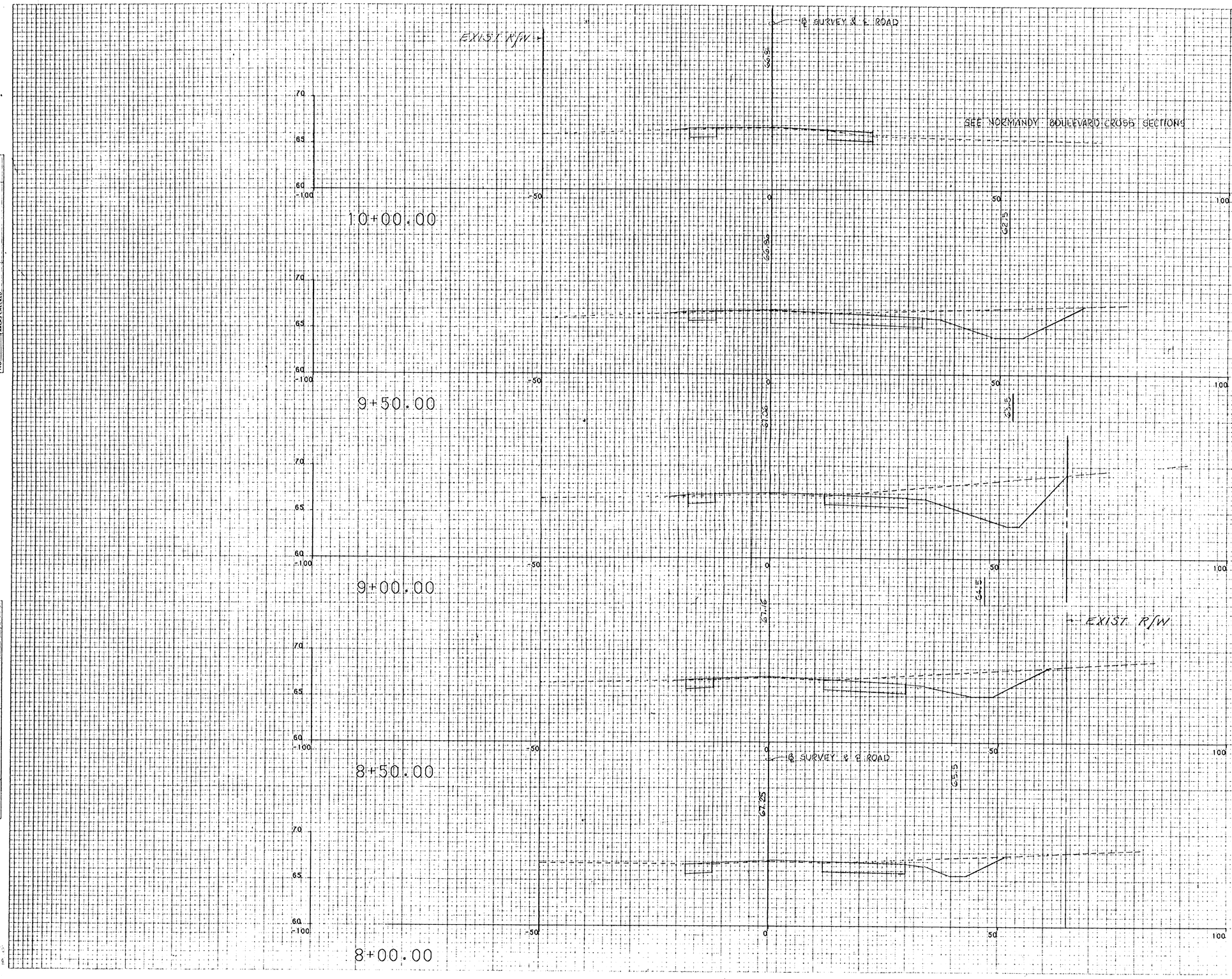
60
65

FOR AGENCY REVIEW ONLY

E574

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
NOTE BOOK	AREAS CHECKED	
NO.		

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED 37524CH	STA 10+00 LT INTERPOLATED	
TEMPLATE		
AREAS		
NOTE BOOK	AREAS CHECKED	
NO.		



HOWLAND BOULEVARD

SCALE: 1"=10' HORZ. 1"=5' VERT.

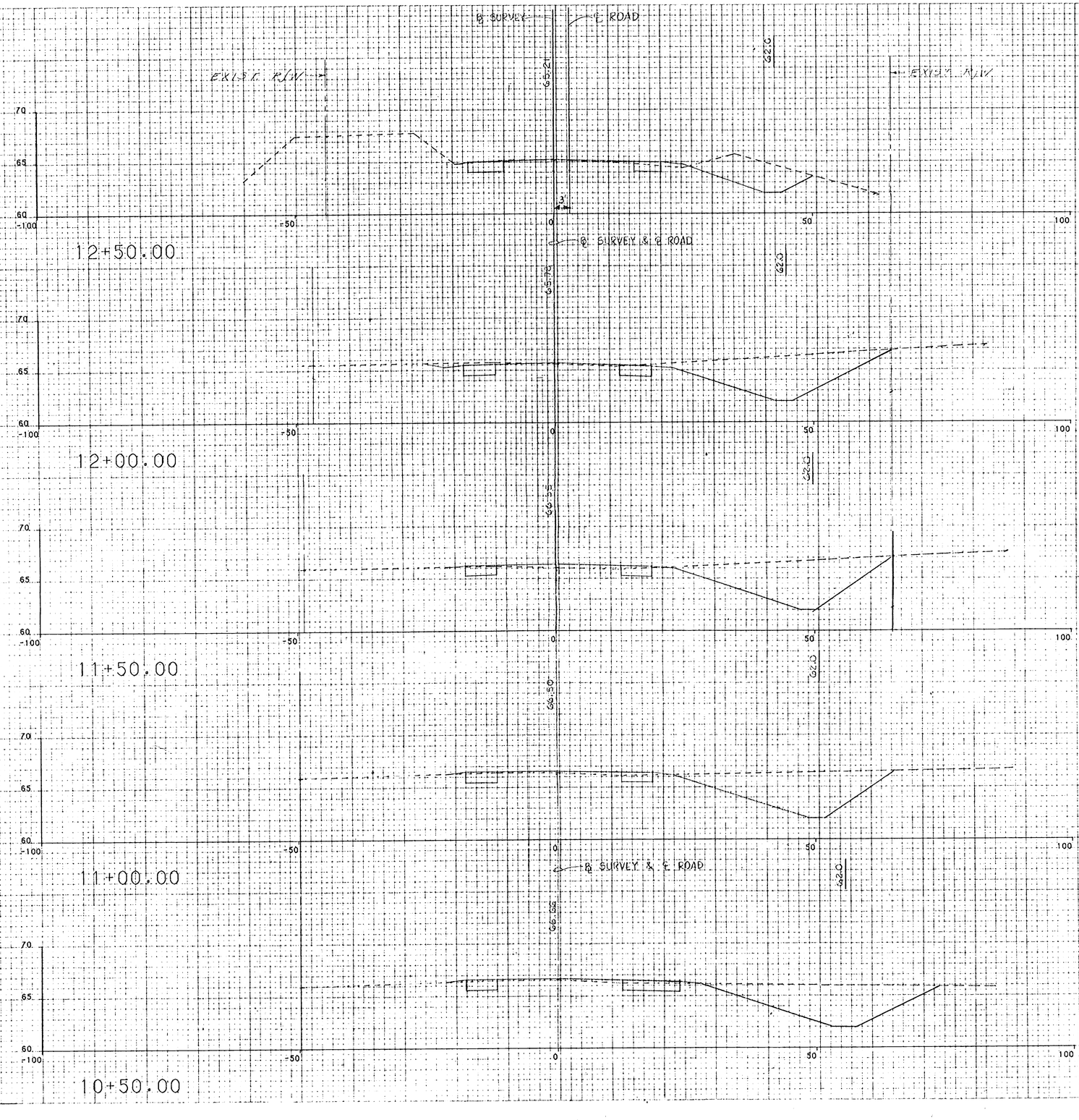
A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
	129		1
12.5		0	
	102		0
97.5		0	
	246		0
167.5		0	
	236		0
87.5		0	
	132		0
55.5		0	

FOR AGENCY REVIEW ONLY

E575

FINAL SURVEY
SURVEYED
PLOTTED
NOTE BOOK
AREAS
AREAS CHECKED
NO.
BY
DATE

ORIGINAL SURVEY
SURVEYED 8/1924E11
PLOTTED
TEMPLATE
NOTE BOOK
AREAS CHECKED
NO.
BY
DATE



HOWLAND BOULEVARD
SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
62.5		2.5	
	162		2
112.5		0	
	217		0
122		0	
	224		1
120		5	
	228		1
126.5		1	

GLACE & RADCLIFFE INC.

DES	AREAS	62
DRN	87524	65
CHD		

55-690071

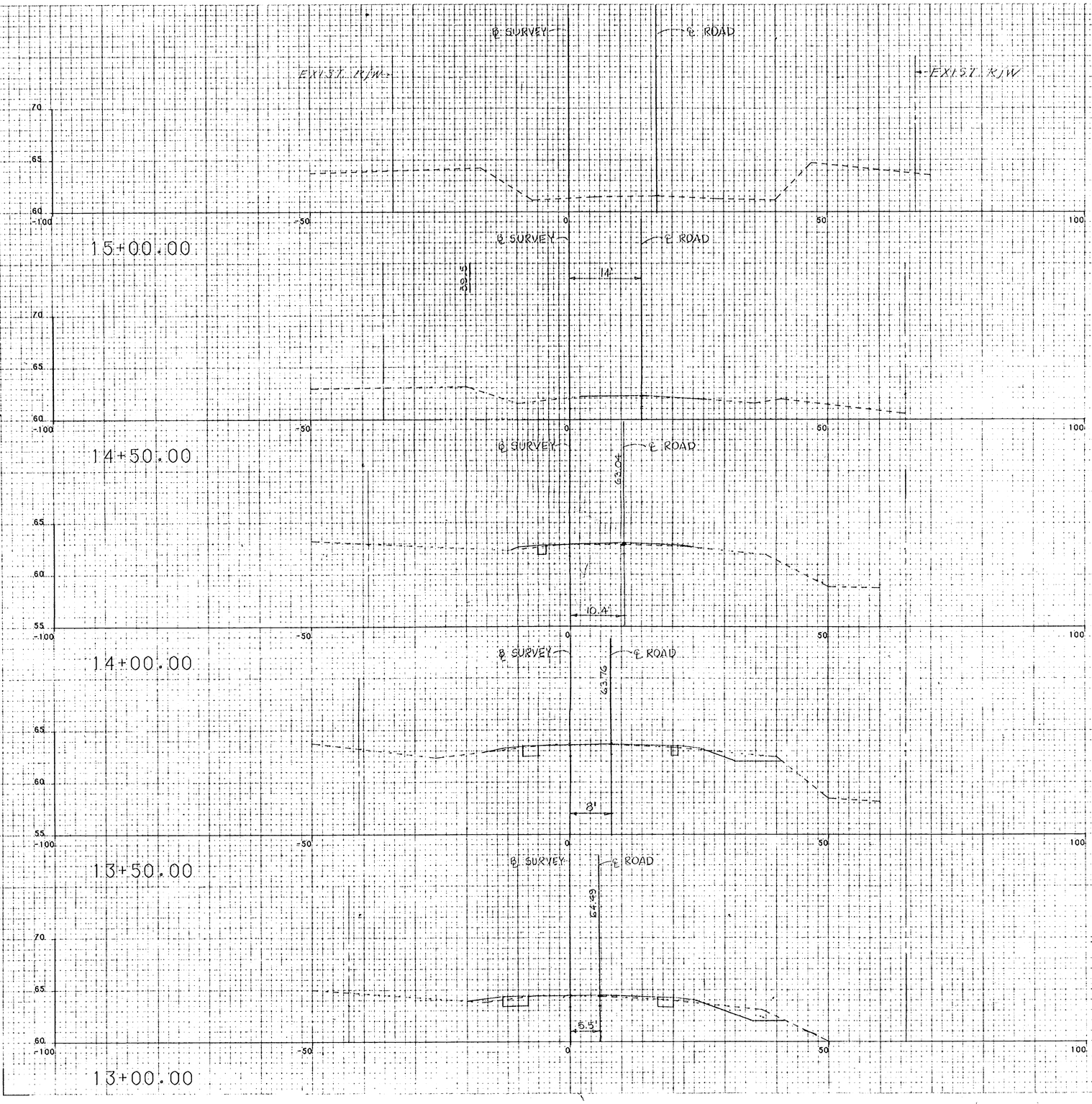
FOR AGENCY REVIEW ONLY

E576

HOWLAND BOULEVARD

SCALE: 1"=10' HORZ. 1"=5' VERT.

A-2, A-3 MATERIAL			
RDWY EXC.		FILL	
A	V	A	V
0		0	
2.5		1	
	16		2
14.5		1	
	30		9
17.5		9	



FINAL SURVEY — NOTE BOOK NO. — SURVEYED — PLOTTED — TEMPLATE — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — NOTE BOOK NO. — SURVEYED 3/22/74 — PLOTTED — PARCEL — AREAS — AREAS CHECKED — BY — DATE

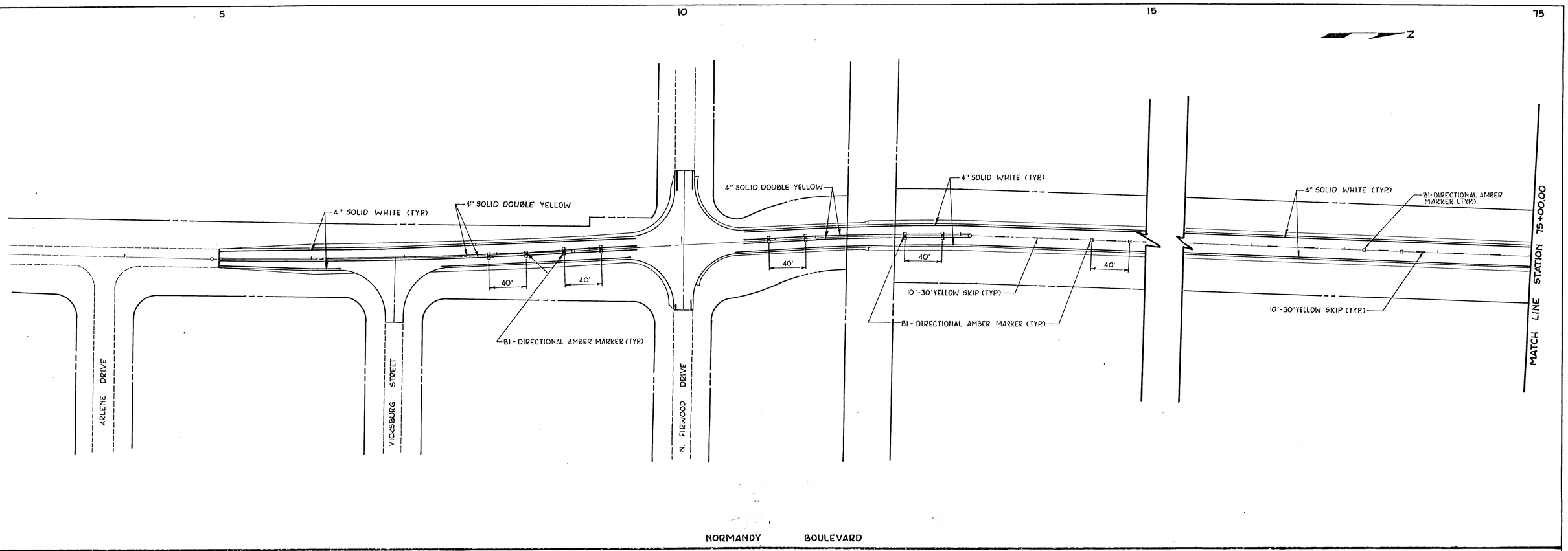
GLACE & RADCLIFFE INC.

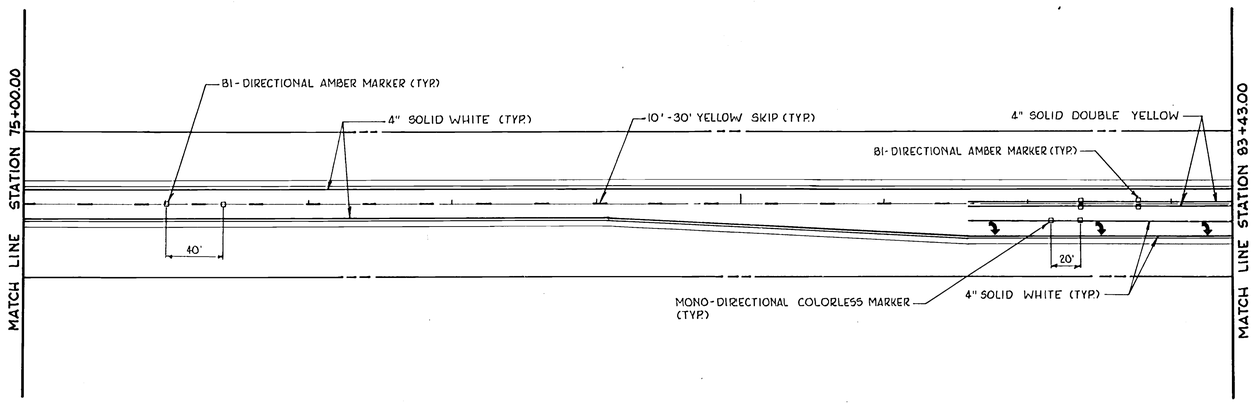
APP'D — DES — CHK'D — DWN — CHK'D — DES — DWN

W33 87524 63 65

FOR AGENCY REVIEW ONLY

E577





*NOTE: SEE FDOT INDEX NO. 17352 TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS FOR DETAILS. FOR PAVEMENT ARROW REQUIREMENTS SEE FDOT INDEX NO. 17346.

NO.	BY	REVISIONS	DATE

DESIGNED	MAJ	DATE	10/88
DRAWN	JAL	DATE	10/88
CHECKED	CEG	DATE	11/88
APPROVED	ELD	DATE	11/88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY FLORIDA

PAVEMENT MARKINGS

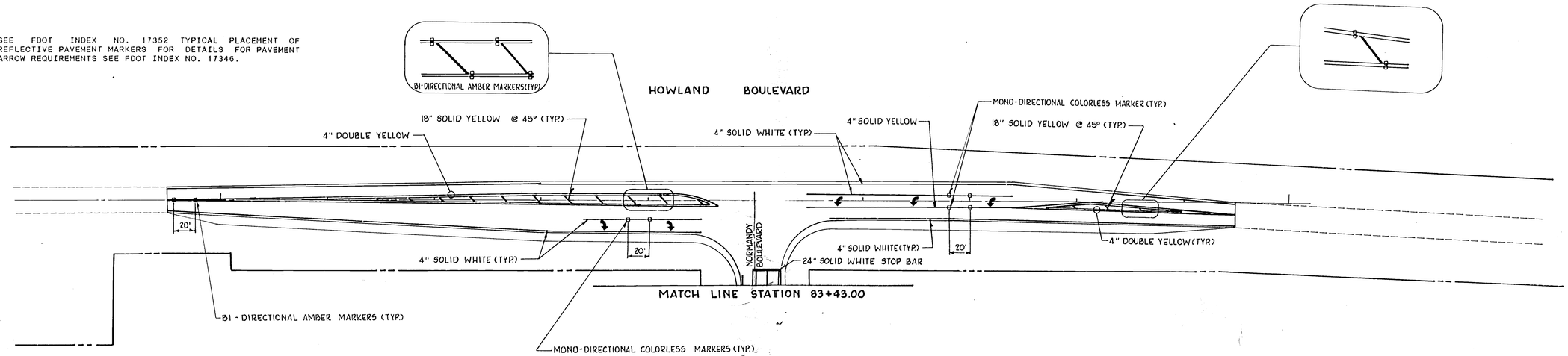
SCALE	SHEET NO.
1" = 50'	64
JOB NO. 81524	OF 65

E578

5 10 15

N

*NOTE: SEE FDOT INDEX NO. 17352 TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKERS FOR DETAILS FOR PAVEMENT ARROW REQUIREMENTS SEE FDOT INDEX NO. 17346.



NO.	BY	REVISIONS	DATE

DESIGNED	MAJ	DATE	10/88
DRAWN	JAL	DATE	10/88
CHECKED	CEG	DATE	11/88
APPROVED	ELD	DATE	11/88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

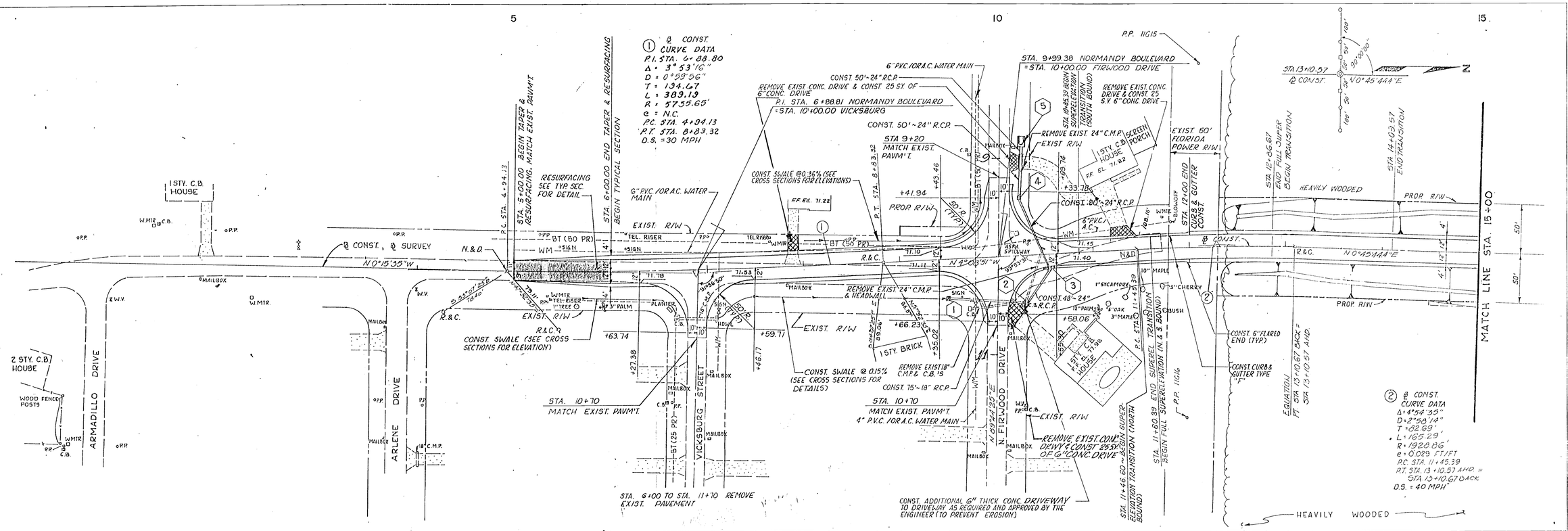
NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY FLORIDA

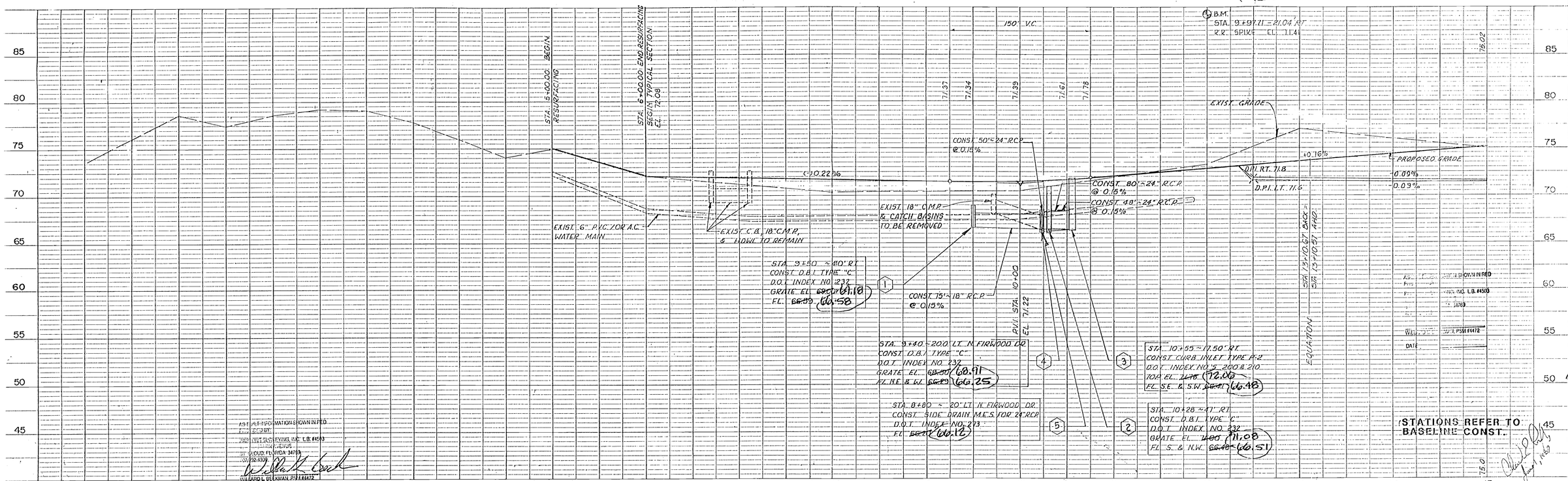
PAVEMENT MARKINGS

SCALE	SHEET NO.
1" = 50'	65
JOB NO. 87524	OF 65

305895

E579





NO.	BY	REVISIONS	DATE
	WBB	10. CHANGE HORIZONTAL ALIGNMENT FOR ℄ CONST.	1-95

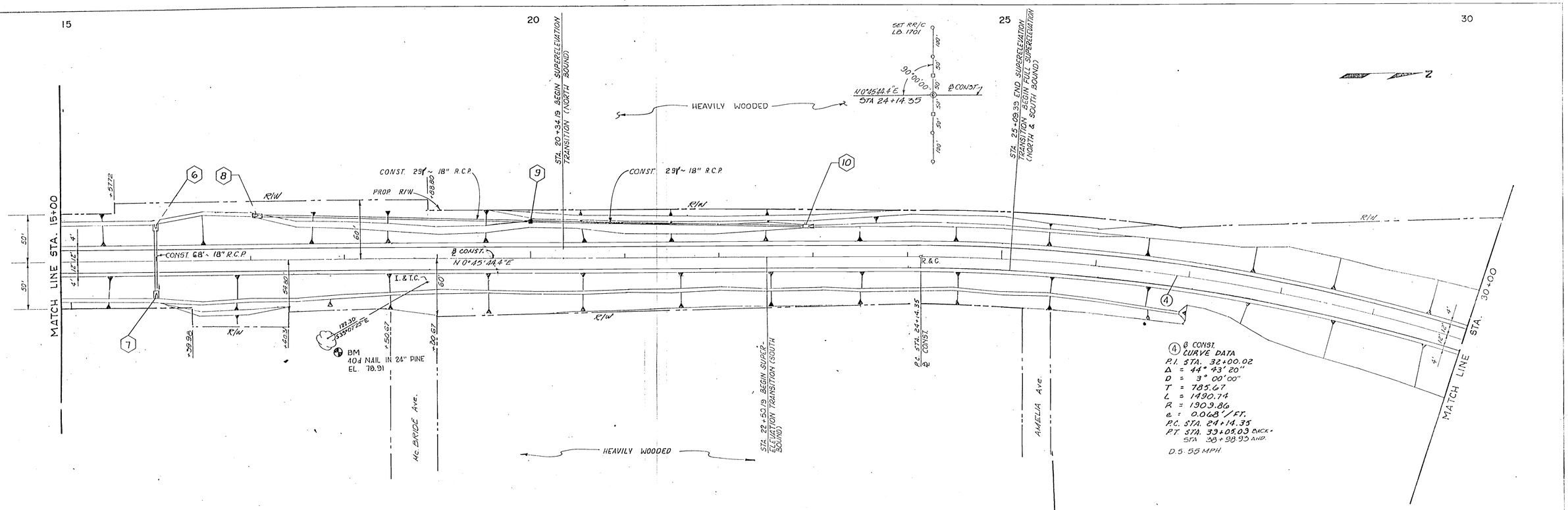
DESIGNED	ATH	DATE	11-88	GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS	NORMANDY BOULEVARD EXTENSION VOLUSIA COUNTY, FLORIDA
DRAWN	JAL	DATE	11-88		
CHECKED	CEG	DATE	11-88		PLAN & PROFILE
APPROVED	ELD	DATE	11-88		

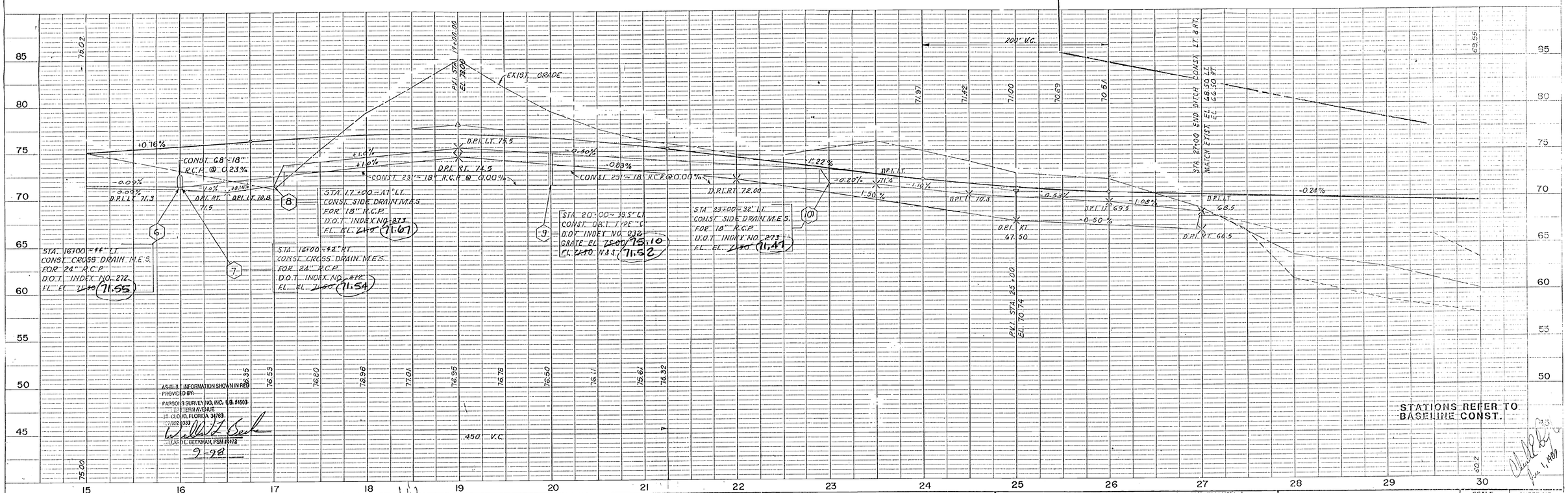
SCALE 1" = 5' VERT. 1" = 50' HORZ.
JOB NO. 87524
SHEET NO. 10 OF 65

E580

RECEIVED
OCT 19 1998
BY

42-127-1035
AMGE





AS-BUILT INFORMATION SHOWN IN RED PROVIDED BY:
PARSONS SURVEYING, INC. LIC. #4503
1ST TERN AVENUE
ST. CLOUD, FLORIDA 34769
(407) 892-1939
HAROLD L. BEERMAN, PSM #4172
9-28-

STATIONS REFER TO BASELINE CONST.

NO.	BY	REVISIONS	DATE
1.0		CHANGE HORIZONTAL ALIGNMENT FOR 2 CONST I-95	

DESIGNED	ATH	DATE	11-88	
DRAWN	JAL	DATE	11-88	
CHECKED	CEG	DATE	11-88	
APPROVED	ELD	DATE	11-88	

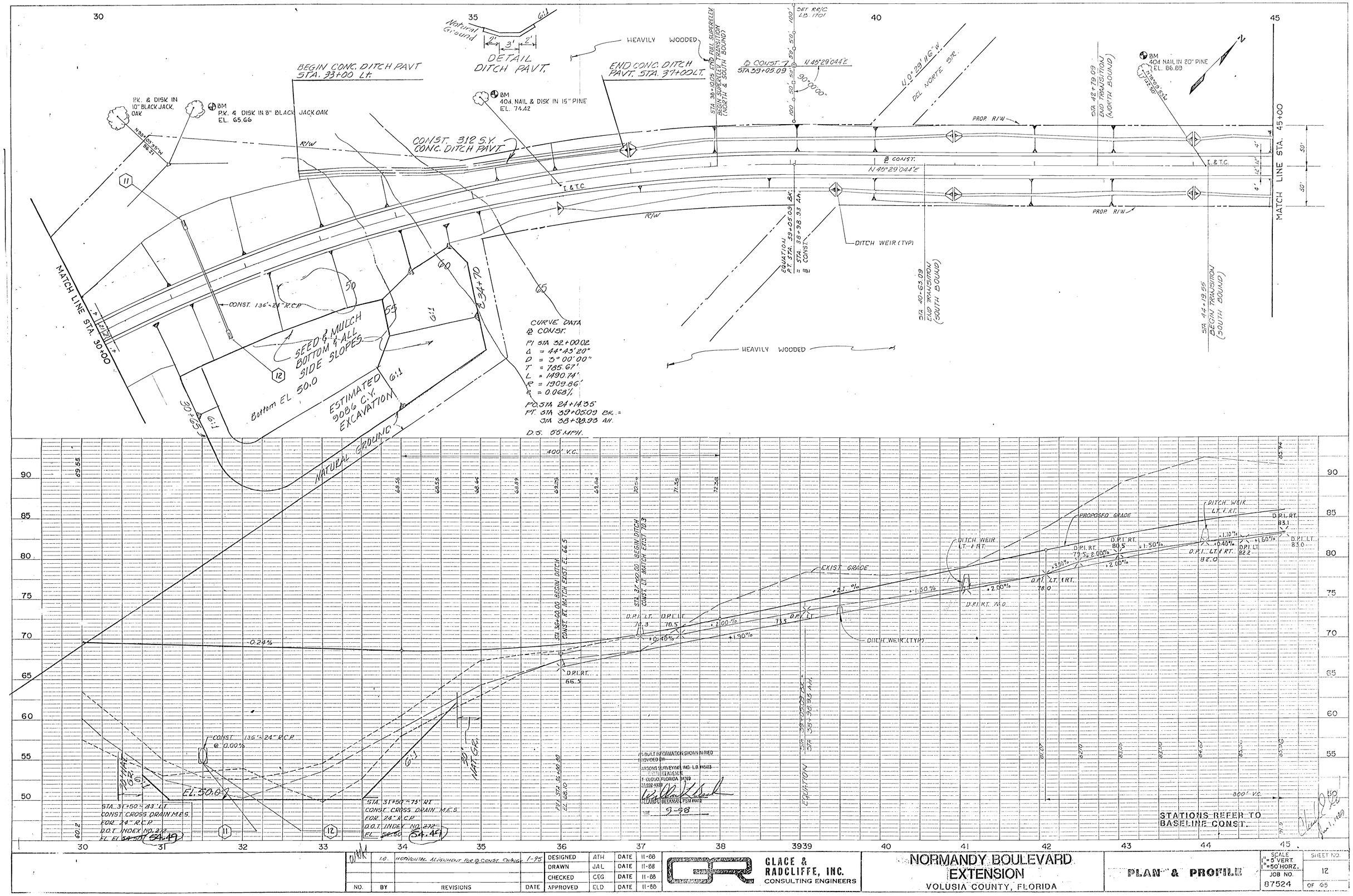
GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87524
SHEET NO. 11
OF 65

E581



AS-BUILT INFORMATION SHOWN HEREON PROVIDED BY:
ARNOLD SURVEYING INC. L.B. #5603
1 EAST BRAVEN ST.
F. CLOUD, FLORIDA 34769
(352) 892-1930
ALLARD L. BEEKMAN, PSM #4178
DATE 5-98

STATIONS REFER TO BASELINE CONST.

NO.	BY	REVISIONS	DATE
		I.D. HORIZONTAL ALIGNMENT FOR ℄ CONST. CHANGE I-95	

DESIGNED	ATH	DATE	11-88	GLACE & RADCLIFFE, INC. CONSULTING ENGINEERS	NORMANDY BOULEVARD EXTENSION VOLUSIA COUNTY, FLORIDA
DRAWN	JAL	DATE	11-88		
CHECKED	CEG	DATE	11-88		
APPROVED	ELD	DATE	11-88		

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87524
SHEET NO. 12
OF 65

E582

45 50 55 60

℄ CONST.
CURVE DATA
PI STA 56+12.05
Δ = 46°05'032"
D = 3°00'00"
T = 812.55'
L = 1536.14'
R = 1909.86'
e = 0.068'/'
PC STA 47+99.11
PT STA 63+35.85 BK. =
STA 63+27.49 AH.
O.S. 55 MPH

30°00'00" ℄ CONST. STA 47+99.11 N45°29'04"E

HEAVILY WOODED

MATCH LINE STA. 45+00

STA 46+35.85 BEGIN TRANSITION (NORTH BOUND)

COLOMBO AVE

N 45°29'04"E

PROP R/W

STA 46+34.75 BEGIN RDWY SUPERELEV. (NORTH & SOUTH BOUND)

BEGIN CONC. DITCH PAVT. STA. 50+50 RT.

℄ CONST.
CONST. 107'+24" R.C.P. @ 0.00%

R/W

MOVED TO BETTER MATCH EXIST. DEPRESSION

END CONC. DITCH PAVT STA 52+00 RT

CONST. 117 S.Y. OF CONC. DITCH PAVT.

HEAVILY WOODED

FLORIDA AVE

MATCH LINE STA. 60+00

P.K. & DISK IN 10" PINE

BM
P.K. & DISK IN 10" PINE
EL. 87.89

I&TC

P.K. & DISK IN 8" PINE

BM
40d NAIL IN 10" PINE
EL. 82.62

EXIST. GRADE

PROPOSED GRADE

D.P.I. LT. 83.0 — 0.00% — D.P.I. LT. 83.0 — .20% — D.P.I. LT. 84.5 — 1.00% — D.P.I. RT. 86.1 — 0.00% — D.P.I. LT. 84.5 — -1.20% — D.P.I. RT. 84.5 — -0.20% — D.P.I. RT. 86.9 — -0.80% — D.P.I. RT. 86.4 — -0.40% — D.P.I. RT. 83.4 — -0.60% — D.P.I. RT. 83.5 — 0.20% — D.P.I. RT. 83.4 — -1.80% — D.P.I. RT. 82.5 — -0.50% — D.P.I. RT. 81.0 — -1.40% — D.P.I. RT. 80.3 — -0.20% — D.P.I. LT. 77.9

P.I. STA. 46+00
EL. 85.64

STA. 47+50 END DITCH CONST. RT.
MATCH EXIST. EL. 86.1

STA. 49+00 BEGIN DITCH CONST.
LT. MATCH EXIST. EL. 87.5

STA. 50+50 END DITCH CONST. RT.
MATCH EXIST. EL. 86.4

STA. 55+00 BEGIN DITCH
CONST. RT. MATCH EXIST. EL. 83.5

P.I. STA. 60+00.00
EL. 81.24

85.96 86.47 86.90 87.24 87.50 87.61 87.75 87.75 87.67 87.50 87.24 81.84 81.49 81.04

800' V.C. 200' V.C.

53+00
STA. 52+00 ~ 64' LT.
CONST. CROSS DRAIN M.E.S.
FOR 24" R.C.P.
D.O.T. INDEX NO. 218
EL. ~~77.00~~ 75.45

53+00
STA. 52+00 ~ 61' RT.
CONST. CROSS DRAIN M.E.S.
FOR 24" R.C.P.
D.O.T. INDEX NO. 272
EL. ~~75.00~~ 75.48

AS-BUILT INFORMATION SHOWN IN RED
PROVIDED BY:
PARSONS SURVEYING, INC. LB. #4503
111 E. GRANADA AVENUE
ORMOND BEACH, FLORIDA 32174
(904) 672-4837
WILLARD L. BEEKMAN, P.S.M. #4172
DATE 9-98

STATIONS REFER TO BASELINE CONST.

Jan 1, 1989

NO.	BY	REVISIONS	DATE
10		HOR. & VERT. ALIGNMENT FOR ACOUST. CHANGE	1-95

DESIGNED	ATH	DATE	11-88	
DRAWN	JAL	DATE	11-88	
CHECKED	CEG	DATE	11-88	
APPROVED	ELD	DATE	11-88	

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87524
SHEET NO. 13 OF 65

E583

60 65 70 75

SET 5/8" RR/S LB 1701 (TYP.)

℄ CONST. STA 63+55.85 — N0°35'58.8"W

90°00'00"

EQUATION STA 63+55.85 BK = STA 63+27.49 AH.

ALABAMA AVE.

STA 64+91.65 END TRANSITION (NORTH BOUND)

HEAVILY WOODED

MISSISSIPPI AVE

P.I. STA 70+93.21
Δ = 0°00'09.6" LT.

N

MATCH LINE STA 60+00

50'
4'
12'
12'
4'

R/W

PROP. R/W

℄ CONST.

N 0° 35' 58.8" W

N 0° 36' 08.4" W

R/W LINE

MATCH LINE STA. 75+00

STA 62+40.81
END FULL SUPERELEVATION
BEGIN TRANSITION
(NORTH & SOUTH BOUND)

STA 67+07.65
END TRANSITION
(SOUTH BOUND)

HEAVILY WOODED

90 85 80 75 70 65 60 55 50

P.I. STA 60+00
EL. 81.24

D.P.I. RT. 73.9 -0.20%

-2.20% D.P.I. LT. 77.3

-1.40% D.P.I. LT. 76.8

D.P.I. LT. 74.1

-2.40%

D.P.I. RT. 77.5

-2.00%

-1.40%

D.P.I. RT. 75.5

-1.00%

D.P.I. RT. 75.0

-1.20%

-2.00%

EXIST. GRADE

PROPOSED GRADE

D.P.I. RT. 72.0

-1.00%

D.P.I. RT. 71.5

-2.10%

DITCH WEIR (TYP.)

EQUATION STA 63+55.85 BK = STA 63+27.49 AH.

D.P.I. RT. 68.5

D.P.I. LT. 68.1

-4.20%

-0.73%

D.P.I. RT. 66.4

-0.20%

D.P.I. RT. 66.3

D.P.I. LT. 67.0

-0.40%

D.P.I. LT. 66.8

0.00%

D.P.I. RT. 66.3

-0.20%

D.P.I. RT. 66.2

-0.20%

0.00%

D.P.I. RT. 66.2

-0.24%

-1.10%

200' V.C.

200' V.C.

71.43 70.80 70.33 69.99 69.80 68.36

P.I. STA. 68+20.00
EL. 70.04

30.50 79.85 77.08 82.4

AS BUILT INFORMATION SHOWN IN RED
PROVIDED BY:
PARSONS SURVEYING, INC L.B. #4504
1411 SIERRA AVENUE
ST. CLOUD, FLORIDA 34769
407/892-4321
WILLARD L. BEEMAN, RSM #4472
DATE 9-28-82

STATIONS REFER TO BASELINE CONST.

60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75

NO.	BY	REVISIONS	DATE
		I.D. HORIZONTAL ALIGNMENT FOR ℄ CONST. CHANGE 1-93	

DESIGNED	ATH	DATE	11-88	
DRAWN	JAL	DATE	11-88	
CHECKED	CEG	DATE	11-88	
APPROVED	ELD	DATE	11-88	

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87524

SHEET NO. 14 OF 65

E584

75 80

HEAVILY WOODED

TENNESSEE AVE.

PROP. R/W

℄ CONST. N0°36'08.1"W

MATCH LINE STA. 75+00

50' 50' 4' 12' 12' 4'

PROP. R/W

BM REBAR EL. 68.60

STA. 79+03.01 BEGIN TAPER ~RT

STA. 81+53.01 END TAPER ~RT

HEAVILY WOODED

R/W

CONST 62"~30" R.C.P.

+25.74

15

16

50'

50'

12'

24'

70'

89°09'24"

DITCH WEIR (TYP)

R/W

HOWLAND BOULEVARD

BT (50 PR.)

BT (50 PR.)

S 89°36'14" E

BT (50 PR.)

RESURFACING SEE TYPICAL SECTION FOR DETAIL
P.I. STA. 84+21.89 NORMANDY BOULEVARD
= STA. 10+19.93 HOWLAND BOULEVARD

FOR INTERSECTION DETAIL
SEE SHEET No. 17

N

SET 5/8" I.R.&C. LB 1761 (TYP.)

90°00'36"

℄ CONST. STA 83+61.80

60.09'

-1.10%
+0.20%
+1.50%
-0.07%
-0.24%
-1.00%
-2.60%
-0.40%
0.00%
0.00%
-0.53%
+0.04%
+0.50%
+3.34%

D.P.I. RT. 63.6
D.P.I. RT. 65.0
D.P.I. LT. 65.0
D.P.I. RT. 63.9
D.P.I. RT. 63.6
D.P.I. LT. 63.5
D.P.I. LT. 63.5
D.P.I. LT. 63.3
DITCH WEIR (TYP)
D.P.I. RT. 63.5
D.P.I. LT. 62.8

P.V.I. STA. 83+00 EL. 65.44
P.V.I. STA. 84+03.89 EL. 66.39

CONST. 80"~30" R.C.P. @ 0.0%

STA. 83+50~48' LT.
CONST. CROSS DRAIN M.E.S.
FOR SINGLE 30" R.C.P.
D.O.T. INDEX No. 272
FL. EL. 61.00 (60.95)

STA. 83+50~58' RT.
CONST. CROSS DRAIN M.E.S.
FOR SINGLE 30" R.C.P.
D.O.T. INDEX No. 272
FL. EL. 61.00 (61.09)

63.36 67.2 66.75

STATIONS REFER TO BASELINE CONST.

AS-BUILT INFORMATION SHOWN IN RED
PREPARED BY:
ARSON SURVEYING, INC. L.B. #4503
1 TRI AVENUE
ST. CLOUD, FLORIDA 34769
(407)892-4837
WILLARD E. BEEKMAN, PSM #4472
DATE 9-98

NO.	BY	REVISIONS	DATE
		I.D. HORIZONTAL ALIGNMENT FOR ℄ CONST. CHANGE	I-95

DESIGNED	ATH	DATE	11-88
DRAWN	JAL	DATE	11-88
CHECKED	CEG	DATE	11-88
APPROVED	FLD	DATE	11-88

GLACE & RADCLIFFE, INC.
CONSULTING ENGINEERS

NORMANDY BOULEVARD EXTENSION
VOLUSIA COUNTY, FLORIDA

PLAN & PROFILE

SCALE 1"=5' VERT. 1"=50' HORZ.
JOB NO. 87321
SHEET NO. 15
OF 65

E585

Permit No. 111974-1

Rhode Island Avenue

EXHIBIT I

STORMWATER MANAGEMENT

AND

DRAINAGE DESIGN CRITERIA

FOR

RHODE ISLAND AVE

County Project P-4904

Prepared for:

Volusia County

111974-1

Submitted to:

RECEIVED
JUN 25 2007
PDS
ALTAMONTE SVC. CTR.

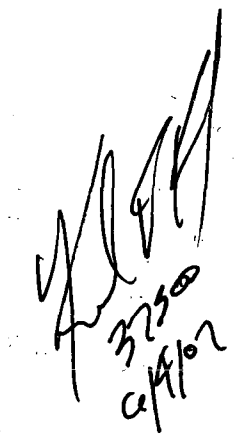
ST. JOHNS RIVER WATER MANAGEMENT DISTRICT
975 Keller Rd
Altamonte Springs, FL 32714

Prepared by:

Dyer, Riddle, Mills & Precourt, Inc.
941 Lake Baldwin Lane
Orlando, Florida 32814

DRMP
ENGINEERS · SURVEYORS · PLANNERS · SCIENTISTS

CERTIFICATE OF AUTHORIZATION NO. 2648



DRMP# 02-0309.000

Submitted: **June 2007**

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STORM DRAIN DESIGN 5

CROSS DRAIN DESIGN 6

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PROPOSED ROADWAY CONDITIONS 10

FLOOD PLAIN IMPACTS 12

CULVERTS 12

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Appendix C – Flood Plain Compensation
Appendix D – Culverts
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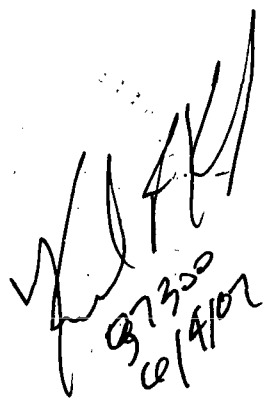


Introduction

Volusia County proposes to construct an extension to Rhode Island Ave. The extension shall be a two-lane roadway that begins at the intersection of Veterans Memorial Parkway running east for 1.3 miles and connecting at Normandy Blvd. This includes the addition of a new bridge crossing at I-4 and associated intersection improvements on Veterans Memorial Parkway, and Normandy Blvd. The project begins at Section 12 & 13, Township 18 South, Range 30 East and extends east approximately 1.3 miles to Section 7 & 18, Township 18 South, Range 31 East (see Location Map, Figure1A and 1B).

Drainage Design Criteria

Stormwater Pond Design

Water Quantity

The water quantity aspects will meet the requirements of the St. John's River Water Management District and Volusia County with appropriate drainage features and stormwater management plan, for a project located within a closed drainage basin. The ponds will be designed such that the post-development total volume will be in total retention for the 100 year, 24 hour storm event (P=10.6 inches) with recovery within 14 days following the 100 year event. If the volume does not completely recover then a second 100-year 24 hour storm will be analyzed.

Water Quality

The water quality aspects of the proposed stormwater management system will be designed in accordance with the SJRWMD criteria for a dry retention system. Ponds will be designed to retain 1.25 inches of runoff from impervious area or first 0.5 inch of runoff from the entire basin, whichever is greater. This criterion is outlined in the Applicants Handbook for Regulation of Stormwater Management Systems, Rule 40C-42.

Pond Layout

Ponds will be designed with side slopes generally at 1:4. Maintenance berms will be designed at 16-feet wide with an 1:8 cross-slope. Backslopes of berms will be at 1:4.

Pond Recovery

Ponds will be designed to recover the Water Quality volume in 72 hours and the Water Quantity volume in 14 days. The dry retention ponds have been modeled using the computer program PONDS (version 3.2) to document the peak stage and the recovery characteristics of the pond.

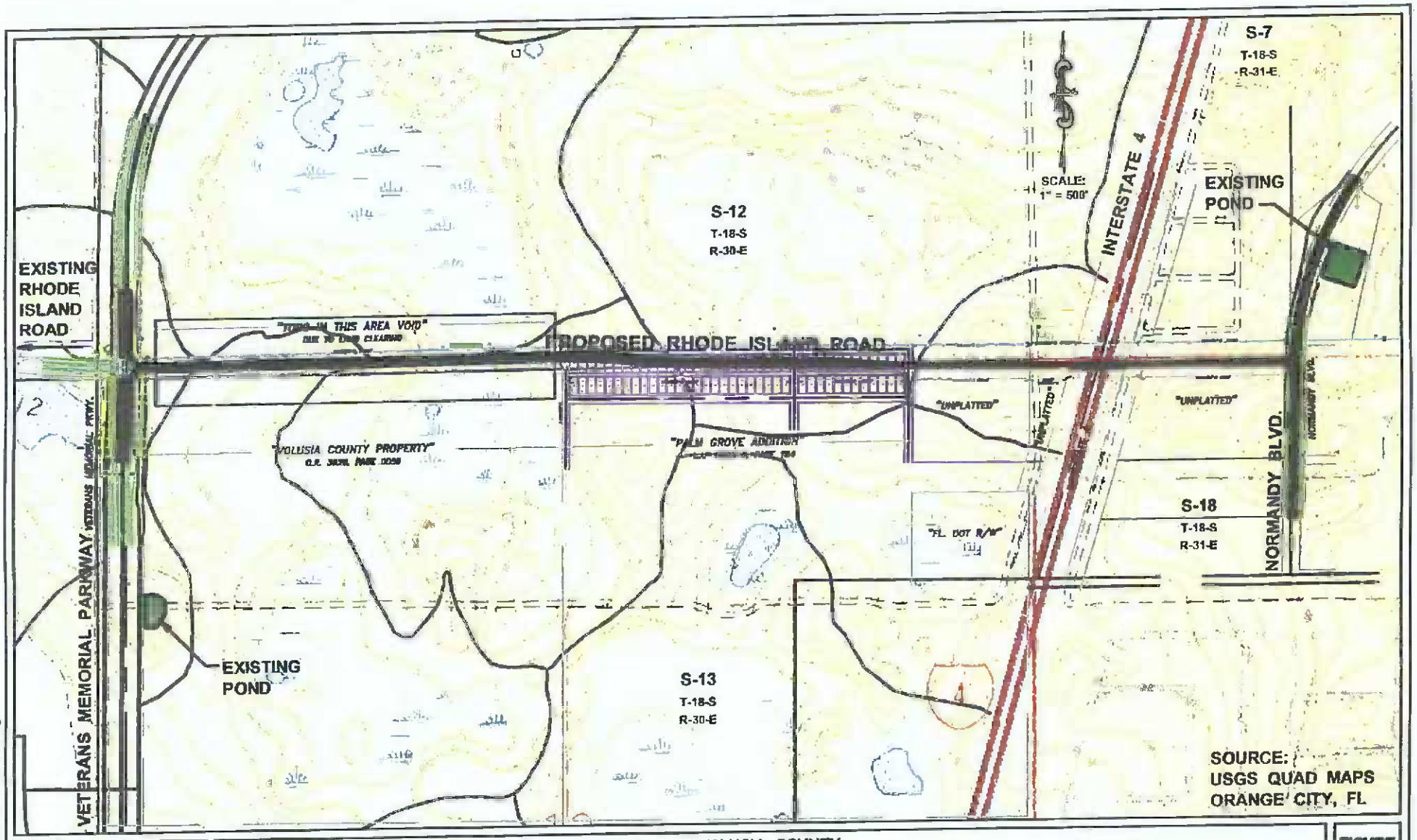
Hydrologic CN values derived from the SCS Technical Release Number 55 (TR-55):

- 98 – Used for impervious areas within right-of-way
- Other CN values used as appropriate from the SCS TR 55 publication.
- The analysis assumes a 4 lane urban roadway for ultimate construction.

Floodplain Storage Criteria

Portions of the project are located within the 100-year flood plain (see figure 2). The areas impacted for this project will require compensating storage.

See Appendix C for the supporting calculations.



DRMP

VOLUSIA COUNTY
RHODE ISLAND ROAD EXTENSION
LOCATION MAP – USGS QUADRANGLE

FIGURE 1A

CAD FILE Ponds-Quad.dwg

Pavement Drainage Design

The pavement drainage has been designed using Volusia County and FDOT criteria as outlined in the FDOT Drainage Manual. The following criteria have been followed in the pavement drainage design:

1. For sections with design speeds 45 mph and less, and without full width shoulders, spread resulting from a rainfall intensity of 4.0 inch per hour shall not exceed one-half the travel lane adjacent to the gutter. (DM, Sec. 4.9.4).
2. Minimum longitudinal gutter grade is 0.3 percent. (DM, Sec. 3.8.1).
3. The inlet spread shall be designed to accommodate the additional runoff from future widening.
4. The overall storm sewer system was designed for the ultimate 4-lane divided roadway. Inlet placement and design has been coordinated to minimize future construction costs.

Storm Drain Design

The storm drain has been designed using Volusia County and FDOT criteria as outlined in the FDOT Drainage Manual. The following criteria have been followed in the storm drain design:

1. All piping reinforced concrete pipe (RCP)
2. Minimum pipe size of 18 inches
3. Manning's n = 0.012
4. If minor energy losses are not considered in the storm drain design, the elevation of the hydraulic gradient shall be at least 1.0 foot below the gutter elevation. (DM, Sec. 3.6.2).
5. The minimum pipe slope shall be that which will produce a velocity of 2.5 feet per second when the storm drain is flowing full, unless otherwise approved by the District Drainage Engineer. (DM, SEC. 3.6.1)
6. Maximum hydraulic gradient should be that which will produce a velocity of approximately 10 ft./sec.
7. Maximum Pipe Runs without Access Structures (DM, Sec. 3.0.1)

Pipe Size	Distance
18"	300'
24" – 36"	400'
≥ 42"	500'

8. Minimum Time of Concentration - 10 minutes. (DM, Sec. 3.5.1).
9. The inlet spacing shall be designed to accommodate the additional runoff from future widening.
10. Inlets spacing shall meet spread criteria (DM, Sec. 3.7). The 3-year frequency storm will govern inlet spacing.

DRMP
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS

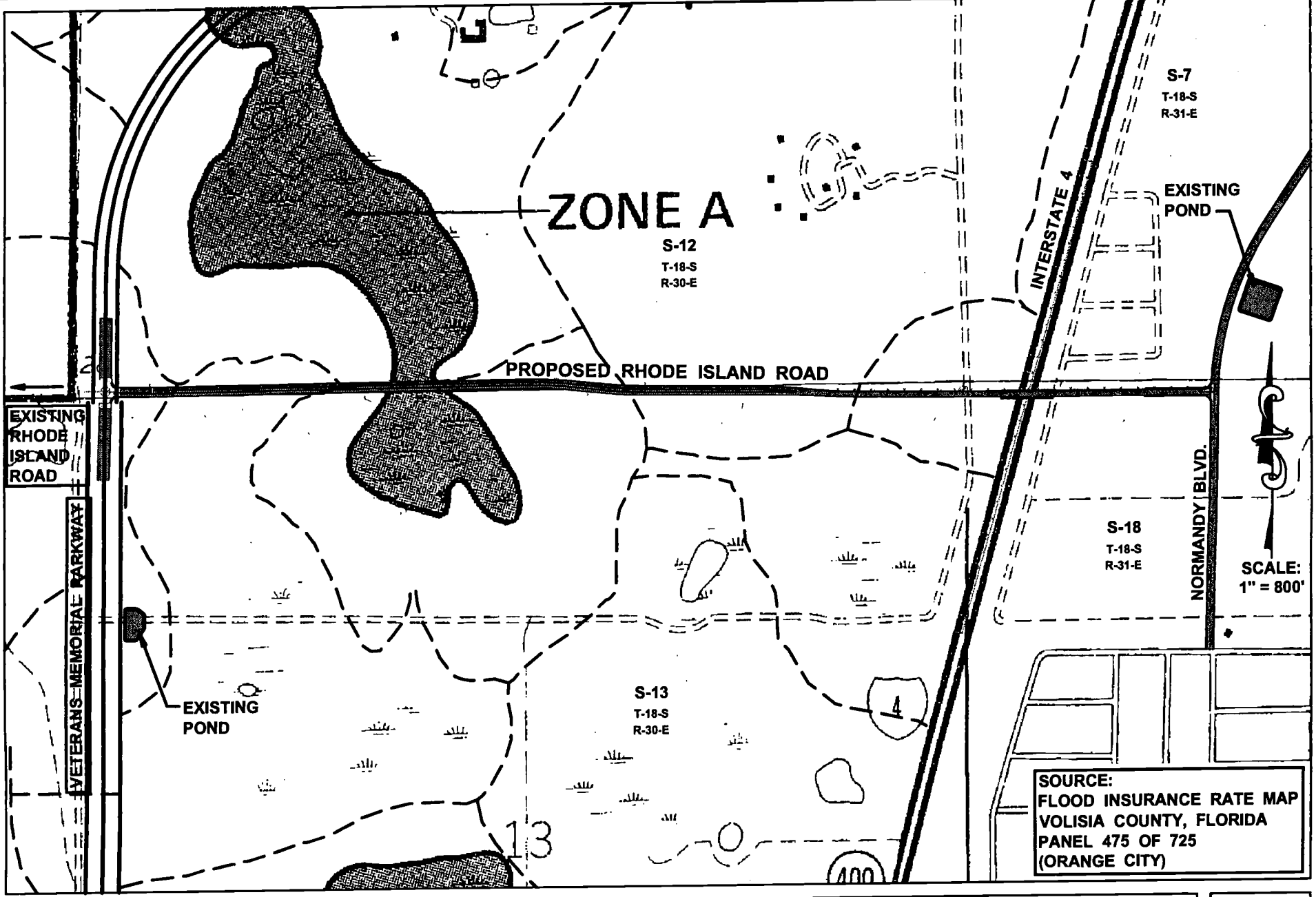
VOLUSIA COUNTY
RHODE ISLAND ROAD EXTENSION
LOCATION MAP – AERIAL

FIGURE
1B

CAD FILE Ponds–Aerial.dwg

Cross Drain Design

The cross drain has been designed to FDOT requirements as stated in the Design Manual. The crossdrain will serve to keep the two bodies of water at approximately the same elevation through the 50-year 24-hour storm event.



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RHODE ISLAND ROAD EXTENSION
PROPOSED POND LOCATIONS

FIGURE 2

CAD FILE Ponds–FIRM.dwg

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RHODE ISLAND ROAD EXTENSION
SOILS MAP

FIGURE 3

CAD FILE Ponds—Soils.dwg

Existing Roadway Conditions (Predevelopment)

The proposed right-of-way contains five drainage basins within the project limits. Portions of Basins A-1 and A-2 are located within the 100 year floodplain as indicated in Figure 2.

Basin A-1 – This basin consists of the area east of the baseline of Veterans memorial Parkway to station 122+20 and extends north and south of the centerline of Rhode Island Ave. It includes the entire right-of-way. The area drains south and eastward, to an existing pond and to an existing wetland.

Basin A-2 – This basin is located on the north and south side of the centerline of Rhode Island Ave and goes from station 122+20 to 131+30. It is located east of a large wetland area that crosses the alignment at approximately station 122+00. Runoff from this basin discharges to the wetland area.

Basin A-3 – This basin is located between stations 131+30 to 145+20. It is within a small closed basin and discharges to existing depressional areas offsite of the alignment.

Basin B – This basin is located between stations 145+20 to 158+30. It is within a small closed basin and discharges to existing depressional areas offsite. It also includes the crossing of Interstate 4. In predevelopment, the bridge runoff is not shown in the basin area; however, the existing and future bridge is shown in post development.

Basin C – Incorporates an area located inside the right-of-way from station 158+30 to 166+61 at the end of the project. The entire drainage area is located within the right-of-way which drains to existing depressional areas.

Soils

The soils classification for the project alignment consists of Apopka, Astatula, Basinger, Cassia, Electra, Orsino, Placid, Smyrna, Tavares (see Figure 3). With the exception of Basinger soil type (Type D), all soils within the project limits are well-drained Type A hydrologic soils.

