Kimley»Horn

MEMORANDUM

To:	Jennifer Marshall, PE FDOT Chief Engineer of Production
From:	Victor Gallo, PE – Project Manager Armando Orozco, PE – Deputy Project Manager Kimely-Horn & Associates, Inc.
Date:	January 27, 2026
Subject:	New Stormwater Rule Evaluation for State Road 30 (US 98) Project Development and Environment (PD&E) Study

Introduction & Objective

This project is located on State Road (SR) 30 (US 98) from County Road (CR) 30A to West of Phillips Inlet Bridge in Walton County, Florida. This technical memorandum provides a revised analysis of the State Road 30 PD&E Study from February 2024 (FPID: 437179-1), following the new stormwater rule as set forth in Chapter 62-330, F.A.C. and the 2024 Applicant's Handbook Volume 1 (A.H. Vol. 1). The basis of this project is to improve regional mobility and accommodate the future traffic needs of SR 30. The proposed improvements primarily consist of widening the existing four-lane divided flush shoulder and curb-and-gutter facility to a six-lane divided facility. The proposed flush shoulder roadway typical section is from Old Blue Mountain Rd/CR 83 to McDavis Blvd. The proposed suburban (curbed inner lanes, flush shoulder outer lanes) roadway typical section is from the Publix at South Walton Entrance to Old Blue Mountain Rd/CR 83 and from McDavis Blvd to Redbud Lane. The proposed curb and gutter typical section is from W. of CR 30A to the Publix at South Walton Entrance and from Redbud Lane to the eastern limit of the project. The total length of this project is approximately 19.4 miles.

The objective of this task is to review the stormwater management alternatives developed in the original Pond Siting Report (PSR) utilizing traditional first flush treatment volume design and performance standards, and to assess the modifications required to meet the new nutrient reduction criteria established by the updated stormwater rule. The new nutrient reduction criteria are quantified differently, focusing on the removal of Total Nitrogen (TN) and Total Phosphorus (TP) in surface water discharges, as determined by Best Management Practice (BMP) efficiency rates based on the existing ambient water quality conditions of the downstream Water of the State, as outlined in Sections 8.3.2 through 8.3.5 of the A.H. Vol 1. This technical memorandum aims to provide findings and updated alternative calculations demonstrating reasonable assurance that stormwater facilities can provide the nutrient reduction required by the new rule. The minimum nutrient reduction rate performance standards for all sites, as specified in Section 8.3 of A.H. Vol. 1, are summarized in **Table 1**.

Kimley»Horn

New Stormwater Rule

For this evaluation, the Florida Department of Environmental Protection (FDEP) Division of Environmental Assessment and Restoration's (DEAR) Waters Not Attaining Standards (WNAS) from the adopted 2022-2024 Biennial Assessment dataset was used to identify impaired waterbodies (WBIDs) within the HUC 12 sub-watersheds. Impaired WBIDs are defined as those that are not meeting their applicable water quality standards under Chapter 62-302, F.A.C. and have been verified as impaired under Chapter 62-303, F.A.C., which are associated with assessment categories 4a, 4b, and 5. This definition of impaired waterbodies for administration of the ERP program was confirmed with FDEP's DEAR and Division of Water Resource Management administrators. This memorandum is focused on the A.H. Vol. 1 of the stormwater rule, Applicant's Handbook Volume II (A.H. Vol. 2) will vary by Water Management District (WMD). Although the new rule establishes nutrient reduction rate standards for TN and TP, the rule does not specify if the impairment classification is to be used for nutrient and nutrient response variable impairments, or all water quality parameters (e.g. bacteria, mercury and metals). Thus, two ambient water quality scenarios were evaluated:

- Scenario 1: focused on nutrient-specific impairments.
- Scenario 2: considered additional risks of using impaired WBIDs with any water quality parameters, including but not limited to nutrients, bacteria, mercury, and metals.

This memorandum presents the results of applying the new stormwater rule, as outlined in the A.H. Vol. 1. While the new stormwater rule standards are not yet in effect for current ERP applications, this assessment assumes full implementation without grandfathering to evaluate future impacts on the Department's Work Program. **Table 1** summarizes the applicable performance standards from Section 8.3, limited to those relevant to the SR 30 project. Nutrient loading analyses were performed for predevelopment and post-development conditions to determine the percent increase in pollutant loading using equation 9-3 in the A.H. Vol. 1. *In no case was the increase in loading larger than the minimum nutrient reduction rates required by the new rule. Therefore, the minimum BMP nutrient reduction rates of the new rule control.* Refer to **Appendix A** for nutrient loading analyses.

Table 1: New Water Quality Performance Standard Requirements

Project Scenario	TP Nutrient Reduction Rate %	TN Nutrient Reduction Rate %	Nutrient Loading Analysis	Presumptive TSS Removal Efficiencies %	A.H. Section
All Sites	80	55	Post ≤ Pre	80	8.3.2
Impaired Waters	80	80	Post ≤ Pre	80	8.3.4
OFW	90	80	Post ≤ Pre	95	8.3.3
Impaired + OFW	95	95	Post ≤ Pre	95	8.3.4

It should be noted that impairment assessment categories at the time of application follow the impaired performance standards. Accordingly, a WBID with a TMDL under Chapter 62-304, F.A.C., but classified as meeting its designated use at the time of application (assessment category 2t), is not required to use the impairment performance standards. Which means, during the PD&E phase, a WBID may be

listed as assessment category 4a (impaired with a TMDL). However, by the time the project advances to design and the ERP application is submitted, the WBID could be reclassified as assessment category 2t (meeting its designated use). In that case, the WBID would no longer be considered impaired and the impaired performance standards would not apply. Similarly, it is possible that a WBID could be reclassified as impaired by the time the project advances to design. In this case, the WBID would be required to use the impairment nutrient reduction performance standards.

This memorandum also assumes the application of the new nutrient reduction standards without the use of any grandfathering provisions within the rule, in order to fully assess the potential future impacts to the Department's Work Program once the rule is fully implemented.

Methodology

BMPTrains 2020 Version 4.3.5 was employed to evaluate the BMP nutrient reduction rates provided by the stormwater alternatives originally sited in the PSR. Based on findings, Vegetated Filter Strips (VFS) and retention swales were modeled in series with the originally sized facilities to determine overall treatment train efficiency rates. The original PSR was used to determine the roadway basin areas and calculations. Oversight from the original PSR will be rectified in the design stage. The swales will be regraded from a 1:8 to 1:6 slope per the original PSR, which will be verified in design. Any impacts to retention swales that were not addressed in the original PSR will be evaluated during the design phase. The evaluation is based on the data present in the original PSR and assumes that potential impacts were previously coordinated by the original consultant. Only one alternative per scenario was analyzed to meet new standards due to the high BMP efficiencies already provided by the original PSR conditions. Unlike the other BMPs mentioned, VFS treatment historically has not been identified as stormwater BMPs within Water Management Districts (WMD) specific Applicant's Handbook Volume 2 (A.H. Vol 2). However, FDOT worked closely with FDEP to incorporate them into the listed Traditional Stormwater BMPs within Appendix O of A.H. Vol. 1, as it is a recognized form of treatment by EPA [EPA 840-B-92-002, 1993]. VFS are vegetated surfaces on the front slope of roadway embankment that treat sheet flow from the adjacent flush shoulder roadway, which is limited to flush shoulder typical sections. They can achieve a high annual runoff capture rate, utilizing the soil's ability to absorb the runoff within the soil's pore space. Various studies have shown that VFS effectively remove sediment, sediment-bound pollutants, and nutrients (US EPA, 1993). Also, FDOT's research BDV24-997-25 demonstrated that FDOT's standard roadside within the clear zone and with A-3 soils can infiltrate up to 3 in/hr in less than 20-ft. The BMPTrains model's primary focus was on the BMP nutrient reduction rate of TN and TP, providing reasonable assurance with the new required criteria as set forth in Chapter 62-330 F.A.C. and the A.H Vol I. The BMP efficiencies are minimum post-development treatment efficiencies, as they do not account for all impacts to swales, superelevated areas, regrading, and soil storage for additional treatment.

BMPTrains models were generated for each type of treatment system, with separate catchments created based on the information about the swales or subbasins from the original PSR conditions. The pre/post event mean concentration (EMC) values were sourced from the A.H. Vol. 1, Table 9.2 for Highways. The Curve Number (CN) values were taken from the original PSR for this evaluation. The flush shoulder typical section allows for VFS and swales in the median and the outside of the roadway,

which were modeled separately and combined using Equation 9-5 in Appendix O. The suburban typical section (curbed inner lanes, flush shoulder outer lanes) allows for VFS and swales on the outside of the roadway, since the median contains a Type E curb. For the segment of the project with curb and gutter typical section, VFS and swale BMP pre-treatment were not employed. The urban area from west of CR 30A to the Publix at South Walton contains five wet ponds that were modeled as wet detention treatment in BMPTrains, and providing reasonable assurance with methodology and limitations in Appendix O.

The urban area at the east end of the corridor contains two dry detention ponds that were modeled as dry retention treatment in BMPTrains. According to the original PSR, permit documentation for these ponds was not available. It was assumed, with reasonable assurance, that these facilities were sized to accommodate a 6-lane typical section like the wet ponds. Since stage-storage tables for these facilities were not included in the original PSR, this evaluation assumed a 4-inch retention depth over the basin to determine a retention volume and model these as BMPs. This assumption was used to optimize nutrient reduction in the existing dry ponds. Any modifications to control structures or the pond to meet recovery criteria will be addressed in the design phase when more information is available. It should be noted that since no pre-development basin information is available for the basins draining to these ponds, the nutrient loading analysis only accounts for post condition loading (6-lane road), as indicated in the narrative of the original PSR.

The retention swales along the corridor were also modeled as dry retention treatment in BMPTrains. For this analysis, stage-storage tables in the original PSR were used to determine available retention volumes. The original PSR did not provide specific basin delineation for each retention swale; therefore, these were lumped into one retention BMP per permitted segment of the project limits. With the help of aerial imagery and ambient water quality tools, it was possible to determine the outfall of some retention swales, in which case this evaluation places them in series with corresponding BMPs. It is important to note that this evaluation is based on data presented in the original PSR, and additional analysis not documented should be addressed during design. Moreover, impacts to retention swales due to the proposed shared-use-path not addressed in the original PSR, will also need to be addressed during design.

The VFS BMPTrains models incorporated two catchments per roadway basin, representing the four VFS alongside SR 30: One for the median VFS, and the second for the outside VFS. A VFS depth of 2 feet was adopted, the storage capacity was set to 0.2 and the VFS slope to 16.67% for 1:6 front slopes, as stated in the original PSR. The VFS width modeled in BMPTrains is based on clear zone widths. Modifications to the VFS's width for nutrient reduction would be a function of water depth in swales, which is typically determined with precision in hydraulic ditch tabulations. The effective VFS width may need to be modified during design and remodeled for nutrient reduction if the water depth in the ditches encroaches into the VFS width used in this evaluation. The width of directly connected impervious area (DCIA) corresponded to the travel lanes and paved shoulders draining to the respective VFS per proposed typical section as shown in **Figure 1 and 2**. Refer to **Figures 1 and 2** for a cross-sectional view of the VFS width and impervious widths per proposed typical section and **Figures 1-3** for the proposed typical sections. Refer to **Appendix B** for the BMPTrains inputs and results.

Kimley»Horn

Individual efficiency rates from BMPTrains were analyzed for each subbasin to properly identify the combined treatment efficiencies. The combined efficiency rate per subbasin for BMPs in series was determined using Equation 9-5 from Appendix O of the A.H. Vol. I. For BMPs in parallel, individual efficiencies were averaged.

$$Overall\ Treatment\ Train\ Efficiency\ for\ BMPs\ in\ Series = Eff1 + [(1 - Eff1)xEff2] + \left[\left((1 - Eff1) - \left((1 - Eff1)xEff2\right)\right)xEff3\right]$$

$$or\ (simplified\ form) = 1 - [(1 - Eff1)x(1 - Eff2)x(1 - Eff3)x \ldots x(1 - Effn)]$$

Eff1 = efficiency of initial treatment system
Eff2 = efficiency of second treatment system
Eff3= efficiency of third treatment system

Plate 3-1: Proposed Rural Roadway Typical Section
(Old Blue Mountain Rd/CR 83 to McDavis Blvd)

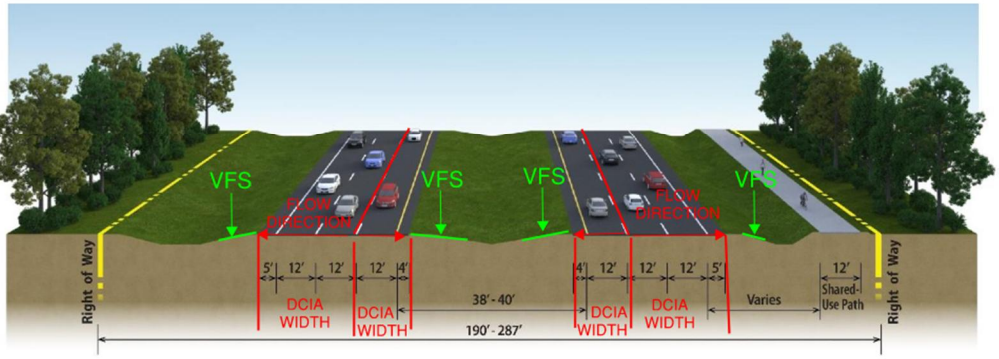


Figure 1: Flush Typical Section for VFS Analysis

Plate 3-2: Proposed Suburban Roadway Typical Section
(Public at South Walton Entrance to Old Blue Mountain Rd/CR 83 and from McDavis Blvd to Redbud Lane)

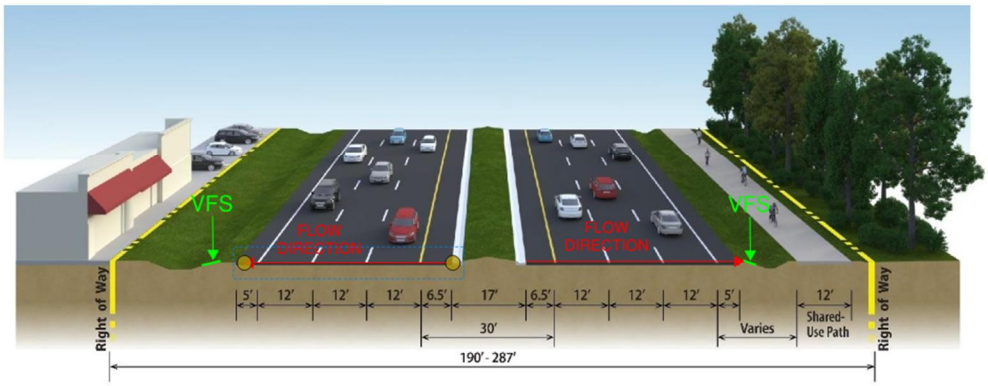


Figure 2: Outer Flush Shoulder Typical Section for VFS Analysis

Plate 3-3: Proposed Urban Roadway Typical Section

(from W. of CR 30A to the Publix at South Walton Entrance and from Redbud Lane to the eastern project limit)

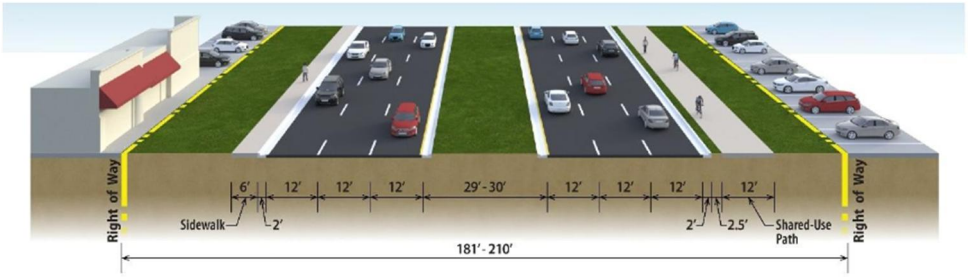


Figure 3: Curb and Gutter Typical Section

Analysis & Results

The original PSR includes three project segments, divided by existing permits, each with stormwater management facilities. This analysis remains consistent with the existing permits' outfalls and also evaluates the nutrient reduction rates with a compensatory. There are three HUC-12 sub-watersheds within the project limits: McQuage Bayou – Mack Bayou Frontal, Peach Creek, and Eastern Lake – Phillips Inlet Frontal. The compensatory approach was used per distinct outfall in each HUC-12 sub-watershed. However, if data found in the original PSR does not facilitate this analysis at the outfall scale, then the HUC-12 scale was used. In such cases, the most conservative BMP nutrient reduction standard amongst the distinct outfalls was assumed to apply to the entire HUC-12. The distinct outfall scale was possible for Eastern Lake and Peach Creek basins. This was implemented due to each distinct receiving water body having a different nutrient reduction requirement. However, this was not possible for the McQuage Bayou – Mack Bayou Frontal basin due to the lack of basin delineation in the original PSR. Aerial and FDOTs ambient water quality tools were used in an attempt to delineate hydraulically connected basins but yielded results that contradict the narrative in the original PSR. This method also streamlined the analysis since the roadway subbasins for the flush shoulder typical section were undefined and information on existing swales in the original PSR was limited. Each BMP per distinct outfall and HUC-12 sub-watershed was analyzed in BMPTrains to assess the performance of BMPs sequenced in series and parallel. The Peach Creek HUC-12 met the nutrient reduction criteria in both Scenario 1 and 2. The McQuage Bayou HUC-12 did not meet criteria for Scenario 1 or 2. The Eastern Lake – Phillips Inlet Frontal HUC-12 met the nutrient reduction criteria in Scenario 1 but not Scenario 2. The following narrative will further discuss the analysis if each HUC 12 sub-watershed within the project limits. Refer to **Appendix A** for a comprehensive matrix of distinct outfall and HUC-12 sub-watersheds, water quality parameters, BMP elements and efficiencies.

Kimley»Horn

Scenario 1: Basins Impaired for Nutrients

Scenario 1 includes one basin specifically impaired for nutrients. The HUC-12 Basin McQuage Bayou-Mack Bayou Frontal is affected by the impairment of WBID 881 - Direct Runoff to Bay for nutrients (Macrophytes). The basin also outfalls to an Outstanding Florida Water (OFW), requiring the BMPs to provide minimum nutrient reduction rates of 95% for both TN and TP. The Peach Creek and Eastern Lake HUC-12 sub-watershed are located within WBIDs that have no nutrient impairments, nor drain downstream to an impaired WBID within the HUC 12 boundaries. However, they do outfall to an OFW, thus requiring 80% and 90% nutrient reduction rates for TN and TP respectively. **Table 2** summarizes ambient water quality findings for Scenario 1

Table 2: Summary of Findings – Scenario 1

Total No. HUC-12 Basins	HUC-12 Basins Impaired for Nutrients	HUC-12 Basins Draining into an OFW
3	1	**3**

Scenario 2: Basins Impaired for any Water Quality Parameter

In addition to nutrient impairments, Scenario 2 includes water bodies where the cause for impairment is not nutrients. In Scenario 2, all HUC-12 sub-watersheds are considered impaired and outfall to an OFW. The McQuage Bayou, Peach Creek, and Eastern Lake HUC 12 sub-watersheds require 95% for both TN and TP nutrient reduction.

Table 3: Summary of Findings – Scenario 2

Total No. HUC-12 Basins	HUC-12 Basins Impaired for Any Water Quality Parameter	HUC-12 Basins Draining into an OFW
3	**3**	**3**

McQuage Bayou – Mack Bayou Frontal

This HUC-12 sub-watershed contains roadway subbasins from CR 30A to US 331 and from US 331 to Peach Creek. It contains curb and gutter, and flush shoulder typical sections, as seen in **Figures 1-3**. The curb and gutter typical section spans from Hunters Road to the Publix at South Walton – this segment contains five existing wet ponds in parallel. The suburban typical section (curbed inner lanes, flush shoulder outer lanes) spans from the Publix at South Walton to Old Blue Mountain Road, for the remainder of the HUC 12 sub-watershed. Nutrient reduction rates were determined using a combined compensatory approach at the HUC-12 scale that included the VFS and dry retention swales in series,

and five existing wet detention ponds in parallel. Retention swales were modeled individually, with their efficiencies combined in series for analysis. The retention volumes modeled correspond to the retention volumes presented in the original PSR stage-storage tables. VFSs were applied only in segments of the project limits with flush shoulder sections, designed with a 2-foot depth and 1:6 slope. The analysis for this sub-watershed indicates that the combined treatment efficiency does not meet the required nutrient reduction performance criteria for both scenarios for the HUC 12 sub-watershed. Additional BMPs like retention ponds, modified swales, or vegetated buffers will be needed to provide 22% TN and 17% TP nutrient reduction basin wide to meet the requirements of the new rule in Scenarios 1 and 2. Please note these values represent the difference between the required BMP efficiency rate and the efficiency rate provided at the HUC 12 sub-watershed scale. The required efficiency rate any additional BMP would need to provide when sequenced in series with all other BMPs is a function of its sequence relative to existing BMPs. Please note that the original PSR states that, in coordination with the Florida Forestry Service, offsite ponds are discouraged in order to protect environmentally sensitive areas. Placement of any offsite BMPs will require further coordination with the Florida Forestry Service during design. Additionally, the use of vegetated buffers within the Point Washington Wildlife Management Area (PWWMA) may serve as an alternative to offsite ponds for achieving the nutrient reduction needed. Additional BMPs needed for this sub-watershed will be addressed during design.

Peach Creek

This HUC-12 sub-watershed includes two roadway subbasins: US 331 to Peach Creek and Peach Creek to the Bay County Line. The flush shoulder typical section extends from US 331 to McDavis Boulevard, after which the roadway transitions to a suburban typical section (curbed inner lanes, flush shoulder outer lanes) through the remainder of the Peach Creek HUC-12 sub-watershed. Under existing conditions, stormwater sheet flows into dry retention swales, which will remain in place post-widening. The original PSR documents a change in the slopes of the swales from 1:8 to 1:6 to increase capacity. For this evaluation, the retention volumes that correspond to the 1:6 retention swales were used to remain consistent with decisions made in the original PSR. The retention volumes modeled correspond to the retention volumes presented in the original PSR. These retention swales were modeled collectively as a single dry retention BMP by summing the retention volumes to treat nutrients across the Peach Creek sub-watershed. In the flush shoulder typical section, the front slopes of both median and outer swales were modeled as VFS, while in the suburban typical section, only the front slope of the outer swale was modeled as VFS. This HUC-12 has two distinct outfalls: Peach Creek and ICWW Bay County Walton County. Both outfalls have distinct nutrient reduction criteria. In Scenario 1 and 2, the compensatory treatment at the outfall scale provided by the existing BMPs meets the required performance standards without the need for additional BMPs. Using Equation 9-5, the combined treatment from the dry retention swales and VFS achieved the required performance standards for both scenarios.

Eastern Lake – Phillips Inlet Frontal

Within this HUC-12 sub-watershed, the roadway subbasins transition through two distinct typical sections. From the end of the Peach Creek HUC-12 to West Shore Drive, the corridor follows a suburban typical section (curbed inner lanes, flush shoulder outer lanes). Beyond West Shore Drive,

the roadway transitions into a curb and gutter typical section. The curb and gutter typical section includes two existing dry detention ponds, intended to remain post roadway widening. The original PSR states that no documentation was available for these two dry retention ponds. For this analysis, the retention volume was determined by assuming 4-inches of retention depth over the roadway basin. This assumption was used to optimize nutrient reduction in the existing dry ponds. Any modifications to control structures or the pond to meet recovery criteria will be addressed in the design phase when more information is available. These ponds were evaluated for nutrient reduction under both Scenario 1 and Scenario 2 and were found to meet the required stormwater performance standards only for Scenario 1. In the suburban section, stormwater treatment is provided by a combination of swales and outer VFS functioning as a treatment train in series. Due to the roadway being crowned in the median, only outer swales were considered suitable for VFS treatment in this segment of the road. The retention swales and VFS were modeled in series, whereas the ponds were modeled in parallel for both the Camp Creek outfall and the Lake Powell outfalls. Both meet the required nutrient reduction criteria for their designated outfall in Scenario 1, but not Scenario 2. Additional BMPs like retention ponds, modified swales, or vegetated buffers will be needed to provide 1% TN and 1% TP nutrient reduction basin wide to meet the requirements of the new rule in Scenario 2.

Conclusion

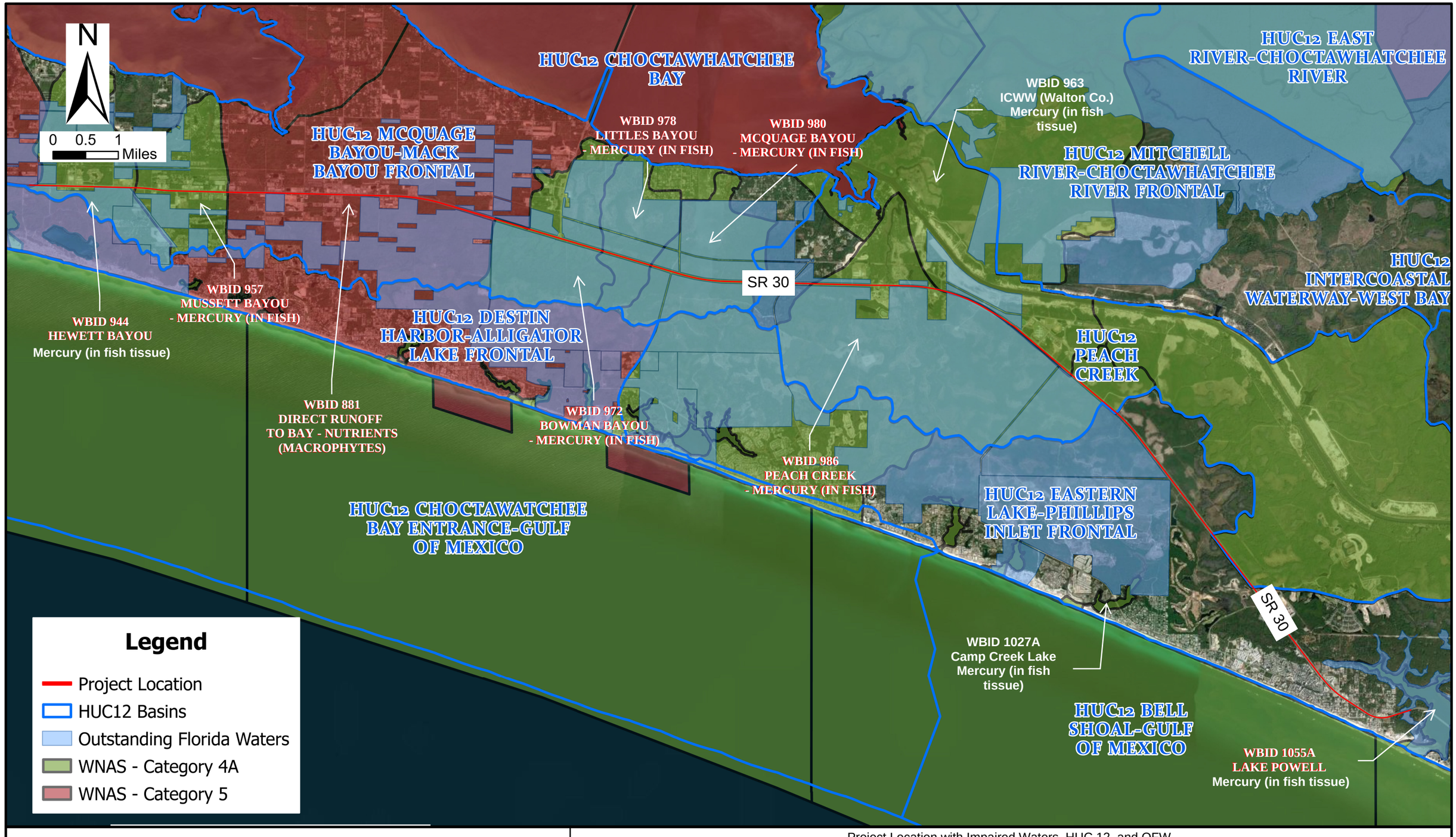
This technical memorandum evaluated the SR 30 PD&E Study stormwater management alternatives under the new stormwater rule in Chapter 62-330, F.A.C. and 2024 A.H. Vol. 1, with a focus on meeting nutrient reduction requirements for TN and TP. Using BMPTrains modeling and the stormwater facilities identified in the original PSR, the analysis demonstrates that the majority of the project corridor can achieve the nutrient reduction performance standards under both Scenario 1 and Scenario 2 without the need for additional BMPs. The Peach Creek HUC-12 sub-watershed in both Scenarios 1 and 2, and the Eastern Lake HUC-12 in Scenario 1, meet the required performance standards at the applicable outfall or HUC-12 scale through existing treatment trains consisting of VFS, retention swales, and existing detention facilities.

The McQuage Bayou HUC-12 in both Scenario 1 and 2, and the Eastern Lake HUC-12 in Scenario 2, do not fully meet the TN and TP nutrient reduction requirements, indicating that supplemental BMPs will be required to achieve the nutrient reduction standards of the new rule. Any additional BMPs will be evaluated during the design phase and will require coordination with the Florida Forest Service consistent with the constraints and recommendations identified in the original PSR. Overall, this evaluation provides reasonable assurance that the stormwater management approach for the SR 30 improvements can be adapted to comply with Chapter 62-330, F.A.C. and A.H. Vol. 1, while identifying specific areas where further design-phase refinement will be necessary.

.

APPENDIX A

Exhibit: Impaired Waters, HUC 12, and OFW
Pollutant Nutrient Loading Analysis
PSR BMPTrains Comparison
Scenario 1 Results
Scenario 2 Results
Pond Stage-Storage Tables
DCIA Calculations



Kimley»Horn

© 2025 Kimley-Horn and Associates, Inc.

200 S Orange Ave, Suite 600, Orlando, FL 32801
Phone: (407) 898-1511 www.kimley-horn.com CA 00000696

Project Location with Impaired Waters, HUC 12, and OFW

SR-30 NEW RULES POND SITING ANALYSIS
WALTON COUNTY, FLORIDA

Scale: As Noted	Project No: 437179-1	January 2026	Figure 1

NUTRIENT LOADING ANALYSIS BY HUC 12

McQuage Bayou									
Ponds	Total Nitrogen Loading				Total Phosphorus Loading			Required Treatment Efficiency:	
	Pre (kg/yr)	Post (kg/yr)	Increase Loading		Pre (kg/yr)	Post (kg/yr)	Increase Loading	Scenario 1	Scenario 2
1 West	25.08	22.74	-10%		3.47	3.15	-10%	80%/80%	80%/80%
2 West	22.67	23.74	5%		3.14	3.29	5%		
3	18.79	17.35	-8%		2.60	2.40	-8%		
4,5	44.23	44.07	-0.4%		6.12	6.10	-0.4%		
6	28.18	28.70	2%		3.90	3.97	2%		
Total:	138.96	136.60			19.23	18.91			
Swales	Total Nitrogen Loading				Total Phosphorus Loading				
	Pre (kg/yr)	Post (kg/yr)	Increase Loading		Pre (kg/yr)	Post (kg/yr)	Increase Loading		
L1-5	18.48	25.98	29%		2.56	3.60	29%	95%/95%	95%/95%
L6-10	30.51	40.86	25%		4.22	5.65	25%		
L12-16	29.86	43.47	31%		4.13	6.01	31%		
L17-21	36.61	48.04	24%		5.07	6.65	24%		
L22-26	25.87	34.99	26%		3.58	4.84	26%		
R2-6	29.76	53.97	45%		4.12	7.47	45%		
R7-12	34.36	55.68	38%		4.76	7.71	38%		
R13-17	31.49	52.64	40%		4.36	7.29	40%		
R18-22	39.23	63.17	38%		5.43	8.74	38%		
R23-24	11.44	23.27	51%		1.58	3.22	51%		
Total:	287.60	442.07			39.80	61.18			
US 331 to Peach Creek	106.55	192.53	45%		14.75	26.65	45%	80%/90%	95%/95%

Peach Creek									
Swales	Total Nitrogen Loading				Total Phosphorus Loading			Required Treatment Efficiency:	
	Pre (kg/yr)	Post (kg/yr)	Increase Loading		Pre (kg/yr)	Post (kg/yr)	Increase Loading	Scenario 1	Scenario 2
US 331 to Peach Creek	78.976	143.235	45%		10.93	19.824	45%	80%/90%	95%/95%
Peach Creek to Bay County Line	118.659	156.326	24%		16.422	21.635	24%	80%/90%	95%/95%
Peach Creek to Bay County Line - ICWW Bay	29.015	45.195	36%		4.016	6.255	36%	55%/80%	80%/80%

Eastern Lake									
Swales	Total Nitrogen Loading				Total Phosphorus Loading			Required Treatment Efficiency:	
	Pre (kg/yr)	Post (kg/yr)	Increase Loading		Pre (kg/yr)	Post (kg/yr)	Increase Loading	Scenario 1	Scenario 2
Peach Creek to Bay County Line - Camp Creek	49.112	82.337	40%		6.797	11.395	40%	80%/90%	95%/95%
Peach Creek to Bay County Line - Lake Powell	90.57	151.844	40%		12.535	21.015	40%	80%/90%	95%/95%
Dry Ponds	Total Nitrogen Loading				Total Phosphorus Loading				
	Pre (kg/yr)	Post (kg/yr)	Increase Loading		Pre (kg/yr)	Post (kg/yr)	Increase Loading		
Pond 1 East*	NA	31.559	NA		NA	4.368	NA	80%/90%	95%/95%
Pond 2 East*	NA	67.516	NA		NA	9.344	NA		
Total:		99.075				13.712			

*Pre development loading is assumed to equate to post loading due to the absence of basin information of existing conditions in the original PSR. It is not anticipated the pre-post loading analysis would control the required BMP nutrient reduction. Therefore, only post loading for 6-lanes roadway was considered for BMP nutrient reduction per ambient water quality analysis.