Table 1: Predevelopment Hydrologic Results

Basin ID	Area (acre)	CN	100-year 24-hour Runoff Volume (acre-feet)
A-1	14.15	34.5	4.4
A-2	2.21	39.0	0.7
A-3	3.49	25.0	1.3
B	8.63	25.0	3.2
C	3.31	25.0	1.1

*Runoff volume based on 10.6 inches of Precipitation

Proposed Roadway Conditions (Post development)

The proposed stormwater management system will be designed to minimize right-of-way requirements while achieving a level of treatment and attenuation that will be favorably reviewed by the appropriate agencies. In addition, the stormwater system will be set up to ensure that offsite properties will not be adversely impacted. The proposed stormwater management system for this project is divided into three major basins for analysis purposes. The stormwater treatment facilities and conveyance systems are designed to accommodate the additional impervious area for future roadway widening.

Basin A-1:
Basin A-1 is directed to Pond A using a combination of roadside swales and closed storm sewer systems. Pond A is a dry retention facility designed to infiltrate the required treatment volume. Pond A is sized to handle all required runoff from Basin A-1, A-2 and A-3. Due to the high surface water of 16.75 NAVD surrounding Pond A, the pond bottom was set at 17.7 NAVD to allow pond recovery of the water quality volume in 72 hours. The 100-year 24-hour storm event does not recover within14 days. Therefore, Pond A was designed to hold the volume of another 100-year 24-hour storm event in addition to the volume not recovered from the first storm. Pond A is 6.56 acres in area and is located on the south side of the alignment just north of existing 75' power easement.

Basin A-2 & Basin A-3:
Basin A-2 & Basin A-3 will be directed to Pond A using a combination of roadside swales and closed storm sewer systems. Since the roadway grade is increasing in elevation as it traverses these basins, it is possible to cross basin divides and minimize the number of pond sites necessary and direct this runoff to Pond A

Basin B:
Basin B is directed to Pond B using a closed storm sewer systems. Pond B is to be constructed to handle runoff from Basin B and offsite runoff from the adjacent existing basin. The pond bottom elevation of 36.0 NAVD allows for the pond recovery based on a seasonal high ground water elevation of 32.6 NAVD. Pond B is 1.95 acres in area and is located on the south side of the alignment at Station 145+45 to 151+60.

Basin C:
Basin C is directed to Pond C using a closed storm sewer systems. The pond bottom elevation of 65.0 NAVD allows for the pond recovery based on a seasonal high ground water elevation of 58.0 NAVD. Pond C is 1.06 acres in area and is located on the south side of the alignment at Station 159+35 to 166+10.

Table 2 – Proposed Hydrologic/Hydraulic Information

Basin ID	Area (acre)	CN	100-year 24-hour Runoff Volume (acre-feet)	Peak Stage 100-year 24-hour
A-1	14.15	54.2	5.38	
A-2	2.21	84.7	1.60	
A-3	3.49	83.3	2.48	
Pond A			9.46	
B	9.72	56.7	3.99	39.16
C	3.31	70.1	1.87	69.65

Table 3 – Water Quality Volumes

Basin	0.5" of Runoff from Basin (ac-ft)	1.25" of Runoff from Impervious Area (ac-ft)	Water Quality Volume Required (ac-ft)	Pond Recovery Time (hours)
A-1	0.59	0.43	0.59	
A-2	0.09	0.18	0.18	
A-3	0.15	0.27	0.27	
Pond A			1.04	
B	0.40	0.37	0.40	2.4
C	0.14	0.18	0.18	2.4

Flood Plain Impacts

There is one area of impact to flood plains designated with 100-year flood elevations by FEMA within the project limits. Impacts were calculated using roadway cross sections to quantify fill and cut areas between the estimated normal water level and the estimated 100-year flood elevation. The end-area method was then used to determine impacted volumes in each area.

Impacts begin at approximate station 118+00 and continue to station 129+50. FEMA has designated this area Zone A as seen in Figure 2. DRMP contacted Volusia County to determine if a 100-year flood elevation had been determined for this area. Based on those conversations there is not an established 100-year elevation in this area. A small study was prepared to establish a 100-year flood elevation based on the current water elevation of 16.75(NAVD). The USGS Quad five foot contours for the area and the soils survey were used to develop the hydrology and storage on the existing basins. An elevation of 17.86 NAVD was determined for this area for the 100-year flood elevation.

In order to provide compensation for this basin the proposed stormwater plan will remove runoff from existing portions of the basin and store within Pond A. In addition an additional pond, located to the east of Pond A will be graded to provide additional storage within the basin.

Flood Plain Impacts	= 5.99 ac-ft
Volume removed by Basin A-1 & A-2	= 5.14 ac-ft
Volume provided in additional Pond	= 1.06 ac-ft
Net Increase of 100-year Flood Plains	= 0.21 ac-ft

See Appendix C for the supporting calculations

Culverts

There is one culvert (crossdrain) proposed along the alignment.

CD-1 (119+50)
This proposed elliptical 14"x 23" RCP is necessary to maintain the drainage connection between two existing low areas located north and south of the alignment. The CD-1 will serve to keep the two bodies of water at approximately the same elevation through the 50-year 24-hour storm event.

See Appendix D for the supporting calculations

APPENDIX A

Predevelopment Hydrology

Rhode Island Ave
Existing Conditions

Basin A-1 Sta. 100+00 to 122+20

Description:

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	4.17	39	162.6734
Wood	Good	A	2.22	25	55.47
Water			0.50	100	50.00
Open	Good	D	0.7	80	56
Future Pond A	Good	A	6.56	25	164.00
		Total =	14.15		488.1
				Weighted CN =	**34.5**

Time of Concentration

a) SHEET FLOW

Length (ft)=	300		
n=	0.45		
US elevation=	36		
DS elevation=	24		
Slope (ft/ft)=	0.040		
Intensity (2yr-24-hour)	4.75		
Time of conc. (hr)=	0.589	**JBTOTAL =**	**0.589**

b) CONCENTRATED FLOW

Length (ft)=	333		
US elevation	24		
DS elevation	12		
Slope (ft/ft)=	0.036		
Paved or unpaved =	unpaved		
Velocity (ft/s)=	3.06		
Time of conc. (hr)=	0.030	**JBTOTAL =**	**0.030**

c) CHANNEL FLOW

Length (ft)=			
Velocity (ft/s)=	1.50	(assumed)	
Time of conc. (hr)=	0.00	**JBTOTAL =**	**0.000**

TOTAL Tc (hr) =	**0.619**
TOTAL Tc (min) =	**37**

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)

P= Rainfall (in)

S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	10.6	inches
Q=	3.77	inches

Volume of Runoff = Q (Area of Basin)

V= 4.44 Ac-ft

Rhode Island Ave
Existing Conditions

Basin A-2 Sta. 122+20 to 131+30

Description:

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	2.21	39	86.34
Wooded	Good	A	0	25	0
		Total =	2.21		86.3
				Weighted CN =	**39.00**

Time of Concentration

a) SHEET FLOW

Length (ft)=	253		
n=	0.45		
US elevation=	20		
DS elevation=	14		
Slope (ft/ft)=	0.024		
Intensity (2yr-24-hour)	4.75		
Time of conc. (hr)=	0.634	**JBTOTAL =**	**0.634**

b) CONCENTRATED FLOW

Length (ft)=	0		
US elevation	0		
DS elevation	0		
Slope (ft/ft)=	#DIV/0!		
Paved or unpaved =	unpaved		
Velocity (ft/s)=	#DIV/0!		
Time of conc. (hr)=	#DIV/0!	**JBTOTAL =**	**0.000**

c) CHANNEL FLOW

Length (ft)=			
Velocity (ft/s)=	1.50 (assumed)		
Time of conc. (hr)=	0.00	**JBTOTAL =**	**0.000**

TOTAL Tc (hr) =	**0.634**
TOTAL Tc (min) =	**38**

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)
P= Rainfall (in)
S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:	P=	10.6	inches
	S=	10.6	inches
	Q=	3.77	inches

Volume of Runoff = Q (Area of Basin)

V= 0.70 Ac-ft

Rhode Island Ave
Existing Conditions

Basin A-3 Sta. 131+30 to 145+20

Description:

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Wooded	Good	A	3.49	25	87.20827
		Total =	3.49		87.2
				Weighted CN =	**25.00**

Time of Concentration

a) SHEET FLOW

Length (ft)=	300		
n=	0.45		
US elevation=	41		
DS elevation=	33		
Slope (ft/ft)=	0.027		
Intensity (2yr-24-hour)	4.75		
Time of conc. (hr)=	0.693	**JBTOTAL =**	**0.693**

b) CONCENTRATED FLOW

Length (ft)=	418		
US elevation	33		
DS elevation	18		
Slope (ft/ft)=	0.036		
Paved or unpaved =	unpaved		
Velocity (ft/s)=	3.06		
Time of conc. (hr)=	0.038	**JBTOTAL =**	**0.038**

c) CHANNEL FLOW

Length (ft)=			
Velocity (ft/s)=	1.50 (assumed)		
Time of conc. (hr)=	0.00	**JBTOTAL =**	**0.000**

TOTAL Tc (hr) =	**0.731**
TOTAL Tc (min) =	**44**

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)
P= Rainfall (in)
S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	10.6	inches
Q=	3.77	inches

Volume of Runoff = Q (Area of Basin)

V= 1.10 Ac-ft

Rhode Island Ave
Existing Conditions

Basin B Sta. 145+20 to 158+20

Description:

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Wooded	Good	A	8.63	25	215.8279
		Total =	8.63		215.8
				Weighted CN =	**25.00**

Time of Concentration

a) SHEET FLOW

Length (ft)=	300		
n=	0.4		
US elevation=	42		
DS elevation=	27		
Slope (ft/ft)=	0.050		
Intensity (2yr-24-hour)	4.75		
Time of conc. (hr)=	0.490	**JBTOTAL =**	**0.490**

b) CONCENTRATED FLOW

Length (ft)=	130		
US elevation	27		
DS elevation	23		
Slope (ft/ft)=	0.031		
Paved or unpaved =	unpaved		
Velocity (ft/s)=	2.83		
Time of conc. (hr)=	0.013	**JBTOTAL =**	**0.013**

c) CHANNEL FLOW

Length (ft)=			
Velocity (ft/s)=	1.50 (assumed)		
Time of conc. (hr)=	0.00	**JBTOTAL =**	**0.000**

TOTAL Tc (hr) =	**0.503**
TOTAL Tc (min) =	**30**

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)
P= Rainfall (in)
S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	10.6	inches
Q=	3.77	inches

Volume of Runoff = Q (Area of Basin)

V= 2.71 Ac-ft

Rhode Island Ave
Existing Conditions

Basin C Sta. 158+20 to 166+61

Description:

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Wooded	Good	A	3.31	25	82.75
		Total =	3.31		82.8
				Weighted CN =	**25.00**

Time of Concentration

a) SHEET FLOW

Length (ft)=	300		
n=	0.4		
US elevation=	74		
DS elevation=	59		
Slope (ft/ft)=	0.050		
Intensity (2yr-24-hour)	4.75		
Time of conc. (hr)=	0.490	**JBTOTAL =**	**0.490**

b) CONCENTRATED FLOW

Length (ft)=	71		
US elevation	59		
DS elevation	57		
Slope (ft/ft)=	0.028		
Paved or unpaved =	unpaved		
Velocity (ft/s)=	2.71		
Time of conc. (hr)=	0.007	**JBTOTAL =**	**0.007**

c) CHANNEL FLOW

Length (ft)=			
Velocity (ft/s)=	1.50 (assumed)		
Time of conc. (hr)=	0.00	**JBTOTAL =**	**0.000**

TOTAL Tc (hr) =	**0.498**
TOTAL Tc (min) =	**30**

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)

P= Rainfall (in)

S= Potential Maximum Retention After Runoff Begins (in)

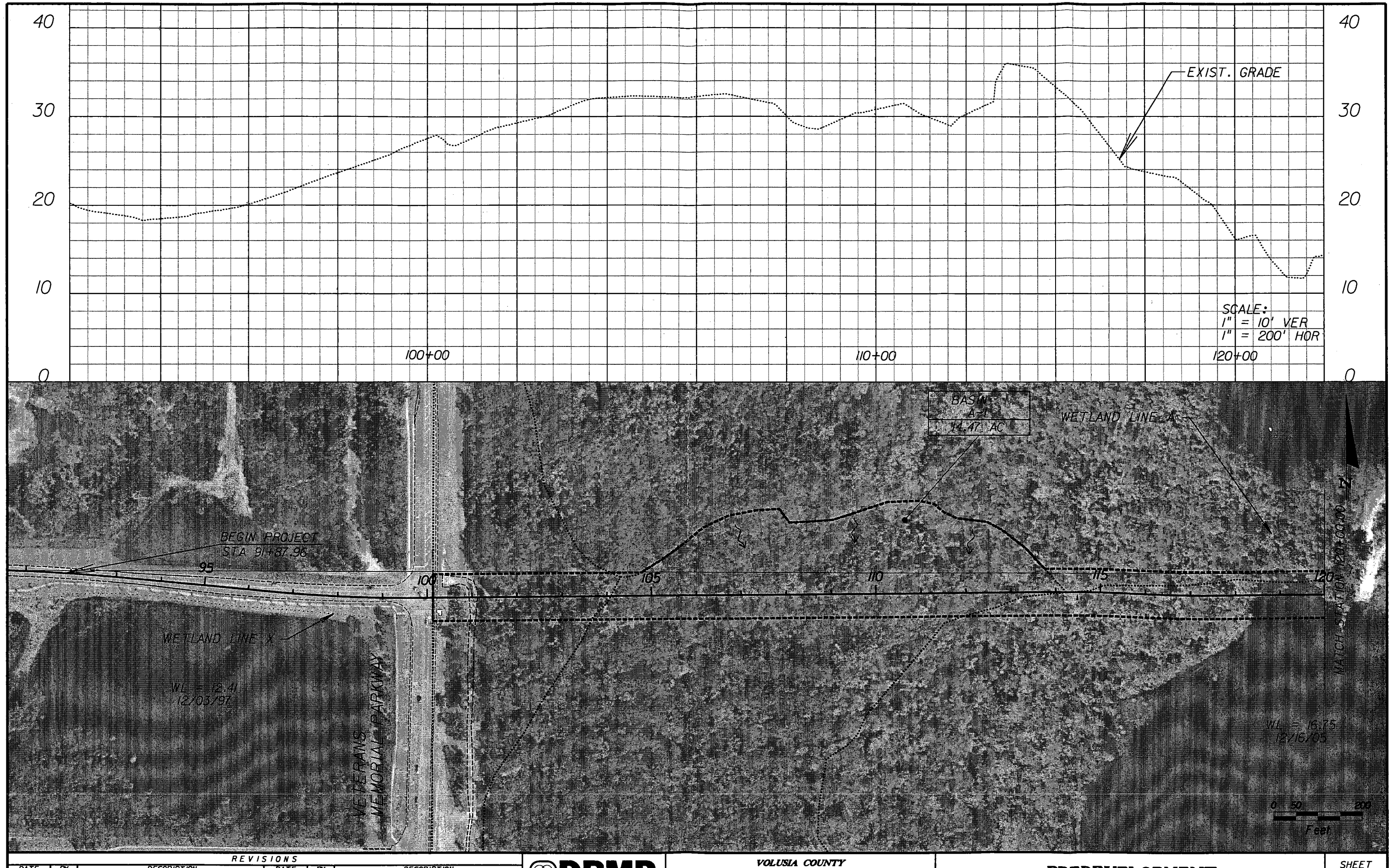
$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	10.6	inches
Q=	3.77	inches

Volume of Runoff = Q (Area of Basin)

V= 1.04 Ac-ft



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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

PREDEVELOPMENT DRAINAGE MAP

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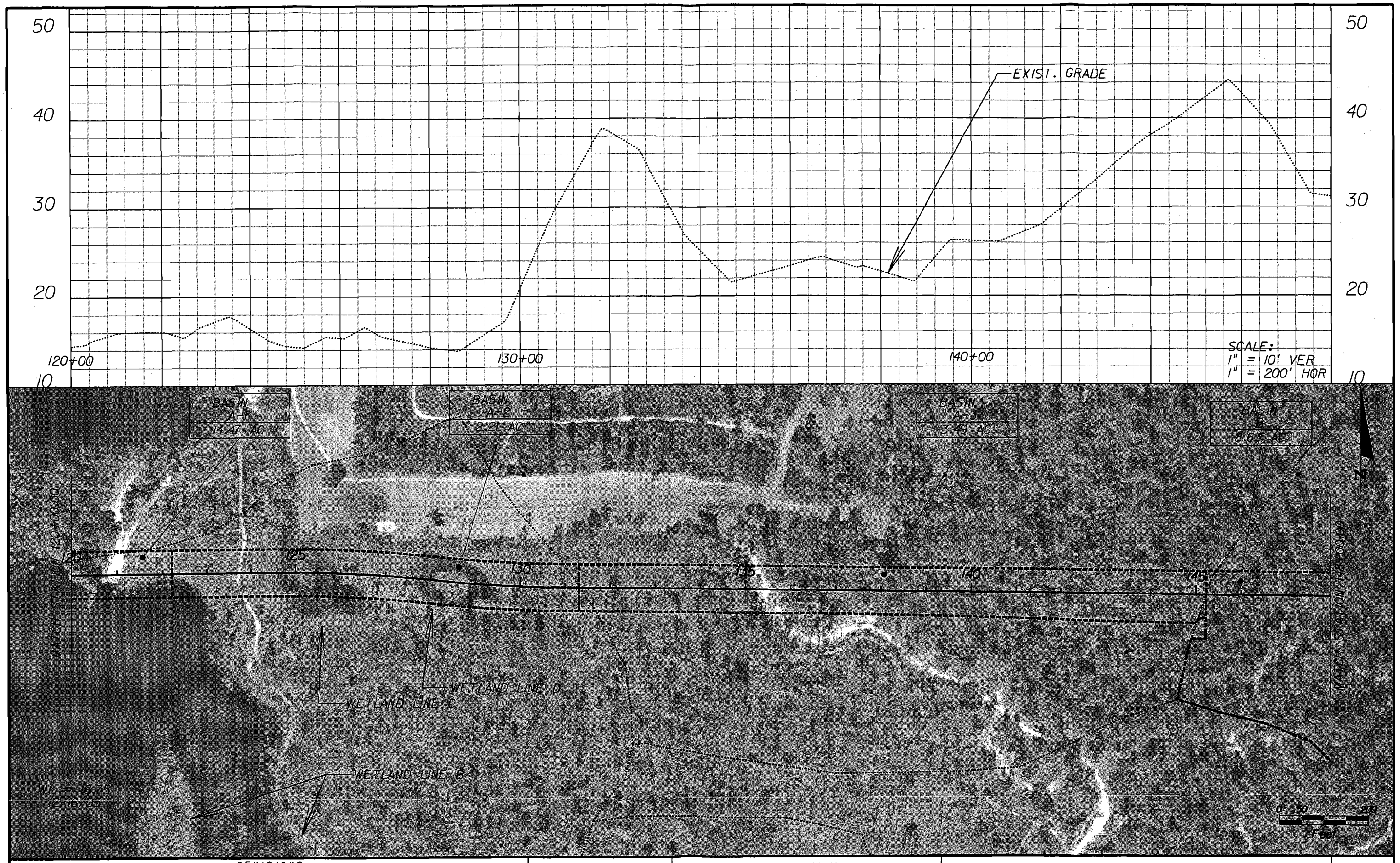

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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

PREDEVELOPMENT DRAINAGE MAP

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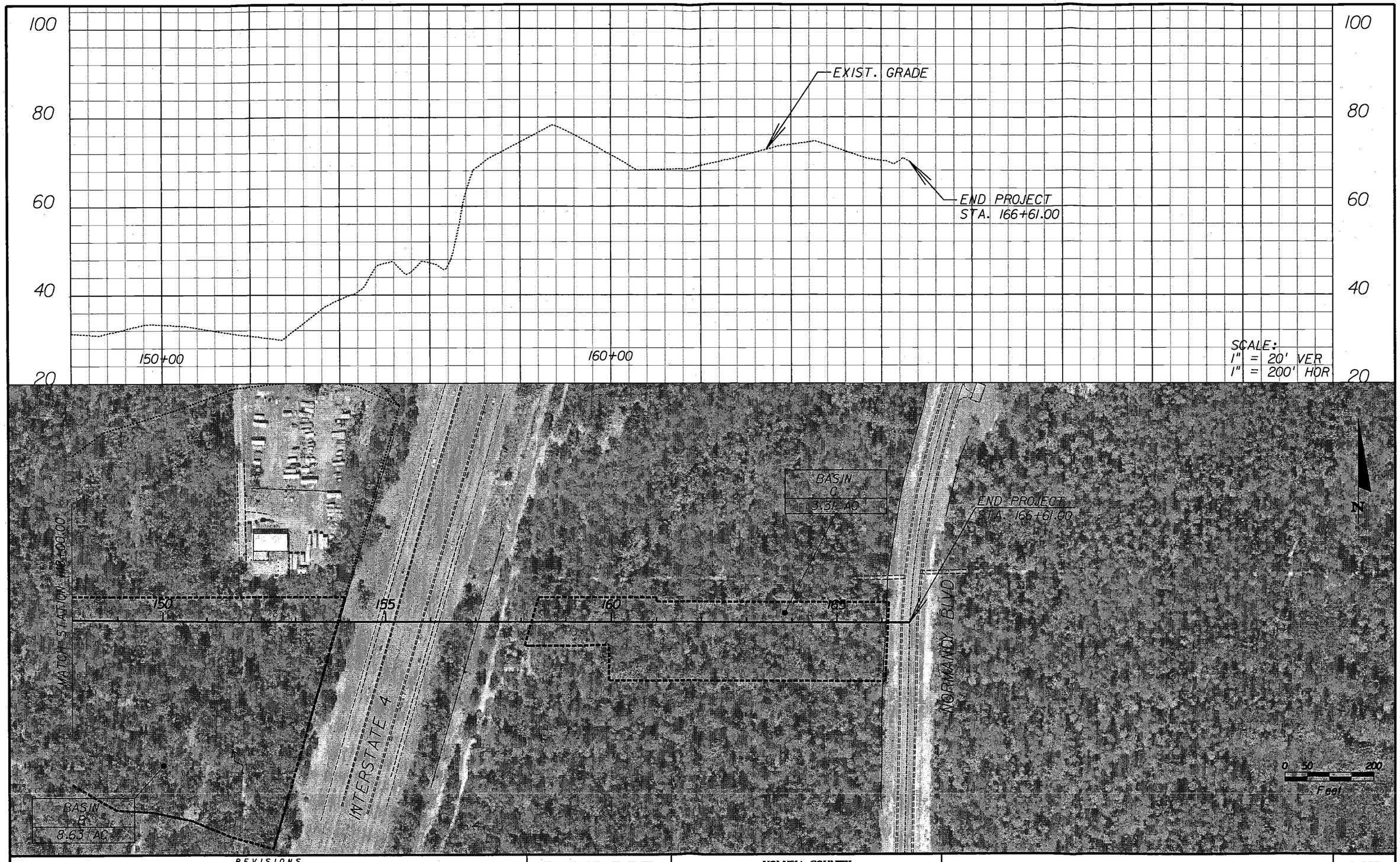

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VOLUSIA COUNTY PUBLIC WORKS SERVICES		
ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

PREDEVLOPMENT DRAINAGE MAP

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APPENDIX B

Post development Hydrology

Rhode Island Ave
Proposed Conditions

Basin A-1 Sta. 100+00 to 122+20

Description: Proposed Roadway

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	1.21	39	47.23
Wood	Good	A	2.22	25	55.47
Impervious	Good		2.74	98	268.49
Future Impervious	Good		1.42	98	139.22
Pond A	Good	A	6.56	39	255.84
		Total =	14.15		766.2
				Weighted CN =	**54.2**

% Impervious Area **29.40%**

Tc (min) =	**10**

Basin	Area (Acres)	CN	Product
A-1	14.15	54	766.25
A-2	2.21	85	187.41
A-3	3.49	83	290.43
Total =	19.85		1244.1
	Total Weighted CN =		**62.7**

% Impervious Area **28.72%**

Water Quality Volumes

	Area (ac.)	c-value
Pervious onsite =	7.77	0.20
Impervious Area =	4.16	0.95
Pond Surface=	0.00	0.95
Total =	11.93	
Weighted c =	0.46	

Use the greater of:		
First half inch of runoff =	0.59	ac-ft
1.25 in. of runoff from impervious area =	0.43	ac-ft
Water Quality Volume (Chapter 40C-42) =	0.59	ac-ft

Required Water Quality Volume for Basin A-1 =	0.59	ac-ft
Required Water Quality Volume for Basin A-2 =	0.18	ac-ft
Required Water Quality Volume for Basin A-3 =	0.27	ac-ft
Required Water Quality Volume in pond A =	1.04	ac-ft
Required Water Quality Elevation in pond A =	17.89	

Rhode Island Ave
Proposed Conditions

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)
P= Rainfall (in)
S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:	P=	10.6	inches
	S=	8.5	inches
	Q=	4.57	inches

Volume of Runoff = Q (Area of Basin)

V= 5.38 Ac-ft

Volume for Pond A = Basin A-1 + Basin A-2+ Basin A-3 = **9.46 Ac-ft**

Stage Storage-Pond A-Dry

	Stage (NGVD) (FT)	Area (Ac)	Incremental Storage (Ac-Ft)	Cumulative Storage (Ac-Ft)
Top of bank	21.00	6.56	6.37	19.73
	20.00	6.17	5.98	13.36
	19.00	5.80	5.70	7.38
	18.00	5.61	1.67	1.67
	17.700	5.55		

Stage Storage-Flood Plain Compensation

	Stage (NGVD) (FT)	Area (Ac)	Incremental Storage (Ac-Ft)	Cumulative Storage (Ac-Ft)
Top of bank	17.86	1.00	1.06	1.06
	16.75	0.92		

Rhode Island Ave
Proposed Conditions

Basin A-2 Sta. 122+20 to 131+30

Description: Proposed Roadway

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	0.50	39	19.53212
Impervious	Good		1.13	98	110.55
Future Impervious	Good		0.58	98	57.32
Open	Good	D	0	80	0
		Total =	2.21		187.4
				Weighted CN =	**84.7**

% Impervious Area **77.38%**

Tc (min) = 10

Water Quality Volumes

	Area (ac.)	c-value
Pervious onsite =	0.50	0.20
Impervious Area =	1.71	0.95
Pond Surface=	0.00	0.95
Total =	2.21	
Weighted c =	0.78	

Use the greater of:

First half inch of runoff =	0.09	ac-ft
1.25 in. of runoff from impervious area =	0.18	ac-ft
Water Quality Volume (Chapter 40C-42) =	0.18	ac-ft

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)

P= Rainfall (in)

S= Potential Maximum Retention After Runoff Begins (in)

$$Q = \frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	1.8	inches
Q=	8.70	inches

Volume of Runoff = Q (Area of Basin)

V= 1.60 Ac-ft

Rhode Island Ave
Proposed Conditions

Basin A-3 Sta. 131+30 to 145+20

Description: Proposed Roadway

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	0.87	39	33.99669
Impervious	Good		1.72	98	168.87
Future Impervious	Good		0.89	98	87.56
Open	Good	D	0	80	0
		Total =	3.49		290.4
				Weighted CN =	**83.3**

% Impervious Area **75.01%**

Tc (min) = 10

Water Quality Volumes

	Area (ac.)	c-value
Pervious onsite =	0.87	0.20
Impervious Area =	2.62	0.95
Pond Surface=	0.00	0.95
Total =	3.49	
Weighted c =	0.76	

Use the greater of:

First half inch of runoff =	0.15	ac-ft
1.25 in. of runoff from impervious area =	0.27	ac-ft
Water Quality Volume (Chapter 40C-42) =	0.27	ac-ft

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)

P= Rainfall (in)

S= Potential Maximum Retention After Runoff Begins (in)

$$Q = \frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	2.0	inches
Q=	8.52	inches

Volume of Runoff = Q (Area of Basin)

V= 2.48 Ac-ft

Rhode Island Ave
Proposed Conditions

Basin B Sta. 145+20 to 158+20

Description: Proposed Roadway

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	3.63	39	141.41
Impervious	Good		1.76	98	172.75
Future Impervious	Good		1.76	98	172.75
Wooded	Good	A	2.57	25	64.15
		Total =	9.72		551.1
				Weighted CN =	**56.7**

% Impervious Area **36.28%**

Tc (min) = 10

Water Quality Volumes

	Area (ac.)	c-value
Pervious onsite =	6.19	0.20
Impervious Area =	3.53	0.95
Pond Surface=	0.00	0.95
Total =	9.72	
Weighted c =	0.47	

Use the greater of:

First half inch of runoff =	0.40	ac-ft
1.25 in. of runoff from impervious area =	0.37	ac-ft
Water Quality Volume (Chapter 40C-42) =	0.40	ac-ft

Required Water Quality Volume in pond =	0.40	ac-ft
Required Water Quality Elevation in pond =	36.37	

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)

P= Rainfall (in)

S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:	P=	10.6	inches
	S=	7.6	inches
	Q=	4.93	inches

Volume of Runoff = Q (Area of Basin)

V= 3.99 Ac-ft

Attenuation Volume for Pond B = Basin B = **3.99** **Ac-ft** **~EL** **39.22**

Rhode Island Ave
Proposed Conditions

Stage Storage-Pond B-Dry

	Stage (NGVD) (FT)	Area (Ac)	Incremental Storage (Ac-Ft)	Cumulative Storage (Ac-Ft)
Top of bank	41.00	1.90	1.77	6.94
	40.00	1.64	1.52	5.17
	39.00	1.39	1.33	3.65
	38.00	1.27	1.22	2.32
	37.00	1.16	1.10	1.10
	36.00	1.04	0.00	0.00

Rhode Island Ave
Proposed Conditions

Basin C Sta. 158+20 to 166+61

Description: Proposed Roadway

Land Use	Hydrologic Condition	Soil Class	Area (Acres)	CN	Product
Open	Good	A	1.56	39	61.0071
Impervious	Good		0.98	98	95.98
Future Impervious	Good		0.76	98	74.65
Open	Good	D	0	80	0
		Total =	3.31		231.6
				Weighted CN =	**70.1**

% Impervious Area **52.67%**

Tc (min) = 10

Water Quality Volumes

	Area (ac.)	c-value
Pervious onsite =	1.56	0.20
Impervious Area =	1.74	0.95
Pond Surface=	0.00	0.95
Total =	3.31	
Weighted c =	0.60	

Use the greater of:

First half inch of runoff =	0.14	ac-ft
1.25 in. of runoff from impervious area =	0.18	ac-ft
Water Quality Volume (Chapter 40C-42) =	0.18	ac-ft
Required Water Quality Volume in pond =	0.18	ac-ft
Required Water Quality Elevation in pond =	65.95	

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)

P= Rainfall (in)

S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

100-year 24-hour Precipitation:

P=	10.6	inches
S=	4.3	inches
Q=	6.78	inches

Volume of Runoff = Q (Area of Basin)

V= 1.87 Ac-ft

Attenuation Volume for Pond C = Basin C = **1.87** **Ac-ft** **~EL** **69.65**

Rhode Island Ave
Proposed Conditions

Stage Storage-Pond C-Dry

	Stage (NGVD) (FT)	Area (Ac)	Incremental Storage (Ac-Ft)	Cumulative Storage (Ac-Ft)
Top of bank	71.00	1.06	0.90	3.08
	70.00	0.74	0.68	2.18
	69.00	0.62	0.55	1.50
	68.00	0.49	0.43	0.95
	67.00	0.37	0.31	0.51
	66.00	0.26	0.20	0.20
	65.00	0.14		

Pond Recovery

PONDS Version 3.2.0169
Retention Pond Recovery - Refined Method
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Project Data

Project Name:	Rhode Island Ave (Pond A)
Simulation Description:	
Project Number:	02-0309.000
Engineer :	Gene McCLendon
Supervising Engineer:	
Date:	01-19-2006

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	9.50
Water Table Elevation, [WT] (ft datum):	16.75
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	9.00
Fillable Porosity, [n] (%):	25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	4.5
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	258235.0

Geometry Data

Equivalent Pond Length, [L] (ft):	700.0
Equivalent Pond Width, [W] (ft):	369.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
17.70	241954.0
18.00	244358.0
19.00	252435.0
20.00	268891.0
21.00	285750.0

Scenario Input Data

Scenario 1 :: 45328 ft³ slug load

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 45328

Initial ground water level (ft datum) default, 16.75

Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.000
0.250	2.500
0.500	3.000
1.000	3.500
1.500	4.000

Scenario 3 :: FDOT 24 Hour (x1)

Hydrograph Type: Inline SCS
Modflow Routing: Routed with infiltration
Repetitions: 1

Basin Area (acres)	20.170
Time Of Concentration (minutes)	10.0
DCIA (%)	0.0
Curve Number	63.8
Design Rainfall Depth (inches)	10.6
Design Rainfall Duration (hours)	24.0
Shape Factor	UHG 323
Rainfall Distribution	FDOT 24 Hour

Initial ground water level (ft datum) default, 16.75

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.000	12.000
0.250	2.500	13.000
0.500	3.000	14.000
1.000	3.500	
1.500	4.000	

Detailed Results :: *Scenario 1 :: 45328 ft³ slug load*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	7554.6670	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	7554.6670	0.0000	17.886	12.59302	0.00000	45328.0	75.6	0.0	U/P
2.400	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
6.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
12.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
24.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
36.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
48.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
60.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
72.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
84.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry
96.000	0.0000	0.0000	----	----	----	45328.0	45328.0	0.0	dry

Summary of Results :: *Scenario 1 :: 45328 ft³ slug load*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	16.75		
Maximum	0.002	17.89		
Inflow				
Rate - Maximum - Positive	0.002		7554.6670	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			45328.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			45328.0
Infiltration				
Rate - Maximum - Positive	0.002		12.5930	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			75.6
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			45328.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	0.00		45328.0
72 Hour Stage and Infiltration Volume	72.000	0.00		45328.0

Detailed Results :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
0.000	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.022	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.044	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.067	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.089	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.111	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.133	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.156	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.178	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.200	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.222	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.244	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.267	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.289	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.311	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.333	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.356	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.378	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.400	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.422	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.444	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.467	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.489	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.511	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.533	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.556	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.578	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.600	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.622	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.644	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.667	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.689	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.711	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.733	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.756	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.778	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.800	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.822	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.844	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.867	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.889	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.911	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.933	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.956	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
0.978	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.000	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.022	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.044	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.067	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.089	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.111	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.133	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.156	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.178	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.200	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.222	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.244	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.267	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.289	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.311	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.333	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.356	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.378	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.400	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.422	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.444	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.467	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.489	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.511	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.533	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.556	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.578	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.600	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.622	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
1.644	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.667	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.689	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.711	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.733	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.756	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.778	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.800	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.822	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.844	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.867	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.889	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.911	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.933	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.956	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
1.978	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.000	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.022	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.044	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.067	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.089	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.111	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.133	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.156	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.178	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.200	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.222	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.244	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.267	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.289	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.311	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.333	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.356	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.378	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.400	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.422	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.444	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.467	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.489	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.511	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.533	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.556	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.578	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.600	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.622	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.644	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.667	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.689	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.711	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.733	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.756	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.778	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.800	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.822	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.844	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.867	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.889	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.911	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.933	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.956	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
2.978	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.000	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.022	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.044	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.067	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.089	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.111	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.133	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.156	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.178	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.200	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.222	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.244	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.267	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
3.289	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.311	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.333	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.356	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.378	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.400	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.422	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.444	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.467	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.489	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.511	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.533	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.556	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.578	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.600	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.622	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.644	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.667	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.689	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.711	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.733	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.756	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.778	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.800	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.822	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.844	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.867	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.889	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.911	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.933	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.956	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
3.978	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.000	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.022	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.044	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.067	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.089	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.111	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.133	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.156	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.178	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.200	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.222	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.244	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.267	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.289	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.311	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.333	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.356	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.378	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.400	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.422	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.444	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.467	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.489	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.511	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.533	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.556	0.0000	0.0000	16.750	0.00000	0.00000	0.0	0.0	0.0	U
4.578	0.0000	0.0000	16.750	0.00006	0.00000	0.0	0.0	0.0	U
4.600	0.0002	0.0000	16.750	0.00035	0.00000	0.0	0.0	0.0	U
4.622	0.0009	0.0000	16.750	0.00118	0.00000	0.1	0.1	0.0	U
4.644	0.0026	0.0000	16.750	0.00297	0.00000	0.2	0.2	0.0	U
4.667	0.0057	0.0000	16.750	0.00613	0.00000	0.5	0.5	0.0	U
4.689	0.0104	0.0000	16.750	0.01082	0.00000	1.2	1.2	0.0	U
4.711	0.0167	0.0000	16.750	0.01700	0.00000	2.3	2.3	0.0	U
4.733	0.0242	0.0000	16.750	0.02450	0.00000	3.9	3.9	0.0	U
4.756	0.0329	0.0000	16.750	0.03313	0.00000	6.2	6.2	0.0	U
4.778	0.0425	0.0000	16.750	0.04270	0.00000	9.2	9.2	0.0	U
4.800	0.0529	0.0000	16.750	0.05305	0.00000	13.0	13.0	0.0	U
4.822	0.0639	0.0000	16.750	0.06407	0.00000	17.7	17.7	0.0	U
4.844	0.0755	0.0000	16.750	0.07565	0.00000	23.3	23.3	0.0	U
4.867	0.0876	0.0000	16.750	0.08772	0.00000	29.8	29.8	0.0	U
4.889	0.1001	0.0000	16.751	0.10021	0.00000	37.3	37.3	0.0	U
4.911	0.1130	0.0000	16.751	0.11307	0.00000	45.8	45.8	0.0	U

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
4.933	0.1262	0.0000	16.751	0.12626	0.00000	55.4	55.4	0.0	U
4.956	0.1397	0.0000	16.751	0.13972	0.00000	66.0	66.0	0.0	U
4.978	0.1534	0.0000	16.751	0.15344	0.00000	77.7	77.7	0.0	U
5.000	0.1673	0.0000	16.751	0.16771	0.00000	90.6	90.6	0.0	U
5.022	0.1828	0.0000	16.752	0.18340	0.00000	104.6	104.6	0.0	U
5.044	0.2007	0.0000	16.752	0.20160	0.00000	119.9	119.9	0.0	U
5.067	0.2223	0.0000	16.752	0.22332	0.00000	136.8	136.8	0.0	U
5.089	0.2481	0.0000	16.752	0.24849	0.00000	155.7	155.7	0.0	U
5.111	0.2755	0.0000	16.753	0.27572	0.00000	176.6	176.6	0.0	U
5.133	0.3037	0.0000	16.753	0.30368	0.00000	199.8	199.8	0.0	U
5.156	0.3317	0.0000	16.753	0.33160	0.00000	225.2	225.2	0.0	U
5.178	0.3593	0.0000	16.754	0.35917	0.00000	252.8	252.8	0.0	U
5.200	0.3865	0.0000	16.754	0.38638	0.00000	282.7	282.7	0.0	U
5.222	0.4133	0.0000	16.755	0.41328	0.00000	314.6	314.6	0.0	U
5.244	0.4400	0.0000	16.755	0.43994	0.00000	348.8	348.8	0.0	U
5.267	0.4665	0.0000	16.756	0.46643	0.00000	385.0	385.0	0.0	U
5.289	0.4928	0.0000	16.757	0.49280	0.00000	423.4	423.4	0.0	U
5.311	0.5191	0.0000	16.757	0.51910	0.00000	463.9	463.9	0.0	U
5.333	0.5454	0.0000	16.758	0.54535	0.00000	506.5	506.5	0.0	U
5.356	0.5715	0.0000	16.759	0.57147	0.00000	551.1	551.1	0.0	U
5.378	0.5975	0.0000	16.759	0.59746	0.00000	597.9	597.9	0.0	U
5.400	0.6234	0.0000	16.760	0.62336	0.00000	646.7	646.7	0.0	U
5.422	0.6492	0.0000	16.761	0.64916	0.00000	697.6	697.6	0.0	U
5.444	0.6749	0.0000	16.762	0.67485	0.00000	750.6	750.6	0.0	U
5.467	0.7005	0.0000	16.762	0.70043	0.00000	805.6	805.6	0.0	U
5.489	0.7259	0.0000	16.763	0.72589	0.00000	862.7	862.7	0.0	U
5.511	0.7513	0.0000	16.764	0.75124	0.00000	921.8	921.8	0.0	U
5.533	0.7765	0.0000	16.765	0.77647	0.00000	982.9	982.9	0.0	U
5.556	0.8016	0.0000	16.766	0.80156	0.00000	1046.0	1046.0	0.0	U
5.578	0.8266	0.0000	16.767	0.82652	0.00000	1111.1	1111.1	0.0	U
5.600	0.8514	0.0000	16.768	0.85136	0.00000	1178.2	1178.2	0.0	U
5.622	0.8761	0.0000	16.769	0.87608	0.00000	1247.3	1247.3	0.0	U
5.644	0.9007	0.0000	16.770	0.90067	0.00000	1318.4	1318.4	0.0	U
5.667	0.9251	0.0000	16.772	0.92512	0.00000	1391.4	1391.4	0.0	U
5.689	0.9495	0.0000	16.773	0.94944	0.00000	1466.4	1466.4	0.0	U
5.711	0.9737	0.0000	16.774	0.97364	0.00000	1543.3	1543.3	0.0	U
5.733	0.9977	0.0000	16.775	0.99770	0.00000	1622.2	1622.2	0.0	U
5.756	1.0217	0.0000	16.776	1.02163	0.00000	1703.0	1703.0	0.0	U
5.778	1.0455	0.0000	16.778	1.04542	0.00000	1785.7	1785.7	0.0	U
5.800	1.0691	0.0000	16.779	1.06908	0.00000	1870.2	1870.2	0.0	U
5.822	1.0926	0.0000	16.780	1.09261	0.00000	1956.7	1956.7	0.0	U
5.844	1.1160	0.0000	16.782	1.11601	0.00000	2045.1	2045.1	0.0	U
5.867	1.1393	0.0000	16.783	1.13929	0.00000	2135.3	2135.3	0.0	U
5.889	1.1625	0.0000	16.785	1.16244	0.00000	2227.4	2227.4	0.0	U
5.911	1.1855	0.0000	16.786	1.18549	0.00000	2321.3	2321.3	0.0	U
5.933	1.2085	0.0000	16.787	1.20843	0.00000	2417.0	2417.0	0.0	U
5.956	1.2313	0.0000	16.789	1.23126	0.00000	2514.6	2514.6	0.0	U
5.978	1.2540	0.0000	16.790	1.25399	0.00000	2614.0	2614.0	0.0	U
6.000	1.2766	0.0000	16.792	1.27661	0.00000	2715.3	2715.3	0.0	U
6.022	1.2992	0.0000	16.794	1.29913	0.00000	2818.3	2818.3	0.0	U
6.044	1.3216	0.0000	16.795	1.32154	0.00000	2923.1	2923.1	0.0	U
6.067	1.3439	0.0000	16.797	1.34386	0.00000	3029.7	3029.7	0.0	U
6.089	1.3661	0.0000	16.799	1.36607	0.00000	3138.1	3138.1	0.0	U
6.111	1.3882	0.0000	16.800	1.38818	0.00000	3248.3	3248.3	0.0	U
6.133	1.4102	0.0000	16.802	1.41019	0.00000	3360.2	3360.2	0.0	U
6.156	1.4321	0.0000	16.804	1.43210	0.00000	3473.9	3473.9	0.0	U
6.178	1.4539	0.0000	16.806	1.45391	0.00000	3589.4	3589.4	0.0	U
6.200	1.4756	0.0000	16.807	1.47562	0.00000	3706.6	3706.6	0.0	U
6.222	1.4973	0.0000	16.809	1.49723	0.00000	3825.5	3825.5	0.0	U
6.244	1.5188	0.0000	16.811	1.51875	0.00000	3946.1	3946.1	0.0	U
6.267	1.5402	0.0000	16.813	1.54017	0.00000	4068.5	4068.5	0.0	U
6.289	1.5615	0.0000	16.815	1.56149	0.00000	4192.5	4192.5	0.0	U
6.311	1.5827	0.0000	16.817	1.58271	0.00000	4318.3	4318.3	0.0	U
6.333	1.6039	0.0000	16.819	1.60385	0.00000	4445.8	4445.8	0.0	U
6.356	1.6249	0.0000	16.821	1.62488	0.00000	4574.9	4574.9	0.0	U
6.378	1.6458	0.0000	16.823	1.64582	0.00000	4705.8	4705.8	0.0	U
6.400	1.6667	0.0000	16.825	1.66667	0.00000	4838.3	4838.3	0.0	U
6.422	1.6875	0.0000	16.827	1.68743	0.00000	4972.4	4972.4	0.0	U
6.444	1.7081	0.0000	16.829	1.70809	0.00000	5108.3	5108.3	0.0	U
6.467	1.7287	0.0000	16.831	1.72866	0.00000	5245.7	5245.7	0.0	U
6.489	1.7492	0.0000	16.833	1.74914	0.00000	5384.8	5384.8	0.0	U
6.511	1.7696	0.0000	16.836	1.76953	0.00000	5525.6	5525.6	0.0	U
6.533	1.7898	0.0000	16.838	1.78983	0.00000	5668.0	5668.0	0.0	U
6.556	1.8101	0.0000	16.840	1.81003	0.00000	5812.0	5812.0	0.0	U

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
6.578	1.8302	0.0000	16.842	1.83015	0.00000	5957.6	5957.6	0.0	U
6.600	1.8502	0.0000	16.845	1.85018	0.00000	6104.8	6104.8	0.0	U
6.622	1.8701	0.0000	16.847	1.87013	0.00000	6253.6	6253.6	0.0	U
6.644	1.8900	0.0000	16.849	1.88998	0.00000	6404.0	6404.0	0.0	U
6.667	1.9098	0.0000	16.852	1.90975	0.00000	6556.0	6556.0	0.0	U
6.689	1.9295	0.0000	16.854	1.92943	0.00000	6709.6	6709.6	0.0	U
6.711	1.9490	0.0000	16.856	1.94902	0.00000	6864.7	6864.7	0.0	U
6.733	1.9686	0.0000	16.859	1.96853	0.00000	7021.4	7021.4	0.0	U
6.756	1.9880	0.0000	16.861	1.98796	0.00000	7179.7	7179.7	0.0	U
6.778	2.0073	0.0000	16.864	2.00729	0.00000	7339.5	7339.5	0.0	U
6.800	2.0266	0.0000	16.866	2.02655	0.00000	7500.8	7500.8	0.0	U
6.822	2.0457	0.0000	16.869	2.04572	0.00000	7663.7	7663.7	0.0	U
6.844	2.0648	0.0000	16.871	2.06481	0.00000	7828.1	7828.1	0.0	U
6.867	2.0838	0.0000	16.874	2.08381	0.00000	7994.1	7994.1	0.0	U
6.889	2.1028	0.0000	16.876	2.10274	0.00000	8161.6	8161.6	0.0	U
6.911	2.1216	0.0000	16.879	2.12158	0.00000	8330.5	8330.5	0.0	U
6.933	2.1404	0.0000	16.882	2.14034	0.00000	8501.0	8501.0	0.0	U
6.956	2.1590	0.0000	16.884	2.15902	0.00000	8673.0	8673.0	0.0	U
6.978	2.1776	0.0000	16.887	2.17761	0.00000	8846.5	8846.5	0.0	U
7.000	2.1962	0.0000	16.890	2.19615	0.00000	9021.4	9021.4	0.0	U
7.022	2.2147	0.0000	16.892	2.21467	0.00000	9197.8	9197.8	0.0	U
7.044	2.2332	0.0000	16.895	2.23322	0.00000	9375.8	9375.8	0.0	U
7.067	2.2518	0.0000	16.898	2.25186	0.00000	9555.2	9555.2	0.0	U
7.089	2.2706	0.0000	16.901	2.27057	0.00000	9736.0	9736.0	0.0	U
7.111	2.2893	0.0000	16.904	2.28927	0.00000	9918.4	9918.4	0.0	U
7.133	2.3079	0.0000	16.906	2.30788	0.00000	10102.3	10102.3	0.0	U
7.156	2.3264	0.0000	16.909	2.32636	0.00000	10287.7	10287.7	0.0	U
7.178	2.3447	0.0000	16.912	2.34470	0.00000	10474.6	10474.6	0.0	U
7.200	2.3629	0.0000	16.915	2.36291	0.00000	10662.9	10662.9	0.0	U
7.222	2.3810	0.0000	16.918	2.38099	0.00000	10852.6	10852.6	0.0	U
7.244	2.3990	0.0000	16.921	2.39896	0.00000	11043.8	11043.8	0.0	U
7.267	2.4168	0.0000	16.924	2.41682	0.00000	11236.5	11236.5	0.0	U
7.289	2.4346	0.0000	16.927	2.43459	0.00000	11430.5	11430.5	0.0	U
7.311	2.4523	0.0000	16.930	2.45226	0.00000	11626.0	11626.0	0.0	U
7.333	2.4699	0.0000	16.933	2.46985	0.00000	11822.9	11822.9	0.0	U
7.356	2.4874	0.0000	16.936	2.48734	0.00000	12021.2	12021.2	0.0	U
7.378	2.5048	0.0000	16.939	2.50475	0.00000	12220.8	12220.8	0.0	U
7.400	2.5221	0.0000	16.942	2.52208	0.00000	12421.9	12421.9	0.0	U
7.422	2.5393	0.0000	16.946	2.53932	0.00000	12624.4	12624.4	0.0	U
7.444	2.5565	0.0000	16.949	2.55649	0.00000	12828.2	12828.2	0.0	U
7.467	2.5736	0.0000	16.952	2.57357	0.00000	13033.4	13033.4	0.0	U
7.489	2.5906	0.0000	16.955	2.59058	0.00000	13240.0	13240.0	0.0	U
7.511	2.6075	0.0000	16.958	2.60751	0.00000	13447.9	13447.9	0.0	U
7.533	2.6244	0.0000	16.962	2.62437	0.00000	13657.2	13657.2	0.0	U
7.556	2.6412	0.0000	16.965	2.64114	0.00000	13867.8	13867.8	0.0	U
7.578	2.6579	0.0000	16.968	2.65785	0.00000	14079.8	14079.8	0.0	U
7.600	2.6745	0.0000	16.971	2.67448	0.00000	14293.1	14293.1	0.0	U
7.622	2.6911	0.0000	16.975	2.69104	0.00000	14507.7	14507.7	0.0	U
7.644	2.7075	0.0000	16.978	2.70753	0.00000	14723.6	14723.6	0.0	U
7.667	2.7240	0.0000	16.981	2.72394	0.00000	14940.9	14940.9	0.0	U
7.689	2.7403	0.0000	16.985	2.74029	0.00000	15159.5	15159.5	0.0	U
7.711	2.7566	0.0000	16.988	2.75656	0.00000	15379.3	15379.3	0.0	U
7.733	2.7728	0.0000	16.992	2.77277	0.00000	15600.5	15600.5	0.0	U
7.756	2.7889	0.0000	16.995	2.78890	0.00000	15823.0	15823.0	0.0	U
7.778	2.8050	0.0000	16.999	2.80497	0.00000	16046.7	16046.7	0.0	U
7.800	2.8210	0.0000	17.002	2.82097	0.00000	16271.8	16271.8	0.0	U
7.822	2.8369	0.0000	17.006	2.83690	0.00000	16498.1	16498.1	0.0	U
7.844	2.8528	0.0000	17.009	2.85277	0.00000	16725.7	16725.7	0.0	U
7.867	2.8686	0.0000	17.013	2.86857	0.00000	16954.5	16954.5	0.0	U
7.889	2.8843	0.0000	17.016	2.88431	0.00000	17184.6	17184.6	0.0	U
7.911	2.9000	0.0000	17.020	2.89998	0.00000	17416.0	17416.0	0.0	U
7.933	2.9156	0.0000	17.023	2.91559	0.00000	17648.6	17648.6	0.0	U
7.956	2.9311	0.0000	17.027	2.93113	0.00000	17882.5	17882.5	0.0	U
7.978	2.9466	0.0000	17.031	2.94678	0.00000	18117.6	18117.6	0.0	U
8.000	2.9627	0.0000	17.034	2.96745	0.00000	18354.0	18354.0	0.0	U
8.022	2.9977	0.0000	17.038	3.00566	0.00000	18592.4	18592.4	0.0	U
8.044	3.0644	0.0000	17.042	3.07623	0.00000	18834.9	18834.9	0.0	U
8.067	3.1783	0.0000	17.046	3.19091	0.00000	19084.6	19084.6	0.0	U
8.089	3.3427	0.0000	17.050	3.34488	0.00000	19345.5	19345.5	0.0	U
8.111	3.5159	0.0000	17.054	3.51454	0.00000	19619.8	19619.8	0.0	U
8.133	3.6836	0.0000	17.058	3.67910	0.00000	19907.8	19907.8	0.0	U
8.156	3.8332	0.0000	17.063	3.82853	0.00000	20208.5	20208.5	0.0	U
8.178	3.9641	0.0000	17.068	3.96020	0.00000	20520.3	20520.3	0.0	U
8.200	4.0794	0.0000	17.073	4.07602	0.00000	20842.1	20842.1	0.0	U

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
8.222	4.1812	0.0000	17.078	4.17857	0.00000	21172.5	21172.5	0.0	U
8.244	4.2725	0.0000	17.083	4.27053	0.00000	21510.7	21510.7	0.0	U
8.267	4.3559	0.0000	17.089	4.35428	0.00000	21855.8	21855.8	0.0	U
8.289	4.4328	0.0000	17.094	4.43138	0.00000	22207.3	22207.3	0.0	U
8.311	4.5040	0.0000	17.100	4.50349	0.00000	22564.8	22564.8	0.0	U
8.333	4.5732	0.0000	17.105	4.57157	0.00000	22927.9	22927.9	0.0	U
8.356	4.6360	0.0000	17.111	4.63511	0.00000	23296.3	23296.3	0.0	U
8.378	4.6953	0.0000	17.117	4.69457	0.00000	23669.5	23669.5	0.0	U
8.400	4.7516	0.0000	17.122	4.75095	0.00000	24047.4	24047.4	0.0	U
8.422	4.8052	0.0000	17.128	4.80455	0.00000	24429.7	24429.7	0.0	U
8.444	4.8562	0.0000	17.134	4.85565	0.00000	24816.1	24816.1	0.0	U
8.467	4.9050	0.0000	17.140	4.90450	0.00000	25206.6	25206.6	0.0	U
8.489	4.9517	0.0000	17.147	4.95128	0.00000	25600.8	25600.8	0.0	U
8.511	4.9966	0.0000	17.153	4.99617	0.00000	25998.8	25998.8	0.0	U
8.533	5.0397	0.0000	17.159	5.03925	0.00000	26400.2	26400.2	0.0	U
8.556	5.0810	0.0000	17.165	5.08059	0.00000	26805.1	26805.1	0.0	U
8.578	5.1206	0.0000	17.172	5.12036	0.00000	27213.1	27213.1	0.0	U
8.600	5.1591	0.0000	17.178	5.15881	0.00000	27624.3	27624.3	0.0	U
8.622	5.1964	0.0000	17.184	5.19608	0.00000	28038.5	28038.5	0.0	U
8.644	5.2325	0.0000	17.191	5.23216	0.00000	28455.7	28455.7	0.0	U
8.667	5.2673	0.0000	17.197	5.26713	0.00000	28875.7	28875.7	0.0	U
8.689	5.3014	0.0000	17.204	5.30113	0.00000	29298.4	29298.4	0.0	U
8.711	5.3345	0.0000	17.210	5.33426	0.00000	29723.9	29723.9	0.0	U
8.733	5.3667	0.0000	17.217	5.36650	0.00000	30151.9	30151.9	0.0	U
8.756	5.3981	0.0000	17.224	5.39788	0.00000	30582.5	30582.5	0.0	U
8.778	5.4287	0.0000	17.230	5.42847	0.00000	31015.6	31015.6	0.0	U
8.800	5.4585	0.0000	17.237	5.45837	0.00000	31451.1	31451.1	0.0	U
8.822	5.4878	0.0000	17.244	5.48768	0.00000	31888.9	31888.9	0.0	U
8.844	5.5166	0.0000	17.251	5.51648	0.00000	32329.1	32329.1	0.0	U
8.867	5.5449	0.0000	17.258	5.54480	0.00000	32771.5	32771.5	0.0	U
8.889	5.5728	0.0000	17.265	5.57274	0.00000	33216.2	33216.2	0.0	U
8.911	5.6005	0.0000	17.271	5.60045	0.00000	33663.2	33663.2	0.0	U
8.933	5.6280	0.0000	17.278	5.62800	0.00000	34112.3	34112.3	0.0	U
8.956	5.6554	0.0000	17.285	5.65540	0.00000	34563.7	34563.7	0.0	U
8.978	5.6827	0.0000	17.292	5.68265	0.00000	35017.2	35017.2	0.0	U
9.000	5.7098	0.0000	17.299	5.70974	0.00000	35472.9	35472.9	0.0	U
9.022	5.7367	0.0000	17.307	5.73669	0.00000	35930.7	35930.7	0.0	U
9.044	5.7635	0.0000	17.314	5.76348	0.00000	36390.8	36390.8	0.0	U
9.067	5.7902	0.0000	17.321	5.79012	0.00000	36852.9	36852.9	0.0	U
9.089	5.8167	0.0000	17.328	5.81662	0.00000	37317.2	37317.2	0.0	U
9.111	5.8430	0.0000	17.335	5.84297	0.00000	37783.6	37783.6	0.0	U
9.133	5.8692	0.0000	17.343	5.86918	0.00000	38252.0	38252.0	0.0	U
9.156	5.8953	0.0000	17.350	5.89524	0.00000	38722.6	38722.6	0.0	U
9.178	5.9212	0.0000	17.357	5.92115	0.00000	39195.3	39195.3	0.0	U
9.200	5.9470	0.0000	17.364	5.94693	0.00000	39670.0	39670.0	0.0	U
9.222	5.9726	0.0000	17.372	5.97256	0.00000	40146.8	40146.8	0.0	U
9.244	5.9981	0.0000	17.379	5.99806	0.00000	40625.6	40625.6	0.0	U
9.267	6.0234	0.0000	17.387	6.02341	0.00000	41106.5	41106.5	0.0	U
9.289	6.0487	0.0000	17.394	6.04863	0.00000	41589.4	41589.4	0.0	U
9.311	6.0737	0.0000	17.402	6.07370	0.00000	42074.3	42074.3	0.0	U
9.333	6.0987	0.0000	17.409	6.09865	0.00000	42561.2	42561.2	0.0	U
9.356	6.1235	0.0000	17.417	6.12345	0.00000	43050.0	43050.0	0.0	U
9.378	6.1482	0.0000	17.424	6.14813	0.00000	43540.9	43540.9	0.0	U
9.400	6.1727	0.0000	17.432	6.17267	0.00000	44033.7	44033.7	0.0	U
9.422	6.1971	0.0000	17.440	6.19707	0.00000	44528.5	44528.5	0.0	U
9.444	6.2214	0.0000	17.447	6.22135	0.00000	45025.3	45025.3	0.0	U
9.467	6.2455	0.0000	17.455	6.24550	0.00000	45524.0	45524.0	0.0	U
9.489	6.2695	0.0000	17.463	6.26951	0.00000	46024.6	46024.6	0.0	U
9.511	6.2934	0.0000	17.471	6.29340	0.00000	46527.1	46527.1	0.0	U
9.533	6.3172	0.0000	17.479	6.31716	0.00000	47031.5	47031.5	0.0	U
9.556	6.3408	0.0000	17.486	6.34079	0.00000	47537.8	47537.8	0.0	U
9.578	6.3643	0.0000	17.494	6.36430	0.00000	48046.0	48046.0	0.0	U
9.600	6.3877	0.0000	17.502	6.38768	0.00000	48556.1	48556.1	0.0	U
9.622	6.4110	0.0000	17.510	6.41094	0.00000	49068.1	49068.1	0.0	U
9.644	6.4341	0.0000	17.518	6.43408	0.00000	49581.9	49581.9	0.0	U
9.667	6.4571	0.0000	17.526	6.45709	0.00000	50097.5	50097.5	0.0	U
9.689	6.4800	0.0000	17.534	6.47998	0.00000	50615.0	50615.0	0.0	U
9.711	6.5028	0.0000	17.542	6.50275	0.00000	51134.3	51134.3	0.0	U
9.733	6.5254	0.0000	17.550	6.52540	0.00000	51655.4	51655.4	0.0	U
9.756	6.5480	0.0000	17.558	6.54794	0.00000	52178.4	52178.4	0.0	U
9.778	6.5704	0.0000	17.566	6.57035	0.00000	52703.1	52703.1	0.0	U
9.800	6.5927	0.0000	17.575	6.59265	0.00000	53229.6	53229.6	0.0	U
9.822	6.6149	0.0000	17.583	6.61483	0.00000	53757.9	53757.9	0.0	U
9.844	6.6369	0.0000	17.591	6.63689	0.00000	54288.0	54288.0	0.0	U

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
9.867	6.6589	0.0000	17.599	6.65884	0.00000	54819.8	54819.8	0.0	U
9.889	6.6807	0.0000	17.607	6.68068	0.00000	55353.4	55353.4	0.0	U
9.911	6.7024	0.0000	17.616	6.70240	0.00000	55888.7	55888.7	0.0	U
9.933	6.7240	0.0000	17.624	6.72401	0.00000	56425.8	56425.8	0.0	U
9.956	6.7455	0.0000	17.632	6.74551	0.00000	56964.6	56964.6	0.0	U
9.978	6.7669	0.0000	17.641	6.76690	0.00000	57505.1	57505.1	0.0	U
10.000	6.7882	0.0000	17.649	6.79498	0.00000	58047.3	58047.3	0.0	U
10.022	6.8366	0.0000	17.658	6.84822	0.00000	58592.3	58592.3	0.0	U
10.044	6.9315	0.0000	17.666	6.94900	0.00000	59143.0	59143.0	0.0	U
10.067	7.0965	0.0000	17.675	7.11606	0.00000	59704.1	59704.1	0.0	U
10.089	7.3398	0.0000	17.684	7.34366	0.00000	60281.6	60281.6	0.0	U
10.111	7.5986	0.0000	17.693	7.59656	0.00000	60879.1	60879.1	0.0	U
10.133	7.8493	0.0000	17.700	7.84225	0.00000	61497.0	61497.0	0.0	U
10.156	8.0719	0.0000	17.700	8.06452	0.00000	62133.9	62133.9	0.0	U
10.178	8.2651	0.0000	17.700	8.25884	0.00000	62787.3	62787.3	0.0	U
10.200	8.4334	0.0000	17.700	8.42798	0.00000	63455.3	63455.3	0.0	U
10.222	8.5801	0.0000	17.700	8.57594	0.00000	64135.8	64135.8	0.0	U
10.244	8.7102	0.0000	17.700	7.20393	0.00000	64827.4	64827.4	0.0	U
10.267	8.8273	0.0000	17.701	3.51832	0.00000	65528.9	65288.4	0.0	U/S
10.289	8.9342	0.0000	17.704	1.22113	0.00000	66239.4	65390.4	0.0	S
10.311	9.0317	0.0000	17.706	1.12222	0.00000	66958.0	65483.8	0.0	S
10.333	9.1259	0.0000	17.709	1.03581	0.00000	67684.3	65569.9	0.0	S
10.356	9.2102	0.0000	17.711	0.96041	0.00000	68417.8	65649.6	0.0	S
10.378	9.2889	0.0000	17.714	0.89465	0.00000	69157.7	65723.6	0.0	S
10.400	9.3627	0.0000	17.717	0.83728	0.00000	69903.8	65792.7	0.0	S
10.422	9.4320	0.0000	17.720	0.78716	0.00000	70655.6	65857.5	0.0	S
10.444	9.4974	0.0000	17.723	0.74332	0.00000	71412.8	65918.6	0.0	S
10.467	9.5593	0.0000	17.726	0.70490	0.00000	72175.0	65976.5	0.0	S
10.489	9.6178	0.0000	17.729	0.67113	0.00000	72942.1	66031.4	0.0	S
10.511	9.6735	0.0000	17.732	0.64138	0.00000	73713.8	66083.9	0.0	S
10.533	9.7263	0.0000	17.735	0.61509	0.00000	74489.8	66134.1	0.0	S
10.556	9.7765	0.0000	17.738	0.59178	0.00000	75269.9	66182.3	0.0	S
10.578	9.8239	0.0000	17.741	0.57104	0.00000	76053.9	66228.7	0.0	S
10.600	9.8695	0.0000	17.744	0.55252	0.00000	76841.6	66273.6	0.0	S
10.622	9.9133	0.0000	17.747	0.53594	0.00000	77632.9	66317.1	0.0	S
10.644	9.9553	0.0000	17.750	0.52103	0.00000	78427.7	66359.4	0.0	S
10.667	9.9955	0.0000	17.753	0.50757	0.00000	79225.7	66400.5	0.0	S
10.689	10.0343	0.0000	17.756	0.49539	0.00000	80026.9	66440.6	0.0	S
10.711	10.0717	0.0000	17.759	0.48433	0.00000	80831.1	66479.8	0.0	S
10.733	10.1079	0.0000	17.762	0.47424	0.00000	81638.3	66518.1	0.0	S
10.756	10.1427	0.0000	17.766	0.46502	0.00000	82448.3	66555.6	0.0	S
10.778	10.1763	0.0000	17.769	0.45656	0.00000	83261.1	66592.5	0.0	S
10.800	10.2089	0.0000	17.772	0.44879	0.00000	84076.5	66628.7	0.0	S
10.822	10.2407	0.0000	17.775	0.44161	0.00000	84894.5	66664.3	0.0	S
10.844	10.2717	0.0000	17.778	0.43497	0.00000	85715.0	66699.3	0.0	S
10.867	10.3020	0.0000	17.782	0.42882	0.00000	86537.9	66733.9	0.0	S
10.889	10.3317	0.0000	17.785	0.42310	0.00000	87363.3	66768.0	0.0	S
10.911	10.3612	0.0000	17.788	0.41778	0.00000	88191.0	66801.6	0.0	S
10.933	10.3905	0.0000	17.792	0.41281	0.00000	89021.1	66834.8	0.0	S
10.956	10.4196	0.0000	17.795	0.40816	0.00000	89853.5	66867.6	0.0	S
10.978	10.4485	0.0000	17.798	0.40381	0.00000	90688.2	66900.1	0.0	S
11.000	10.4784	0.0000	17.801	0.39974	0.00000	91525.3	66932.2	0.0	S
11.022	10.5408	0.0000	17.805	0.39593	0.00000	92366.0	66964.1	0.0	S
11.044	10.6572	0.0000	17.808	0.39240	0.00000	93214.0	66995.6	0.0	S
11.067	10.8539	0.0000	17.812	0.38915	0.00000	94074.4	67026.9	0.0	S
11.089	11.1362	0.0000	17.815	0.38622	0.00000	94954.0	67057.9	0.0	S
11.111	11.4322	0.0000	17.819	0.38357	0.00000	95856.7	67088.6	0.0	S
11.133	11.7170	0.0000	17.822	0.38119	0.00000	96782.7	67119.2	0.0	S
11.156	11.9689	0.0000	17.826	0.37903	0.00000	97730.1	67149.6	0.0	S
11.178	12.1875	0.0000	17.830	0.37707	0.00000	98696.4	67179.9	0.0	S
11.200	12.3781	0.0000	17.834	0.37528	0.00000	99679.0	67210.0	0.0	S
11.222	12.5446	0.0000	17.838	0.37364	0.00000	100675.9	67239.9	0.0	S
11.244	12.6923	0.0000	17.842	0.37212	0.00000	101685.4	67269.8	0.0	S
11.267	12.8256	0.0000	17.846	0.37072	0.00000	102706.1	67299.5	0.0	S
11.289	12.9473	0.0000	17.850	0.36942	0.00000	103737.0	67329.1	0.0	S
11.311	13.0586	0.0000	17.854	0.36822	0.00000	104777.3	67358.6	0.0	S
11.333	13.1660	0.0000	17.858	0.36710	0.00000	105826.3	67388.0	0.0	S
11.356	13.2620	0.0000	17.863	0.36607	0.00000	106883.4	67417.3	0.0	S
11.378	13.3518	0.0000	17.867	0.36510	0.00000	107947.9	67446.6	0.0	S
11.400	13.4360	0.0000	17.871	0.36421	0.00000	109019.4	67475.7	0.0	S
11.422	13.5151	0.0000	17.876	0.36338	0.00000	110097.5	67504.8	0.0	S
11.444	13.5898	0.0000	17.880	0.36261	0.00000	111181.7	67533.9	0.0	S
11.467	13.6604	0.0000	17.884	0.36190	0.00000	112271.7	67562.8	0.0	S
11.489	13.7272	0.0000	17.889	0.36124	0.00000	113367.2	67591.8	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
11.511	13.7907	0.0000	17.893	0.36063	0.00000	114467.9	67620.6	0.0	S
11.533	13.8509	0.0000	17.897	0.36006	0.00000	115573.6	67649.5	0.0	S
11.556	13.9080	0.0000	17.902	0.35954	0.00000	116683.9	67678.3	0.0	S
11.578	13.9622	0.0000	17.906	0.35906	0.00000	117798.7	67707.0	0.0	S
11.600	14.0142	0.0000	17.911	0.35863	0.00000	118917.8	67735.7	0.0	S
11.622	14.0641	0.0000	17.915	0.35823	0.00000	120040.9	67764.4	0.0	S
11.644	14.1119	0.0000	17.920	0.35786	0.00000	121167.9	67793.0	0.0	S
11.667	14.1576	0.0000	17.924	0.35753	0.00000	122298.7	67821.6	0.0	S
11.689	14.2018	0.0000	17.929	0.35723	0.00000	123433.1	67850.2	0.0	S
11.711	14.2444	0.0000	17.933	0.35696	0.00000	124570.9	67878.8	0.0	S
11.733	14.2855	0.0000	17.938	0.35672	0.00000	125712.1	67907.3	0.0	S
11.756	14.3250	0.0000	17.943	0.35651	0.00000	126856.6	67935.9	0.0	S
11.778	14.3633	0.0000	17.947	0.35633	0.00000	128004.1	67964.4	0.0	S
11.800	14.4003	0.0000	17.952	0.35618	0.00000	129154.6	67992.9	0.0	S
11.822	14.4363	0.0000	17.956	0.35605	0.00000	130308.1	68021.4	0.0	S
11.844	14.4715	0.0000	17.961	0.35594	0.00000	131464.4	68049.8	0.0	S
11.867	14.5059	0.0000	17.966	0.35586	0.00000	132623.5	68078.3	0.0	S
11.889	14.5396	0.0000	17.970	0.35580	0.00000	133785.3	68106.8	0.0	S
11.911	14.5730	0.0000	17.975	0.35577	0.00000	134949.8	68135.2	0.0	S
11.933	14.6062	0.0000	17.980	0.35575	0.00000	136117.0	68163.7	0.0	S
11.956	14.6392	0.0000	17.984	0.35576	0.00000	137286.8	68192.2	0.0	S
11.978	14.6719	0.0000	17.989	0.35578	0.00000	138459.3	68220.6	0.0	S
12.000	14.7044	0.0000	17.994	0.35581	0.00000	139634.3	68249.1	0.0	S
12.022	14.6826	0.0000	17.998	0.35584	0.00000	140809.8	68277.6	0.0	S
12.044	14.5705	0.0000	18.003	0.35580	0.00000	141979.9	68306.0	0.0	S
12.067	14.3227	0.0000	18.008	0.35564	0.00000	143135.6	68334.5	0.0	S
12.089	13.9252	0.0000	18.012	0.35532	0.00000	144265.6	68362.9	0.0	S
12.111	13.5036	0.0000	18.016	0.35481	0.00000	145362.7	68391.3	0.0	S
12.133	13.1000	0.0000	18.021	0.35416	0.00000	146426.9	68419.7	0.0	S
12.156	12.7525	0.0000	18.025	0.35339	0.00000	147461.0	68448.0	0.0	S
12.178	12.4619	0.0000	18.029	0.35256	0.00000	148469.5	68476.2	0.0	S
12.200	12.2192	0.0000	18.033	0.35168	0.00000	149456.8	68504.4	0.0	S
12.222	12.0178	0.0000	18.037	0.35079	0.00000	150426.3	68532.5	0.0	S
12.244	11.8483	0.0000	18.040	0.34989	0.00000	151380.9	68560.5	0.0	S
12.267	11.7033	0.0000	18.044	0.34900	0.00000	152323.0	68588.5	0.0	S
12.289	11.5778	0.0000	18.048	0.34814	0.00000	153254.2	68616.4	0.0	S
12.311	11.4702	0.0000	18.051	0.34729	0.00000	154176.1	68644.2	0.0	S
12.333	11.3683	0.0000	18.055	0.34646	0.00000	155089.7	68671.9	0.0	S
12.356	11.2858	0.0000	18.059	0.34567	0.00000	155995.8	68699.6	0.0	S
12.378	11.2136	0.0000	18.062	0.34490	0.00000	156895.8	68727.2	0.0	S
12.400	11.1504	0.0000	18.066	0.34416	0.00000	157790.4	68754.8	0.0	S
12.422	11.0955	0.0000	18.069	0.34346	0.00000	158680.2	68782.3	0.0	S
12.444	11.0479	0.0000	18.073	0.34278	0.00000	159565.9	68809.8	0.0	S
12.467	11.0067	0.0000	18.076	0.34213	0.00000	160448.1	68837.2	0.0	S
12.489	10.9716	0.0000	18.080	0.34151	0.00000	161327.3	68864.5	0.0	S
12.511	10.9416	0.0000	18.083	0.34093	0.00000	162203.8	68891.8	0.0	S
12.533	10.9167	0.0000	18.087	0.34037	0.00000	163078.1	68919.1	0.0	S
12.556	10.8967	0.0000	18.090	0.33984	0.00000	163950.6	68946.3	0.0	S
12.578	10.8813	0.0000	18.094	0.33933	0.00000	164821.8	68973.4	0.0	S
12.600	10.8691	0.0000	18.097	0.33886	0.00000	165691.8	69000.6	0.0	S
12.622	10.8600	0.0000	18.100	0.33841	0.00000	166560.9	69027.6	0.0	S
12.644	10.8540	0.0000	18.104	0.33799	0.00000	167429.5	69054.7	0.0	S
12.667	10.8511	0.0000	18.107	0.33759	0.00000	168297.7	69081.7	0.0	S
12.689	10.8503	0.0000	18.111	0.33722	0.00000	169165.8	69108.7	0.0	S
12.711	10.8517	0.0000	18.114	0.33685	0.00000	170033.8	69135.7	0.0	S
12.733	10.8552	0.0000	18.118	0.33653	0.00000	170902.1	69162.6	0.0	S
12.756	10.8609	0.0000	18.121	0.33624	0.00000	171770.8	69189.5	0.0	S
12.778	10.8683	0.0000	18.124	0.33594	0.00000	172639.9	69216.4	0.0	S
12.800	10.8774	0.0000	18.128	0.33568	0.00000	173509.8	69243.3	0.0	S
12.822	10.8876	0.0000	18.131	0.33544	0.00000	174380.4	69270.1	0.0	S
12.844	10.8988	0.0000	18.135	0.33522	0.00000	175251.8	69296.9	0.0	S
12.867	10.9109	0.0000	18.138	0.33502	0.00000	176124.2	69323.8	0.0	S
12.889	10.9238	0.0000	18.142	0.33483	0.00000	176997.6	69350.5	0.0	S
12.911	10.9366	0.0000	18.145	0.33467	0.00000	177872.0	69377.3	0.0	S
12.933	10.9494	0.0000	18.149	0.33452	0.00000	178747.4	69404.1	0.0	S
12.956	10.9621	0.0000	18.152	0.33438	0.00000	179623.9	69430.8	0.0	S
12.978	10.9747	0.0000	18.156	0.33426	0.00000	180501.4	69457.6	0.0	S
13.000	10.9873	0.0000	18.159	0.33415	0.00000	181379.8	69484.3	0.0	S
13.022	10.9818	0.0000	18.162	0.33405	0.00000	182258.6	69511.1	0.0	S
13.044	10.9454	0.0000	18.166	0.33392	0.00000	183135.7	69537.8	0.0	S
13.067	10.8625	0.0000	18.169	0.33376	0.00000	184008.0	69564.5	0.0	S
13.089	10.7281	0.0000	18.173	0.33355	0.00000	184871.6	69591.2	0.0	S
13.111	10.5838	0.0000	18.176	0.33328	0.00000	185724.1	69617.9	0.0	S
13.133	10.4456	0.0000	18.179	0.33298	0.00000	186565.3	69644.5	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
13.156	10.3266	0.0000	18.183	0.33261	0.00000	187396.2	69671.1	0.0	S
13.178	10.2275	0.0000	18.186	0.33224	0.00000	188218.3	69697.7	0.0	S
13.200	10.1453	0.0000	18.189	0.33188	0.00000	189033.3	69724.3	0.0	S
13.222	10.0776	0.0000	18.192	0.33150	0.00000	189842.2	69750.8	0.0	S
13.244	10.0213	0.0000	18.195	0.33112	0.00000	190646.1	69777.3	0.0	S
13.267	9.9736	0.0000	18.199	0.33073	0.00000	191445.9	69803.8	0.0	S
13.289	9.9329	0.0000	18.202	0.33037	0.00000	192242.2	69830.2	0.0	S
13.311	9.8985	0.0000	18.205	0.33004	0.00000	193035.4	69856.7	0.0	S
13.333	9.8662	0.0000	18.208	0.32969	0.00000	193826.0	69883.1	0.0	S
13.356	9.8406	0.0000	18.211	0.32937	0.00000	194614.3	69909.4	0.0	S
13.378	9.8187	0.0000	18.214	0.32906	0.00000	195400.7	69935.8	0.0	S
13.400	9.8000	0.0000	18.217	0.32877	0.00000	196185.4	69962.1	0.0	S
13.422	9.7842	0.0000	18.220	0.32849	0.00000	196968.8	69988.4	0.0	S
13.444	9.7709	0.0000	18.223	0.32822	0.00000	197751.0	70014.6	0.0	S
13.467	9.7600	0.0000	18.226	0.32797	0.00000	198532.2	70040.9	0.0	S
13.489	9.7512	0.0000	18.230	0.32774	0.00000	199312.7	70067.1	0.0	S
13.511	9.7441	0.0000	18.233	0.32752	0.00000	200092.5	70093.3	0.0	S
13.533	9.7389	0.0000	18.236	0.32730	0.00000	200871.8	70119.5	0.0	S
13.556	9.7354	0.0000	18.239	0.32711	0.00000	201650.8	70145.7	0.0	S
13.578	9.7335	0.0000	18.242	0.32692	0.00000	202429.5	70171.8	0.0	S
13.600	9.7327	0.0000	18.245	0.32675	0.00000	203208.2	70198.0	0.0	S
13.622	9.7330	0.0000	18.248	0.32659	0.00000	203986.8	70224.1	0.0	S
13.644	9.7344	0.0000	18.251	0.32645	0.00000	204765.5	70250.2	0.0	S
13.667	9.7369	0.0000	18.254	0.32631	0.00000	205544.4	70276.3	0.0	S
13.689	9.7401	0.0000	18.257	0.32618	0.00000	206323.4	70302.5	0.0	S
13.711	9.7441	0.0000	18.260	0.32607	0.00000	207102.8	70328.5	0.0	S
13.733	9.7488	0.0000	18.263	0.32597	0.00000	207882.5	70354.6	0.0	S
13.756	9.7542	0.0000	18.266	0.32587	0.00000	208662.6	70380.7	0.0	S
13.778	9.7602	0.0000	18.269	0.32579	0.00000	209443.2	70406.8	0.0	S
13.800	9.7669	0.0000	18.272	0.32570	0.00000	210224.3	70432.8	0.0	S
13.822	9.7739	0.0000	18.275	0.32564	0.00000	211005.9	70458.9	0.0	S
13.844	9.7812	0.0000	18.278	0.32559	0.00000	211788.1	70484.9	0.0	S
13.867	9.7889	0.0000	18.282	0.32553	0.00000	212570.9	70511.0	0.0	S
13.889	9.7968	0.0000	18.285	0.32549	0.00000	213354.4	70537.0	0.0	S
13.911	9.8047	0.0000	18.288	0.32547	0.00000	214138.4	70563.0	0.0	S
13.933	9.8126	0.0000	18.291	0.32544	0.00000	214923.1	70589.1	0.0	S
13.956	9.8204	0.0000	18.294	0.32543	0.00000	215708.4	70615.1	0.0	S
13.978	9.8282	0.0000	18.297	0.32543	0.00000	216494.4	70641.1	0.0	S
14.000	9.8360	0.0000	18.300	0.32542	0.00000	217280.9	70667.2	0.0	S
14.022	9.8435	0.0000	18.303	0.32542	0.00000	218068.1	70693.2	0.0	S
14.044	9.8504	0.0000	18.306	0.32544	0.00000	218855.9	70719.2	0.0	S
14.067	9.8566	0.0000	18.309	0.32545	0.00000	219644.2	70745.3	0.0	S
14.089	9.8620	0.0000	18.312	0.32547	0.00000	220432.9	70771.3	0.0	S
14.111	9.8673	0.0000	18.315	0.32550	0.00000	221222.1	70797.4	0.0	S
14.133	9.8726	0.0000	18.319	0.32553	0.00000	222011.7	70823.4	0.0	S
14.156	9.8782	0.0000	18.322	0.32555	0.00000	222801.7	70849.4	0.0	S
14.178	9.8841	0.0000	18.325	0.32560	0.00000	223592.2	70875.5	0.0	S
14.200	9.8903	0.0000	18.328	0.32565	0.00000	224383.2	70901.5	0.0	S
14.222	9.8966	0.0000	18.331	0.32569	0.00000	225174.7	70927.6	0.0	S
14.244	9.9030	0.0000	18.334	0.32574	0.00000	225966.6	70953.7	0.0	S
14.267	9.9096	0.0000	18.337	0.32580	0.00000	226759.1	70979.7	0.0	S
14.289	9.9163	0.0000	18.340	0.32587	0.00000	227552.2	71005.8	0.0	S
14.311	9.9230	0.0000	18.343	0.32593	0.00000	228345.8	71031.8	0.0	S
14.333	9.9297	0.0000	18.346	0.32600	0.00000	229139.8	71057.9	0.0	S
14.356	9.9365	0.0000	18.350	0.32608	0.00000	229934.5	71084.0	0.0	S
14.378	9.9433	0.0000	18.353	0.32616	0.00000	230729.7	71110.1	0.0	S
14.400	9.9501	0.0000	18.356	0.32624	0.00000	231525.4	71136.2	0.0	S
14.422	9.9570	0.0000	18.359	0.32633	0.00000	232321.7	71162.3	0.0	S
14.444	9.9639	0.0000	18.362	0.32642	0.00000	233118.5	71188.4	0.0	S
14.467	9.9708	0.0000	18.365	0.32652	0.00000	233915.9	71214.5	0.0	S
14.489	9.9776	0.0000	18.368	0.32662	0.00000	234713.9	71240.7	0.0	S
14.511	9.9845	0.0000	18.371	0.32672	0.00000	235512.3	71266.8	0.0	S
14.533	9.9914	0.0000	18.374	0.32683	0.00000	236311.4	71292.9	0.0	S
14.556	9.9983	0.0000	18.378	0.32693	0.00000	237111.0	71319.1	0.0	S
14.578	10.0052	0.0000	18.381	0.32704	0.00000	237911.1	71345.2	0.0	S
14.600	10.0121	0.0000	18.384	0.32716	0.00000	238711.8	71371.4	0.0	S
14.622	10.0190	0.0000	18.387	0.32729	0.00000	239513.1	71397.6	0.0	S
14.644	10.0259	0.0000	18.390	0.32741	0.00000	240314.9	71423.8	0.0	S
14.667	10.0327	0.0000	18.393	0.32754	0.00000	241117.2	71450.0	0.0	S
14.689	10.0396	0.0000	18.396	0.32767	0.00000	241920.1	71476.2	0.0	S
14.711	10.0464	0.0000	18.400	0.32780	0.00000	242723.5	71502.4	0.0	S
14.733	10.0533	0.0000	18.403	0.32793	0.00000	243527.5	71528.6	0.0	S
14.756	10.0601	0.0000	18.406	0.32807	0.00000	244332.1	71554.9	0.0	S
14.778	10.0669	0.0000	18.409	0.32820	0.00000	245137.1	71581.1	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
14.800	10.0737	0.0000	18.412	0.32835	0.00000	245942.8	71607.4	0.0	S
14.822	10.0804	0.0000	18.415	0.32851	0.00000	246748.9	71633.7	0.0	S
14.844	10.0872	0.0000	18.418	0.32866	0.00000	247555.6	71659.9	0.0	S
14.867	10.0939	0.0000	18.422	0.32881	0.00000	248362.9	71686.2	0.0	S
14.889	10.1006	0.0000	18.425	0.32896	0.00000	249170.6	71712.5	0.0	S
14.911	10.1073	0.0000	18.428	0.32912	0.00000	249979.0	71738.9	0.0	S
14.933	10.1140	0.0000	18.431	0.32927	0.00000	250787.8	71765.2	0.0	S
14.956	10.1206	0.0000	18.434	0.32943	0.00000	251597.2	71791.6	0.0	S
14.978	10.1272	0.0000	18.437	0.32959	0.00000	252407.1	71817.9	0.0	S
15.000	10.1338	0.0000	18.441	0.32975	0.00000	253217.5	71844.3	0.0	S
15.022	10.1200	0.0000	18.444	0.32990	0.00000	254027.7	71870.7	0.0	S
15.044	10.0723	0.0000	18.447	0.33003	0.00000	254835.4	71897.1	0.0	S
15.067	9.9735	0.0000	18.450	0.33010	0.00000	255637.2	71923.5	0.0	S
15.089	9.8186	0.0000	18.453	0.33011	0.00000	256428.9	71949.9	0.0	S
15.111	9.6550	0.0000	18.456	0.33005	0.00000	257207.9	71976.3	0.0	S
15.133	9.4987	0.0000	18.459	0.32991	0.00000	257974.0	72002.7	0.0	S
15.156	9.3639	0.0000	18.462	0.32974	0.00000	258728.5	72029.1	0.0	S
15.178	9.2510	0.0000	18.465	0.32954	0.00000	259473.1	72055.5	0.0	S
15.200	9.1564	0.0000	18.468	0.32931	0.00000	260209.4	72081.8	0.0	S
15.222	9.0776	0.0000	18.471	0.32908	0.00000	260938.8	72108.1	0.0	S
15.244	9.0111	0.0000	18.473	0.32884	0.00000	261662.3	72134.5	0.0	S
15.267	8.9540	0.0000	18.476	0.32861	0.00000	262380.9	72160.8	0.0	S
15.289	8.9044	0.0000	18.479	0.32838	0.00000	263095.3	72187.0	0.0	S
15.311	8.8618	0.0000	18.482	0.32816	0.00000	263805.9	72213.3	0.0	S
15.333	8.8214	0.0000	18.484	0.32795	0.00000	264513.2	72239.5	0.0	S
15.356	8.7884	0.0000	18.487	0.32775	0.00000	265217.6	72265.8	0.0	S
15.378	8.7595	0.0000	18.490	0.32755	0.00000	265919.5	72292.0	0.0	S
15.400	8.7341	0.0000	18.493	0.32737	0.00000	266619.3	72318.2	0.0	S
15.422	8.7118	0.0000	18.495	0.32719	0.00000	267317.1	72344.4	0.0	S
15.444	8.6924	0.0000	18.498	0.32703	0.00000	268013.3	72370.5	0.0	S
15.467	8.6755	0.0000	18.501	0.32687	0.00000	268708.0	72396.7	0.0	S
15.489	8.6609	0.0000	18.503	0.32673	0.00000	269401.4	72422.8	0.0	S
15.511	8.6483	0.0000	18.506	0.32659	0.00000	270093.8	72449.0	0.0	S
15.533	8.6377	0.0000	18.509	0.32647	0.00000	270785.3	72475.1	0.0	S
15.556	8.6290	0.0000	18.511	0.32635	0.00000	271475.9	72501.2	0.0	S
15.578	8.6221	0.0000	18.514	0.32624	0.00000	272166.0	72527.3	0.0	S
15.600	8.6164	0.0000	18.517	0.32612	0.00000	272855.5	72553.4	0.0	S
15.622	8.6119	0.0000	18.519	0.32604	0.00000	273544.6	72579.5	0.0	S
15.644	8.6087	0.0000	18.522	0.32597	0.00000	274233.4	72605.6	0.0	S
15.667	8.6066	0.0000	18.525	0.32588	0.00000	274922.1	72631.6	0.0	S
15.689	8.6053	0.0000	18.527	0.32583	0.00000	275610.5	72657.7	0.0	S
15.711	8.6049	0.0000	18.530	0.32578	0.00000	276298.9	72683.8	0.0	S
15.733	8.6054	0.0000	18.533	0.32572	0.00000	276987.4	72709.8	0.0	S
15.756	8.6066	0.0000	18.535	0.32568	0.00000	277675.8	72735.9	0.0	S
15.778	8.6085	0.0000	18.538	0.32566	0.00000	278364.4	72761.9	0.0	S
15.800	8.6111	0.0000	18.541	0.32562	0.00000	279053.3	72788.0	0.0	S
15.822	8.6141	0.0000	18.543	0.32560	0.00000	279742.3	72814.0	0.0	S
15.844	8.6175	0.0000	18.546	0.32560	0.00000	280431.5	72840.1	0.0	S
15.867	8.6213	0.0000	18.549	0.32558	0.00000	281121.1	72866.1	0.0	S
15.889	8.6253	0.0000	18.551	0.32558	0.00000	281810.9	72892.2	0.0	S
15.911	8.6294	0.0000	18.554	0.32559	0.00000	282501.1	72918.2	0.0	S
15.933	8.6334	0.0000	18.557	0.32559	0.00000	283191.6	72944.3	0.0	S
15.956	8.6374	0.0000	18.559	0.32559	0.00000	283882.5	72970.3	0.0	S
15.978	8.6415	0.0000	18.562	0.32562	0.00000	284573.6	72996.4	0.0	S
16.000	8.6455	0.0000	18.565	0.32565	0.00000	285265.1	73022.4	0.0	S
16.022	8.6296	0.0000	18.567	0.32566	0.00000	285956.1	73048.5	0.0	S
16.044	8.5799	0.0000	18.570	0.32565	0.00000	286644.5	73074.5	0.0	S
16.067	8.4792	0.0000	18.573	0.32558	0.00000	287326.8	73100.6	0.0	S
16.089	8.3219	0.0000	18.575	0.32545	0.00000	287998.9	73126.6	0.0	S
16.111	8.1542	0.0000	18.578	0.32523	0.00000	288657.9	73152.7	0.0	S
16.133	7.9933	0.0000	18.580	0.32497	0.00000	289303.8	73178.7	0.0	S
16.156	7.8537	0.0000	18.583	0.32464	0.00000	289937.7	73204.6	0.0	S
16.178	7.7363	0.0000	18.585	0.32430	0.00000	290561.3	73230.6	0.0	S
16.200	7.6376	0.0000	18.588	0.32394	0.00000	291176.3	73256.5	0.0	S
16.222	7.5551	0.0000	18.590	0.32357	0.00000	291784.0	73282.4	0.0	S
16.244	7.4852	0.0000	18.592	0.32323	0.00000	292385.6	73308.3	0.0	S
16.267	7.4249	0.0000	18.595	0.32284	0.00000	292982.0	73334.1	0.0	S
16.289	7.3724	0.0000	18.597	0.32248	0.00000	293573.9	73360.0	0.0	S
16.311	7.3269	0.0000	18.599	0.32213	0.00000	294161.8	73385.7	0.0	S
16.333	7.2839	0.0000	18.601	0.32179	0.00000	294746.3	73411.5	0.0	S
16.356	7.2482	0.0000	18.604	0.32145	0.00000	295327.6	73437.2	0.0	S
16.378	7.2168	0.0000	18.606	0.32113	0.00000	295906.2	73462.9	0.0	S
16.400	7.1889	0.0000	18.608	0.32082	0.00000	296482.4	73488.6	0.0	S
16.422	7.1643	0.0000	18.610	0.32052	0.00000	297056.5	73514.3	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
16.444	7.1426	0.0000	18.612	0.32023	0.00000	297628.8	73539.9	0.0	S
16.467	7.1234	0.0000	18.615	0.31995	0.00000	298199.4	73565.5	0.0	S
16.489	7.1067	0.0000	18.617	0.31968	0.00000	298768.7	73591.1	0.0	S
16.511	7.0919	0.0000	18.619	0.31942	0.00000	299336.6	73616.7	0.0	S
16.533	7.0793	0.0000	18.621	0.31917	0.00000	299903.4	73642.2	0.0	S
16.556	7.0685	0.0000	18.623	0.31894	0.00000	300469.3	73667.7	0.0	S
16.578	7.0595	0.0000	18.625	0.31871	0.00000	301034.5	73693.2	0.0	S
16.600	7.0519	0.0000	18.628	0.31849	0.00000	301598.9	73718.7	0.0	S
16.622	7.0454	0.0000	18.630	0.31828	0.00000	302162.8	73744.2	0.0	S
16.644	7.0402	0.0000	18.632	0.31808	0.00000	302726.3	73769.6	0.0	S
16.667	7.0362	0.0000	18.634	0.31789	0.00000	303289.3	73795.1	0.0	S
16.689	7.0331	0.0000	18.636	0.31768	0.00000	303852.1	73820.5	0.0	S
16.711	7.0309	0.0000	18.638	0.31752	0.00000	304414.6	73845.9	0.0	S
16.733	7.0294	0.0000	18.640	0.31737	0.00000	304977.1	73871.3	0.0	S
16.756	7.0289	0.0000	18.643	0.31718	0.00000	305539.4	73896.7	0.0	S
16.778	7.0290	0.0000	18.645	0.31705	0.00000	306101.7	73922.1	0.0	S
16.800	7.0298	0.0000	18.647	0.31692	0.00000	306664.1	73947.4	0.0	S
16.822	7.0310	0.0000	18.649	0.31676	0.00000	307226.5	73972.8	0.0	S
16.844	7.0327	0.0000	18.651	0.31664	0.00000	307789.0	73998.1	0.0	S
16.867	7.0347	0.0000	18.653	0.31653	0.00000	308351.7	74023.4	0.0	S
16.889	7.0370	0.0000	18.656	0.31639	0.00000	308914.6	74048.7	0.0	S
16.911	7.0394	0.0000	18.658	0.31630	0.00000	309477.7	74074.0	0.0	S
16.933	7.0417	0.0000	18.660	0.31621	0.00000	310040.9	74099.3	0.0	S
16.956	7.0440	0.0000	18.662	0.31609	0.00000	310604.3	74124.6	0.0	S
16.978	7.0464	0.0000	18.664	0.31600	0.00000	311167.9	74149.9	0.0	S
17.000	7.0487	0.0000	18.666	0.31593	0.00000	311731.8	74175.2	0.0	S
17.022	7.0508	0.0000	18.668	0.31582	0.00000	312295.7	74200.5	0.0	S
17.044	7.0525	0.0000	18.671	0.31575	0.00000	312859.8	74225.7	0.0	S
17.067	7.0538	0.0000	18.673	0.31569	0.00000	313424.1	74251.0	0.0	S
17.089	7.0544	0.0000	18.675	0.31559	0.00000	313988.4	74276.2	0.0	S
17.111	7.0550	0.0000	18.677	0.31553	0.00000	314552.8	74301.5	0.0	S
17.133	7.0557	0.0000	18.679	0.31548	0.00000	315117.3	74326.7	0.0	S
17.156	7.0566	0.0000	18.681	0.31540	0.00000	315681.7	74352.0	0.0	S
17.178	7.0577	0.0000	18.684	0.31534	0.00000	316246.3	74377.2	0.0	S
17.200	7.0590	0.0000	18.686	0.31529	0.00000	316811.0	74402.4	0.0	S
17.222	7.0604	0.0000	18.688	0.31522	0.00000	317375.8	74427.6	0.0	S
17.244	7.0620	0.0000	18.690	0.31516	0.00000	317940.7	74452.8	0.0	S
17.267	7.0636	0.0000	18.692	0.31512	0.00000	318505.7	74478.1	0.0	S
17.289	7.0653	0.0000	18.694	0.31510	0.00000	319070.8	74503.3	0.0	S
17.311	7.0671	0.0000	18.697	0.31504	0.00000	319636.1	74528.5	0.0	S
17.333	7.0689	0.0000	18.699	0.31498	0.00000	320201.6	74553.7	0.0	S
17.356	7.0708	0.0000	18.701	0.31496	0.00000	320767.2	74578.9	0.0	S
17.378	7.0726	0.0000	18.703	0.31494	0.00000	321332.9	74604.1	0.0	S
17.400	7.0746	0.0000	18.705	0.31490	0.00000	321898.8	74629.3	0.0	S
17.422	7.0765	0.0000	18.707	0.31485	0.00000	322464.8	74654.5	0.0	S
17.444	7.0785	0.0000	18.710	0.31484	0.00000	323031.0	74679.6	0.0	S
17.467	7.0805	0.0000	18.712	0.31483	0.00000	323597.4	74704.8	0.0	S
17.489	7.0825	0.0000	18.714	0.31480	0.00000	324163.9	74730.0	0.0	S
17.511	7.0845	0.0000	18.716	0.31477	0.00000	324730.6	74755.2	0.0	S
17.533	7.0866	0.0000	18.718	0.31476	0.00000	325297.4	74780.4	0.0	S
17.556	7.0887	0.0000	18.720	0.31476	0.00000	325864.4	74805.6	0.0	S
17.578	7.0907	0.0000	18.722	0.31474	0.00000	326431.6	74830.7	0.0	S
17.600	7.0928	0.0000	18.725	0.31472	0.00000	326999.0	74855.9	0.0	S
17.622	7.0949	0.0000	18.727	0.31472	0.00000	327566.5	74881.1	0.0	S
17.644	7.0970	0.0000	18.729	0.31473	0.00000	328134.1	74906.3	0.0	S
17.667	7.0991	0.0000	18.731	0.31472	0.00000	328702.0	74931.5	0.0	S
17.689	7.1012	0.0000	18.733	0.31470	0.00000	329270.0	74956.6	0.0	S
17.711	7.1033	0.0000	18.736	0.31471	0.00000	329838.2	74981.8	0.0	S
17.733	7.1054	0.0000	18.738	0.31473	0.00000	330406.5	75007.0	0.0	S
17.756	7.1076	0.0000	18.740	0.31472	0.00000	330975.1	75032.2	0.0	S
17.778	7.1097	0.0000	18.742	0.31472	0.00000	331543.8	75057.3	0.0	S
17.800	7.1118	0.0000	18.744	0.31471	0.00000	332112.6	75082.5	0.0	S
17.822	7.1139	0.0000	18.746	0.31474	0.00000	332681.6	75107.7	0.0	S
17.844	7.1161	0.0000	18.749	0.31477	0.00000	333250.8	75132.9	0.0	S
17.867	7.1182	0.0000	18.751	0.31477	0.00000	333820.2	75158.1	0.0	S
17.889	7.1203	0.0000	18.753	0.31478	0.00000	334389.8	75183.2	0.0	S
17.911	7.1224	0.0000	18.755	0.31478	0.00000	334959.5	75208.4	0.0	S
17.933	7.1245	0.0000	18.757	0.31481	0.00000	335529.3	75233.6	0.0	S
17.956	7.1267	0.0000	18.759	0.31485	0.00000	336099.4	75258.8	0.0	S
17.978	7.1288	0.0000	18.762	0.31486	0.00000	336669.6	75284.0	0.0	S
18.000	7.1309	0.0000	18.764	0.31488	0.00000	337240.0	75309.2	0.0	S
18.022	7.1330	0.0000	18.766	0.31489	0.00000	337810.5	75334.4	0.0	S
18.044	7.1350	0.0000	18.768	0.31493	0.00000	338381.3	75359.5	0.0	S
18.067	7.1371	0.0000	18.770	0.31497	0.00000	338952.2	75384.7	0.0	S

Detailed Results (cont,d.) *:: Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
18.089	7.1392	0.0000	18.772	0.31499	0.00000	339523.2	75409.9	0.0	S
18.111	7.1413	0.0000	18.775	0.31501	0.00000	340094.4	75435.1	0.0	S
18.133	7.1434	0.0000	18.777	0.31503	0.00000	340665.8	75460.3	0.0	S
18.156	7.1454	0.0000	18.779	0.31508	0.00000	341237.3	75485.5	0.0	S
18.178	7.1475	0.0000	18.781	0.31513	0.00000	341809.1	75510.8	0.0	S
18.200	7.1496	0.0000	18.783	0.31516	0.00000	342381.0	75536.0	0.0	S
18.222	7.1516	0.0000	18.786	0.31519	0.00000	342953.0	75561.2	0.0	S
18.244	7.1537	0.0000	18.788	0.31521	0.00000	343525.2	75586.4	0.0	S
18.267	7.1557	0.0000	18.790	0.31526	0.00000	344097.6	75611.6	0.0	S
18.289	7.1578	0.0000	18.792	0.31532	0.00000	344670.1	75636.8	0.0	S
18.311	7.1598	0.0000	18.794	0.31535	0.00000	345242.8	75662.1	0.0	S
18.333	7.1618	0.0000	18.796	0.31539	0.00000	345815.7	75687.3	0.0	S
18.356	7.1639	0.0000	18.799	0.31543	0.00000	346388.7	75712.5	0.0	S
18.378	7.1659	0.0000	18.801	0.31546	0.00000	346961.9	75737.8	0.0	S
18.400	7.1679	0.0000	18.803	0.31552	0.00000	347535.3	75763.0	0.0	S
18.422	7.1700	0.0000	18.805	0.31558	0.00000	348108.8	75788.2	0.0	S
18.444	7.1720	0.0000	18.807	0.31563	0.00000	348682.5	75813.5	0.0	S
18.467	7.1740	0.0000	18.810	0.31567	0.00000	349256.3	75838.7	0.0	S
18.489	7.1760	0.0000	18.812	0.31572	0.00000	349830.3	75864.0	0.0	S
18.511	7.1780	0.0000	18.814	0.31576	0.00000	350404.5	75889.3	0.0	S
18.533	7.1800	0.0000	18.816	0.31582	0.00000	350978.8	75914.5	0.0	S
18.556	7.1820	0.0000	18.818	0.31589	0.00000	351553.3	75939.8	0.0	S
18.578	7.1840	0.0000	18.821	0.31595	0.00000	352127.9	75965.1	0.0	S
18.600	7.1860	0.0000	18.823	0.31600	0.00000	352702.7	75990.3	0.0	S
18.622	7.1879	0.0000	18.825	0.31605	0.00000	353277.7	76015.6	0.0	S
18.644	7.1899	0.0000	18.827	0.31609	0.00000	353852.8	76040.9	0.0	S
18.667	7.1919	0.0000	18.829	0.31616	0.00000	354428.0	76066.2	0.0	S
18.689	7.1939	0.0000	18.831	0.31624	0.00000	355003.5	76091.5	0.0	S
18.711	7.1958	0.0000	18.834	0.31630	0.00000	355579.1	76116.8	0.0	S
18.733	7.1978	0.0000	18.836	0.31636	0.00000	356154.8	76142.1	0.0	S
18.756	7.1998	0.0000	18.838	0.31641	0.00000	356730.7	76167.4	0.0	S
18.778	7.2017	0.0000	18.840	0.31647	0.00000	357306.8	76192.7	0.0	S
18.800	7.2037	0.0000	18.842	0.31654	0.00000	357883.0	76218.1	0.0	S
18.822	7.2056	0.0000	18.845	0.31662	0.00000	358459.3	76243.4	0.0	S
18.844	7.2075	0.0000	18.847	0.31668	0.00000	359035.9	76268.7	0.0	S
18.867	7.2095	0.0000	18.849	0.31675	0.00000	359612.6	76294.1	0.0	S
18.889	7.2114	0.0000	18.851	0.31681	0.00000	360189.4	76319.4	0.0	S
18.911	7.2134	0.0000	18.853	0.31687	0.00000	360766.4	76344.7	0.0	S
18.933	7.2153	0.0000	18.856	0.31693	0.00000	361343.5	76370.1	0.0	S
18.956	7.2172	0.0000	18.858	0.31702	0.00000	361920.8	76395.5	0.0	S
18.978	7.2191	0.0000	18.860	0.31710	0.00000	362498.3	76420.8	0.0	S
19.000	7.2210	0.0000	18.862	0.31717	0.00000	363075.9	76446.2	0.0	S
19.022	7.2022	0.0000	18.864	0.31723	0.00000	363652.8	76471.6	0.0	S
19.044	7.1480	0.0000	18.867	0.31724	0.00000	364226.8	76496.9	0.0	S
19.067	7.0406	0.0000	18.869	0.31721	0.00000	364794.4	76522.3	0.0	S
19.089	6.8742	0.0000	18.871	0.31710	0.00000	365351.0	76547.7	0.0	S
19.111	6.6969	0.0000	18.873	0.31692	0.00000	365893.8	76573.1	0.0	S
19.133	6.5268	0.0000	18.875	0.31665	0.00000	366422.8	76598.4	0.0	S
19.156	6.3790	0.0000	18.877	0.31635	0.00000	366939.0	76623.7	0.0	S
19.178	6.2545	0.0000	18.879	0.31600	0.00000	367444.3	76649.0	0.0	S
19.200	6.1496	0.0000	18.881	0.31564	0.00000	367940.5	76674.3	0.0	S
19.222	6.0616	0.0000	18.882	0.31527	0.00000	368428.9	76699.5	0.0	S
19.244	5.9868	0.0000	18.884	0.31490	0.00000	368910.9	76724.7	0.0	S
19.267	5.9221	0.0000	18.886	0.31453	0.00000	369387.2	76749.9	0.0	S
19.289	5.8655	0.0000	18.888	0.31417	0.00000	369858.7	76775.1	0.0	S
19.311	5.8163	0.0000	18.890	0.31381	0.00000	370326.0	76800.2	0.0	S
19.333	5.7697	0.0000	18.891	0.31346	0.00000	370789.4	76825.3	0.0	S
19.356	5.7308	0.0000	18.893	0.31311	0.00000	371249.5	76850.3	0.0	S
19.378	5.6963	0.0000	18.895	0.31278	0.00000	371706.5	76875.4	0.0	S
19.400	5.6656	0.0000	18.897	0.31245	0.00000	372161.0	76900.4	0.0	S
19.422	5.6383	0.0000	18.898	0.31214	0.00000	372613.2	76925.3	0.0	S
19.444	5.6140	0.0000	18.900	0.31184	0.00000	373063.3	76950.3	0.0	S
19.467	5.5924	0.0000	18.902	0.31154	0.00000	373511.5	76975.2	0.0	S
19.489	5.5734	0.0000	18.903	0.31126	0.00000	373958.2	77000.2	0.0	S
19.511	5.5565	0.0000	18.905	0.31098	0.00000	374403.3	77025.0	0.0	S
19.533	5.5417	0.0000	18.907	0.31072	0.00000	374847.3	77049.9	0.0	S
19.556	5.5289	0.0000	18.908	0.31046	0.00000	375290.1	77074.8	0.0	S
19.578	5.5180	0.0000	18.910	0.31021	0.00000	375732.0	77099.6	0.0	S
19.600	5.5085	0.0000	18.912	0.30994	0.00000	376173.0	77124.4	0.0	S
19.622	5.5003	0.0000	18.913	0.30973	0.00000	376613.4	77149.2	0.0	S
19.644	5.4933	0.0000	18.915	0.30952	0.00000	377053.1	77174.0	0.0	S
19.667	5.4877	0.0000	18.917	0.30928	0.00000	377492.4	77198.7	0.0	S
19.689	5.4830	0.0000	18.918	0.30909	0.00000	377931.2	77223.4	0.0	S
19.711	5.4791	0.0000	18.920	0.30890	0.00000	378369.7	77248.2	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
19.733	5.4762	0.0000	18.921	0.30869	0.00000	378807.9	77272.9	0.0	S
19.756	5.4741	0.0000	18.923	0.30852	0.00000	379245.9	77297.5	0.0	S
19.778	5.4728	0.0000	18.925	0.30836	0.00000	379683.8	77322.2	0.0	S
19.800	5.4722	0.0000	18.926	0.30816	0.00000	380121.6	77346.9	0.0	S
19.822	5.4720	0.0000	18.928	0.30801	0.00000	380559.4	77371.5	0.0	S
19.844	5.4723	0.0000	18.930	0.30787	0.00000	380997.1	77396.2	0.0	S
19.867	5.4730	0.0000	18.931	0.30769	0.00000	381434.9	77420.8	0.0	S
19.889	5.4740	0.0000	18.933	0.30753	0.00000	381872.8	77445.4	0.0	S
19.911	5.4750	0.0000	18.935	0.30742	0.00000	382310.8	77470.0	0.0	S
19.933	5.4760	0.0000	18.936	0.30730	0.00000	382748.8	77494.6	0.0	S
19.956	5.4770	0.0000	18.938	0.30714	0.00000	383186.9	77519.2	0.0	S
19.978	5.4780	0.0000	18.939	0.30700	0.00000	383625.1	77543.7	0.0	S
20.000	5.4790	0.0000	18.941	0.30690	0.00000	384063.4	77568.3	0.0	S
20.022	5.4798	0.0000	18.943	0.30680	0.00000	384501.8	77592.8	0.0	S
20.044	5.4804	0.0000	18.944	0.30667	0.00000	384940.2	77617.4	0.0	S
20.067	5.4806	0.0000	18.946	0.30654	0.00000	385378.6	77641.9	0.0	S
20.089	5.4803	0.0000	18.948	0.30645	0.00000	385817.1	77666.4	0.0	S
20.111	5.4800	0.0000	18.949	0.30636	0.00000	386255.5	77690.9	0.0	S
20.133	5.4798	0.0000	18.951	0.30624	0.00000	386693.8	77715.4	0.0	S
20.156	5.4797	0.0000	18.953	0.30613	0.00000	387132.2	77739.9	0.0	S
20.178	5.4798	0.0000	18.954	0.30602	0.00000	387570.6	77764.4	0.0	S
20.200	5.4800	0.0000	18.956	0.30595	0.00000	388009.0	77788.9	0.0	S
20.222	5.4803	0.0000	18.958	0.30588	0.00000	388447.4	77813.4	0.0	S
20.244	5.4808	0.0000	18.959	0.30577	0.00000	388885.8	77837.8	0.0	S
20.267	5.4813	0.0000	18.961	0.30567	0.00000	389324.3	77862.3	0.0	S
20.289	5.4818	0.0000	18.962	0.30557	0.00000	389762.8	77886.7	0.0	S
20.311	5.4824	0.0000	18.964	0.30551	0.00000	390201.4	77911.2	0.0	S
20.333	5.4831	0.0000	18.966	0.30545	0.00000	390640.1	77935.6	0.0	S
20.356	5.4838	0.0000	18.967	0.30536	0.00000	391078.7	77960.1	0.0	S
20.378	5.4845	0.0000	18.969	0.30527	0.00000	391517.4	77984.5	0.0	S
20.400	5.4852	0.0000	18.971	0.30519	0.00000	391956.3	78008.9	0.0	S
20.422	5.4860	0.0000	18.972	0.30511	0.00000	392395.1	78033.3	0.0	S
20.444	5.4868	0.0000	18.974	0.30507	0.00000	392834.0	78057.7	0.0	S
20.467	5.4876	0.0000	18.976	0.30502	0.00000	393273.0	78082.1	0.0	S
20.489	5.4884	0.0000	18.977	0.30494	0.00000	393712.0	78106.5	0.0	S
20.511	5.4893	0.0000	18.979	0.30486	0.00000	394151.1	78130.9	0.0	S
20.533	5.4901	0.0000	18.981	0.30479	0.00000	394590.3	78155.3	0.0	S
20.556	5.4910	0.0000	18.982	0.30473	0.00000	395029.5	78179.7	0.0	S
20.578	5.4918	0.0000	18.984	0.30467	0.00000	395468.8	78204.1	0.0	S
20.600	5.4927	0.0000	18.985	0.30463	0.00000	395908.2	78228.4	0.0	S
20.622	5.4936	0.0000	18.987	0.30460	0.00000	396347.7	78252.8	0.0	S
20.644	5.4945	0.0000	18.989	0.30453	0.00000	396787.2	78277.2	0.0	S
20.667	5.4954	0.0000	18.990	0.30447	0.00000	397226.8	78301.5	0.0	S
20.689	5.4964	0.0000	18.992	0.30441	0.00000	397666.5	78325.9	0.0	S
20.711	5.4973	0.0000	18.994	0.30436	0.00000	398106.2	78350.2	0.0	S
20.733	5.4982	0.0000	18.995	0.30431	0.00000	398546.1	78374.6	0.0	S
20.756	5.4991	0.0000	18.997	0.30426	0.00000	398985.9	78398.9	0.0	S
20.778	5.5001	0.0000	18.999	0.30424	0.00000	399425.9	78423.2	0.0	S
20.800	5.5010	0.0000	19.000	0.30422	0.00000	399866.0	78447.6	0.0	S
20.822	5.5020	0.0000	19.002	0.30416	0.00000	400306.1	78471.9	0.0	S
20.844	5.5029	0.0000	19.004	0.30410	0.00000	400746.3	78496.3	0.0	S
20.867	5.5038	0.0000	19.005	0.30408	0.00000	401186.5	78520.6	0.0	S
20.889	5.5048	0.0000	19.007	0.30406	0.00000	401626.9	78544.9	0.0	S
20.911	5.5057	0.0000	19.009	0.30401	0.00000	402067.3	78569.2	0.0	S
20.933	5.5067	0.0000	19.010	0.30396	0.00000	402507.8	78593.6	0.0	S
20.956	5.5076	0.0000	19.012	0.30394	0.00000	402948.4	78617.9	0.0	S
20.978	5.5085	0.0000	19.013	0.30392	0.00000	403389.0	78642.2	0.0	S
21.000	5.5095	0.0000	19.015	0.30387	0.00000	403829.8	78666.5	0.0	S
21.022	5.4884	0.0000	19.017	0.30380	0.00000	404269.7	78690.8	0.0	S
21.044	5.4306	0.0000	19.018	0.30374	0.00000	404706.4	78715.1	0.0	S
21.067	5.3176	0.0000	19.020	0.30361	0.00000	405136.3	78739.4	0.0	S
21.089	5.1441	0.0000	19.022	0.30338	0.00000	405554.8	78763.7	0.0	S
21.111	4.9613	0.0000	19.023	0.30307	0.00000	405959.0	78787.9	0.0	S
21.133	4.7866	0.0000	19.025	0.30270	0.00000	406348.9	78812.2	0.0	S
21.156	4.6353	0.0000	19.026	0.30231	0.00000	406725.8	78836.4	0.0	S
21.178	4.5078	0.0000	19.027	0.30186	0.00000	407091.5	78860.5	0.0	S
21.200	4.4003	0.0000	19.029	0.30138	0.00000	407447.9	78884.7	0.0	S
21.222	4.3101	0.0000	19.030	0.30090	0.00000	407796.3	78908.8	0.0	S
21.244	4.2332	0.0000	19.031	0.30042	0.00000	408138.0	78932.8	0.0	S
21.267	4.1665	0.0000	19.032	0.29993	0.00000	408474.0	78956.8	0.0	S
21.289	4.1082	0.0000	19.034	0.29946	0.00000	408805.0	78980.8	0.0	S
21.311	4.0573	0.0000	19.035	0.29899	0.00000	409131.6	79004.7	0.0	S
21.333	4.0090	0.0000	19.036	0.29852	0.00000	409454.3	79028.6	0.0	S
21.356	3.9687	0.0000	19.037	0.29807	0.00000	409773.4	79052.5	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
21.378	3.9328	0.0000	19.038	0.29763	0.00000	410089.4	79076.3	0.0	S
21.400	3.9008	0.0000	19.039	0.29717	0.00000	410402.8	79100.1	0.0	S
21.422	3.8723	0.0000	19.041	0.29674	0.00000	410713.7	79123.9	0.0	S
21.444	3.8469	0.0000	19.042	0.29633	0.00000	411022.5	79147.6	0.0	S
21.467	3.8242	0.0000	19.043	0.29593	0.00000	411329.3	79171.3	0.0	S
21.489	3.8041	0.0000	19.044	0.29554	0.00000	411634.4	79195.0	0.0	S
21.511	3.7861	0.0000	19.045	0.29516	0.00000	411938.0	79218.6	0.0	S
21.533	3.7704	0.0000	19.046	0.29479	0.00000	412240.3	79242.2	0.0	S
21.556	3.7567	0.0000	19.047	0.29443	0.00000	412541.4	79265.7	0.0	S
21.578	3.7450	0.0000	19.048	0.29408	0.00000	412841.5	79289.3	0.0	S
21.600	3.7346	0.0000	19.049	0.29374	0.00000	413140.7	79312.8	0.0	S
21.622	3.7256	0.0000	19.050	0.29340	0.00000	413439.1	79336.3	0.0	S
21.644	3.7179	0.0000	19.052	0.29308	0.00000	413736.8	79359.7	0.0	S
21.667	3.7115	0.0000	19.053	0.29276	0.00000	414034.0	79383.2	0.0	S
21.689	3.7061	0.0000	19.054	0.29243	0.00000	414330.7	79406.6	0.0	S
21.711	3.7015	0.0000	19.055	0.29215	0.00000	414627.0	79430.0	0.0	S
21.733	3.6979	0.0000	19.056	0.29187	0.00000	414923.0	79453.3	0.0	S
21.756	3.6952	0.0000	19.057	0.29156	0.00000	415218.7	79476.7	0.0	S
21.778	3.6932	0.0000	19.058	0.29127	0.00000	415514.2	79500.0	0.0	S
21.800	3.6919	0.0000	19.059	0.29103	0.00000	415809.6	79523.3	0.0	S
21.822	3.6911	0.0000	19.060	0.29078	0.00000	416104.9	79546.5	0.0	S
21.844	3.6908	0.0000	19.061	0.29049	0.00000	416400.2	79569.8	0.0	S
21.867	3.6908	0.0000	19.062	0.29024	0.00000	416695.5	79593.0	0.0	S
21.889	3.6912	0.0000	19.063	0.28999	0.00000	416990.8	79616.2	0.0	S
21.911	3.6916	0.0000	19.064	0.28975	0.00000	417286.1	79639.4	0.0	S
21.933	3.6920	0.0000	19.066	0.28952	0.00000	417581.4	79662.6	0.0	S
21.956	3.6924	0.0000	19.067	0.28929	0.00000	417876.8	79685.7	0.0	S
21.978	3.6928	0.0000	19.068	0.28907	0.00000	418172.2	79708.9	0.0	S
22.000	3.6932	0.0000	19.069	0.28885	0.00000	418467.7	79732.0	0.0	S
22.022	3.6723	0.0000	19.070	0.28862	0.00000	418762.3	79755.1	0.0	S
22.044	3.6151	0.0000	19.071	0.28838	0.00000	419053.8	79778.2	0.0	S
22.067	3.5034	0.0000	19.072	0.28807	0.00000	419338.5	79801.2	0.0	S
22.089	3.3311	0.0000	19.073	0.28768	0.00000	419611.9	79824.3	0.0	S
22.111	3.1477	0.0000	19.074	0.28723	0.00000	419871.0	79847.3	0.0	S
22.133	2.9718	0.0000	19.075	0.28669	0.00000	420115.8	79870.2	0.0	S
22.156	2.8188	0.0000	19.076	0.28610	0.00000	420347.4	79893.1	0.0	S
22.178	2.6898	0.0000	19.076	0.28548	0.00000	420567.8	79916.0	0.0	S
22.200	2.5809	0.0000	19.077	0.28484	0.00000	420778.6	79938.8	0.0	S
22.222	2.4894	0.0000	19.078	0.28420	0.00000	420981.4	79961.6	0.0	S
22.244	2.4114	0.0000	19.078	0.28355	0.00000	421177.5	79984.3	0.0	S
22.267	2.3439	0.0000	19.079	0.28291	0.00000	421367.7	80006.9	0.0	S
22.289	2.2847	0.0000	19.080	0.28227	0.00000	421552.8	80029.5	0.0	S
22.311	2.2330	0.0000	19.080	0.28165	0.00000	421733.5	80052.1	0.0	S
22.333	2.1841	0.0000	19.081	0.28103	0.00000	421910.2	80074.6	0.0	S
22.356	2.1431	0.0000	19.082	0.28042	0.00000	422083.3	80097.1	0.0	S
22.378	2.1067	0.0000	19.082	0.27983	0.00000	422253.3	80119.5	0.0	S
22.400	2.0741	0.0000	19.083	0.27924	0.00000	422420.5	80141.8	0.0	S
22.422	2.0450	0.0000	19.083	0.27867	0.00000	422585.3	80164.2	0.0	S
22.444	2.0191	0.0000	19.084	0.27811	0.00000	422747.8	80186.4	0.0	S
22.467	1.9959	0.0000	19.084	0.27757	0.00000	422908.4	80208.7	0.0	S
22.489	1.9753	0.0000	19.085	0.27703	0.00000	423067.3	80230.8	0.0	S
22.511	1.9570	0.0000	19.085	0.27651	0.00000	423224.6	80253.0	0.0	S
22.533	1.9408	0.0000	19.086	0.27599	0.00000	423380.5	80275.1	0.0	S
22.556	1.9267	0.0000	19.086	0.27549	0.00000	423535.2	80297.1	0.0	S
22.578	1.9146	0.0000	19.087	0.27500	0.00000	423688.9	80319.2	0.0	S
22.600	1.9038	0.0000	19.088	0.27452	0.00000	423841.6	80341.1	0.0	S
22.622	1.8944	0.0000	19.088	0.27405	0.00000	423993.5	80363.1	0.0	S
22.644	1.8863	0.0000	19.089	0.27358	0.00000	424144.8	80385.0	0.0	S
22.667	1.8796	0.0000	19.089	0.27312	0.00000	424295.4	80406.8	0.0	S
22.689	1.8737	0.0000	19.090	0.27268	0.00000	424445.5	80428.7	0.0	S
22.711	1.8688	0.0000	19.090	0.27225	0.00000	424595.2	80450.5	0.0	S
22.733	1.8649	0.0000	19.091	0.27183	0.00000	424744.6	80472.2	0.0	S
22.756	1.8618	0.0000	19.091	0.27141	0.00000	424893.6	80494.0	0.0	S
22.778	1.8595	0.0000	19.092	0.27100	0.00000	425042.5	80515.7	0.0	S
22.800	1.8579	0.0000	19.092	0.27060	0.00000	425191.2	80537.3	0.0	S
22.822	1.8568	0.0000	19.093	0.27021	0.00000	425339.8	80559.0	0.0	S
22.844	1.8561	0.0000	19.093	0.26983	0.00000	425488.3	80580.6	0.0	S
22.867	1.8558	0.0000	19.094	0.26945	0.00000	425636.8	80602.1	0.0	S
22.889	1.8559	0.0000	19.094	0.26908	0.00000	425785.2	80623.7	0.0	S
22.911	1.8560	0.0000	19.095	0.26871	0.00000	425933.7	80645.2	0.0	S
22.933	1.8561	0.0000	19.095	0.26835	0.00000	426082.2	80666.7	0.0	S
22.956	1.8562	0.0000	19.096	0.26800	0.00000	426230.7	80688.1	0.0	S
22.978	1.8563	0.0000	19.096	0.26766	0.00000	426379.2	80709.6	0.0	S
23.000	1.8564	0.0000	19.097	0.26731	0.00000	426527.7	80731.0	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
23.022	1.8564	0.0000	19.097	0.26697	0.00000	426676.2	80752.3	0.0	S
23.044	1.8564	0.0000	19.098	0.26663	0.00000	426824.7	80773.7	0.0	S
23.067	1.8562	0.0000	19.098	0.26631	0.00000	426973.2	80795.0	0.0	S
23.089	1.8559	0.0000	19.099	0.26598	0.00000	427121.7	80816.3	0.0	S
23.111	1.8555	0.0000	19.099	0.26566	0.00000	427270.2	80837.5	0.0	S
23.133	1.8552	0.0000	19.100	0.26535	0.00000	427418.6	80858.8	0.0	S
23.156	1.8549	0.0000	19.100	0.26503	0.00000	427567.0	80880.0	0.0	S
23.178	1.8547	0.0000	19.101	0.26472	0.00000	427715.4	80901.2	0.0	S
23.200	1.8546	0.0000	19.101	0.26442	0.00000	427863.8	80922.3	0.0	S
23.222	1.8544	0.0000	19.102	0.26412	0.00000	428012.1	80943.5	0.0	S
23.244	1.8544	0.0000	19.102	0.26382	0.00000	428160.5	80964.6	0.0	S
23.267	1.8543	0.0000	19.103	0.26352	0.00000	428308.8	80985.7	0.0	S
23.289	1.8542	0.0000	19.103	0.26323	0.00000	428457.2	81006.8	0.0	S
23.311	1.8542	0.0000	19.104	0.26294	0.00000	428605.5	81027.8	0.0	S
23.333	1.8542	0.0000	19.104	0.26265	0.00000	428753.8	81048.8	0.0	S
23.356	1.8542	0.0000	19.105	0.26237	0.00000	428902.2	81069.8	0.0	S
23.378	1.8542	0.0000	19.105	0.26209	0.00000	429050.5	81090.8	0.0	S
23.400	1.8542	0.0000	19.106	0.26181	0.00000	429198.8	81111.8	0.0	S
23.422	1.8542	0.0000	19.106	0.26154	0.00000	429347.2	81132.7	0.0	S
23.444	1.8543	0.0000	19.107	0.26127	0.00000	429495.5	81153.6	0.0	S
23.467	1.8543	0.0000	19.107	0.26100	0.00000	429643.9	81174.5	0.0	S
23.489	1.8544	0.0000	19.108	0.26073	0.00000	429792.2	81195.4	0.0	S
23.511	1.8544	0.0000	19.108	0.26046	0.00000	429940.6	81216.2	0.0	S
23.533	1.8545	0.0000	19.109	0.26020	0.00000	430088.9	81237.1	0.0	S
23.556	1.8545	0.0000	19.109	0.25994	0.00000	430237.3	81257.9	0.0	S
23.578	1.8546	0.0000	19.110	0.25968	0.00000	430385.7	81278.6	0.0	S
23.600	1.8547	0.0000	19.110	0.25943	0.00000	430534.0	81299.4	0.0	S
23.622	1.8547	0.0000	19.111	0.25917	0.00000	430682.4	81320.2	0.0	S
23.644	1.8548	0.0000	19.111	0.25892	0.00000	430830.8	81340.9	0.0	S
23.667	1.8549	0.0000	19.112	0.25867	0.00000	430979.2	81361.6	0.0	S
23.689	1.8550	0.0000	19.112	0.25843	0.00000	431127.6	81382.3	0.0	S
23.711	1.8551	0.0000	19.113	0.25818	0.00000	431276.0	81402.9	0.0	S
23.733	1.8551	0.0000	19.113	0.25794	0.00000	431424.4	81423.6	0.0	S
23.756	1.8552	0.0000	19.114	0.25770	0.00000	431572.8	81444.2	0.0	S
23.778	1.8553	0.0000	19.114	0.25746	0.00000	431721.2	81464.8	0.0	S
23.800	1.8554	0.0000	19.115	0.25722	0.00000	431869.7	81485.4	0.0	S
23.822	1.8555	0.0000	19.115	0.25699	0.00000	432018.1	81506.0	0.0	S
23.844	1.8556	0.0000	19.116	0.25676	0.00000	432166.5	81526.5	0.0	S
23.867	1.8557	0.0000	19.116	0.25652	0.00000	432315.0	81547.0	0.0	S
23.889	1.8558	0.0000	19.117	0.25629	0.00000	432463.4	81567.6	0.0	S
23.911	1.8559	0.0000	19.117	0.25607	0.00000	432611.9	81588.1	0.0	S
23.933	1.8560	0.0000	19.118	0.25584	0.00000	432760.4	81608.5	0.0	S
23.956	1.8561	0.0000	19.118	0.25562	0.00000	432908.9	81629.0	0.0	S
23.978	1.8562	0.0000	19.119	0.25539	0.00000	433057.3	81649.4	0.0	S
24.000	1.8563	0.0000	19.119	0.25517	0.00000	433205.8	81669.8	0.0	S
24.022	1.8341	0.0000	19.120	0.25493	0.00000	433353.5	81690.3	0.0	S
24.044	1.7749	0.0000	19.120	0.25466	0.00000	433497.8	81710.6	0.0	S
24.067	1.6601	0.0000	19.121	0.25433	0.00000	433635.2	81731.0	0.0	S
24.089	1.4841	0.0000	19.121	0.25393	0.00000	433761.0	81751.3	0.0	S
24.111	1.2988	0.0000	19.121	0.25344	0.00000	433872.3	81771.6	0.0	S
24.133	1.1217	0.0000	19.122	0.25288	0.00000	433969.1	81791.9	0.0	S
24.156	0.9683	0.0000	19.122	0.25227	0.00000	434052.7	81812.1	0.0	S
24.178	0.8389	0.0000	19.122	0.25163	0.00000	434125.0	81832.2	0.0	S
24.200	0.7298	0.0000	19.122	0.25097	0.00000	434187.8	81852.3	0.0	S
24.222	0.6381	0.0000	19.122	0.25030	0.00000	434242.5	81872.4	0.0	S
24.244	0.5599	0.0000	19.123	0.24962	0.00000	434290.4	81892.4	0.0	S
24.267	0.4921	0.0000	19.123	0.24895	0.00000	434332.5	81912.3	0.0	S
24.289	0.4326	0.0000	19.123	0.24829	0.00000	434369.5	81932.2	0.0	S
24.311	0.3808	0.0000	19.123	0.24763	0.00000	434402.0	81952.1	0.0	S
24.333	0.3315	0.0000	19.123	0.24699	0.00000	434430.5	81971.9	0.0	S
24.356	0.2903	0.0000	19.123	0.24635	0.00000	434455.4	81991.6	0.0	S
24.378	0.2537	0.0000	19.123	0.24572	0.00000	434477.1	82011.3	0.0	S
24.400	0.2209	0.0000	19.123	0.24510	0.00000	434496.1	82030.9	0.0	S
24.422	0.1916	0.0000	19.123	0.24450	0.00000	434512.6	82050.5	0.0	S
24.444	0.1655	0.0000	19.123	0.24391	0.00000	434526.9	82070.0	0.0	S
24.467	0.1421	0.0000	19.123	0.24332	0.00000	434539.2	82089.5	0.0	S
24.489	0.1214	0.0000	19.123	0.24275	0.00000	434549.8	82109.0	0.0	S
24.511	0.1028	0.0000	19.123	0.24219	0.00000	434558.7	82128.3	0.0	S
24.533	0.0865	0.0000	19.123	0.24164	0.00000	434566.3	82147.7	0.0	S
24.556	0.0723	0.0000	19.123	0.24110	0.00000	434572.6	82167.0	0.0	S
24.578	0.0600	0.0000	19.123	0.24057	0.00000	434577.9	82186.3	0.0	S
24.600	0.0492	0.0000	19.122	0.24005	0.00000	434582.3	82205.5	0.0	S
24.622	0.0396	0.0000	19.122	0.23953	0.00000	434585.8	82224.7	0.0	S
24.644	0.0314	0.0000	19.122	0.23903	0.00000	434588.7	82243.8	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
24.667	0.0246	0.0000	19.122	0.23854	0.00000	434590.9	82262.9	0.0	S
24.689	0.0186	0.0000	19.122	0.23806	0.00000	434592.7	82282.0	0.0	S
24.711	0.0136	0.0000	19.122	0.23758	0.00000	434593.9	82301.0	0.0	S
24.733	0.0095	0.0000	19.122	0.23711	0.00000	434594.9	82320.0	0.0	S
24.756	0.0064	0.0000	19.122	0.23665	0.00000	434595.5	82339.0	0.0	S
24.778	0.0040	0.0000	19.122	0.23620	0.00000	434595.9	82357.9	0.0	S
24.800	0.0023	0.0000	19.122	0.23576	0.00000	434596.2	82376.7	0.0	S
24.822	0.0011	0.0000	19.122	0.23532	0.00000	434596.3	82395.6	0.0	S
24.844	0.0004	0.0000	19.122	0.23489	0.00000	434596.4	82414.4	0.0	S
24.867	0.0000	0.0000	19.122	0.23447	0.00000	434596.4	82433.2	0.0	S
24.889	0.0000	0.0000	19.122	0.23405	0.00000	434596.4	82451.9	0.0	S
24.911	0.0000	0.0000	19.121	0.23360	0.00000	434596.4	82470.6	0.0	S
27.311	0.0000	0.0000	19.114	0.19727	0.00000	434596.4	84262.4	0.0	S
30.911	0.0000	0.0000	19.105	0.17230	0.00000	434596.4	86622.5	0.0	S
36.911	0.0000	0.0000	19.092	0.14629	0.00000	434596.4	89991.3	0.0	S
48.911	0.0000	0.0000	19.070	0.11774	0.00000	434596.4	95475.6	0.0	S
60.911	0.0000	0.0000	19.052	0.10215	0.00000	434596.4	100164.3	0.0	S
72.911	0.0000	0.0000	19.035	0.09106	0.00000	434596.4	104301.5	0.0	S
84.911	0.0000	0.0000	19.021	0.08270	0.00000	434596.4	108031.6	0.0	S
96.911	0.0000	0.0000	19.007	0.07615	0.00000	434596.4	111447.1	0.0	S
108.911	0.0000	0.0000	18.995	0.07084	0.00000	434596.4	114610.9	0.0	S
120.911	0.0000	0.0000	18.983	0.06696	0.00000	434596.4	117567.8	0.0	S
312.911	0.0000	0.0000	18.864	0.04087	0.00000	434596.4	147428.4	0.0	S
336.911	0.0000	0.0000	18.850	0.03948	0.00000	434596.4	150934.5	0.0	S
360.911	0.0000	0.0000	18.837	----	----	434596.4	154250.4	0.0	N.A.