SCENARIO 1 - PSR CONDITIONS

			Facility Information				BMP Series Train		Basin Information			Nitrogen				Phosphorus			
Typical	HUC 12	HUC 12 Name	Basin	Pond/Swale ID	Structure ID	Facility Type	BMP Element 1	BMP Element 2	WBID	Impairment	Basin Impairment	BMP 1 Efficiency (PSR)	BMP 2 Efficiency (PSR)	*Req. Nitrogen Treatment (New Rule)*	Nitrogen Combined Efficiency Rate	BMP 1 Efficiency (PSR)	BMP 2 Efficiency (PSR)	*Req. Phosphorus Treatment (New Rule)*	Phosphorus Combined Efficiency Rate
Curb and Gutter	31401020401	McQuage Bayou-Mack Bayou Frontal	CR 30A to US 331	L1	S-4	dry	VFS	Linear Ret. Swale	957 - Mussett Bayou	Not Verified Impaired	OFW	0%	50%	*80%*	50%	0%	50%	*80%*	50%
				L2	S-6	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*80%*	48%
				L3	S-10	dry	VFS	Linear Ret. Swale			OFW	0%	51%	*80%*	51%	0%	51%	*80%*	51%
				L4	S-15	dry	VFS	Linear Ret. Swale			OFW	0%	49%	*80%*	49%	0%	49%	*80%*	49%
				L5	S-22	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*80%*	48%
				L6	S-23	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*80%*	48%
				L7	S-25	dry	VFS	Linear Ret. Swale			OFW	0%	49%	*80%*	49%	0%	49%	*80%*	49%
				L8	S-41	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	45%	*95%*	45%	0%	45%	95%	45%
				L9	S-44	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	53%	*95%*	53%	0%	53%	95%	53%
				L10	S-47	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	44%	*95%*	44%	0%	44%	95%	44%
				L12	S-217	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	57%	*95%*	57%	0%	57%	95%	57%
Curbed inner lanes & flush shoulder outer lanes				L13	S-220A	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	44%	*95%*	92%	86%	44%	95%	92%
				L14	S-222	dry	VFS	Linear Ret. Swale	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	86%	59%	*95%*	94%	86%	59%	95%	94%
				L15	S-225	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	54%	*95%*	94%	86%	54%	95%	94%
				L16	S-229	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	41%	*95%*	92%	86%	41%	95%	92%
				L17	S-232	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	52%	*95%*	93%	86%	52%	95%	93%
Flush shoulder				L18	S-236	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	46%	*95%*	96%	93%	46%	95%	96%
				L19	S-240	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	52%	*95%*	97%	93%	52%	95%	97%
				L20	S-244	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou	Not Verified Impaired	OFW	93%	44%	*80%*	96%	93%	44%	*90%*	96%
				L21	S-247	dry	VFS	Linear Ret. Swale			OFW	93%	49%	*80%*	96%	93%	49%	*90%*	96%
				L22	S-250	dry	VFS	Linear Ret. Swale			OFW	93%	30%	*80%*	95%	93%	30%	*90%*	95%
				L23	S-251	dry	VFS	Linear Ret. Swale			OFW	93%	55%	*80%*	97%	93%	55%	*90%*	97%
				L24	S-252	dry	VFS	Linear Ret. Swale			OFW	93%	10%	*80%*	94%	93%	10%	*90%*	94%
				L25	S-256	dry	VFS	Linear Ret. Swale			OFW	93%	35%	*80%*	95%	93%	35%	*90%*	95%
				L26	S-258	dry	VFS	Linear Ret. Swale			OFW	93%	46%	*80%*	96%	93%	46%	*90%*	96%
Curb and Gutter				R2	S-3	dry	VFS	Linear Ret. Swale	957 - Mussett Bayou	Not Verified Impaired	OFW	0%	42%	*80%*	42%	0%	42%	*90%*	42%
				R3	S-9	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*90%*	48%
				R4	S-14	dry	VFS	Linear Ret. Swale			OFW	0%	40%	*80%*	40%	0%	40%	*90%*	40%
				R5	S-21	dry	VFS	Linear Ret. Swale			OFW	0%	41%	*80%*	41%	0%	41%	*90%*	41%
				R6	S-26	dry	VFS	Linear Ret. Swale			OFW	0%	42%	*80%*	42%	0%	42%	*90%*	42%
				R7	S-42	dry	VFS	Linear Ret. Swale	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	42%	*95%*	42%	0%	42%	95%	42%
				R8	S-46	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	45%	*95%*	45%	0%	45%	95%	45%
				R9	S-50	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	*95%*	42%	0%	42%	95%	42%
				R11	S-214	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	*95%*	42%	0%	42%	95%	42%
				R12	S-216	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	43%	*95%*	43%	0%	43%	95%	43%
Curbed inner lanes & flush shoulder outer lanes				R13	S-219	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	40%	*95%*	92%	86%	40%	95%	92%
				R14	S-221	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	46%	*95%*	92%	86%	46%	95%	92%
				R15	S-224	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	47%	*95%*	93%	86%	47%	95%	93%
				R16	S-228	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	45%	*95%*	92%	86%	45%	95%	92%
				R17	S-229A	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	44%	*95%*	92%	86%	44%	95%	92%
				R18	S-231	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	42%	*95%*	92%	86%	42%	95%	92%
Flush shoulder				R19	S-237	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou	Not Verified Impaired	OFW	93%	46%	*80%*	96%	93%	46%	*90%*	96%
				R20	S-242	dry	VFS	Linear Ret. Swale			OFW	93%	45%	*80%*	96%	93%	45%	*90%*	96%
				R21	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	38%	*80%*	96%	93%	38%	*90%*	96%
				R22	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	29%	*80%*	95%	93%	29%	*90%*	95%
				R23	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	22%	*80%*	95%	93%	22%	*90%*	95%
				R24	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	22%	*80%*	95%	93%	22%	*90%*	95%
				R25	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	42%	*80%*	96%	93%	42%	*90%*	96%
Curb and Gutter				Pond 1 West	-	wet	Wet Pond	-	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired Waters	24%	0%	*80%*	24%	51%	0%	*80%*	51%
				Pond 2 West	-	wet	Wet Pond	-			Impaired Waters	42%	0%	*80%*	42%	75%	0%	*80%*	75%
				Pond 3	-	wet	Wet Pond	-			Impaired Waters	41%	0%	*80%*	41%	70%	0%	*80%*	70%
				Pond 4/5	-	wet	Wet Pond	-			Impaired Waters	42%	0%	*80%*	42%	73%	0%	*80%*	73%
				Pond 6	-	wet	Wet Pond	-			Impaired Waters	42%	0%	*80%*	42%	75%	0%	*80%*	75%
Flush shoulder	31401020401	McQuage Bayou-Mack Bayou Frontal	US 331 to Peach Creek	-	S-5 to S-39	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou, 978 - Littles Bayou, 980 - Mcquage Bayou, 986 - Peach Creek	Not Verified Impaired	OFW	93%	65%	*80%*	98%	93%	65%	*90%*	98%
									981 - Direct Runoff to Bay	Not Verified Impaired	OFW	93%	65%	*80%*	98%	93%	65%	*90%*	98%
Flush shoulder	31401011001	Peach Creek	US 331 to Peach Creek	-	S-41 to S-64	dry	VFS	Linear Ret. Swale	981 - Direct Runoff to Bay	Not Verified Impaired	OFW	93%	66%	*80%*	98%	93%	66%	*90%*	98%
									986 - Peach Creek	Not Verified Impaired									
Flush shoulder, then Curbed inner lanes & flush shoulder outer lanes after McDavis Blvd			Peach Creek to Bay County Line		S-1 to S-41		VFS	Linear Ret. Swale	986 - Peach Creek										
									963 - ICWW Walton County	Not Verified Impaired	OFW	90%	69%	*80%*	97%	90%	69%	*90%*	97%
Curbed inner lanes & flush shoulder outer lanes		Peach Creek (ICWW Bay County Walton County outfall)			(L) S-75 to S-85		VFS Outside	Linear Ret. Swale	1008 - ICWW Bay County Walton County	Not Verified Impaired	No Verified Impairments	86%	59%	55%	94%	86%	59%	*80%*	94%
Curbed inner lanes & flush shoulder outer lanes	31401011004	Eastern Lake - Phillips Inlet Frontal	Peach Creek to Bay County Line	Pond 1 East	-	dry	Dry Pond	-	1055B - Lake Powell Drain	Not verified impaired	OFW	97%	0%	*80%*	97%	97%	49%	*90%*	98%
Curb and Gutter				Pond 2 East	-	dry	Dry Pond	-	1055B - Lake Powell Drain	Not verified impaired	OFW	97%	0%	*80%*	97%	97%	0%	*90%*	97%
Curbed inner lanes & flush shoulder outer lanes				-	S-42 to S-76	dry	VFS Outside	Linear Ret. Swale	1027B - Camp Creek	Not verified impaired	OFW	86%	54%	*80%*	94%	86%	54%	*90%*	94%
Curbed inner lanes & flush shoulder outer lanes				-	S-78 to S-107	dry	VFS Outside	Linear Ret. Swale	1055B - Lake Powell Drain	Not verified impaired	OFW	86%	52%	*80%*	93%	86%	52%	*90%*	93%

SCENARIO 2 - PSR CONDITIONS

			Facility Information				BMP Series Train		Basin Information			Nitrogen				Phosphorus			
Typical	HUC 12	HUC 12 Name	Basin	Pond/Swale ID	Structure ID	Facility Type	BMP Element 1	BMP Element 2	WBID	Impairment	Basin Impairment	BMP 1 Efficiency (PSR)	BMP 2 Efficiency (PSR)	*Req. Nitrogen Treatment (New Rule)*	Nitrogen Combined Efficiency Rate	BMP 1 Efficiency (PSR)	BMP 2 Efficiency (PSR)	*Req. Phosphorus Treatment (New Rule)*	Phosphorus Combined Efficiency Rate
Curb and Gutter	31401020401	McQuage Bayou-Mack Bayou Frontal	CR 30A to US 331	L1	S-4	dry	VFS	Linear Ret. Swale	957 - Mussett Bayou	4a - Mercury (in fish)	Impaired+OFW	0%	50%	95%	50%	0%	50%	95%	50%
				L2	S-6	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	48%	95%	48%	0%	48%	95%	48%
				L3	S-10	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	51%	95%	51%	0%	51%	95%	51%
				L4	S-15	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	49%	95%	49%	0%	49%	95%	49%
				L5	S-22	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	48%	95%	48%	0%	48%	95%	48%
				L6	S-23	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	48%	95%	48%	0%	48%	95%	48%
				L7	S-25	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	49%	95%	49%	0%	49%	95%	49%
				L8	S-41	dry	VFS	Linear Ret. Swale	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	45%	95%	45%	0%	45%	95%	45%
				L9	S-44	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	53%	95%	53%	0%	53%	95%	53%
				L10	S-47	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	44%	95%	44%	0%	44%	95%	44%
				L12	S-217	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	57%	95%	57%	0%	57%	95%	57%
Curbed inner lanes & flush shoulder outer lanes				L13	S-220A	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	44%	95%	92%	86%	44%	95%	92%
				L14	S-222	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	59%	95%	94%	86%	59%	95%	94%
				L15	S-225	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	54%	95%	94%	86%	54%	95%	94%
				L16	S-229	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	41%	95%	92%	86%	41%	95%	92%
				L17	S-232	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	52%	95%	93%	86%	52%	95%	93%
Flush shoulder				L18	S-236	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	46%	95%	96%	93%	46%	95%	96%
				L19	S-240	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	52%	95%	97%	93%	52%	95%	97%
				L20	S-244	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou	4a - Mercury (in fish)	Impaired+OFW	93%	44%	95%	96%	93%	44%	95%	96%
				L21	S-247	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	49%	95%	96%	93%	49%	95%	96%
				L22	S-250	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	30%	95%	95%	93%	30%	95%	95%
				L23	S-251	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	55%	95%	97%	93%	55%	95%	97%
				L24	S-252	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	10%	95%	94%	93%	10%	95%	94%
				L25	S-256	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	35%	95%	95%	93%	35%	95%	95%
				L26	S-258	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	46%	95%	96%	93%	46%	95%	96%
Curb and Gutter				R2	S-3	dry	VFS	Linear Ret. Swale	957 - Mussett Bayou	4a - Mercury (in fish)	Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R3	S-9	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	48%	95%	48%	0%	48%	95%	48%
				R4	S-14	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	40%	95%	40%	0%	40%	95%	40%
				R5	S-21	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	41%	95%	41%	0%	41%	95%	41%
				R6	S-26	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R7	S-42	dry	VFS	Linear Ret. Swale	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R8	S-46	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	45%	95%	45%	0%	45%	95%	45%
				R9	S-50	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R11	S-214	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R12	S-216	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	43%	95%	43%	0%	43%	95%	43%
Curbed inner lanes & flush shoulder outer lanes				R13	S-219	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	40%	95%	92%	86%	40%	95%	92%
				R14	S-221	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	46%	95%	92%	86%	46%	95%	92%
				R15	S-224	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	47%	95%	93%	86%	47%	95%	93%
				R16	S-228	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	45%	95%	92%	86%	45%	95%	92%
				R17	S-229A	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	44%	95%	92%	86%	44%	95%	92%
				R18	S-231	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	42%	95%	92%	86%	42%	95%	92%
Flush shoulder				R19	S-237	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou	4a - Mercury (in fish)	Impaired+OFW	93%	46%	95%	96%	93%	46%	95%	96%
				R20	S-242	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	45%	95%	96%	93%	45%	95%	96%
				R21	S-246	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	38%	95%	96%	93%	38%	95%	96%
				R22	S-246	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	29%	95%	95%	93%	29%	95%	95%
				R23	S-246	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	22%	95%	95%	93%	22%	95%	95%
				R24	S-246	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	22%	95%	95%	93%	22%	95%	95%
				R25	S-246	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	42%	95%	96%	93%	42%	95%	96%
Curb and Gutter				Pond 1 West	-	wet	Wet Pond	-	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired Waters	24%	0%	80%	24%	51%	0%	80%	51%
				Pond 2 West	-	wet	Wet Pond	-			Impaired Waters	42%	0%	80%	42%	75%	0%	80%	75%
				Pond 3	-	wet	Wet Pond	-			Impaired Waters	41%	0%	80%	41%	70%	0%	80%	70%
				Pond 4/5	-	wet	Wet Pond	-			Impaired Waters	42%	0%	80%	42%	73%	0%	80%	73%
				Pond 6	-	wet	Wet Pond	-			Impaired Waters	42%	0%	80%	42%	75%	0%	80%	75%
Flush shoulder	31401020401	McQuage Bayou-Mack Bayou Frontal	US 331 to Peach Creek	-	S-5 to S-39	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou, 978 - Littles Bayou, 980 - Mcquage Bayou, 986 - Peach Creek	4a - Mercury (in fish)	Impaired+OFW	93%	65%	95%	98%	93%	65%	95%	98%
									981 - Direct Runoff to Bay	Not verified impaired	OFW	93%	65%	80%	98%	93%	65%	90%	98%
Flush shoulder	31401011001	Peach Creek	US 331 to Peach Creek	-	S-41 to S-64	dry	VFS	Linear Ret. Swale	981 - Direct Runoff to Bay	Not verified impaired	OFW	93%	66%	80%	98%	93%	66%	90%	98%
									986 - Peach Creek	4a - Mercury (in fish)	Impaired+OFW			95%				95%	
Flush shoulder, then Curbed inner lanes & flush shoulder outer lanes			Peach Creek to Bay County Line		S-1 to S-41				986 - Peach Creek	4a - Mercury (in fish)	Impaired+OFW	90%	69%	95%	97%	90%	69%	95%	97%
									963 - ICWW Walton County	4a - Mercury (in fish)	Impaired+OFW								
Curbed inner lanes & flush shoulder outer lanes		Peach Creek (ICWW Bay County Walton County outfall)			(L) S-75 to S-84		VFS Outside	Linear Ret. Swale	1008 - ICWW Bay County Walton County	4a - Mercury (in fish)	Impaired Waters	86%	59%	80%	94%	86%	59%	80%	94%
Curbed inner lanes & flush shoulder outer lanes	31401011004	Eastern Lake - Phillips Inlet Frontal	Peach Creek to Bay County Line	Pond 1 East	-	dry	Dry Pond	-	1055A - Lake Powell Drain	4a -Mercury (in fish)	Impaired+OFW	97%	0%	95%	97%	97%	0%	95%	97%
Curb and Gutter				Pond 2 East	-	dry	Dry Pond	-	1055A - Lake Powell Drain	4a -Mercury (in fish)	Impaired+OFW	97%	0%	95%	97%	97%	0%	95%	97%
Curbed inner lanes & flush shoulder outer lanes				-	S-42 to S-76	dry	VFS Outside	Linear Ret. Swale	1027A - Camp Creek Lake	4a - Mercury (in fish)	Impaired+OFW	86%	54%	95%	94%	86%	54%	95%	94%
Curbed inner lanes & flush shoulder outer lanes				-	S-78 to S-107	dry	VFS Outside	Linear Ret. Swale	1055A - Lake Powell Drain	4a -Mercury (in fish)	Impaired+OFW	86%	52%	95%	93%	86%	52%	95%	93%

SCENARIO 1 - POST CONDITIONS

			Facility Information				BMP Series Train		Basin Information			Nitrogen				Phosphorus			
Typical	HUC 12	HUC 12 Name	Basin	Pond/Swale ID	Structure ID	Facility Type	BMP Element 1	BMP Element 2	WBID	Impairment	Basin Impairment	BMP Element 1 Efficiency	BMP Element 2 Efficiency	*Req. Nitrogen Treatment (New Rule)*	Nitrogen Combined Efficiency Rate	BMP Element 1 Efficiency	BMP Element 2 Efficiency	*Req. Phosphorus Treatment (New Rule)*	Phosphorus Combined Efficiency Rate
Curb and Gutter	31401020401	McQuage Bayou-Mack Bayou Frontal	CR 30A to US 331	L1	S-4	dry	VFS	Linear Ret. Swale	957 - Mussett Bayou	Not Verified Impaired	OFW	0%	50%	*80%*	50%	0%	50%	*80%*	50%
				L2	S-6	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*80%*	48%
				L3	S-10	dry	VFS	Linear Ret. Swale			OFW	0%	51%	*80%*	51%	0%	51%	*80%*	51%
				L4	S-15	dry	VFS	Linear Ret. Swale			OFW	0%	49%	*80%*	49%	0%	49%	*80%*	49%
				L5	S-22	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*80%*	48%
				L6	S-23	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*80%*	48%
				L7	S-25	dry	VFS	Linear Ret. Swale			OFW	0%	49%	*80%*	49%	0%	49%	*80%*	49%
Curbed inner lanes & flush shoulder outer lanes				L8	S-41	dry	VFS	Linear Ret. Swale	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	45%	95%	45%	0%	45%	95%	45%
				L9	S-44	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	53%	95%	53%	0%	53%	95%	53%
				L10	S-47	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	44%	95%	44%	0%	44%	95%	44%
				L12	S-217	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	57%	95%	57%	0%	57%	95%	57%
				L13	S-220A	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	44%	95%	92%	86%	44%	95%	92%
				L14	S-222	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	59%	95%	94%	86%	59%	95%	94%
				L15	S-225	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	54%	95%	94%	86%	54%	95%	94%
				L16	S-229	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	41%	95%	92%	86%	41%	95%	92%
				L17	S-232	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	52%	95%	93%	86%	52%	95%	93%
Flush shoulder				L18	S-236	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	46%	95%	96%	93%	46%	95%	96%
				L19	S-240	dry	VFS	Linear Ret. Swale			Impaired+OFW	93%	52%	95%	97%	93%	52%	95%	97%
				L20	S-244	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou	Not Verified Impaired	OFW	93%	44%	*80%*	96%	93%	44%	*90%*	96%
				L21	S-247	dry	VFS	Linear Ret. Swale			OFW	93%	49%	*80%*	96%	93%	49%	*90%*	96%
				L22	S-250	dry	VFS	Linear Ret. Swale			OFW	93%	30%	*80%*	95%	93%	30%	*90%*	95%
				L23	S-251	dry	VFS	Linear Ret. Swale			OFW	93%	55%	*80%*	97%	93%	55%	*90%*	97%
				L24	S-252	dry	VFS	Linear Ret. Swale			OFW	93%	10%	*80%*	94%	93%	10%	*90%*	94%
				L25	S-256	dry	VFS	Linear Ret. Swale			OFW	93%	35%	*80%*	95%	93%	35%	*90%*	95%
				L26	S-258	dry	VFS	Linear Ret. Swale			OFW	93%	46%	*80%*	96%	93%	46%	*90%*	96%
Curb and Gutter				R2	S-3	dry	VFS	Linear Ret. Swale	957 - Mussett Bayou	Not Verified Impaired	OFW	0%	42%	*80%*	42%	0%	42%	*90%*	42%
				R3	S-9	dry	VFS	Linear Ret. Swale			OFW	0%	48%	*80%*	48%	0%	48%	*90%*	48%
				R4	S-14	dry	VFS	Linear Ret. Swale			OFW	0%	40%	*80%*	40%	0%	40%	*90%*	40%
				R5	S-21	dry	VFS	Linear Ret. Swale			OFW	0%	41%	*80%*	41%	0%	41%	*90%*	41%
				R6	S-26	dry	VFS	Linear Ret. Swale			OFW	0%	42%	*80%*	42%	0%	42%	*90%*	42%
Curbed inner lanes & flush shoulder outer lanes				R7	S-42	dry	VFS	Linear Ret. Swale	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R8	S-46	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	45%	95%	45%	0%	45%	95%	45%
				R9	S-50	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R11	S-214	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	42%	95%	42%	0%	42%	95%	42%
				R12	S-216	dry	VFS	Linear Ret. Swale			Impaired+OFW	0%	43%	95%	43%	0%	43%	95%	43%
				R13	S-219	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	40%	95%	92%	86%	40%	95%	92%
				R14	S-221	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	46%	95%	92%	86%	46%	95%	92%
				R15	S-224	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	47%	95%	93%	86%	47%	95%	93%
				R16	S-228	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	45%	95%	92%	86%	45%	95%	92%
				R17	S-229A	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	44%	95%	92%	86%	44%	95%	92%
				R18	S-231	dry	VFS	Linear Ret. Swale			Impaired+OFW	86%	42%	95%	92%	86%	42%	95%	92%
Flush shoulder				R19	S-237	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou	Not Verified Impaired	OFW	93%	46%	*80%*	96%	93%	46%	*90%*	96%
				R20	S-242	dry	VFS	Linear Ret. Swale			OFW	93%	45%	*80%*	96%	93%	45%	*90%*	96%
				R21	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	38%	*80%*	96%	93%	38%	*90%*	96%
				R22	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	29%	*80%*	95%	93%	29%	*90%*	95%
				R23	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	22%	*80%*	95%	93%	22%	*90%*	95%
				R24	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	22%	*80%*	95%	93%	22%	*90%*	95%
				R25	S-246	dry	VFS	Linear Ret. Swale			OFW	93%	42%	*80%*	96%	93%	42%	*90%*	96%
Curb and Gutter				Pond 1 West	-	wet	Wet Pond	-	881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired Waters	24%	0%	*80%*	24%	51%	0%	*80%*	51%
				Pond 2 West	-	wet	Wet Pond	-			Impaired Waters	42%	0%	*80%*	42%	75%	0%	*80%*	75%
				Pond 3	-	wet	Wet Pond	-			Impaired Waters	41%	0%	*80%*	41%	70%	0%	*80%*	70%
				Pond 4/5	-	wet	Wet Pond	-			Impaired Waters	42%	0%	*80%*	42%	73%	0%	*80%*	73%
				Pond 6	-	wet	Wet Pond	-			Impaired Waters	42%	0%	*80%*	42%	75%	0%	*80%*	75%
Flush shoulder	31401020401	McQuage Bayou-Mack Bayou Frontal	US 331 to Peach Creek		S-5 to S-39	dry	VFS	Linear Ret. Swale	972 - Bowman Bayou, 978 - Littles Bayou, 980 - Mcquage Bayou, 986 - Peach Creek	Not Verified Impaired	OFW	93%	65%	*80%*	98%	83%	65%	90%	94%
									981 - Direct Runoff to Bay	Not Verified Impaired	OFW	93%	65%	*80%*	98%	83%	65%	90%	94%
Flush shoulder	31401011001	Peach Creek	US 331 to Peach Creek	-	S-41 to S-64	dry	VFS	Linear Ret. Swale	981 - Direct Runoff to Bay	Not Verified Impaired	OFW	93%	66%	*80%*	98%	86%	66%	*90%*	95%
									986 - Peach Creek										
Flush shoulder, then Curbed inner lanes & flush shoulder outer lanes			Peach Creek to Bay County Line		S-1 to S-41		VFS	Linear Ret. Swale	986 - Peach Creek										
									963 - ICWW Walton County	Not Verified Impaired	OFW	90%	69%	*80%*	97%	75%	69%	*90%*	92%
Curbed inner lanes & flush shoulder outer lanes		Peach Creek (ICWW Bay County Walton County outfall)			(L) S-75 to S-84		VFS Outside	Linear Ret. Swale	1008 - ICWW Bay County Walton County	Not Verified Impaired	No Verified Impairments	86%	59%	55%	94%	75%	59%	*80%*	90%
Curbed inner lanes & flush shoulder outer lanes	31401011004	Eastern Lake - Phillips Inlet Frontal	Peach Creek to Bay County Line	Pond 1 East	-	dry	Dry Pond	-	1055B - Lake Powell Drain	Not verified impaired	OFW	97%	0%	*80%*	97%	97%	0%	*90%*	97%
Curb and Gutter				Pond 2 East	-	dry	Dry Pond	-	1055B - Lake Powell Drain	Not verified impaired	OFW	97%	0%	*80%*	97%	97%	0%	*90%*	97%
Curbed inner lanes & flush shoulder outer lanes				-	S-42 to S-76	dry	VFS Outside	Linear Ret. Swale	1027B - Camp Creek	Not verified impaired	OFW	86%	54%	*80%*	94%	86%	54%	90%	94%
Curbed inner lanes & flush shoulder outer lanes				-	S-78 to S-107	dry	VFS Outside	Linear Ret. Swale	1055B - Lake Powell Drain	Not verified impaired	OFW	86%	52%	*80%*	93%	86%	52%	90%	93%

SCENARIO 2 - POST CONDITIONS

			Facility Information				BMP Series Train			Basin Information			Nitrogen					Phosphorus				
Typical	HUC 12	HUC 12 Name	Basin	Pond/Swale ID	Structure ID	Facility Type	BMP Element 1	BMP Element 2	BMP Element 3	WBID	Impairment	Basin Impairment	BMP Element 1 Efficiency	BMP Element 2 Efficiency	BMP Element 3 Efficiency	*Req. Nitrogen Treatment (New Rule)*	Nitrogen Combined Efficiency Rate	BMP Element 1 Efficiency	BMP Element 2 Efficiency	BMP Element 3 Efficiency	*Req. Phosphorus Treatment (New Rule)*	Phosphorus Combined Efficiency Rate
Curb and Gutter	31401020401	McQuage Bayou-Mack Bayou Frontal	CB 30A to US 331	L1	S-4	dry	VFS	Linear Ret. Swale		957 - Mussett Bayou	4a - Mercury (in fish)	Impaired+OFW	0%	50%	0%	95%	50%	0%	50%	0%	95%	50%
				L2	S-6	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	48%	0%	95%	48%	0%	48%	0%	95%	48%
				L3	S-10	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	51%	0%	95%	51%	0%	51%	0%	95%	51%
				L4	S-15	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	49%	0%	95%	49%	0%	49%	0%	95%	49%
				L5	S-22	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	48%	0%	95%	48%	0%	48%	0%	95%	48%
				L6	S-23	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	48%	0%	95%	48%	0%	48%	0%	95%	48%
				L7	S-25	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	49%	0%	95%	49%	0%	49%	0%	95%	49%
				L8	S-41	dry	VFS	Linear Ret. Swale		881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	45%	0%	95%	45%	0%	45%	0%	95%	45%
				L9	S-44	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	53%	0%	95%	53%	0%	53%	0%	95%	53%
				L10	S-47	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	44%	0%	95%	44%	0%	44%	0%	95%	44%
				L12	S-217	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	57%	0%	95%	57%	0%	57%	0%	95%	57%
Curbed inner lanes & flush shoulder outer lanes				L13	S-220A	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	44%	0%	95%	92%	86%	44%	0%	95%	92%
				L14	S-222	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	59%	0%	95%	94%	86%	59%	0%	95%	94%
				L15	S-225	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	54%	0%	95%	94%	86%	54%	0%	95%	94%
				L16	S-229	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	41%	0%	95%	92%	86%	41%	0%	95%	92%
				L17	S-232	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	52%	0%	95%	93%	86%	52%	0%	95%	93%
Flush shoulder				L18	S-236	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	46%	0%	95%	96%	93%	46%	0%	95%	96%
				L19	S-240	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	52%	0%	95%	97%	93%	52%	0%	95%	97%
				L20	S-244	dry	VFS	Linear Ret. Swale		972 - Bowman Bayou	4a - Mercury (in fish)	Impaired+OFW	93%	44%	0%	95%	96%	93%	44%	0%	95%	96%
				L21	S-247	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	49%	0%	95%	96%	93%	49%	0%	95%	96%
				L22	S-250	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	30%	0%	95%	95%	93%	30%	0%	95%	95%
				L23	S-251	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	55%	0%	95%	97%	93%	55%	0%	95%	97%
				L24	S-252	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	10%	0%	95%	94%	93%	10%	0%	95%	94%
				L25	S-256	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	35%	0%	95%	95%	93%	35%	0%	95%	95%
				L26	S-258	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	46%	0%	95%	96%	93%	46%	0%	95%	96%
Curb and Gutter				R2	S-3	dry	VFS	Linear Ret. Swale		957 - Mussett Bayou	4a - Mercury (in fish)	Impaired+OFW	0%	42%	0%	95%	42%	0%	42%	0%	95%	42%
				R3	S-9	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	48%	0%	95%	48%	0%	48%	0%	95%	48%
				R4	S-14	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	40%	0%	95%	40%	0%	40%	0%	95%	40%
				R5	S-21	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	41%	0%	95%	41%	0%	41%	0%	95%	41%
				R6	S-26	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	42%	0%	95%	42%	0%	42%	0%	95%	42%
				R7	S-42	dry	VFS	Linear Ret. Swale		881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired+OFW	0%	42%	0%	95%	42%	0%	42%	0%	95%	42%
				R8	S-46	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	45%	0%	95%	45%	0%	45%	0%	95%	45%
				R9	S-50	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	42%	0%	95%	42%	0%	42%	0%	95%	42%
				R11	S-214	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	42%	0%	95%	42%	0%	42%	0%	95%	42%
				R12	S-216	dry	VFS	Linear Ret. Swale				Impaired+OFW	0%	43%	0%	95%	43%	0%	43%	0%	95%	43%
Curbed inner lanes & flush shoulder outer lanes				R13	S-219	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	40%	0%	95%	92%	86%	40%	0%	95%	92%
				R14	S-221	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	46%	0%	95%	92%	86%	46%	0%	95%	92%
				R15	S-224	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	47%	0%	95%	93%	86%	47%	0%	95%	93%
				R16	S-228	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	45%	0%	95%	92%	86%	45%	0%	95%	92%
				R17	S-229A	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	44%	0%	95%	92%	86%	44%	0%	95%	92%
				R18	S-231	dry	VFS	Linear Ret. Swale				Impaired+OFW	86%	42%	0%	95%	92%	86%	42%	0%	95%	92%
Flush shoulder				R19	S-237	dry	VFS	Linear Ret. Swale		972 - Bowman Bayou	4a - Mercury (in fish)	Impaired+OFW	93%	46%	0%	95%	96%	93%	46%	0%	95%	96%
				R20	S-242	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	45%	0%	95%	96%	93%	45%	0%	95%	96%
				R21	S-246	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	38%	0%	95%	96%	93%	38%	0%	95%	96%
				R22	S-246	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	29%	0%	95%	95%	93%	29%	0%	95%	95%
				R23	S-246	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	22%	0%	95%	95%	93%	22%	0%	95%	95%
				R24	S-246	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	22%	0%	95%	95%	93%	22%	0%	95%	95%
				R25	S-246	dry	VFS	Linear Ret. Swale				Impaired+OFW	93%	42%	0%	95%	96%	93%	42%	0%	95%	96%
Curb and Gutter				Pond 1 West	-	wet	Wet Pond	-		881 - Direct Runoff to Bay	5 - Nutrients (Macrophytes)	Impaired Waters	24%	0%	0%	*80%*	24%	51%	0%	0%	*80%*	51%
				Pond 2 West	-	wet	Wet Pond	-				Impaired Waters	42%	0%	0%	*80%*	42%	75%	0%	0%	*80%*	75%
				Pond 3	-	wet	Wet Pond	-				Impaired Waters	41%	0%	0%	*80%*	41%	70%	0%	0%	*80%*	70%
				Pond 4/5	-	wet	Wet Pond	-				Impaired Waters	42%	0%	0%	*80%*	42%	73%	0%	0%	*80%*	73%
				Pond 6	-	wet	Wet Pond	-				Impaired Waters	42%	0%	0%	*80%*	42%	75%	0%	0%	*80%*	75%
Flush shoulder	31401020401	McQuage Bayou-Mack Bayou Frontal	US 331 to Peach Creek	-	S-5 to S-39	dry	VFS	Linear Ret. Swale		972 - Bowman Bayou, 978 - Littles Bayou, 980 - Mcquage Bayou, 986 - Peach Creek	4a - Mercury (in fish)	Impaired+OFW	93%	65%	0%	95%	98%	93%	65%	0%	95%	98%
										981 - Direct Runoff to Bay	Not verified impaired	OFW	93%	65%	0%	*80%*	98%	93%	65%	0%	*90%*	98%
Flush shoulder	31401011001	Peach Creek	US 331 to Peach Creek	-	S-41 to S-64	dry	VFS	Linear Ret. Swale		981 - Direct Runoff to Bay	Not verified impaired	OFW	93%	66%	0%	*80%*	98%	93%	66%	0%	*90%*	98%
										986 - Peach Creek	4a - Mercury (in fish)	Impaired+OFW				95%					95%	
Flush shoulder, then Curbed inner lanes & flush shoulder outer lanes			Peach Creek to Bay County Line		S-1 to S-41		VFS	Linear Ret. Swale		986 - Peach Creek	4a - Mercury (in fish)	Impaired+OFW	90%	69%	0%	95%	97%	90%	69%	0%	95%	97%
										963 - ICWW Walton County	4a - Mercury (in fish)	Impaired+OFW										
Curbed inner lanes & flush shoulder outer lanes		Peach Creek (ICWW Bay County Walton County outfall)			(L) S-75 to S-84		VFS	Linear Ret. Swale		1008 - ICWW Bay County Walton County	4a - Mercury (in fish)	Impaired Waters	86%	59%	0%	*80%*	94%	86%	59%	0%	*80%*	94%
Curbed inner lanes & flush shoulder outer lanes	31401011004	Eastern Lake - Phillips Inlet Frontal	Peach Creek to Bay County Line	Pond 1 East	-	dry	Dry Pond	-		1055A - Lake Powell Drain	4a -Mercury (in fish)	Impaired+OFW	97%	0%	0%	95%	97%	97%	0%	0%	95%	97%
Curb and Gutter				Pond 2 East	-	dry	Dry Pond	-		1055A - Lake Powell Drain	4a -Mercury (in fish)	Impaired+OFW	97%	0%	0%	95%	97%	97%	0%	0%	95%	97%
Curbed inner lanes & flush shoulder outer lanes				-	S-42 to S-76	dry	VFS Outside	Linear Ret. Swale	Dry retention BMP	1027A - Camp Creek Lake	4a - Mercury (in fish)	Impaired+OFW	86%	54%	40%	95%	94%	86%	54%	40%	95%	94%
Curbed inner lanes & flush shoulder outer lanes				-	S-78 to S107	dry	VFS Outside	Linear Ret. Swale		1055A - Lake Powell Drain	4a -Mercury (in fish)	Impaired+OFW	86%	52%	0%	95%	93%	86%	52%	0%	95%	93%

SCENARIO 1 COMPENSATORY ANALYSIS

SR 30 (US 98)
437179-1-22-01

Location: Walton County

Outfall	Required Nutrient Reduction per Outfall	HUC 12 Sub Watershed	Pre-Dev. Loading (kg/yr)		Post-Dev. Loading (kg/yr)		BMP Series Train Description	Annual Capture Efficiency Rate								Provided BMP Efficiency Rate	
								TN				TP					
			TN	TP	TN	TP		BMP1	BMP2	BMP3	BMP 4	BMP1	BMP2	BMP3	BMP4	TN	TP
McQuage Bayou - CR 30A to US 331	95% TN / 95% TP	McQuage Bayou	287.60	39.80	442.07	61.18	VFS + Retention Swales	52%	44%			52%	44%			73.1%	73.1%
		McQuage Bayou	138.96	19.23	136.60	18.91	Wet Ponds: Pond 1 West, Pond 2 West, Pond 2, Pond 4/5, & Pond 6	38%				69%				38.0%	69.0%
McQuage Bayou - US 331 to Peach Creek	80% TN / 90% TP	McQuage Bayou	106.55	14.75	192.53	26.65	VFS + Retention Swales	93%	65%			93%	65%			97.6%	97.6%
Peach Creek	80% TN / 90% TP	Peach Creek	78.976	10.93	143.235	19.824	VFS + Retention Swales	93%	66%			93%	66%			97.6%	97.6%
		Peach Creek	118.659	16.422	156.326	21.635	VFS + Retention Swales	90%	69%			90%	69%			96.9%	96.9%
ICWW Bay County	55% TN / 80% TP	Peach Creek	29.015	4.016	45.195	6.255	VFS + Retention Swales	86%	59%			86%	59%			94.3%	94.3%
Camp Creek	80% TN / 90% TP	Eastern Lake	49.112	6.797	82.337	11.395	VFS Outside + Retention Swales	86%	54%			86%	54%			93.6%	93.6%
Lake Powell		Eastern Lake	90.57	12.535	151.844	21.015	VFS Outside + Retention Swales	86%	52%			86%	52%			93.3%	93.3%
	80% TN / 90% TP	Eastern Lake	0	0	99.075	13.712	Pond 1 East & Pond 2 East	97%				97%				97.0%	97.0%

	TN	TP	
Minimum BMP Efficiency:	95%	95%	McQuage Bayou
Minimum BMP Efficiency:	80%	90%	Peach Creek
Minimum BMP Efficiency:	80%	90%	Eastern Lake

HUC 12 Sub Watershed	Pre-Dev. Nutrient Loading (kg/yr)		Post-Dev. Nutrient Loading (kg/yr)		Minimum Required Treatment Summary								Provided Treatment Summary					
					Development Loading Increase (kg/yr)		Post-Dev. BMP Load Allowable (kg/yr)		Reduction from Pre-Dev Condition		Required BMP Efficiency Rate		Post-Dev. BMP Nutrient Loading (kg/yr)		Provided BMP Efficiency Rate		Provided Pre-Development Reductions	
	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP
McQuage Bayou	533.1	73.8	771.2	106.7	238.1	33.0	38.6	5.3	31%	31%	95%	95%	208.2	23.0	73%	78%	61%	69%
Peach Creek	226.7	31.4	344.8	47.7	118.1	16.3	69.0	4.8	34%	34%	80%	90%	10.8	1.5	97%	97%	95%	95%
Eastern Lake	139.7	19.3	333.3	46.1	193.6	26.8	66.7	4.6	58%	58%	80%	90%	18.5	2.6	94%	94%	87%	87%

SCENARIO 2 COMPENSATORY ANALYSIS

SR 30 (US 98)
437179-1-22-01

Location: Walton County

Outfall	Required Nutrient Reduction per Outfall	HUC 12 Sub Watershed	Pre-Dev. Loading (kg/yr)		Post-Dev. Loading (kg/yr)		BMP Series Train Description	Annual Capture Efficiency Rate								Provided BMP Efficiency Rate	
								TN				TP					
			TN	TP	TN	TP		BMP1	BMP2	BMP3	BMP 4	BMP1	BMP2	BMP3	BMP4	TN	TP
McQuage Bayou - CR 30A to US 331	95% TN / 95% TP	McQuage Bayou	287.60	39.80	442.07	61.18	VFS + Retention Swales	52%	44%			52%	44%			73.1%	73.1%
		McQuage Bayou	138.96	19.23	136.60	18.91	Wet Ponds: Pond 1 West, Pond 2 West, Pond 2, Pond 4/5, & Pond 6	38%				69%				38.0%	69.0%
McQuage Bayou - US 331 to Peach Creek		McQuage Bayou	106.55	14.75	192.53	26.65	VFS + Retention Swales	93%	65%			93%	65%			97.6%	97.6%
Peach Creek	95% TN / 95% TP	Peach Creek	78.976	10.93	143.235	19.824	VFS + Retention Swales	93%	66%			93%	66%			97.6%	97.6%
		Peach Creek	118.659	16.422	156.326	21.635	VFS + Retention Swales	90%	69%			90%	69%			96.9%	96.9%
ICWW Bay County	80% TN / 80% TP	Peach Creek	29.015	4.016	45.195	6.255	VFS Outside + Retention Swales	86%	59%			86%	59%			94.3%	94.3%
Camp Creek	95% TN / 95% TP	Eastern Lake	49.112	6.797	82.337	11.395	VFS Outside + Retention Swales	86%	54%			86%	54%			93.6%	93.6%
Lake Powell		Eastern Lake	90.57	12.535	151.844	21.015	VFS Outside + Retention Swales	86%	52%			86%	52%			93.3%	93.3%
	95% TN / 95% TP	Eastern Lake	99.075	13.712	99.075	13.712	Pond 1 East & Pond 2 East	97%				97%				97.0%	97.0%

	TN	TP	
Minimum BMP Efficiency:	95%	95%	McQuage Bayou
Minimum BMP Efficiency:	95%	95%	Peach Creek
Minimum BMP Efficiency:	95%	95%	Eastern Lake

HUC 12 Sub Watershed	Pre-Dev. Nutrient Loading (kg/yr)		Post-Dev. Nutrient Loading (kg/yr)		Minimum Required Treatment Summary								Provided Treatment Summary					
					Development Loading Increase (kg/yr)		Post-Dev. BMP Load Allowable (kg/yr)		Reduction from Pre-Dev Condition		Required BMP Efficiency Rate		Post-Dev. BMP Nutrient Loading (kg/yr)		Provided BMP Efficiency Rate		Provided Pre-Development Reductions	
	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP	TN	TP
McQuage Bayou	533.1	73.8	771.2	106.7	238.1	33.0	38.6	5.3	31%	31%	95%	95%	208.2	23.0	73%	78%	61%	69%
Peach Creek	226.7	31.4	344.8	47.7	118.1	16.3	17.2	2.4	34%	34%	95%	95%	10.8	1.5	97%	97%	95%	95%
Eastern Lake	238.8	33.0	333.3	46.1	94.5	13.1	16.7	2.3	28%	28%	95%	95%	18.5	2.6	94%	94%	92%	92%

POND STAGE STORAGE TABLES

Existing Wet Detention Pond	Permanent Pool Volume (ac-ft)	TN Efficiency (PSR)	TP Efficiency (PSR)
1 West	0.21	24%	51%
2 West	4.68	42%	75%
3	1.87	41%	70%
4/5	7.14	42%	73%
6	5.67	42%	75%

Existing Wet Ponds:

Pond 1 West				
ELEV (m)	ELEV (ft)	AREA (ac)	AVG STORAGE	PERM POOL VOL (ac-ft)
1.50	4.92	0.01	0.06	0.21
2.80	9.19	0.02	0.03	
3.10	10.17	0.05	0.11	
3.70	12.14	0.06		

Pond 2 West				
ELEV (m)	ELEV (ft)	AREA (ac)	AVG STORAGE	PERM POOL VOL (ac-ft)
2.00	6.56	0.57	3.91	4.68
3.60	11.81	0.92	0.77	
3.80	12.47	1.42		

Pond 3				
ELEV (m)	ELEV (ft)	AREA (ac)	AVG STORAGE	PERM POOL VOL (ac-ft)
1.50	4.92	0.09	0.69	1.87
2.90	9.51	0.21	0.30	
3.20	10.50	0.40	0.88	
3.80	12.47	0.49		

Pond 4/5				
ELEV	ELEV (ft)	AREA (ac)	AVG STORAGE	PERM POOL VOL (ac-ft)
1.25	4.10	0.17	5.55	7.14
4.00	13.12	1.06	1.59	
4.40	14.44	1.36		

Pond 6				
ELEV (m)	ELEV (ft)	AREA (ac)	AVG STORAGE	PERM POOL VOL (ac-ft)
1.75	5.74	0.25	2.82	5.67
3.85	12.63	0.57	0.76	
4.15	13.62	0.98	2.09	
4.75	15.58	1.14		

Existing Dry Ponds:

Pond 1 East					
Area (ac)		Bottom (ft)	Berm (ft)	Depth (ft)	Retention volume (ac-ft)
Pond RW:	0.44	24.28	29.20	4.92	2.19

Pond 2 East					
Area (ac)		Bottom (ft)	Berm (ft)	Depth (ft)	Retention volume (ac-ft)
Pond RW:	0.33 ac	7.55	12.17	4.62	4.58

DCIA Calculations

Swale ID	Total Area (ac)	Pre Dev Impervious Area (ac)	Post Dev Impervious Area (ac)	Pre DCIA %	Post DCIA %	Typical Section
L1	0.73	0.32	0.49	43.8%	67.1%	Curb and gutter - 44'
L2	0.44	0.24	0.34	54.5%	77.3%	
L3	1.51	0.75	1.1	49.7%	72.8%	
L4	1.15	0.57	0.82	49.6%	71.3%	
L5	1.29	0.77	1.01	59.7%	78.3%	
L6	0.94	0.53	0.69	56.4%	73.4%	
L7	2.45	1.33	1.82	54.3%	74.3%	
L8	0.87	0.59	0.74	67.8%	85.1%	
L9	0.35	0.21	0.28	60.0%	80.0%	
L10	2.89	1.73	2.39	59.9%	82.7%	
L12	2.76	1.22	1.51	44.2%	54.7%	
L13	0.32	0.06	0.18	18.8%	56.3%	Curbed inner lanes & flush shoulder outer lanes - 47.5'
L14	0.62	0.1	0.35	16.1%	56.5%	
L15	0.45	0.08	0.27	17.8%	60.0%	
L16	5.47	2.8	3.96	51.2%	72.4%	
L17	0.57	0.32	0.44	56.1%	77.2%	
L18	3.25	1.98	2.59	60.9%	79.7%	Flush Shoulder - 45'
L19	1.43	0.74	1.04	51.7%	72.7%	
L20	0.74	0.44	0.58	59.5%	78.4%	
L21	3.03	1.79	2.31	59.1%	76.2%	
L22	0.34	0.22	0.32	64.7%	94.1%	
L23	1.83	0.97	1.21	53.0%	66.1%	
L24	1.41	0.77	1.04	54.6%	73.8%	
L25	1.44	0.78	1.02	54.2%	70.8%	
L26	2.01	0.97	1.47	48.3%	73.1%	

R2	1.29	0.57	1.24	44.19%	96.12%	Curb and gutter - 44'
R3	1.27	0.27	1.02	21.26%	80.31%	
R4	1.51	0.81	1.35	53.64%	89.40%	
R5	2.14	1.23	1.96	57.48%	91.59%	
R6	2.49	1.38	2.27	55.42%	91.16%	
R7	0.93	0.46	0.82	49.46%	88.17%	
R8	2.11	1.16	1.9	54.98%	90.05%	
R9	1.62	0.99	1.49	61.11%	91.98%	
R11	2.19	1.31	2.1	59.82%	95.89%	
R12	1.89	1.02	1.78	53.97%	94.18%	
R13	0.75	0.39	0.66	52.00%	88.00%	Curbed inner lanes & flush shoulder outer lane - 47.5
R14	1.09	0.52	0.92	47.71%	84.40%	
R15	1.04	0.54	0.88	51.92%	84.62%	
R16	3.11	1.51	2.67	48.55%	85.85%	
R17	3.03	1.55	2.51	51.16%	82.84%	
R18	0.96	0.62	0.84	64.58%	87.50%	
R19	3.19	1.62	2.73	50.78%	85.58%	Flush Shoulder - 45'
R20	2.15	1.1	1.85	51.16%	86.05%	
R21	2.7	1.46	2.41	54.07%	89.26%	
R22	1.55	0.83	1.34	53.55%	86.45%	
R23	1.03	0.56	0.93	54.37%	90.29%	
R24	1.06	0.53	0.97	50.00%	91.51%	
R25	1.65	0.54	1.48	32.73%	89.70%	

M1	3.24	1.35	0	41.67%	0.00%	Curbed inner lanes & flush shoulder outer
M2	2.05	0.43	0	20.98%	0.00%	
M3	1.14	0.4	0	35.09%	0.00%	Curb and gutter
M4	1.92	0.84	0	43.75%	0.00%	Curbed inner lanes & flush shoulder outer
M5	2.07	0.83	0	40.10%	0.00%	
M6	1.74	0.65	0	37.36%	0.00%	Flush Shoulder

Per HUC-12						
McQuage Bayou:						
US 331 to Peach Creek	66.67	14.71	27.42	22.06%	41.13%	Flush Shoulder
Combined:	157.87	60.46	91.51	38.30%	57.97%	
Peach Creek:						
US 331 to Peach Creek	49.46	10.9	20.4	22.04%	41.25%	Flush Shoulder, Curbed inner lanes & flush shoulder outer lane after McDavis Blvd
Peach Creek to Bay County Line	41.08	16.9	22.44	41.14%	54.63%	Curbed inner lanes & flush shoulder outer lane
ICWW	10.25	4.13	6.52	40.29%	63.61%	Curbed inner lanes & flush shoulder outer lane
Combined:	*90.54*	*27.8*	*42.84*	*30.70%*	*47.32%*	
Eastern Lake:						
Peach Creek to Bay County Line	51.03	22.57	38.36	44.23%	75.17%	Curbed inner lanes & flush shoulder outer lane

APPENDIX B

BMPTrains Reports

EXISTING PONDS

POND 1 WEST

Complete Report (not including cost) Ver 4.3.5

Project: Pond 1 West
Date: 10/10/2025 9:57:02 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 1 West
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	4.81
Rational Coefficient (0-1)	0.64
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	68.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	16.274
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	25.082
Phosphorus Loading (kg/yr)	3.471

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	4.81
Rational Coefficient (0-1)	0.58
Non DCIA Curve Number	84.00

DCIA Percent (0-100)	58.60
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	14.751
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	22.735
Phosphorus Loading (kg/yr)	3.146

Catchment Number: 1 Name: Pond 1 West

Project: Pond 1 West
Date: 10/10/2025

Wet Detention Design

Permanent Pool Volume (ac-ft)	0.210
Permanent Pool Volume (ac-ft) for 31 days residence	1.253
Annual Residence Time (days)	5
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	4.81
Contributing Area (acres)	4.810
Non-DCIA Curve Number	84.00
DCIA Percent	58.60
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	24
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	51

Media Mix Information

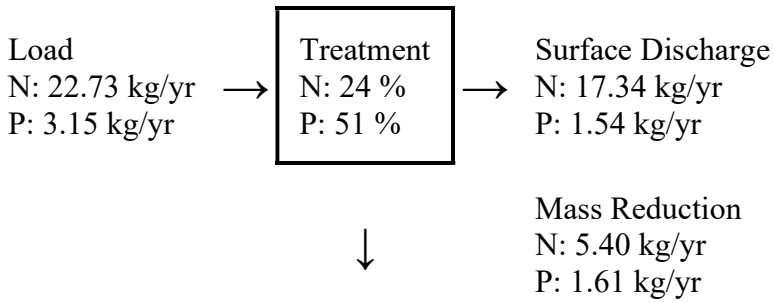
Type of Media Mix	Not Specified

Media N Reduction (%)
Media P Reduction (%)

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: Pond 1 West

Analysis Type: Specified Removal Efficiency

Date:10/10/2025

BMP Types:

Catchment 1 - (Pond 1 West) Wet Detention Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	25.08 kg/yr	
Total N post load	22.73 kg/yr	
Target N load reduction	80 %	
Target N discharge load	4.55 kg/yr	
Percent N load reduction	24 %	
Provided N discharge load	17.34 kg/yr	38.23 lb/yr
Provided N load removed	5.4 kg/yr	11.9 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	3.471 kg/yr	
Total P post load	3.146 kg/yr	
Target P load reduction	80 %	
Target P discharge load	.629 kg/yr	
Percent P load reduction	51 %	
Provided P discharge load	1.535 kg/yr	3.39 lb/yr
Provided P load removed	1.611 kg/yr	3.553 lb/yr

POND 2 WEST

Complete Report (not including cost) Ver 4.3.5

Project: Pond 2 West
Date: 10/10/2025 10:01:10 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 2 West
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	5.25
Rational Coefficient (0-1)	0.53
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	50.70
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	14.708
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	22.669
Phosphorus Loading (kg/yr)	3.137

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	5.25
Rational Coefficient (0-1)	0.56
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	54.70
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250

Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	15.405
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	23.743
Phosphorus Loading (kg/yr)	3.286

Catchment Number: 1 Name: Pond 2 West

Project: Pond 2 West
Date: 10/10/2025

Wet Detention Design

Permanent Pool Volume (ac-ft)	4.680
Permanent Pool Volume (ac-ft) for 31 days residence	1.308
Annual Residence Time (days)	111
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	5.25
Contributing Area (acres)	5.250
Non-DCIA Curve Number	84.00
DCIA Percent	54.70
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	75

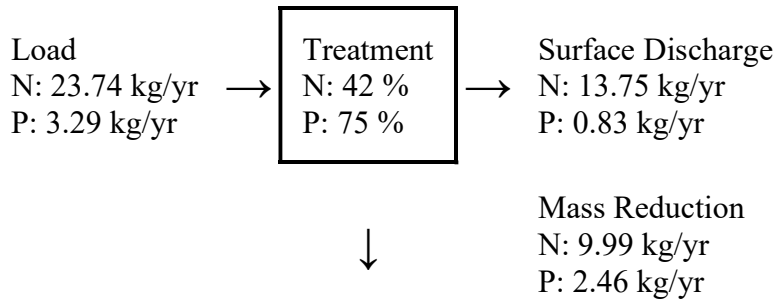
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: Pond 2 West

Analysis Type: Specified Removal Efficiency

Date:10/10/2025

BMP Types:

Catchment 1 - (Pond 2 West) Wet Detention
Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	22.67 kg/yr	
Total N post load	23.74 kg/yr	
Target N load reduction	80 %	
Target N discharge load	4.75 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	13.75 kg/yr	30.32 lb/yr
Provided N load removed	9.99 kg/yr	22.03 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	3.137 kg/yr	
Total P post load	3.286 kg/yr	
Target P load reduction	80 %	
Target P discharge load	.657 kg/yr	
Percent P load reduction	75 %	
Provided P discharge load	.826 kg/yr	1.82 lb/yr
Provided P load removed	2.46 kg/yr	5.424 lb/yr

POND 3

Complete Report (not including cost) Ver 4.3.5

Project: Pond 3
Date: 10/8/2025 1:40:25 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 3
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	3.64
Rational Coefficient (0-1)	0.64
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	67.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	12.191
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	18.790
Phosphorus Loading (kg/yr)	2.601

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	3.64
Rational Coefficient (0-1)	0.59
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	59.34
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173

Runoff Volume (ac-ft/yr)	11.254
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	17.346
Phosphorus Loading (kg/yr)	2.401

Catchment Number: 1 Name: Pond 3

Project: Pond 3
Date: 10/8/2025

Wet Detention Design

Permanent Pool Volume (ac-ft)	1.870
Permanent Pool Volume (ac-ft) for 31 days residence	0.956
Annual Residence Time (days)	61
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	3.64
Contributing Area (acres)	3.640
Non-DCIA Curve Number	84.00
DCIA Percent	59.34
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	41
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	70

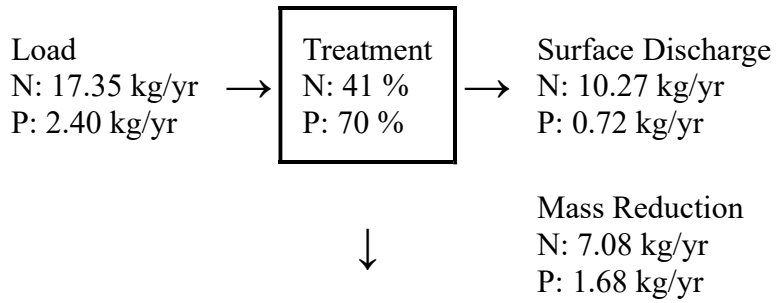
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: Pond 3

Analysis Type: Specified Removal Efficiency

Date:10/8/2025

BMP Types:

Catchment 1 - (Pond 3) Wet Detention

Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	18.79 kg/yr	
Total N post load	17.35 kg/yr	
Target N load reduction	80 %	
Target N discharge load	3.47 kg/yr	
Percent N load reduction	41 %	
Provided N discharge load	10.27 kg/yr	22.64 lb/yr
Provided N load removed	7.08 kg/yr	15.61 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	2.601 kg/yr	
Total P post load	2.401 kg/yr	
Target P load reduction	80 %	
Target P discharge load	.48 kg/yr	
Percent P load reduction	70 %	
Provided P discharge load	.723 kg/yr	1.59 lb/yr
Provided P load removed	1.678 kg/yr	3.699 lb/yr

POND 4/5

Complete Report (not including cost) Ver 4.3.5

Project: Pond 4/5
Date: 10/8/2025 1:47:09 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 4/5
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	8.73
Rational Coefficient (0-1)	0.63
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	65.18
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	28.699
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	44.232
Phosphorus Loading (kg/yr)	6.122

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	8.73
Rational Coefficient (0-1)	0.62
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	64.83
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173

Runoff Volume (ac-ft/yr)	28.596
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	44.073
Phosphorus Loading (kg/yr)	6.100

Catchment Number: 1 Name: Pond 4/5

Project: Pond 4/5
Date: 10/8/2025

Wet Detention Design

Permanent Pool Volume (ac-ft)	7.140
Permanent Pool Volume (ac-ft) for 31 days residence	2.429
Annual Residence Time (days)	91
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	8.73
Contributing Area (acres)	8.730
Non-DCIA Curve Number	84.00
DCIA Percent	64.83
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	73

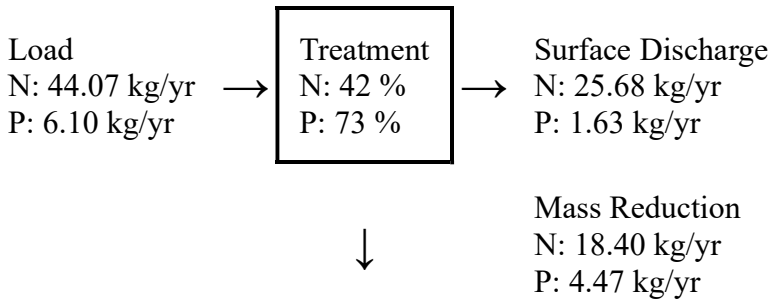
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: Pond 4/5

Analysis Type: Specified Removal Efficiency

Date:10/8/2025

BMP Types:

Catchment 1 - (Pond 4/5)
Wet Detention
Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	44.23 kg/yr	
Total N post load	44.07 kg/yr	
Target N load reduction	80 %	
Target N discharge load	8.81 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	25.68 kg/yr	56.61 lb/yr
Provided N load removed	18.4 kg/yr	40.57 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	6.122 kg/yr	
Total P post load	6.1 kg/yr	
Target P load reduction	80 %	
Target P discharge load	1.22 kg/yr	
Percent P load reduction	73 %	
Provided P discharge load	1.634 kg/yr	3.6 lb/yr
Provided P load removed	4.466 kg/yr	9.848 lb/yr

POND 6

Complete Report (not including cost) Ver 4.3.5

Project: Pond 6
Date: 10/8/2025 1:58:57 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 6
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	5.73
Rational Coefficient (0-1)	0.61
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	62.30
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	18.285
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	28.182
Phosphorus Loading (kg/yr)	3.900

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	5.73
Rational Coefficient (0-1)	0.62
Non DCIA Curve Number	84.00
DCIA Percent (0-100)	64.05
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173

Runoff Volume (ac-ft/yr)	18.620
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	28.698
Phosphorus Loading (kg/yr)	3.972

Catchment Number: 1 Name: Pond 6

Project: Pond 6
Date: 10/8/2025

Wet Detention Design

Permanent Pool Volume (ac-ft)	5.670
Permanent Pool Volume (ac-ft) for 31 days residence	1.581
Annual Residence Time (days)	111
Littoral Zone Efficiency Credit	
Wetland Efficiency Credit	

Watershed Characteristics

Catchment Area (acres)	5.73
Contributing Area (acres)	5.730
Non-DCIA Curve Number	84.00
DCIA Percent	64.05
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	75

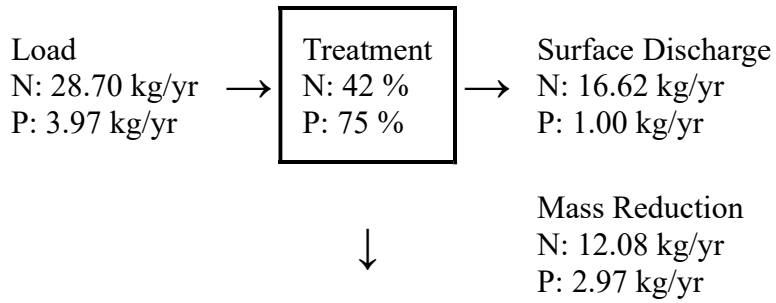
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.000
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.000
TP Concentration (mg/L)	0.000

Load Diagram for Wet Detention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: Pond 6

Analysis Type: Specified Removal Efficiency

Date:10/8/2025

BMP Types:

Catchment 1 - (Pond 6) Wet Detention

Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	28.18 kg/yr	
Total N post load	28.7 kg/yr	
Target N load reduction	80 %	
Target N discharge load	5.74 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	16.62 kg/yr	36.64 lb/yr
Provided N load removed	12.08 kg/yr	26.63 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	3.9 kg/yr	
Total P post load	3.972 kg/yr	
Target P load reduction	80 %	
Target P discharge load	.794 kg/yr	
Percent P load reduction	75 %	
Provided P discharge load	.998 kg/yr	2.2 lb/yr
Provided P load removed	2.974 kg/yr	6.557 lb/yr

DRY POND 1 EAST

Complete Report (not including cost) Ver 4.3.5

Project: Pond 1 East
Date: 1/6/2026 10:15:32 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 1 East
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	6.57
Rational Coefficient (0-1)	0.59
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	69.41
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	20.476
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	31.559
Phosphorus Loading (kg/yr)	4.368

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	6.57
Rational Coefficient (0-1)	0.59
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	69.41
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250

Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	20.476
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	31.559
Phosphorus Loading (kg/yr)	4.368

Catchment Number: 1 Name: Pond 1 East

Project: Pond 1 East
Date: 1/6/2026

Retention Design

Retention Depth (in)	4.000
Retention Volume (ac-ft)	2.190

Watershed Characteristics

Catchment Area (acres)	6.57
Contributing Area (acres)	6.570
Non-DCIA Curve Number	39.00
DCIA Percent	69.41
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	97
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	97

Media Mix Information

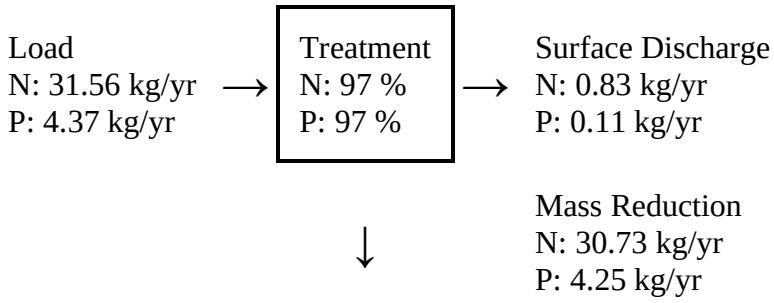
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

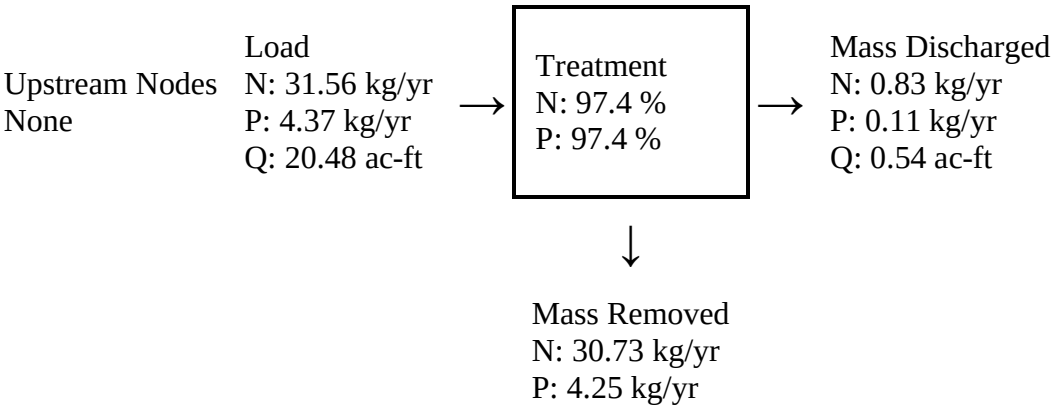
Treatment Rate (MG/yr)	0.000

TN Mass Load (kg/yr)	30.728
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	4.253
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: Pond 1 East

Date:1/6/2026

Analysis Type: Specified Removal Efficiency

Routing Summary
Catchment 1 Routed to Outlet

BMP Types:

Catchment 1 - (Pond 1 East)

Retention

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	31.56 kg/yr	
Total N post load	31.56 kg/yr	
Target N load reduction	80 %	
Target N discharge load	6.31 kg/yr	
Percent N load reduction	97 %	
Provided N discharge load	.83 kg/yr	1.83 lb/yr
Provided N load removed	30.73 kg/yr	67.76 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.368 kg/yr	
Total P post load	4.368 kg/yr	
Target P load reduction	80 %	
Target P discharge load	.874 kg/yr	
Percent P load reduction	97 %	
Provided P discharge load	.115 kg/yr	.25 lb/yr
Provided P load removed	4.253 kg/yr	9.377 lb/yr

DRY POND 2 EAST

Complete Report (not including cost) Ver 4.3.5

Project: Pond 2 East
Date: 1/6/2026 10:17:01 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Pond 2 East
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	13.75
Rational Coefficient (0-1)	0.61
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	70.98
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	43.806
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	67.516
Phosphorus Loading (kg/yr)	9.344

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	13.75
Rational Coefficient (0-1)	0.61
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	70.98
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250

Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	43.806
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	67.516
Phosphorus Loading (kg/yr)	9.344

Catchment Number: 1 Name: Pond 2 East

Project: Pond 2 East
Date: 1/6/2026

Retention Design

Retention Depth (in)	4.000
Retention Volume (ac-ft)	4.583

Watershed Characteristics

Catchment Area (acres)	13.75
Contributing Area (acres)	13.750
Non-DCIA Curve Number	39.00
DCIA Percent	70.98
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	97
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	97

Media Mix Information

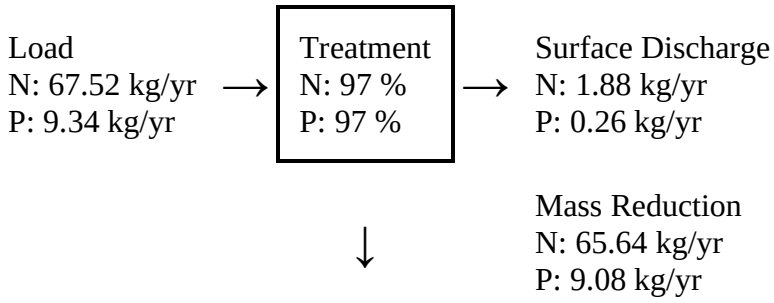
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

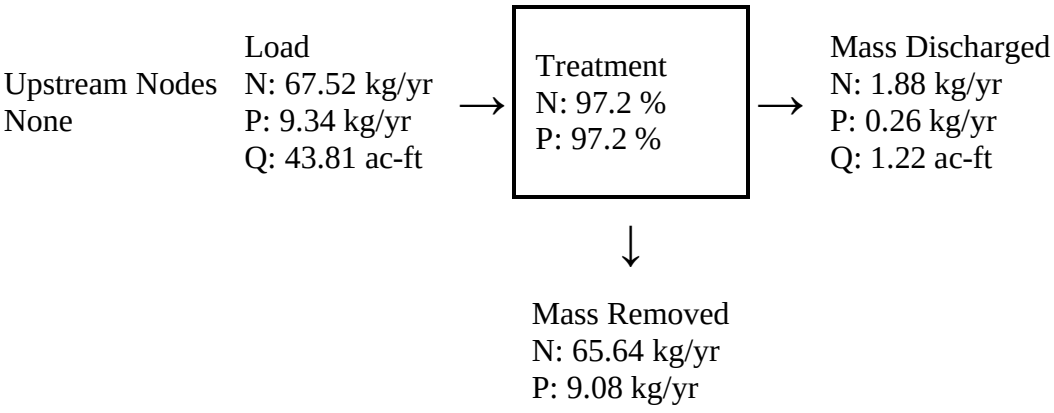
Treatment Rate (MG/yr)	0.000

TN Mass Load (kg/yr)	65.640
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	9.085
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: Pond 2 East

Date:1/6/2026

Analysis Type: Specified Removal Efficiency

Routing Summary
Catchment 1 Routed to Outlet

BMP Types:

Catchment 1 - (Pond 2 East)

Retention

Based on % removal values to the nearest percent

Total nitrogen target removal met? **Yes**

Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	67.52 kg/yr	
Total N post load	67.52 kg/yr	
Target N load reduction	80 %	
Target N discharge load	13.5 kg/yr	
Percent N load reduction	97 %	
Provided N discharge load	1.88 kg/yr	4.14 lb/yr
Provided N load removed	65.64 kg/yr	144.74 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	9.344 kg/yr	
Total P post load	9.344 kg/yr	
Target P load reduction	80 %	
Target P discharge load	1.869 kg/yr	
Percent P load reduction	97 %	
Provided P discharge load	.26 kg/yr	.57 lb/yr
Provided P load removed	9.085 kg/yr	20.031 lb/yr

Swales L1-L5

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 10:39:15 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	L1	L2	L3	L4	L5
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.73	0.44	1.51	1.15	1.29
Rational Coefficient (0-1)	0.38	0.47	0.43	0.43	0.51
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	43.80	54.50	49.70	49.60	59.70
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	1.454	1.084	3.400	2.584	3.468
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	2.241	1.670	5.240	3.983	5.346
Phosphorus Loading (kg/yr)	0.310	0.231	0.725	0.551	0.740

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.73	0.44	1.51	1.15	1.29
Rational Coefficient (0-1)	0.57	0.66	0.62	0.61	0.67
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	67.10	77.30	72.80	71.30	78.30
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.201	1.524	4.932	3.680	4.523
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	3.392	2.348	7.601	5.672	6.970
Phosphorus Loading (kg/yr)	0.469	0.325	1.052	0.785	0.965

Catchment Number: 1 Name: L1

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.500
Retention Volume (ac-ft)	0.030

Watershed Characteristics

Catchment Area (acres)	0.73
Contributing Area (acres)	0.730
Non-DCIA Curve Number	39.00
DCIA Percent	67.10
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	50
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	50

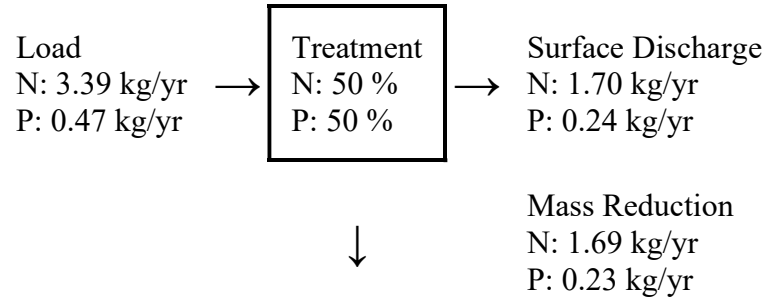
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.692
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.234
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: L2

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.550
Retention Volume (ac-ft)	0.020

Watershed Characteristics

Catchment Area (acres)	0.44
Contributing Area (acres)	0.440
Non-DCIA Curve Number	39.00
DCIA Percent	77.30
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	48
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	48

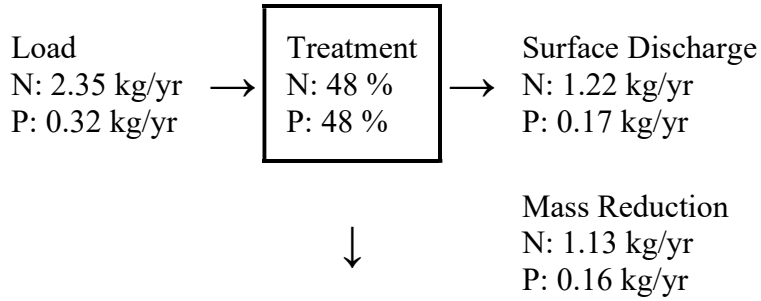
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.131
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.157
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: L3

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.560
Retention Volume (ac-ft)	0.070

Watershed Characteristics

Catchment Area (acres)	1.51
Contributing Area (acres)	1.510
Non-DCIA Curve Number	39.00
DCIA Percent	72.80
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	51
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	51

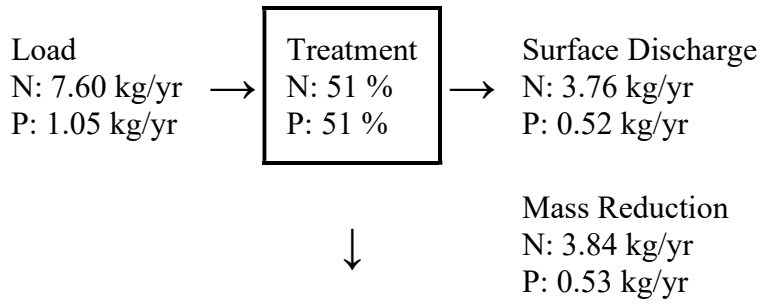
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.841
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.532
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: L4

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.520
Retention Volume (ac-ft)	0.050

Watershed Characteristics

Catchment Area (acres)	1.15
Contributing Area (acres)	1.150
Non-DCIA Curve Number	39.00
DCIA Percent	71.30
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	49

Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	49

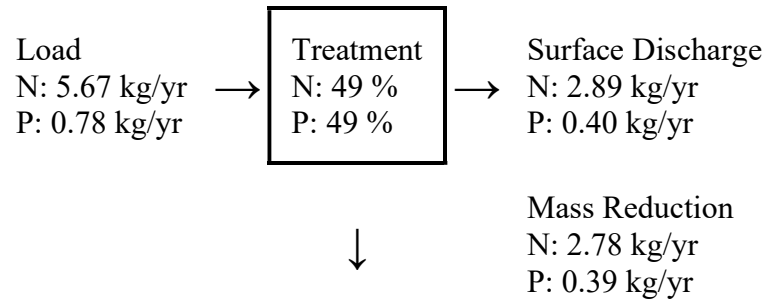
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.782
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.385
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: L5

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.560
Retention Volume (ac-ft)	0.060

Watershed Characteristics

Catchment Area (acres)	1.29
Contributing Area (acres)	1.290
Non-DCIA Curve Number	39.00
DCIA Percent	78.30
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	48
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	48

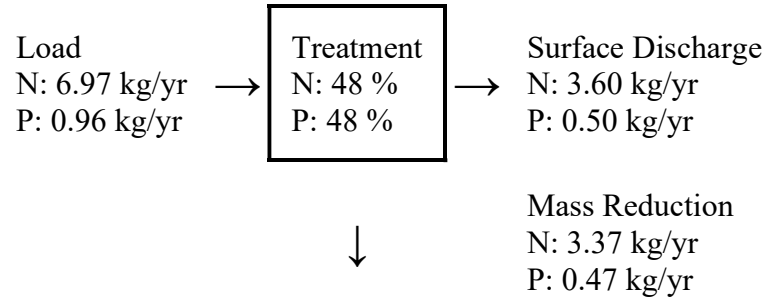
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.368
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.466
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (L1) Retention

Catchment 2 - (L2) Retention

Catchment 3 - (L3) Retention

Catchment 4 - (L4) Retention

Catchment 5 - (L5) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	18.48 kg/yr	
Total N post load	25.98 kg/yr	
Target N load reduction	80 %	
Target N discharge load	5.2 kg/yr	
Percent N load reduction	49 %	
Provided N discharge load	13.17 kg/yr	29.04 lb/yr
Provided N load removed	12.81 kg/yr	28.25 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	2.558 kg/yr	
Total P post load	3.596 kg/yr	
Target P load reduction	80 %	
Target P discharge load	.719 kg/yr	
Percent P load reduction	49 %	
Provided P discharge load	1.823 kg/yr	4.02 lb/yr
Provided P load removed	1.773 kg/yr	3.91 lb/yr

Swales L6-L10

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 10:59:56 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	L6	L7	L8	L9	L10
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.94	2.45	0.87	0.35	2.89
Rational Coefficient (0-1)	0.48	0.47	0.58	0.51	0.51
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	56.40	54.30	67.80	60.00	59.90
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.393	6.013	2.650	0.946	7.795
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	3.688	9.268	4.084	1.457	12.014
Phosphorus Loading (kg/yr)	0.510	1.283	0.565	0.202	1.663

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.94	2.45	0.87	0.35	2.89
Rational Coefficient (0-1)	0.63	0.63	0.72	0.68	0.70
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	73.40	74.30	85.10	80.00	82.70
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	3.095	8.164	3.310	1.253	10.689
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	4.770	12.583	5.101	1.931	16.474
Phosphorus Loading (kg/yr)	0.660	1.741	0.706	0.267	2.280

Catchment Number: 1 Name: L6

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.510
Retention Volume (ac-ft)	0.040

Watershed Characteristics

Catchment Area (acres)	0.94
Contributing Area (acres)	0.940
Non-DCIA Curve Number	39.00
DCIA Percent	73.40
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	48
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	48

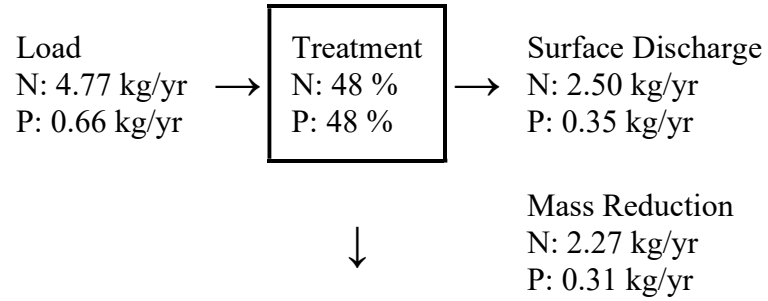
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.272
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.314
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: L7

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.540
Retention Volume (ac-ft)	0.110

Watershed Characteristics

Catchment Area (acres)	2.45
Contributing Area (acres)	2.450
Non-DCIA Curve Number	39.00
DCIA Percent	74.30
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	49
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	49

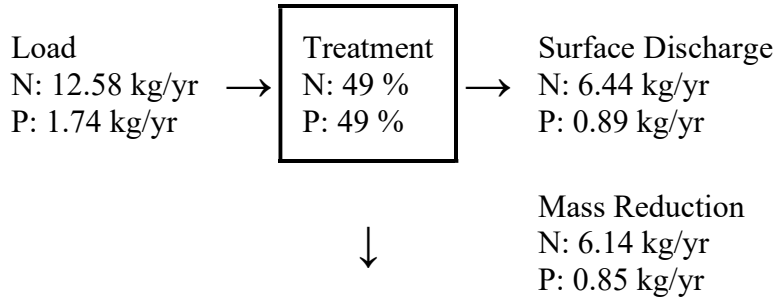
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	6.144
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.850
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: L8

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.550
Retention Volume (ac-ft)	0.040

Watershed Characteristics

Catchment Area (acres)	0.87
Contributing Area (acres)	0.870
Non-DCIA Curve Number	39.00
DCIA Percent	85.10
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	45
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	45

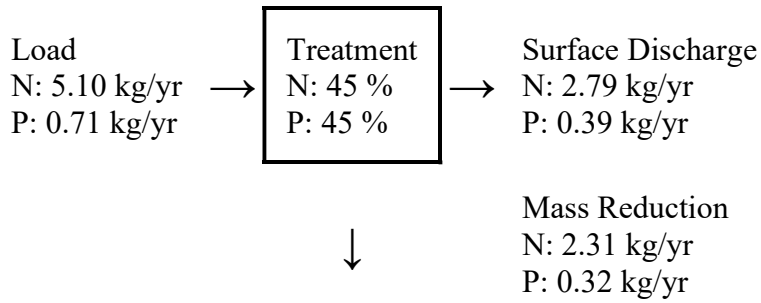
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.309
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.320
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: L9

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.670
Retention Volume (ac-ft)	0.020

Watershed Characteristics

Catchment Area (acres)	0.35
Contributing Area (acres)	0.350
Non-DCIA Curve Number	39.00
DCIA Percent	80.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	53
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	53

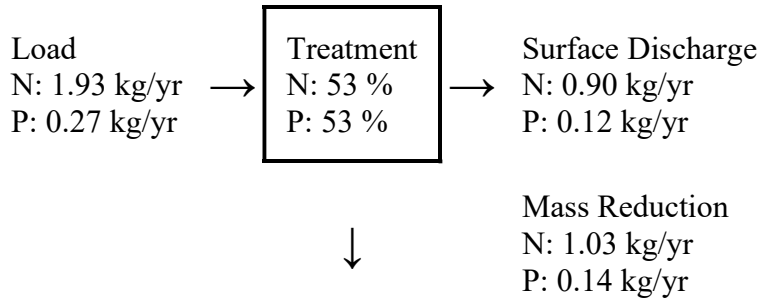
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.031
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.143
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: L10

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.500
Retention Volume (ac-ft)	0.120

Watershed Characteristics

Catchment Area (acres)	2.89
Contributing Area (acres)	2.890
Non-DCIA Curve Number	39.00
DCIA Percent	82.70
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	44
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	44

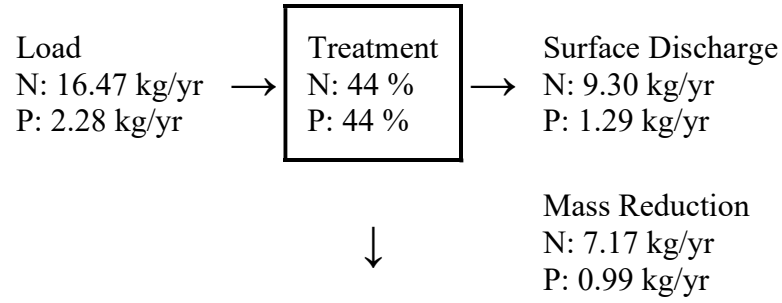
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	7.174
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.993
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (L6) Retention

Catchment 2 - (L7) Retention

Catchment 3 - (L8) Retention

Catchment 4 - (L9) Retention

Catchment 5 - (L10) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	30.51 kg/yr	
Total N post load	40.86 kg/yr	
Target N load reduction	80 %	
Target N discharge load	8.17 kg/yr	
Percent N load reduction	46 %	
Provided N discharge load	21.93 kg/yr	48.35 lb/yr
Provided N load removed	18.93 kg/yr	41.74 lb/yr

Phosphorus

Surface Water Discharge		
Total P pre load	4.223 kg/yr	
Total P post load	5.655 kg/yr	
Target P load reduction	80 %	
Target P discharge load	1.131 kg/yr	
Percent P load reduction	46 %	
Provided P discharge load	3.035 kg/yr	6.69 lb/yr
Provided P load removed	2.62 kg/yr	5.777 lb/yr

Swales L12-L16

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 11:22:41 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	L12	L13	L14	L15	L16
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	2.76	0.32	0.62	0.45	5.47
Rational Coefficient (0-1)	0.38	0.17	0.15	0.16	0.44
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	44.20	18.80	16.10	17.80	51.20
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	5.545	0.286	0.480	0.382	12.678
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	8.546	0.440	0.740	0.589	19.540
Phosphorus Loading (kg/yr)	1.183	0.061	0.102	0.081	2.704

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	2.76	0.32	0.62	0.45	5.47
Rational Coefficient (0-1)	0.47	0.48	0.49	0.51	0.62
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	54.70	56.30	56.50	60.00	72.40
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	6.823	0.813	1.581	1.216	17.769
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	10.516	1.254	2.437	1.874	27.387
Phosphorus Loading (kg/yr)	1.455	0.173	0.337	0.259	3.790

Catchment Number: 1 Name: L12

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.520
Retention Volume (ac-ft)	0.120

Watershed Characteristics

Catchment Area (acres)	2.76
Contributing Area (acres)	2.760
Non-DCIA Curve Number	39.00
DCIA Percent	54.70
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	57
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	57

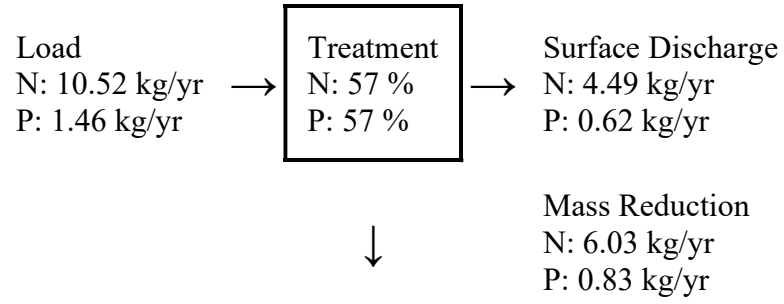
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	6.025
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.834
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: L13

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.360
Retention Volume (ac-ft)	0.010

Watershed Characteristics

Catchment Area (acres)	0.32
Contributing Area (acres)	0.320
Non-DCIA Curve Number	39.00
DCIA Percent	56.30
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	44
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	44

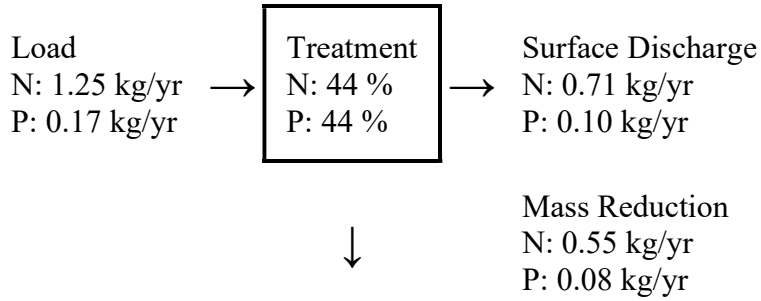
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.547
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.076
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: L14

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.580
Retention Volume (ac-ft)	0.030

Watershed Characteristics

Catchment Area (acres)	0.62
Contributing Area (acres)	0.620
Non-DCIA Curve Number	39.00
DCIA Percent	56.50
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	59
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	59

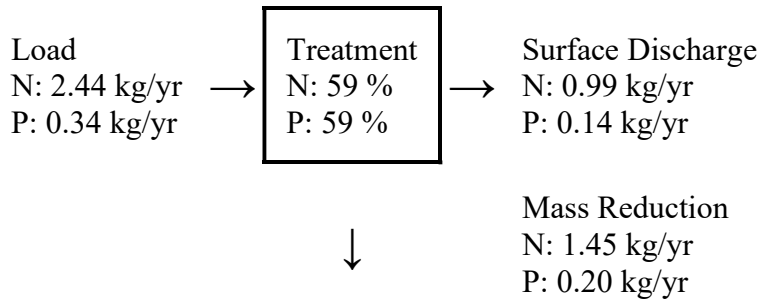
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.449
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.201
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: L15

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.520
Retention Volume (ac-ft)	0.020

Watershed Characteristics

Catchment Area (acres)	0.45
Contributing Area (acres)	0.450
Non-DCIA Curve Number	39.00
DCIA Percent	60.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	54
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	54

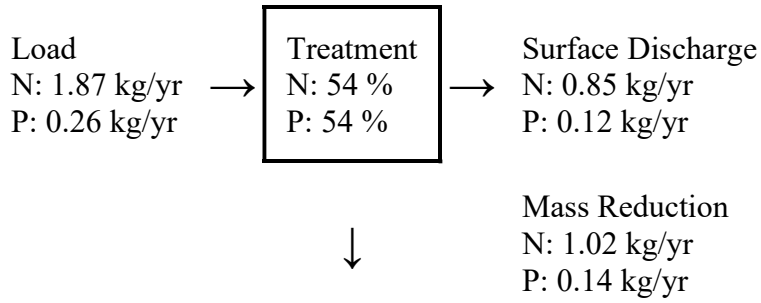
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.019
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.141
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: L16

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.417
Retention Volume (ac-ft)	0.190

Watershed Characteristics

Catchment Area (acres)	5.47
Contributing Area (acres)	5.470
Non-DCIA Curve Number	39.00
DCIA Percent	72.40
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	41
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	41

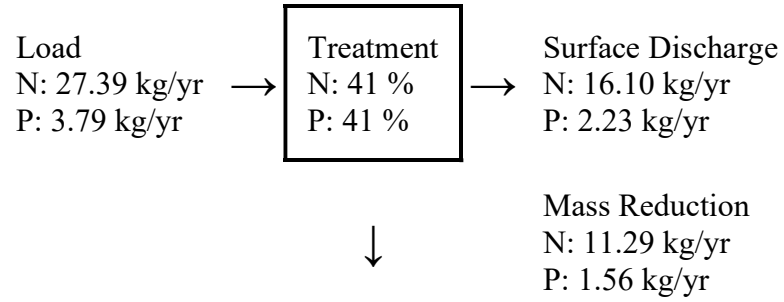
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	11.285
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	1.562
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (L12) Retention

Catchment 2 - (L13) Retention

Catchment 3 - (L14) Retention

Catchment 4 - (L15) Retention

Catchment 5 - (L16) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	29.86 kg/yr	
Total N post load	43.47 kg/yr	
Target N load reduction	95 %	
Target N discharge load	2.17 kg/yr	
Percent N load reduction	47 %	
Provided N discharge load	23.14 kg/yr	51.02 lb/yr
Provided N load removed	20.33 kg/yr	44.82 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.132 kg/yr	
Total P post load	6.016 kg/yr	
Target P load reduction	95 %	
Target P discharge load	.301 kg/yr	
Percent P load reduction	47 %	
Provided P discharge load	3.203 kg/yr	7.06 lb/yr
Provided P load removed	2.813 kg/yr	6.203 lb/yr

Swales L17-L21

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 11:29:39 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	L17	L18	L19	L20	L21
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.57	3.25	1.43	0.74	3.03
Rational Coefficient (0-1)	0.48	0.52	0.45	0.51	0.51
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	56.10	60.90	51.70	59.50	59.10
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	1.444	8.909	3.346	1.983	8.068
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	2.225	13.732	5.157	3.057	12.435
Phosphorus Loading (kg/yr)	0.308	1.900	0.714	0.423	1.721

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.57	3.25	1.43	0.74	3.03
Rational Coefficient (0-1)	0.66	0.68	0.62	0.67	0.65
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	77.20	79.70	72.70	78.40	76.20
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	1.971	11.591	4.664	2.598	10.348
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	3.038	17.865	7.189	4.004	15.948
Phosphorus Loading (kg/yr)	0.420	2.472	0.995	0.554	2.207

Catchment Number: 1 Name: L17

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.630
Retention Volume (ac-ft)	0.030

Watershed Characteristics

Catchment Area (acres)	0.57
Contributing Area (acres)	0.570
Non-DCIA Curve Number	39.00
DCIA Percent	77.20
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	52
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	52

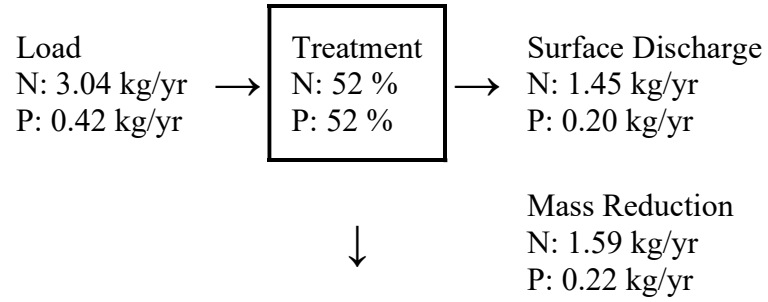
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.593
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.220
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: L18

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.517
Retention Volume (ac-ft)	0.140

Watershed Characteristics

Catchment Area (acres)	3.25
Contributing Area (acres)	3.250
Non-DCIA Curve Number	39.00
DCIA Percent	79.70
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	46
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	46

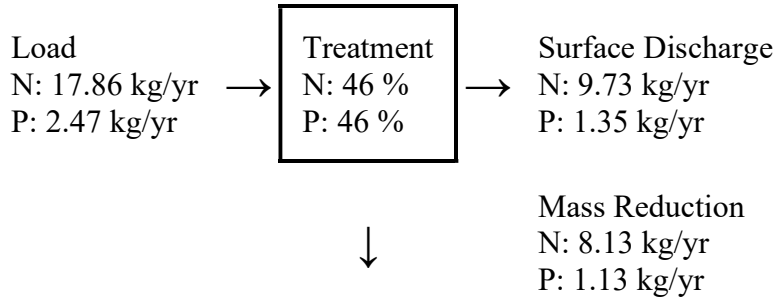
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	8.133
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	1.126
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: L19

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.590
Retention Volume (ac-ft)	0.070

Watershed Characteristics

Catchment Area (acres)	1.43
Contributing Area (acres)	1.430
Non-DCIA Curve Number	39.00
DCIA Percent	72.70
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	52
Required TP Treatment Efficiency (%)	80
Provided TP Treatment Efficiency (%)	52

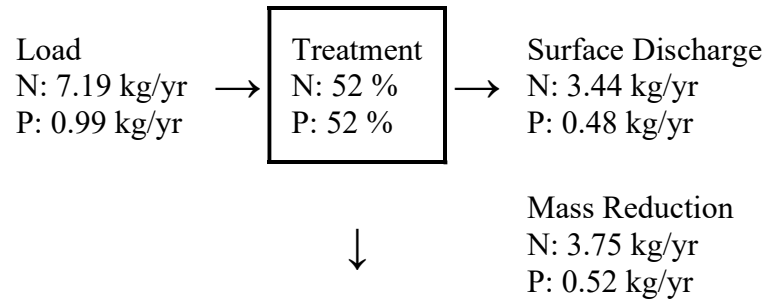
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.750
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.519
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: L20

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.480
Retention Volume (ac-ft)	0.030

Watershed Characteristics

Catchment Area (acres)	0.74
Contributing Area (acres)	0.740
Non-DCIA Curve Number	39.00
DCIA Percent	78.40
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	44
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	44

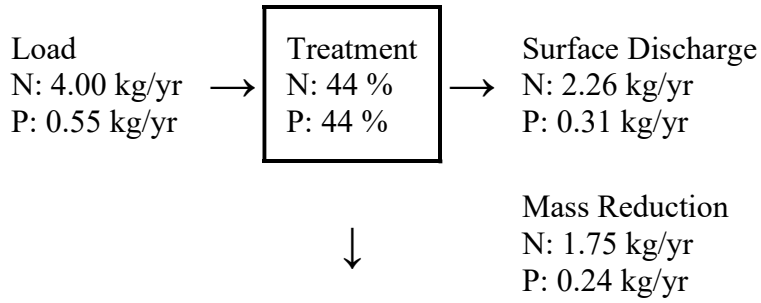
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.748
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.242
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: L21

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.555
Retention Volume (ac-ft)	0.140

Watershed Characteristics

Catchment Area (acres)	3.03
Contributing Area (acres)	3.030
Non-DCIA Curve Number	39.00
DCIA Percent	76.20
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	49
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	49

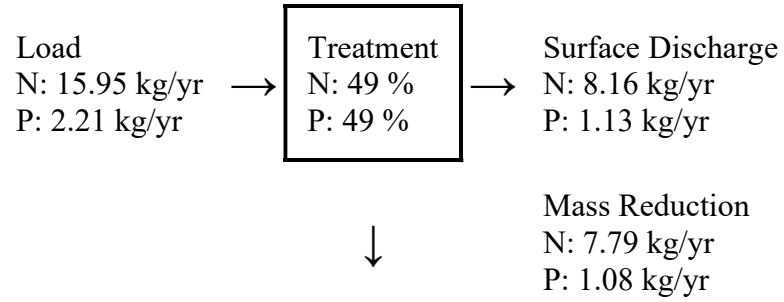
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	7.793
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	1.078
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (L17) Retention

Catchment 2 - (L18) Retention

Catchment 3 - (L19) Retention

Catchment 4 - (L20) Retention

Catchment 5 - (L21) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	36.61 kg/yr	
Total N post load	48.04 kg/yr	
Target N load reduction	80 %	
Target N discharge load	9.61 kg/yr	
Percent N load reduction	48 %	
Provided N discharge load	25.03 kg/yr	55.19 lb/yr
Provided N load removed	23.02 kg/yr	50.75 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	5.066 kg/yr	
Total P post load	6.649 kg/yr	
Target P load reduction	80 %	
Target P discharge load	1.33 kg/yr	
Percent P load reduction	48 %	
Provided P discharge load	3.464 kg/yr	7.64 lb/yr
Provided P load removed	3.185 kg/yr	7.024 lb/yr

Swales L22-L26

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 11:37:33 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	L26	L22	L23	L24	L25
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	2.01	0.34	1.83	1.41	1.44
Rational Coefficient (0-1)	0.42	0.55	0.46	0.47	0.47
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	48.30	64.70	53.00	54.60	54.20
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	4.402	0.989	4.387	3.479	3.528
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	6.784	1.524	6.761	5.363	5.438
Phosphorus Loading (kg/yr)	0.939	0.211	0.936	0.742	0.753

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	2.01	0.34	1.83	1.41	1.44
Rational Coefficient (0-1)	0.62	0.80	0.57	0.63	0.61
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	73.10	94.10	66.10	73.80	70.80
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	6.592	1.428	5.436	4.667	4.576
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	10.159	2.202	8.379	7.194	7.053
Phosphorus Loading (kg/yr)	1.406	0.305	1.160	0.996	0.976

Catchment Number: 1 Name: L26

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.480
Retention Volume (ac-ft)	0.080

Watershed Characteristics

Catchment Area (acres)	2.01
Contributing Area (acres)	2.010
Non-DCIA Curve Number	39.00
DCIA Percent	73.10
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	46
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	46

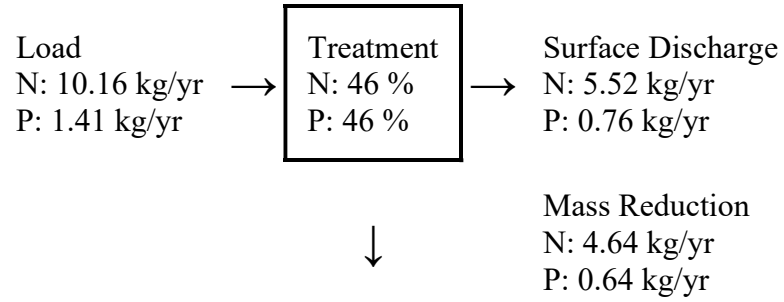
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	4.644
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.643
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: L22

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.360
Retention Volume (ac-ft)	0.010

Watershed Characteristics

Catchment Area (acres)	0.34
Contributing Area (acres)	0.340
Non-DCIA Curve Number	39.00
DCIA Percent	94.10
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	30
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	30

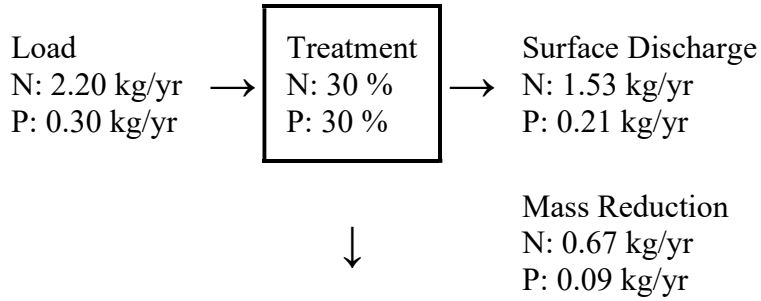
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.671
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.093
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: L23

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.590
Retention Volume (ac-ft)	0.090

Watershed Characteristics

Catchment Area (acres)	1.83
Contributing Area (acres)	1.830
Non-DCIA Curve Number	39.00
DCIA Percent	66.10
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	55
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	55

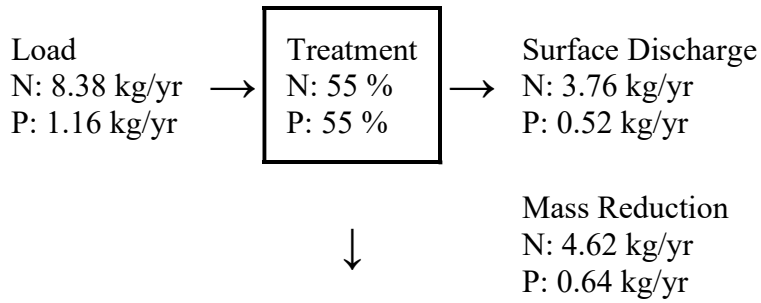
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	4.619
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.639
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: L24

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.085
Retention Volume (ac-ft)	0.010

Watershed Characteristics

Catchment Area (acres)	1.41
Contributing Area (acres)	1.410
Non-DCIA Curve Number	39.00
DCIA Percent	73.80
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	10
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	10

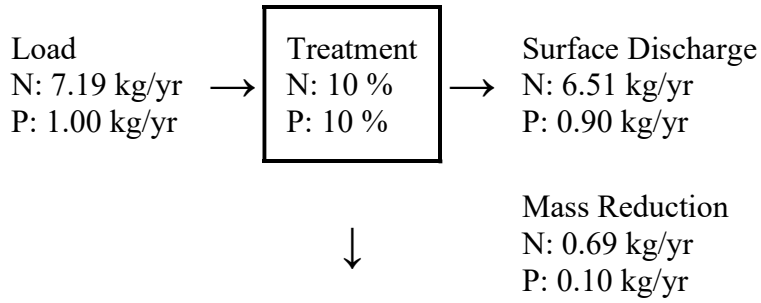
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	0.687
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.095
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: L25

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.330
Retention Volume (ac-ft)	0.040

Watershed Characteristics

Catchment Area (acres)	1.44
Contributing Area (acres)	1.440
Non-DCIA Curve Number	39.00
DCIA Percent	70.80
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	35
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	35

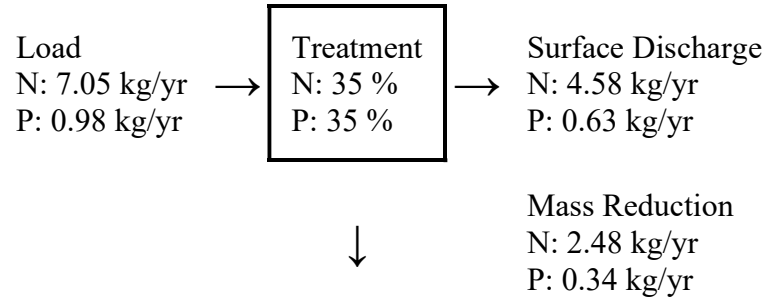
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.478
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.343
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (L26) Retention

Catchment 2 - (L22) Retention

Catchment 3 - (L23) Retention

Catchment 4 - (L24) Retention

Catchment 5 - (L25) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	25.87 kg/yr	
Total N post load	34.99 kg/yr	
Target N load reduction	80 %	
Target N discharge load	7 kg/yr	
Percent N load reduction	37 %	
Provided N discharge load	21.89 kg/yr	48.26 lb/yr
Provided N load removed	13.1 kg/yr	28.88 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	3.58 kg/yr	
Total P post load	4.842 kg/yr	
Target P load reduction	90 %	
Target P discharge load	.484 kg/yr	
Percent P load reduction	37 %	
Provided P discharge load	3.029 kg/yr	6.68 lb/yr
Provided P load removed	1.813 kg/yr	3.997 lb/yr

Swales R2-R6

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 12:39:52 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	R2	R3	R4	R5	R6
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	1.29	1.27	1.51	2.14	2.49
Rational Coefficient (0-1)	0.38	0.19	0.46	0.49	0.48
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	44.19	21.26	53.64	57.48	55.42
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.591	1.272	3.662	5.548	6.234
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	3.994	1.961	5.645	8.551	9.608

Phosphorus Loading (kg/yr)	0.553	0.271	0.781	1.183	1.330

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	1.29	1.27	1.51	2.14	2.49
Rational Coefficient (0-1)	0.82	0.68	0.76	0.78	0.78
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	96.12	80.31	89.40	91.59	91.16
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	5.533	4.563	6.031	8.754	10.138
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	8.528	7.033	9.295	13.492	15.626
Phosphorus Loading (kg/yr)	1.180	0.973	1.286	1.867	2.163

Catchment Number: 1 Name: R2

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.560
Retention Volume (ac-ft)	0.060

Watershed Characteristics

Catchment Area (acres)	1.29
Contributing Area (acres)	1.290
Non-DCIA Curve Number	39.00
DCIA Percent	96.12
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	42

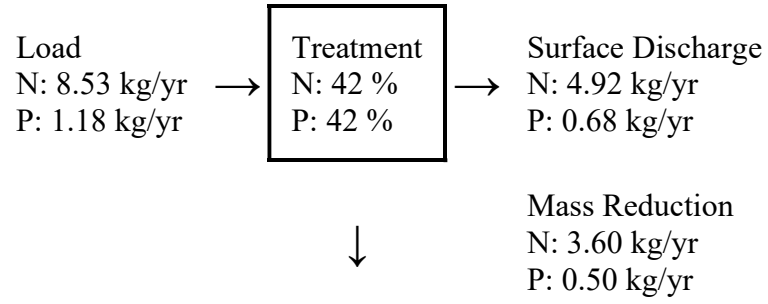
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.604
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.499
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: R3

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.570
Retention Volume (ac-ft)	0.060

Watershed Characteristics

Catchment Area (acres)	1.27
Contributing Area (acres)	1.270
Non-DCIA Curve Number	39.00
DCIA Percent	80.31
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	48
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	48

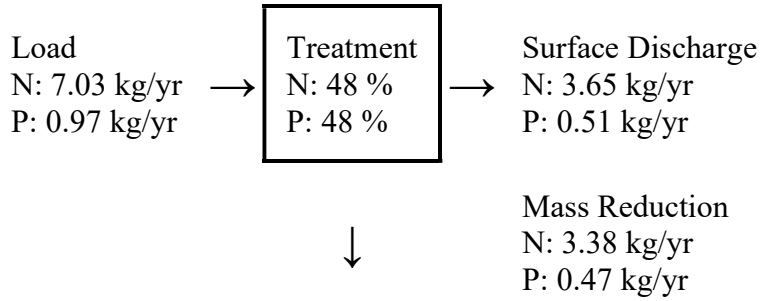
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.381
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.468
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: R4

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.480
Retention Volume (ac-ft)	0.060

Watershed Characteristics

Catchment Area (acres)	1.51
Contributing Area (acres)	1.510
Non-DCIA Curve Number	39.00
DCIA Percent	89.40
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	40
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	40

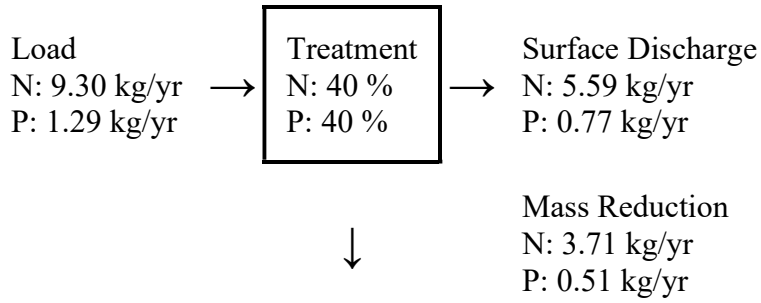
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	3.710
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.513
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: R5

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.505
Retention Volume (ac-ft)	0.090

Watershed Characteristics

Catchment Area (acres)	2.14
Contributing Area (acres)	2.140
Non-DCIA Curve Number	39.00
DCIA Percent	91.59
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	41
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	41

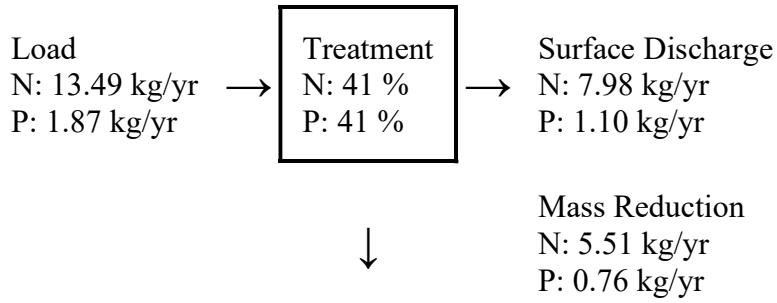
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	5.515
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.763
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: R6

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.530
Retention Volume (ac-ft)	0.110

Watershed Characteristics

Catchment Area (acres)	2.49
Contributing Area (acres)	2.490
Non-DCIA Curve Number	39.00
DCIA Percent	91.16
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	42

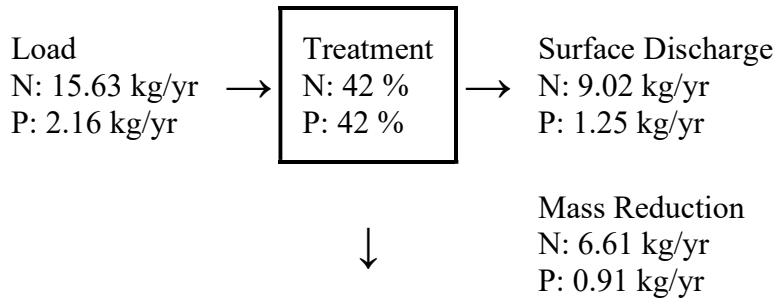
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	6.605
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.914
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (R2) Retention

Catchment 2 - (R3) Retention

Catchment 3 - (R4) Retention

Catchment 4 - (R5) Retention

Catchment 5 - (R6)