Summary of Results :: *Scenario 3 :: FDOT 24 Hour (x1)*

	Time (hours)	Stage (ft datum)	Rate (ft^3/s)	Volume (ft^3)
Stage				
Minimum	0.000	16.75		
Maximum	24.378	19.12		
Inflow				
Rate - Maximum - Positive	12.000		14.7044	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.844			434596.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	360.911			434596.4
Infiltration				
Rate - Maximum - Positive	10.222		8.5759	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	360.911			154250.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	360.911			154250.4
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	360.911			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

Project Data

Project Name:	Rhode Island Ave (Pond A)
Simulation Description:	
Project Number:	02-0309.000
Engineer :	Gene McCLendon
Supervising Engineer:	
Date:	01-19-2006

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	9.50
Water Table Elevation, [WT] (ft datum):	18.85
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	9.00
Fillable Porosity, [n] (%):	25.00

Vertical infiltration was not considered.

Geometry Data

Equivalent Pond Length, [L] (ft):	700.0
Equivalent Pond Width, [W] (ft):	369.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
17.70	241954.0
18.00	244358.0
19.00	252435.0
20.00	268891.0
21.00	285750.0

Scenario Input Data

Scenario 1 :: 45328 ft³ slug load

Hydrograph Type: Slug Load
Modflow Routing: Routed with infiltration

Treatment Volume (ft³) 45328

Initial ground water level (ft datum) default, 18.85

Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.000
0.250	2.500
0.500	3.000
1.000	3.500
1.500	4.000

Scenario 3 :: FDOT 24 Hour (x1)

Hydrograph Type: Inline SCS
Modflow Routing: Routed with infiltration
Repetitions: 1

Basin Area (acres)	20.170
Time Of Concentration (minutes)	10.0
DCIA (%)	0.0
Curve Number	63.8
Design Rainfall Depth (inches)	10.6
Design Rainfall Duration (hours)	24.0
Shape Factor	UHG 323
Rainfall Distribution	FDOT 24 Hour

Initial ground water level (ft datum) default, 18.85

Time After Storm Event (days)	Time After Storm Event (days)	Time After Storm Event (days)
0.100	2.000	12.000
0.250	2.500	13.000
0.500	3.000	14.000
1.000	3.500	
1.500	4.000	

Detailed Results :: *Scenario 1 :: 45328 ft³ slug load*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	7554.6670	0.0000	18.850	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	7554.6670	0.0000	19.030	0.37005	0.00000	45328.0	2.2	0.0	S
2.400	0.0000	0.0000	19.028	0.04968	0.00000	45328.0	549.5	0.0	S
6.000	0.0000	0.0000	19.026	0.02521	0.00000	45328.0	926.5	0.0	S
12.000	0.0000	0.0000	19.025	0.01677	0.00000	45328.0	1331.5	0.0	S
24.000	0.0000	0.0000	19.022	0.01143	0.00000	45328.0	1884.3	0.0	S
36.000	0.0000	0.0000	19.021	0.00927	0.00000	45328.0	2319.1	0.0	S
48.000	0.0000	0.0000	19.019	0.00795	0.00000	45328.0	2685.3	0.0	S
60.000	0.0000	0.0000	19.018	0.00705	0.00000	45328.0	3006.3	0.0	S
72.000	0.0000	0.0000	19.017	0.00639	0.00000	45328.0	3294.9	0.0	S
84.000	0.0000	0.0000	19.016	0.00588	0.00000	45328.0	3558.6	0.0	S
96.000	0.0000	0.0000	19.015	----	----	45328.0	3802.7	0.0	N.A.

Summary of Results :: *Scenario 1 :: 45328 ft³ slug load*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	18.85		
Maximum	0.002	19.03		
Inflow				
Rate - Maximum - Positive	0.002		7554.6670	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			45328.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			45328.0
Infiltration				
Rate - Maximum - Positive	0.002		0.3701	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	96.000			3802.7
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			3802.7
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	19.02		2319.1
72 Hour Stage and Infiltration Volume	72.000	19.02		3294.9

Detailed Results :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
0.000	0.0000	0.0000	18.850	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.022	0.0000	0.0000	18.851	-1.56846	0.00000	0.0	-251.1	0.0	S
0.044	0.0000	0.0000	18.851	0.00151	0.00000	0.0	-251.0	0.0	S
0.067	0.0000	0.0000	18.851	0.00135	0.00000	0.0	-250.8	0.0	S
0.089	0.0000	0.0000	18.851	0.00121	0.00000	0.0	-250.7	0.0	S
0.111	0.0000	0.0000	18.851	0.00110	0.00000	0.0	-250.6	0.0	S
0.133	0.0000	0.0000	18.851	0.00101	0.00000	0.0	-250.6	0.0	S
0.156	0.0000	0.0000	18.851	0.00093	0.00000	0.0	-250.5	0.0	S
0.178	0.0000	0.0000	18.851	0.00086	0.00000	0.0	-250.4	0.0	S
0.200	0.0000	0.0000	18.851	0.00081	0.00000	0.0	-250.3	0.0	S
0.222	0.0000	0.0000	18.851	0.00076	0.00000	0.0	-250.3	0.0	S
0.244	0.0000	0.0000	18.851	0.00071	0.00000	0.0	-250.2	0.0	S
0.267	0.0000	0.0000	18.851	0.00068	0.00000	0.0	-250.2	0.0	S
0.289	0.0000	0.0000	18.851	0.00064	0.00000	0.0	-250.1	0.0	S
0.311	0.0000	0.0000	18.851	0.00062	0.00000	0.0	-250.1	0.0	S
0.333	0.0000	0.0000	18.851	0.00059	0.00000	0.0	-250.0	0.0	S
0.356	0.0000	0.0000	18.851	0.00057	0.00000	0.0	-250.0	0.0	S
0.378	0.0000	0.0000	18.851	0.00055	0.00000	0.0	-249.9	0.0	S
0.400	0.0000	0.0000	18.851	0.00053	0.00000	0.0	-249.9	0.0	S
0.422	0.0000	0.0000	18.851	0.00051	0.00000	0.0	-249.8	0.0	S
0.444	0.0000	0.0000	18.851	0.00050	0.00000	0.0	-249.8	0.0	S
0.467	0.0000	0.0000	18.851	0.00048	0.00000	0.0	-249.8	0.0	S
0.489	0.0000	0.0000	18.851	0.00047	0.00000	0.0	-249.7	0.0	S
0.511	0.0000	0.0000	18.851	0.00046	0.00000	0.0	-249.7	0.0	S
0.533	0.0000	0.0000	18.851	0.00045	0.00000	0.0	-249.7	0.0	S
0.556	0.0000	0.0000	18.851	0.00044	0.00000	0.0	-249.6	0.0	S
0.578	0.0000	0.0000	18.851	0.00043	0.00000	0.0	-249.6	0.0	S
0.600	0.0000	0.0000	18.851	0.00042	0.00000	0.0	-249.5	0.0	S
0.622	0.0000	0.0000	18.851	0.00041	0.00000	0.0	-249.5	0.0	S
0.644	0.0000	0.0000	18.851	0.00040	0.00000	0.0	-249.5	0.0	S
0.667	0.0000	0.0000	18.851	0.00040	0.00000	0.0	-249.4	0.0	S
0.689	0.0000	0.0000	18.851	0.00039	0.00000	0.0	-249.4	0.0	S
0.711	0.0000	0.0000	18.851	0.00038	0.00000	0.0	-249.4	0.0	S
0.733	0.0000	0.0000	18.851	0.00038	0.00000	0.0	-249.4	0.0	S
0.756	0.0000	0.0000	18.851	0.00037	0.00000	0.0	-249.3	0.0	S
0.778	0.0000	0.0000	18.851	0.00036	0.00000	0.0	-249.3	0.0	S
0.800	0.0000	0.0000	18.851	0.00036	0.00000	0.0	-249.3	0.0	S
0.822	0.0000	0.0000	18.851	0.00035	0.00000	0.0	-249.2	0.0	S
0.844	0.0000	0.0000	18.851	0.00035	0.00000	0.0	-249.2	0.0	S
0.867	0.0000	0.0000	18.851	0.00034	0.00000	0.0	-249.2	0.0	S
0.889	0.0000	0.0000	18.851	0.00034	0.00000	0.0	-249.2	0.0	S
0.911	0.0000	0.0000	18.851	0.00033	0.00000	0.0	-249.1	0.0	S
0.933	0.0000	0.0000	18.851	0.00033	0.00000	0.0	-249.1	0.0	S
0.956	0.0000	0.0000	18.851	0.00033	0.00000	0.0	-249.1	0.0	S
0.978	0.0000	0.0000	18.851	0.00032	0.00000	0.0	-249.1	0.0	S
1.000	0.0000	0.0000	18.851	0.00032	0.00000	0.0	-249.0	0.0	S
1.022	0.0000	0.0000	18.851	0.00031	0.00000	0.0	-249.0	0.0	S
1.044	0.0000	0.0000	18.851	0.00031	0.00000	0.0	-249.0	0.0	S
1.067	0.0000	0.0000	18.851	0.00031	0.00000	0.0	-249.0	0.0	S
1.089	0.0000	0.0000	18.851	0.00030	0.00000	0.0	-248.9	0.0	S
1.111	0.0000	0.0000	18.851	0.00030	0.00000	0.0	-248.9	0.0	S
1.133	0.0000	0.0000	18.851	0.00030	0.00000	0.0	-248.9	0.0	S
1.156	0.0000	0.0000	18.851	0.00030	0.00000	0.0	-248.9	0.0	S
1.178	0.0000	0.0000	18.851	0.00029	0.00000	0.0	-248.8	0.0	S
1.200	0.0000	0.0000	18.851	0.00029	0.00000	0.0	-248.8	0.0	S
1.222	0.0000	0.0000	18.851	0.00029	0.00000	0.0	-248.8	0.0	S
1.244	0.0000	0.0000	18.851	0.00028	0.00000	0.0	-248.8	0.0	S
1.267	0.0000	0.0000	18.851	0.00028	0.00000	0.0	-248.7	0.0	S
1.289	0.0000	0.0000	18.851	0.00028	0.00000	0.0	-248.7	0.0	S
1.311	0.0000	0.0000	18.851	0.00028	0.00000	0.0	-248.7	0.0	S
1.333	0.0000	0.0000	18.851	0.00027	0.00000	0.0	-248.7	0.0	S
1.356	0.0000	0.0000	18.851	0.00027	0.00000	0.0	-248.7	0.0	S
1.378	0.0000	0.0000	18.851	0.00027	0.00000	0.0	-248.6	0.0	S
1.400	0.0000	0.0000	18.851	0.00027	0.00000	0.0	-248.6	0.0	S
1.422	0.0000	0.0000	18.851	0.00026	0.00000	0.0	-248.6	0.0	S
1.444	0.0000	0.0000	18.851	0.00026	0.00000	0.0	-248.6	0.0	S
1.467	0.0000	0.0000	18.851	0.00026	0.00000	0.0	-248.5	0.0	S
1.489	0.0000	0.0000	18.851	0.00026	0.00000	0.0	-248.5	0.0	S
1.511	0.0000	0.0000	18.851	0.00026	0.00000	0.0	-248.5	0.0	S
1.533	0.0000	0.0000	18.851	0.00025	0.00000	0.0	-248.5	0.0	S
1.556	0.0000	0.0000	18.851	0.00025	0.00000	0.0	-248.5	0.0	S
1.578	0.0000	0.0000	18.851	0.00025	0.00000	0.0	-248.4	0.0	S
1.600	0.0000	0.0000	18.851	0.00025	0.00000	0.0	-248.4	0.0	S
1.622	0.0000	0.0000	18.851	0.00025	0.00000	0.0	-248.4	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
1.644	0.0000	0.0000	18.851	0.00025	0.00000	0.0	-248.4	0.0	S
1.667	0.0000	0.0000	18.851	0.00024	0.00000	0.0	-248.4	0.0	S
1.689	0.0000	0.0000	18.851	0.00024	0.00000	0.0	-248.3	0.0	S
1.711	0.0000	0.0000	18.851	0.00024	0.00000	0.0	-248.3	0.0	S
1.733	0.0000	0.0000	18.851	0.00024	0.00000	0.0	-248.3	0.0	S
1.756	0.0000	0.0000	18.851	0.00024	0.00000	0.0	-248.3	0.0	S
1.778	0.0000	0.0000	18.851	0.00024	0.00000	0.0	-248.3	0.0	S
1.800	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.2	0.0	S
1.822	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.2	0.0	S
1.844	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.2	0.0	S
1.867	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.2	0.0	S
1.889	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.2	0.0	S
1.911	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.2	0.0	S
1.933	0.0000	0.0000	18.851	0.00023	0.00000	0.0	-248.1	0.0	S
1.956	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.1	0.0	S
1.978	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.1	0.0	S
2.000	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.1	0.0	S
2.022	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.1	0.0	S
2.044	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.0	0.0	S
2.067	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.0	0.0	S
2.089	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.0	0.0	S
2.111	0.0000	0.0000	18.851	0.00022	0.00000	0.0	-248.0	0.0	S
2.133	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-248.0	0.0	S
2.156	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-248.0	0.0	S
2.178	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.9	0.0	S
2.200	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.9	0.0	S
2.222	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.9	0.0	S
2.244	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.9	0.0	S
2.267	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.9	0.0	S
2.289	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.9	0.0	S
2.311	0.0000	0.0000	18.851	0.00021	0.00000	0.0	-247.8	0.0	S
2.333	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.8	0.0	S
2.356	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.8	0.0	S
2.378	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.8	0.0	S
2.400	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.8	0.0	S
2.422	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.8	0.0	S
2.444	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.7	0.0	S
2.467	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.7	0.0	S
2.489	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.7	0.0	S
2.511	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.7	0.0	S
2.533	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.7	0.0	S
2.556	0.0000	0.0000	18.851	0.00020	0.00000	0.0	-247.7	0.0	S
2.578	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.7	0.0	S
2.600	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.6	0.0	S
2.622	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.6	0.0	S
2.644	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.6	0.0	S
2.667	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.6	0.0	S
2.689	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.6	0.0	S
2.711	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.6	0.0	S
2.733	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.5	0.0	S
2.756	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.5	0.0	S
2.778	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.5	0.0	S
2.800	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.5	0.0	S
2.822	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.5	0.0	S
2.844	0.0000	0.0000	18.851	0.00019	0.00000	0.0	-247.5	0.0	S
2.867	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.5	0.0	S
2.889	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
2.911	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
2.933	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
2.956	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
2.978	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
3.000	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
3.022	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.4	0.0	S
3.044	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.3	0.0	S
3.067	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.3	0.0	S
3.089	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.3	0.0	S
3.111	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.3	0.0	S
3.133	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.3	0.0	S
3.156	0.0000	0.0000	18.851	0.00018	0.00000	0.0	-247.3	0.0	S
3.178	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.3	0.0	S
3.200	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S
3.222	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S
3.244	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S
3.267	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
3.289	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S
3.311	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S
3.333	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.2	0.0	S
3.356	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.378	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.400	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.422	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.444	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.467	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.489	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.511	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.1	0.0	S
3.533	0.0000	0.0000	18.851	0.00017	0.00000	0.0	-247.0	0.0	S
3.556	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-247.0	0.0	S
3.578	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-247.0	0.0	S
3.600	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-247.0	0.0	S
3.622	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-247.0	0.0	S
3.644	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-247.0	0.0	S
3.667	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-247.0	0.0	S
3.689	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.711	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.733	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.756	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.778	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.800	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.822	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.844	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.9	0.0	S
3.867	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
3.889	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
3.911	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
3.933	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
3.956	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
3.978	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
4.000	0.0000	0.0000	18.851	0.00016	0.00000	0.0	-246.8	0.0	S
4.022	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.8	0.0	S
4.044	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.067	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.089	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.111	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.133	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.156	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.178	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.200	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.7	0.0	S
4.222	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.244	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.267	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.289	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.311	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.333	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.356	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.378	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.400	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.6	0.0	S
4.422	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.444	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.467	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.489	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.511	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.533	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.556	0.0000	0.0000	18.851	0.00015	0.00000	0.0	-246.5	0.0	S
4.578	0.0000	0.0000	18.851	0.00014	0.00000	0.0	-246.5	0.0	S
4.600	0.0002	0.0000	18.851	0.00014	0.00000	0.0	-246.4	0.0	S
4.622	0.0009	0.0000	18.851	0.00015	0.00000	0.1	-246.4	0.0	S
4.644	0.0026	0.0000	18.851	0.00015	0.00000	0.2	-246.4	0.0	S
4.667	0.0057	0.0000	18.851	0.00015	0.00000	0.5	-246.4	0.0	S
4.689	0.0104	0.0000	18.851	0.00015	0.00000	1.2	-246.4	0.0	S
4.711	0.0167	0.0000	18.851	0.00016	0.00000	2.3	-246.4	0.0	S
4.733	0.0242	0.0000	18.851	0.00017	0.00000	3.9	-246.4	0.0	S
4.756	0.0329	0.0000	18.851	0.00019	0.00000	6.2	-246.4	0.0	S
4.778	0.0425	0.0000	18.851	0.00021	0.00000	9.2	-246.3	0.0	S
4.800	0.0529	0.0000	18.851	0.00023	0.00000	13.0	-246.3	0.0	S
4.822	0.0639	0.0000	18.851	0.00026	0.00000	17.7	-246.3	0.0	S
4.844	0.0755	0.0000	18.851	0.00029	0.00000	23.3	-246.3	0.0	S
4.867	0.0876	0.0000	18.851	0.00032	0.00000	29.8	-246.3	0.0	S
4.889	0.1001	0.0000	18.851	0.00036	0.00000	37.3	-246.2	0.0	S
4.911	0.1130	0.0000	18.851	0.00041	0.00000	45.8	-246.2	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
4.933	0.1262	0.0000	18.851	0.00045	0.00000	55.4	-246.2	0.0	S
4.956	0.1397	0.0000	18.851	0.00050	0.00000	66.0	-246.1	0.0	S
4.978	0.1534	0.0000	18.851	0.00056	0.00000	77.7	-246.1	0.0	S
5.000	0.1673	0.0000	18.851	0.00061	0.00000	90.6	-246.0	0.0	S
5.022	0.1828	0.0000	18.851	0.00067	0.00000	104.6	-246.0	0.0	S
5.044	0.2007	0.0000	18.851	0.00074	0.00000	119.9	-245.9	0.0	S
5.067	0.2223	0.0000	18.852	0.00081	0.00000	136.8	-245.9	0.0	S
5.089	0.2481	0.0000	18.852	0.00089	0.00000	155.7	-245.8	0.0	S
5.111	0.2755	0.0000	18.852	0.00098	0.00000	176.6	-245.7	0.0	S
5.133	0.3037	0.0000	18.852	0.00108	0.00000	199.8	-245.6	0.0	S
5.156	0.3317	0.0000	18.852	0.00119	0.00000	225.2	-245.6	0.0	S
5.178	0.3593	0.0000	18.852	0.00130	0.00000	252.8	-245.5	0.0	S
5.200	0.3865	0.0000	18.852	0.00142	0.00000	282.7	-245.3	0.0	S
5.222	0.4133	0.0000	18.852	0.00155	0.00000	314.6	-245.2	0.0	S
5.244	0.4400	0.0000	18.852	0.00168	0.00000	348.8	-245.1	0.0	S
5.267	0.4665	0.0000	18.853	0.00181	0.00000	385.0	-245.0	0.0	S
5.289	0.4928	0.0000	18.853	0.00195	0.00000	423.4	-244.8	0.0	S
5.311	0.5191	0.0000	18.853	0.00210	0.00000	463.9	-244.6	0.0	S
5.333	0.5454	0.0000	18.853	0.00225	0.00000	506.5	-244.5	0.0	S
5.356	0.5715	0.0000	18.853	0.00240	0.00000	551.1	-244.3	0.0	S
5.378	0.5975	0.0000	18.853	0.00256	0.00000	597.9	-244.1	0.0	S
5.400	0.6234	0.0000	18.854	0.00272	0.00000	646.7	-243.9	0.0	S
5.422	0.6492	0.0000	18.854	0.00289	0.00000	697.6	-243.7	0.0	S
5.444	0.6749	0.0000	18.854	0.00305	0.00000	750.6	-243.4	0.0	S
5.467	0.7005	0.0000	18.854	0.00322	0.00000	805.6	-243.2	0.0	S
5.489	0.7259	0.0000	18.854	0.00340	0.00000	862.7	-242.9	0.0	S
5.511	0.7513	0.0000	18.855	0.00358	0.00000	921.8	-242.6	0.0	S
5.533	0.7765	0.0000	18.855	0.00376	0.00000	982.9	-242.3	0.0	S
5.556	0.8016	0.0000	18.855	0.00394	0.00000	1046.0	-242.0	0.0	S
5.578	0.8266	0.0000	18.855	0.00413	0.00000	1111.1	-241.7	0.0	S
5.600	0.8514	0.0000	18.856	0.00432	0.00000	1178.2	-241.4	0.0	S
5.622	0.8761	0.0000	18.856	0.00451	0.00000	1247.3	-241.0	0.0	S
5.644	0.9007	0.0000	18.856	0.00471	0.00000	1318.4	-240.6	0.0	S
5.667	0.9251	0.0000	18.856	0.00490	0.00000	1391.4	-240.3	0.0	S
5.689	0.9495	0.0000	18.857	0.00510	0.00000	1466.4	-239.9	0.0	S
5.711	0.9737	0.0000	18.857	0.00530	0.00000	1543.3	-239.4	0.0	S
5.733	0.9977	0.0000	18.857	0.00551	0.00000	1622.2	-239.0	0.0	S
5.756	1.0217	0.0000	18.858	0.00572	0.00000	1703.0	-238.6	0.0	S
5.778	1.0455	0.0000	18.858	0.00592	0.00000	1785.7	-238.1	0.0	S
5.800	1.0691	0.0000	18.858	0.00613	0.00000	1870.2	-237.6	0.0	S
5.822	1.0926	0.0000	18.859	0.00635	0.00000	1956.7	-237.1	0.0	S
5.844	1.1160	0.0000	18.859	0.00656	0.00000	2045.1	-236.6	0.0	S
5.867	1.1393	0.0000	18.859	0.00678	0.00000	2135.3	-236.1	0.0	S
5.889	1.1625	0.0000	18.860	0.00700	0.00000	2227.4	-235.5	0.0	S
5.911	1.1855	0.0000	18.860	0.00722	0.00000	2321.3	-234.9	0.0	S
5.933	1.2085	0.0000	18.861	0.00744	0.00000	2417.0	-234.4	0.0	S
5.956	1.2313	0.0000	18.861	0.00766	0.00000	2514.6	-233.7	0.0	S
5.978	1.2540	0.0000	18.861	0.00789	0.00000	2614.0	-233.1	0.0	S
6.000	1.2766	0.0000	18.862	0.00812	0.00000	2715.3	-232.5	0.0	S
6.022	1.2992	0.0000	18.862	0.00835	0.00000	2818.3	-231.8	0.0	S
6.044	1.3216	0.0000	18.863	0.00858	0.00000	2923.1	-231.1	0.0	S
6.067	1.3439	0.0000	18.863	0.00881	0.00000	3029.7	-230.5	0.0	S
6.089	1.3661	0.0000	18.863	0.00904	0.00000	3138.1	-229.7	0.0	S
6.111	1.3882	0.0000	18.864	0.00928	0.00000	3248.3	-229.0	0.0	S
6.133	1.4102	0.0000	18.864	0.00951	0.00000	3360.2	-228.3	0.0	S
6.156	1.4321	0.0000	18.865	0.00975	0.00000	3473.9	-227.5	0.0	S
6.178	1.4539	0.0000	18.865	0.00999	0.00000	3589.4	-226.7	0.0	S
6.200	1.4756	0.0000	18.866	0.01023	0.00000	3706.6	-225.9	0.0	S
6.222	1.4973	0.0000	18.866	0.01048	0.00000	3825.5	-225.1	0.0	S
6.244	1.5188	0.0000	18.867	0.01072	0.00000	3946.1	-224.2	0.0	S
6.267	1.5402	0.0000	18.867	0.01096	0.00000	4068.5	-223.3	0.0	S
6.289	1.5615	0.0000	18.868	0.01121	0.00000	4192.5	-222.5	0.0	S
6.311	1.5827	0.0000	18.868	0.01146	0.00000	4318.3	-221.5	0.0	S
6.333	1.6039	0.0000	18.869	0.01171	0.00000	4445.8	-220.6	0.0	S
6.356	1.6249	0.0000	18.869	0.01196	0.00000	4574.9	-219.7	0.0	S
6.378	1.6458	0.0000	18.870	0.01221	0.00000	4705.8	-218.7	0.0	S
6.400	1.6667	0.0000	18.870	0.01246	0.00000	4838.3	-217.7	0.0	S
6.422	1.6875	0.0000	18.871	0.01272	0.00000	4972.4	-216.7	0.0	S
6.444	1.7081	0.0000	18.871	0.01297	0.00000	5108.3	-215.7	0.0	S
6.467	1.7287	0.0000	18.872	0.01323	0.00000	5245.7	-214.6	0.0	S
6.489	1.7492	0.0000	18.872	0.01348	0.00000	5384.8	-213.6	0.0	S
6.511	1.7696	0.0000	18.873	0.01374	0.00000	5525.6	-212.5	0.0	S
6.533	1.7898	0.0000	18.873	0.01400	0.00000	5668.0	-211.4	0.0	S
6.556	1.8101	0.0000	18.874	0.01426	0.00000	5812.0	-210.2	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
6.578	1.8302	0.0000	18.875	0.01452	0.00000	5957.6	-209.1	0.0	S
6.600	1.8502	0.0000	18.875	0.01479	0.00000	6104.8	-207.9	0.0	S
6.622	1.8701	0.0000	18.876	0.01505	0.00000	6253.6	-206.7	0.0	S
6.644	1.8900	0.0000	18.876	0.01531	0.00000	6404.0	-205.5	0.0	S
6.667	1.9098	0.0000	18.877	0.01558	0.00000	6556.0	-204.3	0.0	S
6.689	1.9295	0.0000	18.878	0.01585	0.00000	6709.6	-203.0	0.0	S
6.711	1.9490	0.0000	18.878	0.01611	0.00000	6864.7	-201.7	0.0	S
6.733	1.9686	0.0000	18.879	0.01638	0.00000	7021.4	-200.4	0.0	S
6.756	1.9880	0.0000	18.879	0.01665	0.00000	7179.7	-199.1	0.0	S
6.778	2.0073	0.0000	18.880	0.01692	0.00000	7339.5	-197.8	0.0	S
6.800	2.0266	0.0000	18.881	0.01719	0.00000	7500.8	-196.4	0.0	S
6.822	2.0457	0.0000	18.881	0.01746	0.00000	7663.7	-195.0	0.0	S
6.844	2.0648	0.0000	18.882	0.01773	0.00000	7828.1	-193.6	0.0	S
6.867	2.0838	0.0000	18.883	0.01801	0.00000	7994.1	-192.2	0.0	S
6.889	2.1028	0.0000	18.883	0.01828	0.00000	8161.6	-190.7	0.0	S
6.911	2.1216	0.0000	18.884	0.01856	0.00000	8330.5	-189.3	0.0	S
6.933	2.1404	0.0000	18.885	0.01883	0.00000	8501.0	-187.8	0.0	S
6.956	2.1590	0.0000	18.885	0.01911	0.00000	8673.0	-186.2	0.0	S
6.978	2.1776	0.0000	18.886	0.01938	0.00000	8846.5	-184.7	0.0	S
7.000	2.1962	0.0000	18.887	0.01966	0.00000	9021.4	-183.1	0.0	S
7.022	2.2147	0.0000	18.887	0.01994	0.00000	9197.8	-181.6	0.0	S
7.044	2.2332	0.0000	18.888	0.02022	0.00000	9375.8	-180.0	0.0	S
7.067	2.2518	0.0000	18.889	0.02050	0.00000	9555.2	-178.3	0.0	S
7.089	2.2706	0.0000	18.889	0.02078	0.00000	9736.0	-176.7	0.0	S
7.111	2.2893	0.0000	18.890	0.02106	0.00000	9918.4	-175.0	0.0	S
7.133	2.3079	0.0000	18.891	0.02135	0.00000	10102.3	-173.3	0.0	S
7.156	2.3264	0.0000	18.892	0.02163	0.00000	10287.7	-171.6	0.0	S
7.178	2.3447	0.0000	18.892	0.02191	0.00000	10474.6	-169.8	0.0	S
7.200	2.3629	0.0000	18.893	0.02220	0.00000	10662.9	-168.1	0.0	S
7.222	2.3810	0.0000	18.894	0.02249	0.00000	10852.6	-166.3	0.0	S
7.244	2.3990	0.0000	18.895	0.02277	0.00000	11043.8	-164.5	0.0	S
7.267	2.4168	0.0000	18.895	0.02306	0.00000	11236.5	-162.6	0.0	S
7.289	2.4346	0.0000	18.896	0.02335	0.00000	11430.5	-160.8	0.0	S
7.311	2.4523	0.0000	18.897	0.02364	0.00000	11626.0	-158.9	0.0	S
7.333	2.4699	0.0000	18.898	0.02392	0.00000	11822.9	-157.0	0.0	S
7.356	2.4874	0.0000	18.898	0.02421	0.00000	12021.2	-155.1	0.0	S
7.378	2.5048	0.0000	18.899	0.02450	0.00000	12220.8	-153.1	0.0	S
7.400	2.5221	0.0000	18.900	0.02479	0.00000	12421.9	-151.2	0.0	S
7.422	2.5393	0.0000	18.901	0.02508	0.00000	12624.4	-149.2	0.0	S
7.444	2.5565	0.0000	18.902	0.02538	0.00000	12828.2	-147.2	0.0	S
7.467	2.5736	0.0000	18.902	0.02567	0.00000	13033.4	-145.1	0.0	S
7.489	2.5906	0.0000	18.903	0.02596	0.00000	13240.0	-143.0	0.0	S
7.511	2.6075	0.0000	18.904	0.02625	0.00000	13447.9	-141.0	0.0	S
7.533	2.6244	0.0000	18.905	0.02655	0.00000	13657.2	-138.8	0.0	S
7.556	2.6412	0.0000	18.906	0.02684	0.00000	13867.8	-136.7	0.0	S
7.578	2.6579	0.0000	18.907	0.02713	0.00000	14079.8	-134.6	0.0	S
7.600	2.6745	0.0000	18.907	0.02743	0.00000	14293.1	-132.4	0.0	S
7.622	2.6911	0.0000	18.908	0.02772	0.00000	14507.7	-130.2	0.0	S
7.644	2.7075	0.0000	18.909	0.02802	0.00000	14723.6	-127.9	0.0	S
7.667	2.7240	0.0000	18.910	0.02832	0.00000	14940.9	-125.7	0.0	S
7.689	2.7403	0.0000	18.911	0.02861	0.00000	15159.5	-123.4	0.0	S
7.711	2.7566	0.0000	18.912	0.02891	0.00000	15379.3	-121.1	0.0	S
7.733	2.7728	0.0000	18.913	0.02921	0.00000	15600.5	-118.8	0.0	S
7.756	2.7889	0.0000	18.913	0.02950	0.00000	15823.0	-116.4	0.0	S
7.778	2.8050	0.0000	18.914	0.02980	0.00000	16046.7	-114.1	0.0	S
7.800	2.8210	0.0000	18.915	0.03010	0.00000	16271.8	-111.7	0.0	S
7.822	2.8369	0.0000	18.916	0.03040	0.00000	16498.1	-109.2	0.0	S
7.844	2.8528	0.0000	18.917	0.03070	0.00000	16725.7	-106.8	0.0	S
7.867	2.8686	0.0000	18.918	0.03100	0.00000	16954.5	-104.3	0.0	S
7.889	2.8843	0.0000	18.919	0.03129	0.00000	17184.6	-101.8	0.0	S
7.911	2.9000	0.0000	18.920	0.03159	0.00000	17416.0	-99.3	0.0	S
7.933	2.9156	0.0000	18.921	0.03190	0.00000	17648.6	-96.8	0.0	S
7.956	2.9311	0.0000	18.921	0.03220	0.00000	17882.5	-94.2	0.0	S
7.978	2.9466	0.0000	18.922	0.03250	0.00000	18117.6	-91.6	0.0	S
8.000	2.9627	0.0000	18.923	0.03280	0.00000	18354.0	-89.0	0.0	S
8.022	2.9977	0.0000	18.924	0.03312	0.00000	18592.4	-86.4	0.0	S
8.044	3.0644	0.0000	18.925	0.03347	0.00000	18834.9	-83.7	0.0	S
8.067	3.1783	0.0000	18.926	0.03386	0.00000	19084.6	-81.0	0.0	S
8.089	3.3427	0.0000	18.927	0.03433	0.00000	19345.5	-78.3	0.0	S
8.111	3.5159	0.0000	18.928	0.03489	0.00000	19619.8	-75.5	0.0	S
8.133	3.6836	0.0000	18.929	0.03550	0.00000	19907.8	-72.7	0.0	S
8.156	3.8332	0.0000	18.931	0.03615	0.00000	20208.5	-69.9	0.0	S
8.178	3.9641	0.0000	18.932	0.03683	0.00000	20520.3	-66.9	0.0	S
8.200	4.0794	0.0000	18.933	0.03753	0.00000	20842.1	-64.0	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
8.222	4.1812	0.0000	18.934	0.03825	0.00000	21172.5	-60.9	0.0	S
8.244	4.2725	0.0000	18.936	0.03897	0.00000	21510.7	-57.8	0.0	S
8.267	4.3559	0.0000	18.937	0.03969	0.00000	21855.8	-54.7	0.0	S
8.289	4.4328	0.0000	18.938	0.04042	0.00000	22207.3	-51.5	0.0	S
8.311	4.5040	0.0000	18.940	0.04114	0.00000	22564.8	-48.2	0.0	S
8.333	4.5732	0.0000	18.941	0.04186	0.00000	22927.9	-44.9	0.0	S
8.356	4.6360	0.0000	18.943	0.04258	0.00000	23296.3	-41.5	0.0	S
8.378	4.6953	0.0000	18.944	0.04330	0.00000	23669.5	-38.1	0.0	S
8.400	4.7516	0.0000	18.946	0.04401	0.00000	24047.4	-34.6	0.0	S
8.422	4.8052	0.0000	18.947	0.04472	0.00000	24429.7	-31.1	0.0	S
8.444	4.8562	0.0000	18.949	0.04542	0.00000	24816.1	-27.4	0.0	S
8.467	4.9050	0.0000	18.950	0.04612	0.00000	25206.6	-23.8	0.0	S
8.489	4.9517	0.0000	18.952	0.04681	0.00000	25600.8	-20.1	0.0	S
8.511	4.9966	0.0000	18.953	0.04750	0.00000	25998.8	-16.3	0.0	S
8.533	5.0397	0.0000	18.955	0.04818	0.00000	26400.2	-12.5	0.0	S
8.556	5.0810	0.0000	18.957	0.04886	0.00000	26805.1	-8.6	0.0	S
8.578	5.1206	0.0000	18.958	0.04954	0.00000	27213.1	-4.7	0.0	S
8.600	5.1591	0.0000	18.960	0.05021	0.00000	27624.3	-0.7	0.0	S
8.622	5.1964	0.0000	18.961	0.05088	0.00000	28038.5	3.4	0.0	S
8.644	5.2325	0.0000	18.963	0.05154	0.00000	28455.7	7.5	0.0	S
8.667	5.2673	0.0000	18.965	0.05220	0.00000	28875.7	11.6	0.0	S
8.689	5.3014	0.0000	18.966	0.05285	0.00000	29298.4	15.8	0.0	S
8.711	5.3345	0.0000	18.968	0.05350	0.00000	29723.9	20.1	0.0	S
8.733	5.3667	0.0000	18.970	0.05415	0.00000	30151.9	24.4	0.0	S
8.756	5.3981	0.0000	18.971	0.05479	0.00000	30582.5	28.7	0.0	S
8.778	5.4287	0.0000	18.973	0.05543	0.00000	31015.6	33.2	0.0	S
8.800	5.4585	0.0000	18.975	0.05607	0.00000	31451.1	37.6	0.0	S
8.822	5.4878	0.0000	18.977	0.05670	0.00000	31888.9	42.1	0.0	S
8.844	5.5166	0.0000	18.978	0.05733	0.00000	32329.1	46.7	0.0	S
8.867	5.5449	0.0000	18.980	0.05796	0.00000	32771.5	51.3	0.0	S
8.889	5.5728	0.0000	18.982	0.05858	0.00000	33216.2	56.0	0.0	S
8.911	5.6005	0.0000	18.983	0.05920	0.00000	33663.2	60.7	0.0	S
8.933	5.6280	0.0000	18.985	0.05982	0.00000	34112.3	65.4	0.0	S
8.956	5.6554	0.0000	18.987	0.06044	0.00000	34563.7	70.2	0.0	S
8.978	5.6827	0.0000	18.989	0.06105	0.00000	35017.2	75.1	0.0	S
9.000	5.7098	0.0000	18.991	0.06167	0.00000	35472.9	80.0	0.0	S
9.022	5.7367	0.0000	18.992	0.06228	0.00000	35930.7	85.0	0.0	S
9.044	5.7635	0.0000	18.994	0.06289	0.00000	36390.8	90.0	0.0	S
9.067	5.7902	0.0000	18.996	0.06350	0.00000	36852.9	95.0	0.0	S
9.089	5.8167	0.0000	18.998	0.06411	0.00000	37317.2	100.1	0.0	S
9.111	5.8430	0.0000	19.000	0.06471	0.00000	37783.6	105.3	0.0	S
9.133	5.8692	0.0000	19.001	0.06532	0.00000	38252.0	110.5	0.0	S
9.156	5.8953	0.0000	19.003	0.06592	0.00000	38722.6	115.7	0.0	S
9.178	5.9212	0.0000	19.005	0.06653	0.00000	39195.3	121.0	0.0	S
9.200	5.9470	0.0000	19.007	0.06713	0.00000	39670.0	126.4	0.0	S
9.222	5.9726	0.0000	19.009	0.06773	0.00000	40146.8	131.8	0.0	S
9.244	5.9981	0.0000	19.011	0.06833	0.00000	40625.6	137.2	0.0	S
9.267	6.0234	0.0000	19.013	0.06893	0.00000	41106.5	142.7	0.0	S
9.289	6.0487	0.0000	19.015	0.06953	0.00000	41589.4	148.2	0.0	S
9.311	6.0737	0.0000	19.016	0.07012	0.00000	42074.3	153.8	0.0	S
9.333	6.0987	0.0000	19.018	0.07072	0.00000	42561.2	159.5	0.0	S
9.356	6.1235	0.0000	19.020	0.07131	0.00000	43050.0	165.2	0.0	S
9.378	6.1482	0.0000	19.022	0.07191	0.00000	43540.9	170.9	0.0	S
9.400	6.1727	0.0000	19.024	0.07250	0.00000	44033.7	176.7	0.0	S
9.422	6.1971	0.0000	19.026	0.07309	0.00000	44528.5	182.5	0.0	S
9.444	6.2214	0.0000	19.028	0.07369	0.00000	45025.3	188.4	0.0	S
9.467	6.2455	0.0000	19.030	0.07428	0.00000	45524.0	194.3	0.0	S
9.489	6.2695	0.0000	19.032	0.07487	0.00000	46024.6	200.2	0.0	S
9.511	6.2934	0.0000	19.034	0.07546	0.00000	46527.1	206.2	0.0	S
9.533	6.3172	0.0000	19.036	0.07605	0.00000	47031.5	212.3	0.0	S
9.556	6.3408	0.0000	19.038	0.07664	0.00000	47537.8	218.4	0.0	S
9.578	6.3643	0.0000	19.040	0.07723	0.00000	48046.0	224.6	0.0	S
9.600	6.3877	0.0000	19.042	0.07781	0.00000	48556.1	230.8	0.0	S
9.622	6.4110	0.0000	19.044	0.07840	0.00000	49068.1	237.0	0.0	S
9.644	6.4341	0.0000	19.046	0.07899	0.00000	49581.9	243.3	0.0	S
9.667	6.4571	0.0000	19.048	0.07957	0.00000	50097.5	249.7	0.0	S
9.689	6.4800	0.0000	19.050	0.08016	0.00000	50615.0	256.0	0.0	S
9.711	6.5028	0.0000	19.052	0.08075	0.00000	51134.3	262.5	0.0	S
9.733	6.5254	0.0000	19.054	0.08133	0.00000	51655.4	269.0	0.0	S
9.756	6.5480	0.0000	19.056	0.08191	0.00000	52178.4	275.5	0.0	S
9.778	6.5704	0.0000	19.058	0.08250	0.00000	52703.1	282.1	0.0	S
9.800	6.5927	0.0000	19.060	0.08308	0.00000	53229.6	288.7	0.0	S
9.822	6.6149	0.0000	19.062	0.08366	0.00000	53757.9	295.4	0.0	S
9.844	6.6369	0.0000	19.064	0.08424	0.00000	54288.0	302.1	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
9.867	6.6589	0.0000	19.066	0.08483	0.00000	54819.8	308.8	0.0	S
9.889	6.6807	0.0000	19.068	0.08541	0.00000	55353.4	315.7	0.0	S
9.911	6.7024	0.0000	19.070	0.08599	0.00000	55888.7	322.5	0.0	S
9.933	6.7240	0.0000	19.072	0.08657	0.00000	56425.8	329.4	0.0	S
9.956	6.7455	0.0000	19.075	0.08715	0.00000	56964.6	336.4	0.0	S
9.978	6.7669	0.0000	19.077	0.08773	0.00000	57505.1	343.4	0.0	S
10.000	6.7882	0.0000	19.079	0.08831	0.00000	58047.3	350.4	0.0	S
10.022	6.8366	0.0000	19.081	0.08891	0.00000	58592.3	357.5	0.0	S
10.044	6.9315	0.0000	19.083	0.08955	0.00000	59143.0	364.6	0.0	S
10.067	7.0965	0.0000	19.085	0.09027	0.00000	59704.1	371.8	0.0	S
10.089	7.3398	0.0000	19.087	0.09110	0.00000	60281.6	379.1	0.0	S
10.111	7.5986	0.0000	19.090	0.09203	0.00000	60879.1	386.4	0.0	S
10.133	7.8493	0.0000	19.092	0.09305	0.00000	61497.0	393.8	0.0	S
10.156	8.0719	0.0000	19.095	0.09414	0.00000	62133.9	401.3	0.0	S
10.178	8.2651	0.0000	19.097	0.09528	0.00000	62787.3	408.9	0.0	S
10.200	8.4334	0.0000	19.100	0.09644	0.00000	63455.3	416.5	0.0	S
10.222	8.5801	0.0000	19.102	0.09763	0.00000	64135.8	424.3	0.0	S
10.244	8.7102	0.0000	19.105	0.09882	0.00000	64827.4	432.1	0.0	S
10.267	8.8273	0.0000	19.108	0.10001	0.00000	65528.9	440.1	0.0	S
10.289	8.9342	0.0000	19.111	0.10120	0.00000	66239.4	448.1	0.0	S
10.311	9.0317	0.0000	19.113	0.10238	0.00000	66958.0	456.3	0.0	S
10.333	9.1259	0.0000	19.116	0.10356	0.00000	67684.3	464.5	0.0	S
10.356	9.2102	0.0000	19.119	0.10473	0.00000	68417.8	472.9	0.0	S
10.378	9.2889	0.0000	19.122	0.10589	0.00000	69157.7	481.3	0.0	S
10.400	9.3627	0.0000	19.125	0.10704	0.00000	69903.8	489.8	0.0	S
10.422	9.4320	0.0000	19.128	0.10818	0.00000	70655.6	498.4	0.0	S
10.444	9.4974	0.0000	19.131	0.10931	0.00000	71412.8	507.1	0.0	S
10.467	9.5593	0.0000	19.134	0.11043	0.00000	72175.0	515.9	0.0	S
10.489	9.6178	0.0000	19.137	0.11154	0.00000	72942.1	524.8	0.0	S
10.511	9.6735	0.0000	19.140	0.11264	0.00000	73713.8	533.7	0.0	S
10.533	9.7263	0.0000	19.143	0.11373	0.00000	74489.8	542.8	0.0	S
10.556	9.7765	0.0000	19.146	0.11481	0.00000	75269.9	551.9	0.0	S
10.578	9.8239	0.0000	19.149	0.11588	0.00000	76053.9	561.2	0.0	S
10.600	9.8695	0.0000	19.152	0.11694	0.00000	76841.6	570.5	0.0	S
10.622	9.9133	0.0000	19.155	0.11799	0.00000	77632.9	579.9	0.0	S
10.644	9.9553	0.0000	19.158	0.11903	0.00000	78427.7	589.4	0.0	S
10.667	9.9955	0.0000	19.161	0.12007	0.00000	79225.7	598.9	0.0	S
10.689	10.0343	0.0000	19.164	0.12110	0.00000	80026.9	608.6	0.0	S
10.711	10.0717	0.0000	19.167	0.12211	0.00000	80831.1	618.3	0.0	S
10.733	10.1079	0.0000	19.170	0.12312	0.00000	81638.3	628.1	0.0	S
10.756	10.1427	0.0000	19.173	0.12413	0.00000	82448.3	638.0	0.0	S
10.778	10.1763	0.0000	19.177	0.12512	0.00000	83261.1	648.0	0.0	S
10.800	10.2089	0.0000	19.180	0.12611	0.00000	84076.5	658.0	0.0	S
10.822	10.2407	0.0000	19.183	0.12709	0.00000	84894.5	668.1	0.0	S
10.844	10.2717	0.0000	19.186	0.12806	0.00000	85715.0	678.3	0.0	S
10.867	10.3020	0.0000	19.189	0.12903	0.00000	86537.9	688.6	0.0	S
10.889	10.3317	0.0000	19.192	0.12999	0.00000	87363.3	699.0	0.0	S
10.911	10.3612	0.0000	19.196	0.13095	0.00000	88191.0	709.4	0.0	S
10.933	10.3905	0.0000	19.199	0.13190	0.00000	89021.1	719.9	0.0	S
10.956	10.4196	0.0000	19.202	0.13284	0.00000	89853.5	730.5	0.0	S
10.978	10.4485	0.0000	19.205	0.13378	0.00000	90688.2	741.2	0.0	S
11.000	10.4784	0.0000	19.209	0.13472	0.00000	91525.3	751.9	0.0	S
11.022	10.5408	0.0000	19.212	0.13568	0.00000	92366.0	762.8	0.0	S
11.044	10.6572	0.0000	19.215	0.13669	0.00000	93214.0	773.6	0.0	S
11.067	10.8539	0.0000	19.218	0.13779	0.00000	94074.4	784.6	0.0	S
11.089	11.1362	0.0000	19.222	0.13899	0.00000	94954.0	795.7	0.0	S
11.111	11.4322	0.0000	19.225	0.14032	0.00000	95856.7	806.9	0.0	S
11.133	11.7170	0.0000	19.229	0.14174	0.00000	96782.7	818.1	0.0	S
11.156	11.9689	0.0000	19.232	0.14324	0.00000	97730.1	829.5	0.0	S
11.178	12.1875	0.0000	19.236	0.14478	0.00000	98696.4	841.1	0.0	S
11.200	12.3781	0.0000	19.240	0.14636	0.00000	99679.0	852.7	0.0	S
11.222	12.5446	0.0000	19.244	0.14794	0.00000	100675.9	864.5	0.0	S
11.244	12.6923	0.0000	19.248	0.14953	0.00000	101685.4	876.4	0.0	S
11.267	12.8256	0.0000	19.252	0.15112	0.00000	102706.1	888.4	0.0	S
11.289	12.9473	0.0000	19.256	0.15271	0.00000	103737.0	900.6	0.0	S
11.311	13.0586	0.0000	19.260	0.15428	0.00000	104777.3	912.8	0.0	S
11.333	13.1660	0.0000	19.264	0.15585	0.00000	105826.3	925.2	0.0	S
11.356	13.2620	0.0000	19.268	0.15740	0.00000	106883.4	937.8	0.0	S
11.378	13.3518	0.0000	19.272	0.15894	0.00000	107947.9	950.4	0.0	S
11.400	13.4360	0.0000	19.276	0.16046	0.00000	109019.4	963.2	0.0	S
11.422	13.5151	0.0000	19.280	0.16198	0.00000	110097.5	976.1	0.0	S
11.444	13.5898	0.0000	19.284	0.16348	0.00000	111181.7	989.1	0.0	S
11.467	13.6604	0.0000	19.288	0.16496	0.00000	112271.7	1002.3	0.0	S
11.489	13.7272	0.0000	19.293	0.16643	0.00000	113367.2	1015.5	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
11.511	13.7907	0.0000	19.297	0.16789	0.00000	114467.9	1028.9	0.0	S
11.533	13.8509	0.0000	19.301	0.16934	0.00000	115573.6	1042.4	0.0	S
11.556	13.9080	0.0000	19.305	0.17077	0.00000	116683.9	1056.0	0.0	S
11.578	13.9622	0.0000	19.310	0.17219	0.00000	117798.7	1069.7	0.0	S
11.600	14.0142	0.0000	19.314	0.17360	0.00000	118917.8	1083.5	0.0	S
11.622	14.0641	0.0000	19.318	0.17500	0.00000	120040.9	1097.5	0.0	S
11.644	14.1119	0.0000	19.323	0.17638	0.00000	121167.9	1111.5	0.0	S
11.667	14.1576	0.0000	19.327	0.17775	0.00000	122298.7	1125.7	0.0	S
11.689	14.2018	0.0000	19.331	0.17911	0.00000	123433.1	1140.0	0.0	S
11.711	14.2444	0.0000	19.336	0.18047	0.00000	124570.9	1154.4	0.0	S
11.733	14.2855	0.0000	19.340	0.18181	0.00000	125712.1	1168.8	0.0	S
11.756	14.3250	0.0000	19.344	0.18314	0.00000	126856.6	1183.4	0.0	S
11.778	14.3633	0.0000	19.349	0.18446	0.00000	128004.1	1198.2	0.0	S
11.800	14.4003	0.0000	19.353	0.18577	0.00000	129154.6	1213.0	0.0	S
11.822	14.4363	0.0000	19.358	0.18707	0.00000	130308.1	1227.9	0.0	S
11.844	14.4715	0.0000	19.362	0.18836	0.00000	131464.4	1242.9	0.0	S
11.867	14.5059	0.0000	19.366	0.18964	0.00000	132623.5	1258.0	0.0	S
11.889	14.5396	0.0000	19.371	0.19092	0.00000	133785.3	1273.2	0.0	S
11.911	14.5730	0.0000	19.375	0.19218	0.00000	134949.8	1288.6	0.0	S
11.933	14.6062	0.0000	19.380	0.19344	0.00000	136117.0	1304.0	0.0	S
11.956	14.6392	0.0000	19.384	0.19470	0.00000	137286.8	1319.5	0.0	S
11.978	14.6719	0.0000	19.389	0.19594	0.00000	138459.3	1335.1	0.0	S
12.000	14.7044	0.0000	19.393	0.19718	0.00000	139634.3	1350.9	0.0	S
12.022	14.6826	0.0000	19.398	0.19837	0.00000	140809.8	1366.7	0.0	S
12.044	14.5705	0.0000	19.402	0.19947	0.00000	141979.9	1382.6	0.0	S
12.067	14.3227	0.0000	19.406	0.20041	0.00000	143135.6	1398.6	0.0	S
12.089	13.9252	0.0000	19.411	0.20115	0.00000	144265.6	1414.7	0.0	S
12.111	13.5036	0.0000	19.415	0.20168	0.00000	145362.7	1430.8	0.0	S
12.133	13.1000	0.0000	19.419	0.20202	0.00000	146426.9	1446.9	0.0	S
12.156	12.7525	0.0000	19.423	0.20225	0.00000	147461.0	1463.1	0.0	S
12.178	12.4619	0.0000	19.427	0.20238	0.00000	148469.5	1479.3	0.0	S
12.200	12.2192	0.0000	19.430	0.20246	0.00000	149456.8	1495.5	0.0	S
12.222	12.0178	0.0000	19.434	0.20250	0.00000	150426.3	1511.7	0.0	S
12.244	11.8483	0.0000	19.438	0.20253	0.00000	151380.9	1527.9	0.0	S
12.267	11.7033	0.0000	19.441	0.20256	0.00000	152323.0	1544.1	0.0	S
12.289	11.5778	0.0000	19.445	0.20259	0.00000	153254.2	1560.3	0.0	S
12.311	11.4702	0.0000	19.448	0.20263	0.00000	154176.1	1576.5	0.0	S
12.333	11.3683	0.0000	19.452	0.20268	0.00000	155089.7	1592.7	0.0	S
12.356	11.2858	0.0000	19.455	0.20275	0.00000	155995.8	1608.9	0.0	S
12.378	11.2136	0.0000	19.459	0.20284	0.00000	156895.8	1625.2	0.0	S
12.400	11.1504	0.0000	19.462	0.20294	0.00000	157790.4	1641.4	0.0	S
12.422	11.0955	0.0000	19.465	0.20305	0.00000	158680.2	1657.6	0.0	S
12.444	11.0479	0.0000	19.469	0.20319	0.00000	159565.9	1673.9	0.0	S
12.467	11.0067	0.0000	19.472	0.20335	0.00000	160448.1	1690.1	0.0	S
12.489	10.9716	0.0000	19.475	0.20352	0.00000	161327.3	1706.4	0.0	S
12.511	10.9416	0.0000	19.479	0.20371	0.00000	162203.8	1722.7	0.0	S
12.533	10.9167	0.0000	19.482	0.20392	0.00000	163078.1	1739.0	0.0	S
12.556	10.8967	0.0000	19.485	0.20413	0.00000	163950.6	1755.3	0.0	S
12.578	10.8813	0.0000	19.488	0.20438	0.00000	164821.8	1771.7	0.0	S
12.600	10.8691	0.0000	19.492	0.20464	0.00000	165691.8	1788.0	0.0	S
12.622	10.8600	0.0000	19.495	0.20492	0.00000	166560.9	1804.4	0.0	S
12.644	10.8540	0.0000	19.498	0.20520	0.00000	167429.5	1820.8	0.0	S
12.667	10.8511	0.0000	19.502	0.20551	0.00000	168297.7	1837.2	0.0	S
12.689	10.8503	0.0000	19.505	0.20582	0.00000	169165.8	1853.7	0.0	S
12.711	10.8517	0.0000	19.508	0.20615	0.00000	170033.8	1870.2	0.0	S
12.733	10.8552	0.0000	19.511	0.20650	0.00000	170902.1	1886.7	0.0	S
12.756	10.8609	0.0000	19.515	0.20685	0.00000	171770.8	1903.2	0.0	S
12.778	10.8683	0.0000	19.518	0.20722	0.00000	172639.9	1919.8	0.0	S
12.800	10.8774	0.0000	19.521	0.20760	0.00000	173509.8	1936.4	0.0	S
12.822	10.8876	0.0000	19.524	0.20799	0.00000	174380.4	1953.0	0.0	S
12.844	10.8988	0.0000	19.528	0.20839	0.00000	175251.8	1969.6	0.0	S
12.867	10.9109	0.0000	19.531	0.20881	0.00000	176124.2	1986.3	0.0	S
12.889	10.9238	0.0000	19.534	0.20923	0.00000	176997.6	2003.1	0.0	S
12.911	10.9366	0.0000	19.538	0.20966	0.00000	177872.0	2019.8	0.0	S
12.933	10.9494	0.0000	19.541	0.21010	0.00000	178747.4	2036.6	0.0	S
12.956	10.9621	0.0000	19.544	0.21057	0.00000	179623.9	2053.4	0.0	S
12.978	10.9747	0.0000	19.547	0.21100	0.00000	180501.4	2070.3	0.0	S
13.000	10.9873	0.0000	19.551	0.21146	0.00000	181379.8	2087.2	0.0	S
13.022	10.9818	0.0000	19.554	0.21190	0.00000	182258.6	2104.1	0.0	S
13.044	10.9454	0.0000	19.557	0.21233	0.00000	183135.7	2121.1	0.0	S
13.067	10.8625	0.0000	19.561	0.21271	0.00000	184008.0	2138.1	0.0	S
13.089	10.7281	0.0000	19.564	0.21302	0.00000	184871.6	2155.1	0.0	S
13.111	10.5838	0.0000	19.567	0.21328	0.00000	185724.1	2172.2	0.0	S
13.133	10.4456	0.0000	19.570	0.21346	0.00000	186565.3	2189.3	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
13.156	10.3266	0.0000	19.573	0.21362	0.00000	187396.2	2206.3	0.0	S
13.178	10.2275	0.0000	19.576	0.21376	0.00000	188218.3	2223.4	0.0	S
13.200	10.1453	0.0000	19.579	0.21386	0.00000	189033.3	2240.5	0.0	S
13.222	10.0776	0.0000	19.582	0.21395	0.00000	189842.2	2257.6	0.0	S
13.244	10.0213	0.0000	19.585	0.21406	0.00000	190646.1	2274.8	0.0	S
13.267	9.9736	0.0000	19.588	0.21418	0.00000	191445.9	2291.9	0.0	S
13.289	9.9329	0.0000	19.591	0.21429	0.00000	192242.2	2309.0	0.0	S
13.311	9.8985	0.0000	19.594	0.21440	0.00000	193035.4	2326.2	0.0	S
13.333	9.8662	0.0000	19.597	0.21453	0.00000	193826.0	2343.3	0.0	S
13.356	9.8406	0.0000	19.600	0.21468	0.00000	194614.3	2360.5	0.0	S
13.378	9.8187	0.0000	19.603	0.21482	0.00000	195400.7	2377.7	0.0	S
13.400	9.8000	0.0000	19.606	0.21498	0.00000	196185.4	2394.9	0.0	S
13.422	9.7842	0.0000	19.609	0.21515	0.00000	196968.8	2412.1	0.0	S
13.444	9.7709	0.0000	19.612	0.21531	0.00000	197751.0	2429.3	0.0	S
13.467	9.7600	0.0000	19.615	0.21550	0.00000	198532.2	2446.5	0.0	S
13.489	9.7512	0.0000	19.618	0.21570	0.00000	199312.7	2463.8	0.0	S
13.511	9.7441	0.0000	19.621	0.21588	0.00000	200092.5	2481.0	0.0	S
13.533	9.7389	0.0000	19.624	0.21610	0.00000	200871.8	2498.3	0.0	S
13.556	9.7354	0.0000	19.626	0.21633	0.00000	201650.8	2515.6	0.0	S
13.578	9.7335	0.0000	19.629	0.21653	0.00000	202429.5	2532.9	0.0	S
13.600	9.7327	0.0000	19.632	0.21677	0.00000	203208.2	2550.3	0.0	S
13.622	9.7330	0.0000	19.635	0.21703	0.00000	203986.8	2567.6	0.0	S
13.644	9.7344	0.0000	19.638	0.21728	0.00000	204765.5	2585.0	0.0	S
13.667	9.7369	0.0000	19.641	0.21754	0.00000	205544.4	2602.4	0.0	S
13.689	9.7401	0.0000	19.644	0.21780	0.00000	206323.4	2619.8	0.0	S
13.711	9.7441	0.0000	19.647	0.21807	0.00000	207102.8	2637.2	0.0	S
13.733	9.7488	0.0000	19.650	0.21835	0.00000	207882.5	2654.7	0.0	S
13.756	9.7542	0.0000	19.653	0.21863	0.00000	208662.6	2672.2	0.0	S
13.778	9.7602	0.0000	19.655	0.21892	0.00000	209443.2	2689.7	0.0	S
13.800	9.7669	0.0000	19.658	0.21922	0.00000	210224.3	2707.2	0.0	S
13.822	9.7739	0.0000	19.661	0.21952	0.00000	211005.9	2724.7	0.0	S
13.844	9.7812	0.0000	19.664	0.21983	0.00000	211788.1	2742.3	0.0	S
13.867	9.7889	0.0000	19.667	0.22014	0.00000	212570.9	2759.9	0.0	S
13.889	9.7968	0.0000	19.670	0.22045	0.00000	213354.4	2777.5	0.0	S
13.911	9.8047	0.0000	19.673	0.22077	0.00000	214138.4	2795.2	0.0	S
13.933	9.8126	0.0000	19.676	0.22110	0.00000	214923.1	2812.9	0.0	S
13.956	9.8204	0.0000	19.679	0.22143	0.00000	215708.4	2830.6	0.0	S
13.978	9.8282	0.0000	19.682	0.22176	0.00000	216494.4	2848.3	0.0	S
14.000	9.8360	0.0000	19.684	0.22209	0.00000	217280.9	2866.1	0.0	S
14.022	9.8435	0.0000	19.687	0.22243	0.00000	218068.1	2883.8	0.0	S
14.044	9.8504	0.0000	19.690	0.22277	0.00000	218855.9	2901.6	0.0	S
14.067	9.8566	0.0000	19.693	0.22311	0.00000	219644.2	2919.5	0.0	S
14.089	9.8620	0.0000	19.696	0.22346	0.00000	220432.9	2937.3	0.0	S
14.111	9.8673	0.0000	19.699	0.22380	0.00000	221222.1	2955.2	0.0	S
14.133	9.8726	0.0000	19.702	0.22415	0.00000	222011.7	2973.1	0.0	S
14.156	9.8782	0.0000	19.705	0.22450	0.00000	222801.7	2991.1	0.0	S
14.178	9.8841	0.0000	19.708	0.22485	0.00000	223592.2	3009.1	0.0	S
14.200	9.8903	0.0000	19.711	0.22520	0.00000	224383.2	3027.1	0.0	S
14.222	9.8966	0.0000	19.714	0.22556	0.00000	225174.7	3045.1	0.0	S
14.244	9.9030	0.0000	19.717	0.22591	0.00000	225966.6	3063.2	0.0	S
14.267	9.9096	0.0000	19.720	0.22627	0.00000	226759.1	3081.2	0.0	S
14.289	9.9163	0.0000	19.723	0.22663	0.00000	227552.2	3099.4	0.0	S
14.311	9.9230	0.0000	19.725	0.22699	0.00000	228345.8	3117.5	0.0	S
14.333	9.9297	0.0000	19.728	0.22735	0.00000	229139.8	3135.7	0.0	S
14.356	9.9365	0.0000	19.731	0.22771	0.00000	229934.5	3153.9	0.0	S
14.378	9.9433	0.0000	19.734	0.22808	0.00000	230729.7	3172.1	0.0	S
14.400	9.9501	0.0000	19.737	0.22845	0.00000	231525.4	3190.4	0.0	S
14.422	9.9570	0.0000	19.740	0.22881	0.00000	232321.7	3208.7	0.0	S
14.444	9.9639	0.0000	19.743	0.22918	0.00000	233118.5	3227.0	0.0	S
14.467	9.9708	0.0000	19.746	0.22956	0.00000	233915.9	3245.3	0.0	S
14.489	9.9776	0.0000	19.749	0.22993	0.00000	234713.9	3263.7	0.0	S
14.511	9.9845	0.0000	19.752	0.23030	0.00000	235512.3	3282.1	0.0	S
14.533	9.9914	0.0000	19.755	0.23068	0.00000	236311.4	3300.6	0.0	S
14.556	9.9983	0.0000	19.758	0.23105	0.00000	237111.0	3319.0	0.0	S
14.578	10.0052	0.0000	19.761	0.23143	0.00000	237911.1	3337.5	0.0	S
14.600	10.0121	0.0000	19.764	0.23181	0.00000	238711.8	3356.1	0.0	S
14.622	10.0190	0.0000	19.767	0.23219	0.00000	239513.1	3374.6	0.0	S
14.644	10.0259	0.0000	19.770	0.23256	0.00000	240314.9	3393.2	0.0	S
14.667	10.0327	0.0000	19.773	0.23295	0.00000	241117.2	3411.8	0.0	S
14.689	10.0396	0.0000	19.776	0.23333	0.00000	241920.1	3430.5	0.0	S
14.711	10.0464	0.0000	19.778	0.23371	0.00000	242723.5	3449.2	0.0	S
14.733	10.0533	0.0000	19.781	0.23409	0.00000	243527.5	3467.9	0.0	S
14.756	10.0601	0.0000	19.784	0.23448	0.00000	244332.1	3486.6	0.0	S
14.778	10.0669	0.0000	19.787	0.23486	0.00000	245137.1	3505.4	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
14.800	10.0737	0.0000	19.790	0.23525	0.00000	245942.8	3524.2	0.0	S
14.822	10.0804	0.0000	19.793	0.23563	0.00000	246748.9	3543.0	0.0	S
14.844	10.0872	0.0000	19.796	0.23602	0.00000	247555.6	3561.9	0.0	S
14.867	10.0939	0.0000	19.799	0.23641	0.00000	248362.9	3580.8	0.0	S
14.889	10.1006	0.0000	19.802	0.23680	0.00000	249170.6	3599.7	0.0	S
14.911	10.1073	0.0000	19.805	0.23718	0.00000	249979.0	3618.7	0.0	S
14.933	10.1140	0.0000	19.808	0.23757	0.00000	250787.8	3637.7	0.0	S
14.956	10.1206	0.0000	19.811	0.23796	0.00000	251597.2	3656.7	0.0	S
14.978	10.1272	0.0000	19.814	0.23835	0.00000	252407.1	3675.7	0.0	S
15.000	10.1338	0.0000	19.817	0.23874	0.00000	253217.5	3694.8	0.0	S
15.022	10.1200	0.0000	19.820	0.23912	0.00000	254027.7	3713.9	0.0	S
15.044	10.0723	0.0000	19.823	0.23946	0.00000	254835.4	3733.1	0.0	S
15.067	9.9735	0.0000	19.826	0.23975	0.00000	255637.2	3752.3	0.0	S
15.089	9.8186	0.0000	19.829	0.23997	0.00000	256428.9	3771.4	0.0	S
15.111	9.6550	0.0000	19.832	0.24009	0.00000	257207.9	3790.7	0.0	S
15.133	9.4987	0.0000	19.835	0.24016	0.00000	257974.0	3809.9	0.0	S
15.156	9.3639	0.0000	19.837	0.24019	0.00000	258728.5	3829.1	0.0	S
15.178	9.2510	0.0000	19.840	0.24020	0.00000	259473.1	3848.3	0.0	S
15.200	9.1564	0.0000	19.843	0.24018	0.00000	260209.4	3867.5	0.0	S
15.222	9.0776	0.0000	19.845	0.24014	0.00000	260938.8	3886.7	0.0	S
15.244	9.0111	0.0000	19.848	0.24009	0.00000	261662.3	3905.9	0.0	S
15.267	8.9540	0.0000	19.851	0.24006	0.00000	262380.9	3925.1	0.0	S
15.289	8.9044	0.0000	19.853	0.24004	0.00000	263095.3	3944.3	0.0	S
15.311	8.8618	0.0000	19.856	0.24001	0.00000	263805.9	3963.5	0.0	S
15.333	8.8214	0.0000	19.858	0.24000	0.00000	264513.2	3982.7	0.0	S
15.356	8.7884	0.0000	19.861	0.24000	0.00000	265217.6	4001.9	0.0	S
15.378	8.7595	0.0000	19.864	0.24000	0.00000	265919.5	4021.1	0.0	S
15.400	8.7341	0.0000	19.866	0.24000	0.00000	266619.3	4040.3	0.0	S
15.422	8.7118	0.0000	19.869	0.24002	0.00000	267317.1	4059.5	0.0	S
15.444	8.6924	0.0000	19.871	0.24006	0.00000	268013.3	4078.7	0.0	S
15.467	8.6755	0.0000	19.874	0.24010	0.00000	268708.0	4098.0	0.0	S
15.489	8.6609	0.0000	19.876	0.24014	0.00000	269401.4	4117.2	0.0	S
15.511	8.6483	0.0000	19.879	0.24018	0.00000	270093.8	4136.4	0.0	S
15.533	8.6377	0.0000	19.881	0.24025	0.00000	270785.3	4155.6	0.0	S
15.556	8.6290	0.0000	19.884	0.24033	0.00000	271475.9	4174.8	0.0	S
15.578	8.6221	0.0000	19.886	0.24041	0.00000	272166.0	4194.0	0.0	S
15.600	8.6164	0.0000	19.889	0.24050	0.00000	272855.5	4213.3	0.0	S
15.622	8.6119	0.0000	19.891	0.24059	0.00000	273544.6	4232.5	0.0	S
15.644	8.6087	0.0000	19.894	0.24069	0.00000	274233.4	4251.8	0.0	S
15.667	8.6066	0.0000	19.896	0.24080	0.00000	274922.1	4271.0	0.0	S
15.689	8.6053	0.0000	19.899	0.24090	0.00000	275610.5	4290.3	0.0	S
15.711	8.6049	0.0000	19.901	0.24102	0.00000	276298.9	4309.6	0.0	S
15.733	8.6054	0.0000	19.904	0.24113	0.00000	276987.4	4328.9	0.0	S
15.756	8.6066	0.0000	19.906	0.24125	0.00000	277675.8	4348.2	0.0	S
15.778	8.6085	0.0000	19.909	0.24141	0.00000	278364.4	4367.5	0.0	S
15.800	8.6111	0.0000	19.911	0.24159	0.00000	279053.3	4386.8	0.0	S
15.822	8.6141	0.0000	19.914	0.24173	0.00000	279742.3	4406.1	0.0	S
15.844	8.6175	0.0000	19.916	0.24187	0.00000	280431.5	4425.5	0.0	S
15.867	8.6213	0.0000	19.919	0.24201	0.00000	281121.1	4444.8	0.0	S
15.889	8.6253	0.0000	19.921	0.24219	0.00000	281810.9	4464.2	0.0	S
15.911	8.6294	0.0000	19.924	0.24239	0.00000	282501.1	4483.6	0.0	S
15.933	8.6334	0.0000	19.926	0.24255	0.00000	283191.6	4503.0	0.0	S
15.956	8.6374	0.0000	19.929	0.24274	0.00000	283882.5	4522.4	0.0	S
15.978	8.6415	0.0000	19.931	0.24293	0.00000	284573.6	4541.8	0.0	S
16.000	8.6455	0.0000	19.934	0.24309	0.00000	285265.1	4561.2	0.0	S
16.022	8.6296	0.0000	19.936	0.24327	0.00000	285956.1	4580.7	0.0	S
16.044	8.5799	0.0000	19.939	0.24343	0.00000	286644.5	4600.2	0.0	S
16.067	8.4792	0.0000	19.941	0.24352	0.00000	287326.8	4619.6	0.0	S
16.089	8.3219	0.0000	19.944	0.24353	0.00000	287998.9	4639.1	0.0	S
16.111	8.1542	0.0000	19.946	0.24347	0.00000	288657.9	4658.6	0.0	S
16.133	7.9933	0.0000	19.949	0.24335	0.00000	289303.8	4678.1	0.0	S
16.156	7.8537	0.0000	19.951	0.24318	0.00000	289937.7	4697.5	0.0	S
16.178	7.7363	0.0000	19.953	0.24296	0.00000	290561.3	4717.0	0.0	S
16.200	7.6376	0.0000	19.955	0.24271	0.00000	291176.3	4736.4	0.0	S
16.222	7.5551	0.0000	19.958	0.24251	0.00000	291784.0	4755.8	0.0	S
16.244	7.4852	0.0000	19.960	0.24232	0.00000	292385.6	4775.2	0.0	S
16.267	7.4249	0.0000	19.962	0.24210	0.00000	292982.0	4794.6	0.0	S
16.289	7.3724	0.0000	19.964	0.24189	0.00000	293573.9	4814.0	0.0	S
16.311	7.3269	0.0000	19.966	0.24169	0.00000	294161.8	4833.3	0.0	S
16.333	7.2839	0.0000	19.968	0.24150	0.00000	294746.3	4852.6	0.0	S
16.356	7.2482	0.0000	19.970	0.24131	0.00000	295327.6	4871.9	0.0	S
16.378	7.2168	0.0000	19.972	0.24114	0.00000	295906.2	4891.2	0.0	S
16.400	7.1889	0.0000	19.974	0.24098	0.00000	296482.4	4910.5	0.0	S
16.422	7.1643	0.0000	19.977	0.24082	0.00000	297056.5	4929.8	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
16.444	7.1426	0.0000	19.979	0.24064	0.00000	297628.8	4949.1	0.0	S
16.467	7.1234	0.0000	19.981	0.24052	0.00000	298199.4	4968.3	0.0	S
16.489	7.1067	0.0000	19.983	0.24042	0.00000	298768.7	4987.5	0.0	S
16.511	7.0919	0.0000	19.985	0.24027	0.00000	299336.6	5006.8	0.0	S
16.533	7.0793	0.0000	19.987	0.24018	0.00000	299903.4	5026.0	0.0	S
16.556	7.0685	0.0000	19.989	0.24011	0.00000	300469.3	5045.2	0.0	S
16.578	7.0595	0.0000	19.991	0.24000	0.00000	301034.5	5064.4	0.0	S
16.600	7.0519	0.0000	19.993	0.23993	0.00000	301598.9	5083.6	0.0	S
16.622	7.0454	0.0000	19.995	0.23988	0.00000	302162.8	5102.8	0.0	S
16.644	7.0402	0.0000	19.997	0.23980	0.00000	302726.3	5122.0	0.0	S
16.667	7.0362	0.0000	19.999	0.23975	0.00000	303289.3	5141.2	0.0	S
16.689	7.0331	0.0000	20.001	0.23972	0.00000	303852.1	5160.3	0.0	S
16.711	7.0309	0.0000	20.003	0.23967	0.00000	304414.6	5179.5	0.0	S
16.733	7.0294	0.0000	20.005	0.23962	0.00000	304977.1	5198.7	0.0	S
16.756	7.0289	0.0000	20.007	0.23961	0.00000	305539.4	5217.9	0.0	S
16.778	7.0290	0.0000	20.009	0.23962	0.00000	306101.7	5237.0	0.0	S
16.800	7.0298	0.0000	20.011	0.23960	0.00000	306664.1	5256.2	0.0	S
16.822	7.0310	0.0000	20.013	0.23958	0.00000	307226.5	5275.4	0.0	S
16.844	7.0327	0.0000	20.015	0.23960	0.00000	307789.0	5294.5	0.0	S
16.867	7.0347	0.0000	20.017	0.23962	0.00000	308351.7	5313.7	0.0	S
16.889	7.0370	0.0000	20.019	0.23963	0.00000	308914.6	5332.9	0.0	S
16.911	7.0394	0.0000	20.021	0.23965	0.00000	309477.7	5352.0	0.0	S
16.933	7.0417	0.0000	20.023	0.23966	0.00000	310040.9	5371.2	0.0	S
16.956	7.0440	0.0000	20.025	0.23970	0.00000	310604.3	5390.4	0.0	S
16.978	7.0464	0.0000	20.027	0.23975	0.00000	311167.9	5409.6	0.0	S
17.000	7.0487	0.0000	20.029	0.23978	0.00000	311731.8	5428.7	0.0	S
17.022	7.0508	0.0000	20.031	0.23982	0.00000	312295.7	5447.9	0.0	S
17.044	7.0525	0.0000	20.033	0.23986	0.00000	312859.8	5467.1	0.0	S
17.067	7.0538	0.0000	20.035	0.23989	0.00000	313424.1	5486.3	0.0	S
17.089	7.0544	0.0000	20.037	0.23995	0.00000	313988.4	5505.5	0.0	S
17.111	7.0550	0.0000	20.039	0.24002	0.00000	314552.8	5524.7	0.0	S
17.133	7.0557	0.0000	20.041	0.24008	0.00000	315117.3	5543.9	0.0	S
17.156	7.0566	0.0000	20.043	0.24013	0.00000	315681.7	5563.1	0.0	S
17.178	7.0577	0.0000	20.045	0.24019	0.00000	316246.3	5582.3	0.0	S
17.200	7.0590	0.0000	20.047	0.24024	0.00000	316811.0	5601.5	0.0	S
17.222	7.0604	0.0000	20.049	0.24029	0.00000	317375.8	5620.8	0.0	S
17.244	7.0620	0.0000	20.051	0.24037	0.00000	317940.7	5640.0	0.0	S
17.267	7.0636	0.0000	20.054	0.24046	0.00000	318505.7	5659.2	0.0	S
17.289	7.0653	0.0000	20.056	0.24053	0.00000	319070.8	5678.5	0.0	S
17.311	7.0671	0.0000	20.058	0.24060	0.00000	319636.1	5697.7	0.0	S
17.333	7.0689	0.0000	20.060	0.24067	0.00000	320201.6	5717.0	0.0	S
17.356	7.0708	0.0000	20.062	0.24074	0.00000	320767.2	5736.2	0.0	S
17.378	7.0726	0.0000	20.064	0.24081	0.00000	321332.9	5755.5	0.0	S
17.400	7.0746	0.0000	20.066	0.24089	0.00000	321898.8	5774.7	0.0	S
17.422	7.0765	0.0000	20.068	0.24096	0.00000	322464.8	5794.0	0.0	S
17.444	7.0785	0.0000	20.070	0.24103	0.00000	323031.0	5813.3	0.0	S
17.467	7.0805	0.0000	20.072	0.24111	0.00000	323597.4	5832.6	0.0	S
17.489	7.0825	0.0000	20.074	0.24119	0.00000	324163.9	5851.9	0.0	S
17.511	7.0845	0.0000	20.076	0.24128	0.00000	324730.6	5871.2	0.0	S
17.533	7.0866	0.0000	20.078	0.24137	0.00000	325297.4	5890.5	0.0	S
17.556	7.0887	0.0000	20.080	0.24150	0.00000	325864.4	5909.8	0.0	S
17.578	7.0907	0.0000	20.082	0.24164	0.00000	326431.6	5929.1	0.0	S
17.600	7.0928	0.0000	20.084	0.24173	0.00000	326999.0	5948.5	0.0	S
17.622	7.0949	0.0000	20.086	0.24183	0.00000	327566.5	5967.8	0.0	S
17.644	7.0970	0.0000	20.088	0.24192	0.00000	328134.1	5987.1	0.0	S
17.667	7.0991	0.0000	20.090	0.24201	0.00000	328702.0	6006.5	0.0	S
17.689	7.1012	0.0000	20.092	0.24210	0.00000	329270.0	6025.9	0.0	S
17.711	7.1033	0.0000	20.094	0.24219	0.00000	329838.2	6045.2	0.0	S
17.733	7.1054	0.0000	20.096	0.24229	0.00000	330406.5	6064.6	0.0	S
17.756	7.1076	0.0000	20.098	0.24243	0.00000	330975.1	6084.0	0.0	S
17.778	7.1097	0.0000	20.100	0.24257	0.00000	331543.8	6103.4	0.0	S
17.800	7.1118	0.0000	20.102	0.24267	0.00000	332112.6	6122.8	0.0	S
17.822	7.1139	0.0000	20.104	0.24277	0.00000	332681.6	6142.2	0.0	S
17.844	7.1161	0.0000	20.106	0.24289	0.00000	333250.8	6161.7	0.0	S
17.867	7.1182	0.0000	20.108	0.24302	0.00000	333820.2	6181.1	0.0	S
17.889	7.1203	0.0000	20.110	0.24313	0.00000	334389.8	6200.5	0.0	S
17.911	7.1224	0.0000	20.112	0.24322	0.00000	334959.5	6220.0	0.0	S
17.933	7.1245	0.0000	20.114	0.24335	0.00000	335529.3	6239.5	0.0	S
17.956	7.1267	0.0000	20.116	0.24349	0.00000	336099.4	6258.9	0.0	S
17.978	7.1288	0.0000	20.118	0.24360	0.00000	336669.6	6278.4	0.0	S
18.000	7.1309	0.0000	20.120	0.24370	0.00000	337240.0	6297.9	0.0	S
18.022	7.1330	0.0000	20.122	0.24383	0.00000	337810.5	6317.4	0.0	S
18.044	7.1350	0.0000	20.125	0.24397	0.00000	338381.3	6336.9	0.0	S
18.067	7.1371	0.0000	20.127	0.24408	0.00000	338952.2	6356.4	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
18.089	7.1392	0.0000	20.129	0.24418	0.00000	339523.2	6376.0	0.0	S
18.111	7.1413	0.0000	20.131	0.24432	0.00000	340094.4	6395.5	0.0	S
18.133	7.1434	0.0000	20.133	0.24447	0.00000	340665.8	6415.1	0.0	S
18.156	7.1454	0.0000	20.135	0.24458	0.00000	341237.3	6434.6	0.0	S
18.178	7.1475	0.0000	20.137	0.24469	0.00000	341809.1	6454.2	0.0	S
18.200	7.1496	0.0000	20.139	0.24483	0.00000	342381.0	6473.8	0.0	S
18.222	7.1516	0.0000	20.141	0.24498	0.00000	342953.0	6493.4	0.0	S
18.244	7.1537	0.0000	20.143	0.24510	0.00000	343525.2	6513.0	0.0	S
18.267	7.1557	0.0000	20.145	0.24521	0.00000	344097.6	6532.6	0.0	S
18.289	7.1578	0.0000	20.147	0.24535	0.00000	344670.1	6552.2	0.0	S
18.311	7.1598	0.0000	20.149	0.24551	0.00000	345242.8	6571.8	0.0	S
18.333	7.1618	0.0000	20.151	0.24563	0.00000	345815.7	6591.5	0.0	S
18.356	7.1639	0.0000	20.153	0.24574	0.00000	346388.7	6611.1	0.0	S
18.378	7.1659	0.0000	20.155	0.24589	0.00000	346961.9	6630.8	0.0	S
18.400	7.1679	0.0000	20.157	0.24605	0.00000	347535.3	6650.5	0.0	S
18.422	7.1700	0.0000	20.159	0.24616	0.00000	348108.8	6670.2	0.0	S
18.444	7.1720	0.0000	20.161	0.24628	0.00000	348682.5	6689.9	0.0	S
18.467	7.1740	0.0000	20.163	0.24643	0.00000	349256.3	6709.6	0.0	S
18.489	7.1760	0.0000	20.165	0.24659	0.00000	349830.3	6729.3	0.0	S
18.511	7.1780	0.0000	20.167	0.24671	0.00000	350404.5	6749.0	0.0	S
18.533	7.1800	0.0000	20.169	0.24683	0.00000	350978.8	6768.8	0.0	S
18.556	7.1820	0.0000	20.171	0.24699	0.00000	351553.3	6788.5	0.0	S
18.578	7.1840	0.0000	20.173	0.24715	0.00000	352127.9	6808.3	0.0	S
18.600	7.1860	0.0000	20.175	0.24727	0.00000	352702.7	6828.1	0.0	S
18.622	7.1879	0.0000	20.178	0.24739	0.00000	353277.7	6847.9	0.0	S
18.644	7.1899	0.0000	20.180	0.24755	0.00000	353852.8	6867.7	0.0	S
18.667	7.1919	0.0000	20.182	0.24772	0.00000	354428.0	6887.5	0.0	S
18.689	7.1939	0.0000	20.184	0.24784	0.00000	355003.5	6907.3	0.0	S
18.711	7.1958	0.0000	20.186	0.24796	0.00000	355579.1	6927.1	0.0	S
18.733	7.1978	0.0000	20.188	0.24812	0.00000	356154.8	6947.0	0.0	S
18.756	7.1998	0.0000	20.190	0.24829	0.00000	356730.7	6966.8	0.0	S
18.778	7.2017	0.0000	20.192	0.24842	0.00000	357306.8	6986.7	0.0	S
18.800	7.2037	0.0000	20.194	0.24854	0.00000	357883.0	7006.6	0.0	S
18.822	7.2056	0.0000	20.196	0.24871	0.00000	358459.3	7026.5	0.0	S
18.844	7.2075	0.0000	20.198	0.24888	0.00000	359035.9	7046.4	0.0	S
18.867	7.2095	0.0000	20.200	0.24901	0.00000	359612.6	7066.3	0.0	S
18.889	7.2114	0.0000	20.202	0.24916	0.00000	360189.4	7086.2	0.0	S
18.911	7.2134	0.0000	20.204	0.24932	0.00000	360766.4	7106.1	0.0	S
18.933	7.2153	0.0000	20.206	0.24945	0.00000	361343.5	7126.1	0.0	S
18.956	7.2172	0.0000	20.208	0.24958	0.00000	361920.8	7146.1	0.0	S
18.978	7.2191	0.0000	20.210	0.24974	0.00000	362498.3	7166.0	0.0	S
19.000	7.2210	0.0000	20.212	0.24992	0.00000	363075.9	7186.0	0.0	S
19.022	7.2022	0.0000	20.214	0.25003	0.00000	363652.8	7206.0	0.0	S
19.044	7.1480	0.0000	20.216	0.25011	0.00000	364226.8	7226.0	0.0	S
19.067	7.0406	0.0000	20.218	0.25017	0.00000	364794.4	7246.0	0.0	S
19.089	6.8742	0.0000	20.220	0.25016	0.00000	365351.0	7266.0	0.0	S
19.111	6.6969	0.0000	20.222	0.25003	0.00000	365893.8	7286.1	0.0	S
19.133	6.5268	0.0000	20.224	0.24981	0.00000	366422.8	7306.0	0.0	S
19.156	6.3790	0.0000	20.226	0.24958	0.00000	366939.0	7326.0	0.0	S
19.178	6.2545	0.0000	20.228	0.24932	0.00000	367444.3	7346.0	0.0	S
19.200	6.1496	0.0000	20.229	0.24903	0.00000	367940.5	7365.9	0.0	S
19.222	6.0616	0.0000	20.231	0.24873	0.00000	368428.9	7385.8	0.0	S
19.244	5.9868	0.0000	20.233	0.24844	0.00000	368910.9	7405.7	0.0	S
19.267	5.9221	0.0000	20.235	0.24814	0.00000	369387.2	7425.6	0.0	S
19.289	5.8655	0.0000	20.236	0.24785	0.00000	369858.7	7445.4	0.0	S
19.311	5.8163	0.0000	20.238	0.24757	0.00000	370326.0	7465.2	0.0	S
19.333	5.7697	0.0000	20.239	0.24730	0.00000	370789.4	7485.0	0.0	S
19.356	5.7308	0.0000	20.241	0.24704	0.00000	371249.5	7504.8	0.0	S
19.378	5.6963	0.0000	20.243	0.24678	0.00000	371706.5	7524.5	0.0	S
19.400	5.6656	0.0000	20.244	0.24654	0.00000	372161.0	7544.3	0.0	S
19.422	5.6383	0.0000	20.246	0.24626	0.00000	372613.2	7564.0	0.0	S
19.444	5.6140	0.0000	20.247	0.24606	0.00000	373063.3	7583.7	0.0	S
19.467	5.5924	0.0000	20.249	0.24586	0.00000	373511.5	7603.4	0.0	S
19.489	5.5734	0.0000	20.251	0.24561	0.00000	373958.2	7623.0	0.0	S
19.511	5.5565	0.0000	20.252	0.24544	0.00000	374403.3	7642.7	0.0	S
19.533	5.5417	0.0000	20.254	0.24527	0.00000	374847.3	7662.3	0.0	S
19.556	5.5289	0.0000	20.255	0.24505	0.00000	375290.1	7681.9	0.0	S
19.578	5.5180	0.0000	20.257	0.24490	0.00000	375732.0	7701.5	0.0	S
19.600	5.5085	0.0000	20.258	0.24476	0.00000	376173.0	7721.1	0.0	S
19.622	5.5003	0.0000	20.260	0.24457	0.00000	376613.4	7740.7	0.0	S
19.644	5.4933	0.0000	20.261	0.24444	0.00000	377053.1	7760.2	0.0	S
19.667	5.4877	0.0000	20.263	0.24432	0.00000	377492.4	7779.8	0.0	S
19.689	5.4830	0.0000	20.264	0.24416	0.00000	377931.2	7799.3	0.0	S
19.711	5.4791	0.0000	20.266	0.24401	0.00000	378369.7	7818.8	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
19.733	5.4762	0.0000	20.268	0.24393	0.00000	378807.9	7838.4	0.0	S
19.756	5.4741	0.0000	20.269	0.24384	0.00000	379245.9	7857.9	0.0	S
19.778	5.4728	0.0000	20.271	0.24371	0.00000	379683.8	7877.4	0.0	S
19.800	5.4722	0.0000	20.272	0.24360	0.00000	380121.6	7896.9	0.0	S
19.822	5.4720	0.0000	20.274	0.24353	0.00000	380559.4	7916.3	0.0	S
19.844	5.4723	0.0000	20.275	0.24347	0.00000	380997.1	7935.8	0.0	S
19.867	5.4730	0.0000	20.277	0.24337	0.00000	381434.9	7955.3	0.0	S
19.889	5.4740	0.0000	20.278	0.24327	0.00000	381872.8	7974.8	0.0	S
19.911	5.4750	0.0000	20.280	0.24319	0.00000	382310.8	7994.2	0.0	S
19.933	5.4760	0.0000	20.281	0.24316	0.00000	382748.8	8013.7	0.0	S
19.956	5.4770	0.0000	20.283	0.24313	0.00000	383186.9	8033.1	0.0	S
19.978	5.4780	0.0000	20.284	0.24305	0.00000	383625.1	8052.6	0.0	S
20.000	5.4790	0.0000	20.286	0.24298	0.00000	384063.4	8072.0	0.0	S
20.022	5.4798	0.0000	20.287	0.24292	0.00000	384501.8	8091.5	0.0	S
20.044	5.4804	0.0000	20.289	0.24290	0.00000	384940.2	8110.9	0.0	S
20.067	5.4806	0.0000	20.290	0.24289	0.00000	385378.6	8130.3	0.0	S
20.089	5.4803	0.0000	20.292	0.24283	0.00000	385817.1	8149.7	0.0	S
20.111	5.4800	0.0000	20.294	0.24277	0.00000	386255.5	8169.2	0.0	S
20.133	5.4798	0.0000	20.295	0.24272	0.00000	386693.8	8188.6	0.0	S
20.156	5.4797	0.0000	20.297	0.24271	0.00000	387132.2	8208.0	0.0	S
20.178	5.4798	0.0000	20.298	0.24271	0.00000	387570.6	8227.4	0.0	S
20.200	5.4800	0.0000	20.300	0.24267	0.00000	388009.0	8246.8	0.0	S
20.222	5.4803	0.0000	20.301	0.24262	0.00000	388447.4	8266.3	0.0	S
20.244	5.4808	0.0000	20.303	0.24258	0.00000	388885.8	8285.7	0.0	S
20.267	5.4813	0.0000	20.304	0.24255	0.00000	389324.3	8305.1	0.0	S
20.289	5.4818	0.0000	20.306	0.24256	0.00000	389762.8	8324.5	0.0	S
20.311	5.4824	0.0000	20.307	0.24257	0.00000	390201.4	8343.9	0.0	S
20.333	5.4831	0.0000	20.309	0.24255	0.00000	390640.1	8363.3	0.0	S
20.356	5.4838	0.0000	20.310	0.24252	0.00000	391078.7	8382.7	0.0	S
20.378	5.4845	0.0000	20.312	0.24249	0.00000	391517.4	8402.1	0.0	S
20.400	5.4852	0.0000	20.313	0.24247	0.00000	391956.3	8421.5	0.0	S
20.422	5.4860	0.0000	20.315	0.24249	0.00000	392395.1	8440.9	0.0	S
20.444	5.4868	0.0000	20.316	0.24251	0.00000	392834.0	8460.3	0.0	S
20.467	5.4876	0.0000	20.318	0.24250	0.00000	393273.0	8479.7	0.0	S
20.489	5.4884	0.0000	20.320	0.24248	0.00000	393712.0	8499.1	0.0	S
20.511	5.4893	0.0000	20.321	0.24246	0.00000	394151.1	8518.5	0.0	S
20.533	5.4901	0.0000	20.323	0.24245	0.00000	394590.3	8537.9	0.0	S
20.556	5.4910	0.0000	20.324	0.24248	0.00000	395029.5	8557.3	0.0	S
20.578	5.4918	0.0000	20.326	0.24251	0.00000	395468.8	8576.7	0.0	S
20.600	5.4927	0.0000	20.327	0.24251	0.00000	395908.2	8596.1	0.0	S
20.622	5.4936	0.0000	20.329	0.24250	0.00000	396347.7	8615.5	0.0	S
20.644	5.4945	0.0000	20.330	0.24250	0.00000	396787.2	8634.9	0.0	S
20.667	5.4954	0.0000	20.332	0.24249	0.00000	397226.8	8654.3	0.0	S
20.689	5.4964	0.0000	20.333	0.24249	0.00000	397666.5	8673.7	0.0	S
20.711	5.4973	0.0000	20.335	0.24253	0.00000	398106.2	8693.1	0.0	S
20.733	5.4982	0.0000	20.336	0.24257	0.00000	398546.1	8712.5	0.0	S
20.756	5.4991	0.0000	20.338	0.24258	0.00000	398985.9	8731.9	0.0	S
20.778	5.5001	0.0000	20.339	0.24259	0.00000	399425.9	8751.3	0.0	S
20.800	5.5010	0.0000	20.341	0.24259	0.00000	399866.0	8770.7	0.0	S
20.822	5.5020	0.0000	20.342	0.24260	0.00000	400306.1	8790.1	0.0	S
20.844	5.5029	0.0000	20.344	0.24260	0.00000	400746.3	8809.5	0.0	S
20.867	5.5038	0.0000	20.346	0.24265	0.00000	401186.5	8828.9	0.0	S
20.889	5.5048	0.0000	20.347	0.24270	0.00000	401626.9	8848.3	0.0	S
20.911	5.5057	0.0000	20.349	0.24271	0.00000	402067.3	8867.7	0.0	S
20.933	5.5067	0.0000	20.350	0.24273	0.00000	402507.8	8887.2	0.0	S
20.956	5.5076	0.0000	20.352	0.24275	0.00000	402948.4	8906.6	0.0	S
20.978	5.5085	0.0000	20.353	0.24276	0.00000	403389.0	8926.0	0.0	S
21.000	5.5095	0.0000	20.355	0.24277	0.00000	403829.8	8945.4	0.0	S
21.022	5.4884	0.0000	20.356	0.24280	0.00000	404269.7	8964.8	0.0	S
21.044	5.4306	0.0000	20.358	0.24279	0.00000	404706.4	8984.3	0.0	S
21.067	5.3176	0.0000	20.359	0.24269	0.00000	405136.3	9003.7	0.0	S
21.089	5.1441	0.0000	20.361	0.24252	0.00000	405554.8	9023.1	0.0	S
21.111	4.9613	0.0000	20.362	0.24227	0.00000	405959.0	9042.5	0.0	S
21.133	4.7866	0.0000	20.363	0.24195	0.00000	406348.9	9061.9	0.0	S
21.156	4.6353	0.0000	20.365	0.24157	0.00000	406725.8	9081.2	0.0	S
21.178	4.5078	0.0000	20.366	0.24117	0.00000	407091.5	9100.5	0.0	S
21.200	4.4003	0.0000	20.367	0.24076	0.00000	407447.9	9119.8	0.0	S
21.222	4.3101	0.0000	20.368	0.24033	0.00000	407796.3	9139.0	0.0	S
21.244	4.2332	0.0000	20.370	0.23991	0.00000	408138.0	9158.3	0.0	S
21.267	4.1665	0.0000	20.371	0.23949	0.00000	408474.0	9177.4	0.0	S
21.289	4.1082	0.0000	20.372	0.23907	0.00000	408805.0	9196.6	0.0	S
21.311	4.0573	0.0000	20.373	0.23867	0.00000	409131.6	9215.7	0.0	S
21.333	4.0090	0.0000	20.374	0.23827	0.00000	409454.3	9234.8	0.0	S
21.356	3.9687	0.0000	20.375	0.23788	0.00000	409773.4	9253.8	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
21.378	3.9328	0.0000	20.376	0.23750	0.00000	410089.4	9272.8	0.0	S
21.400	3.9008	0.0000	20.377	0.23713	0.00000	410402.8	9291.8	0.0	S
21.422	3.8723	0.0000	20.378	0.23677	0.00000	410713.7	9310.8	0.0	S
21.444	3.8469	0.0000	20.379	0.23640	0.00000	411022.5	9329.7	0.0	S
21.467	3.8242	0.0000	20.381	0.23606	0.00000	411329.3	9348.6	0.0	S
21.489	3.8041	0.0000	20.382	0.23573	0.00000	411634.4	9367.5	0.0	S
21.511	3.7861	0.0000	20.383	0.23541	0.00000	411938.0	9386.3	0.0	S
21.533	3.7704	0.0000	20.384	0.23510	0.00000	412240.3	9405.1	0.0	S
21.556	3.7567	0.0000	20.385	0.23481	0.00000	412541.4	9423.9	0.0	S
21.578	3.7450	0.0000	20.386	0.23452	0.00000	412841.5	9442.7	0.0	S
21.600	3.7346	0.0000	20.387	0.23424	0.00000	413140.7	9461.4	0.0	S
21.622	3.7256	0.0000	20.388	0.23397	0.00000	413439.1	9480.2	0.0	S
21.644	3.7179	0.0000	20.389	0.23371	0.00000	413736.8	9498.9	0.0	S
21.667	3.7115	0.0000	20.390	0.23345	0.00000	414034.0	9517.6	0.0	S
21.689	3.7061	0.0000	20.391	0.23321	0.00000	414330.7	9536.2	0.0	S
21.711	3.7015	0.0000	20.392	0.23297	0.00000	414627.0	9554.9	0.0	S
21.733	3.6979	0.0000	20.393	0.23274	0.00000	414923.0	9573.5	0.0	S
21.756	3.6952	0.0000	20.394	0.23251	0.00000	415218.7	9592.1	0.0	S
21.778	3.6932	0.0000	20.395	0.23230	0.00000	415514.2	9610.7	0.0	S
21.800	3.6919	0.0000	20.396	0.23209	0.00000	415809.6	9629.3	0.0	S
21.822	3.6911	0.0000	20.397	0.23189	0.00000	416104.9	9647.8	0.0	S
21.844	3.6908	0.0000	20.398	0.23169	0.00000	416400.2	9666.4	0.0	S
21.867	3.6908	0.0000	20.399	0.23150	0.00000	416695.5	9684.9	0.0	S
21.889	3.6912	0.0000	20.400	0.23131	0.00000	416990.8	9703.4	0.0	S
21.911	3.6916	0.0000	20.401	0.23113	0.00000	417286.1	9721.9	0.0	S
21.933	3.6920	0.0000	20.402	0.23096	0.00000	417581.4	9740.4	0.0	S
21.956	3.6924	0.0000	20.403	0.23079	0.00000	417876.8	9758.9	0.0	S
21.978	3.6928	0.0000	20.404	0.23062	0.00000	418172.2	9777.3	0.0	S
22.000	3.6932	0.0000	20.405	0.23046	0.00000	418467.7	9795.8	0.0	S
22.022	3.6723	0.0000	20.406	0.23028	0.00000	418762.3	9814.2	0.0	S
22.044	3.6151	0.0000	20.407	0.23008	0.00000	419053.8	9832.6	0.0	S
22.067	3.5034	0.0000	20.408	0.22981	0.00000	419338.5	9851.0	0.0	S
22.089	3.3311	0.0000	20.409	0.22947	0.00000	419611.9	9869.4	0.0	S
22.111	3.1477	0.0000	20.410	0.22907	0.00000	419871.0	9887.7	0.0	S
22.133	2.9718	0.0000	20.410	0.22860	0.00000	420115.8	9906.0	0.0	S
22.156	2.8188	0.0000	20.411	0.22807	0.00000	420347.4	9924.3	0.0	S
22.178	2.6898	0.0000	20.412	0.22750	0.00000	420567.8	9942.5	0.0	S
22.200	2.5809	0.0000	20.413	0.22692	0.00000	420778.6	9960.7	0.0	S
22.222	2.4894	0.0000	20.413	0.22633	0.00000	420981.4	9978.8	0.0	S
22.244	2.4114	0.0000	20.414	0.22574	0.00000	421177.5	9996.9	0.0	S
22.267	2.3439	0.0000	20.415	0.22515	0.00000	421367.7	10015.0	0.0	S
22.289	2.2847	0.0000	20.415	0.22458	0.00000	421552.8	10032.9	0.0	S
22.311	2.2330	0.0000	20.416	0.22401	0.00000	421733.5	10050.9	0.0	S
22.333	2.1841	0.0000	20.416	0.22346	0.00000	421910.2	10068.8	0.0	S
22.356	2.1431	0.0000	20.417	0.22291	0.00000	422083.3	10086.6	0.0	S
22.378	2.1067	0.0000	20.417	0.22238	0.00000	422253.3	10104.5	0.0	S
22.400	2.0741	0.0000	20.418	0.22186	0.00000	422420.5	10122.2	0.0	S
22.422	2.0450	0.0000	20.419	0.22135	0.00000	422585.3	10139.9	0.0	S
22.444	2.0191	0.0000	20.419	0.22085	0.00000	422747.8	10157.6	0.0	S
22.467	1.9959	0.0000	20.420	0.22036	0.00000	422908.4	10175.3	0.0	S
22.489	1.9753	0.0000	20.420	0.21989	0.00000	423067.3	10192.9	0.0	S
22.511	1.9570	0.0000	20.421	0.21943	0.00000	423224.6	10210.5	0.0	S
22.533	1.9408	0.0000	20.421	0.21896	0.00000	423380.5	10228.0	0.0	S
22.556	1.9267	0.0000	20.422	0.21852	0.00000	423535.2	10245.5	0.0	S
22.578	1.9146	0.0000	20.422	0.21809	0.00000	423688.9	10263.0	0.0	S
22.600	1.9038	0.0000	20.423	0.21766	0.00000	423841.6	10280.4	0.0	S
22.622	1.8944	0.0000	20.423	0.21725	0.00000	423993.5	10297.8	0.0	S
22.644	1.8863	0.0000	20.424	0.21685	0.00000	424144.8	10315.2	0.0	S
22.667	1.8796	0.0000	20.424	0.21645	0.00000	424295.4	10332.5	0.0	S
22.689	1.8737	0.0000	20.424	0.21607	0.00000	424445.5	10349.8	0.0	S
22.711	1.8688	0.0000	20.425	0.21570	0.00000	424595.2	10367.1	0.0	S
22.733	1.8649	0.0000	20.425	0.21533	0.00000	424744.6	10384.3	0.0	S
22.756	1.8618	0.0000	20.426	0.21497	0.00000	424893.6	10401.5	0.0	S
22.778	1.8595	0.0000	20.426	0.21462	0.00000	425042.5	10418.7	0.0	S
22.800	1.8579	0.0000	20.427	0.21428	0.00000	425191.2	10435.9	0.0	S
22.822	1.8568	0.0000	20.427	0.21394	0.00000	425339.8	10453.0	0.0	S
22.844	1.8561	0.0000	20.428	0.21362	0.00000	425488.3	10470.1	0.0	S
22.867	1.8558	0.0000	20.428	0.21330	0.00000	425636.8	10487.2	0.0	S
22.889	1.8559	0.0000	20.429	0.21298	0.00000	425785.2	10504.2	0.0	S
22.911	1.8560	0.0000	20.429	0.21267	0.00000	425933.7	10521.2	0.0	S
22.933	1.8561	0.0000	20.430	0.21237	0.00000	426082.2	10538.2	0.0	S
22.956	1.8562	0.0000	20.430	0.21207	0.00000	426230.7	10555.2	0.0	S
22.978	1.8563	0.0000	20.431	0.21178	0.00000	426379.2	10572.2	0.0	S
23.000	1.8564	0.0000	20.431	0.21149	0.00000	426527.7	10589.1	0.0	S