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet
Catchment 6 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	29.76 kg/yr	
Total N post load	53.97 kg/yr	
Target N load reduction	80 %	
Target N discharge load	10.79 kg/yr	
Percent N load reduction	42 %	
Provided N discharge load	31.16 kg/yr	68.71 lb/yr
Provided N load removed	22.81 kg/yr	50.31 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.118 kg/yr	
Total P post load	7.47 kg/yr	
Target P load reduction	90 %	
Target P discharge load	.747 kg/yr	
Percent P load reduction	42 %	
Provided P discharge load	4.312 kg/yr	9.51 lb/yr
Provided P load removed	3.158 kg/yr	6.962 lb/yr

Swales R7-R12

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 12:49:09 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	R7	R8	R9	R11	R12
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.93	2.11	1.62	2.19	1.89
Rational Coefficient (0-1)	0.43	0.47	0.52	0.51	0.46
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	49.46	54.98	61.11	59.82	53.97
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.084	5.242	4.456	5.900	4.611
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	3.212	8.080	6.868	9.093	7.107
Phosphorus Loading (kg/yr)	0.445	1.118	0.950	1.258	0.984

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.93	2.11	1.62	2.19	1.89
Rational Coefficient (0-1)	0.75	0.77	0.78	0.82	0.80
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	88.17	90.05	91.98	95.89	94.18
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	3.664	8.488	6.655	9.372	7.947
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	5.647	13.082	10.256	14.445	12.248
Phosphorus Loading (kg/yr)	0.782	1.811	1.419	1.999	1.695

Catchment Number: 1 Name: R7

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.510
Retention Volume (ac-ft)	0.040

Watershed Characteristics

Catchment Area (acres)	0.93
Contributing Area (acres)	0.930
Non-DCIA Curve Number	39.00
DCIA Percent	88.17
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	42

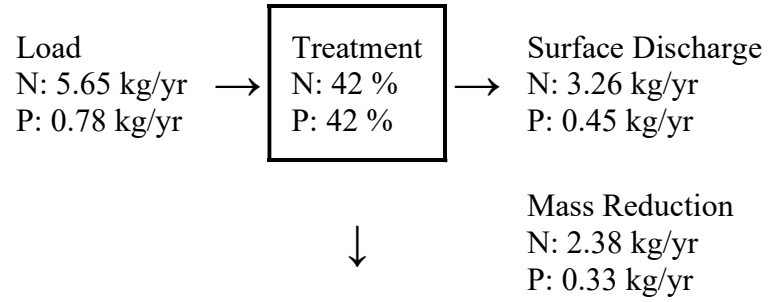
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.383
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.330
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: R8

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.570
Retention Volume (ac-ft)	0.100

Watershed Characteristics

Catchment Area (acres)	2.11
Contributing Area (acres)	2.110
Non-DCIA Curve Number	39.00
DCIA Percent	90.05
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	45
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	45

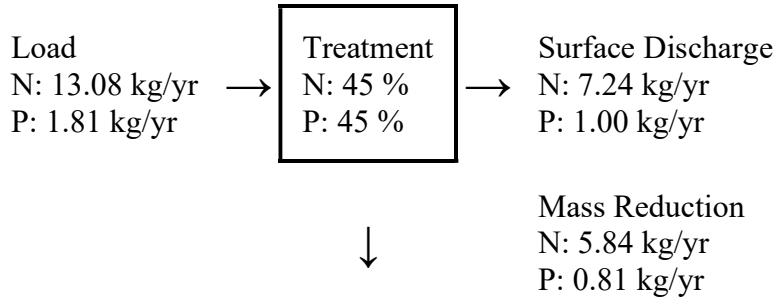
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	5.840
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.808
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: R9

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.520
Retention Volume (ac-ft)	0.070

Watershed Characteristics

Catchment Area (acres)	1.62
Contributing Area (acres)	1.620
Non-DCIA Curve Number	39.00
DCIA Percent	91.98
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	42

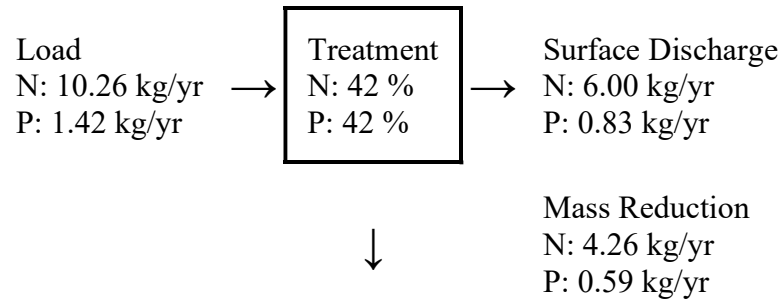
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	4.258
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.589
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: R11

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.550
Retention Volume (ac-ft)	0.100

Watershed Characteristics

Catchment Area (acres)	2.19
Contributing Area (acres)	2.190
Non-DCIA Curve Number	39.00
DCIA Percent	95.89
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	42

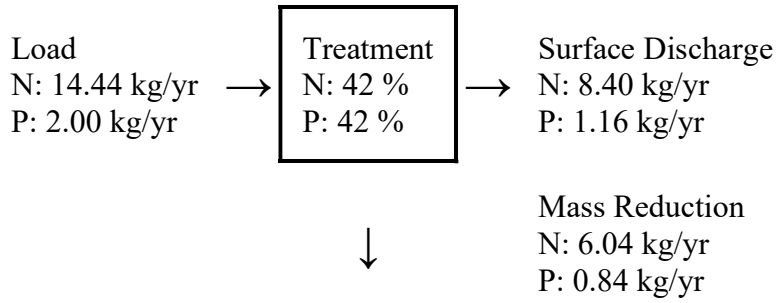
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	6.042
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.836
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: R12

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.570
Retention Volume (ac-ft)	0.090

Watershed Characteristics

Catchment Area (acres)	1.89
Contributing Area (acres)	1.890
Non-DCIA Curve Number	39.00
DCIA Percent	94.18
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	43
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	43

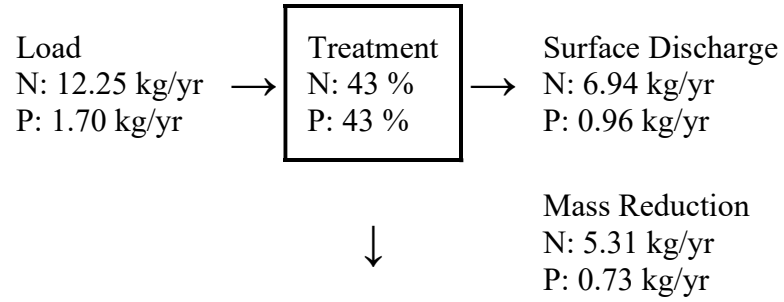
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	5.310
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.735
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (R7) Retention

Catchment 2 - (R8) Retention

Catchment 3 - (R9) Retention

Catchment 4 - (R11) Retention

Catchment 5 - (R12) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	34.36 kg/yr	
Total N post load	55.68 kg/yr	
Target N load reduction	95 %	
Target N discharge load	2.78 kg/yr	
Percent N load reduction	43 %	
Provided N discharge load	31.84 kg/yr	70.22 lb/yr
Provided N load removed	23.83 kg/yr	52.55 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.755 kg/yr	
Total P post load	7.706 kg/yr	
Target P load reduction	95 %	
Target P discharge load	.385 kg/yr	
Percent P load reduction	43 %	
Provided P discharge load	4.407 kg/yr	9.72 lb/yr
Provided P load removed	3.299 kg/yr	7.273 lb/yr

Swales R13-R17

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 12:55:41 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	R13	R14	R15	R16	R17
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.75	1.09	1.04	3.11	3.03
Rational Coefficient (0-1)	0.45	0.41	0.45	0.42	0.44
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	52.00	47.71	51.92	48.55	51.16
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	1.765	2.359	2.444	6.845	7.017
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	2.720	3.635	3.766	10.550	10.816
Phosphorus Loading (kg/yr)	0.376	0.503	0.521	1.460	1.497

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.75	1.09	1.04	3.11	3.03
Rational Coefficient (0-1)	0.75	0.72	0.72	0.73	0.71
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	88.00	84.40	84.62	85.85	82.84
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.949	4.113	3.935	11.934	11.225
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	4.545	6.339	6.064	18.394	17.301
Phosphorus Loading (kg/yr)	0.629	0.877	0.839	2.546	2.394

Catchment Number: 1 Name: R13

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.480
Retention Volume (ac-ft)	0.030

Watershed Characteristics

Catchment Area (acres)	0.75
Contributing Area (acres)	0.750
Non-DCIA Curve Number	39.00
DCIA Percent	88.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	40
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	40

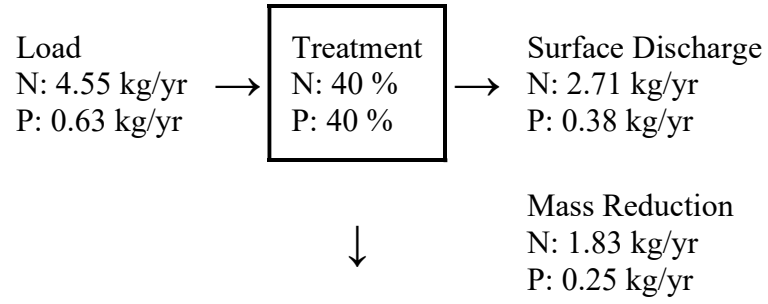
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.834
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.254
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: R14

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.550
Retention Volume (ac-ft)	0.050

Watershed Characteristics

Catchment Area (acres)	1.09
Contributing Area (acres)	1.090
Non-DCIA Curve Number	39.00
DCIA Percent	84.40
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	46
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	46

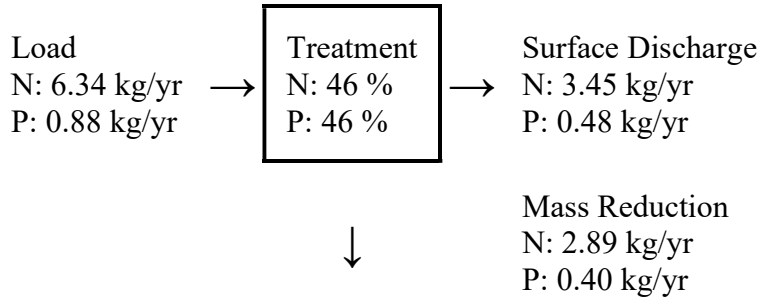
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.886
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.399
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: R15

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.580
Retention Volume (ac-ft)	0.050

Watershed Characteristics

Catchment Area (acres)	1.04
Contributing Area (acres)	1.040
Non-DCIA Curve Number	39.00
DCIA Percent	84.62
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	47
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	47

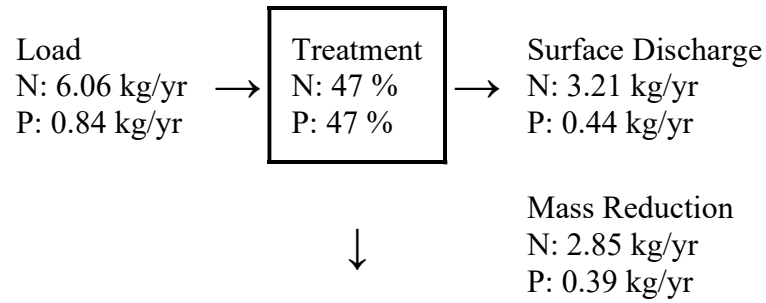
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.849
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.394
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: R16

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.540
Retention Volume (ac-ft)	0.140

Watershed Characteristics

Catchment Area (acres)	3.11
Contributing Area (acres)	3.110
Non-DCIA Curve Number	39.00
DCIA Percent	85.85
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	45
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	45

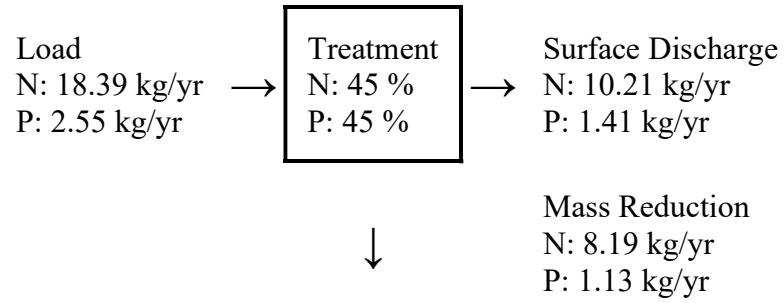
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	8.186
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	1.133
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: R17

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.515
Retention Volume (ac-ft)	0.130

Watershed Characteristics

Catchment Area (acres)	3.03
Contributing Area (acres)	3.030
Non-DCIA Curve Number	39.00
DCIA Percent	82.84
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	44
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	44

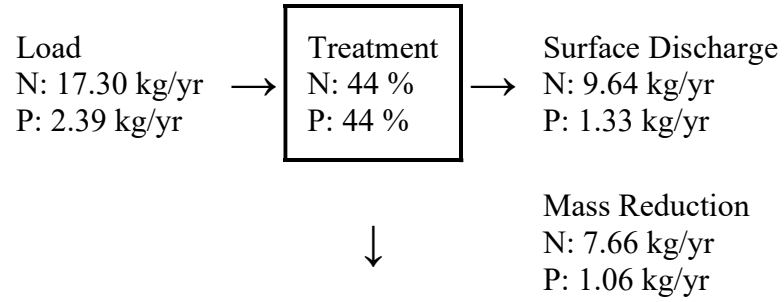
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	7.660
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	1.060
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (R13) Retention

Catchment 2 - (R14) Retention

Catchment 3 - (R15) Retention

Catchment 4 - (R16) Retention

Catchment 5 - (R17) Retention

Based on % removal values to the nearest percent

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	31.49 kg/yr	
Total N post load	52.64 kg/yr	
Target N load reduction	95 %	
Target N discharge load	2.63 kg/yr	
Percent N load reduction	44 %	
Provided N discharge load	29.23 kg/yr	64.45 lb/yr
Provided N load removed	23.42 kg/yr	51.63 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.358 kg/yr	
Total P post load	7.286 kg/yr	
Target P load reduction	95 %	
Target P discharge load	.364 kg/yr	
Percent P load reduction	44 %	
Provided P discharge load	4.045 kg/yr	8.92 lb/yr
Provided P load removed	3.241 kg/yr	7.146 lb/yr

Swales R18-R22

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 1:01:53 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	R18	R19	R20	R21	R22
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.96	3.19	2.15	2.70	1.55
Rational Coefficient (0-1)	0.55	0.44	0.44	0.47	0.46
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	64.58	50.78	51.16	54.07	53.55
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.787	7.335	4.979	6.600	3.753
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000

Nitrogen Loading (kg/yr)	4.296	11.304	7.675	10.172	5.785
Phosphorus Loading (kg/yr)	0.595	1.565	1.062	1.408	0.801

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.96	3.19	2.15	2.70	1.55
Rational Coefficient (0-1)	0.74	0.73	0.73	0.76	0.74
Non DCIA Curve Number	39.00	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	87.50	85.58	86.05	89.26	86.45
Wet Pond Area (ac)	0.00	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	3.754	12.203	8.269	10.767	5.989
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	5.786	18.809	12.745	16.595	9.231
Phosphorus Loading (kg/yr)	0.801	2.603	1.764	2.297	1.278

Catchment Number: 1 Name: R18

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.500
Retention Volume (ac-ft)	0.040

Watershed Characteristics

Catchment Area (acres)	0.96
Contributing Area (acres)	0.960
Non-DCIA Curve Number	39.00
DCIA Percent	87.50
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	95
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	95
Provided TP Treatment Efficiency (%)	42

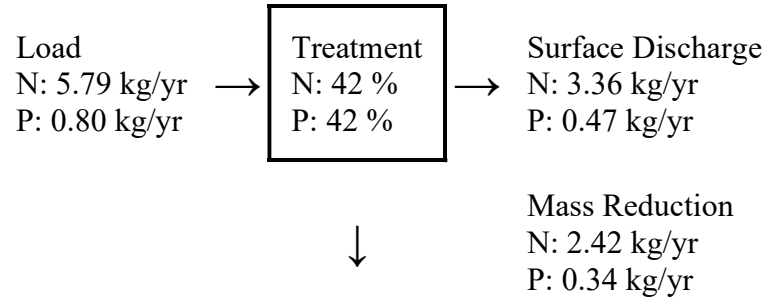
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.425
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.336
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: R19

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.565
Retention Volume (ac-ft)	0.150

Watershed Characteristics

Catchment Area (acres)	3.19
Contributing Area (acres)	3.190
Non-DCIA Curve Number	39.00
DCIA Percent	85.58
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	46
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	46

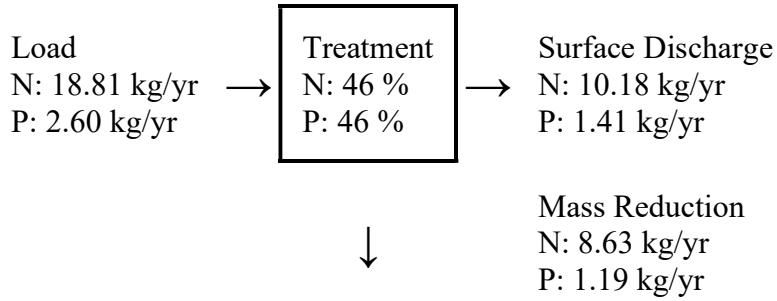
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	8.629
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	1.194
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: R20

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.560
Retention Volume (ac-ft)	0.100

Watershed Characteristics

Catchment Area (acres)	2.15
Contributing Area (acres)	2.150
Non-DCIA Curve Number	39.00
DCIA Percent	86.05
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	45
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	45

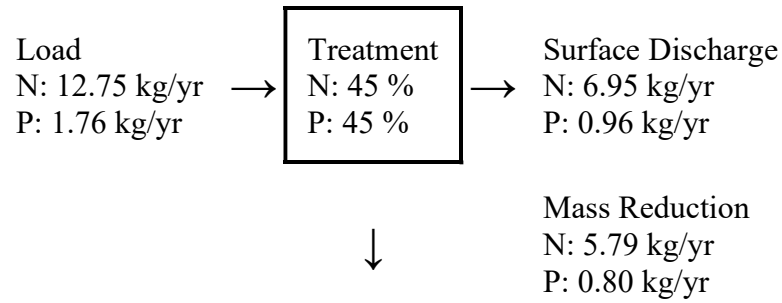
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	5.795
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.802
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 4 Name: R21

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.445
Retention Volume (ac-ft)	0.100

Watershed Characteristics

Catchment Area (acres)	2.70
Contributing Area (acres)	2.700
Non-DCIA Curve Number	39.00
DCIA Percent	89.26
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	38
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	38

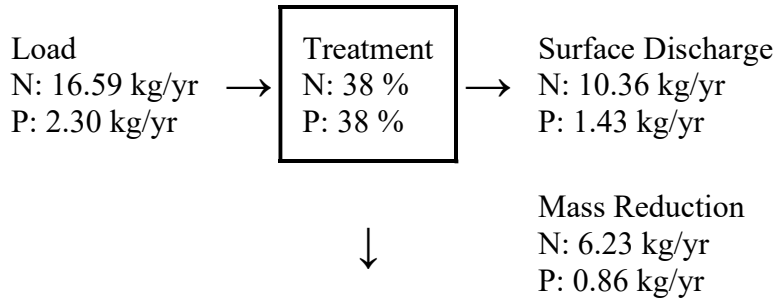
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	6.230
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.862
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 5 Name: R22

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.310
Retention Volume (ac-ft)	0.040

Watershed Characteristics

Catchment Area (acres)	1.55
Contributing Area (acres)	1.550
Non-DCIA Curve Number	39.00
DCIA Percent	86.45
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	29
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	29

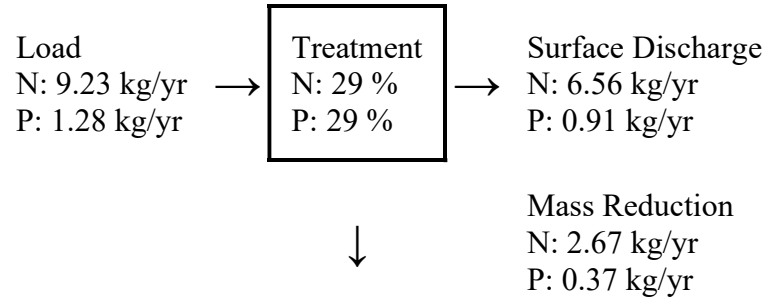
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	2.672
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.370
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (R18) Retention

Catchment 2 - (R19) Retention

Catchment 3 - (R20) Retention

Catchment 4 - (R21) Retention

Catchment 5 - (R22) Retention

Date:10/10/2025

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Based on % removal values to the nearest percent

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	39.23 kg/yr	
Total N post load	63.16 kg/yr	
Target N load reduction	80 %	
Target N discharge load	12.63 kg/yr	
Percent N load reduction	41 %	
Provided N discharge load	37.41 kg/yr	82.5 lb/yr
Provided N load removed	25.75 kg/yr	56.78 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	5.43 kg/yr	
Total P post load	8.742 kg/yr	
Target P load reduction	90 %	
Target P discharge load	.874 kg/yr	
Percent P load reduction	41 %	
Provided P discharge load	5.178 kg/yr	11.42 lb/yr
Provided P load removed	3.564 kg/yr	7.859 lb/yr

Swales R23-R25

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 1:14:25 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	R23	R24	R25
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values
Area (acres)	1.03	1.06	1.65
Rational Coefficient (0-1)	0.47	0.43	0.29
Non DCIA Curve Number	39.00	39.00	39.00
DCIA Percent (0-100)	54.37	50.00	32.73
Nitrogen EMC (mg/l)	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	2.531	2.401	2.487
Groundwater N (kg/yr)	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	3.901	3.700	3.834
Phosphorus Loading (kg/yr)	0.540	0.512	0.531

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values
Area (acres)	1.03	1.06	1.65
Rational Coefficient (0-1)	0.77	0.78	0.76
Non DCIA Curve Number	39.00	39.00	39.00
DCIA Percent (0-100)	90.29	91.51	89.70

Wet Pond Area (ac)	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	4.154	4.332	6.612
Groundwater N (kg/yr)	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	6.403	6.677	10.191
Phosphorus Loading (kg/yr)	0.886	0.924	1.410

Catchment Number: 1 Name: R23

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.230
Retention Volume (ac-ft)	0.020

Watershed Characteristics

Catchment Area (acres)	1.03
Contributing Area (acres)	1.030
Non-DCIA Curve Number	39.00
DCIA Percent	90.29
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	22
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	22

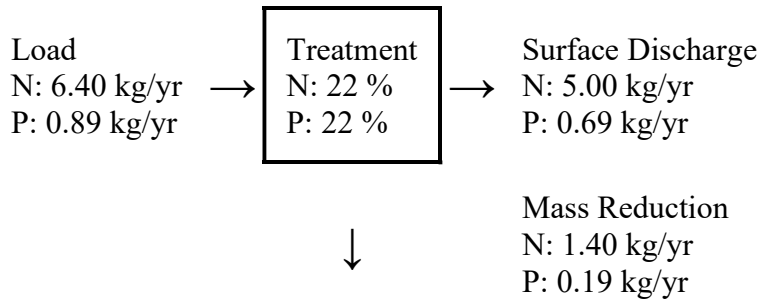
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.404
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.194
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 2 Name: R24

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.230
Retention Volume (ac-ft)	0.020

Watershed Characteristics

Catchment Area (acres)	1.06
Contributing Area (acres)	1.060
Non-DCIA Curve Number	39.00
DCIA Percent	91.51
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	22
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	22

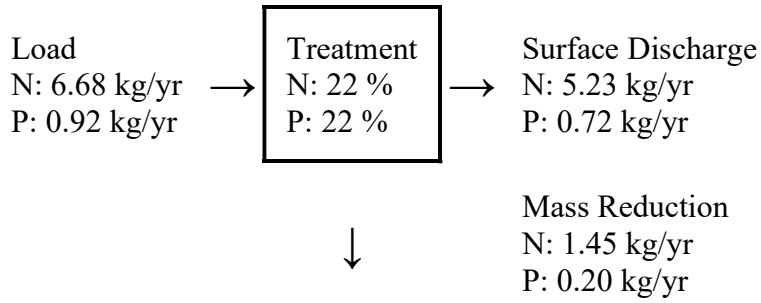
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	1.450
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.201
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Catchment Number: 3 Name: R25

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.510
Retention Volume (ac-ft)	0.070

Watershed Characteristics

Catchment Area (acres)	1.65
Contributing Area (acres)	1.650
Non-DCIA Curve Number	39.00
DCIA Percent	89.70
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	42
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	42

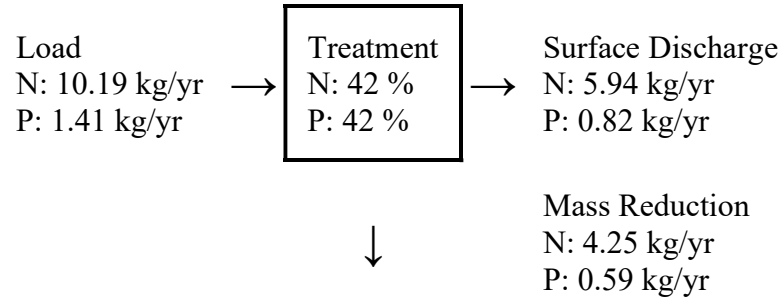
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	4.250
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	0.588
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

Date:10/10/2025

BMP Types:

Catchment 1 - (R23) Retention

Catchment 2 - (R24) Retention

Catchment 3 - (R25) Retention

Based on % removal values to the nearest percent

Routing Summary

Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet
Catchment 5 Routed to Outlet

Total nitrogen target removal met? **No**

Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	11.44 kg/yr	
Total N post load	23.27 kg/yr	
Target N load reduction	80 %	
Target N discharge load	4.65 kg/yr	
Percent N load reduction	31 %	
Provided N discharge load	16.17 kg/yr	35.65 lb/yr
Provided N load removed	7.1 kg/yr	15.66 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	1.583 kg/yr	
Total P post load	3.221 kg/yr	
Target P load reduction	90 %	
Target P discharge load	.322 kg/yr	
Percent P load reduction	31 %	
Provided P discharge load	2.237 kg/yr	4.93 lb/yr
Provided P load removed	.983 kg/yr	2.168 lb/yr

Swales US 331 to Peach Creek

McQuage Bayou

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 1:20:48 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	US 331 to Peach Creek
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	66.67
Rational Coefficient (0-1)	0.20
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	22.06
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	69.130
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	106.546
Phosphorus Loading (kg/yr)	14.746

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	66.67
Rational Coefficient (0-1)	0.36
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	41.13
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250

Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	124.918
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	192.531
Phosphorus Loading (kg/yr)	26.646

Catchment Number: US 331 to Peach Creek

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.506
Retention Volume (ac-ft)	2.811

Watershed Characteristics

Catchment Area (acres)	66.67
Contributing Area (acres)	66.670
Non-DCIA Curve Number	39.00
DCIA Percent	41.13
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	65
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	65

Media Mix Information

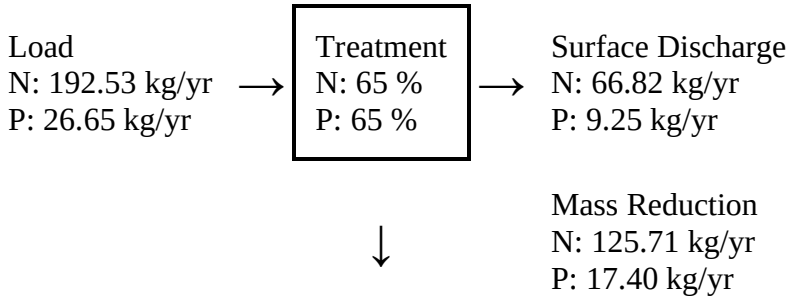
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	125.711
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	17.398

TP Concentration (mg/L) 0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

Date:10/10/2025

BMP Types:

Catchment 1 - (US 331 to Peach Creek) Retention Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	106.55 kg/yr	
Total N post load	192.53 kg/yr	
Target N load reduction	80 %	
Target N discharge load	38.51 kg/yr	
Percent N load reduction	65 %	
Provided N discharge load	66.82 kg/yr	147.34 lb/yr

Provided N load removed	125.71 kg/yr	277.19 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	14.746 kg/yr	
Total P post load	26.646 kg/yr	
Target P load reduction	90 %	
Target P discharge load	2.665 kg/yr	
Percent P load reduction	65 %	
Provided P discharge load	9.248 kg/yr	20.39 lb/yr
Provided P load removed	17.398 kg/yr	38.363 lb/yr

US 331 to Peach Creek

Peach Creek

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 10/10/2025 1:25:52 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	US 331 to Peach Creek
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	49.46
Rational Coefficient (0-1)	0.20
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	22.04
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	51.241
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	78.976
Phosphorus Loading (kg/yr)	10.930

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	49.46
Rational Coefficient (0-1)	0.36
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	41.25
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250

Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	92.934
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	143.235
Phosphorus Loading (kg/yr)	19.824

Catchment Number: US 331 to Peach Creek

Project: US 98 (SR 30)
Date: 10/10/2025

Retention Design

Retention Depth (in)	0.532
Retention Volume (ac-ft)	2.193

Watershed Characteristics

Catchment Area (acres)	49.46
Contributing Area (acres)	49.460
Non-DCIA Curve Number	39.00
DCIA Percent	41.25
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	66
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	66

Media Mix Information

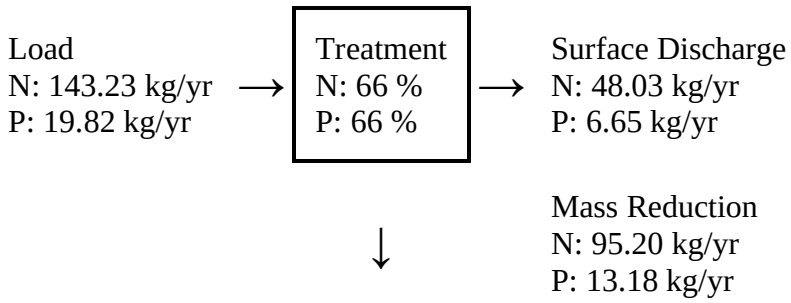
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	95.201
TN Concentration (mg/L)	0.000

TP Mass Load (kg/yr)	13.176
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Analysis Type: Specified Removal Efficiency

Date:10/10/2025

BMP Types:

Catchment 1 - (US 331 to Peach Creek) Retention Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	78.98 kg/yr	
Total N post load	143.23 kg/yr	
Target N load reduction	80 %	
Target N discharge load	28.65 kg/yr	
Percent N load reduction	66 %	
Provided N discharge load	48.03 kg/yr	105.91 lb/yr

Provided N load removed	95.2 kg/yr	209.92 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	10.93 kg/yr	
Total P post load	19.824 kg/yr	
Target P load reduction	90 %	
Target P discharge load	1.982 kg/yr	
Percent P load reduction	66 %	
Provided P discharge load	6.648 kg/yr	14.66 lb/yr
Provided P load removed	13.176 kg/yr	29.053 lb/yr

Peach Creek to Bay County Line
Peach Creek

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 1/7/2026 1:46:29 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Peach Creek to Bay County Line
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	41.08
Rational Coefficient (0-1)	0.36
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	41.14
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	76.989
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	118.659
Phosphorus Loading (kg/yr)	16.422

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	41.08
Rational Coefficient (0-1)	0.47
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	54.63

Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	101.428
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	156.326
Phosphorus Loading (kg/yr)	21.635

Catchment Number: 1 Name: Peach Creek to Bay County Line

Project: US 98 (SR 30)
Date: 1/7/2026

Retention Design

Retention Depth (in)	0.736
Retention Volume (ac-ft)	2.520

Watershed Characteristics

Catchment Area (acres)	41.08
Contributing Area (acres)	41.080
Non-DCIA Curve Number	39.00
DCIA Percent	54.63
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	69
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	69

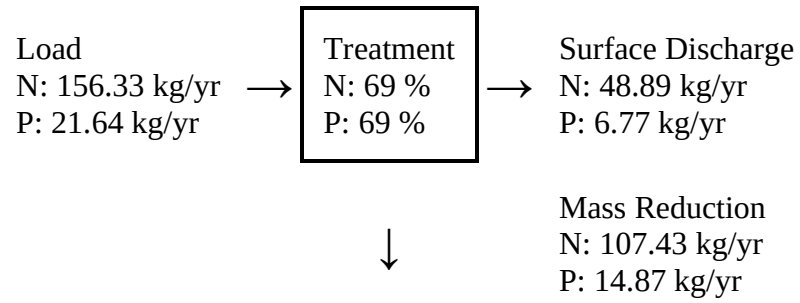
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

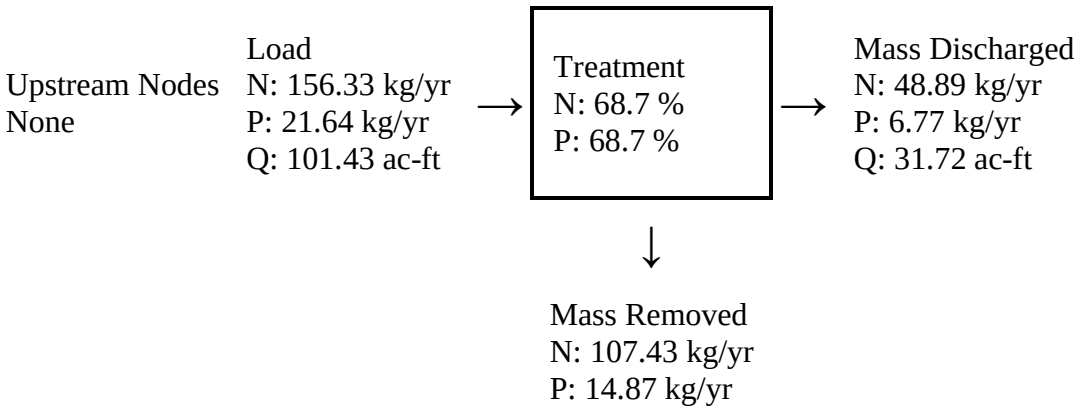
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	107.432
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	14.869
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30) Date:1/7/2026

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (Peach Creek to Bay County Line) Retention Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	118.66 kg/yr	
Total N post load	156.33 kg/yr	
Target N load reduction	80 %	
Target N discharge load	31.27 kg/yr	
Percent N load reduction	69 %	
Provided N discharge load	48.89 kg/yr	107.81 lb/yr
Provided N load removed	107.43 kg/yr	236.89 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	16.422 kg/yr	
Total P post load	21.635 kg/yr	
Target P load reduction	90 %	
Target P discharge load	2.164 kg/yr	
Percent P load reduction	69 %	
Provided P discharge load	6.767 kg/yr	14.92 lb/yr
Provided P load removed	14.869 kg/yr	32.785 lb/yr

Peach Creek to Bay County Line
Peach Creek - ICWW

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 1/7/2026 1:41:27 PM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Peach Creek to Bay County Line
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	10.25
Rational Coefficient (0-1)	0.35
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	40.29
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	18.826
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	29.015
Phosphorus Loading (kg/yr)	4.016

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	10.25
Rational Coefficient (0-1)	0.54
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	63.61
Wet Pond Area (ac)	0.00

Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	29.324
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	45.195
Phosphorus Loading (kg/yr)	6.255

Catchment Number: 1 Name: Peach Creek to Bay County Line

Project: US 98 (SR 30)
Date: 1/7/2026

Retention Design

Retention Depth (in)	0.632
Retention Volume (ac-ft)	0.540

Watershed Characteristics

Catchment Area (acres)	10.25
Contributing Area (acres)	10.250
Non-DCIA Curve Number	39.00
DCIA Percent	63.61
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	59
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	59

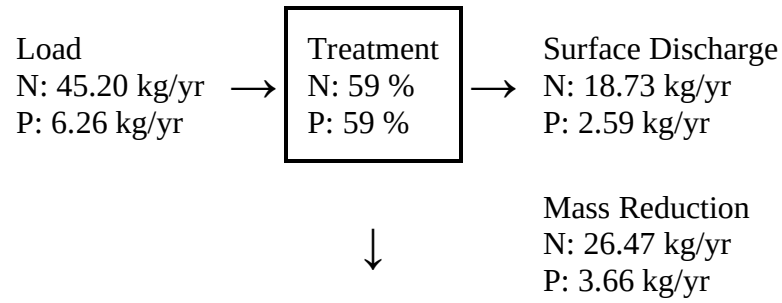
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