Detailed Results (cont.d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
23.022	1.8564	0.0000	20.432	0.21121	0.00000	426676.2	10606.0	0.0	S
23.044	1.8564	0.0000	20.432	0.21093	0.00000	426824.7	10622.9	0.0	S
23.067	1.8562	0.0000	20.433	0.21066	0.00000	426973.2	10639.8	0.0	S
23.089	1.8559	0.0000	20.433	0.21039	0.00000	427121.7	10656.6	0.0	S
23.111	1.8555	0.0000	20.434	0.21012	0.00000	427270.2	10673.4	0.0	S
23.133	1.8552	0.0000	20.434	0.20986	0.00000	427418.6	10690.2	0.0	S
23.156	1.8549	0.0000	20.434	0.20960	0.00000	427567.0	10707.0	0.0	S
23.178	1.8547	0.0000	20.435	0.20934	0.00000	427715.4	10723.8	0.0	S
23.200	1.8546	0.0000	20.435	0.20909	0.00000	427863.8	10740.5	0.0	S
23.222	1.8544	0.0000	20.436	0.20884	0.00000	428012.1	10757.2	0.0	S
23.244	1.8544	0.0000	20.436	0.20859	0.00000	428160.5	10773.9	0.0	S
23.267	1.8543	0.0000	20.437	0.20835	0.00000	428308.8	10790.6	0.0	S
23.289	1.8542	0.0000	20.437	0.20810	0.00000	428457.2	10807.2	0.0	S
23.311	1.8542	0.0000	20.438	0.20787	0.00000	428605.5	10823.9	0.0	S
23.333	1.8542	0.0000	20.438	0.20763	0.00000	428753.8	10840.5	0.0	S
23.356	1.8542	0.0000	20.439	0.20740	0.00000	428902.2	10857.1	0.0	S
23.378	1.8542	0.0000	20.439	0.20717	0.00000	429050.5	10873.7	0.0	S
23.400	1.8542	0.0000	20.440	0.20694	0.00000	429198.8	10890.2	0.0	S
23.422	1.8542	0.0000	20.440	0.20672	0.00000	429347.2	10906.8	0.0	S
23.444	1.8543	0.0000	20.441	0.20650	0.00000	429495.5	10923.3	0.0	S
23.467	1.8543	0.0000	20.441	0.20628	0.00000	429643.9	10939.8	0.0	S
23.489	1.8544	0.0000	20.442	0.20606	0.00000	429792.2	10956.3	0.0	S
23.511	1.8544	0.0000	20.442	0.20584	0.00000	429940.6	10972.8	0.0	S
23.533	1.8545	0.0000	20.443	0.20563	0.00000	430088.9	10989.3	0.0	S
23.556	1.8545	0.0000	20.443	0.20542	0.00000	430237.3	11005.7	0.0	S
23.578	1.8546	0.0000	20.444	0.20521	0.00000	430385.7	11022.1	0.0	S
23.600	1.8547	0.0000	20.444	0.20500	0.00000	430534.0	11038.5	0.0	S
23.622	1.8547	0.0000	20.445	0.20480	0.00000	430682.4	11054.9	0.0	S
23.644	1.8548	0.0000	20.445	0.20460	0.00000	430830.8	11071.3	0.0	S
23.667	1.8549	0.0000	20.445	0.20440	0.00000	430979.2	11087.7	0.0	S
23.689	1.8550	0.0000	20.446	0.20420	0.00000	431127.6	11104.0	0.0	S
23.711	1.8551	0.0000	20.446	0.20400	0.00000	431276.0	11120.3	0.0	S
23.733	1.8551	0.0000	20.447	0.20381	0.00000	431424.4	11136.6	0.0	S
23.756	1.8552	0.0000	20.447	0.20362	0.00000	431572.8	11152.9	0.0	S
23.778	1.8553	0.0000	20.448	0.20342	0.00000	431721.2	11169.2	0.0	S
23.800	1.8554	0.0000	20.448	0.20323	0.00000	431869.7	11185.5	0.0	S
23.822	1.8555	0.0000	20.449	0.20305	0.00000	432018.1	11201.7	0.0	S
23.844	1.8556	0.0000	20.449	0.20286	0.00000	432166.5	11218.0	0.0	S
23.867	1.8557	0.0000	20.450	0.20268	0.00000	432315.0	11234.2	0.0	S
23.889	1.8558	0.0000	20.450	0.20249	0.00000	432463.4	11250.4	0.0	S
23.911	1.8559	0.0000	20.451	0.20231	0.00000	432611.9	11266.6	0.0	S
23.933	1.8560	0.0000	20.451	0.20213	0.00000	432760.4	11282.8	0.0	S
23.956	1.8561	0.0000	20.452	0.20196	0.00000	432908.9	11298.9	0.0	S
23.978	1.8562	0.0000	20.452	0.20178	0.00000	433057.3	11315.1	0.0	S
24.000	1.8563	0.0000	20.453	0.20160	0.00000	433205.8	11331.2	0.0	S
24.022	1.8341	0.0000	20.453	0.20141	0.00000	433353.5	11347.3	0.0	S
24.044	1.7749	0.0000	20.454	0.20118	0.00000	433497.8	11363.5	0.0	S
24.067	1.6601	0.0000	20.454	0.20090	0.00000	433635.2	11379.5	0.0	S
24.089	1.4841	0.0000	20.454	0.20053	0.00000	433761.0	11395.6	0.0	S
24.111	1.2988	0.0000	20.455	0.20008	0.00000	433872.3	11411.6	0.0	S
24.133	1.1217	0.0000	20.455	0.19957	0.00000	433969.1	11427.6	0.0	S
24.156	0.9683	0.0000	20.455	0.19900	0.00000	434052.7	11443.6	0.0	S
24.178	0.8389	0.0000	20.456	0.19840	0.00000	434125.0	11459.4	0.0	S
24.200	0.7298	0.0000	20.456	0.19778	0.00000	434187.8	11475.3	0.0	S
24.222	0.6381	0.0000	20.456	0.19716	0.00000	434242.5	11491.1	0.0	S
24.244	0.5599	0.0000	20.456	0.19653	0.00000	434290.4	11506.8	0.0	S
24.267	0.4921	0.0000	20.456	0.19591	0.00000	434332.5	11522.5	0.0	S
24.289	0.4326	0.0000	20.456	0.19530	0.00000	434369.5	11538.2	0.0	S
24.311	0.3808	0.0000	20.456	0.19470	0.00000	434402.0	11553.8	0.0	S
24.333	0.3315	0.0000	20.456	0.19410	0.00000	434430.5	11569.3	0.0	S
24.356	0.2903	0.0000	20.456	0.19352	0.00000	434455.4	11584.8	0.0	S
24.378	0.2537	0.0000	20.456	0.19294	0.00000	434477.1	11600.3	0.0	S
24.400	0.2209	0.0000	20.456	0.19238	0.00000	434496.1	11615.7	0.0	S
24.422	0.1916	0.0000	20.456	0.19183	0.00000	434512.6	11631.1	0.0	S
24.444	0.1655	0.0000	20.456	0.19128	0.00000	434526.9	11646.4	0.0	S
24.467	0.1421	0.0000	20.456	0.19075	0.00000	434539.2	11661.7	0.0	S
24.489	0.1214	0.0000	20.456	0.19024	0.00000	434549.8	11676.9	0.0	S
24.511	0.1028	0.0000	20.456	0.18973	0.00000	434558.7	11692.1	0.0	S
24.533	0.0865	0.0000	20.456	0.18923	0.00000	434566.3	11707.3	0.0	S
24.556	0.0723	0.0000	20.456	0.18874	0.00000	434572.6	11722.4	0.0	S
24.578	0.0600	0.0000	20.456	0.18826	0.00000	434577.9	11737.5	0.0	S
24.600	0.0492	0.0000	20.456	0.18779	0.00000	434582.3	11752.5	0.0	S
24.622	0.0396	0.0000	20.456	0.18733	0.00000	434585.8	11767.5	0.0	S
24.644	0.0314	0.0000	20.456	0.18688	0.00000	434588.7	11782.5	0.0	S

Detailed Results (cont,d.) :: *Scenario 3 :: FDOT 24 Hour (x1)*

Elapsed Time (hours)	Inflow Rate (ft^3/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft^3/s)	Overflow Discharge (ft^3/s)	Cumulative Inflow Volume (ft^3)	Cumulative Infiltration Volume (ft^3)	Cumulative Discharge Volume (ft^3)	Flow Type
24.667	0.0246	0.0000	20.456	0.18644	0.00000	434590.9	11797.4	0.0	S
24.689	0.0186	0.0000	20.456	0.18600	0.00000	434592.7	11812.3	0.0	S
24.711	0.0136	0.0000	20.456	0.18558	0.00000	434593.9	11827.2	0.0	S
24.733	0.0095	0.0000	20.456	0.18516	0.00000	434594.9	11842.0	0.0	S
24.756	0.0064	0.0000	20.456	0.18475	0.00000	434595.5	11856.8	0.0	S
24.778	0.0040	0.0000	20.456	0.18435	0.00000	434595.9	11871.6	0.0	S
24.800	0.0023	0.0000	20.456	0.18396	0.00000	434596.2	11886.3	0.0	S
24.822	0.0011	0.0000	20.456	0.18357	0.00000	434596.3	11901.0	0.0	S
24.844	0.0004	0.0000	20.456	0.18319	0.00000	434596.4	11915.7	0.0	S
24.867	0.0000	0.0000	20.456	0.18281	0.00000	434596.4	11930.3	0.0	S
24.889	0.0000	0.0000	20.455	0.18245	0.00000	434596.4	11944.9	0.0	S
24.911	0.0000	0.0000	20.455	0.18206	0.00000	434596.4	11959.5	0.0	S
27.311	0.0000	0.0000	20.450	0.15142	0.00000	434596.4	13339.7	0.0	S
30.911	0.0000	0.0000	20.444	0.13110	0.00000	434596.4	15140.4	0.0	S
36.911	0.0000	0.0000	20.435	0.11050	0.00000	434596.4	17689.9	0.0	S
48.911	0.0000	0.0000	20.420	0.08836	0.00000	434596.4	21812.0	0.0	S
60.911	0.0000	0.0000	20.407	0.07645	0.00000	434596.4	25324.1	0.0	S
72.911	0.0000	0.0000	20.396	0.06805	0.00000	434596.4	28417.5	0.0	S
84.911	0.0000	0.0000	20.386	0.06177	0.00000	434596.4	31203.9	0.0	S
96.911	0.0000	0.0000	20.376	0.05685	0.00000	434596.4	33754.1	0.0	S
108.911	0.0000	0.0000	20.368	0.05288	0.00000	434596.4	36116.0	0.0	S
120.911	0.0000	0.0000	20.360	0.04999	0.00000	434596.4	38323.3	0.0	S
312.911	0.0000	0.0000	20.278	0.03058	0.00000	434596.4	60652.5	0.0	S
336.911	0.0000	0.0000	20.269	0.02955	0.00000	434596.4	63276.2	0.0	S
360.911	0.0000	0.0000	20.260	----	----	434596.4	65758.9	0.0	N.A.

Summary of Results :: *Scenario 3 :: FDOT 24 Hour (x1)*

	Time (hours)	Stage (ft datum)	Rate (ft^3/s)	Volume (ft^3)
Stage				
Minimum	0.000	18.85		
Maximum	24.422	20.46		
Inflow				
Rate - Maximum - Positive	12.000		14.7044	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	24.844			434596.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	360.911			434596.4
Infiltration				
Rate - Maximum - Positive	19.067		0.2502	
Rate - Maximum - Negative	0.022		-1.5685	
Cumulative Volume - Maximum Positive	360.911			65758.9
Cumulative Volume - Maximum Negative	0.022			-251.1
Cumulative Volume - End of Simulation	360.911			65758.9
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	360.911			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.
72 Hour Stage and Infiltration Volume	N.A.	N.A.		N.A.

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Project Data

Project Name:	Rhode Island Ave (Pond B)
Simulation Description:	
Project Number:	02-0309.000
Engineer :	Gene McCLendon
Supervising Engineer:	
Date:	05-22-2006

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	22.50
Water Table Elevation, [WT] (ft datum):	32.60
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	26.20
Fillable Porosity, [n] (%):	25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	13.1
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	64085.0

Geometry Data

Equivalent Pond Length, [L] (ft):	585.0
Equivalent Pond Width, [W] (ft):	108.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
36.00	46586.0
37.00	51746.0
38.00	57005.0
39.00	62366.0
40.00	73388.0
41.00	84812.0

Detailed Results :: *Scenario 1 :: 17637 ft³ slug load*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	2939.5000	0.0000	32.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	2939.5000	0.0000	36.370	7.05848	0.00000	17637.0	42.4	0.0	U/P
2.400	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
6.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
12.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
24.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
36.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
48.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
60.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
72.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
84.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry
96.000	0.0000	0.0000	----	----	----	17637.0	17637.0	0.0	dry

Summary of Results :: *Scenario 1 :: 17637 ft³ slug load*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	32.60		
Maximum	0.002	36.37		
Inflow				
Rate - Maximum - Positive	0.002		2939.5000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			17637.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			17637.0
Infiltration				
Rate - Maximum - Positive	0.002		7.0585	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			42.4
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			17637.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	0.00		17637.0
72 Hour Stage and Infiltration Volume	72.000	0.00		17637.0

Detailed Results :: *Scenario 2 :: 173812 ft³ slug load*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	28968.6700	0.0000	32.600	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	28968.6700	0.0000	39.167	7.06518	0.00000	173812.0	42.4	0.0	U/P
2.400	0.0000	0.0000	37.768	6.20892	0.00000	173812.0	83362.3	0.0	U/S
6.000	0.0000	0.0000	37.523	0.88970	0.00000	173812.0	96884.8	0.0	S
12.000	0.0000	0.0000	37.268	0.55497	0.00000	173812.0	110568.9	0.0	S
24.000	0.0000	0.0000	36.940	0.34435	0.00000	173812.0	127756.7	0.0	S
36.000	0.0000	0.0000	36.692	0.26033	0.00000	173812.0	140320.9	0.0	S
48.000	0.0000	0.0000	36.492	0.21000	0.00000	173812.0	150249.6	0.0	S
60.000	0.0000	0.0000	36.324	0.17616	0.00000	173812.0	158464.9	0.0	S
72.000	0.0000	0.0000	36.177	0.15168	0.00000	173812.0	165469.9	0.0	S
84.000	0.0000	0.0000	36.048	0.09655	0.00000	173812.0	171570.2	0.0	S
96.000	0.0000	0.0000	35.850	0.04884	0.00000	173812.0	173812.0	0.0	S
288.000	0.0000	0.0000	34.599	0.00000	0.00000	173812.0	173812.0	0.0	S
312.000	0.0000	0.0000	34.471	0.00000	0.00000	173812.0	173812.0	0.0	S
336.000	0.0000	0.0000	34.364	----	----	173812.0	173812.0	0.0	N.A.