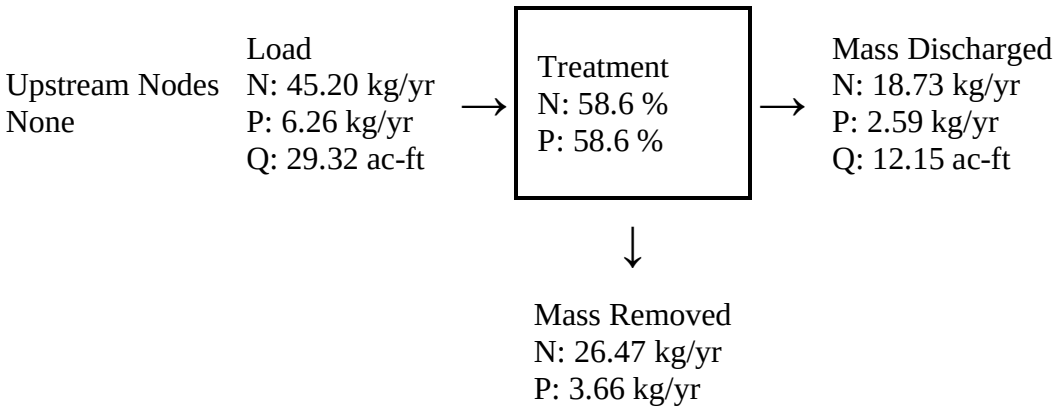
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	26.465
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	3.663
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30) Date:1/7/2026

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (Peach Creek to Bay County Line) Retention Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	29.01 kg/yr	
Total N post load	45.2 kg/yr	
Target N load reduction	80 %	
Target N discharge load	9.04 kg/yr	
Percent N load reduction	59 %	
Provided N discharge load	18.73 kg/yr	41.3 lb/yr
Provided N load removed	26.47 kg/yr	58.36 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	4.016 kg/yr	
Total P post load	6.255 kg/yr	
Target P load reduction	90 %	
Target P discharge load	.626 kg/yr	
Percent P load reduction	59 %	
Provided P discharge load	2.592 kg/yr	5.72 lb/yr
Provided P load removed	3.663 kg/yr	8.076 lb/yr

Peach Creek to Bay County Line

Eastern Lake

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 1/8/2026 10:03:30 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Peach Creek to Bay County Line
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	15.85
Rational Coefficient (0-1)	0.38
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	44.23
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	31.865
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	49.112
Phosphorus Loading (kg/yr)	6.797

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	15.85
Rational Coefficient (0-1)	0.64
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	75.17

Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	53.422
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	82.337
Phosphorus Loading (kg/yr)	11.395

Catchment Number: 1 Name: Peach Creek to Bay County Line

Project: US 98 (SR 30)
Date: 1/8/2026

Retention Design

Retention Depth (in)	0.651
Retention Volume (ac-ft)	0.860

Watershed Characteristics

Catchment Area (acres)	15.85
Contributing Area (acres)	15.850
Non-DCIA Curve Number	39.00
DCIA Percent	75.17
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	54
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	54

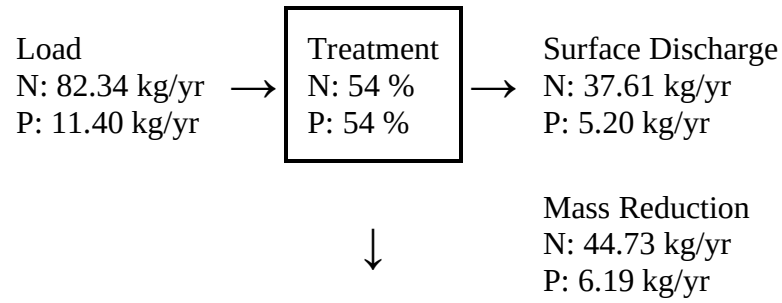
Media Mix Information

Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

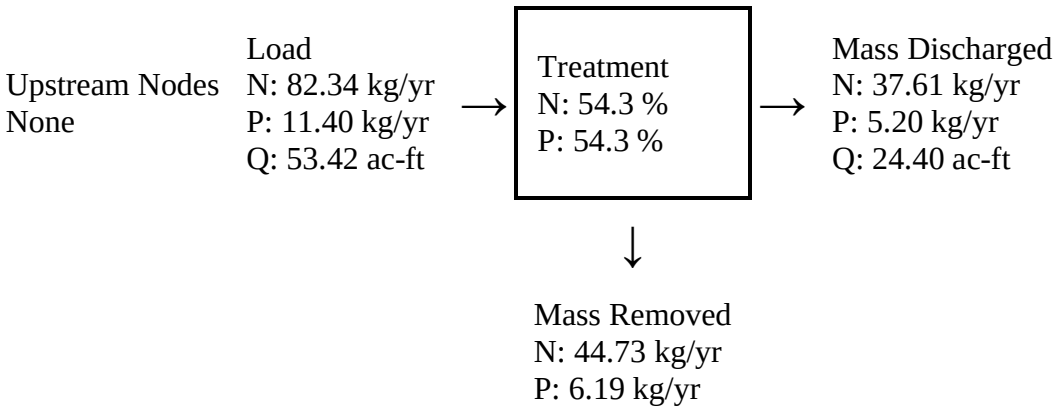
Groundwater Discharge (Stand-Alone)

Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	44.730
TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	6.191
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30) Date:1/8/2026

Analysis Type: Specified Removal Efficiency

BMP Types:

Catchment 1 - (Peach Creek to Bay County Line) Retention Based on % removal values to the nearest percent

Routing Summary
Catchment 1 Routed to Outlet

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	49.11 kg/yr	
Total N post load	82.34 kg/yr	
Target N load reduction	80 %	
Target N discharge load	16.47 kg/yr	
Percent N load reduction	54 %	
Provided N discharge load	37.61 kg/yr	82.92 lb/yr
Provided N load removed	44.73 kg/yr	98.63 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	6.797 kg/yr	
Total P post load	11.395 kg/yr	
Target P load reduction	90 %	
Target P discharge load	1.14 kg/yr	
Percent P load reduction	54 %	
Provided P discharge load	5.205 kg/yr	11.48 lb/yr
Provided P load removed	6.191 kg/yr	13.65 lb/yr

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 1/8/2026 10:05:52 AM

Site and Catchment Information

Analysis: Specified Removal Efficiency

Catchment Name	Peach Creek to Bay County Line
Rainfall Zone	Florida Zone 1
Annual Mean Rainfall	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	29.23
Rational Coefficient (0-1)	0.38
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	44.23
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	58.764
Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	90.570
Phosphorus Loading (kg/yr)	12.535

Post-Condition Landuse Information

Landuse	User Defined Values
Area (acres)	29.23
Rational Coefficient (0-1)	0.64
Non DCIA Curve Number	39.00
DCIA Percent (0-100)	75.17
Wet Pond Area (ac)	0.00
Nitrogen EMC (mg/l)	1.250
Phosphorus EMC (mg/l)	0.173
Runoff Volume (ac-ft/yr)	98.520

Groundwater N (kg/yr)	0.000
Groundwater P (kg/yr)	0.000
Nitrogen Loading (kg/yr)	151.844
Phosphorus Loading (kg/yr)	21.015

Catchment Number: 1 Name: Peach Creek to Bay County Line

Project: US 98 (SR 30)
Date: 1/8/2026

Retention Design

Retention Depth (in)	0.600
Retention Volume (ac-ft)	1.462

Watershed Characteristics

Catchment Area (acres)	29.23
Contributing Area (acres)	29.230
Non-DCIA Curve Number	39.00
DCIA Percent	75.17
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	80
Provided TN Treatment Efficiency (%)	52
Required TP Treatment Efficiency (%)	90
Provided TP Treatment Efficiency (%)	52

Media Mix Information

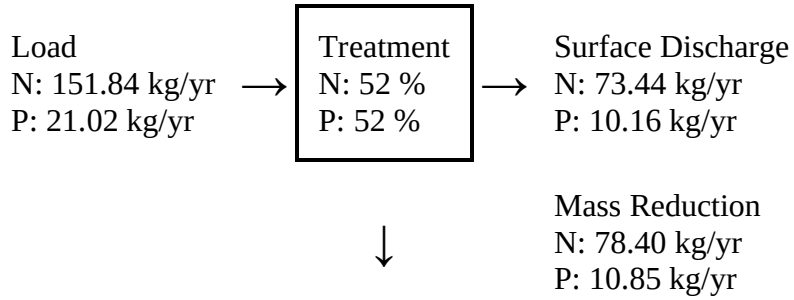
Type of Media Mix	Not Specified
Media N Reduction (%)	
Media P Reduction (%)	

Groundwater Discharge (Stand-Alone)

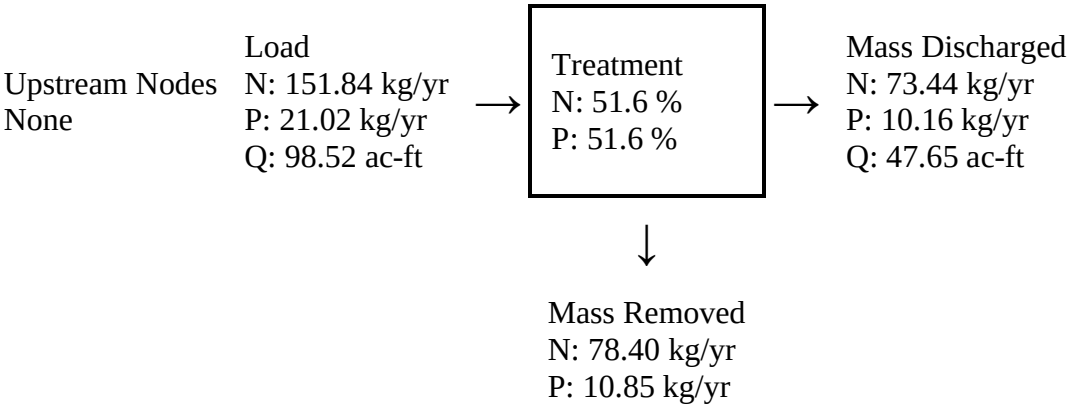
Treatment Rate (MG/yr)	0.000
TN Mass Load (kg/yr)	78.403

TN Concentration (mg/L)	0.000
TP Mass Load (kg/yr)	10.851
TP Concentration (mg/L)	0.000

Load Diagram for Retention (stand-alone)



Load Diagram for Retention (As Used In Routing)



Summary Treatment Report Version: 4.3.5

Project: US 98 (SR 30)

Date:1/8/2026

Analysis Type: Specified Removal Efficiency

BMP Types:

Routing Summary
Catchment 1 Routed to Outlet

Catchment 1 - (Peach Creek to Bay County Line) Retention Based on % removal values to the nearest percent

Total nitrogen target removal met? **No**
Total phosphorus target removal met? **No**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	90.57 kg/yr	
Total N post load	151.84 kg/yr	
Target N load reduction	80 %	
Target N discharge load	30.37 kg/yr	
Percent N load reduction	52 %	
Provided N discharge load	73.44 kg/yr	161.94 lb/yr
Provided N load removed	78.4 kg/yr	172.88 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	12.535 kg/yr	
Total P post load	21.015 kg/yr	
Target P load reduction	90 %	
Target P discharge load	2.102 kg/yr	
Percent P load reduction	52 %	
Provided P discharge load	10.164 kg/yr	22.41 lb/yr
Provided P load removed	10.851 kg/yr	23.926 lb/yr

VFS Rural

Complete Report (not including cost) Ver 4.3.5

Project: L1 VFS
Date: 1/6/2026 2:36:47 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	L1 WO	L1 WI	L1 EO	L1 EI
Rainfall Zone	Florida Zone 1	Florida Zone 1	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	63.00	63.00	63.00	63.00

Pre-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.35	0.19	0.35	0.19
Rational Coefficient (0-1)	0.26	0.23	0.26	0.23
Non DCIA Curve Number	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	29.00	26.00	29.00	26.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	0.470	0.230	0.470	0.230
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	0.724	0.355	0.724	0.355
Phosphorus Loading (kg/yr)	0.100	0.049	0.100	0.049

Post-Condition Landuse Information

Landuse	User Defined Values	User Defined Values	User Defined Values	User Defined Values
Area (acres)	0.35	0.19	0.35	0.19
Rational Coefficient (0-1)	0.59	0.38	0.59	0.38
Non DCIA Curve Number	39.00	39.00	39.00	39.00
DCIA Percent (0-100)	69.50	44.00	69.50	44.00
Wet Pond Area (ac)	0.00	0.00	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173	0.173	0.173
Runoff Volume (ac-ft/yr)	1.092	0.380	1.092	0.380
Groundwater N (kg/yr)	0.000	0.000	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000	0.000	0.000
Nitrogen Loading (kg/yr)	1.683	0.586	1.683	0.586
Phosphorus Loading (kg/yr)	0.233	0.081	0.233	0.081

Catchment Number: 1 Name: L1 WO

Project: L1 VFS
Date: 1/6/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Vegetated Filter Strip

VFS Width (ft)	24.000
VFS Length (ft)	525.000
VFS Depth (ft)	2.000
Width of Area Feeding Buffer (ft)	29.000
Water storage capacity of soil (in/in)	0.200
Slope of VFS (< 20%)	16.670
Annual Capture Percentage	90

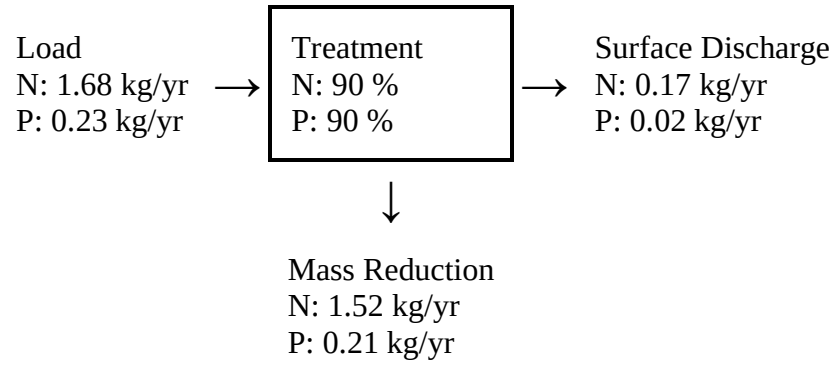
Watershed Characteristics

Catchment Area (acres)	0.35
Contributing Area (acres)	0.350
Non-DCIA Curve Number	39.00
DCIA Percent	69.50
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

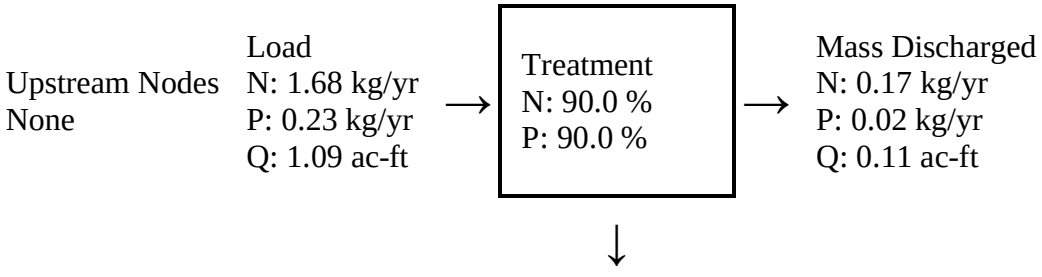
Surface Water Discharge

Required TN Treatment Efficiency (%)	57
Provided TN Treatment Efficiency (%)	90
Required TP Treatment Efficiency (%)	57
Provided TP Treatment Efficiency (%)	90

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Mass Removed
N: 1.52 kg/yr
P: 0.21 kg/yr

Catchment Number: 2 Name: L1 WI

Project: L1 VFS
Date: 1/6/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Vegetated Filter Strip

VFS Width (ft)	15.000
VFS Length (ft)	525.000
VFS Depth (ft)	2.000
Width of Area Feeding Buffer (ft)	16.000
Water storage capacity of soil (in/in)	0.200
Slope of VFS (< 20%)	16.670
Annual Capture Percentage	96

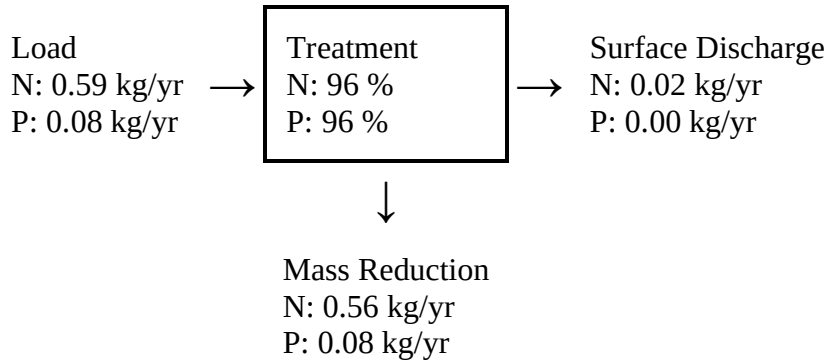
Watershed Characteristics

Catchment Area (acres)	0.19
Contributing Area (acres)	0.190
Non-DCIA Curve Number	39.00
DCIA Percent	44.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

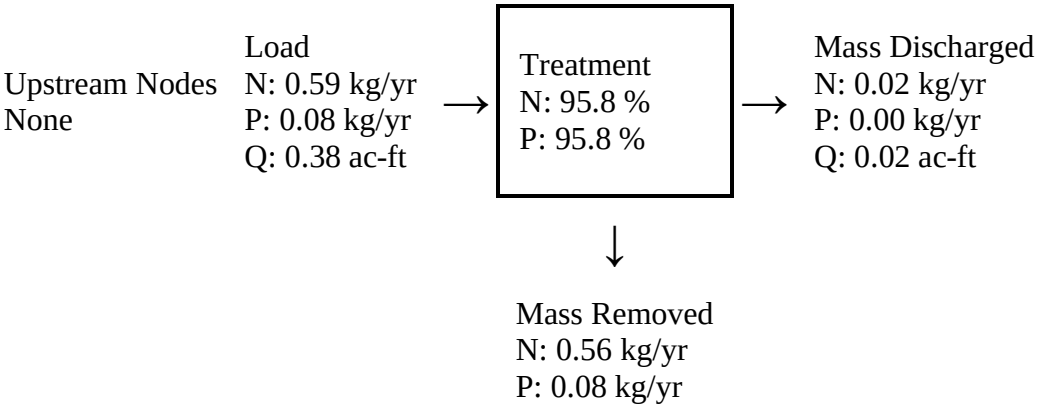
Surface Water Discharge

Required TN Treatment Efficiency (%)	39
Provided TN Treatment Efficiency (%)	96
Required TP Treatment Efficiency (%)	39
Provided TP Treatment Efficiency (%)	96

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Catchment Number: 3 Name: L1 EO

Project: L1 VFS
Date: 1/6/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Vegetated Filter Strip

VFS Width (ft)	24.000
VFS Length (ft)	525.000
VFS Depth (ft)	2.000
Width of Area Feeding Buffer (ft)	29.000
Water storage capacity of soil (in/in)	0.200

Slope of VFS (< 20%)	16.670
Annual Capture Percentage	90

BMP in Series Number: 2
BMP Type: None

BMP in Series Number: 3
BMP Type: None

BMP in Series Number: 4
BMP Type: None

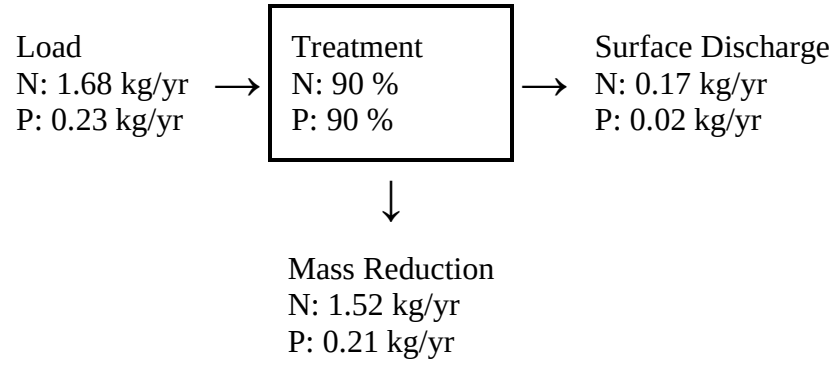
Watershed Characteristics

Catchment Area (acres)	0.35
Contributing Area (acres)	0.350
Non-DCIA Curve Number	39.00
DCIA Percent	69.50
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

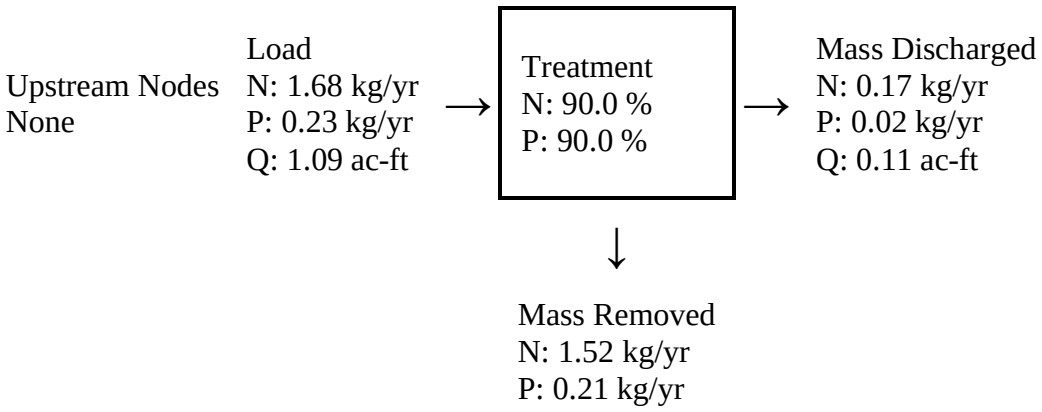
Surface Water Discharge

Required TN Treatment Efficiency (%)	57
Provided TN Treatment Efficiency (%)	90
Required TP Treatment Efficiency (%)	57
Provided TP Treatment Efficiency (%)	90

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Catchment Number: 4 Name: L1 EI

Project: L1 VFS
Date: 1/6/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Vegetated Filter Strip

VFS Width (ft)	15.000
VFS Length (ft)	525.000
VFS Depth (ft)	2.000
Width of Area Feeding Buffer (ft)	16.000
Water storage capacity of soil (in/in)	0.200
Slope of VFS (< 20%)	16.670
Annual Capture Percentage	96

BMP in Series Number: 2
BMP Type: None

BMP in Series Number: 3
BMP Type: None

BMP in Series Number: 4
BMP Type: None

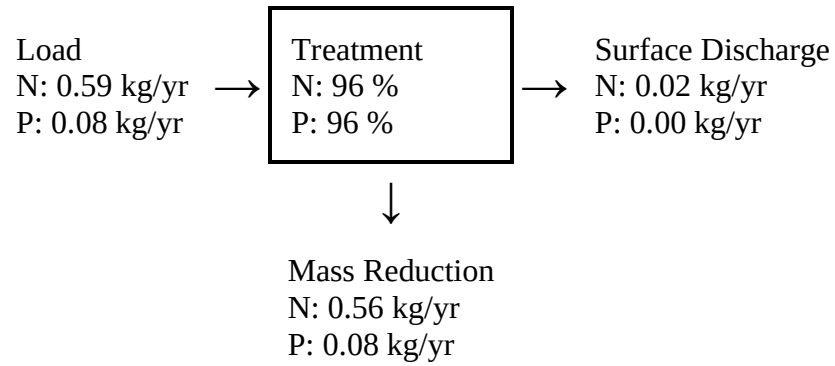
Watershed Characteristics

Catchment Area (acres)	0.19
Contributing Area (acres)	0.190
Non-DCIA Curve Number	39.00
DCIA Percent	44.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	63.00

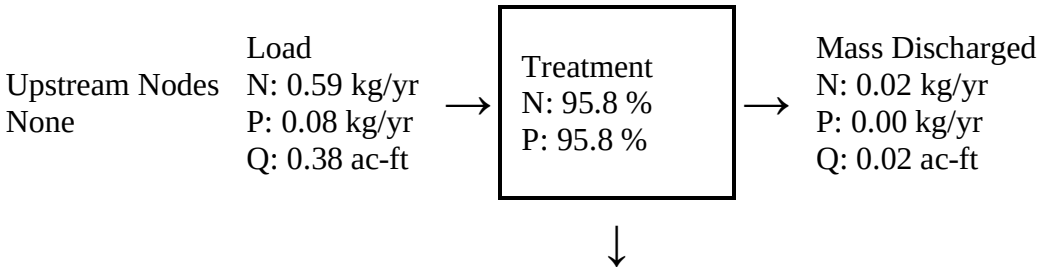
Surface Water Discharge

Required TN Treatment Efficiency (%)	39
Provided TN Treatment Efficiency (%)	96
Required TP Treatment Efficiency (%)	39
Provided TP Treatment Efficiency (%)	96

Load for Multiple BMP in Series



Load Diagram for Multiple BMP (As Used In Routing)



Mass Removed
N: 0.56 kg/yr
P: 0.08 kg/yr

Summary Treatment Report Version: 4.3.5

Project: L1 VFS

Analysis Type: Net Improvement
BMP Types:
Catchment 1 - (L1 WO) Multiple BMP
Catchment 2 - (L1 WI) Multiple BMP
Catchment 3 - (L1 EO) Multiple BMP
Catchment 4 - (L1 EI) Multiple BMP
Based on % removal values to the nearest percent

Date:1/6/2026

Routing Summary
Catchment 1 Routed to Outlet
Catchment 2 Routed to Outlet
Catchment 3 Routed to Outlet
Catchment 4 Routed to Outlet

Total nitrogen target removal met? **Yes**
Total phosphorus target removal met? **Yes**

Summary Report

Nitrogen

Surface Water Discharge

Total N pre load	2.16 kg/yr	
Total N post load	4.54 kg/yr	
Target N load reduction	52 %	
Target N discharge load	2.16 kg/yr	
Percent N load reduction	92 %	
Provided N discharge load	.38 kg/yr	.85 lb/yr
Provided N load removed	4.15 kg/yr	9.16 lb/yr

Phosphorus

Surface Water Discharge

Total P pre load	.299 kg/yr	
Total P post load	.628 kg/yr	
Target P load reduction	52 %	
Target P discharge load	.299 kg/yr	
Percent P load reduction	92 %	
Provided P discharge load	.053 kg/yr	.12 lb/yr
Provided P load removed	.575 kg/yr	1.268 lb/yr

VFS Suburban

Complete Report (not including cost) Ver 4.3.5

Project: US 98 (SR 30)
Date: 1/6/2026 2:53:57 PM

Site and Catchment Information

Analysis: Net Improvement

Catchment Name	L13 WO	L13 EO
Rainfall Zone	Florida Zone 1	Florida Zone 1
Annual Mean Rainfall	65.00	65.00
Landuse	User Defined Values	User Defined Values
Area (acres)	0.40	0.40
Rational Coefficient (0-1)	0.26	0.26
Non DCIA Curve Number	39.00	39.00
DCIA Percent (0-100)	29.00	29.00
Nitrogen EMC (mg/l)	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173
Runoff Volume (ac-ft/yr)	0.554	0.554
Groundwater N (kg/yr)	0.000	0.000
Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	0.854	0.854
Phosphorus Loading (kg/yr)	0.118	0.118
Landuse	User Defined Values	User Defined Values
Area (acres)	0.40	0.40
Rational Coefficient (0-1)	0.54	0.54
Non DCIA Curve Number	39.00	39.00
DCIA Percent (0-100)	63.00	63.00
Wet Pond Area (ac)	0.00	0.00
Nitrogen EMC (mg/l)	1.250	1.250
Phosphorus EMC (mg/l)	0.173	0.173
Runoff Volume (ac-ft/yr)	1.170	1.170
Groundwater N (kg/yr)	0.000	0.000

Groundwater P (kg/yr)	0.000	0.000
Nitrogen Loading (kg/yr)	1.803	1.803
Phosphorus Loading (kg/yr)	0.249	0.249

Catchment Number: 1 Name: L13 WO

Project: US 98 (SR 30)
Date: 1/6/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Vegetated Filter Strip

VFS Width (ft)	24.000
VFS Length (ft)	371.000
VFS Depth (ft)	2.000
Width of Area Feeding Buffer (ft)	47.500
Water storage capacity of soil (in/in)	0.200
Slope of VFS (< 20%)	16.670
Annual Capture Percentage	86

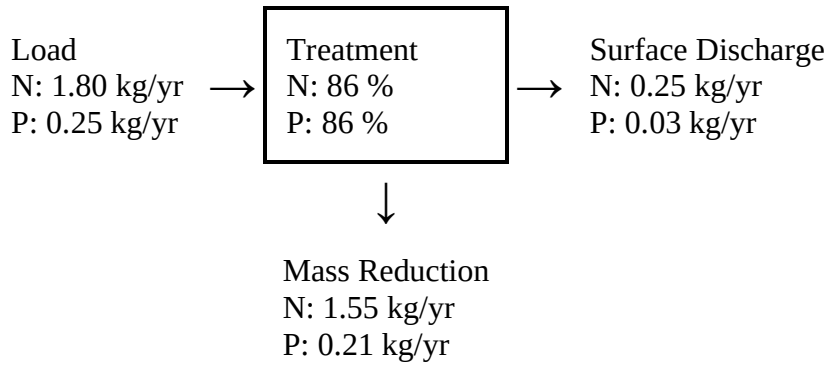
Watershed Characteristics

Catchment Area (acres)	0.40
Contributing Area (acres)	0.400
Non-DCIA Curve Number	39.00
DCIA Percent	63.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	65.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	53
Provided TN Treatment Efficiency (%)	86
Required TP Treatment Efficiency (%)	53
Provided TP Treatment Efficiency (%)	86

Load for Multiple BMP in Series



Catchment Number: 3 Name: L13 EO

Project: US 98 (SR 30)
Date: 1/6/2026

Multiple BMP in Series Design Parameters

BMP in Series Number: 1
BMP Type: Vegetated Filter Strip

VFS Width (ft)	24.000
VFS Length (ft)	371.000
VFS Depth (ft)	2.000
Width of Area Feeding Buffer (ft)	47.500
Water storage capacity of soil (in/in)	0.200
Slope of VFS (< 20%)	16.670
Annual Capture Percentage	86

Watershed Characteristics

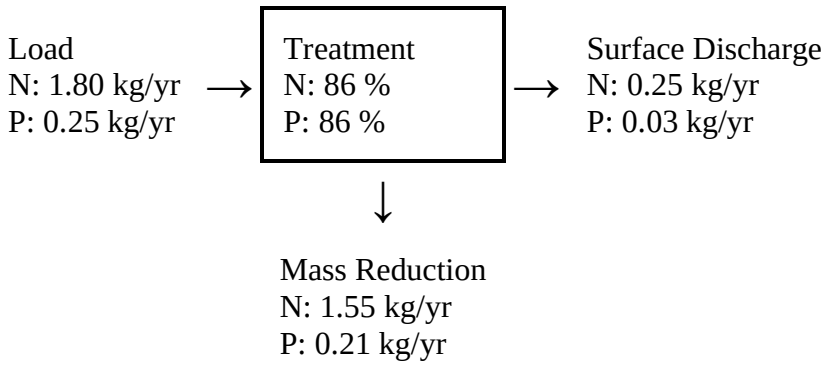
Catchment Area (acres)	0.40
Contributing Area (acres)	0.400
Non-DCIA Curve Number	39.00
DCIA Percent	63.00
Rainfall Zone	Florida Zone 1
Rainfall (in)	65.00

Surface Water Discharge

Required TN Treatment Efficiency (%)	53
Provided TN Treatment Efficiency (%)	86

Required TP Treatment Efficiency (%)	53
Provided TP Treatment Efficiency (%)	86

Load for Multiple BMP in Series



APPENDIX C

Original PSR

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

TECHNICAL REPORT COVERSHEET

650-050-38
ENVIRONMENTAL
MANAGEMENT
08/22

FINAL CONCEPTUAL DRAINAGE REPORT

Florida Department of Transportation

District 3

SR 30 (US 98) Project Development & Environment (PD&E) Study

Limits of Project: From County Road (CR) 30A to West of Phillips Inlet Bridge

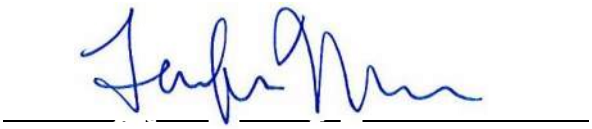
Walton County, Florida

Financial Management Number: 437179-1

ETDM Number: 14476

Date: February 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022 and executed by the Federal Highway Administration and FDOT.



Authorized Signature

Jennifer Nunn, P.E.
Print/Type Name

Senior Engineer
Title

165 Lincoln Avenue
Address

Winter Park, FL 32789
Address

Seal

Executive Summary

The Balmoral Group has subcontracted with H.W. Lochner, Inc. to provide drainage design services for the State of Florida Department of Transportation (*FDOT*) District 3 for the State Road (*SR*) 30 (US 98) improvements from County Road (*CR*) 30A (near Sandestin) to West of Phillips Inlet Bridge (Financial Project Identification (*FPID*) 437179-1-22-01) in Walton County.

This Conceptual Drainage Report (*CDR*) is part of the Project Development and Environment (*PD&E*) Study. The purpose is to provide a review of the existing drainage patterns and outfalls, preliminarily size stormwater management facilities (*SMF*s) to accommodate the required treatment and attenuation volumes, and discuss the conceptual approach to the proposed stormwater management design.

This project is located within the Choctawhatchee – St. Andrew Drain Basin and crosses twelve (12) Waterbody Identification (*WBID*) basins, with the majority of the corridor flowing north (ultimately to the Choctawhatchee Bay) and the eastern portion discharging south towards the Gulf. The majority of the project limits are within Point Washington Wildlife Management Area (*PWWMA*), which is classified as an Outstanding Florida Waterbody (*OFW*), and Lake Powell and Phillips Inlet are considered a special OFW. The project is contained within the Northwest Florida Water Management District (*NWFWMD*).

Generally, runoff flows from south to north through the project limits from off-site basins on the south side of SR 30, except for a section near the end of the project that discharges from north to south. There are forty-four existing outfalls identified within the project limits, which correspond to forty-four existing offsite basins. Portions of the existing corridor have closed storm sewer systems which convey runoff to existing ponds for treatment and attenuation. The majority of the roadway runoff sheet flows into existing linear swales which discharge to existing outfalls.

Proposed basins are anticipated to mimic existing drainage patterns. Proposed SMFs will be required to treat all runoff within the on-site roadway basin. The conceptual drainage approach is to estimate the amount of additional required storage volume needed to accommodate the proposed improvements, account for impacts to existing linear swales, and provide additional 50% treatment volume to comply with OFW criteria and provide presumptive criteria. Calculations were performed for each existing SMF within the corridor: wet detention ponds, dry retention ponds, and linear swales to determine the existing permitted storage volume in order to identify the need for additional capacity for the proposed condition. Discussion is primarily organized by the original FDOT FPID numbers.