Summary of Results :: *Scenario 2 :: 173812 ft³ slug load*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	32.60		
Maximum	0.002	39.17		
Inflow				
Rate - Maximum - Positive	0.002		28968.6700	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			173812.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	336.000			173812.0
Infiltration				
Rate - Maximum - Positive	0.002		7.0652	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	96.000			173812.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	336.000			173812.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	336.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	36.69		140320.9
72 Hour Stage and Infiltration Volume	72.000	36.18		165469.9

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Project Data

Project Name:	Rhode Island Ave (Pond C)
Simulation Description:	
Project Number:	02-0309.000
Engineer :	Gene McCLendon
Supervising Engineer:	
Date:	01-19-2006

Aquifer Data

Base Of Aquifer Elevation, [B] (ft datum):	48.50
Water Table Elevation, [WT] (ft datum):	58.00
Horizontal Saturated Hydraulic Conductivity, [Kh] (ft/day):	27.60
Fillable Porosity, [n] (%):	25.00
Unsaturated Vertical Infiltration Rate, [Iv] (ft/day):	13.8
Maximum Area For Unsaturated Infiltration, [Av] (ft^2):	30343.0

Geometry Data

Equivalent Pond Length, [L] (ft):	674.0
Equivalent Pond Width, [W] (ft):	45.0

Ground water mound is expected to intersect the pond bottom

Stage vs Area Data

Stage (ft datum)	Area (ft^2)
65.00	6129.0
66.00	11145.0
67.00	16261.0
68.00	21478.0
69.00	26796.0
70.00	32214.0
71.00	46199.0

Detailed Results :: *Scenario 1 :: 7900 ft³ slug load*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	1316.6670	0.0000	58.000	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	1316.6670	0.0000	65.932	0.97826	0.00000	7900.0	5.9	0.0	U/P
2.400	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
6.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
12.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
24.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
36.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
48.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
60.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
72.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
84.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry
96.000	0.0000	0.0000	----	----	----	7900.0	7900.0	0.0	dry

Summary of Results :: *Scenario 1 :: 7900 ft³ slug load*

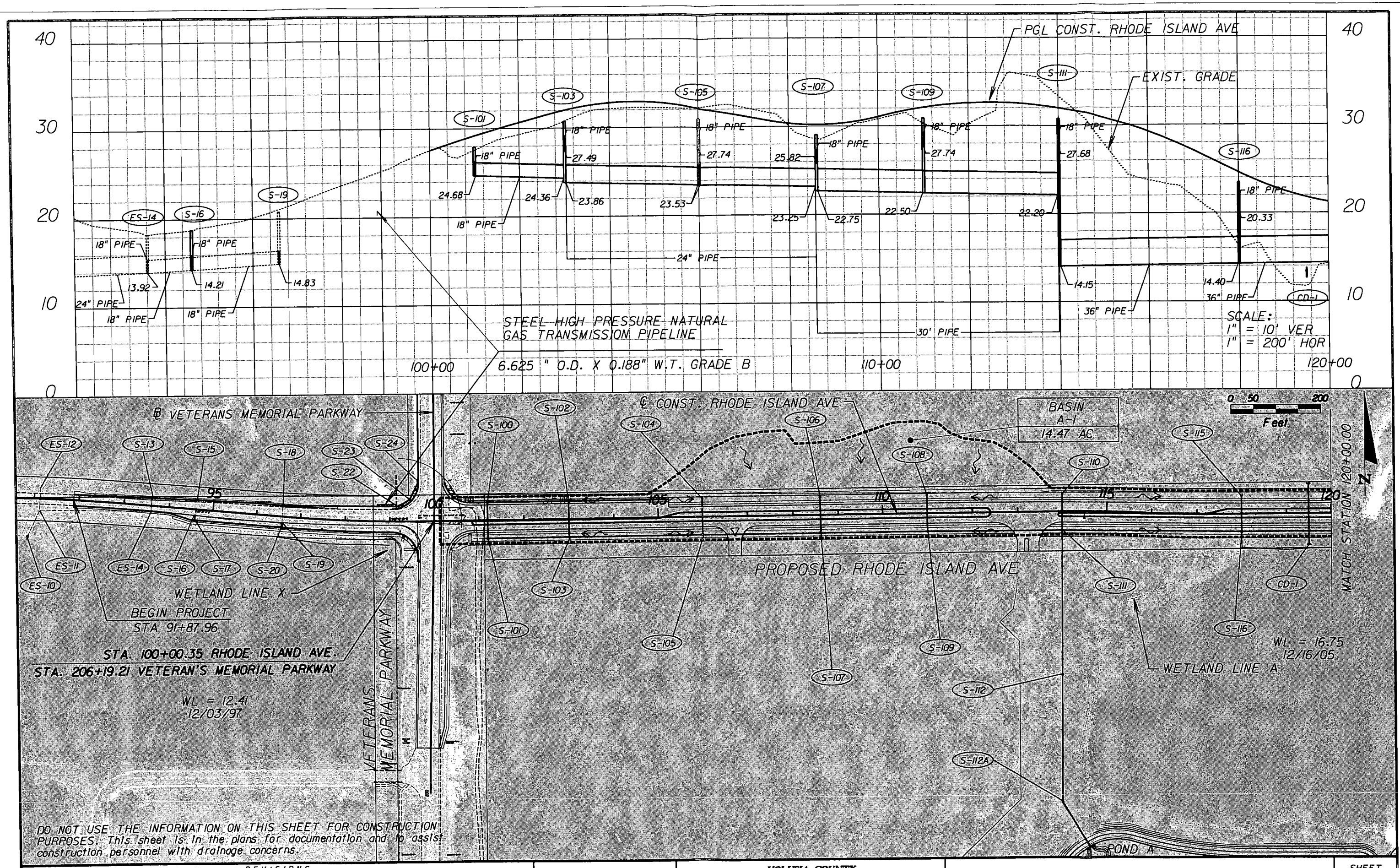
	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	58.00		
Maximum	0.002	65.93		
Inflow				
Rate - Maximum - Positive	0.002		1316.6670	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			7900.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			7900.0
Infiltration				
Rate - Maximum - Positive	0.002		0.9783	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			5.9
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			7900.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	96.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	0.00		7900.0
72 Hour Stage and Infiltration Volume	72.000	0.00		7900.0

Detailed Results :: *Scenario 2 :: 81312 ft³ slug load*

Elapsed Time (hours)	Inflow Rate (ft³/s)	Outside Recharge (ft/day)	Stage Elevation (ft datum)	Infiltration Rate (ft³/s)	Overflow Discharge (ft³/s)	Cumulative Inflow Volume (ft³)	Cumulative Infiltration Volume (ft³)	Cumulative Discharge Volume (ft³)	Flow Type
0.000	13552.0000	0.0000	58.000	0.00000	0.00000	0.0	0.0	0.0	N.A.
0.002	13552.0000	0.0000	69.564	0.98117	0.00000	81312.0	5.9	0.0	U/P
2.400	0.0000	0.0000	68.176	3.90904	0.00000	81312.0	36235.0	0.0	U/P
6.000	0.0000	0.0000	63.177	2.17385	0.00000	81312.0	81312.0	0.0	U/S
12.000	0.0000	0.0000	61.808	0.00000	0.00000	81312.0	81312.0	0.0	S
24.000	0.0000	0.0000	60.827	0.00000	0.00000	81312.0	81312.0	0.0	S
36.000	0.0000	0.0000	60.315	0.00000	0.00000	81312.0	81312.0	0.0	S
48.000	0.0000	0.0000	59.993	0.00000	0.00000	81312.0	81312.0	0.0	S
60.000	0.0000	0.0000	59.768	0.00000	0.00000	81312.0	81312.0	0.0	S
72.000	0.0000	0.0000	59.600	0.00000	0.00000	81312.0	81312.0	0.0	S
84.000	0.0000	0.0000	59.469	0.00000	0.00000	81312.0	81312.0	0.0	S
96.000	0.0000	0.0000	59.363	0.00000	0.00000	81312.0	81312.0	0.0	S
288.000	0.0000	0.0000	58.825	0.00000	0.00000	81312.0	81312.0	0.0	S
312.000	0.0000	0.0000	58.770	0.00000	0.00000	81312.0	81312.0	0.0	S
336.000	0.0000	0.0000	58.724	----	----	81312.0	81312.0	0.0	N.A.

Summary of Results :: *Scenario 2 :: 81312 ft³ slug load*

	Time (hours)	Stage (ft datum)	Rate (ft³/s)	Volume (ft³)
Stage				
Minimum	0.000	58.00		
Maximum	0.002	69.56		
Inflow				
Rate - Maximum - Positive	0.002		13552.0000	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	0.002			81312.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	336.000			81312.0
Infiltration				
Rate - Maximum - Positive	2.400		3.9090	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	6.000			81312.0
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	336.000			81312.0
Combined Discharge				
Rate - Maximum - Positive	None		None	
Rate - Maximum - Negative	None		None	
Cumulative Volume - Maximum Positive	None			None
Cumulative Volume - Maximum Negative	None			None
Cumulative Volume - End of Simulation	336.000			0.0
Discharge Structure 1 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 2 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Discharge Structure 3 - inactive				
Rate - Maximum - Positive	disabled		disabled	
Rate - Maximum - Negative	disabled		disabled	
Cumulative Volume - Maximum Positive	disabled			disabled
Cumulative Volume - Maximum Negative	disabled			disabled
Cumulative Volume - End of Simulation	disabled			disabled
Pollution Abatement:				
36 Hour Stage and Infiltration Volume	36.000	60.31		81312.0
72 Hour Stage and Infiltration Volume	72.000	59.60		81312.0



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.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRMP
ENGINEERS · SURVEYORS · PLANNERS · SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
1505 E. COLONIAL DRIVE, ORLANDO, FLORIDA 32803
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
KEN KNIEL, P.E. P.E. NO. 37300

VOLUSIA COUNTY PUBLIC WORKS SERVICES		
ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

DRAINAGE MAP
RHODE ISLAND AVE

SHEET NO.

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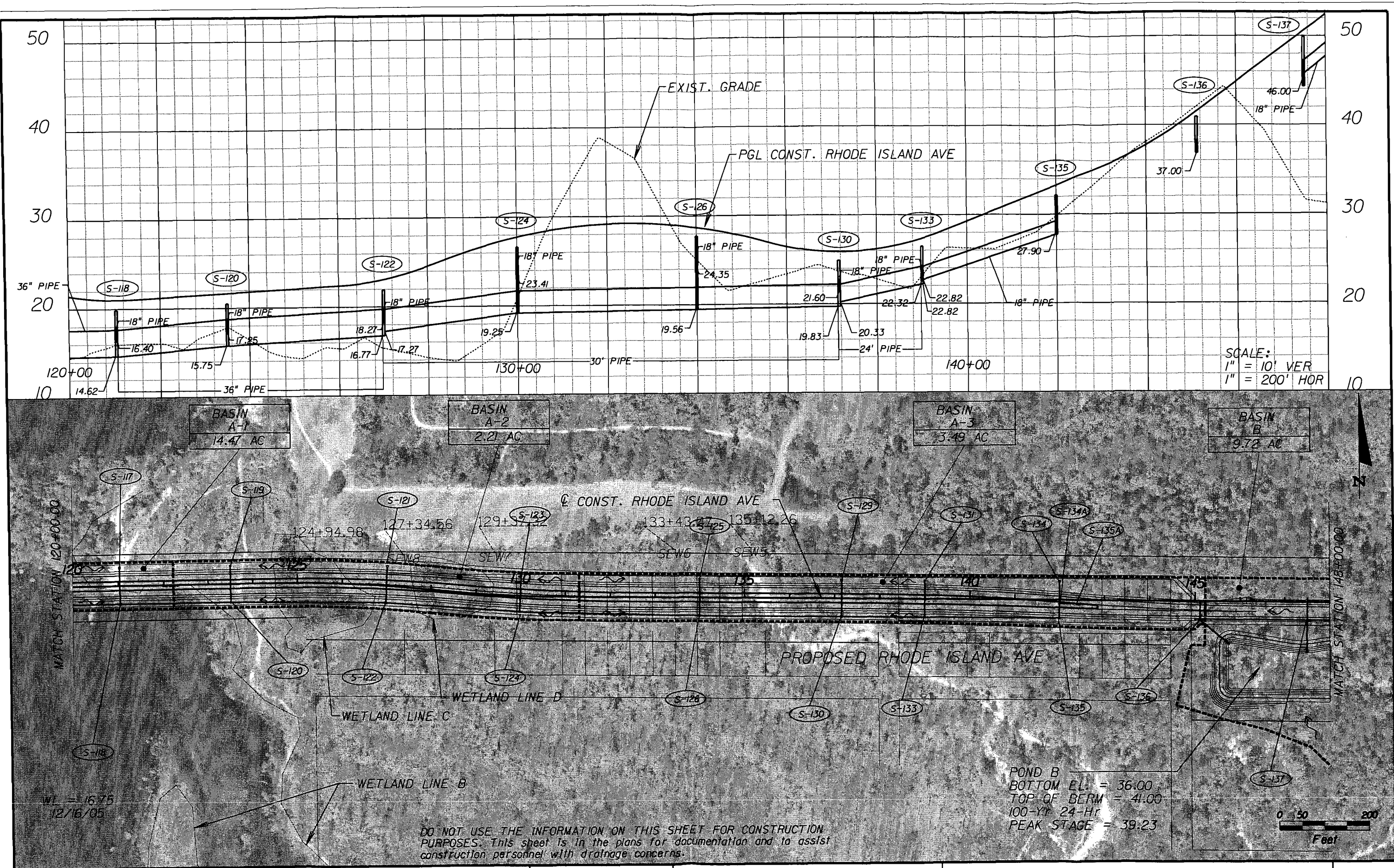
E672



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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

DRAINAGE MAP
RHODE ISLAND AVE

SHEET NO.

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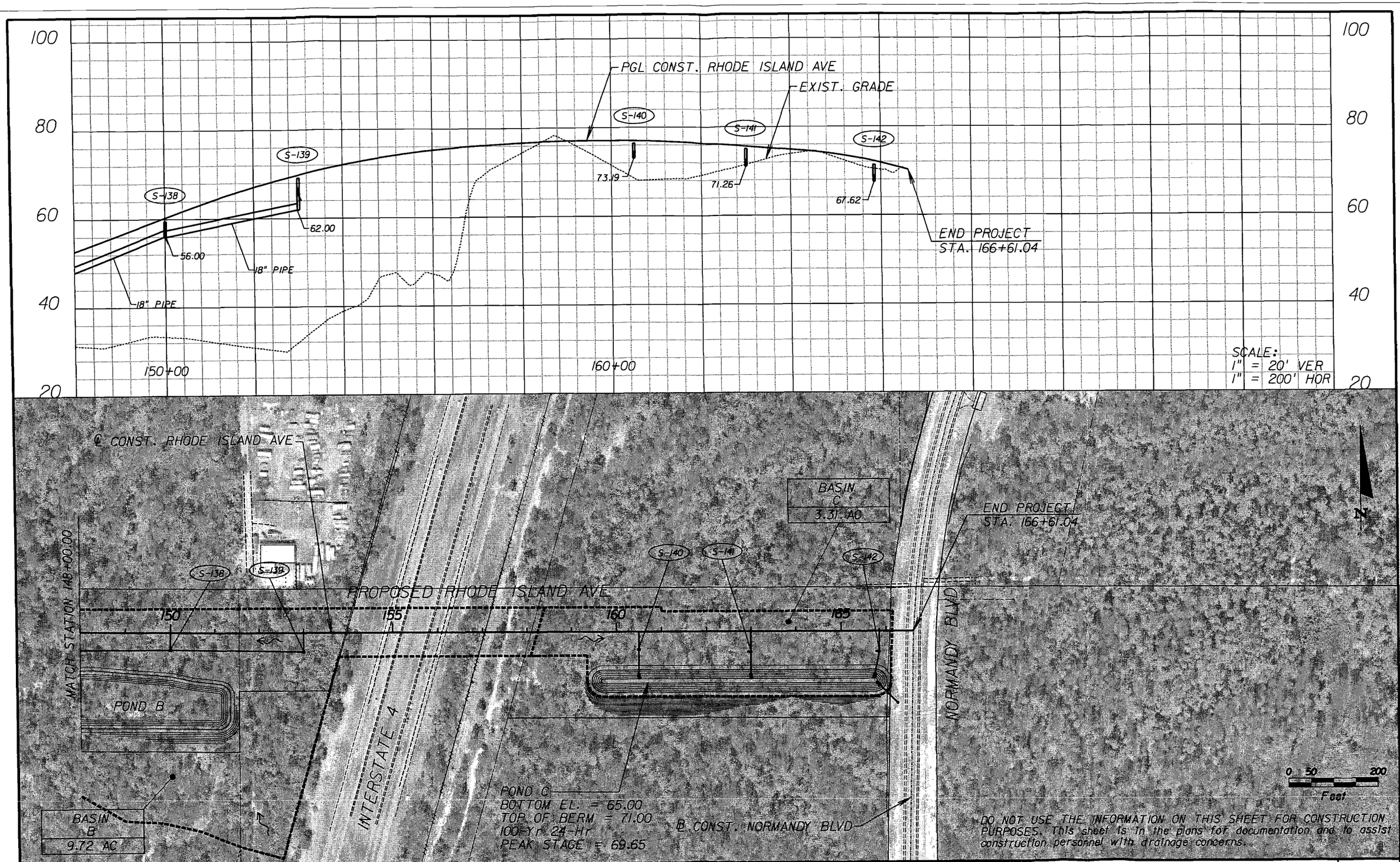
E673



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VOLUSIA COUNTY PUBLIC WORKS SERVICES		
ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

DRAINAGE MAP
RHODE ISLAND AVE

SHEET NO.

E674

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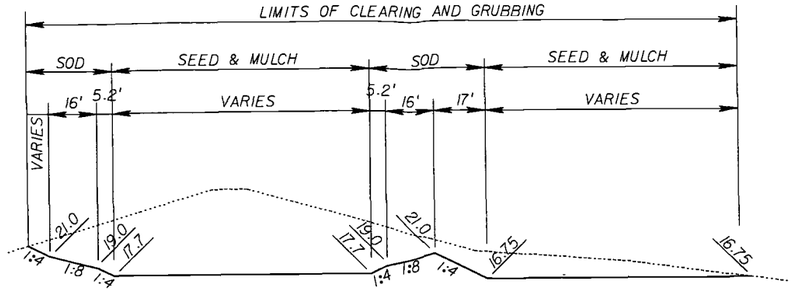

POND & FLOOD PLAIN COMPENSATION TYPICAL SECTION

NOT TO SCALE

0 20 100

Feet

N

CONTROL POINTS		
ID	STATION, OFFSET	RADIUS
1	115+31.63, 873.61' RT	128.8'
2	114+57.17, 1072.88' RT	56.8'
3	120+13.33, 1065.57' RT	60.8'
4	121+62.24, 965.75' RT	49'
5	122+10.38, 853.90' RT	99'
6	121+63.72, 802.11' RT	49'
7	120+47.60, 814.59' RT	28.8'
8	118+30.44, 240.66' LT	1025.2'
9	114+86.28, 746.54' RT	15.6'
10	114+95.05, 777.88' RT	5'
11	114+74.54, 776.07' RT	24.5'
12	114+66.60, 794.07' RT	5'
13	114+41.49, 772.00' RT	15.6'

CONST. 48" PIPE

CONST. 48" PIPE

STA. 114+62.62 (762.00' RT)
CONST. STRAIGHT CONC. ENDWALL
INDEX NO. 260
F.L. 13.70 (RT)

S-112A

SOIL BORING

SOIL BORING

SOIL BORING

SOIL BORING

POND A

CONST. 278 SY OF
CONC. DITCH PAVEMENT
SEE INDEX 281

FLOOD PLAIN
COMPENSATION

POWER EASEMENT

POND AREA	PEAK STAGE
TOP OF BERM = 6.56AC	100 YR - 24 HR
BOTTOM = 5.55AC	19.34 FT

NOTES:
1. INITIAL CONSTRUCTION OF THE STORMWATER RETENTION AREA BASIN SHALL BE TO ROUGH GRADE BY UNDER-EXCAVATING THE BASIN BOTTOM AND SIDE SLOPES BY APPROXIMATELY 1 FOOT.
2. AFTER THE DRAINAGE AREA CONTRIBUTING TO THE STORMWATER RETENTION AREA HAS BEEN FULLY STABILIZED, THE INTERIOR SIDE SLOPES AND BASIN BOTTOM SHALL BE EXCAVATED TO FINAL DESIGN SPECIFICATIONS (LINES AND GRADES). THE EXCESS SOIL AND UNSUITABLE MATERIAL SHALL BE CAREFULLY EXCAVATED AND REMOVED FROM THE POND SO THAT ALL ACCUMULATED SILTS, CLAYS AND ORGANICS AND OTHER FINE SEDIMENT MATERIAL ARE REMOVED FROM THE RETENTION AREA. THE EXCAVATED MATERIAL SHALL BE DISPOSED OF BEYOND THE LIMITS OF THE DRAINAGE AREA OF THE BASIN.
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4. NO FILL OR OTHER CONSTRUCTION MATERIALS SHALL BE STORED AND/OR PLACED WITHIN THE LIMITS OF THE POND EXCAVATION AREAS.

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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT NO.
	VOLUSIA	P-4904

POND A DETAIL

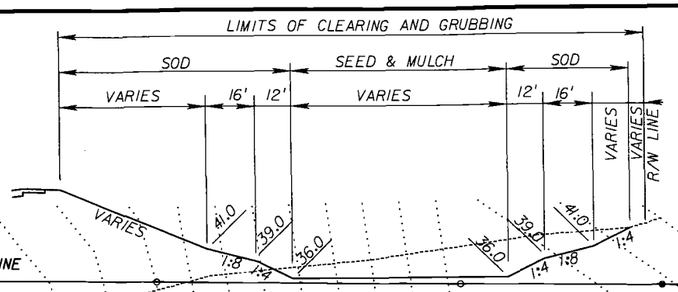
SHEET NO.

E675

04/04/2007 11:55:28 AM R:\WRR\design\pdplrddrmp_A.dgn

CONTROL POINTS

ID	STATION, OFFSET	RADIUS
1	145+82.47, 191.00' RT	7'
2	145+81.33, 101.04' RT	7'
3	147+36.34, 84.48' LT	200'
4	148+19.80, 306.72' RT	200'
5	149+93.17, 169.51' RT	50'
6	150+57.58, 80.42' RT	50'
7	151+08.80, 143.22' RT	7'
8	151+09.15, 191.00' RT	7'



POND TYPICAL SECTION

NOT TO SCALE

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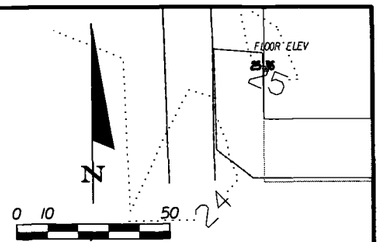

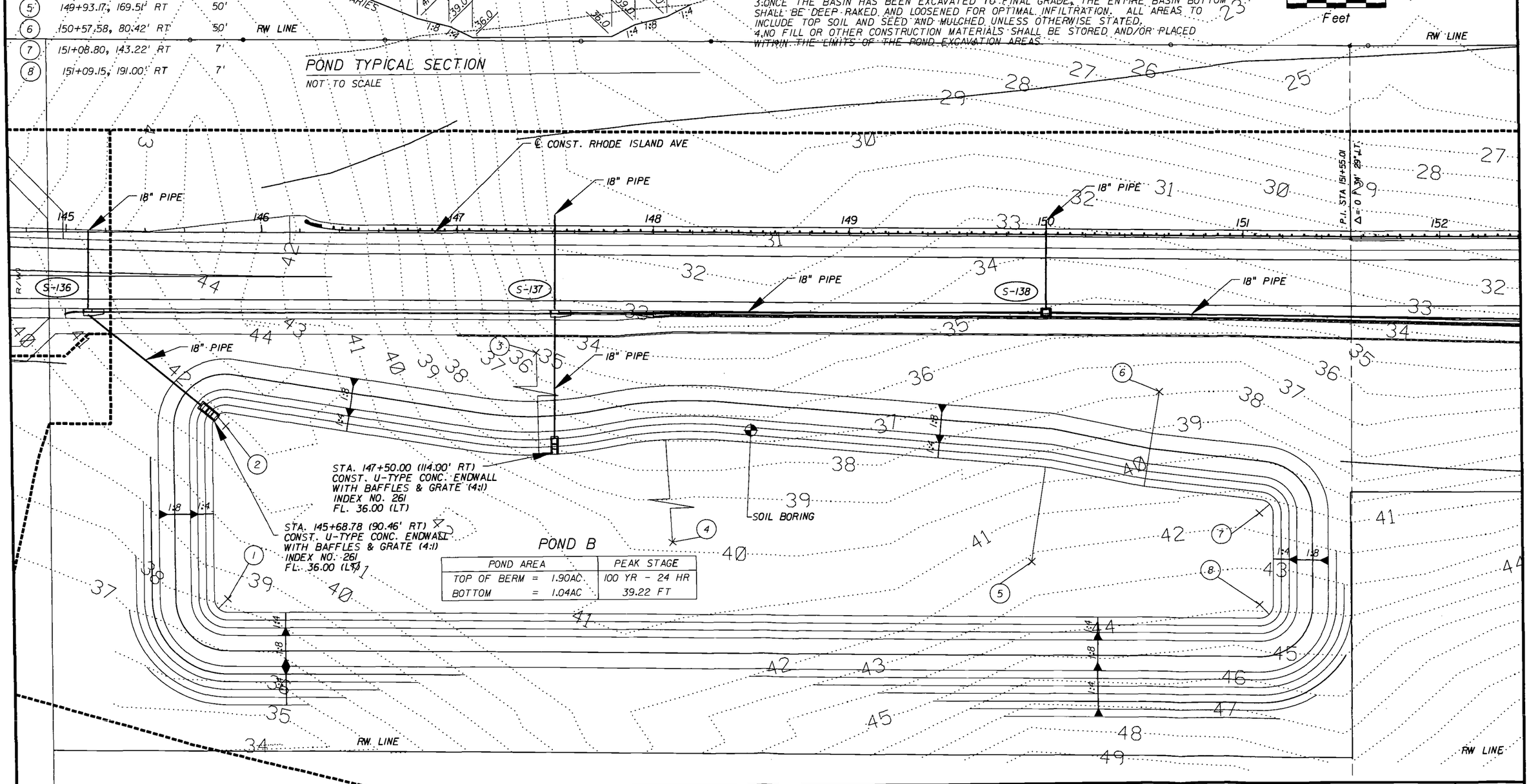

POND B

POND AREA	PEAK STAGE
TOP OF BERM = 1.90AC.	100 YR - 24 HR
BOTTOM = 1.04AC.	39.22 FT

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT NO.
	VOLUSIA	P-4904

POND B DETAIL

SHEET NO.

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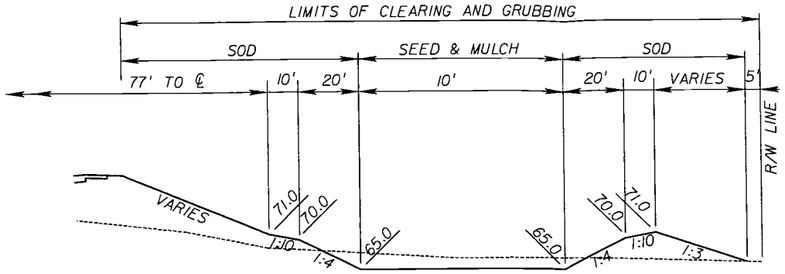
E676

CONTROL POINTS

ID	STATION, OFFSET	RADIUS
(1)	159+70.00, 112.00' RT	5'
(2)	165+75.00, 112.00' RT	5'

POND AREA		PEAK STAGE
TOP OF BERM	= 1.06AC	100 YR - 24 HR
BOTTOM	= 0.14AC	69.65 FT



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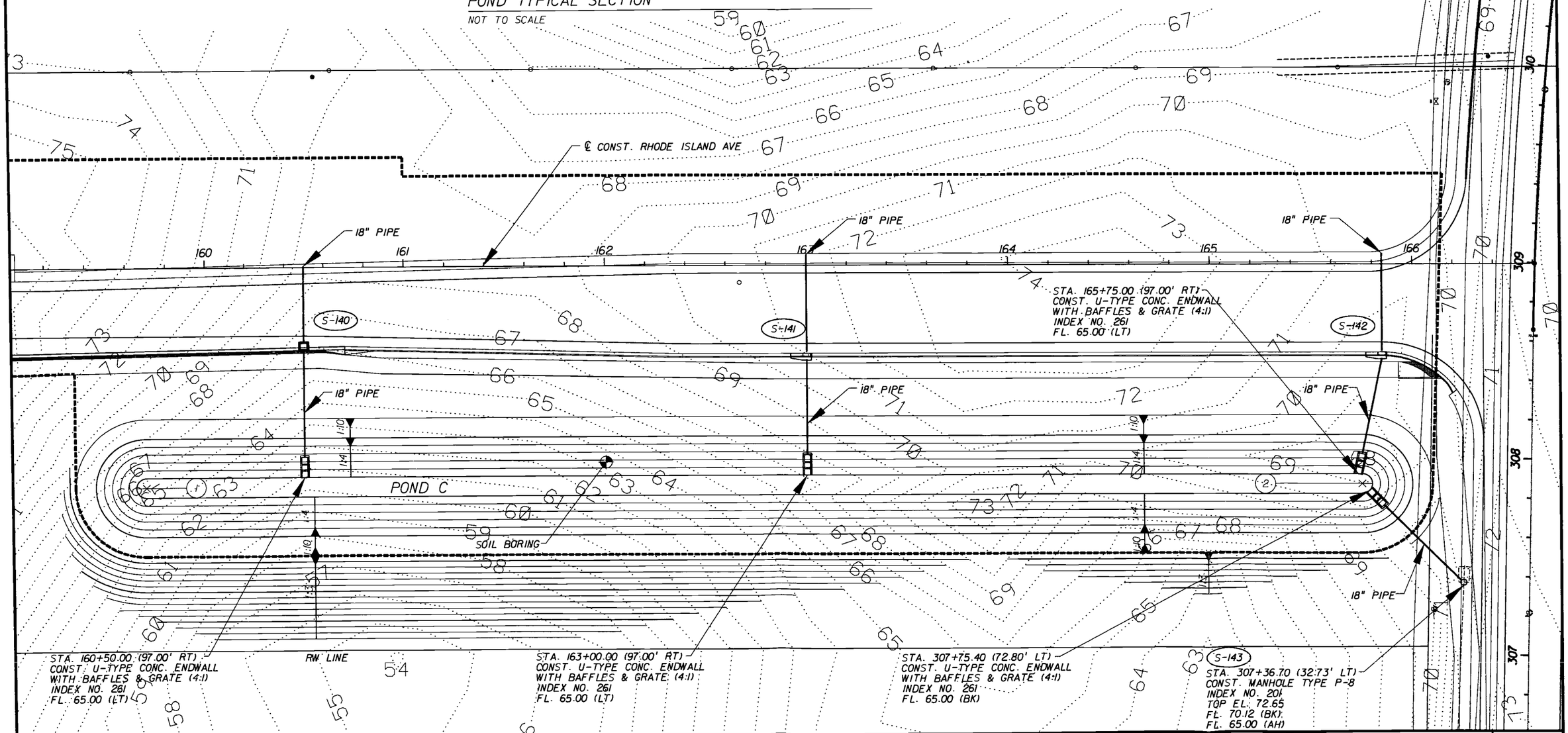
POND TYPICAL SECTION

NOT TO SCALE



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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT NO.
	VOLUSIA	P-4904

POND C DETAIL

SHEET NO.

E677

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APPENDIX C

Flood Plain Compensation

Rhode Island Ave

100-year Overall Offsite Basins
Description:

Pipe Invert

Sta.	119+50
Upstream	0.00
Downstream	0.00
Pipe Size	xx" RCP

Land Use	Soil Class	Area I (Acres)	Area II (Acres)	Area III (Acres)	Total Area (Acres)	CN	Product
Woods	C	0.00	0.05	9.55	9.61	70.00	672.4
Woods	D	12.53	0.00	6.56	19.09	77.00	1469.9
Woods	A	128.23	84.12	42.57	254.92	25.00	6373.0
Pond surface		24.96	39.33	22.44	86.73	100.00	8673.0
				Total =	370.35		17188.3
						Weighted CN =	**46.41**

NAVD '88 + 1.056 = NVGD '29

Water Current Elevation 16.75 NAVD '88 = 17.81 NVGD '29

Stage Storage

Stage (NGVD) (FT)	Area I (Ac)	Area II (Ac)	Area III (Ac)	Total Area (Ac)	Incremental Storage (Ac-Ft)	Cumulative Storage (Ac-Ft)
20.00	27.33	50.66	28.17	106.15	211.20	211.20
17.81	22.62	43.41	20.70	86.73	0.00	0.00
15.00	18.95	37.76	14.88	71.58		

SCS Runoff Curve Number Method (TR-55)

Q= Runoff (in)
P= Rainfall (in)
S= Potential Maximum Retention After Runoff Begins (in)

$$Q=\frac{(P-0.2S)^2}{(P+0.8S)}$$

25-year 96-hour Precipitation:

P= 12.3 inches
S= 11.55 inches
Q= 4.66 inches

Volume of Runoff = Q (Area of Basin)

V= 143.75 Ac-ft ~ EL = 19.30 NVGD '29
~ EL = 18.24 NAVD '88

100-year 24-hour Precipitation:

P= 10.6 inches
S= 11.55 inches
Q= 3.47 inches

Volume of Runoff = Q (Area of Basin)

V= 106.94 Ac-ft ~ EL = 18.92 NVGD '29
~ EL = 17.86 NAVD '88

JOINS PANEL 0610

APPROXIMATE SCALE
1000 0 1000

Volusia County
Unincorporated Areas
125155

City of
Orange City
120633

ZONE A

ZONE X

BENNETT AV
INDUSTRIAL DR N
E INDUSTRIAL
INDUSTRIAL DR S
HIGHLAND ST
RHODE ISLAND AV
STRAWBERRY DR
ELM DR E
FERN DR E
GARDENIA DR E
HOLLY DR E
AMHURST DR
LEAVITT AV
WHITE BIRCH CT
LAUREL LEAF ST
IRIS DR E
WILLOW DR
1ST ST SE
2ND ST SE
PARKVIEW AV
BISCAYNE DR
CRESTVIEW DR
DEL-RAY DR
HARP AV
KELLY DR
EASTRIDGE DR
FAIRLAWN DR
HIGHLAND DR
INDEPENDENCE DR
CIRCLE DR
JAMESON DR
GRAND PLAZA DR
ROBERTS ST
HILLSIDE AV
TREE
PINE
TREEMONTE DR
BACKSTAGE CT
HOMEWOOD AV
EASTRIDGE DR
TERRACE HILL BLVD
HARLEY STRICKLAND BLVD
THREADGILL DR
MEDICAL CENTER DR
ABBOTTWOODS LN
DOVEWOOD LN
FLOWERFIELD LN
R 30 E
R 31 E
GERANIUM ST
FLAGLER AV
GODFREY CT
GAMEWELL CT
ANNAPOLIS DR
FIRWOOD DR W
GIFFORD CT
GLORIA DR N
ANTOINETTE ST
ANTELOPE DR
GERALDINE DR
GONDOLIER TER
APRICOT DR
GALVESTON AV
GALLAGHER AV
PARKTON DR N
SUNBURST ST
ROCKFORD ST
JEFFERS ST
TAYLORVILLE ST
PLUMTREE DR
PARKTON DR E
PARKTON DR W
PARKTON DR S
EVERETT ST
DUSTIN TER
ANCHOR DR S
BALDWIN CT
EXOTIC TER

11 12 13 14 23 24 4

800 17 92 15

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP
VOLUSIA COUNTY,
FLORIDA
AND INCORPORATED AREAS

PANEL 620 OF 930

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DEBARY,CITY OF	120672	0620	G
DELTONA, CITY OF	120677	0620	G
ORANGE CITY, CITY OF	120633	0620	G
VOLUSIA COUNTY	125155	0620	G

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

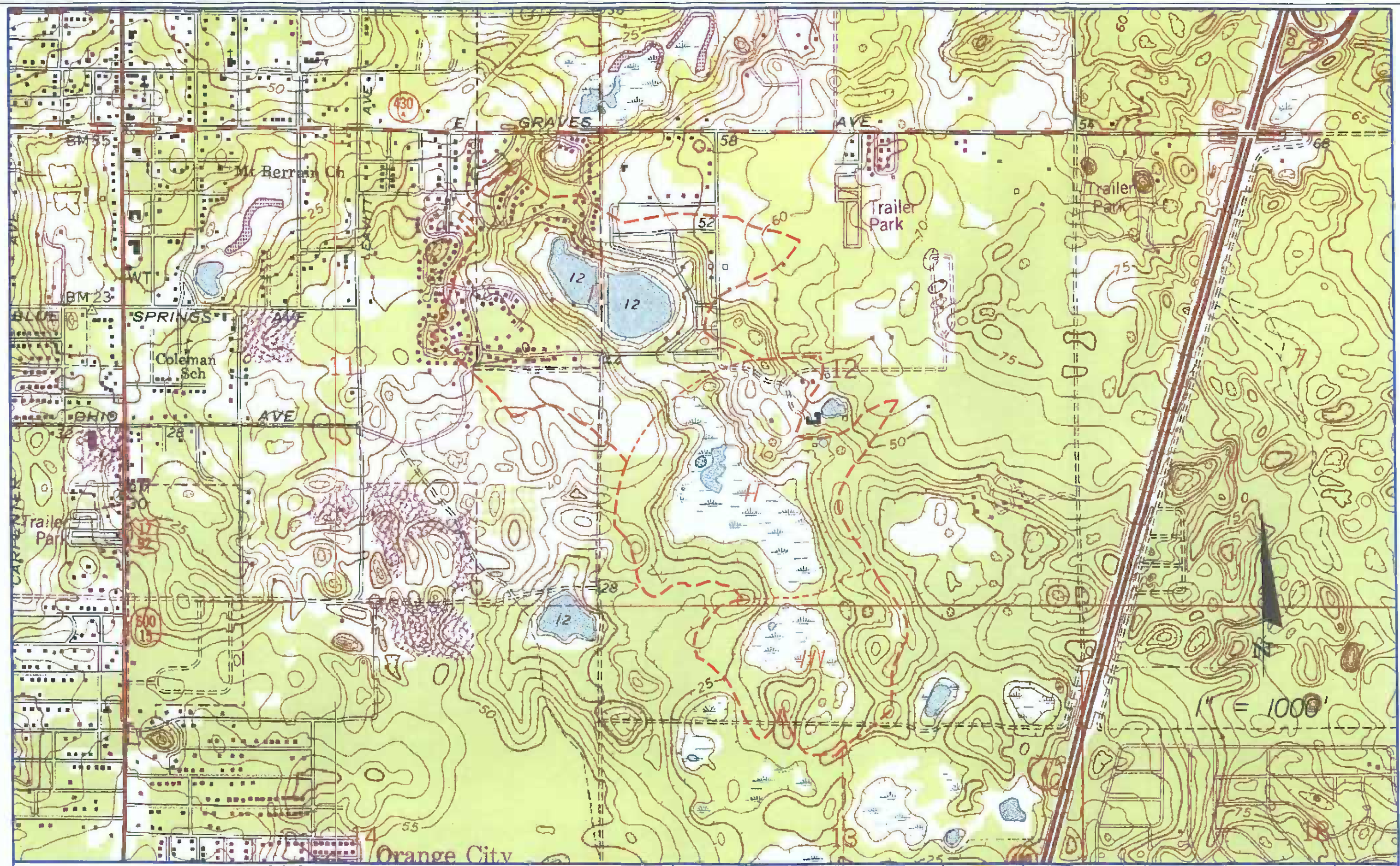
MAP NUMBER
12127C0620 G

EFFECTIVE DATE:
APRIL 15, 2002

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

E680



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VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT ID
	VOLUSIA	P-4904

OFFSITE BASINS
RHODE ISLAND AVE

SHEET NO. 3

E681

Rhode Island Ave
Proposed Conditions

Basin A-1, A-2, A-3

100-year Flood Elevation	**17.86**	(NAVD)
Normal Water Level	**16.75**	(NAVD)

Station	Excavation	Fill	Cross Section Area Sq Ft	Volume Acres-ft
117+50	0	0	0	
				0.17
118+00	0	299	299	
				0.34
118+50	0	294	294	
				0.34
119+00	0	293	293	
				0.33
119+50	0	286	286	
				0.33
120+00	0	289	289	
				0.33
120+50	0	284	284	
				0.30
121+00	0	245	245	
				0.23
121+50	0	164	164	
				0.18
122+00	0	144	144	
				0.17
122+50	0	160	160	
				0.17
123+00	0	145	145	
				0.13
123+50	0	76	76	
				0.14
124+00	0	175	175	
				0.21
124+50	0	190	190	
				0.23
125+00	0	210	210	
				0.24
125+50	0	213	213	
				0.24
126+00	0	206	206	
				0.24
126+50	0	210	210	
				0.26
127+00	0	252	252	
				0.29

Rhode Island Ave
Proposed Conditions

127+50	0	257	257		
					0.29
128+00	0	255	255		
					0.29
128+50	0	257	257		
					0.28
129+00	0	236	236		
					0.18
129+50	0	79	79		
					0.05
130+00	0	0	0		
				Total	5.99

APPENDIX D

Culverts

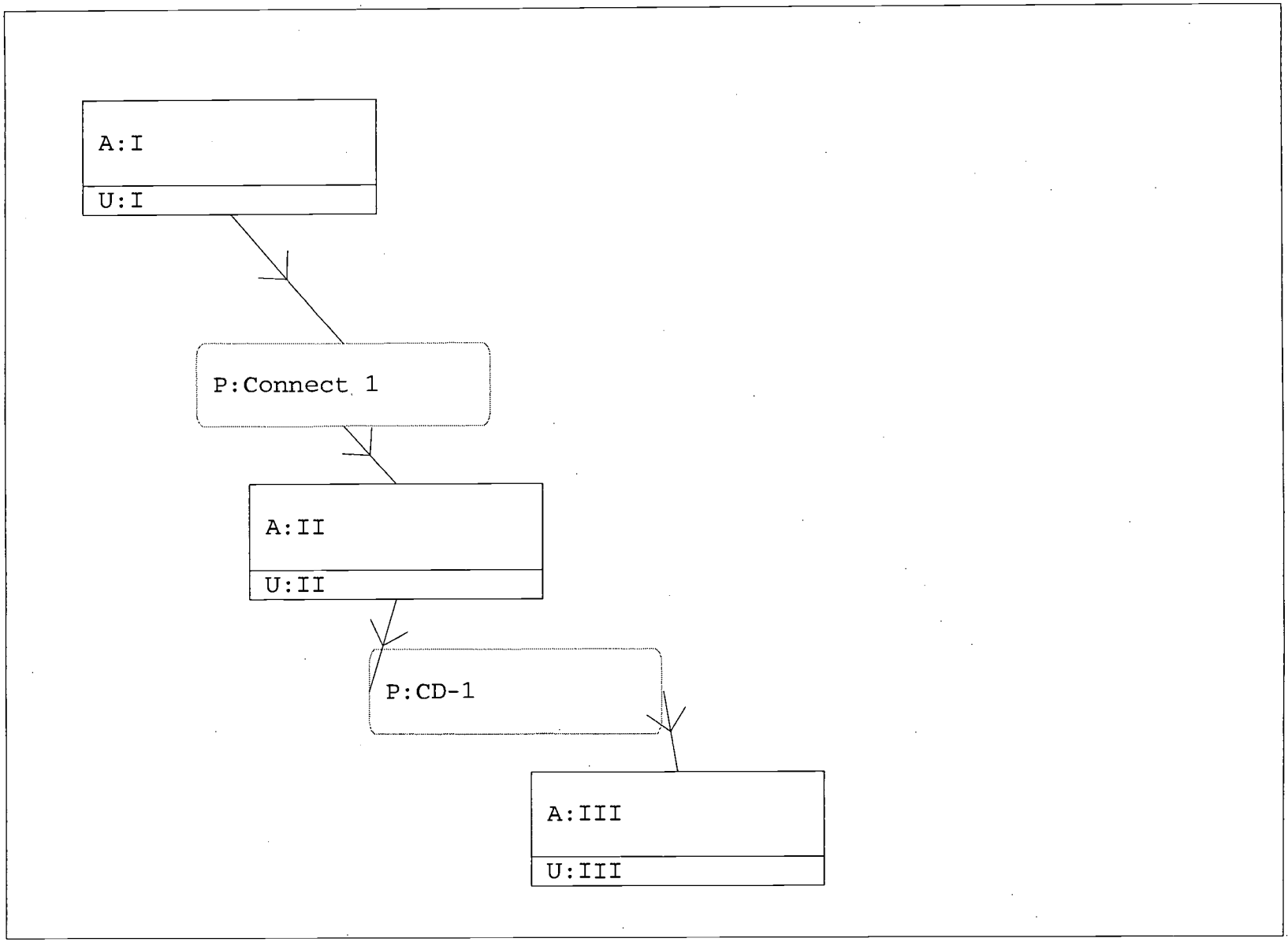
Cross Drain

CD-1 (119+50)
This proposed elliptical 14"x 23" RCP is necessary to maintain the drainage connection between two existing low areas located north and south of the alignment. The CD-1 will serve to keep the two bodies of water at approximately the same elevation through the 50-year 24-hour storm event.

Nodes
A Stage/Area
V Stage/Volume
T Time/Stage
M Manhole

Basins
O Overland Flow
U SCS Unit Hydro
S Santa Barbara

Links
P Pipe
W Weir
C Channel
D Drop Structure
B Bridge
R Rating Curve
H Breach



Name	Group	Simulation	Max Time Stage hrs	Max Stage ft	Warning Stage ft	Max Delta Stage ft	Max Surf Area ft2	Max Time Inflow hrs	Max Inflow cfs	Max Time Outflow hrs	Max Outflow cfs
I	BASE	50yr-24hr	25.10	18.731	20.000	0.0039	1097889	12.83	82.369	18.00	5.685
II	BASE	50yr-24hr	30.00	18.706	20.000	0.0037	2061383	12.50	134.806	0.00	0.000
III	BASE	50yr-24hr	25.17	18.772	20.000	0.0049	1084955	12.59	100.661	0.00	0.000

```
           Basin Name: I
           Group Name: BASE
           Simulation: 50yr-24hr
            Node Name: I
           Basin Type: SCS Unit Hydrograph

      Unit Hydrograph: Uh323
        Peaking Fator: 323.0
 Spec Time Inc (min): 8.53
 Comp Time Inc (min): 8.53
       Rainfall File: Flmod
Rainfall Amount (in): 9.500
Storm Duration (hrs): 24.00
              Status: Onsite
  Time of Conc (min): 64.00
    Time Shift (hrs): 0.00
           Area (ac): 165.720
Vol of Unit Hyd (in): 1.001
        Curve Number: 40.230
            DCIA (%): 0.000

      Time Max (hrs): 12.80
      Flow Max (cfs): 82.918
  Runoff Volume (in): 1.989
 Runoff Volume (ft3): 1196285.917
```

```
           Basin Name: II
           Group Name: BASE
           Simulation: 50yr-24hr
            Node Name: II
           Basin Type: SCS Unit Hydrograph

      Unit Hydrograph: Uh323
        Peaking Fator: 323.0
 Spec Time Inc (min): 6.00
 Comp Time Inc (min): 6.00
       Rainfall File: Flmod
Rainfall Amount (in): 9.500
Storm Duration (hrs): 24.00
              Status: Onsite
  Time of Conc (min): 45.00
    Time Shift (hrs): 0.00
           Area (ac): 123.500
Vol of Unit Hyd (in): 1.000
        Curve Number: 48.900
            DCIA (%): 0.000

      Time Max (hrs): 12.50
      Flow Max (cfs): 136.766
  Runoff Volume (in): 3.076
```

Runoff Volume (ft3): 1378845.024

Basin Name: III
Group Name: BASE
Simulation: 50yr-24hr
Node Name: III
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh323
Peaking Fator: 323.0
Spec Time Inc (min): 7.60
Comp Time Inc (min): 7.60
Rainfall File: Flmod
Rainfall Amount (in): 9.500
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 57.00
Time Shift (hrs): 0.00
Area (ac): 81.120
Vol of Unit Hyd (in): 1.000
Curve Number: 55.250
DCIA (%): 0.000

Time Max (hrs): 12.54
Flow Max (cfs): 102.630
Runoff Volume (in): 3.883
Runoff Volume (ft3): 1143508.739

Name: I
Group: BASE

Node: I
Type: SCS Unit Hydrograph

Status: Onsite

Unit Hydrograph: Uh323
Rainfall File: Flmod
Rainfall Amount(in): 8.600
Area(ac): 165.720
Curve Number: 40.23
DCIA(%): 0.00

Peaking Factor: 323.0
Storm Duration(hrs): 24.00
Time of Conc(min): 64.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: II
Group: BASE

Node: II
Type: SCS Unit Hydrograph

Status: Onsite

Unit Hydrograph: Uh323
Rainfall File: Flmod
Rainfall Amount(in): 8.600
Area(ac): 123.500
Curve Number: 48.90
DCIA(%): 0.00

Peaking Factor: 323.0
Storm Duration(hrs): 24.00
Time of Conc(min): 45.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name: III
Group: BASE

Node: III
Type: SCS Unit Hydrograph

Status: Onsite

Unit Hydrograph: Uh323
Rainfall File: Flmod
Rainfall Amount(in): 8.600
Area(ac): 81.120
Curve Number: 55.25
DCIA(%): 0.00

Peaking Factor: 323.0
Storm Duration(hrs): 24.00
Time of Conc(min): 57.00
Time Shift(hrs): 0.00
Max Allowable Q(cfs): 999999.000

Name:	CD-1	From Node:	II	Length(ft):	142.00
Group:	BASE	To Node:	III	Count:	1
				Friction Equation:	Average Conveyance
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Horz Ellipse	Horz Ellipse		Flow:	Both
Span(in):	23.00	23.00		Entrance Loss Coef:	0.50
Rise(in):	14.00	14.00		Exit Loss Coef:	0.50
Invert(ft):	15.250	12.000		Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dn
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

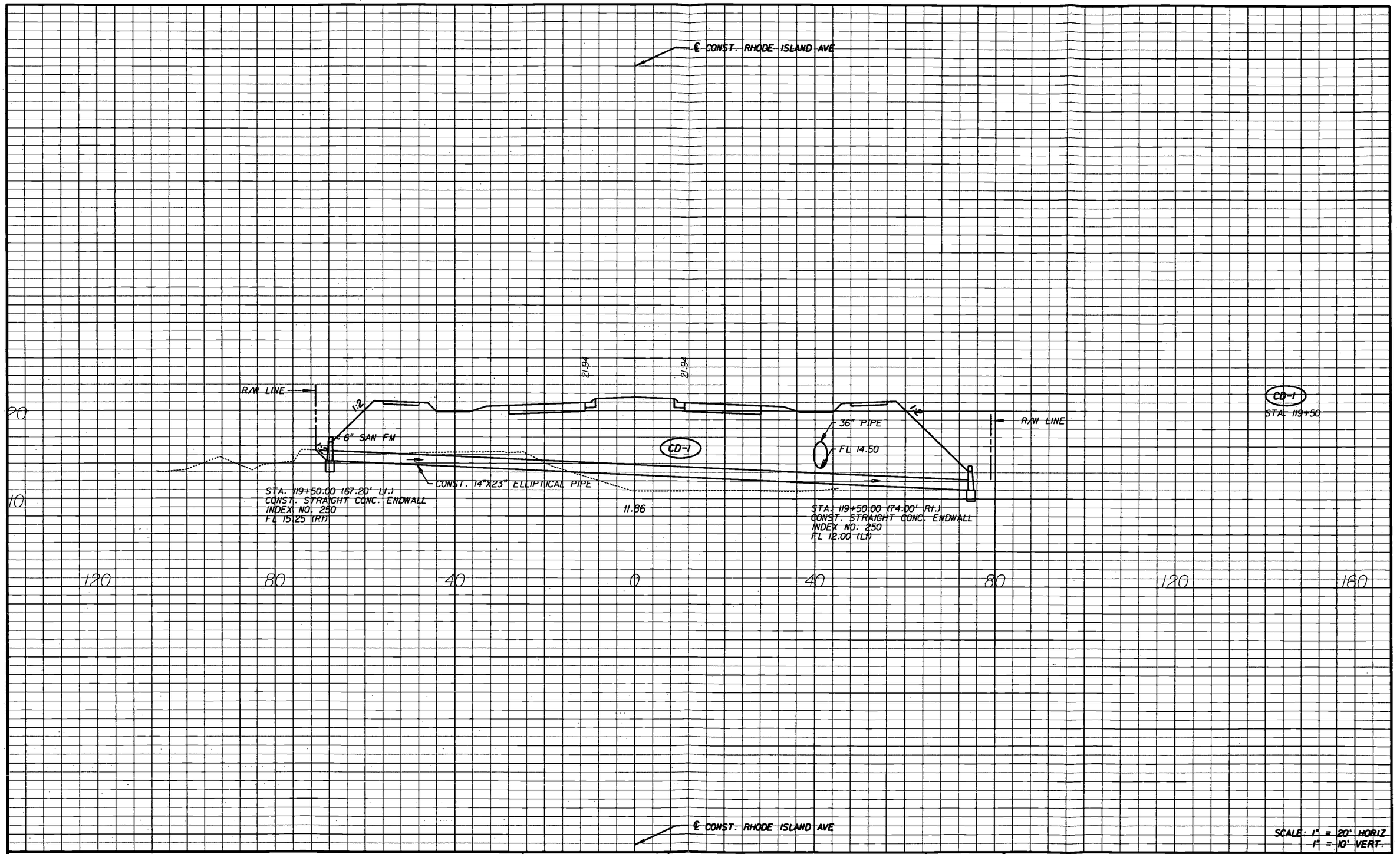
Upstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Downstream FHWA Inlet Edge Description:
Horizontal Ellipse Concrete: Square edge with headwall

Name:	Connect 1	From Node:	I	Length(ft):	150.00
Group:	BASE	To Node:	II	Count:	1
				Friction Equation:	Average Conveyance
	UPSTREAM	DOWNSTREAM		Solution Algorithm:	Automatic
Geometry:	Circular	Circular		Flow:	Both
Span(in):	24.00	24.00		Entrance Loss Coef:	0.50
Rise(in):	24.00	24.00		Exit Loss Coef:	0.50
Invert(ft):	16.750	16.750		Bend Loss Coef:	0.00
Manning's N:	0.012000	0.012000		Outlet Ctrl Spec:	Use dc or tw
Top Clip(in):	0.000	0.000		Inlet Ctrl Spec:	Use dn
Bot Clip(in):	0.000	0.000		Stabilizer Option:	None

Upstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall

Downstream FHWA Inlet Edge Description:
Circular Concrete: Square edge w/ headwall



SCALE: 1" = 20' HORIZ
1" = 10' VERT.

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DRMP
ENGINEERS • SURVEYORS • PLANNERS • SCIENTISTS
DYER, RIDDLE, MILLS & PRECOURT, INC.
1505 E. COLONIAL DRIVE, ORLANDO, FLORIDA 32803
PHONE: (407) 896-0594 FAX: (407) 896-4836
CERTIFICATE OF AUTHORIZATION NO. 2648
KEN KNIEL, P.E. P.E. NO. 37300

VOLUSIA COUNTY
PUBLIC WORKS SERVICES

ROAD NO.	COUNTY	COUNTY PROJECT NO.
	VOLUSIA	P-4904

CROSSDRAIN 1
RHODE ISLAND AVE

SHEET NO.

05/22/2006 01:56:03 PM R:\WRR\reports\Drainage Calcs\CD-1.dgn

APPENDIX E

Pavement Drainage & Storm Tabs

RHODE ISLAND AVE
PAVEMENT DRAINAGE/INLET CALCULATIONS

Equations:

Impervious Area = Station Length * Impervious Cross Length

Q = CIA

Long Slope = DPGL / Station Length

Allowable Q = (28 * Long Slope0.5)

Terminal Allowable Q = (15 * Long Slope0.5)

Long Slope = DPGL / Station Length

Spread = [(0.015*Q)/(0.56*Cross Slope1.67*Long Slope0.5)]0.375

Terminal Inlet (TI) is the terminal point in a series of shoulder inlets, where the inlet placement ceases.

Low Point (LP) is point in the Roadway Profile where there will be bi-directional flow

Transition Break (TB) is a point where the superelevation equals zero.