Table of Contents

EXECUTIVE SUMMARY II

1.0 INTRODUCTION 7

2.0 PROJECT SUMMARY 7

2.1 Project Description 7
2.2 Purpose and Need 7
2.3 General Project Information 8
2.4 Existing Roadway Conditions 9
2.4.1 Existing Typical Sections 9
2.5 Floodplains 10
2.6 Existing Drainage Patterns 10
2.7 Topography and Land Use 11
2.8 Soil Characteristics 11
2.9 Historic Flooding 11
3.0 DESIGN CONSIDERATIONS 12

3.1 Alternatives Analysis 12
3.2 Build Alternative 12
3.2.1 Build Typical Section 12
3.2.2 Build Alignment 14
3.2.3 Mainline Alternative 1 and Alternative 2 15
3.3 Permit Agency Coordination 16
3.3.1 Northwest Florida Water Management District (NWFWMD) 16
3.4 WATERSS Initial Stakeholder Meeting 17
4.0 EXISTING DRAINAGE 18

4.1 SR 30 from CR 30A to East of SR 83 (FPID 220642-1) 18
4.1.1 Urban Area 18
4.1.2 Rural Area 19
4.2 SR 30 from East of SR 83 to East of Peach Creek (FPID 220643-1) 19
4.3 SR 30 from East of Peach Creek to Bay County Line (FPID 220644-1) . 20
4.3.1 Rural Area 20

4.3.2 Urban Area 20

5.0 STORMWATER MANAGEMENT FACILITY (SMF) SIZING ANALYSIS 22

5.1 Proposed Drainage Basins 22

5.2 SMF Sizing 22

5.1.1 Existing Wet Detention Ponds 22

5.1.2 Existing Dry Retention Ponds 24

5.1.3 Existing Linear Ponds 24

5.1.4 Interchange Ponds 26

6.0 FLOODPLAIN ANALYSIS 27

7.0 CONCLUSION 29

8.0 REFERENCES 31

LIST OF TABLES

Table 4-1: Existing Pond Summary (FPID 220642-1) 19
Table 4-2: Existing Pond Summary (FPID 220644-1) 21
Table 5-1: Impervious Area (Permitted v. Proposed) for Existing Wet Detention Ponds 23
Table 5-2: Summary of Additional Required Volume for Existing Wet Detention Ponds 24
Table 5-3: Summary of Additional Required Volume for Existing Linear Swales 25
Table 6-1: Summary of Estimated Floodplain Impacts 28

LIST OF PLATES

Plate 2-1: Location Map 8
Plate 2-2: Existing 4-Lane Divided Rural Typical Section 9
Plate 2-3: Existing 4-Lane Divided Urban Typical Section 9
Plate 2-4: Existing 4-Lane Divided Bridge Structure Typical Section 9
Plate 3-1: Proposed Rural Roadway Typical Section 13
Plate 3-2: Proposed Suburban Roadway Typical Section 13
Plate 3-3: Proposed Urban Roadway Typical Section 14
Plate 3-4: Proposed Bridge Structural Typical Section 14

APPENDICES

Appendix A – Maps and Figures
- Figure 1: Location Map
- Figure 2A - 2B: FEMA Map
- Figure 3A - 3B: WBID Map
- Figure 4: Topographic Map
- Figure 5: Land Cover Map
- Figure 6: Soil Map
- Figure 7A – 7E: Existing SMFs

Appendix B – Pond Sizing Calculations

Appendix C – Existing Permitted Documents

Appendix D – Correspondence and Project Information

LIST OF ACRONYMS

BFE – Base Flood Elevation

CDR – Conceptual Drainage Report

CR – County Road

DEM – Digital Elevation Model

ELA - Environmental Look Around

ERP – Environmental Resource Permit

FDOT – Florida Department of Transportation

FDEP - Florida Department of Environmental Protection

FEMA – Federal Emergency Management Agency

FPID - Financial Project Identification

LOS – Level of Service

NAVD - North American Vertical Datum of 1988

NGVD - National Geodetic Vertical Datum of 1929

NOAA - National Oceanic and Atmospheric Administration

NRCS – Natural Resources Conservation Service

NWFWMD – Northwest Florida Water Management District

OFW – Outstanding Florida Water

PD&E – Project Development and Environment

PWWMA - Point Washington Wildlife Management Area

SCS - Soil Conservation Service

SIS – Strategic Intermodal System

SMF – Stormwater Management Facility

SR – State Road

SSURGO – Survey Geographic Database

WATERSS - Watershed Approach to Evaluate Regional Stormwater Solutions

WBID – Waterbody Identification

1.0 INTRODUCTION

FDOT District 3 initiated a PD&E Study of SR 30 (US 98) from CR 30A to West of Phillips Inlet Bridge in Walton County in July 2022. The study will investigate transportation improvements along the SR 30 corridor within the project limits.

2.0 PROJECT SUMMARY

2.1 PROJECT DESCRIPTION

The FDOT is conducting a PD&E Study to address capacity issues along SR 30 from CR 30A West (near Sandestin) to West of Phillips Inlet Bridge, a distance of approximately 19.38 miles in Walton County. Plate 2-1 shows the project location. The proposed improvements consist of widening SR 30 from a four-lane divided facility to a six-lane divided facility with a potential interchange at US 331. Intersection and safety improvements as well as pedestrian and bicycle accommodations will also be considered along the corridor.

The existing SR 30 within the project area is a four-lane divided facility. The segment of SR 30 from CR 30A West to Redbud Lane is functionally classified as a rural principal arterial other and the segment from Redbud Lane to west of Phillips Inlet Bridge is functionally classified as an urban principal arterial other.

2.2 PURPOSE AND NEED

The purpose of this project is to evaluate future capacity needs and traffic concerns on SR 30 from CR 30A to West of Phillips Inlet Bridge. This project is needed to evaluate traffic congestion concerns on SR 30 from CR 30A to West of Phillips Inlet Bridge. This segment is projected to operate at Level of Service (*LOS*) F in the year 2040 if no capacity improvements are constructed. This route is considered a critical east-west corridor which provides a connection to US 331, an important northbound hurricane evacuation route.

Plate 2-1: Location Map



2.3 GENERAL PROJECT INFORMATION

The total length of this project is approximately 19.38-mi as shown in Figure 1, Location Map in Appendix A. The project uses the North American Vertical Datum of 1988 (*NAVD*), and the horizontal datum for the project is Florida State Plane (*NAD 1983*), Northern Zone. Conversion to a NAVD elevation is accomplished by subtracting 0.39-ft from the National Geodetic Vertical Datum of 1929 (*NGVD*) elevation (i.e. 10.00-ft NGVD = 9.61-ft NAVD). All stations are referenced to the proposed alignment along SR 30. The project is located within Walton County and the following Townships, Ranges and Sections:

- *Sections 31-33 of Township 2 South and Range 19 West*
- *Sections 32-36 of Township 2 South and Range 20 West*
- *Sections 6, 8-9, 15-16, 22-23, 26, 35-36 of Township 3 South and Range 18 West*
- *Sections 1-4 of Township 3 South and Range 19 West*

Most of the project limits are within PWWMA, which is classified as an Other *OFW*, and Lake Powell and Phillips Inlet are considered special OFWs as well. The project is wholly contained within the NWFWMD.

2.4 EXISTING ROADWAY CONDITIONS

2.4.1 Existing Typical Sections

The existing SR 30 roadway is a four-lane divided facility. The rural typical section features four 12-foot travel lanes with paved shoulders and an average 64-foot grassed median along the corridor. The urban typical section features four 12-foot travel lanes and a 46-foot grassed median with curb and gutter and a proposed storm sewer system along the eastern end of the corridor. There are two bridges located within the rural typical section, which are structurally sound. The existing typical sections within the project corridor are presented in Plate 2-2, Plate 2-3, and Plate 2-4.

Plate 2-2: Existing 4-Lane Divided Rural Typical Section

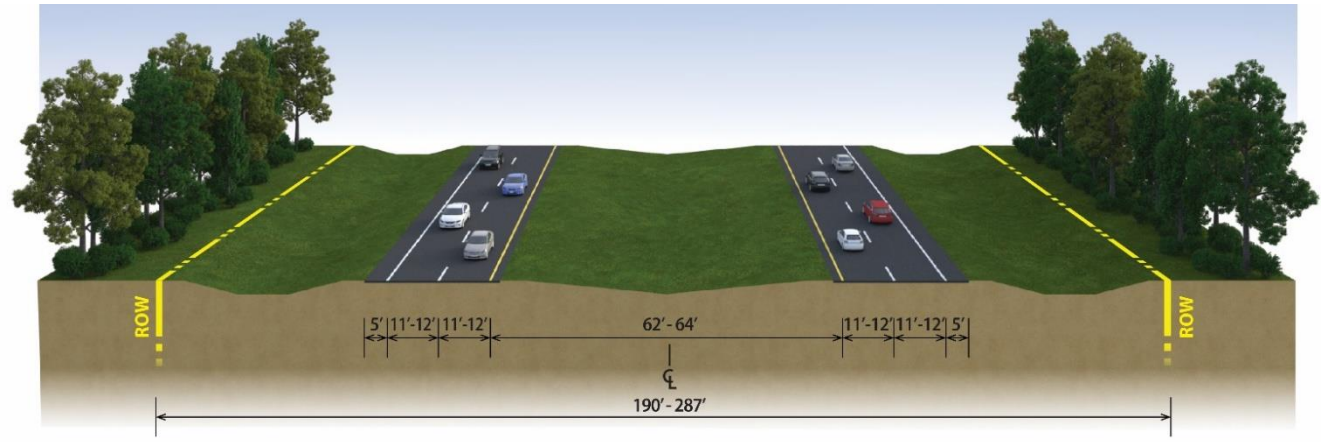


Plate 2-3: Existing 4-Lane Divided Urban Typical Section

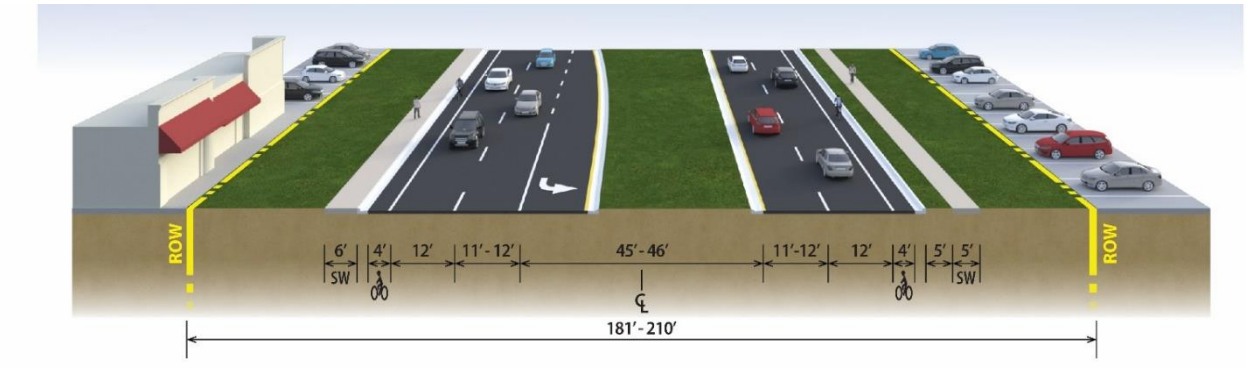
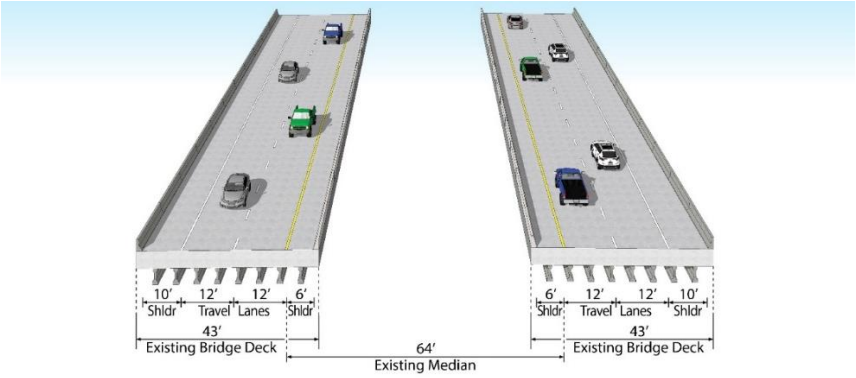


Plate 2-4: Existing 4-Lane Divided Bridge Structure Typical Section



2.5 FLOODPLAINS

The SR 30 corridor has several encroachments into the Federal Emergency Management Agency's (*FEMA*) Flood Zone A, which is an area within the 100-year floodplain that has no base flood elevation (*BFE*) established. In addition, the corridor has areas within Zone X. The area downstream of the SR 30 Peach Creek crossing is in FEMA Flood Zone AE which has a BFE established; however, Peach Creek is not a regulated floodway. The FEMA floodplain information effective October 5, 2017 and revised on December 30, 2020 is provided in Figure 2A and Figure 2B, FEMA Maps in Appendix A.

2.6 EXISTING DRAINAGE PATTERNS

The project is solely comprised of all open basins and is located within the Choctawhatchee – St. Andrew Drain Basin. For assessment purposes, the Florida Department of Environmental Protection (*FDEP*) has divided the Choctawhatchee–St. Andrew Bay Basin into water assessment polygons with a unique WBID number for each watershed or stream reach. The project crosses twelve WBID basins, with the majority of the corridor flowing north and ultimately to the Choctawhatchee Bay with the eastern corridor portion discharging south towards the Gulf. The basins have WBID numbers 881, 944, 957, 972, 978, 980, 981, 963, 986, 1027B, 1008 and 1055B which includes freshwater segments as shown in Figure 3A and Figure 3B, WBID Map in Appendix A. WBID #881, Direct Runoff to Bay and Choctawhatchee Bay are both impaired for nutrients.

Generally, runoff flows from south to north through the project limits from off-site basins on the south side of SR 30, except for a section that discharges from north to south. There are forty-four existing outfalls identified within the project limits, which correspond to forty-four existing offsite basins. Portions of the existing corridor have closed storm sewer systems which convey runoff to existing ponds for treatment and attenuation. The majority of the

roadway runoff sheet flows into existing linear swales which discharge to existing outfalls. Existing SMFs along the corridor include wet detention ponds, dry retention ponds, and linear swales.

Field visits on November 8-9, 2022 was performed to verify the outfalls and review the existing drainage patterns. Field notes and photos are provided in the Location Hydraulic Report (under separate cover).

2.7 TOPOGRAPHY AND LAND USE

The terrain of the project area is relatively flat, and elevations range from 0-ft to 69.59-ft NAVD. The elevations are lower in the vicinity of the Gulf of Mexico, located south of the project limits. A Digital Elevation Model (*DEM*) was developed from 2020 NWFWMD LiDAR data for Walton County. Topographic information can be found in Figure 4, Topographic Map (Digital Elevation Model) in Appendix A.

The existing land use along SR 30 consists mainly of commercial and services, institutional, residential medium and low densities, park/recreation and agricultural. Refer to Figure 5, Land Cover Map in Appendix A.

2.8 SOIL CHARACTERISTICS

Soil Survey Geographic Database (*SSURGO*) of Walton County was used to identify the soil types within and adjacent to the proposed project on the SR 30 corridor. The majority of the project is within Type A, A/D, and B/D soils which are well drained soils. Refer to Figure 6, Soil Map in Appendix A for an exhibit of the soils as mapped in the Natural Resources Conservation Service (*NRCS*) Soil Survey.

2.9 HISTORIC FLOODING

Timothy Hendrix, FDOT District 3 Maintenance Engineer, verified that there were no recorded flooding issues within the project limits in the FDOT maintained database. Robert Ellis, FDOT District 3 Operations Engineer Manager for Ponce de Leon Operations, also confirmed that there are no flood issues in the area. Refer to Appendix D.

A few locations of overtopping were discussed in the initial Stakeholder meeting as part of the Watershed Approach to Evaluate Regional Stormwater Solutions (*WATERSS*) process held on September 18, 2023. Meeting notes are included in Appendix D.

3.0 DESIGN CONSIDERATIONS

This project is intended to enhance the efficiency of SR 30, recognizing its importance to the larger transportation network within the State of Florida as part of the Strategic Intermodal System (*SIS*), and to be consistent with other adjacent capacity projects

3.1 ALTERNATIVES ANALYSIS

The following alternatives are being considered:

- *No Build Alternative: The No Build Alternative is defined as the alternative in which the proposed project activity would not take place and assumes that no action will be taken to improve SR 30 within the project limits. The No Build Alternative serves as the baseline against which the Build Alternatives are evaluated and remains under consideration throughout this PD&E study.*
- *Build Alternatives: The Build Alternative(s) address the project's purpose and need. Widening SR 30 from four to six lanes, within the existing median will be examined. Critical intersection will be studied for safety and operational improvements. An interchange at US 331 will be considered.*

3.2 BUILD ALTERNATIVE

3.2.1 Build Typical Section

The Context Classifications of SR 30 within the project limit are C1 (Natural), C2 (Rural), C3C (Suburban Commercial). Therefore, three proposed typical sections are a part of this study. The proposed rural typical section with a design speed of 65 mph (for SIS) consists of three 12-foot wide travel lanes in each direction. The opposing travel lanes are separated by an approximate 40-foot grassed median that includes 10-foot shoulders (5-foot outside paved and 4-foot inside paved). The width required for the footprint rural typical (outside shoulder to outside shoulder) is 132 feet, as shown in Plate 3-1. A 12-foot shared-use path will be examined, along the southside of the alignment.

The proposed suburban typical section with a design speed of 55 mph (for SIS) consists of three 12-foot wide travel lanes in each direction. The opposing travel lanes are separated by a 30-foot median that includes 6.5 foot offset from the edge of travel way to the lip of the gutter, Type E curb and grassed median. The outside shoulder is 10-feet (5-feet paved). The width required for the footprint of the suburban typical (outside shoulder to outside shoulder)

is 122 feet, see Plate 3-2. A 12-foot shared-use path on the alignment's southside is included.

Plate 3-1: Proposed Rural Roadway Typical Section

(Old Blue Mountain Rd/CR 83 to McDavis Blvd)

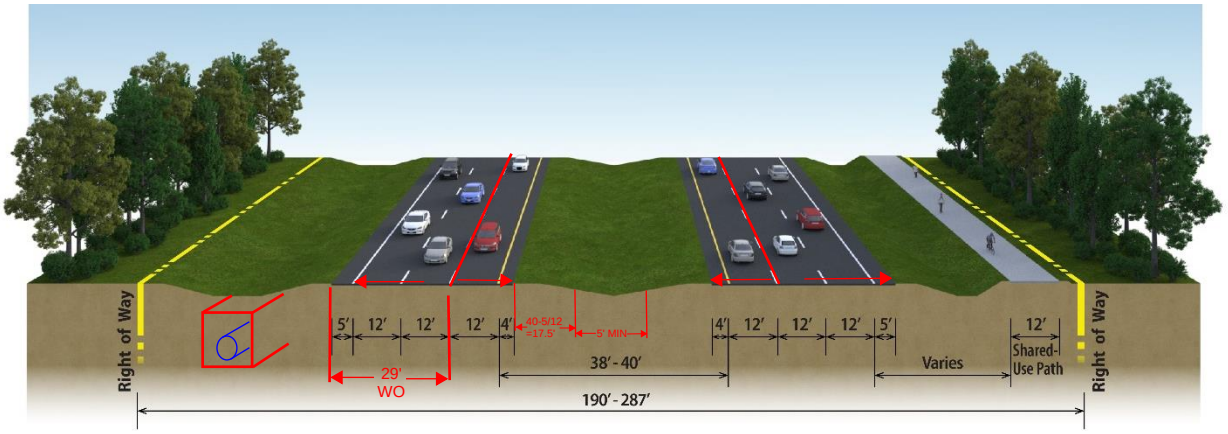
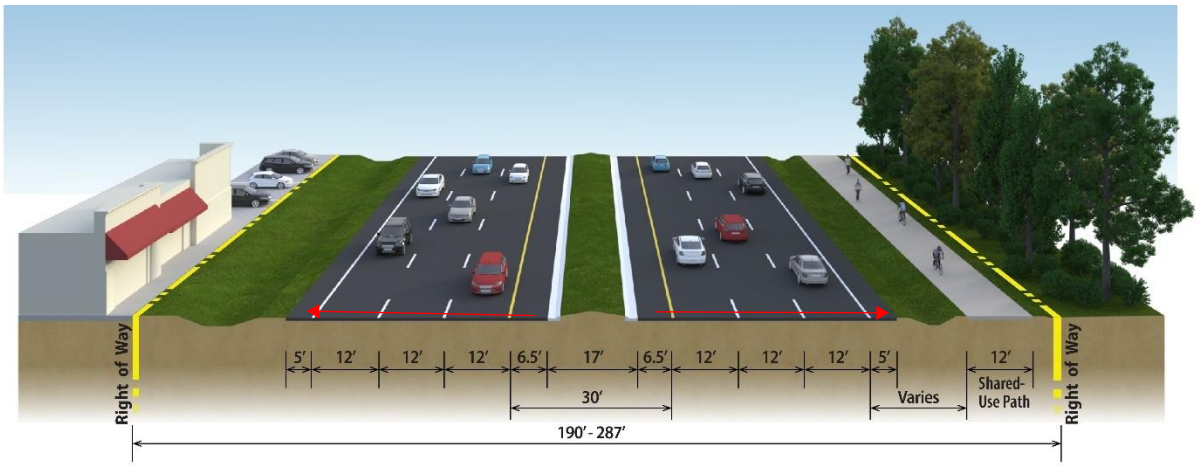


Plate 3-2: Proposed Suburban Roadway Typical Section

(Public at South Walton Entrance to Old Blue Mountain Rd/CR 83 and from McDavis Blvd to Redbud Lane)



The proposed urban typical section with a design speed of 45 mph (for SIS) consists of three 12-foot wide travel lanes in each direction. The opposing travel lanes are separated by an approximate 30-foot median that includes Type E curb and gutter and grassed median. The outside curb and gutter is Type F. Pedestrian and bicycle accommodations consist of a sidewalk and a shared use path. The width required for the footprint of the urban typical (outside sidewalk to outside shared use path) is 123.5 feet, as shown in Plate 3-3.

As shown in the Plate 3-4, the proposed bridges may consist of two structures. Including the barrier walls, each of the bridge decks are 58'-8" wide.

Plate 3-3: Proposed Urban Roadway Typical Section

(from W. of CR 30A to the Publix at South Walton Entrance and from Redbud Lane to the eastern project limit)

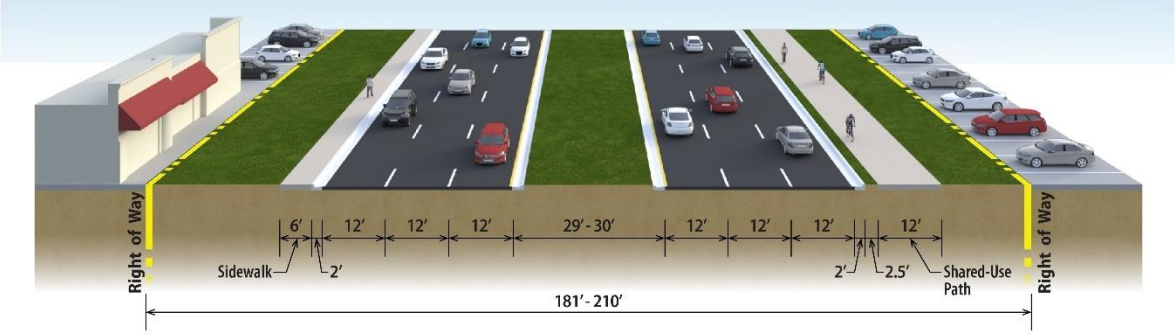
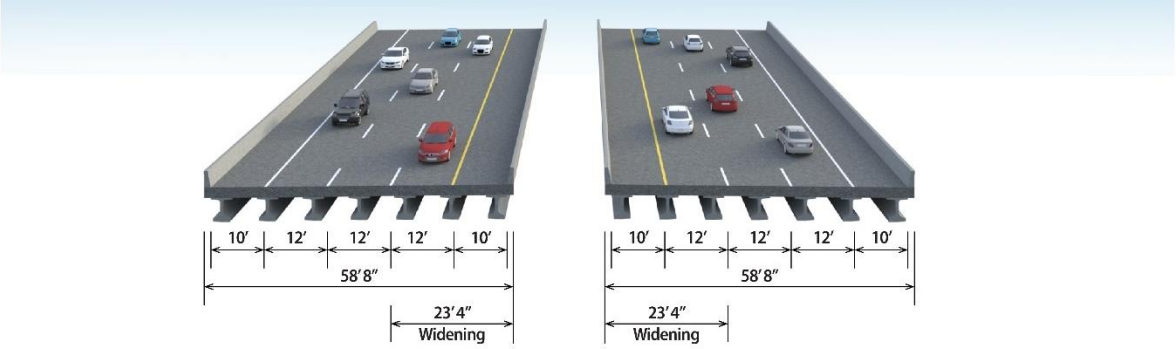


Plate 3-4: Proposed Bridge Structural Typical Section



3.2.2 Build Alignment

The Build Alternatives will utilize the proposed typical sections where the centerline of the proposed typical section is placed along the existing roadway centerline with the proposed widening to the inside median, a minimal amount of additional right-of-way required in very select area but the majority of the corridor does not require right of way along either side of the existing facility. The western terminus of the alternatives is just west of the CR 30A intersection. Heading eastward, for 350' from the center of the intersection, the alternatives follow the existing tangent and will utilize the existing pavement width. The alternatives continue to follow the existing alignment which curves slightly to the south for approximately 0.20 miles followed by a tangent section that is roughly 500 feet then a slight curve to the north for 0.20 miles. The alternatives then continue on the existing tangent for nearly 0.93 miles followed by a slight curve to the north for about 0.10 miles then a tangent for almost 330 feet next a slight curve to the south for about 0.01 miles. Continuing on the existing tangent for 1.71 miles, the alternatives heads eastward into a larger curve to the south for a distance of 0.66 miles. The alternatives then continue on the existing tangent for nearly 3.30 miles in the south easterly direction followed by a curve to the north for a distance of 0.57

miles then a tangent for 1.93 miles followed by an S-curve with each curve being a distance of 0.12 miles for a total S-curve length of 0.24 miles. Continuing eastward, a 0.26 mile target carries the alternative over Peach Creek and to a significant curve to the south for 1.1 miles. This is followed by a short tangent of 0.20 miles and another curve to the south for 0.34 miles. The alternative continues on the existing tangent for 1.64 miles in the southeasterly direction, followed by a curve to the south for 0.48 miles then a long tangent for 4.0 miles. Having entered into the Phillip Inlet Beach area, the alternatives continue with a curve to the north for 0.41 miles into a tangent for 0.35 miles followed by another curve to the north for 0.32 miles. The alternatives are brought to the eastern termini on a 0.29 mile tangent, ending west of the Phillip Inlet Bridge.

3.2.3 Mainline Alternative 1 and Alternative 2

The difference between the two mainline build alternatives is in the application of the proposed typical sections. Build Alternative 1 will utilize the Urban Typical from west of CR 30A to the Publix at South Walton Entrance and from Redbud Lane to the eastern project limit. The suburban typical will be utilized from Publix at South Walton Entrance to Old Blue Mountain Rd/CR 83 and from McDavis Blvd to Redbud Lane. The rural typical will be utilized from Old Blue Mountain Rd/CR 83 to McDavis Blvd.

Another way to describe the Alternative 1 is beginning from the western termini to the eastern termini. From west of CR 30A to the Publix at South Walton Entrance and urban typical section will be applied, followed by a suburban typical from Publix at South Walton Entrance to Old Blue Mountain Rd/CR 83 then a rural typical from Old Blue Mountain Rd/CR 83 to McDavis Blvd followed by a suburban typical from McDavis Blvd to Redbud Lane and finally an urban typical section from Redbud Lane to the eastern project limit.

Like Build Alternative 1, Build Alternative 2 will utilize the Urban Typical from west of CR 30A to the Publix at South Walton Entrance and from Redbud Lane to the eastern project limit. However, the limits of the suburban and rural typical differ between Build Alternative 1 and Build Alternative 2. The suburban typical will be utilized from Publix at South Walton Entrance to 0.5 miles east of the Publix at South Walton Entrance and from 1.5 miles west of Watersound Parkway to Redbud Lane. The rural typical section will be utilized from 0.5 miles east of the Publix at South Walton Entrance to 1.5 miles west of Watersound Parkway.

Another way to describe the Alternative 2 is beginning from the western termini to the eastern termini. From west of CR 30A to the Publix at South Walton Entrance an urban typical section will be applied, followed by a suburban typical from Publix at South Walton Entrance to 0.5 miles west of the Publix at South Walton Entrance then a rural typical from

0.5 miles west of the Publix at South Walton Entrance to 1.5 miles west of Watersound Parkway followed by a suburban typical from 1.5 miles west of Watersound Parkway to Redbud Lane and finally an urban typical section from Redbud Lane to the eastern project limit.

3.3 PERMIT AGENCY COORDINATION

3.3.1 Northwest Florida Water Management District (NWFWMD)

The project will be permitted through the NWFWMD. An individual Environmental Resource Permit (*ERP*) will be required for this project.

3.3.1.1 Water Quality

For dry retention ponds or linear swales with on-line retention, retention of the runoff from one inch of rainfall over the contributing area with a minimum required volume of one-half inch of runoff from the contributing area is required. Note the previously permitted calculations provided for one-half inch of runoff from the contributing area.

For wet detention ponds, treatment volume is required for one inch of runoff from the contributing area.

Most of the project limits are within PWWMA, which is classified as Other OFW, and Lake Powell and Phillips Inlet are considered a special OFW. WBID #881, Direct Runoff to Bay, is impaired for nutrients. To comply with OFW criteria and provide presumptive criteria, SMF sizing will include an additional 50% treatment volume. Note the previously permitted calculations did not include any additional treatment volume.

3.3.1.2 Water Quantity

The project lies within open watersheds and is subject to rate control criteria. The peak rate of post-development discharge will not exceed the pre-development peak rate of runoff from the 25-year/24-hour storm event. Previously permitted calculations relied on a rainfall amount of 11.1 inches. The National Oceanic and Atmospheric Administration (*NOAA*) Point Precipitation Frequency Estimates determines the 25-year/24-hour rainfall amount to be 10.8-inches (refer to Appendix D). To provide a conservative estimate, the previous permitted amount of 11.1 inches will be utilized.

3.4 WATERSS INITIAL STAKEHOLDER MEETING

An initial stakeholder meeting (formerly known as the Environmental Look Around (*ELA*)) was held on September 18, 2023 as part of the first step in the WATERSS process. This is a process used by FDOT to proactively look for opportunities for joint stormwater management projects with agencies or stakeholders. The WATERSS process provides an opportunity for assessing and utilizing options for FDOT to partner in innovative, cooperative regional stormwater management projects.

At the WATERSS meeting, the County mentioned a regional stormwater facility located within the Old Town of Santa Rosa that is currently under design by the County and their private consultants. There was subsequent additional discussion with the County and its consultants regarding potential coordination with this project. There is currently no additional capacity being included for a widened SR 30 typical section. An action item of this discussion was for The Balmoral Group to review how much contributing area from SR 30 could feasibly be routed to this regional facility. To date, this information has not been received for review. Further discussion between FDOT and the County would be required to discuss receiving credits for an ultimate SR 30 typical section.

Preliminary coordination with the Florida Forestry Service was initiated regarding their knowledge of any alternative management opportunities if use of off-site ponds is necessary to meet required stormwater needs within the limits of the wildlife management areas. Subsequent correspondence with Florida Department of Agriculture and Consumer Services (*FDACS*) indicated further discussion would be required if off-site ponds were deemed necessary in order to determine if alternative solutions would be available.

Refer to correspondence included in Appendix D.

4.0 EXISTING DRAINAGE

Existing drainage patterns and infrastructure were evaluated based on existing plans, permits, and field review. As-built and construction plans along with permit data and drainage calculations were reviewed for the three permitted segments of SR 30 along the project corridor:

1. *SR 30 (US 98) from CR 30A to East of SR 83 (US 3310) (FPID 220642-1)*
2. *SR 30 (US 98) from East of SR 83 (US 331) to East Side of Peach Creek (FPID 220643-1)*
3. *SR 30 (US 98) from East Side of Peach Creek to Bay County Line (FPID 220644-1)*

Additional information was found within the resurfacing plans from FPID 443650-1-52-01 - SR 30 (US 98) from East of Village RD to East of SR 83 (US 331) Construction Plans.

Overall, the entire corridor has 354 linear treatment swales and seven existing ponds. The seven existing wet detention and dry retention ponds were designed to accommodate future improvements and widening of the SR 30 according to their respective drainage reports. Existing drainage information is presented according to the three existing permitted segments, and utilized information is included in Appendix C.

4.1 SR 30 FROM CR 30A TO EAST OF SR 83 (FPID 220642-1)

This section of SR 30 begins east of CR 30A and terminates east of SR 83 (US 331) and includes nineteen primary drainage sub-basins and utilizes five (5) ponds in the urban area and fifty-four (54) dry retention ditches in the rural area for the treatment and attenuation of stormwater runoff. The location of these facilities is shown on Figure 7A and Figure 7B in Appendix A.

4.1.1 Urban Area

Within the urban area (from Bishop Tolbert Road to Veterans Road), runoff is collected by curb and gutter, conveyed to curb inlets and routed to one of five wet detention ponds. The wet detention ponds were designed to treat 1-inch of runoff from the contributing drainage area and meet attenuation criteria for the critical duration storm (which considered the 1-hour through 10-day event for frequencies from 2-year through 100-year). Each pond and outfall structure were designed for an ultimate 6-lane section which included an additional

3.6 meter (11.81 feet) lane towards the median in each direction. See Table 4-1 for Existing Pond information and Appendix C for excerpts from previous permits and studies.

Table 4-1: Existing Pond Summary (FPID 220642-1)

Pond	SMF Type	Basin Area (AC)*	Impervious Area (AC)	Outfall	Weir Elevation (FT NAVD)	Treatment Volume (AC-FT)	NWL (FT NAVD)
Pond 1	Wet	4.17	3.27	Existing Canal	12.85	0.46	11.75
Pond 2	Wet	3.69	2.66	Existing Canal	14.75	0.50	14.05
Pond 3	Wet	3.15	2.44	Existing Ditch	13.10	0.35	12.08
Pond 4/5	Wet	7.53	5.69	Existing Ditch	15.03	0.84	14.05
Pond 6	Wet	4.73	3.57	Existing Ditch	16.07	0.55	15.19

**Does not include pond area, and included 6-lanes of pavement*

4.1.2 Rural Area

Within the rural section (from CR 30A to Bishop Tolbert Road and from Veterans Road to east of US 331), runoff drains to treatment swales located in the median where the roadway is in superelevation and between the existing roadway and off-site conveyance ditches. The existing linear swales have outfall structures that discharge to the off-site ditches and provide treatment for 0.5-inches of runoff from the contributing area. These fifty-four swales were designed to comply with critical duration analysis similar to the wet detention ponds. From review of the permitted calculations, the impervious area appears to only account for the existing 4-lane condition and does not include capacity for an ultimate 6-lane section.

4.2 SR 30 FROM EAST OF SR 83 TO EAST OF PEACH CREEK (FPID 220643-1)

This section of SR 30 begins east of SR 83 (US 331) and terminates east of the Peach Creek crossing and utilizes 114 retention swales to provide treatment and attenuation. Treatment was provided for 0.5-inches over the contributing area. From review of the treatment calculations, the proposed condition for half of the typical section includes 8.7 meters (28.5 feet) of pavement. This accounts for two lanes of pavement and an outside shoulder for the

existing 4-lane section, but does not include capacity for an ultimate 6-lane section. The location of these linear pond facilities is shown on Figure 7B and Figure 7C in Appendix A.

4.3 SR 30 FROM EAST OF PEACH CREEK TO BAY COUNTY LINE (FPID 220644-1)

This section of SR 30 begins east of Peach Creek crossing and terminates at the Bay County line utilizing 186 dry retention ditches in the rural area and two (2) dry retention ponds in the urban area for the treatment and attenuation of stormwater runoff. The location of these facilities is shown on Figure 7C, Figure7D, and Figure 7E in Appendix A.

4.3.1 Rural Area

Within the rural section (from east of the Peach Creek crossing to West Shore Drive), runoff drains to 186 treatment swales located in the median where the roadway is in superelevation and between the existing roadway and off-site conveyance ditches. The existing linear swales have outfall structures that discharge to the off-site ditches and provide treatment for 0.5-inches of runoff from the contributing area. These 186 swales were designed to comply with critical duration analysis. The permitted calculations discuss potential construction of a 6-lane section. To accommodate the ultimate 6-lane section, it will be necessary to regrade the retention ditches to 1:6 side slopes to provide additional storage. There may also be a need for additional ditch blocks or other modifications.

4.3.2 Urban Area

Within the urban area (from West Shore Drive to Bay County Line), runoff is collected by curb and gutter and conveyed to curb inlets and routed to one of two dry retention ponds. The dry detention ponds were designed to treat 0.5-inches of runoff from the contributing drainage area and meet attenuation criteria for the critical duration storm (which considered the 1-hour through 10-day event for the 100-year frequency). Each pond and its associated outfall structure and contributing storm drain system were designed for an ultimate 6-lane section. See Table 4-2 for existing pond information and Appendix C for excerpts from previous permits and studies.