Shoulder Gutter 10-yr Intensity 7.4 in/hr

All Other Gutters Intensity 4.0 in/hr

Calcs:

Struct. No.	Station ID	Offset	Side	Area (acres) 0.20	Area (acres) 0.950	Calc Flow (cfs)	Allow Flow (cfs)	Inlet Type	Cross Slope (ft/ft)	Long Slope %	Spread (ft)	Allowable Spread (ft)
Existing Rhode Island Ave												
ES-10	90+87.76	84.31	RT					MES				
ES-11	91+12.06	26.27	RT	0.52	0.165			DBI-D				
ES-12	91+13.04	26.05	LT	0.52	0.165			DBI-C				
S-13	93+60.77	15.89	LT		0.094	0.36		P-6	0.020	0.33%	5.91	6.00
ES-14	93+60.78	11.70	RT	0.008	0.118	0.45		P-6	0.020	0.33%	6.48	6.00
Low Point	93+60.77											
S-13	93+60.77	15.89	LT		0.039	0.15		P-6	0.020	0.33%	4.24	6.00
S-14	93+60.78	11.70	RT	0.002	0.074	0.28		P-6	0.020	0.33%	5.43	6.00
S-15	94+60	19.77	LT		0.078	0.29		P-5	0.020	1.92%	3.96	6.00
S-16	94+60	14.00	RT					MH				
S-17	94+60	24.00	RT		0.205	0.78		P-5	0.020	1.92%	5.70	6.00
S-18	96+58.39	24.00	LT		0.215	0.82		P-5	0.020	1.92%	5.80	6.00
S-19	96+59.73	15.47	RT					MH				
S-20	96+60	24.00	RT		0.149	0.57		P-5	0.020	1.92%	5.05	6.00
S-21	98+00	24.00	RT		0.221	0.84		P-5	0.020	1.92%	5.86	6.00
S-22	99+20	34.00	LT					MH				
S-23	99+45	49.70	LT					MH				
Existing Veteran's Memorial Parkway												
S-24	207+00	36.88	LT		0.467	1.78		P-5	0.020	0.80%	9.14	11.00
Proposed Rhode Island Ave Extension												
S-100	101+00	41.25	LT	0.01	0.244	0.94		P-5	0.020	0.30%	8.66	12.5
S-101	101+00	41.25	RT	0.45	0.476			DBI-S				
S-102	103+00	41.25	LT	0.01	0.201	0.77		P-5	0.020	0.30%	8.04	12.5
S-103	103+00	41.25	RT					MH				
High Point	104+64.11											
S-104	106+00	41.25	LT					MH				
S-105	106+00	41.25	RT	0.04	0.204			DBI-S				
S-106	108+60.61	41.25	LT	0.09	0.435			DBI-S				
S-107	108+60.61	41.25	RT	0.05	0.231			DBI-S				
Low Point	108+60.61											
S-106	108+60.61	41.25	LT	0.16	0.214			DBI-S				
S-107	108+60.61	41.25	RT	0.21	0.275			DBI-S				
S-108	111+00	41.25	LT					MH				
S-109	111+00	41.25	RT					MH				

RHODE ISLAND AVE
PAVEMENT DRAINAGE/INLET CALCULATIONS

Struct. No.	Station ID	Offset	Side	Area (acres) 0.20	Area (acres) 0.950	Calc Flow (cfs)	Allow Flow (cfs)	Inlet Type	Cross Slope (ft/ft)	Long Slope %	Spread (ft)	Allowable Spread (ft)
High Point	112+03.27											
S-110	114+00	41.25	LT					MH				
S-111	114+00	41.25	RT					MH				
S-115	118+00	41.25	LT	0.28	0.373			DBI-S				
S-116	118+00	41.25	RT	0.24	0.313			DBI-S				
S-117	121+03.27	41.25	LT	0.14	0.190			DBI-S				
S-118	121+03.27	41.25	RT	0.14	0.190			DBI-S				
Low Point	121+03.27											
S-117	121+03.27	41.25	LT	0.28	0.373			DBI-S				
S-118	121+03.27	41.25	RT	0.28	0.373			DBI-S				
S-119	123+50	41.25	LT					MH				
S-120	123+50	41.25	RT					MH				
S-121	127+00	41.25	LT	0.26	0.345			DBI-S				
S-122	127+00	41.25	RT	0.26	0.345			DBI-S				
S-123	130+00	41.25	LT					MH				
S-124	130+00	41.25	RT					MH				
High Point	132+50.89											
S-125	134+00	41.25	LT					MH				
S-126	134+00	41.25	RT					MH				
S-129	137+16.02	41.25	LT	0.22	0.291			DBI-S				
S-130	137+16.02	41.25	RT	0.22	0.291			DBI-S				
Low Point	137+16.02											
S-129	137+16.02	41.25	LT	0.36	0.321			DBI-S				
S-130	137+16.02	41.25	RT	0.31	0.303			DBI-S				
S-131	139+00	41.25	LT					MH				
S-133	139+00	41.25	RT					MH				
S-134	142+00	41.25	LT	0.252	0.06			DBI-S				
S-134A	142+00	9.00	RT					MH				
S-135	142+00	41.25	RT	0.14	2.621			DBI-S				
Transition	142+29											
S-135A	142+40	8.81	RT		0.020	0.07		P-5	0.010	2.01%	3.62	7.5
S-136	145+16.14	41.25	RT	0.02	0.27	1.05		P-5	0.020	3.81%	5.60	12.5
S-137	147+50	41.25	RT	0.00	0.31	1.19		P-5	0.020	3.81%	5.88	12.5
S-138	150+00	41.50	RT	0.00	0.39	1.47		BWI	0.020	3.81%	6.36	11
S-139	153+00	45.00	RT	0.00	0.836	3.18		BWI	0.020	2.49%	9.19	11
High Point	159+74.29											
S-140	160+50	42.18	RT	0.00	0.082	0.31		BWI	0.020	0.21%	6.12	12.5
S-141	163+00	46.50	RT	0.02	0.301	1.16		P-5	0.020	0.77%	7.84	12.5
S-142	165+85	46.50	RT	0.02	0.364	1.40		P-5	0.020	2.52%	6.75	12.5

STORM SEWER HYDRAULICS

System: **S-10**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	12.41	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	14.23	7	3	0.20	0.95	0.00

FROM / Station / Type	Brls	TO / Offset / Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
ES-11		**ES-10**	0.52	1.04	0.21					0.00	0.00		20.16	14.40	14.40	14.23	0.170	24	0.2707	Partial super	4.46	12.91	0.0120
91+12.06		26.27	0.17	1.65	1.56	18.12	0.00	5.10	1.77	0.00	0.00	9.04		0.00	15.17	15.00							
DBI-D	1	62.79	0.00	0.00	0.00					0.00	0.00	**9.04**	5.76	0.00	13.17	13.00	0.170	24	0.2774		4.11		
ES-12		**ES-11**	0.52	0.52	0.10					0.00	0.00		20.17	14.68	14.68	14.67	0.012	18	0.0222	Full	0.96	6.45	0.0120
91+13.04		-26.05	0.17	0.17	0.16	10.00	0.91	6.50	0.26	0.00	0.00	1.70		0.00	14.83	14.67							
DBI-C	1	52.33	0.00	0.00	0.00					0.00	0.00	**1.70**	5.49	0.00	13.33	13.17	0.160	18	0.3211		3.65		
ES-14		**ES-11**	0.00	0.00	0.00					0.00	0.00		18.25	15.03	15.03	14.54	0.490	24	0.1975	Partial super	3.65	10.96	0.0120
93+60.78		11.70	0.13	1.32	1.25	16.99	1.13	5.25	1.25	0.00	0.00	6.56		0.00	15.92	15.43							
P-6	1	248.13	0.00	0.00	0.00					0.00	0.00	**6.56**	3.22	0.00	13.92	13.43	0.490	24	0.1999		3.49		
S-13		**ES-14**	0.00	0.00	0.00					0.00	0.00		18.17	15.42	15.42	15.42	0.002	18	0.0060	Full	0.50	6.49	0.0120
93+60.77		-15.89	0.09	0.17	0.16	16.07	0.92	5.38	0.16	0.00	0.00	0.88		0.00	15.50	15.42							
P-6	1	27.59	0.00	0.00	0.00					0.00	0.00	**0.88**	2.75	0.00	14.00	13.92	0.080	18	0.3253		3.67		
S-15		**S-13**	0.00	0.00	0.00					0.00	0.00		18.65	15.50	15.50	15.50	0.002	18	0.0018	Full	0.27	11.24	0.0120
94+60		-19.77	0.08	0.08	0.07	10.00	6.07	6.50	0.07	0.00	0.00	0.48		0.00	16.44	15.50							
P-5	1	99.31	0.00	0.00	0.00					0.00	0.00	**0.48**	3.15	0.00	14.94	14.00	0.940	18	0.9761		6.36		
S-16		**ES-14**	0.00	0.00	0.00					0.00	0.00		18.76	15.65	15.65	15.42	0.235	18	0.2364	Full	3.13	6.25	0.0120
94+60		14.00	0.00	1.01	0.96	13.64	0.53	5.76	0.96	0.00	0.00	5.53		0.00	15.71	15.42							
MHP-8	1	99.25	0.00	0.00	0.00					0.00	0.00	**5.53**	3.11	0.00	14.21	13.92	0.290	18	0.3013		3.53		
S-17		**S-16**	0.00	0.00	0.00					0.00	0.00		18.56	15.71	15.71	15.71	0.001	18	0.0124	Full	0.72	8.60	0.0120
94+60		24.00	0.20	0.20	0.19	10.00	0.23	6.50	0.19	0.00	0.00	1.27		0.00	15.75	15.71							
P-5	1	10.00	0.00	0.00	0.00					0.00	0.00	**1.27**	2.85	0.00	14.25	14.21	0.040	18	0.5714		4.87		
S-18		**S-19**	0.00	0.00	0.00					0.00	0.00		20.92	16.35	16.35	16.33	0.019	18	0.0491	Full	1.43	6.53	0.0120
96+58.39		-24.00	0.22	0.44	0.41	11.90	0.46	6.09	0.41	0.00	0.00	2.52		0.00	16.45	16.33							
P-5	1	39.49	0.00	0.00	0.00					0.00	0.00	**2.52**	4.57	0.00	14.95	14.83	0.120	18	0.3288		3.69		
S-19		**S-16**	0.00	0.00	0.00					0.00	0.00		20.73	16.03	16.03	15.71	0.325	18	0.1627	Full	2.60	6.39	0.0120
96+59.73		15.47	0.00	0.81	0.77	12.36	1.28	5.99	0.77	0.00	0.00	4.59		0.00	16.33	15.71							
MHP-8	1	199.76	0.00	0.00	0.00					0.00	0.00	**4.59**	4.70	0.00	14.83	14.21	0.620	18	0.3151		3.61		
S-20		**S-19**	0.00	0.00	0.00					0.00	0.00		20.56	16.33	16.33	16.33	0.003	18	0.0391	Full	1.27	4.84	0.0120
96+60		24.00	0.15	0.37	0.35	10.43	0.11	6.40	0.35	0.00	0.00	2.25		0.00	16.34	16.33							
P-5	1	8.53	0.00	0.00	0.00					0.00	0.00	**2.25**	4.23	0.00	14.84	14.83	0.010	18	0.1807		2.74		
S-21		**S-20**	0.00	0.00	0.00					0.00	0.00		23.16	17.80	17.80	16.34	1.459	18	1.0345	Partial sub	5.46	15.80	0.0120
98+00		24.00	0.22	0.22	0.21	10.00	0.43	6.50	0.21	0.00	0.00	1.37		0.00	19.00	16.34							
P-5	1	141.02	0.00	0.00	0.00					0.00	0.00	**1.37**	5.36	0.00	17.50	14.84	2.660	18	1.9273		8.94		
S-22		**S-18**	0.00	0.00	0.00					0.00	0.00		26.31	21.48	21.48	17.52	3.960	18	1.5265	Partial sub	5.04	14.14	0.0120
99+20		-34.00	0.00	0.22	0.21	11.04	0.86	6.26	0.21	0.00	0.00	1.32		0.00	22.67	18.71							
MHP-8	1	259.42	0.00	0.00	0.00					0.00	0.00	**1.32**	4.83	0.00	21.17	17.21	3.960	18	1.5444		8.00		

Units: ENGLISH

Automated Storm sewer Analysis & Design (ASAD), copyright 1992-2002, Hiteshew Engineering Systems, Inc. Ph: (352) 383-4191
Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

T60v11.RPT 10/14/2002

STORM SEWER HYDRAULICS

System: **S-10**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	12.41	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	14.23	7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls	Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-23	**S-22**		0.00	0.00	0.00					0.00	0.00		26.95	22.67	22.67	22.67	0.004	18	0.0140	Full	0.76		
99+45	-49.70		0.00	0.22	0.21	10.40	0.64	6.41	0.21	0.00	0.00	1.35		0.00	23.49	22.67						20.11	0.0120
MHP-8	1 29.25		0.00	0.00	0.00					0.00	0.00	**1.35**	4.28	0.00	21.99	21.17	0.820	18	3.1237		11.38		
S-24	**S-23**		0.00	0.00	0.00					0.00	0.00		27.45	24.06	24.06	23.49	0.566	18	0.4714	Partial sub	5.03		
207+00	-36.88		0.22	0.22	0.21	10.00	0.40	6.50	0.21	0.00	0.00	1.37		0.00	25.24	23.49						13.91	0.0120
P-5	1 120.15		0.00	0.00	0.00					0.00	0.00	**1.37**	3.39	0.00	23.74	21.99	1.750	18	1.4938		7.87		

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STORM SEWER HYDRAULICS

System: **POND A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	17.67	Storm Event - IDF Curve		Runoff Coefficients	
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	18.00	7	3	0.20	0.95	0.00

FROM / TO	Brls	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-100		0.01	0.01	0.00					0.00	0.00		28.62	26.21	26.21	26.20	0.015	18	0.0179	Full	0.86	4.60	0.0120
S-101													0.00	26.31	26.18							
101+00		-41.25	0.24	0.24	0.23	10.00	1.61	6.50	0.23	0.00	0.00	1.52										
P-5	1	83.00	0.00	0.00	0.00					0.00	0.00	**1.52**	2.41	0.00	24.81	24.68	0.130	18	0.1635		2.60	
S-101		0.44	0.45	0.09					0.00	0.00		28.13	26.20	26.20	25.86	0.338	18	0.1691	Full	2.65	4.59	0.0120
S-103													0.00	26.18	25.86							
101+00		41.25	0.46	0.71	0.67	11.61	1.26	6.14	0.76	0.00	0.00	4.68										
DBI-D	1	200.00	0.00	0.00	0.00					0.00	0.00	**4.68**	1.93	0.00	24.68	24.36	0.320	18	0.1624		2.60	
S-102		0.01	0.01	0.00					0.00	0.00		31.45	28.15	28.15	28.02	0.130	18	0.1566	Partial super	2.22	4.60	0.0120
S-103													0.00	29.12	28.99							
103+00		-41.25	0.20	0.20	0.19	10.00	0.62	6.50	0.19	0.00	0.00	1.26										
P-5	1	83.00	0.00	0.00	0.00					0.00	0.00	**1.26**	3.30	0.00	27.62	27.49	0.130	18	0.1635		2.60	
S-103		0.00	0.46	0.09					0.00	0.00		30.96	25.08	25.08	24.75	0.330	24	0.1100	Partial super	2.81	8.17	0.0120
S-105													0.00	25.86	25.53							
103+00		41.25	0.00	0.91	0.86	12.87	2.79	5.90	0.95	0.00	0.00	5.63										
MHP-8	1	300.00	0.00	0.00	0.00					0.00	0.00	**5.63**	5.88	0.00	23.86	23.53	0.330	24	0.1111		2.60	
S-104		0.00	0.00	0.00					0.00	0.00		31.19	27.89	27.89	27.76	0.130	18	0.1566	Partial critical	0.02	4.60	0.0120
S-105													0.00	29.37	29.24							
106+00		-41.25	0.00	0.00	0.00	10.00	62.01	6.50	0.00	0.00	0.00	0.00										
MHP-8	1	83.00	0.00	0.00	0.00					0.00	0.00	**0.00**	3.30	0.00	27.87	27.74	0.130	18	0.1635		2.60	
S-105		0.04	0.50	0.10					0.00	0.00		31.09	24.33	24.33	24.05	0.280	24	0.1074	Partial super	2.33	8.08	0.0120
S-107													0.00	25.53	25.25							
106+00		41.25	0.20	1.11	1.06	72.01	4.95	2.38	1.16	0.00	0.00	2.76										
DBI-D	1	260.61	0.00	0.00	0.00					0.00	0.00	**2.76**	6.76	0.00	23.53	23.25	0.280	24	0.1087		2.57	
S-106		0.25	0.25	0.05					0.00	0.00		29.19	27.18	27.18	27.05	0.130	18	0.1576	Partial super	2.97	4.60	0.0120
S-107													0.00	27.53	27.40							
108+60.61		-41.25	0.65	0.65	0.62	10.00	0.46	6.50	0.67	0.00	0.00	4.34										
DBI-D	1	82.50	0.00	0.00	0.00					0.00	0.00	**4.34**	2.01	0.00	26.03	25.90	0.130	18	0.1635		2.60	
S-107		0.26	1.01	0.20					0.00	0.00		29.19	23.80	23.80	23.55	0.250	30	0.1044	Partial super	2.73	14.45	0.0120
S-109													0.00	25.25	25.00							
108+60.61		41.25	0.51	2.27	2.15	76.96	3.65	2.28	2.36	0.00	0.00	5.37										
DBI-D	1	239.39	0.00	0.00	0.00					0.00	0.00	**5.37**	5.39	0.00	22.75	22.50	0.250	30	0.1058		2.94	
S-108		0.00	0.00	0.00					0.00	0.00		31.09	27.89	27.89	27.76	0.130	18	0.1576	Partial critical	0.02	4.60	0.0120
S-109													0.00	29.37	29.24							
111+00		-41.25	0.00	0.00	0.00	10.00	61.64	6.50	0.00	0.00	0.00	0.00										
MHP-8	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.00**	3.20	0.00	27.87	27.74	0.130	18	0.1635		2.60	
S-109		0.00	1.01	0.20					0.00	0.00		31.09	23.55	23.55	23.25	0.300	30	0.1002	Partial super	2.67	14.16	0.0120
S-111													0.00	25.00	24.70							
111+00		41.25	0.00	2.27	2.15	80.61	1.87	2.21	2.36	0.00	0.00	5.20										
MHP-8	1	299.37	0.00	0.00	0.00					0.00	0.00	**5.20**	7.54	0.00	22.50	22.20	0.300	30	0.1016		2.88	
S-110		0.00	0.00	0.00					0.00	0.00		31.03	27.83	27.83	27.52	0.310	18	0.3758	Partial critical	0.02	7.15	0.0120
S-111													0.00	29.31	29.00							
114+00		-41.25	0.00	0.00	0.00	10.00	61.64	6.50	0.00	0.00	0.00	0.00										
MHP-8	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.00**	3.20	0.00	27.81	27.50	0.310	18	0.3949		4.05	
S-111		0.00	4.55	0.91					0.00	0.00		31.03	18.07	18.07	18.00	0.071	48	0.1033	Full	3.98	73.82	0.0120
OF-1					8,700.2								0.00	18.15	18.00							
114+00		41.25	0.00	6.50	6.18		0.00	7.05	7.09	0.00	0.00	50.01										
MHJ-8	1	69.15	0.00	0.00	0.00					0.00	0.00	**50.01**	12.96	0.00	14.15	14.00	0.150	48	0.2251		5.87	

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STORM SEWER HYDRAULICS

System: **POND A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	17.67	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	18.00	7	3	0.20	0.95	0.00

FROM / Station / Type	Brls	TO / Offset / Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-115		**S-116**	0.28	0.28	0.06					0.00	0.00		23.68	21.28	21.28	21.15	0.130	18	0.1576	Partial super	2.71	4.62	0.0120
118+00		-41.25	0.37	0.37	0.35	10.00	0.51	6.50	0.41	0.00	0.00	2.67		0.00	21.96	21.83							
DBI-D	1	82.50	0.00	0.00	0.00					0.00	0.00	**2.67**	2.40	0.00	20.46	20.33	0.130	18	0.1646		2.61		
S-116		**S-111**	0.24	3.54	0.71					0.00	0.00		23.68	18.93	18.93	18.07	0.855	36	0.2136	Full	4.72	18.16	0.0120
118+00		41.25	0.31	4.24	4.03	8,698.(	1.41	7.05	4.73	0.00	0.00	33.39		0.00	17.40	17.15							
DBI-D(J)	1	400.12	0.00	0.00	0.00					0.00	0.00	**33.39**	4.75	0.00	14.40	14.15	0.250	36	0.0632		2.57		
S-117		**S-118**	0.42	0.42	0.08					0.00	0.00		19.91	19.49	19.49	19.38	0.103	18	0.1251	Full	2.28	5.73	0.0120
121+03.27		-41.25	0.56	0.56	0.53	10.00	0.60	6.50	0.62	0.00	0.00	4.03		0.00	18.10	17.90							
DBI-D	1	82.50	0.00	0.00	0.00					0.00	0.00	**4.03**	0.42	0.00	16.60	16.40	0.200	18	0.2532		3.24		
S-118		**S-116**	0.66	3.02	0.60					0.00	0.00		19.91	19.38	19.38	18.93	0.458	36	0.1508	Full	3.97	19.57	0.0120
121+03.27		41.25	0.88	3.55	3.37	8,697.(	1.28	7.05	3.98	0.00	0.00	28.06		0.00	17.62	17.40							
DBI-D(J)	1	303.77	0.00	0.00	0.00					0.00	0.00	**28.06**	0.53	0.00	14.62	14.40	0.220	36	0.0734		2.77		
S-119		**S-120**	0.00	0.00	0.00					0.00	0.00		20.60	19.52	19.52	19.52	0.000	18	0.0000	Full	0.00	4.63	0.0120
123+50		-41.25	0.00	0.00	0.00	10.00	8,677.(	6.50	0.00	0.00	0.00	0.00		0.00	18.88	18.75							
MHP-8	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.00**	1.08	0.00	17.38	17.25	0.130	18	0.1656		2.62		
S-120		**S-118**	0.00	1.94	0.39					0.00	0.00		20.60	19.52	19.52	19.38	0.135	36	0.0547	Full	2.39	49.35	0.0120
123+50		41.25	0.00	2.11	2.01	8,695.(	1.72	7.05	2.39	0.00	0.00	16.89		0.00	18.75	17.62							
MHJ-8	1	246.73	0.00	0.00	0.00					0.00	0.00	**16.89**	1.08	0.00	15.75	14.62	1.130	36	0.4665		6.98		
S-121		**S-122**	0.26	0.26	0.05					0.00	0.00		22.05	19.81	19.81	19.77	0.039	18	0.0471	Full	1.40	9.58	0.0120
127+00		-41.25	0.34	0.34	0.33	10.00	0.98	6.50	0.38	0.00	0.00	2.47		0.00	20.33	19.77							
DBI-D	1	82.50	0.00	0.00	0.00					0.00	0.00	**2.47**	2.24	0.00	18.83	18.27	0.560	18	0.7089		5.42		
S-122		**S-120**	0.26	1.94	0.39					0.00	0.00		22.05	19.71	19.71	19.52	0.190	36	0.0546	Full	2.39	39.41	0.0120
127+00		41.25	0.34	2.11	2.01	8,693.(	2.42	7.05	2.39	0.00	0.00	16.89		0.00	19.77	18.75							
DBI-D(J)	1	347.34	0.00	0.00	0.00					0.00	0.00	**16.89**	2.34	0.00	16.77	15.75	1.020	36	0.2975		5.58		
S-123		**S-124**	0.00	0.00	0.00					0.00	0.00		26.76	23.56	23.56	23.43	0.130	18	0.1576	Partial critical	0.02	4.60	0.0120
130+00		-41.25	0.00	0.00	0.00	10.00	61.64	6.50	0.00	0.00	0.00	0.00		0.00	25.04	24.91							
MHP-8	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.00**	3.20	0.00	23.54	23.41	0.130	18	0.1635		2.60		
S-124		**S-122**	0.00	1.42	0.28					0.00	0.00		26.76	20.22	20.22	19.77	0.447	30	0.1492	Partial sub	6.58	36.34	0.0120
130+00		41.25	0.00	1.42	1.35	8,692.(	0.76	7.05	1.64	0.00	0.00	11.53		0.00	21.75	19.77							
MHP-8	1	299.55	0.00	0.00	0.00					0.00	0.00	**11.53**	6.54	0.00	19.25	17.27	1.980	30	0.6688		7.40		
S-125		**S-126**	0.00	0.00	0.00					0.00	0.00		27.70	24.40	24.40	24.27	0.130	18	0.1576	Partial critical	0.02	4.60	0.0120
134+00		-41.25	0.00	0.00	0.00	10.00	61.64	6.50	0.00	0.00	0.00	0.00		0.00	25.88	25.75							
MHP-8	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.00**	3.30	0.00	24.38	24.25	0.130	18	0.1635		2.60		
S-126		**S-124**	0.00	1.42	0.28					0.00	0.00		27.70	21.47	21.47	21.16	0.310	30	0.0771	Partial super	2.87	12.38	0.0120
134+00		41.25	0.00	1.42	1.35	8,690.(	2.33	7.05	1.64	0.00	0.00	11.53		0.00	22.06	21.75							
MHP-8	1	402.07	0.00	0.00	0.00					0.00	0.00	**11.53**	6.23	0.00	19.56	19.25	0.310	30	0.0777		2.52		

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T60v11.RPT 10/14/2002

STORM SEWER HYDRAULICS

System: **POND A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	17.67	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	18.00	7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls / Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL Crown Line	HGL Flow Line	Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-129	**S-130**	0.58	0.58	0.12					0.00	0.00		24.85	22.76	22.76	22.63	0.130	18	0.1576	Partial super	2.98	4.60	0.0120
137+16.02	-41.25	0.61	0.61	0.58	10.00	0.46	6.50	0.70	0.00	0.00	4.54		0.00	23.05	22.92							
DBI-D 1	82.50	0.00	0.00	0.00					0.00	0.00	**4.54**	2.09	0.00	21.55	21.42	0.130	18	0.1635		2.60		
S-130	**S-126**	0.45	1.42	0.28					0.00	0.00		24.85	22.27	22.27	22.06	0.213	30	0.0674	Full	2.35	13.05	0.0120
137+16.02	41.25	0.53	1.42	1.35	8,688.1	2.24	7.05	1.64	0.00	0.00	11.53		0.00	22.33	22.06							
DBI-D 1	316.02	0.00	0.00	0.00					0.00	0.00	**11.53**	2.58	0.00	19.83	19.56	0.270	30	0.0863		2.66		
S-131	**S-133**	0.00	0.00	0.00					0.00	0.00		26.42	23.82	23.82	23.82	0.000	18	0.0000	Full	0.00	7.87	0.0120
139+00	-41.25	0.00	0.00	0.00	10.00	8,677.5	6.50	0.00	0.00	0.00	0.00		0.00	24.20	23.82							
MHP-8 1	82.50	0.00	0.00	0.00					0.00	0.00	**0.00**	2.60	0.00	22.70	22.32	0.380	18	0.4780		4.45		
S-133	**S-130**	0.00	0.39	0.08					0.00	0.00		26.39	22.74	22.74	22.40	0.338	24	0.1837	Partial sub	5.10	25.24	0.0120
139+00	41.25	0.00	0.28	0.27	8,687.5	0.60	7.05	0.34	0.00	0.00	2.43		0.00	24.32	22.40							
MHP-8 1	183.98	0.00	0.00	0.00					0.00	0.00	**2.43**	3.65	0.00	22.32	20.40	1.920	24	1.0609		8.03		
S-134	**S-134A**	0.25	0.25	0.05					0.00	0.00		32.36	29.60	29.60	29.60	0.002	18	0.0038	Full	0.40	7.40	0.0120
142+00	-41.25	0.06	0.06	0.06	10.00	2.12	6.50	0.11	0.00	0.00	0.70		0.00	29.80	29.60							
DBI-D 1	50.25	0.00	0.00	0.00					0.00	0.00	**0.70**	2.76	0.00	28.30	28.10	0.200	18	0.4233		4.19		
S-134A	**S-135**	0.00	0.25	0.05					0.00	0.00		34.04	29.40	29.40	29.40	0.001	18	0.0045	Full	0.43	9.41	0.0120
142+00	9.00	0.00	0.08	0.08	12.12	1.24	6.04	0.13	0.00	0.00	0.76		0.00	29.60	29.40							
MHP-8 1	32.25	0.00	0.00	0.00					0.00	0.00	**0.76**	4.64	0.00	28.10	27.90	0.200	18	0.6838		5.32		
S-135	**S-133**	0.14	0.39	0.08					0.00	0.00		32.31	28.27	28.27	23.19	5.080	18	1.6933	Partial sub	5.86	14.88	0.0120
142+00	41.25	0.20	0.28	0.27	13.36	0.85	5.81	0.34	0.00	0.00	2.00		0.00	29.40	24.32							
DBI-D 1	300.00	0.00	0.00	0.00					0.00	0.00	**2.00**	4.04	0.00	27.90	22.82	5.080	18	1.7104		8.42		
S-135A	**S-134A**	0.00	0.00	0.00					0.00	0.00		34.50	30.63	30.63	30.43	0.200	18	0.5000	Partial critical	1.68	8.37	0.0120
142+40	8.81	0.02	0.02	0.02	10.00	0.40	6.50	0.02	0.00	0.00	0.12		0.00	32.00	31.80							
P-5 1	40.00	0.00	0.00	0.00					0.00	0.00	**0.12**	3.87	0.00	30.50	30.30	0.200	18	0.5405		4.73		

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STORM SEWER HYDRAULICS

System: **S-136**

PROJECT						CONDITIONS		
Number: 02-0309.000	Organization: DYER RIDDLE MILLS and PRECOUR	Outfall Tailwater El:	36.96	Storm Event - IDF Curve		Runoff Coefficients		
Description: RHODE ISLAND AVE	Designed by:	Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
County: VOLUSIA	Checked by:	Storm Sewer Control El	37.50	7	3	0.20	0.95	0.00

FROM Station / Type	TO Offset / Brls / Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-136	**OF-2A**	0.02	0.02	0.00					0.00	0.00		41.28	37.52	37.52	37.50	0.016	18	0.0222	Full	0.96	13.55	0.0120
145+16.14	41.35	0.27	0.27	0.26	10.00	0.00	6.50	0.26	0.00	0.00	1.69		0.00	38.50	37.50							
P-5	1 71.99	0.00	0.00	0.00					0.00	0.00	**1.69**	3.76	0.00	37.00	36.00	1.000	18	1.4186		7.67		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **S-137**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	36.96	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	37.50	7	3	0.20	0.95	0.00

FROM / Station / Type		TO / Offset / Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-137		**OF-2**	0.00	0.00	0.00					0.00	0.00		50.10	45.98	45.98	37.50	8.478	18	11.6348	Partial sub	18.93	41.52	0.0120
147+50		41.25	0.31	1.54	1.46	10.98	0.00	6.28	1.46	0.00	0.00	9.16		0.00	47.00	37.50							
P-5	1	72.86	0.00	0.00	0.00					0.00	0.00	**9.16**	4.12	0.00	45.50	36.00	9.500	18	13.3122		23.50		
S-138		**S-137**	0.00	0.00	0.00					0.00	0.00		59.55	56.59	56.59	46.59	10.000	18	4.0000	Partial sub	11.58	22.90	0.0120
150+00		41.25	0.39	1.23	1.16	10.62	0.36	6.36	1.16	0.00	0.00	7.41		0.00	57.50	47.50							
BW218	1	250.00	0.00	0.00	0.00					0.00	0.00	**7.41**	2.96	0.00	56.00	46.00	10.000	18	4.0506		12.96		
S-139		**S-138**	0.00	0.00	0.00					0.00	0.00		69.19	62.58	62.58	57.50	5.083	18	1.6918	Partial sub	8.13	16.17	0.0120
153+00		45.00	0.84	0.84	0.79	10.00	0.62	6.50	0.79	0.00	0.00	5.17		0.00	63.50	57.50							
BW218	1	300.45	0.00	0.00	0.00					0.00	0.00	**5.17**	6.61	0.00	62.00	56.00	6.000	18	2.0188		9.15		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **S-140**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	68.36	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	68.36	7	3	0.20	0.95	0.00

FROM Station / Type	TO Offset Brls	Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-140	**OF-3A**		0.00	0.00	0.00					0.00	0.00		76.53	73.31	73.31	68.36	4.947	18	9.0244	Partial sub	7.92	44.65	0.0120
160+50		42.18	0.08	0.08	0.08	10.00	0.00	6.50	0.08	0.00	0.00	0.51		0.00	74.69	66.50							
BW218	1	54.82	0.00	0.00	0.00					0.00	0.00	**0.51**	3.22	0.00	73.19	65.00	8.190	18	15.3962		25.27		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **S-141**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	68.36	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	68.36	7	3	0.20	0.95	0.00

FROM Station / Type	TO Offset Brls	Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-141	**OF-3B**		0.02	0.02	0.00					0.00	0.00		75.20	71.48	71.48	68.36	3.120	18	6.1777	Partial sub	11.74	40.67	0.0120
163+00		46.50	0.30	0.30	0.29	10.00	0.00	6.50	0.29	0.00	0.00	1.89		0.00	72.76	66.50							
P-5	1	50.50	0.00	0.00	0.00					0.00	0.00	**1.89**	3.72	0.00	71.26	65.00	6.260	18	12.7755		23.02		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **S-142**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	68.36	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	68.36	7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls	Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-142	**OF-3C**		0.02	0.02	0.00					0.00	0.00		71.48	68.38	68.38	68.36	0.021	18	0.0400	Full	1.29		
165+85		46.50	0.36	0.36	0.35	10.00	0.00	6.50	0.35	0.00	0.00	2.28		0.00	69.12	66.50						26.05	0.0120
P-5	1	51.48	0.00	0.00	0.00					0.00	0.00	**2.28**	3.10	0.00	67.62	65.00	2.620	18	5.2420		14.74		

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Future Roadway

RHODE ISLAND AVE
PAVEMENT DRAINAGE/INLET CALCULATIONS

Equations:

Impervious Area = Station Length * Impervious Cross Length

Q = CIA

Long Slope = DPGL / Station Length

Allowable Q = (28 * Long Slope0.5)

Terminal Allowable Q = (15 * Long Slope0.5)

Long Slope = DPGL / Station Length

Spread = [(0.015*Q)/(0.56*Cross Slope1.67*Long Slope0.5)]0.375

Terminal Inlet (TI) is the terminal point in a series of shoulder inlets, where the inlet placement ceases.

Low Point (LP) is point in the Roadway Profile where there will be bi-directional flow

Transition Break (TB) is a point where the superelevation equals zero.

Shoulder Gutter 10-yr Intensity 7.4 in/hr

All Other Gutters Intensity 4.0 in/hr

Calcs:

Struct. No.	Station ID	Offset	Side	Area (acres) 0.20	Area (acres) 0.950	Calc Flow (cfs)	Allow Flow (cfs)	Inlet Type	Cross Slope (ft/ft)	Long Slope %	Spread (ft)	Allowable Spread (ft)
S-200	101+00	41.25	LT	0.01	0.244	0.94		P-5	0.020	1.63%	6.31	12.5
S-201	101+00	41.25	RT	0.04	0.189	0.75		P-5	0.020	1.63%	5.80	12.5
S-202	103+00	41.25	LT	0.01	0.201	0.77		P-5	0.020	0.97%	6.45	12.5
S-203	103+00	41.25	RT	0.03	0.155	0.62		P-5	0.020	0.97%	5.93	12.5
High Point	104+64.11											12.5
S-204	106+00	41.25	LT	0.04	0.129	0.52		P-5	0.020	0.80%	5.76	12.5
S-205	106+00	41.25	RT	0.04	0.129	0.52		P-5	0.020	0.80%	5.76	12.5
S-205A	108+40	41.25	LT	0.06	0.227	0.92		P-5	0.020	0.18%	9.40	12.5
S-205B	108+40	41.25	RT	0.06	0.227	0.92		P-5	0.020	0.18%	9.40	12.5
S-206	108+60.61	41.25	LT	0.01	0.020	0.08		P-5	0.020	0.01%	6.46	12.5
S-207	108+60.61	41.25	RT	0.01	0.020	0.08		P-5	0.020	0.01%	6.46	12.5
Low Point	108+60.61											12.5
S-206	108+60.61	41.25	LT	0.01	0.018	0.07		P-5	0.020	0.01%	6.31	12.5
S-207	108+60.61	41.25	RT	0.01	0.018	0.07		P-5	0.020	0.01%	6.31	12.5
S-207A	108+80	41.25	LT	0.06	0.208	0.84		P-5	0.020	0.17%	9.20	12.5
S-207B	108+80	41.25	RT	0.06	0.208	0.84		P-5	0.020	0.17%	9.20	12.5
S-208	111+00	41.25	LT	0.04	0.139	0.56		P-5	0.020	0.78%	5.95	12.5
S-209	111+00	41.25	RT	0.04	0.139	0.56		P-5	0.020	0.78%	5.95	12.5
High Point	112+46.32											12.5
S-210	114+00	41.25	LT	0.04	0.146	0.59		P-5	0.020	0.82%	6.00	12.5
S-211	114+00	41.25	RT	0.04	0.146	0.59		P-5	0.020	0.82%	6.00	12.5
S-215	118+00	41.25	LT	0.11	0.379	1.53		P-5	0.020	2.48%	6.99	12.5
S-216	118+00	41.25	RT	0.11	0.379	1.53		P-5	0.020	2.48%	6.99	12.5
S-216A	120+80	41.25	LT	0.08	0.265	1.07		P-5	0.020	0.19%	9.89	12.5
S-216B	120+80	41.25	RT	0.08	0.265	1.07		P-5	0.020	0.19%	9.89	12.5
S-217	121+03.27	41.25	LT	0.01	0.022	0.09		P-5	0.020	0.01%	6.76	12.5
S-218	121+03.27	41.25	RT	0.01	0.022	0.09		P-5	0.020	0.01%	6.76	12.5
Low Point	121+03.27											12.5
S-217	121+03.27	41.25	LT	0.00	0.016	0.06		P-5	0.020	0.01%	5.97	12.5
S-218	121+03.27	41.25	RT	0.00	0.016	0.06		P-5	0.020	0.01%	5.97	12.5
S-218A	121+20	41.25	LT	0.06	0.218	0.88		P-5	0.020	0.14%	9.77	12.5
S-218B	121+20	41.25	RT	0.06	0.218	0.88		P-5	0.020	0.14%	9.77	12.5
S-219	123+50	41.25	LT	0.09	0.331	1.33		P-5	0.020	0.30%	9.87	12.5
S-220	123+50	41.25	RT	0.09	0.331	1.33		P-5	0.020	0.30%	9.87	12.5
S-221	127+00	41.25	LT	0.08	0.284	1.14		P-5	0.020	1.09%	7.31	12.5
S-222	127+00	41.25	RT	0.08	0.284	1.14		P-5	0.020	1.09%	7.31	12.5
S-223	130+00	41.25	LT	0.07	0.238	0.96		P-5	0.020	1.17%	6.76	12.5

RHODE ISLAND AVE
PAVEMENT DRAINAGE/INLET CALCULATIONS

Struct. No.	Station ID	Offset	Side	Area (acres) 0.20	Area (acres) 0.950	Calc Flow (cfs)	Allow Flow (cfs)	Inlet Type	Cross Slope (ft/ft)	Long Slope %	Spread (ft)	Allowable Spread (ft)
S-224	130+00	41.25	RT	0.07	0.238	0.96		P-5	0.020	1.17%	6.76	12.5
High Point	132+50.89											12.5
S-225	134+00	41.25	LT	0.04	0.141	0.57		P-5	0.020	0.69%	6.13	12.5
S-226	134+00	41.25	RT	0.04	0.141	0.57		P-5	0.020	0.69%	6.13	12.5
S-227	136+95	41.25	LT	0.08	0.279	1.13		P-5	0.020	0.18%	10.14	12.5
S-228	136+95	41.25	RT	0.08	0.279	1.13		P-5	0.020	0.18%	10.14	12.5
S-229	137+16.02	41.25	LT	0.01	0.020	0.08		P-5	0.020	0.01%	6.51	12.5
S-230	137+16.02	41.25	RT	0.01	0.020	0.08		P-5	0.020	0.01%	6.51	12.5
Low Point	137+16.02											12.5
S-229	137+16.02	41.25	LT	0.01	0.018	0.07		P-5	0.020	0.01%	6.26	12.5
S-230	137+16.02	41.25	RT	0.01	0.018	0.07		P-5	0.020	0.01%	6.26	12.5
S-230A	137+35	41.25	LT	0.04	0.156	0.63		P-5	0.020	0.17%	8.32	12.5
S-230B	137+35	41.25	RT	0.04	0.156	0.63		P-5	0.020	0.17%	8.32	12.5
S-231	139+00	41.25	LT	0.08	0.284	1.14		P-5	0.020	1.62%	6.80	12.5
S-232	139+00	0.00	MD					MH				12.5
S-233	139+00	41.25	RT	0.08	0.284	1.14		P-5	0.020	1.62%	6.80	12.5
S-234	142+00	41.25	LT	0.09	0.299	1.21		P-5	0.020	2.01%	6.65	
S-235	142+00	41.25	RT	0.09	0.299	1.21		P-5	0.020	2.01%	6.65	
												12.5
S-236A	145+16.14	41.25	LT	0.04	0.234	0.92		P-5	0.020	3.81%	5.34	12.5
S-236	145+16.14	41.25	RT	0.04	0.234	0.92		P-5	0.020	3.81%	5.34	12.5
S-237A	147+50	41.25	LT	0.05	0.250	0.99		P-5	0.020	3.81%	5.47	12.5
S-237	147+50	41.25	RT	0.05	0.250	0.99		P-5	0.020	3.81%	5.47	12.5
S-238A	150+00	41.50	LT	0.06	0.300	1.18		BWI	0.020	3.81%	5.86	11
S-238	150+00	41.50	RT	0.06	0.300	1.18		BWI	0.020	3.81%	5.86	11
S-239A	153+00	45.00	LT	0.01	0.820	3.13		BWI	0.020	2.49%	9.14	11
S-239	153+00	45.00	RT	0.01	0.820	3.13		BWI	0.020	2.49%	9.14	11
High Point	159+74.29											
S-242A	160+50	41.50	LT	0.02	0.072	0.29		BWI	0.020	0.21%	5.94	12.5
S-242	160+50	41.50	RT	0.02	0.083	0.33		BWI	0.020	0.21%	6.24	12.5
S-243A	163+00	46.25	LT	0.07	0.242	0.98		P-5	0.020	0.77%	7.36	12.5
S-243	163+00	46.25	RT	0.02	0.306	1.18		P-5	0.020	0.77%	7.89	12.5
S-244A	165+85	46.25	LT	0.05	0.270	1.06		P-5	0.020	2.30%	6.19	12.5
S-244	165+85	46.25	RT	0.02	0.348	1.34		P-5	0.020	2.30%	6.75	12.5

STORM SEWER HYDRAULICS

System: **Pond A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

		Storm Event - IDF Curve		CONDITIONS Runoff Coefficients		
Outfall Tailwater El:	17.67	Zone	Frequency	Area 1	Area 2	Area 3
Exit Loss at Outfall:	0.00					
Storm Sewer Control El	18.00	7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls / Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-200	**S-201**	0.01	0.01	0.00					0.00	0.00		28.52	26.19	26.19	26.18	0.015	18	0.0179	Full	0.86		
101+20	-41.25	0.24	0.24	0.23	10.00	1.60	6.50	0.23	0.00	0.00	1.52		0.00	26.31	26.18						4.60	0.0120
P-5	1 82.50	0.00	0.00	0.00					0.00	0.00	**1.52**	2.33	0.00	24.81	24.68	0.130	18	0.1635		2.60		
S-201	**S-203**	0.04	0.05	0.01					0.00	0.00		28.50	25.95	25.95	25.86	0.093	18	0.0518	Full	1.47		
101+20	41.25	0.19	0.43	0.41	11.60	2.05	6.15	0.42	0.00	0.00	2.59		0.00	26.18	25.86						4.84	0.0120
P-5	1 180.00	0.00	0.00	0.00					0.00	0.00	**2.59**	2.55	0.00	24.68	24.36	0.320	18	0.1808		2.74		
S-202	**S-203**	0.01	0.01	0.00					0.00	0.00		31.33	28.15	28.15	28.02	0.130	18	0.1576	Partial super	2.22		
103+00	-41.25	0.20	0.20	0.19	10.00	0.62	6.50	0.19	0.00	0.00	1.26		0.00	29.12	28.99						4.60	0.0120
P-5	1 82.50	0.00	0.00	0.00					0.00	0.00	**1.26**	3.18	0.00	27.62	27.49	0.130	18	0.1635		2.60		
S-203	**S-205**	0.03	0.09	0.02					0.00	0.00		31.33	25.63	25.63	25.53	0.098	24	0.0325	Full	1.41		
103+00	41.25	0.16	0.79	0.75	13.64	3.55	5.76	0.77	0.00	0.00	4.42		0.00	25.86	25.53						8.17	0.0120
P-5	1 300.00	0.00	0.00	0.00					0.00	0.00	**4.42**	5.70	0.00	23.86	23.53	0.330	24	0.1111		2.60		
S-204	**S-205**	0.04	0.04	0.01					0.00	0.00		31.58	28.31	28.31	28.18	0.130	18	0.1576	Partial critical	1.99		
106+00	-41.25	0.13	0.13	0.12	10.00	0.69	6.50	0.13	0.00	0.00	0.85		0.00	29.37	29.24						4.60	0.0120
P-5	1 82.50	0.00	0.00	0.00					0.00	0.00	**0.85**	3.27	0.00	27.87	27.74	0.130	18	0.1635		2.60		
S-205	**S-205B**	0.04	0.17	0.03					0.00	0.00		31.58	25.39	25.39	25.27	0.115	24	0.0481	Full	1.71		
106+00	41.25	0.13	1.05	0.99	17.20	2.34	5.22	1.03	0.00	0.00	5.37		0.00	25.53	25.27						8.12	0.0120
P-5	1 240.00	0.00	0.00	0.00					0.00	0.00	**5.37**	6.19	0.00	23.53	23.27	0.260	24	0.1097		2.58		
S-205A	**S-206**	0.06	0.06	0.01					0.00	0.00		29.69	27.45	27.45	27.45	0.003	18	0.0169	Full	0.84		
108+40	-41.25	0.23	0.23	0.22	10.00	0.41	6.50	0.23	0.00	0.00	1.48		0.00	27.48	27.45						4.70	0.0120
P-5	1 20.61	0.00	0.00	0.00					0.00	0.00	**1.48**	2.24	0.00	25.98	25.95	0.030	18	0.1703		2.66		
S-205B	**S-207**	0.06	0.23	0.05					0.00	0.00		29.69	25.26	25.26	25.25	0.013	24	0.0640	Full	1.97		
108+40	41.25	0.23	1.27	1.21	19.54	0.17	4.93	1.26	0.00	0.00	6.20		0.00	25.27	25.25						8.26	0.0120
P-5	1 20.61	0.00	0.00	0.00					0.00	0.00	**6.20**	4.43	0.00	23.27	23.25	0.020	24	0.1136		2.63		
S-206	**S-207**	0.02	0.14	0.03					0.00	0.00		29.67	26.92	26.92	26.79	0.130	18	0.1576	Partial super	2.79		
108+60.61	-41.25	0.04	0.47	0.45	10.42	0.49	6.40	0.48	0.00	0.00	3.06		0.00	27.53	27.40						4.60	0.0120
P-6	1 82.50	0.00	0.00	0.00					0.00	0.00	**3.06**	2.75	0.00	26.03	25.90	0.130	18	0.1635		2.60		
S-207	**S-207B**	0.02	0.39	0.08					0.00	0.00		29.67	25.23	25.23	25.22	0.007	30	0.0385	Full	1.78		
108+60.61	41.25	0.04	1.79	1.70	19.71	0.18	4.92	1.77	0.00	0.00	8.72		0.00	25.25	25.22						19.01	0.0120
P-6	1 19.39	0.00	0.00	0.00					0.00	0.00	**8.72**	4.44	0.00	22.75	22.72	0.030	30	0.1830		3.87		
S-207A	**S-206**	0.06	0.06	0.01					0.00	0.00		29.69	27.45	27.45	27.45	0.003	18	0.0144	Full	0.77		
108+80	-41.25	0.21	0.21	0.20	10.00	0.42	6.50	0.21	0.00	0.00	1.36		0.00	27.48	27.45						4.87	0.0120
P-5	1 19.39	0.00	0.00	0.00					0.00	0.00	**1.36**	2.24	0.00	25.98	25.95	0.030	18	0.1830		2.76		
S-207B	**S-209**	0.06	0.45	0.09					0.00	0.00		29.69	24.24	24.24	24.02	0.220	30	0.1000	Partial super	3.11		
108+80	41.25	0.21	1.99	1.89	19.89	1.18	4.89	1.98	0.00	0.00	9.71		0.00	25.22	25.00						14.15	0.0120
P-5	1 220.00	0.00	0.00	0.00					0.00	0.00	**9.71**	5.45	0.00	22.72	22.50	0.220	30	0.1014		2.88		

Units: ENGLISH

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Portions of ASAD were developed by Kenneth J. Leeming, P.E. at International Engineering Consultants, Inc.

STORM SEWER HYDRAULICS

System: **Pond A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

Outfall Tailwater El:	17.67
Exit Loss at Outfall:	0.00
Storm Sewer Control El	18.00

CONDITIONS				
Storm Event - IDF Curve		Runoff Coefficients		
Zone	Frequency	Area 1	Area 2	Area 3
7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls	Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-208	**S-209**		0.04	0.04	0.01					0.00	0.00		31.58	28.32	28.32	28.19	0.130	18	0.1576	Partial critical	2.04	4.60	0.0120
111+00	-41.25		0.14	0.14	0.13	10.00	0.68	6.50	0.14	0.00	0.00	0.91		0.00	29.37	29.24							
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.91**	3.26	0.00	27.87	27.74	0.130	18	0.1635		2.60		
S-209	**S-211**		0.04	0.53	0.11					0.00	0.00		31.58	19.31	19.31	18.04	1.268	30	0.4237	Partial sub	7.83	47.32	0.0120
111+00	41.25		0.14	2.27	2.16	21.07	0.64	4.77	2.26	0.00	0.00	10.79		0.00	21.00	17.65							
P-5	1	299.37	0.00	0.00	0.00					0.00	0.00	**10.79**	12.27	0.00	18.50	15.15	3.350	30	1.1342		9.64		
S-210	**S-211**		0.04	0.04	0.01					0.00	0.00		31.52	28.18	28.18	27.87	0.310	18	0.3758	Partial critical	2.82	7.15	0.0120
114+00	-41.25		0.15	0.15	0.14	10.00	0.49	6.50	0.15	0.00	0.00	0.95		0.00	29.31	29.00							
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.95**	3.34	0.00	27.81	27.50	0.310	18	0.3949		4.05		
S-211	**OF-1**		0.04	2.37	0.47					0.00	0.00		31.52	18.04	18.04	18.00	0.042	48	0.0608	Full	3.05	73.82	0.0120
114+00	41.25		0.15	8.65	8.22	24.77	0.00	4.41	8.69	0.00	0.00	38.39		0.00	18.15	18.00							
J-5	1	69.15	0.00	0.00	0.00					0.00	0.00	**38.39**	13.48	0.00	14.15	14.00	0.150	48	0.2251		5.87		
S-215	**S-216**		0.11	0.11	0.02					0.00	0.00		24.17	21.24	21.24	21.11	0.130	18	0.1576	Partial super	2.67	4.63	0.0120
118+00	-41.25		0.38	0.38	0.36	10.00	0.51	6.50	0.38	0.00	0.00	2.49		0.00	21.96	21.83							
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**2.49**	2.93	0.00	20.46	20.33	0.130	18	0.1656		2.62		
S-216	**S-211**		0.11	1.76	0.35					0.00	0.00		24.17	18.64	18.64	18.04	0.602	36	0.1505	Full	3.97	18.18	0.0120
118+00	41.25		0.38	6.09	5.79	23.08	1.68	4.57	6.14	0.00	0.00	28.03		0.00	17.40	17.15							
J-5	1	400.12	0.00	0.00	0.00					0.00	0.00	**28.03**	5.53	0.00	14.40	14.15	0.250	36	0.0633		2.57		
S-216A	**S-217**		0.08	0.08	0.02					0.00	0.00		20.42	19.09	19.09	19.08	0.005	18	0.0234	Full	0.99	8.38	0.0120
120+80	-41.25		0.26	0.26	0.25	10.00	0.39	6.50	0.27	0.00	0.00	1.74		0.00	18.21	18.10							
P-5	1	23.27	0.00	0.00	0.00					0.00	0.00	**1.74**	1.33	0.00	16.71	16.60	0.110	18	0.5427		4.74		
S-216B	**S-216**		0.08	1.54	0.31					0.00	0.00		20.42	18.99	18.99	18.64	0.342	36	0.1219	Full	3.57	19.47	0.0120
120+80	41.25		0.26	5.33	5.07	21.77	1.31	4.69	5.37	0.00	0.00	25.23		0.00	17.60	17.40							
J-5	1	280.50	0.00	0.00	0.00					0.00	0.00	**25.23**	1.43	0.00	14.60	14.40	0.200	36	0.0726		2.75		
S-217	**S-218**		0.01	0.15	0.03					0.00	0.00		20.40	19.08	19.08	19.01	0.072	18	0.0875	Full	1.90	5.74	0.0120
121+03.27	-41.25		0.04	0.52	0.49	10.39	0.72	6.41	0.52	0.00	0.00	3.37		0.00	18.10	17.90							
P-6	1	82.50	0.00	0.00	0.00					0.00	0.00	**3.37**	1.32	0.00	16.60	16.40	0.200	18	0.2548		3.25		
S-218	**S-216B**		0.01	1.46	0.29					0.00	0.00		20.40	19.01	19.01	18.99	0.026	36	0.1106	Full	3.40	23.91	0.0120
121+03.27	41.25		0.04	5.07	4.81	21.66	0.11	4.71	5.11	0.00	0.00	24.03		0.00	17.62	17.60							
J-6	1	23.27	0.00	0.00	0.00					0.00	0.00	**24.03**	1.39	0.00	14.62	14.60	0.020	36	0.1095		3.38		
S-218A	**S-217**		0.06	0.06	0.01					0.00	0.00		20.41	19.09	19.09	19.08	0.003	18	0.0157	Full	0.81	9.71	0.0120
121+20	-41.25		0.22	0.22	0.21	10.00	0.35	6.50	0.22	0.00	0.00	1.43		0.00	18.20	18.10							
P-5	1	16.73	0.00	0.00	0.00					0.00	0.00	**1.43**	1.32	0.00	16.70	16.60	0.100	18	0.7283		5.50		
S-218B	**S-218**		0.06	1.30	0.26					0.00	0.00		20.41	19.03	19.03	19.01	0.015	36	0.0879	Full	3.03	29.84	0.0120
121+20	41.25		0.22	4.51	4.28	21.57	0.09	4.72	4.54	0.00	0.00	21.42		0.00	17.64	17.62							
J-5	1	16.73	0.00	0.00	0.00					0.00	0.00	**21.42**	1.38	0.00	14.64	14.62	0.020	36	0.1705		4.22		

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STORM SEWER HYDRAULICS

System: **Pond A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	17.67	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	18.00	7	3	0.20	0.95	0.00

FROM Station / Type	Brls	TO Offset / Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-219		**S-220**	0.09	0.09	0.02					0.00	0.00		21.09	19.25	19.25	19.22	0.030	18	0.0361	Full	1.22		
123+50		-41.25	0.33	0.33	0.31	10.00	1.12	6.50	0.33	0.00	0.00	2.16		0.00	18.88	18.75						4.63	0.0120
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**2.16**	1.84	0.00	17.38	17.25	0.130	18	0.1656		2.62		
S-220		**S-218B**	0.09	1.24	0.25					0.00	0.00		21.09	19.22	19.22	19.03	0.194	36	0.0843	Full	2.97		
123+50		41.25	0.33	4.29	4.08	20.28	1.29	4.85	4.32	0.00	0.00	20.98		0.00	18.32	17.64						39.72	0.0120
J-5	1	230.00	0.00	0.00	0.00					0.00	0.00	**20.98**	1.87	0.00	15.32	14.64	0.680	36	0.3022		5.62		
S-221		**S-222**	0.08	0.08	0.02					0.00	0.00		22.54	19.79	19.79	19.77	0.022	18	0.0267	Full	1.05		
127+00		-41.25	0.28	0.28	0.27	10.00	1.31	6.50	0.29	0.00	0.00	1.86		0.00	20.33	19.77						9.61	0.0120
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**1.86**	2.75	0.00	18.83	18.27	0.560	18	0.7134		5.44		
S-222		**S-220**	0.08	1.06	0.21					0.00	0.00		22.54	19.45	19.45	19.22	0.232	36	0.0669	Full	2.64		
127+00		41.25	0.28	3.63	3.45	18.09	2.19	5.11	3.66	0.00	0.00	18.69		0.00	19.77	18.32						47.03	0.0120
J-5	1	347.34	0.00	0.00	0.00					0.00	0.00	**18.69**	3.09	0.00	16.77	15.32	1.450	36	0.4236		6.65		
S-223		**S-224**	0.07	0.07	0.01					0.00	0.00		27.25	24.14	24.14	24.01	0.130	18	0.1576	Partial super	2.36		
130+00		-41.25	0.24	0.24	0.23	10.00	0.58	6.50	0.24	0.00	0.00	1.56		0.00	25.04	24.91						4.60	0.0120
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**1.56**	3.11	0.00	23.54	23.41	0.130	18	0.1635		2.60		
S-224		**S-222**	0.07	0.90	0.18					0.00	0.00		27.25	20.41	20.41	19.77	0.641	30	0.2140	Partial sub	7.19		
130+00		41.25	0.24	3.06	2.91	17.39	0.69	5.20	3.09	0.00	0.00	16.04		0.00	21.75	19.77						36.37	0.0120
P-5	1	299.55	0.00	0.00	0.00					0.00	0.00	**16.04**	6.84	0.00	19.25	17.27	1.980	30	0.6699		7.41		
S-225		**S-226**	0.04	0.04	0.01					0.00	0.00		28.19	24.83	24.83	24.70	0.130	18	0.1576	Partial critical	2.04		
134+00		-41.25	0.14	0.14	0.13	10.00	0.67	6.50	0.14	0.00	0.00	0.92		0.00	25.88	25.75						4.60	0.0120
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**0.92**	3.36	0.00	24.38	24.25	0.130	18	0.1635		2.60		
S-226		**S-224**	0.04	0.76	0.15					0.00	0.00		28.19	22.17	22.17	21.75	0.422	30	0.1049	Full	2.93		
134+00		41.25	0.14	2.58	2.45	15.11	2.29	5.52	2.61	0.00	0.00	14.39		0.00	22.06	21.75						12.38	0.0120
P-5	1	402.07	0.00	0.00	0.00					0.00	0.00	**14.39**	6.02	0.00	19.56	19.25	0.310	30	0.0777		2.52		
S-227		**S-229**	0.08	0.08	0.02					0.00	0.00		25.44	23.24	23.24	23.23	0.005	18	0.0258	Full	1.03		
136+95		-41.25	0.28	0.28	0.27	10.00	0.34	6.50	0.28	0.00	0.00	1.83		0.00	23.26	23.23						4.64	0.0120
P-5	1	21.02	0.00	0.00	0.00					0.00	0.00	**1.83**	2.20	0.00	21.76	21.73	0.030	18	0.1665		2.63		
S-228		**S-226**	0.08	0.68	0.14					0.00	0.00		25.44	22.44	22.44	22.17	0.273	30	0.0924	Full	2.75		
136+95		41.25	0.28	2.30	2.19	13.32	1.79	5.82	2.32	0.00	0.00	13.51		0.00	22.30	21.75						19.28	0.0120
P-5	1	295.00	0.00	0.00	0.00					0.00	0.00	**13.51**	3.00	0.00	19.80	19.25	0.550	30	0.1884		3.93		
S-229		**S-230**	0.02	0.17	0.03					0.00	0.00		25.42	23.01	23.01	22.92	0.086	18	0.1048	Full	2.08		
137+16.02		-41.25	0.04	0.57	0.54	10.34	0.66	6.42	0.57	0.00	0.00	3.68		0.00	23.05	22.92						4.60	0.0120
P-6	1	82.50	0.00	0.00	0.00					0.00	0.00	**3.68**	2.41	0.00	21.55	21.42	0.130	18	0.1635		2.60		
S-230		**S-228**	0.02	0.60	0.12					0.00	0.00		25.42	22.46	22.46	22.44	0.015	30	0.0721	Full	2.43		
137+16.02		41.25	0.04	2.02	1.92	13.18	0.14	5.84	2.04	0.00	0.00	11.93		0.00	22.33	22.30						18.13	0.0120
P-6	1	21.02	0.00	0.00	0.00					0.00	0.00	**11.93**	2.96	0.00	19.83	19.80	0.030	30	0.1665		3.69		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **Pond A**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	17.67	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	18.00	7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls / Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-230A	**S-229**	0.07	0.07	0.01					0.00	0.00		25.44	23.23	23.23	23.23	0.004	18	0.0208	Full	0.93		
137+35	-41.25	0.25	0.25	0.24	10.00	0.34	6.50	0.25	0.00	0.00	1.64		0.00	23.26	23.23						4.93	0.0120
P-5	1 18.98	0.00	0.00	0.00					0.00	0.00	**1.64**	2.21	0.00	21.76	21.73	0.030	18	0.1877		2.79		
S-230B	**S-230**	0.07	0.41	0.08					0.00	0.00		25.44	22.48	22.48	22.46	0.022	24	0.1167	Full	2.67		
137+35	41.25	0.25	1.42	1.35	13.06	0.12	5.86	1.43	0.00	0.00	8.37		0.00	22.40	22.33						16.22	0.0120
P-5	1 18.98	0.00	0.00	0.00					0.00	0.00	**8.37**	2.96	0.00	20.40	20.33	0.070	24	0.4380		5.16		
S-231	**S-232**	0.08	0.08	0.02					0.00	0.00		26.91	23.83	23.83	23.82	0.011	18	0.0267	Full	1.05		
139+00	-41.25	0.28	0.28	0.27	10.00	0.65	6.50	0.29	0.00	0.00	1.86		0.00	24.20	23.82						11.34	0.0120
P-5	1 41.25	0.00	0.00	0.00					0.00	0.00	**1.86**	3.08	0.00	22.70	22.32	0.380	18	0.9935		6.42		
S-232	**S-233**	0.00	0.08	0.02					0.00	0.00		27.71	23.54	23.54	23.48	0.060	18	0.1455	Partial super	2.41		
139+00	0.00	0.00	0.28	0.27	10.65	0.28	6.35	0.29	0.00	0.00	1.82		0.00	24.38	24.32						4.51	0.0120
MHP-8	1 41.25	0.00	0.00	0.00					0.00	0.00	**1.82**	4.17	0.00	22.88	22.82	0.060	18	0.1569		2.55		
S-233	**S-230B**	0.08	0.34	0.07					0.00	0.00		26.91	23.02	23.02	22.48	0.535	24	0.3245	Partial sub	7.16		
139+00	41.25	0.28	1.17	1.11	12.67	0.38	5.93	1.18	0.00	0.00	6.98		0.00	24.32	22.40						26.68	0.0120
P-5	1 165.00	0.00	0.00	0.00					0.00	0.00	**6.98**	3.89	0.00	22.32	20.40	1.920	24	1.1852		8.49		
S-234	**S-235**	0.09	0.09	0.02					0.00	0.00		32.85	26.52	26.52	26.50	0.025	18	0.0298	Full	1.11		
142+00	-41.25	0.30	0.30	0.28	10.00	1.24	6.50	0.30	0.00	0.00	1.96		0.00	26.70	26.50						5.71	0.0120
P-5	1 82.50	0.00	0.00	0.00					0.00	0.00	**1.96**	6.33	0.00	25.20	25.00	0.200	18	0.2516		3.23		
S-235	**S-233**	0.09	0.18	0.04					0.00	0.00		32.85	25.88	25.88	25.12	0.760	18	0.2533	Partial super	3.48		
142+00	41.25	0.30	0.60	0.57	11.24	1.44	6.22	0.60	0.00	0.00	3.76		0.00	26.50	25.74						5.76	0.0120
P-5	1 300.00	0.00	0.00	0.00					0.00	0.00	**3.76**	6.97	0.00	25.00	24.24	0.760	18	0.2559		3.26		

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STORM SEWER HYDRAULICS

System: **S-236**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

Outfall Tailwater El:	36.96
Exit Loss at Outfall:	0.00
Storm Sewer Control El	37.50

CONDITIONS				
Storm Event - IDF Curve		Runoff Coefficients		
Zone	Frequency	Area 1	Area 2	Area 3
7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls / Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe: Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-236	**OF-2A**	0.04	0.08	0.02					0.00	0.00		41.28	37.55	37.55	37.50	0.047	18	0.0650	Full	1.64		
145+16.14	41.25	0.24	0.48	0.46	11.58	0.00	6.15	0.47	0.00	0.00	2.90		0.00	38.50	37.50						13.55	0.0120
P-5	1 72.06	0.00	0.00	0.00					0.00	0.00	**2.90**	3.73	0.00	37.00	36.00	1.000	18	1.4172		7.67		
S-236A	**S-236**	0.04	0.04	0.01					0.00	0.00		41.28	38.52	38.52	38.50	0.015	18	0.0182	Full	0.87		
145+16.14	-41.25	0.24	0.24	0.23	10.00	1.58	6.50	0.24	0.00	0.00	1.54		0.00	38.87	38.50						7.76	0.0120
P-5	1 82.50	0.00	0.00	0.00					0.00	0.00	**1.54**	2.76	0.00	37.37	37.00	0.370	18	0.4654		4.39		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **S-237**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	36.96	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	37.50	7	3	0.20	0.95	0.00

FROM Station / Type		TO Offset / Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-237		**OF-2**	0.05	0.24	0.05					0.00	0.00		50.10	45.17	45.17	37.50	7.674	18	10.5318	Partial sub	21.20	39.27	0.0120
147+50		41.25	0.25	2.74	2.60	11.57	0.00	6.15	2.65	0.00	0.00	16.31		0.00	46.00	37.50							
P-5	1	72.86	0.00	0.00	0.00					0.00	0.00	**16.31**	4.93	0.00	44.50	36.00	8.500	18	11.9109		22.22		
S-237A		**S-237**	0.05	0.05	0.01					0.00	0.00		50.10	46.85	46.85	46.45	0.400	18	0.4849	Partial critical	3.57	8.07	0.0120
147+50		-41.25	0.25	0.25	0.24	10.00	0.39	6.50	0.25	0.00	0.00	1.61		0.00	47.90	47.50							
P-5	1	82.50	0.00	0.00	0.00					0.00	0.00	**1.61**	3.25	0.00	46.40	46.00	0.400	18	0.5031		4.57		
S-238		**S-237**	0.06	0.14	0.03					0.00	0.00		59.74	56.82	56.82	46.82	10.000	18	4.0000	Partial sub	13.50	22.90	0.0120
150+00		41.25	0.30	2.24	2.13	11.26	0.31	6.22	2.16	0.00	0.00	13.40		0.00	57.50	47.50							
BW218	1	250.00	0.00	0.00	0.00					0.00	0.00	**13.40**	2.92	0.00	56.00	46.00	10.000	18	4.0506		12.96		
S-238A		**S-238**	0.06	0.06	0.01					0.00	0.00		59.74	57.52	57.52	57.50	0.024	18	0.0288	Full	1.09	9.04	0.0120
150+00		-41.25	0.30	0.30	0.28	10.00	1.26	6.50	0.30	0.00	0.00	1.93		0.00	58.00	57.50							
BW218	1	82.50	0.00	0.00	0.00					0.00	0.00	**1.93**	2.22	0.00	56.50	56.00	0.500	18	0.6309		5.11		
S-239		**S-238**	0.01	0.02	0.00					0.00	0.00		69.19	62.86	62.86	56.86	6.000	18	1.9970	Partial sub	9.65	16.17	0.0120
153+00		45.00	0.82	1.64	1.56	10.29	0.52	6.43	1.56	0.00	0.00	10.05		0.00	63.50	57.50							
BW218	1	300.45	0.00	0.00	0.00					0.00	0.00	**10.05**	6.33	0.00	62.00	56.00	6.000	18	2.0188		9.15		
S-239A		**S-239**	0.01	0.01	0.00					0.00	0.00		69.19	66.83	66.83	66.33	0.500	18	0.5556	Partial critical	5.09	8.64	0.0120
153+00		-45.00	0.82	0.82	0.78	10.00	0.29	6.50	0.78	0.00	0.00	5.08		0.00	67.50	67.00							
BW218	1	90.00	0.00	0.00	0.00					0.00	0.00	**5.08**	2.36	0.00	66.00	65.50	0.500	18	0.5764		4.89		

Units: ENGLISH

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STORM SEWER HYDRAULICS

System: **S-240**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

CONDITIONS					
Outfall Tailwater El:	68.36	Storm Event - IDF Curve		Runoff Coefficients		
Exit Loss at Outfall:	0.00	Zone	Frequency	Area 1	Area 2	Area 3
Storm Sewer Control El	68.36	7	3	0.20	0.95	0.00

FROM Station / Type	TO Offset / Brls	Len	Drainage Areas Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs) Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-240	**OF-3A**		0.02	0.04	0.01					0.00	0.00		76.53	73.34	73.34	68.36	4.982	18	9.0886	Partial sub	10.74	44.65	0.0120
160+50		42.18	0.08	0.16	0.15	10.82	0.00	6.31	0.16	0.00	0.00	1.01		0.00	74.69	66.50							
BW218	1	54.82	0.00	0.00	0.00					0.00	0.00	**1.01**	3.19	0.00	73.19	65.00	8.190	18	15.3962		25.27		
S-240A	**S-240**		0.02	0.02	0.00					0.00	0.00		76.53	73.66	73.66	73.53	0.130	18	0.1541	Partial critical	1.71	4.56	0.0120
160+50		-42.18	0.08	0.08	0.08	10.00	0.82	6.50	0.08	0.00	0.00	0.52		0.00	74.82	74.69							
BW218	1	84.36	0.00	0.00	0.00					0.00	0.00	**0.52**	2.87	0.00	73.32	73.19	0.130	18	0.1603		2.58		

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STORM SEWER HYDRAULICS

System: **S-241**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

		Storm Event - IDF Curve		CONDITIONS: Runoff Coefficients		
Outfall Tailwater El:	68.36	Zone	Frequency	Area 1	Area 2	Area 3
Exit Loss at Outfall:	0.00	7	3	0.20	0.95	0.00
Storm Sewer Control El	68.36					

FROM / Station / Type	TO / Offset / Brls / Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-241	**OF-3B**	0.02	0.04	0.01					0.00	0.00		75.20	68.41	68.41	68.36	0.050	18	0.0984	Full	2.02		
163+00	46.50	0.30	0.60	0.57	11.46	0.00	6.18	0.58	0.00	0.00	3.57		0.00	68.50	66.50						22.99	0.0120
P-5	1 50.50	0.00	0.00	0.00					0.00	0.00	**3.57**	6.79	0.00	67.00	65.00	2.000	18	4.0816		13.01		
S-241A	**S-241**	0.02	0.02	0.00					0.00	0.00		75.20	68.53	68.53	68.50	0.025	18	0.0273	Full	1.06		
163+00	-46.50	0.30	0.30	0.28	10.00	1.46	6.50	0.29	0.00	0.00	1.88		0.00	68.66	68.50						4.80	0.0120
P-5	1 93.00	0.00	0.00	0.00					0.00	0.00	**1.88**	6.67	0.00	67.16	67.00	0.160	18	0.1778		2.72		

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STORM SEWER HYDRAULICS

System: **S-242**

PROJECT			
Number:	02-0309.000	Organization:	DYER RIDDLE MILLS and PRECOUR
Description:	RHODE ISLAND AVE	Designed by:	
County:	VOLUSIA	Checked by:	

Outfall Tailwater El:	68.36
Exit Loss at Outfall:	0.00
Storm Sewer Control El	68.36

CONDITIONS				
Storm Event - IDF Curve		Runoff Coefficients		
Zone	Frequency	Area 1	Area 2	Area 3
7	3	0.20	0.95	0.00

FROM / Station / Type	TO / Offset / Brls	Len	Drainage Areas: Inc.	Sub-Total	Sub-Total CA	Tc (min)	Travel Time (min)	Inten. (in/hr)	Total CA (ac)	Flow (cfs): Qb / Qfd / Qdw	S-Qb / S-Qfd / S-Qdw	CIA / TOTAL	Inlet Elevations: Inlet / Clear.	HGL / Min HGL / Jnc Loss	Pipe Elevations: HGL / Crown Line / Flow Line		Fall (ft)	Pipe Height / Width (in)	HGL (%) / FL (%)	Flow Type	Velocity: Actual / Physical (fps)	Capacity (cfs)	Mann'g 'N'
S-242	**OF-3C**		0.02	0.04	0.01					0.00	0.00		71.48	68.43	68.43	68.36	0.074	18	0.1434	Full	2.44		
165+85		46.50	0.36	0.72	0.68	11.22	0.00	6.23	0.69	0.00	0.00	4.31		0.00	69.12	66.50						26.05	0.0120
P-5	1	51.48	0.00	0.00	0.00					0.00	0.00	**4.31**	3.05	0.00	67.62	65.00	2.620	18	5.2420		14.74		
S-242A	**S-242**		0.02	0.02	0.00					0.00	0.00		71.48	69.16	69.16	69.12	0.036	18	0.0391	Full	1.27		
165+85		-46.50	0.36	0.36	0.34	10.00	1.22	6.50	0.35	0.00	0.00	2.25		0.00	69.27	69.12						4.65	0.0120
P-5	1	93.00	0.00	0.00	0.00					0.00	0.00	**2.25**	2.32	0.00	67.77	67.62	0.150	18	0.1667		2.63		

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Permit No. 42-127-3037AN

Albertsons

STORMWATER CALCULATIONS

ZEV COHEN & associates, Inc.
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176
ENGINEERS PLANNERS SURVEYORS

ZEV COHEN & associates, inc.
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176
ENGINEERS PLANNERS SURVEYORS
FAX (904) 677-2505

PROJECT NAME ALBERTSONS FILE NO. _____

DATE 5/25/95 BY MDC SHEET __ OF __

DESCRIPTION POST DEVELOPMENT

BASIN #1

TOTAL AREA = 30,492 SF OR 0.70 AC

PERV. AREA = 23958 SF OR 0.55 AC

IMPERV. AREA = 6534 SF OR 0.15 AC

C.N = [0.55(39) + 0.15(95)] / 6.70

C.N = 51

T_c = 10 MIN

BASIN #2

TOTAL AREA = 463,478 SF OR 10.64 AC

IMPERV. AREA = 299,387 SF OR 6.87 AC

PERVIOUS AREA = 164,091 SF OR 3.77 AC.

C.N = [3.77(39) + 6.87(95)] / 10.64 AC.

C.N = 75

T_c = 13 MIN

ZEV COHEN & associates, inc.
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176
ENGINEERS PLANNERS SURVEYORS
FAX (904) 677-2505

PROJECT NAME _____ FILE NO. _____

DATE _____ BY _____ SHEET __ OF __

DESCRIPTION _____

POLLUTION ABATEMENT VOL. (ON LINE; DRY RETENTION)

NOTE: DUE to EQUALIZER PIPE LK#1 & LK#2 ACT AS ONE RETENTION ARE. THEREFORE BASINS 1 & 2 ACT AS ONE.

TOTAL AREA = 11.34 AC IMP AREA = 7.02 AC

(1.0")(11.34 AC)(1'/12") = 0.945 AC·FT

(1.75") (OR 7.02 AC)(1'/12") = 1.023 AC FT (* GOVERNS)

∴ 1.023 ACFT + 0.254 ACFT = 1.277 AC FT OR 55,626 CF

(0.254 AC. FT. IS PRE DEVELOPMENT ONSITE STORAGE)

MIN WEIR ELEV @ VOL = 55,626 IS 25.71'

STAGE STORAGE RA1 & RA2

ELEV (FT)	AREA (SF)	VOL. (CF)
24	28672	0
25	32760	30,716
26	37104	65648
27	41692	105047
28	46495	149,141
29	51,500	198139
30	56,706	252,243

ZEV COHEN & associates, Inc.
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176
ENGINEERS PLANNERS SURVEYORS
FAX (904) 677-2505

PROJECT NAME TROUT LAKE FILE NO. 9419

DATE 5-17-95 BY MB SHEET __ OF __

DESCRIPTION PRELIMINARY STORMWATER CALCS.

STAGE - STORAGE

RA #1

ELEV (FT)	AREA (SF)	AREA (AC)	VOL (CF)	VOL (AC-FT)	PERIMETER
24	8496	0.195	0	0	392
25	10130	0.233	9313	0.214	
26	11894	0.273	20325	0.467	
27	13775	0.316	33160	0.761	
28	15758	0.362	47927	1.100	
29	17842	0.410	64727	1.486	
30	20027	0.460	83662	1.921	559

RA #2

ELEV (FT)	AREA (SF)	AREA (AC)	VOL (CF)	VOL (AC-FT)	PERI
24	20176	0.463	0	0	595
25	22630	0.520	21403	0.491	
26	25210	0.579	45323	1.040	
27	27917	0.641	71887	1.650	
28	30737	0.706	101214	2.323	
29	33658	0.773	133442	3.063	
30	36679	0.842	168581	3.870	768

POST-DEVELOPMENT DRAINAGE BASIN MAP

SAXON BLVD. (R/W VARIES)

BASIN 3A

BASIN 3B

BASIN 2

BASIN 1

LOT #1 5,000 S.F. MAX.

LOT #2 ALBERTSONS 49,793 S.F. F.F. EL. 34.0

LOT #3 3,000 S.F. MAX.

LOT #4 RETAIL 20,000 S.F. FUTURE PHASE F.F. EL. 33.5

LOT 1 LOT 2 LOT 3 LOT 4 LOT 5 LOT 6 LOT 7 LOT 8 LOT 9 LOT 10 LOT 11 LOT 12

PARCEL 'B'

PARCEL 'A'

TROUT LAKE
LAKE ELEV. = 23.48
(AS OF 4-27-95 BY ACCURITE SURVEYS OF ORLANDO, INC.)

LK#1 TOB EL. 30.0 BTM EL. 25.0

LK#2 TOB EL. 30.0 BTM EL. 24.0

LK#3 TOB EL. 30.0 BTM EL. 25.0

LK#4 TOB EL. 27.0 BTM EL. 22.0

25' LANDSCAPE BUFFER

25' MINIMUM LANDSCAPE BUFFER

WEST FINLAND DR. (60' R/W)

FAIRHAVEN ST.

FOURMID ST.

ARDEN STREET (50' R/W)

8" PVC WATERMAIN

4" PVC SANITARY FORCEMAIN

CENTER PYLON SIGN

MONUMENT SIGN

5' CONC S/W TO MEANDER AROUND EXIST. TREES

TYPICAL 8" PVC SANITARY @ 0.40%

(19' TOTAL W/2' OVERHANG)

5' CONC. SIDEWALK

6' HIGH MASONRY SCREEN WALL

EXISTING 8" WATERMAIN

10' PLATTED REAR UTILITY & DRAINAGE EASEMENT

30' INGRESS-EGRESS EASEMENT PER O.R. BOOK 3974, PAGE 1921

20' DEDICATED TO VOL. CO. FOR R/W PURPOSES

SEWAGE PUMP STATION

FIRE HYDRANT (TYPICAL)

CARTS

L. LIQUOR 3,326 SF

ENTRY/ EXIT

EMERGENCY EXITS

ELECTRICAL PANELS ENCLOSURE

LOADING

RAMP

BUILDING EXPANSION LIMIT LINE

1200 LF 4" PVC FORCEMAIN TO EXISTING SANITARY MANHOLE

BLOCK 160, DELTONA LAKES, UNIT THREE, PB 25, PAGES 160 - 220

ENVIRONMENTAL LINE BY BREEDLOVE DENNIS & ASSOC., INC. REFERENCE IN BPUD (VOLUSIA COUNTY RESOLUTION #91-217)

ACOE LIMITS OF WETLAND JURISDICTION AS FLAGGED BY THE LAND PLANNING GROUP AND APPROVED BY S.J.R.W.M.D. ON 10-5-92

LIMITS OF ESTIMATED 100 YEAR FLOOD PLAIN ELEVATION @ ELEV. 24.25

BLOCK 20 ORANGE CITY ESTATES MAP BOOK 23, PAGES 61 & 62

EXIST. DRAINAGE STRUCTURES

D11 - 33.59 TOP (ABANDONED)		D10A - 29.62 TOP	26.37 N. INV
D12 - 33.25 TOP	29.25 N. INV 28.65 E. INV	D113 - 29.82 TOP	26.57 N. INV
MH1 - 34.23 TOP	27.53 S. INV 26.38 W. INV 26.38 E. INV	D112 - 27.18 TOP	25.58 NW INV
D13 - 30.94 TOP	28.94 E. INV 28.94 NW INV	D113 - 29.58 TOP	26.43 W. INV
D14 - 31.74 TOP	29.49 N. INV	D114 - 29.13 TOP	25.53 W. INV 25.53 E. INV 25.53 N. INV
D16 - 36.34 TOP	33.19 N. INV	D115 - 30.03 TOP	26.43 E. INV 26.43 NW INV
D18 - 29.35 TOP	26.29 N. INV		

LEGEND - EXISTING CONDITIONS

BB	- BOTTOM OF BANK	MEAS	- MEASURED
BC	- BACK OF CURB	MH	- SANITARY MANHOLE
BM	- BENCHMARK	MW	- MONITORING WELL
CALC	- CALCULATED	NAD	- NAIL & DISK
Δ	- CENTRAL ANGLE	OH	- OVERHANG
CBW	- CONCRETE BLOCK WALL	OL	- OH LINE
CF	- CONCRETE FLUME	OPL	- OVERHEAD POWER LINE
CLF	- CHAIN LINK FENCE	PC	- POINT OF CURVATURE
CM	- CONCRETE MONUMENT	PI	- POINT OF INTERSECTION
CMP	- CORRUGATED METAL PIPE	POB	- POINT OF BEGINNING
CONC	- CONCRETE	POC	- POINT OF COMMENCEMENT
COVD	- COVERED	PP	- POWER POLE
CP	- CONCRETE PAD	PS	- PARKING SPACES
CW	- CONCRETE WALKWAY	PT	- POINT OF TANGENCY
DI#	- DRAIN INLET	PVC	- PLASTIC PIPE
DW	- DRIVEWAY	R	- CURVE RADIUS
ESMT	- EASEMENT	RCP	- REINFORCED CONCRETE PIPE
E/P	- EDGE OF PAVEMENT	R/W	- RIGHT OF WAY
EDM	- EDGE OF DIRT ROAD	-S-	- SANITARY LINE
FFE	- FINISHED FLOOR ELEVATION	SN	- SIGN
FH	- FIRE HYDRANT	00.00	- SPOT ELEVATION
FL	- FLOW LINE	-SD-	- SANITARY/DRAIN LINE
FND	- FOUND	STMH	- STORM MANHOLE
-G-	- GAS LINE	TB	- TOP OF BANK
GBD	- GAS VALVE	TC	- TOP OF CURB
-o-	- GUY WIRE ANCHOR	TM	- TELEPHONE RISER
HC	- HANDICAP PARKING	TV	- CABLE TV RISER
INV	- INVERT ELEVATION	TYP	- TYPICAL
IP	- IRON PIPE	UB	- UTILITY BOX
IR	- IRON ROD	UNTL	- UNDERGROUND TELEPHONE
L	- ARC LENGTH	-W-	- WATER LINE
LP	- LIGHT POLE	WF	- WOOD FENCE
SD	- STORM DRAIN	WM	- WATER METER
NGVD	- NATIONAL GEODETIC VERTICAL DATUM	WV	- WATER VALVE

N

0 50 100 150

SCALE : 1" = 60'

TREE LEGEND

43 - 8 PINE	212 - 6" OAK	239 - 12" PINE	345 - 8" PINE	407 - 8" OAK	452 - 12" PINE	511 - 10" PINE	
45 - 8 OAK	225 - 8" OAK	300 - 14" PINE	346 - 10" PINE	408 - 8" PINE	453 - 10" OAK	512 - 10" PINE	
46 - 10" DBL. PINE	226 - 8" OAK	301 - 10" PINE	348 - 12" PINE	409 - 10" DBL PINE	454 - 14" PINE	513 - 12" PINE	
47 - 12 PINE	227 - 8" OAK	302 - 10" PINE	349 - 12" PINE	410 - 8" OAK	455 - 8" PINE	514 - 12" PINE	
48 - 10 PINE	230 - 8" OAK	303 - 12" PINE	350 - 12" PINE	413 - 12" PINE	456 - 14" PINE	516 - 12" PINE	
49 - 12 PINE	231 - 8" OAK	304 - 8" PINE	351 - 8" DBL PINE	414 - 14" PINE	457 - 8" PINE	517 - 20" PINE	
50 - 12 PINE	232 - 8" OAK	305 - 14" PINE	352 - 12" PINE	415 - 8" PINE	458 - 18" PINE	518 - 20" PINE	
51 - 12 PINE	244 - 8" OAK	306 - 12" PINE	353 - 12" PINE	416 - 8" PINE	459 - 14" PINE	519 - 8" OAK	
54 - 10" OAK	245 - 8" OAK	307 - 10" DBL PINE	354 - 8" DBL PINE	418 - 14" PINE	460 - 12" PINE	546 - 12" PINE	
67 - 8" PINE	247 - 8" OAK	308 - 8" OAK	355 - 8" DBL PINE	419 - 8" OAK	461 - 8" PINE	560 - 15" PINE	
68 - 12" PINE	248 - 10" PINE	310 - 12" PINE	356 - 12" PINE	420 - 8" DBL OAK	462 - 12" PINE	566 - 20" PINE	
69 - 12" PINE	249 - 8" PINE	311 - 8" PINE	357 - 8" DBL PINE	421 - 10" PINE	463 - 14" PINE	573 - 8" PINE	
78 - DBL. 8" OAK	250 - 14" PINE	312 - 14" DBL PINE	358 - 8" DBL PINE	422 - 8" DBL OAK	464 - 14" PINE	574 - 12" PINE	
80 - 8" OAK	251 - 8" OAK	313 - 14" PINE	359 - 10" PINE	423 - 12" PINE	465 - 12" PINE	575 - 15" PINE	
81 - 8" OAK	252 - 8" OAK	315 - 8" DBL PINE	360 - 10" PINE	424 - 18" PINE	466 - 12" PINE	576 - 15" PINE	
83 - 8" OAK	253 - 8" OAK	316 - 8" PINE	361 - 10" PINE	425 - 16" PINE	467 - 8" PINE	577 - 15" PINE	
84 - 8" OAK	254 - 18" PINE	317 - 12" PINE	362 - 10" PINE	426 - 10" OAK	468 - 8" PINE	578 - 15" PINE	
85 - 12" PINE	255 - 14" PINE	318 - 8" PINE	363 - 8" PINE	427 - 8" PINE	469 - 8" PINE	579 - 15" PINE	
87 - 12" OAK	256 - 8" OAK	319 - 12" PINE	364 - 8" PINE	428 - 8" OAK	470 - 8" PINE	580 - 15" PINE	
89 - 12" OAK	258 - 8" OAK	320 - 8" PINE	365 - 10" PINE	429 - 8" OAK	478 - 8" OAK	581 - 8" PINE	
90 - 10" OAK	260 - 18" PINE	321 - 8" PINE	366 - 10" PINE	430 - 12" PINE	479 - 8" OAK	585 - 12" PINE	
92 - 10" OAK	262 - 10" PINE	322 - 12" PINE	367 - 10" OAK	431 - 8" PINE	480 - 8" OAK	588 - 10" PINE	
93 - 8" OAK	263 - 8" OAK	323 - 12" PINE	368 - 10" OAK	432 - 10" PINE	481 - 8" OAK	589 - 10" PINE	
102 - 10" OAK	267 - 8" OAK	324 - 12" PINE	369 - 12" PINE	433 - 12" PINE	482 - 8" PINE	588 - 10" PINE	
103 - 8" OAK	268 - 8" PINE	325 - 8" PINE	370 - 8" PINE	434 - 12" PINE	484 - 8" PINE	621 - 15" PINE	
125 - 10" OAK	271 - 8" OAK	326 - 8" DBL PINE	371 - 8" PINE	435 - 10" PINE	485 - 8" PINE	622 - 15" PINE	
126 - 10" OAK	272 - 8" OAK	327 - 8" PINE	372 - 8" PINE	436 - 10" PINE	486 - 8" PINE	623 - 15" PINE	
135 - 24" PINE	282 - 8" PINE	328 - 8" PINE	373 - 8" PINE	437 - 10" PINE	487 - 8" PINE	624 - 15" PINE	
137 - 8" OAK	284 - 10" PINE	329 - 10" PINE	374 - 10" PINE	438 - 12" PINE	488 - 10" PINE	625 - 15" PINE	
139 - 12" PINE	285 - 8" PINE	330 - 10" PINE	375 - 8" PINE	439 - 12" PINE	489 - 10" PINE	626 - 15" PINE	
142 - 10" PINE	286 - 8" PINE	331 - 10" PINE	376 - 8" PINE	440 - 12" PINE	490 - 8" PINE	627 - 15" PINE	
143 - 8" PINE	287 - 8" PINE	332 - 8" PINE	377 - 8" PINE	441 - 12" PINE	491 - 8" PINE	628 - 15" PINE	
144 - 24" PINE	288 - 10" PINE	334 - 8" PINE	378 - 12" PINE	442 - 10" PINE	492 - 8" PINE	629 - 15" PINE	
145 - 8" OAK	290 - 12" PINE	335 - 14" PINE	379 - 8" PINE	443 - 10" PINE	493 - 10" PINE	633 - 15" PINE	
153 - 8" OAK	291 - 12" PINE	336 - 8" PINE	380 - 8" PINE	444 - 12" PINE	494 - 12" PINE	823 - 15" PINE	
154 - 8" DBL OAK	292 - 8" PINE	337 - 12" PINE	381 - 8" PINE	445 - 12" PINE	495 - 8" PINE	832 - 15" PINE	
155 - 8" PINE	293 - 10" OAK	338 - 12" PINE	382 - 8" PINE	446 - 10" PINE	496 - 8" PINE	833 - 15" PINE	
156 - 12" OAK	295 - 10" PINE	339 - 8" PINE	383 - 8" PINE	447 - 10" PINE	497 - 8" PINE	836 - 15" PINE	
158 - 12" OAK	298 - 12" OAK	340 - 10" PINE	400 - 8" OAK	448 - 8" PINE	498 - 8" PINE	838 - 15" PINE	
211 - 12" OAK		341 - 8" PINE	402 - 12" PINE	449 - 8" PINE	499 - 8" PINE	646 - 15" PINE	
		342 - 8" PINE	403 - 8" PINE	450 - 8" PINE	500 - 20" PINE	647 - 20" PINE	
		343 - 8" DBL PINE	404 - 14" OAK	451 - 8" PINE	501 - 15" PINE		
					502 - 10" PINE		
					510 - 10" PINE		

NOTE: TREE LOCATIONS BY ACCURITE SURVEYS OF ORLANDO INC. DATED APRIL, 3 1990.

LEGEND

- 24 — EXISTING CONTOUR
- 28 — PROPOSED CONTOUR
- DIRECTION OF FLOW
- PROPOSED PVC WATERMAIN W/VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER LINE AND MANHOLE
- PROPOSED MITERED END SECTION
- PROPOSED STORM INLET W/PIPE

REV.	DATE	DESCRIPTION	BY
2	5-19-95	REV. PER COUNTY COMMENTS DATED MAY 12, 1995	RJD
1	4-20-95	REV. PER COUNTY COMMENTS	RJD

REVISIONS

ALBERTSONS

COMMUNITY OF DELTONA

RECEIVED
JUN 07 1995
12-12-95 0937AM
RECORDS
ORANGE COUNTY, FLORIDA

ZEV COHEN & associates, inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS
(EB 4516) (LB 4516) (LC 82)
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176

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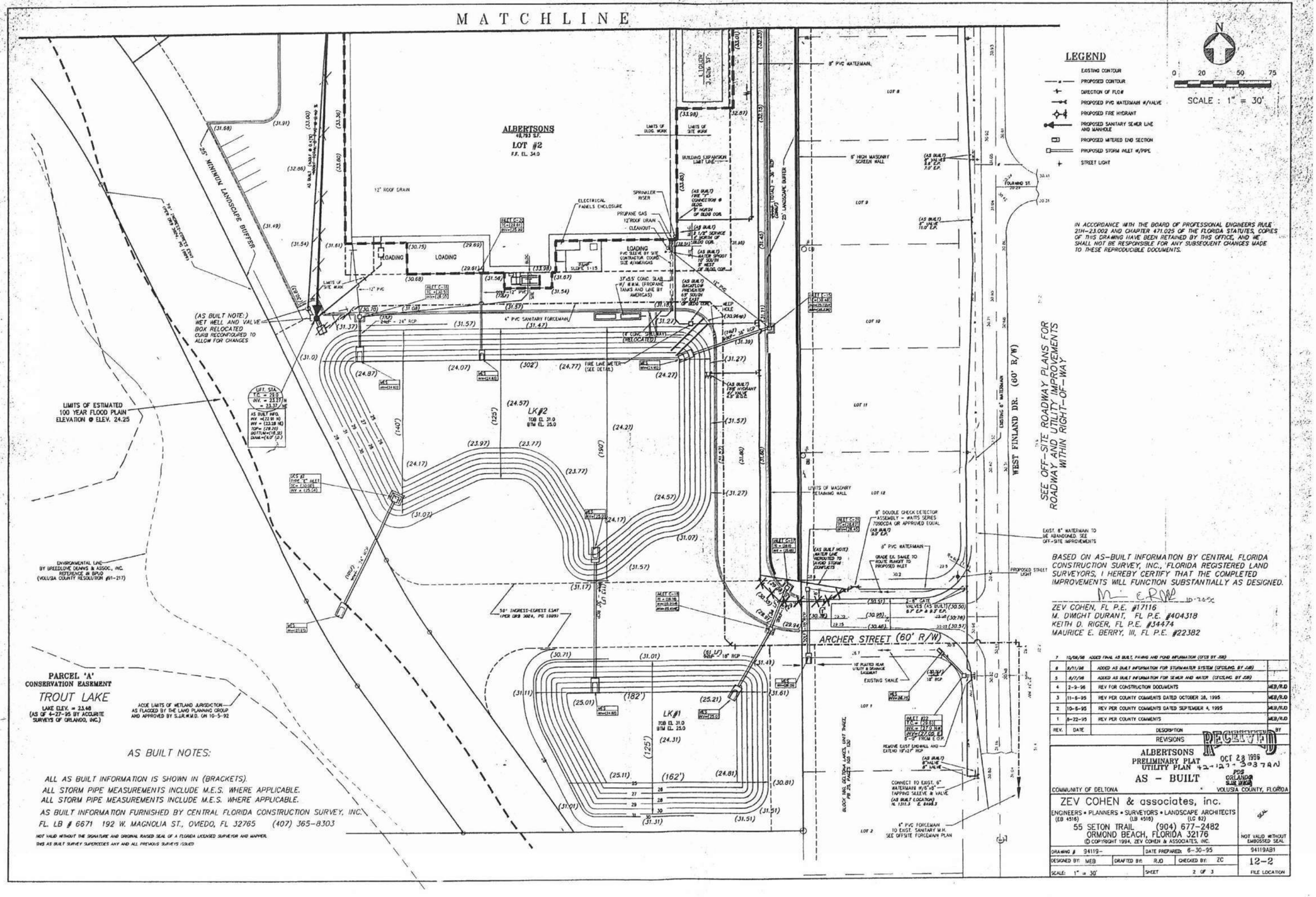
JUN 6 1995 ERP

NOT VALID WITHOUT EMBOSSED SEAL

DRAWING # 94119-		DATE PREPARED: 4-9-95	94119ALB
DESIGNED BY: ZC	DRAFTED BY: RJD	CHECKED BY: ZC	12-2
SCALE: 1" = 60'	SHEET 3 OF 3		FILE LOCATION

E723

MATCHLINE



AS BUILT NOTES:

ALL AS BUILT INFORMATION IS SHOWN IN (BRACKETS).
ALL STORM PIPE MEASUREMENTS INCLUDE M.E.S. WHERE APPLICABLE.
ALL STORM PIPE MEASUREMENTS INCLUDE M.E.S. WHERE APPLICABLE.
AS BUILT INFORMATION FURNISHED BY CENTRAL FLORIDA CONSTRUCTION SURVEY, INC.
FL. LB # 6671 192 W. MAGNOLIA ST., OVIEDO, FL 32765 (407) 365-8303

NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.
THIS AS BUILT SURVEY SUPERCEDES ANY AND ALL PREVIOUS SURVEYS ISSUED

N

0 20 50 75

SCALE : 1" = 30'

LEGEND

- EXISTING CONTOUR
- PROPOSED CONTOUR
- DIRECTION OF FLOW
- PROPOSED PVC WATERMAIN W/VALVE
- PROPOSED FIRE HYDRANT
- PROPOSED SANITARY SEWER LINE AND MANHOLE
- PROPOSED MITERED END SECTION
- PROPOSED STORM INLET W/PIPE
- STREET LIGHT

IN ACCORDANCE WITH THE BOARD OF PROFESSIONAL ENGINEERS RULE 21H-23.002 AND CHAPTER 471.025 OF THE FLORIDA STATUTES, COPIES OF THIS DRAWING HAVE BEEN RETAINED BY THIS OFFICE, AND WE SHALL NOT BE RESPONSIBLE FOR ANY SUBSEQUENT CHANGES MADE TO THESE REPRODUCIBLE DOCUMENTS.

SEE OFF-SITE ROADWAY PLANS FOR ROADWAY AND UTILITY IMPROVEMENTS WITHIN RIGHT-OF-WAY

BASED ON AS-BUILT INFORMATION BY CENTRAL FLORIDA CONSTRUCTION SURVEY, INC., FLORIDA REGISTERED LAND SURVEYORS, I HEREBY CERTIFY THAT THE COMPLETED IMPROVEMENTS WILL FUNCTION SUBSTANTIALLY AS DESIGNED.

M. E. R. 10-28-96

ZEV COHEN, FL P.E. #17116
M. DWIGHT DURANT, FL P.E. #404318
KEITH D. RIGER, FL P.E. #34474
MAURICE E. BERRY, III, FL P.E. #22382

REV.	DATE	DESCRIPTION	BY
		REVISIONS	
7	10/28/96	ADDED FINAL AS BUILT, PAVING AND POND INFORMATION (CFCS BY JSB)	
6	9/11/96	ADDED AS BUILT INFORMATION FOR STORMWATER SYSTEM (CFCS/ENG. BY JSB)	
5	8/7/96	ADDED AS BUILT INFORMATION FOR SEWER AND WATER (CFCS/ENG. BY JSB)	
4	2-9-96	REV FOR CONSTRUCTION DOCUMENTS	MEB/R.D
3	11-6-95	REV PER COUNTY COMMENTS DATED OCTOBER 28, 1995	MEB/R.D
2	10-6-95	REV PER COUNTY COMMENTS DATED SEPTEMBER 4, 1995	MEB/R.D
1	8-22-95	REV PER COUNTY COMMENTS	MEB/R.D

RECEIVED
OCT 28 1996
PDS ORLANDO S.J.R.W.M.D.

ALBERTSONS
PRELIMINARY PLAT
UTILITY PLAN 42-127-30879N
AS - BUILT

COMMUNITY OF DELTONA * VOLUSIA COUNTY, FLORIDA

ZEV COHEN & associates, inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS
(EB 4516) (LB 4516) (LC 62)
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176
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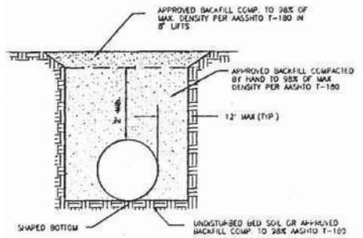
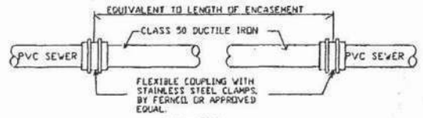
DRAWING # 94119-		DATE PREPARED: 6-30-95	94119AB1
DESIGNED BY: MEB	DRAFTED BY: RJD	CHECKED BY: ZC	12-2
SCALE: 1" = 30'	SHEET 2 OF 3		FILE LOCATION

E724



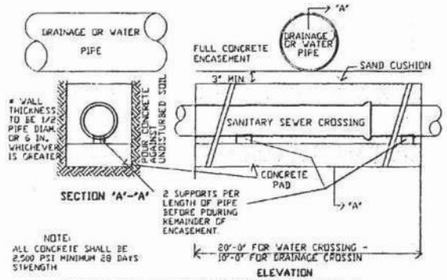
PIPE BEDDING DETAIL

NOT TO SCALE



PVC METHOD

DUCTILE IRON ALTERNATE TO CONCRETE SEWER ENCASEMENT

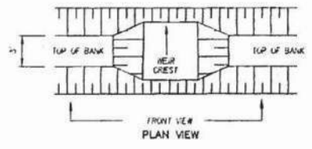


ELEVATION

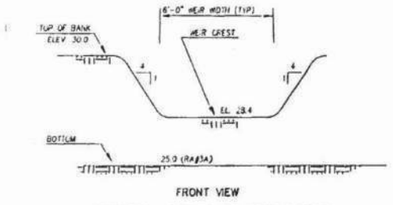
WATER MAIN SHALL BE LOCATED ABOVE OR BELOW ENCASEMENT AS SHOWN ON PLANS OR DETERMINED IN THE FIELD. USE ENCASEMENT WHERE VERTICAL CLEARENCE BETWEEN WATER MAIN AND SEWER IS LESS THAN 18 INCHES.

FOR ALT. DUCTILE IRON PIPE MAY BE USED IN LIEU OF CONCRETE ENCASEMENT AT WATER LINE CROSSING WITH A LENGTH OF PIPE CENTERED AT THE POINT OF CROSSING, SO AS TO LOCATE JOINTS AT A MAXIMUM DISTANCE FROM THE WATER LINE.

FULL CONCRETE SEWER ENCASEMENT



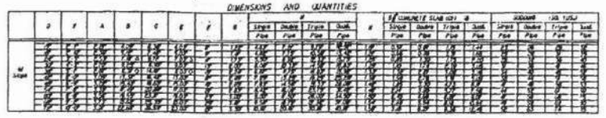
PLAN VIEW



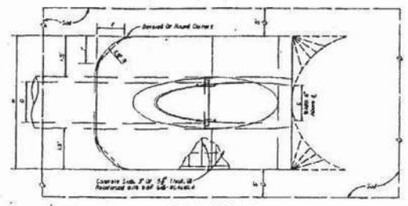
FRONT VIEW

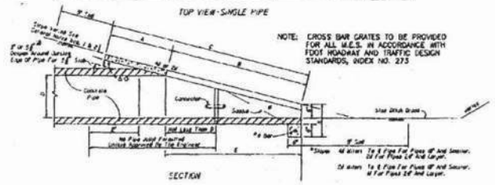
SODDED OVERFLOW WEIR DETAIL

NTS



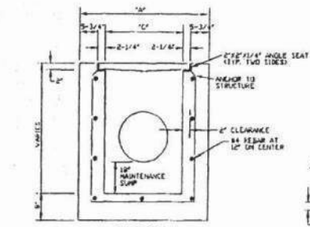
DIMENSIONS AND QUANTITIES

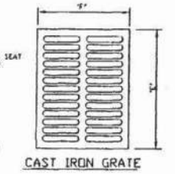


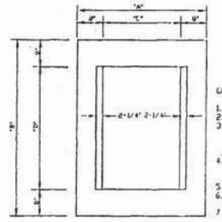


MITERED END SECTION DETAIL

NTS







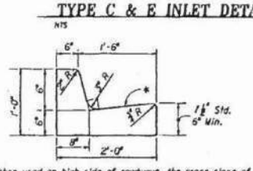
INLET TYPE	DIMENSIONS					
	A	B	C	D	E	F
"D"	3'-6"	4'-5"	2'-0"	3'-1"	2'-2"	2'-4"
"E"	4'-4"	5'-10"	3'-0"	4'-0"	4'-8"	2'-4"

GENERAL NOTES:

1. ALL EXPOSED EDGES AND CORNERS TO BE CHAMFERED 3/4".
2. CAST IRON GRATES TO BE IN ACCORDANCE WITH FLORIDA D.O.T. SPECS.
3. TYPE "E" MODIFIED INLET IS A TYPE "E" TURNED 90° TO RECEIVE RCP'S UP TO 48" DIA. INLETS RECEIVING RCP'S LARGER THAN 48" DIA SHALL BE IN ACCORDANCE WITH FLORIDA D.O.T. STANDARDS, AND SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
4. INLET WALLS AND FOOTINGS MAY BE EITHER POURED-IN-PLACE 2500 LB. CONCRETE OR PRECAST CLASS "A" 2000 LB. CONCRETE OR STANDARD MANHOLE BRICK AND BLOCK) WITH 1/2" PLASTER AND LIME) 'x' 0" PRECAST CAP.
5. GRATES FOR TYPE 'E' AND 'E' MOD. ARE TO BE CAST IN 1'x0 SECTIONS.
6. STEEL REINFORCING SHALL BE DESIGNED BY A FLA. REG. P.E. AND BE DESIGNED FOR EACH SPECIFIC STRUCTURE.
7. SHOP DRAWINGS FOR ALL STRUCTURES SHALL BE SUBMITTED TO AND APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.

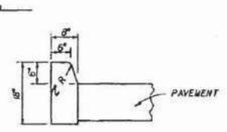
TYPE C & E INLET DETAIL

NTS

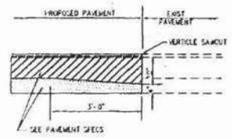


*Notes: When used on high side of roadways, the cross slope of the gutter shall match the cross slope of the adjacent pavement the thickness of the lip shall be 6", unless otherwise shown on plans.

TYPE F CONC. CURB

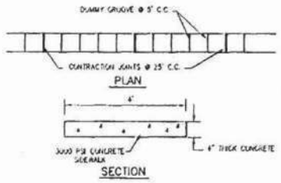


TYPE D CONC. CURB



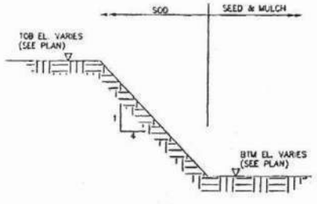
JUNCTION PROPOSED/EXISTING ASPHALT PAVEMENT

NTS



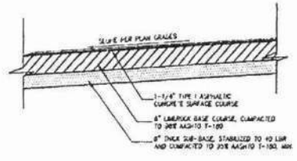
TYPICAL SIDEWALK DETAIL

N.T.S.



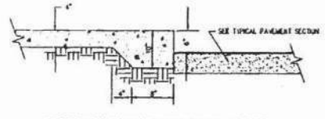
TYPICAL SECTION THRU RETENTION AREAS

NTS



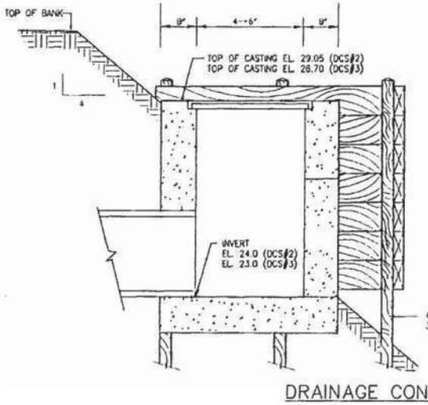
TYPICAL PAVEMENT SECTION

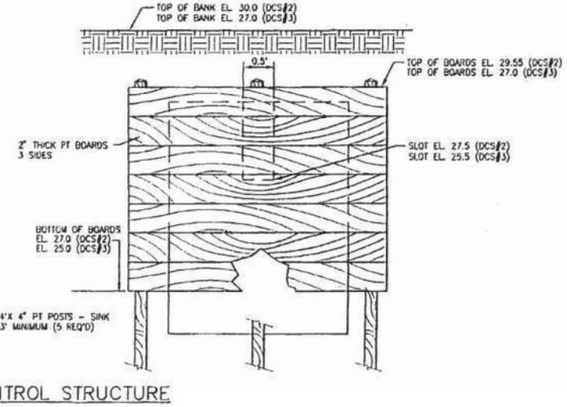
NTS



SIDEWALK TURN-DOWN EDGE DETAIL

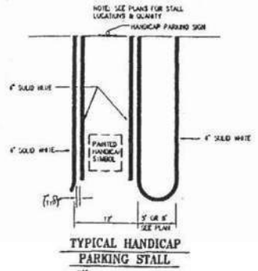
NTS





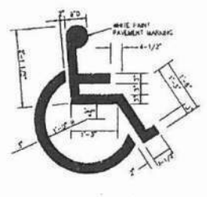
DRAINAGE CONTROL STRUCTURE

N.T.S.



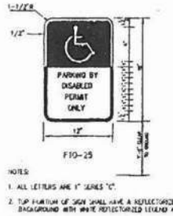
TYPICAL HANDICAP PARKING STALL

NTS



TYPICAL HANDICAP PARKING SYMBOL

NTS



HANDICAP PARKING SIGN

NTS

RECEIVED
JUN 07 1995
RECORDS ORLANDO

REV.	DATE	DESCRIPTION
		REVISIONS

ALBERTSONS
FINAL SITE PLAN
CONSTRUCTION DETAILS
VOLUSIA COUNTY, FLORIDA

ZEV COHEN & associates, inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS
(EB 4518) (LB 4518) (LC 62)
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176

JUN 08 1995

NOT VALID WITHOUT EMBOSSED SEAL

DRAWING # 94113-		DATE PREPARED: 6-2-95	
DESIGNED BY: MDD	DRAFTED BY: RJD	CHECKED BY: MDD	
SCALE: NONE	SHEET 4 OF 4		

94113D11

12-2
FILE LOCATION

E725

N

0 50 100 150

SCALE : 1" = 60'

DETAIL OF "POND"
SCALE: 1" = 30'

SAXON BLVD. (R/W VARIES)

P.O.C.

N03°21'56"W 39.80' DEED

N 85°20'57" E 198.99'/DEED

N 89°47'18" E 219.77'

L=111.87' C2

L=107.24' C3

C1 L=247.17'

N 75°28'04" E 335.98' DEED

1' NON-VEHICULAR ACCESS EASEMENT

LOT #3

LOT #1

LOT #4

LOT #2

PARCEL 'B'

PARCEL 'A'

JURISDICTION LINE S.J.R.W.M.D. WETLAND

(PART OF BLOCK 20, ORANGE CITY ESTATES, MAP BOOK 23, PAGES 61 & 62

ENVIRONMENTAL LINE BY BREEDLOVE DENNIS & ASSOC., INC. REFERENCE IN SPUD (VOLUSIA COUNTY RESOLUTION #91-217)

ACOE LIMITS OF WETLAND JURISDICTION AS FLAGGED BY THE LAND PLANNING GROUP AND APPROVED BY S.J.R.W.M.D. ON 10-5-92

LIMITS OF ESTIMATED 100 YEAR FLOOD PLAIN ELEVATION @ ELEV. 24.25

TROUT LAKE
LAKE ELEV. = 22.3
(AS OF 10/28/94 BY ACCURITE SURVEYS OF ORLANDO, INC.)

50' INGRESS-EGRESS ESMT (PER ORB 3824, PG 1889)

ARCHER STREET (50' R/W)

FAIRHAVEN ST.

WEST FINLAND DR. (60' R/W)

S 89°36'31" W 125.00'

S 00°23'29" E 240.00' PLAT

S 00°23'29" E 693.02'

N 00°00'00" E 1011.78' CALC

N 90°00'00" W 1117.47' CALC

BLOCK 20 ORANGE CITY ESTATES MAP BOOK 23, PAGES 61 & 62

BLOCK 181, DELTONA LAKES, UNIT THREE, PB 25, PAGES 103 - 120

CURVE TABLE

CURVE NO.	CENTRAL ANGLE	RADIUS	ARC LENGTH	TANGENT	CHORD BEARING	CHORD DISTANCE
C1	1°48'51"	7808.44'	247.17'	123.60'	N 87°58'35" E	247.16'
C2	0°30'42"	7586.44'	111.87'	55.94'	N 87°03'24" E	111.87'
C3	0°48'32"	7598.44'	107.24'	53.62'	N 89°23'02" E	107.24'
C4	3°10'59"	479.00'	78.77'	39.47'	N 31°16'27" W	78.69'
C5	22°47'32"	409.00'	162.7'	82.44'	N 38°04'44" W	161.63'

VICINITY MAP N.T.S.

SITE

SAXON BLVD.

ENTERPRISE ROAD

INTERSTATE 4

ORANGE CITY BLVD.

NORTH

DELTONA

LAKE MONROE

LEGAL DESCRIPTION

COMMENCE AT THE NORTHEAST CORNER OF THE SOUTHEAST 1/4 OF SECTION 24, TOWNSHIP 18 SOUTH, RANGE 30 EAST, VOLUSIA COUNTY, FLORIDA; RUN THENCE S00°23'29"E, ALONG THE EAST LINE OF SAID SOUTHEAST 1/4 A DISTANCE OF 378.07 FEET TO THE SOUTH RIGHT-OF-WAY LINE OF SAXON BOULEVARD AND FOR A POINT OF BEGINNING; CONTINUE THENCE S00°23'29"E ALONG THE EAST LINE OF SAID SOUTHEAST 1/4 AND THE EAST LINE OF BLOCK 20, ORANGE CITY ESTATES, AS RECORDED IN MAP BOOK 23, PAGES 61 AND 62, PUBLIC RECORDS OF VOLUSIA COUNTY, FLORIDA, A DISTANCE OF 1178.14 FEET; THENCE N89°36'31"E A DISTANCE OF 140.82 FEET TO A POINT OF CURVATURE OF A CURVE CONCAVE NORTHEASTERLY, HAVING A RADIUS OF 479.00 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 9°10'59" A DISTANCE OF 76.77 FEET TO A POINT OF TANGENCY; THENCE N36°40'28"E A DISTANCE OF 340.08 FEET TO A POINT OF CURVATURE OF A CURVE CONCAVE SOUTHWESTERLY, HAVING A RADIUS OF 409.00 FEET; THENCE NORTHWESTERLY ALONG THE ARC OF SAID CURVE THROUGH A CENTRAL ANGLE OF 22°47'32" A DISTANCE OF 162.70 FEET TO A POINT OF TANGENCY; THENCE N13°53'03"W A DISTANCE OF 114.03 FEET; THENCE N61°23'39"W A DISTANCE OF 274.29 FEET; THENCE S00°00'00"E A DISTANCE OF 804.58 FEET; THENCE S90°00'00"E A DISTANCE OF 651.81 FEET TO THE POINT OF BEGINNING.

CONTAINS 458,948 square feet or 10.5360 acres, more or less.

TOTAL PARCEL CONTAINING 29.8708 ACES, MORE OR LESS

NOTES:

1. SURVEY INFORMATION BY ACCURIGHT SURVEYS OF ORLANDO.
2. SEE UTILITY PLAN FOR PROPOSED UTILITY SERVICE.

REV.	DATE	DESCRIPTION	BY
3	5-19-95	REV. PER COUNTY COMMENTS DATED MAY 12, 1995	RJD
2	4-21-95	REV. PER COUNTY COMMENTS	JCC/RJD
1	12-13-94	REV. PER 12/16/94 D.R.C. COMMENTS	JCC/RJD

REVISIONS

RECEIVED JUN 07 1995 RECORDS ORLANDO

ALBERTSONS-
OVERALL DEVELOPMENT PLAN
LOT DIMENSION PLAN

COMMUNITY OF DELTONA — VOLUSIA COUNTY, FLORIDA

ZEV COHEN & associates, inc.
ENGINEERS • PLANNERS • SURVEYORS • LANDSCAPE ARCHITECTS
(EB 4516) (LB 4516) (LC 82)
55 SETON TRAIL (904) 677-2482
ORMOND BEACH, FLORIDA 32176

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JUN 06 1995

NOT VALID WITHOUT EMBOSSED SEAL

DRAWING # 94119-	DATE PREPARED: 11-18-94		94119PLT
DESIGNED BY: ZC	DRAFTED BY: RJD	CHECKED BY: ZC	12-2
SCALE: 1" = 60'	SHEET 2 OF 3		FILE LOCATION

E726

State Project No. 77160-3436

Work Program No. 5148828

Interstate4 / County Road 46A Interchange

FINAL DRAINAGE CALCULATIONS

FOR

Interstate 4 / County Road 46A Interchange

State Project No.: 77160-3436
Work Program No.: 5148828
Seminole County

Prepared By

Metric Engineering, Inc.
Altamonte Springs, Florida

For the

Florida Department of Transportation
District 5
Deland, Florida

April 1997

5/20/97

E728

Receiving Water Bodies

There are two major receiving water bodies located in this landlocked basin: Loch Lehman and the FDOT Borrow. The stormwater conveyance system is designed for Pond A to overflow to Pond B via a broad crested weir at elevation 73' NGVD. Pond B is designed to overflow to Pond C via a broad crested weir at elevation 69.5' NGVD. Pond C is designed to overflow to the discontinued FDOT Borrow Pit, Wetland 4, via a broad crested weir at elevation 66.0' NGVD. During the first 100 year - 24 hour storm event neither of the three ponds overflow. Due to the Ponds not recovering within 14 days, a second 100 year - 24 hour storm is applied to determine the Basins' volume capabilities. During this storm event, Pond A and B do not overflow, and Pond C overflows to the FDOT Borrow Pit, Wetland 4. This major receiving water body and Loch Lehman are connected by a 30" equalization cross-culvert which runs under Interstate 4.

The project site is landlocked and therefore does not have a positive outfall. The SJRWMD indicates that for a landlocked basin, the post-development volume of direct runoff may not exceed the pre-development volume of direct runoff for the 25 year - 96 hour storm event. A volume analysis was performed to determine if the above criteria is met. The following table illustrates the results of this analysis.

TABLE A1: Pre/Post Volume Analysis - 25 year/96 hour storm

Water Body	Pre-Development Stage (ft. NGVD)	Pre-Development Storage Volume (ac-ft)	Post-Development Stage (ft. NGVD)	Post-Development Storage Volume (ac-ft)	Difference in Volume (ac-ft)
Loch Lehman	61.96	38.83	61.56	35.34	+ 3.49
FDOT Borrow Pit	61.96	20.25	61.56	17.91	+ 2.34

(+) indicates volume surplus
(-) indicates volume shortage

The above table indicates that the pre-development/post-development requirement has not been exceeded. The post-development volume of direct runoff does not exceed the pre-development volume of direct runoff. Therefore, the SJRWMD criteria has been met. Attached are the calculations to support these results.

VOLUME CALCULATIONS

PROJECT TITLE:	INTERSTATE 4/C.R. 46A			
PROJECT NUMBER:	4 1063			
FILE NAME:	25/96LOCH	SCALE:	N/A	DATE
BASIN NAME:	BASIN I	MADE BY:	EMZ	03/25/97
VOLUME ANALYSIS:	25 YR VOL	CHECKED BY:		03/25/97

25 YEAR - 96 HOUR STORM EVENT

PRE-DEVELOPMENT LOCH LEHMAN:

STAGE (FT NGVD)	AREA (AC)
58	8.6
60	9.66
65	12.96
70	19.71

25 yr/96 hour stage:	61.97	ft
Area:	10.96	ac
Volume:	38.83	ac-ft

POST-DEVELOPMENT LOCH LEHMAN:

STAGE (FT NGVD)	AREA (AC)
58	8.6
60	9.66
65	12.96
70	19.71

25 yr/96 hour stage:	61.56	ft
Area:	10.69	ac
Volume:	35.34	ac-ft

DIFFERENCE IN PRE/POST VOLUME:	**+ 3.49**	**ac-ft**
(+) designates surplus		

VOLUME CALCULATIONS

PROJECT TITLE:	INTERSTATE 4/C.R. 46A			
PROJECT NUMBER:	4.1063			
FILE NAME:	25/96BP	SCALE:	N/A	DATE
BASIN NAME:	BASIN#2	MADE BY:	EMZ	03/25/97
VOLUME ANALYSIS:	25 YR VOL	CHECKED BY:		03/25/97

25 YEAR - 96 HOUR STORM EVENT

PRE-DEVELOPMENT BORROW PIT:

STAGE (FT NGVD)	AREA (AC)
58	4.31
60	5.24
65	6.89

25 yr/96 hour stage:	61.97	ft
Area:	5.89	ac
Volume:	20.25	ac-ft

POST-DEVELOPMENT BORROW PIT:

STAGE (FT NGVD)	AREA (AC)
58	4.31
60	5.24
65	6.89

25 yr/96 hour stage:	61.56	ft
Area:	5.75	ac
Volume:	17.91	ac-ft

DIFFERENCE IN PRE/POST VOLUME:	**+ 2.34**	**ac-ft**
(+) designates surplus		

SECTION V

SECTION V: FLOODPLAINS

Previous studies performed in this project area have determined several 100-year flood elevations. The drainage map for the original construction of I-4 shows a recorded high water of 65.8' NGVD dated 1960. At that time Loch Lehman was a 43 acre lake. The construction of I-4 bisected Loch Lehman and the east side remnant excavated to create the borrow pit that is there now. A 30" RCP culvert set at an invert of 57.0' NGVD was installed under I-4 which connected the bisected Loch Lehman. Although the 65.8' NGVD stage was associated with the passage of hurricane Donna through the central Florida region, review of historical rainfall data indicates that 17.3" of rainfall fell in the month of September (the month of the hurricane), and 23" of rainfall fell in the preceding three months. Cumulative rainfall to that point in the year was over 60". Rainfall for the year was 62.9" which was 11.6" above the yearly average recorded from 1914-1991.

The rainfall data referenced was excerpted from a study entitled Lockhart-Smith Canal, Monroe Basin Engineering Study and Drainage Inventory prepared by Singhofen & Associates, Inc. dated September 1992. The Lockhart-Smith Canal study determined a 100-year flood elevation of 63.5' NGVD in the Loch Lehman/FDOT borrow pit. Review of the information presented in the Lockhart-Smith Canal study and verified field conditions have revealed the following inconsistencies:

- Trout Lake drainage basin is shown as 108 acres in the study, area determined from the SJRWMD contour maps is 61.87 acres.
- Study shows Loch Lehman (Twin-B4) overflowing to the FDOT borrow pit (Twin-B2) at and staging up to elevation 67' NGVD. There is a 30" RCP equalizing culvert under I-4 with an invert of 57.5' NGVD.
- Study does not show 24" culvert south of C.R. 46A under I-4 conveying runoff from the area southwest of I-4/C.R. 46A (Twin-B5) to area southeast of I-4/C.R. 46A (Twin-B3).
- Study shows area southeast of I-4/C.R. 46A (Twin-B3) connected to the FDOT borrow pit (Twin-B2). Contour maps and field review fail to show a connection below elevation 70' NGVD. This area is divided into three distinct isolated basins which are not connected below the 100 year/24 hour event.

- Generally, all basins defined in the study were larger than what was defined by contour maps and field verified.
- Although soils in the basin are predominantly type A soils as per the SCS (project located in the most effective recharge area of the Wekiva River Basin), curve numbers (CN) used in the study were for type B soils and higher.
- Geotechnical information indicate that normal high water in Loch Lehman is closer to elevation 58' NGVD. Elevation used in the study was 57.0' NGVD.

Review of SJRWMD aerials with contours indicates that Trout Lake, a closed basin to the west, has possible overflow to Loch Lehman at an elevation of approximately 74.3' NGVD. Discharge from the Loch Lehman/FDOT borrow pit system is possible at an elevation of approximately 66.3' NGVD east to Twin Lake West. (See Appendix C for references to the Singhofen & Associates, Inc. Lockhart-Smith Canal/Monroe Basin Study.)

The location hydraulic report prepared for this project by Greiner Inc. and dated December 1989 determined a 100-year flood elevation of 61.06' NGVD in the Loch Lehman/FDOT borrow pit system. Since this study was performed, Rinehart Road has been extended to the north with resultant partial filling of the borrow pit area to build the roadway. In addition, Greiner Inc. is currently developing construction plans for the Greenway Interchange with I-4. Part of their design will be encroaching into the floodplain of Loch Lehman hence they also have determined a 100-year floodplain elevation as part of that effort. Their study is using the results of Metric's post development model as the basis of their report.

Metric Engineering Inc. (MEI) collected SJRWMD aerial and contour maps, SCS soil surveys of Seminole County, and various construction plans and reports and used this information to develop the hydrologic and hydraulic parameters used in our engineering analysis. The following assumptions were made in MEI's engineering analysis:

- The 100-year flood elevation calculations assumed the north Rinehart Road extension was not yet constructed. Post developed conditions will account for Rinehart Road.

- Beginning water surface elevation for Loch Lehman and the borrow pit was assumed to be elevation 58.0' NGVD.

Based on the above assumptions MEI determined a 100-year - 24 hour flood elevation of 61.80' NGVD and a 25 year - 96 hour flood elevation of 61.97' NGVD. As demonstrated by the events during 1960, catastrophic type rainfall could result in a stage of up to 66.3' NGVD in Loch Lehman and the borrow pit, the elevation of the overflow from this closed basin. It is recommended that the interchange and associated ramps be placed at elevations one foot above or higher than this 66.3' NGVD elevation. This recommendation assumes that the overflow from Loch Lehman and the borrow pit to Twin Lake West remain at said elevation 66.3' NGVD.

An elevation of 61.8' NGVD is being used as the basis for calculating the floodplain impact resulting from this project. The only impact area is in the FDOT borrow pit area resulting from the construction of Ramp C and retention Pond C. Construction of Ramp C, Pond C and Rinehart Road. requires fill to be placed in the FDOT Borrow Pit. The Ramp C impact is from Station 660+00 to Station 666+00, 1.23 ac-ft to be placed below the SHWL of 58' NGVD and 4.65 ac-ft to be placed between the SHWL and the 100 year - 24 hour flood elevation of 61.8' NGVD. The Pond C impact is from Station 32+00 to Station 40+46.7, 1.24 ac-ft to be placed below the SHWL and 2.59 ac-ft to be placed between the SHWL and the 100 year- 24 hour flood elevation. The Rinehart Road impact is from Station 51+85 to Station 55+00, 0.26 ac-ft to be placed between the SHWL and the 100 year- 24 hour flood elevation for a total impact of 2.47 ac-ft below SHWL and 7.50 ac-ft between SHWL and the 100 year - 24 hour flood elevation of 51.8' NGVD. The mitigation consists of dredging 2.88 ac-ft below the SHWL and 7.53 ac-ft between the SHWL and the 100 year - 24 hour flood elevation on Interstate 4 from Station 565+79 to Station 573+21. The attached spreadsheets and cross-sections show the impacts below the SHW elevation and between the SHW and the 100 year- 24 hour flood elevation.

FLOODPLAIN VOLUME CALCULATIONS.

PROJECT TITLE:	INTERSTATE 4/C.R. 46 A			
PROJECT NUMBER:	4.1063			
FILE NAME:	FLDRMPCF	**SCALE:**	NA	DATE
BASIN NAME:	RAMP C	**MADE BY:**	JY	19-Dec-96
FLOOD PLAIN ANALYSIS:	FILL	**CHCKED BY:**		19-Dec-96

	CROSS-SECTIONAL AREAS (FT^2)		VOLUMES (FT^3)	
STATION	BELOW SHWL 58'	25YR/96HR 61.8' NGVD	BELOW SHWL 58'	25YR/96HR 61.8' NGVD
RAMP C				
66000	0	0		
			0	2650
66100	0	53		
			1250	21000
66200	25	367		
			23000	57825
66300	435	789.5		
			25500	70975
66400	75	630		
			3750	40650
66500	0	183		
			0	9300
66600	0	3		
	TOTALS (FT^3)		53500	202400
	TOTALS (AC-FT)		1.23	4.65

FLOODPLAIN VOLUME CALCULATIONS.

PROJECT TITLE:	INTERSTATE 4/C.R. 46 A				
PROJECT NUMBER:	4.1063				
FILE NAME:	FLDPNDCF	**SCALE:**	NA	DATE	
BASIN NAME:	POND C	**MADE BY:**	JY	19-Dec-96	
FLOOD PLAIN ANALYSIS:	FILL	**CHCKED BY:**		19-Dec-96	

	CROSS-SECTIONAL AREAS (FT^2)			VOLUMES (FT^3)		
STATION	BELOW SHWL 58'		25YR/96HR 61.8' NGVD	BELOW SHWL 58'		25YR/96HR 61.8' NGVD
POND C						
3200	0		0			
				0		3715
3300	0		74.3			
				0		4240
3400	0		10.5			
				0		2875
3500	0		47			
				0		4300
3600	0		39			
				8550		12300
3700	171		207			
				16375		20275
3800	156.5		198.5			
				9175		16250
3900	27		126.5			
				1746		4950
3936	70		148.5			
				7238		17105
3980	259		629			
				5100		12485
4000	251		619.5			
				5860.85		14465.325
4046.7	0		0			
		TOTALS (FT^3)		54044.85		112960.325
		TOTALS (AC-FT)		1.24		2.59

FLOODPLAIN VOLUME CALCULATIONS.

PROJECT TITLE:	INTERSTATE 4/C.R. 46 A			
PROJECT NUMBER:	4.1063			
FILE NAME:	FLDRHNF	**SCALE:**	NA	DATE
BASIN NAME:	RINEHART ROAD	**MADE BY:**	JY	20-Dec-96
FLOOD PLAIN ANALYSIS:	FILL	**CHCKED BY:**		20-Dec-96

	CROSS-SECTIONAL AREAS (FT^2)		VOLUMES (FT^3)	
STATION	BELOW SHWL 58'	25YR/96HR 61.8' NGVD	BELOW SHWL 58'	25YR/96HR 61.8' NGVD
RINEHART RD				
5185		7		
				148.5
5200		12.8		
				4770
5300		82.6		
				5255
5400		22.5		
				1125
5500		0		
	TOTALS (FT^3)			11298.5
	TOTALS (AC-FT)			0.26

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FLOODPLAIN VOLUME CALCULATIONS.

PROJECT TITLE:	INTERSTATE 4/C.R. 46 A			
PROJECT NUMBER:	4.1063			
FILE NAME:	FLDI4D	SCALE:	NA	DATE
BASIN NAME:	INTERSTATE 4	MADE BY:	JY	19-May-97
FLOOD PLAIN ANALYSIS:	DREDGE	CHCKED BY:		19-May-97

	CROSS-SECTIONAL AREAS (FT^2)		VOLUMES (FT^3)	
STATION	BELOW SHWL 58'	25YR/96HR 61.8' NGVD	BELOW SHWL 58'	25YR/96HR 61.8' NGVD
INTERSTATE 4				
56579	0	0		
			1200.15	3150
56600	114.3	300		
			15705	40150
56700	199.8	503		
			22245	58230
56800	245.1	661.6		
			24695	63805
56900	248.8	614.5		
			19615	50925
57000	143.5	404		
			13955	39390
57100	135.6	383.8		
			13795	36730
57200	140.3	350.8		
			13980	35220
57300	139.3	353.6		
			1462.65	3712.8
57321	0	0		
TOTALS (FT^3)			125452.65	328162.8
TOTALS (AC-FT)			2.88	7.53

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(8U Advanced Interconnected Channel & Pond Routing (ICPR Ver 2.21) [1]
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Colonial Town Park Revised with Theater
12/13/02

********** Input Report **********

--------Class: Node----------

Name: BOUNDARY Base Flow(cfs): 0 Init Stage(ft): 50
Group: BASE Warn Stage(ft): 50
Comment:

Time(hrs)	Stage(ft)
0	50
100	50

--------Class: Node----------

Name: POND10 Base Flow(cfs): 0 Init Stage(ft): 64
Group: BASE Warn Stage(ft): 74
Comment: DRY RETENTION POND

Stage(ft)	Area(ac)
64	2.67
74	5.67

--------Class: Node----------

Name: POND20 Base Flow(cfs): 0 Init Stage(ft): 65
Group: BASE Warn Stage(ft): 75
Comment: NATURAL WET RETENTION POND

Stage(ft)	Area(ac)
65	0.89
66	0.89
67	1.89
68	2.03
69	2.4
70	2.61
71	2.79
72	2.94
73	3.38
74	3.53
75	3.63