Table 4-2: Existing Pond Summary (FPID 220644-1)

Pond	SMF Type	Basin Area (AC)*	Outfall	Impervious Area Treated (AC)	Orifice Elevation (FT NAVD)	Pond Bottom Elevation (FT NAVD)
Pond 1	Dry	6.57	Existing Ditch	4.56	24.28	23.88
Pond 2	Dry	13.75	Existing Ditch	9.76	7.74	7.15

**Does not include pond area, and includes 6-lanes of pavement*

5.0 STORMWATER MANAGEMENT FACILITY (SMF) SIZING ANALYSIS

5.1 PROPOSED DRAINAGE BASINS

The anticipated proposed improvements of SR 30 will include constructing additional impervious area to accommodate one additional lane in each direction. Proposed basins are anticipated to mimic existing basins with the established outfall locations remaining unchanged.

In the proposed condition, the limits of the urban area are anticipated to remain unchanged from the existing condition in both Alternatives. Alternative 1 includes use of a suburban typical from Mc Davis Boulevard to Redbud where the typical section transitions to the urban typical section. Alternative 2 includes use of a rural typical section within this segment.

The proposed condition continues to maintain a separate ditch system for off-site contributing area, which will continue to flow in a manner similar to the existing condition. By maintaining separate systems, only on-site contributing basins will be utilized to establish the required treatment volume. For existing basins with treatment, existing systems will be utilized and modified as necessary to accommodate additional runoff.

5.2 SMF SIZING

For the conceptual drainage analysis, review of the permitted calculations was performed for the existing wet detention ponds, dry retention ponds, and linear swales. Calculations were performed to determine the additional required volumes that would be needed for the proposed improvements. These calculations account for increases in impervious within the contributing basin, the additional 50% treatment volume, and impacts to the existing SMF storage (for the linear swales).

5.1.1 Existing Wet Detention Ponds

A review of the permitted impervious area compared to the proposed impervious area was performed for the existing wet detention ponds. The results found that for three existing ponds, Pond 1, Pond 3, and Pond 4/5, the permitted impervious area is greater than the proposed within the contributing area for these ponds. This means the permitted pond has sufficient treatment and attenuation capacity as constructed to accommodate the proposed

urban typical section. Pond 2 and Pond 6 have a slight increase in proposed impervious area compared to the permitted impervious area. Refer to Table 5-1 for the summary of impervious area comparison.

Table 5-1: Impervious Area (Permitted v. Proposed) for Existing Wet Detention Ponds

Pond	Total Impervious Area (Permitted) (ac)	Total Impervious Area (Proposed) (ac)	Net Impervious Area (ac)
Pond 1	3.27	2.82	**-0.45**
Pond 2	2.66	2.87	**0.21**
Pond 3	2.44	2.16	**-0.28**
Pond 4/5	5.69	5.66	**-0.03**
Pond 6	3.57	3.67	**0.10**

Further evaluation was performed on Pond 2 and Pond 6 since the proposed condition resulted in more impervious area than was previously permitted.

Based on the permitted weir elevation of Pond 2, sufficient treatment volume is provided with 0.50 ac-ft compared to the required treatment volume of 0.44 ac-ft with the proposed condition. The attenuation volume with the additional 0.21 acres of impervious was also confirmed to fit within the pond volume and still maintain the 1-foot of freeboard within the pond. No modifications are warranted to Pond 2 to accommodate the proposed 6 lane section.

The permitted weir elevation for Pond 6 is 15.68 feet NAVD (16.07 feet NGVD), which calculations reported as providing a treatment volume of 0.55 ac-ft. Replicating calculations found that the existing weir elevation provides 0.39 ac-ft of treatment volume. The difference is attributed to conversion between square meters and ac-ft. The required treatment volume for the proposed condition is 0.48 ac-ft. Conservatively, the weir elevation would need to be raised 0.08 feet if the replicated calculations are used. The attenuation volume with the additional 0.10 acres of impervious was also confirmed to fit within the pond volume and still maintain the 1-foot of freeboard within the pond. With design survey, it may be determined that the Pond 2 control structure may not require modification since the needed weir adjustment increase is estimated to be minimal. Refer to Appendix B for calculations.

The above modifications are required to meet proposed improvements as long as the additional 50% treatment volume criteria is not applied. If the additional 50% treatment

volume is required due to the ultimate discharge to the Choctawhatchee Bay and/or to provide presumptive criteria for the nutrient impaired WBID #881, all ponds will need to be modified to accommodate the additional volumes. Table 5-2 shows the required volumes that would be needed to meet the additional 50% treatment volume for the proposed improvements.

Table 5-2: Summary of Additional Required Volume for Existing Wet Detention Ponds

Pond	Permitted Provided Treatment Volume (ac-ft)	Proposed Treatment Volume (ac-ft)	Additional 50% Treatment Volume (ac-ft)	Additional Attenuation Volume (ac-ft)	Total Required Additional Volume (ac-ft)
Pond 1	0.46	0.40	0.20	--	0.14
Pond 2	0.50	0.44	0.22	0.21	0.37
Pond 3	0.35	0.30	0.15	--	0.11
Pond 4/5	0.84	0.73	0.36	--	0.25
Pond 6	0.55	0.48	0.24	0.09	0.26

5.1.2 Existing Dry Retention Ponds

From review of the available FPID 220644-1 Project Drainage Report Volume I (provided in Appendix C), contributing basin calculations, existing stage area data for the ponds, and treatment volume calculations were not available. Based on the permitted narrative, the storm drain system was sized for an ultimate 6-lane typical section. Since this segment was permitted in a similar timeframe as FPID 220642-1, it is assumed the existing dry retention ponds will accommodate the 6-lane typical section similar to the existing wet ponds. There was no discussion of the additional 50% OFW criteria within the permitted drainage report. This criterion will also need to be evaluated during design along with any control structure modifications to accommodate the proposed improvements.

5.1.3 Existing Linear Ponds

The existing linear ponds were sized to provide treatment for 0.5-inches of runoff over the contributing area. Additional right-of-way is not required for the majority of the mainline roadway improvements and thus, the contributing basin area and the required treatment volume are not expected to change significantly. The proposed roadway widening is anticipated to impact portions of the linear swales. In most of the tangent sections, the

proposed widening will occur within the median, where existing linear treatment swales are not present; and therefore, there are no impacts to the treatment capacity of the existing linear swales. Within the superelevated portions, the inside widening will impact the median linear swales and some impacts are also anticipated to the outside linear swales, primarily occurring within the existing horizontal curves. The proposed 12-ft shared use path along the right side of the alignment will also impact several linear swales.

Evaluation of the linear swales was performed for each FPID segment to determine additional required volume due to attenuation, impacts to existing swale storage, and additional 50% treatment volume. Each linear swale contributing basin was derived from the permitted calculations, and a pre-development and post-development curve number was estimated for each. The increase in attenuation volume was estimated using the Soil Conservation Service (*SCS*) method. Some sections had more available data than others. Previously permitted impervious area and pervious area for each contributing basin was available for FPID 220642-1 while assumptions from the typical sections were utilized for FPID 220643-1 and FPID 220644-1. Loss of existing swale storage was anticipated for all median linear swales. Alternative 1 was reviewed against existing plans to determine where outside widening or the proposed shared use path would also impact existing swale storage. An additional 50% of treatment volume storage was assumed to be required for all linear swales. A summary of the required additional volumes is shown in Table 5-3. Supporting calculations are provided in Appendix B (pages 10 through 19).

Table 5-3: Summary of Additional Required Volume for Existing Linear Swales

Segment FPID	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
220642-1	14.96	1.39	2.11	18.46
220643-1	7.78	0.00	1.30	9.08
220644-1	1.53	1.65	1.07	4.25
Total	**24.27**	**3.04**	**4.47**	**31.78**

The existing linear swales will require modifications. Existing linear swales within FPID 220642-1 utilized 1:8 front slopes, and all linear swales within FPID 220643-1 and FPID 220644-1 utilized 1:8 front and back slopes. Utilizing clear zone criteria, these slopes can be

steepened to 1:6 side slopes. Other modifications include additional ditch blocks to provide more storage within the ditches with more gradient as well as raising ditch blocks and weir elevations where sufficient freeboard is available. Since these modifications rely on detailed design data, they can be further vetted in the design phase.

Another option to increase storage within the right-of-way is to evaluate installation of closed off-site systems. By piping off-site contributing areas, the on-site linear swales can be expanded significantly (in some cases, widened by 30 feet). The separate systems still allow for treatment volume to be governed by the on-site contributing area; however, the available right-of-way is utilized for on-site treatment rather than off-site conveyance. Since the contributing basin would be larger with the swale expansion, a review of whether the 1-inch of rainfall over the contributing area would govern treatment volume criteria will need to be analyzed. Also, floodplain impacts would need to be evaluated since several of these off-site areas are hydraulically connected to FEMA floodplains. A conceptual evaluation of this has been performed in Section 6.0.

5.1.4 Interchange Ponds

Additional right-of-way is anticipated with all US 331 interchange concepts under consideration. Treatment and attenuation of additional impervious area is anticipated to be accommodated within the infield areas or outside linear swales within the interchange footprint acquired. Stormwater management for the interchange concepts is not a controlling factor in the evaluation of these concepts as acquiring right-of-way will not be performed solely for stormwater management purposes.

6.0 FLOODPLAIN ANALYSIS

As shown in Figures 2A-2B, FEMA Maps in Appendix A, there are several FEMA floodplain encroachments within the right-of-way.

Within the NWFWMD Applicant's Handbook II, Section 3.4, a system shall not cause a net reduction in flood storage within a 10-year floodplain. Per the FDOT Drainage Manual, all designs with floodplain encroachments should include an evaluation of the inherent flood-related risks to the highway facility and to the surrounding property. For the purposes of this analysis, the amount of floodplain impacts associated with the proposed improvements was estimated using best available information, which included existing plans/permits, field reconnaissance, and LiDAR. No detailed modeling was performed.

For Zone AE floodplains, the BFE established by FEMA was utilized for the 100-year elevation. For Zone A floodplains, the following information was referenced to estimate the 100-year elevation and ultimately, the flood data box data governed:

- *Flood Data Box used to determine 100-year Upstream Stage of Cross Drain (FPID 220642-1, FPID 220643-1, and FPID 220644-1)*
- *Observed stain line on cross drain endwall from field visit using DEM to assume Cross Drain invert elevation*
- *Overlay the 100-year Zone A FEMA shape on the DEM and estimate average elevation along boundary*

A GIS analysis was performed to inundate the floodplain area at the estimated 100-year elevation within the area of the Zone A FEMA floodplain shape within the existing SR 30 right-of-way. Assuming the proposed improvements impacted the full extent of the right-of-way, which accounts for converting off-site ditches to closed conveyance systems, the inundation area for each floodplain is equivalent to the anticipated floodplain impact area. Since the terrain is mostly flat in this area with the floodplains connecting large wetland sloughs, the floodplain depth was assumed to be one-foot for all encountered floodplains. Using the floodplain impact area and estimated floodplain depth, an estimated impact volume was calculated. The total impact volume for the project is estimated to be 68.58 ac-ft. Refer to Table 6-1 for a summary of the results. These correspond to Figure B1, Figure B2, Figure B3, and Figure B4 in Appendix B.

Table 6-1: Summary of Estimated Floodplain Impacts

FEMA Floodplain ID	FEMA Flood Zone	BFE Estimate (ft NAVD)	BFE Source*	Estimated Floodplain Depth (ft)	Area of Inundation at Est. BFE (ac)	Estimated Impact Volume (ac-ft)
1	A	15.6	FDB	1.0	8.55	8.55
2	A	16.4	FDB	1.0	17.04	17.04
3	A	19.0	FDB	1.0	9.06	9.06
4	A	21.3	FDB	1.0	1.46	1.46
5	A	22.4	FDB	1.0	1.25	1.25
6	A	24.5	FDB	1.0	1.16	1.16
7	A	25.5	FDB	1.0	5.66	5.66
8	A	23.4	FDB	1.0	1.93	1.93
9	A	16.5	FDB	1.0	0.01	0.01
10	A	17.3	FDB	1.0	0.56	0.56
11	A	16.0	FDB	1.0	0.04	0.04
12	AE	7.0	BFE	1.0	0.19	0.19
13	A	37.7	FDB	1.0	3.53	3.53
14	A	39.3	FDB	1.0	2.71	2.71
15	A	38.5	FDB	1.0	2.11	2.11
16	A	40.0	FDB	1.0	3.32	3.32
17	A	36.0	FDB	1.0	1.29	1.29
18	A	38.5	FDB	1.0	0.42	0.42
19	A	41.0	FDB	1.0	1.81	1.81
20	A	34.5	FDB	1.0	1.87	1.87
21	AE	10.0	BFE	1.0	0.23	0.23
				Total Impact Volume		**64.23**

**BFE Source*
FDB - Flood Data Box 100-year stage
BFE - Zone AE with an established BFE

Although Table 6-1 represents a significant amount of impacts, it should be noted that most of the surrounding property are undeveloped state lands and wetland sloughs. Very few have upstream existing structures that would be susceptible to impacts. Risk to off-site properties as a result of the loss of floodplain storage is minimal in the state lands areas. Also, the floodplain impact is based on the best available data from a desktop analysis. During design, hydrologic modeling will be performed to better estimate 100-year elevations. Geotechnical information and design survey will be necessary for this evaluation.

7.0 CONCLUSION

In summary, this conceptual drainage report provides the required additional volumes for proposed SMFs for each basin along the study area.

Existing wet detention pond sizes can handle the proposed roadway improvements with control structure modifications; however, additional volume would be needed in all five existing ponds to accommodate the additional 50% treatment volume.

Due to the lack of information for the two existing dry retention ponds, it is assumed similar minor improvements (i.e. control structure modifications) may be needed to accommodate the proposed roadway improvements; however, more significant capacity would be required to meet the additional 50% treatment volume.

For the existing linear swales, significant additional capacity is required to accommodate the proposed improvements, the loss of existing storage and the additional 50% treatment volume. Modifications to existing swale side slopes and ditch block weir elevations could be proposed to increase storage within existing facilities. However, more substantial storage could be obtained by converting offsite conveyance to a closed system and expanding the width of the on-site swales. Where feasible, swale modifications should balance the need for additional storage with opportunities for landscaping, including consideration of flatter slopes and curvilinear backslopes. As part of the FDOT Highway Beautification Policy and aesthetic considerations as part of the Drainage Manual and Drainage Design Guide, the aesthetics of the pond will be evaluated among the other factors during the site selection process. In areas where a closed system is proposed to convey off-site flow, additional opportunities for storage and landscaping may be achieved.

A conceptual floodplain impact analysis was performed to estimate the volume of floodplain impacts associated with filling in the FEMA floodplain within the entire SR 30 right-of-way.

Because a majority of the corridor is constrained by PWWMA and utilizes existing linear swales, there is a balance between providing SMFs that meet the current criteria to further protect environmentally sensitive areas and requiring expanded SMFs that result in additional right-of-way. It is recommended that further analysis is performed in design using design level information (survey and geotech) to determine what linear swale modifications can be performed within the existing right-of-way. If treatment and attenuation criteria cannot be satisfied, further discussions with Florida Forestry may be warranted to explore alternative stormwater management strategies such as handling treatment within the right-

of-way and allowing the state lands to receive an increase in peak discharge. This would need to be evaluated in conjunction with a more accurate floodplain analysis using hydrologic modeling to demonstrate the anticipated increase in stage as a result of floodplain impacts and additional flow.

8.0 REFERENCES

1. Federal Emergency Management Agency (October 05, 2017, Revised December 30, 2020). *Flood Insurance Rate Maps, Walton County, Florida and incorporated Areas*.

2. Florida Department of Transportation (January 2024). *Design Manual.*

3. Florida Department of Transportation (January 2024). *Drainage Manual*.

4. Florida Department of Transportation (January 2024). *FDOT Standard Plans for Road Construction.*

5. Northwest Florida Water Management District (NWFWMD). *Applicants Handbook Design & Performance Standards (2018)*.

Appendix A

Maps and Figures





Legend

Project Limits

FIGURE 1

Project Location Map

Sources:
Esri, DigitalGlobe,
GeoEye,
FDOT, and the
GIS User Community

PD&E Study for SR 30
(US 98) Near San Desin
from W CR 30A to W
of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us

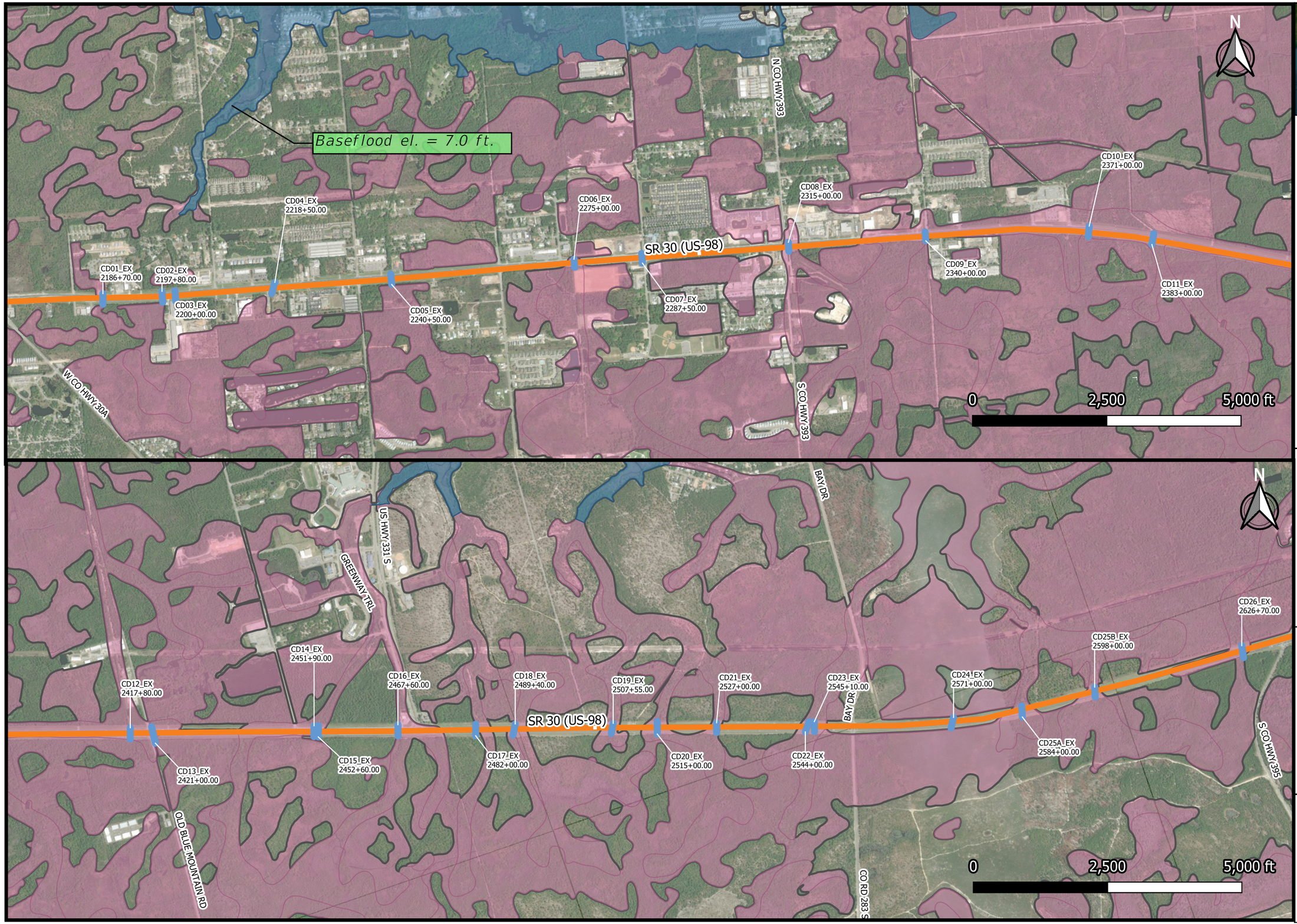


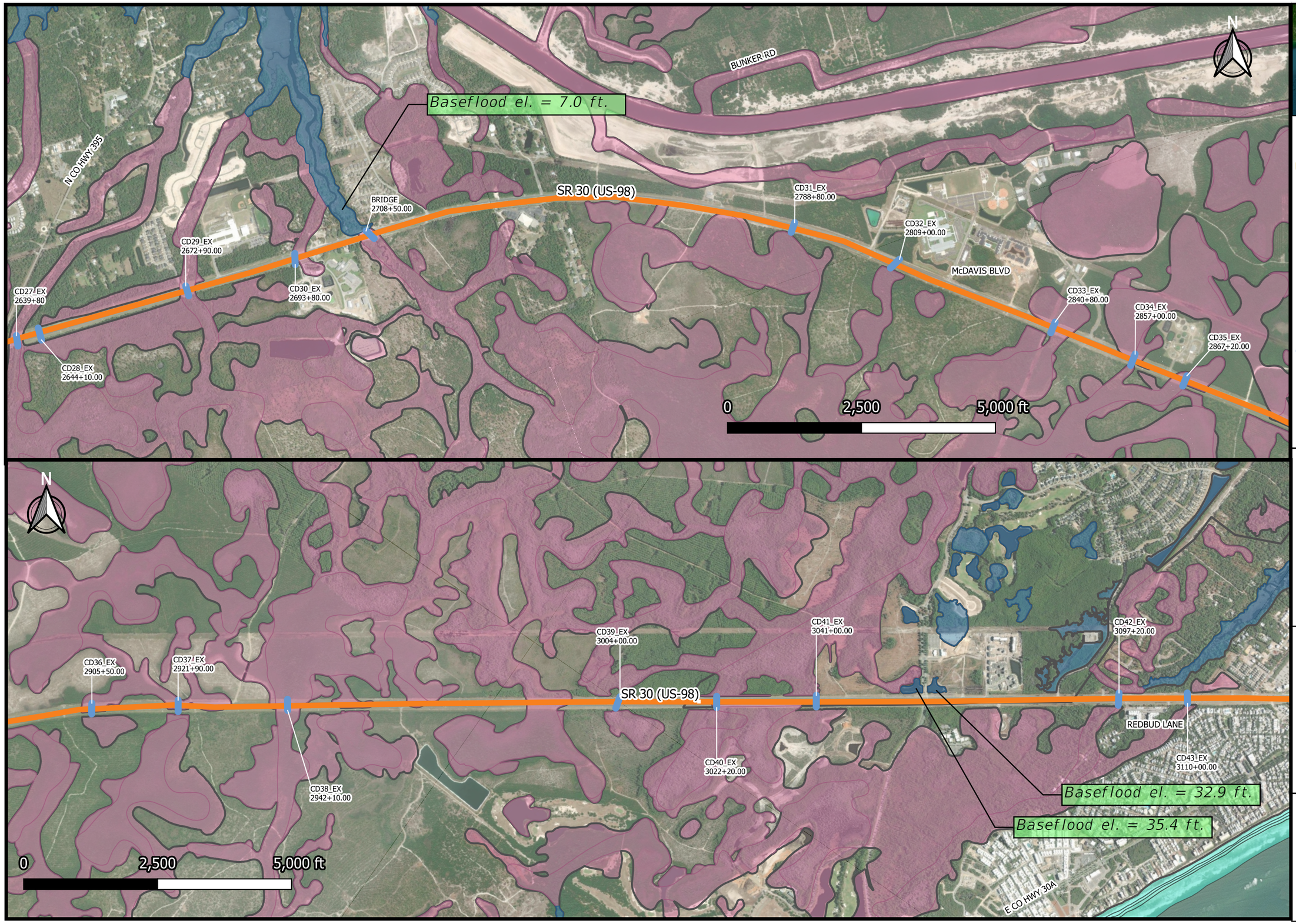
FIGURE 2A
FEMA Flood
Insurance Rate Maps

Sources:
FEMA FIS Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30
(US 98) Near San Desin
from W CR 30A to W
of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us





Legend

- Project Limits
- FEMA Flood Zones
  - A
  - AE
  - X
- Existing CD

FIGURE 2B

FEMA Flood
Insurance Rate Maps

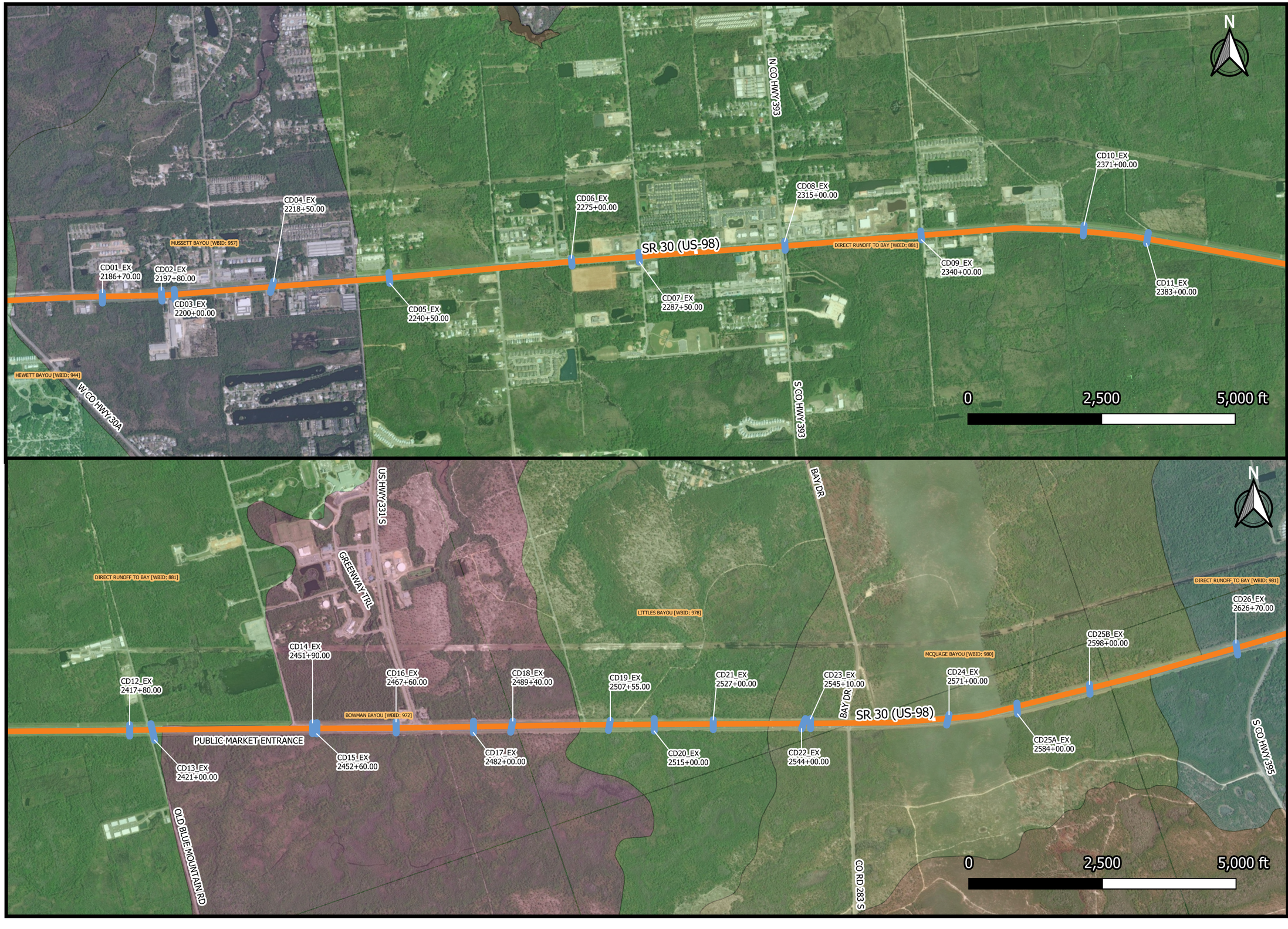
Sources:
FEMA FIS Walton County
Effective: 10/05/2017
Revised: 12/30/2020

FDOT

PD&E Study for SR 30
(US 98) Near San Desin
from W CR 30A to W
of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us





Legend

- Project Limits
- Existing CD

FIGURE 3A

WBID Map

Sources:
FDOT, FDEP (BMAP- April 2019,
Impaired WBIDs- October 2019,
WBIDs- July 2018))

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us





Legend

- Project Limits
- Existing CD

FIGURE 3A

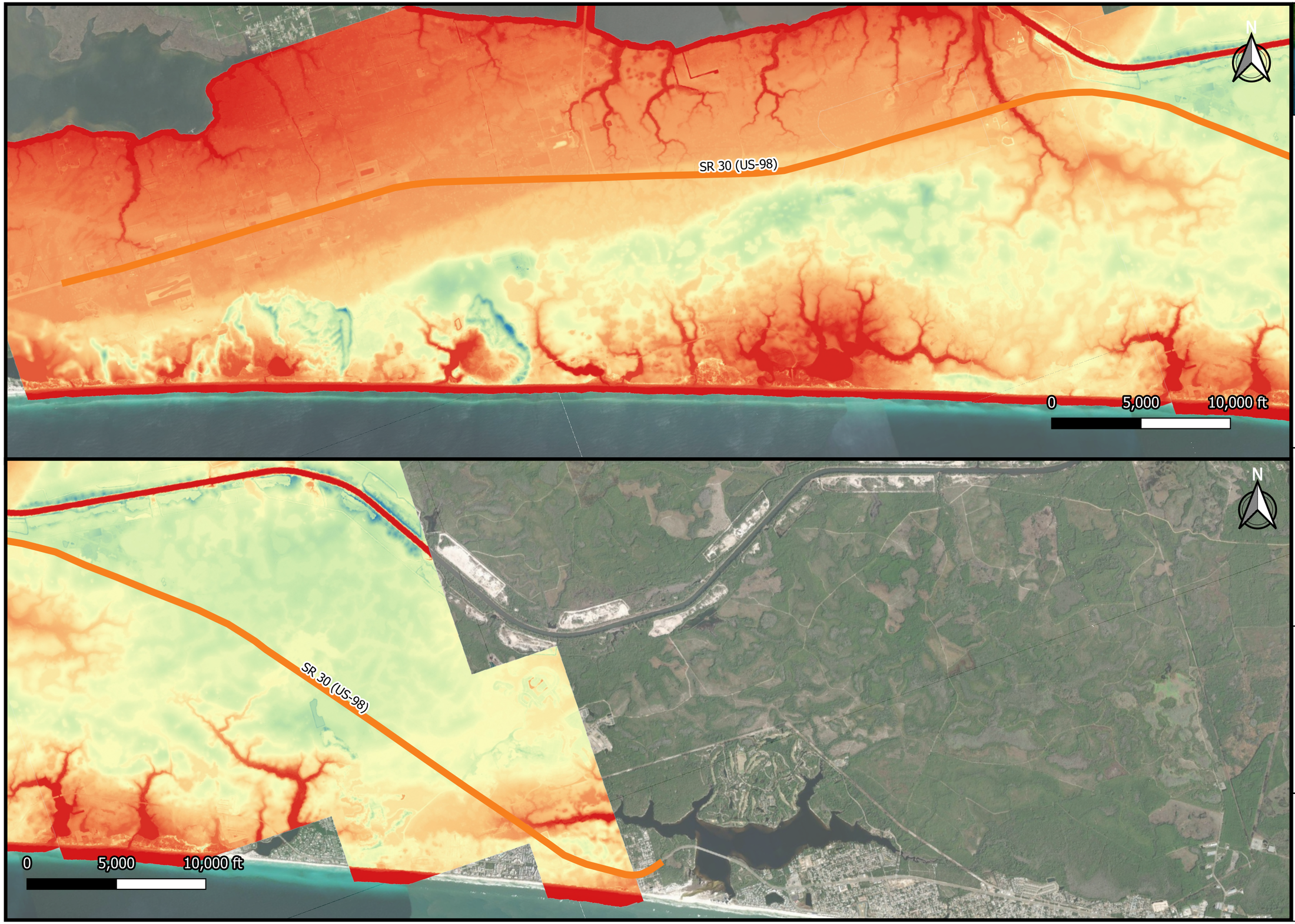
WBID Map

Sources:
FDOT, FDEP (BMAP- April 2019,
Impaired WBIDs- October 2019,
WBIDs- July 2018))

PD&E Study for SR 30
(US 98) Near San Desin
from W CR 30A to W
of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us





Legend

Project Limits

Elevation

- -1.3 ft.
- 10.2 ft.
- 21.7 ft.
- 33.2 ft.
- 44.7 ft.
- 56.2 ft.
- 67.7 ft.

FIGURE 4

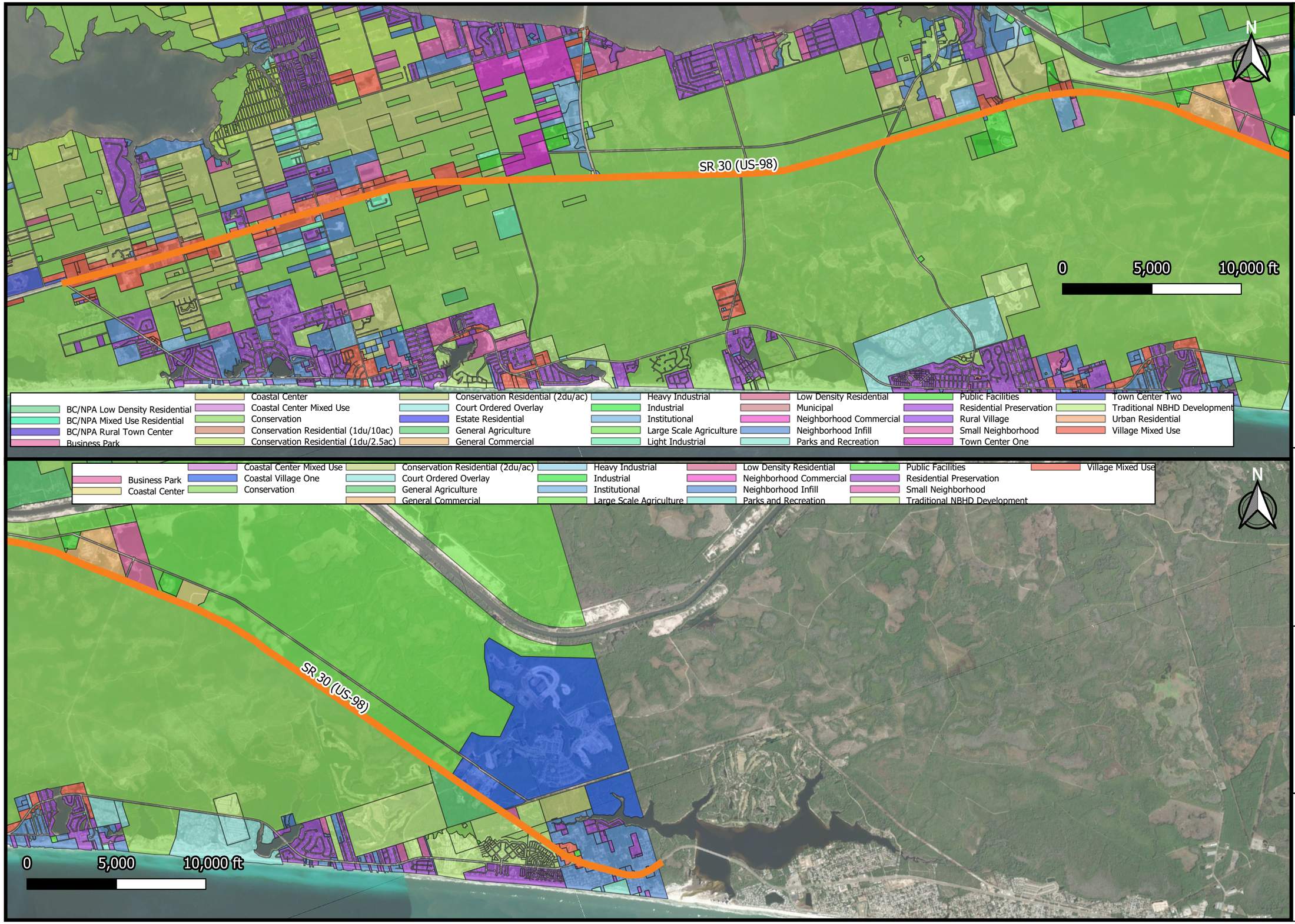
Topographic Map
(Digital Elevation Model)

Sources:
USGS Hurricane
Michael 2020 DEM
FL 2017 LWR DEM

PD&E Study for SR 30
(US 98) Near San Desin
from W CR 30A to W
of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us





Legend

Project Limits

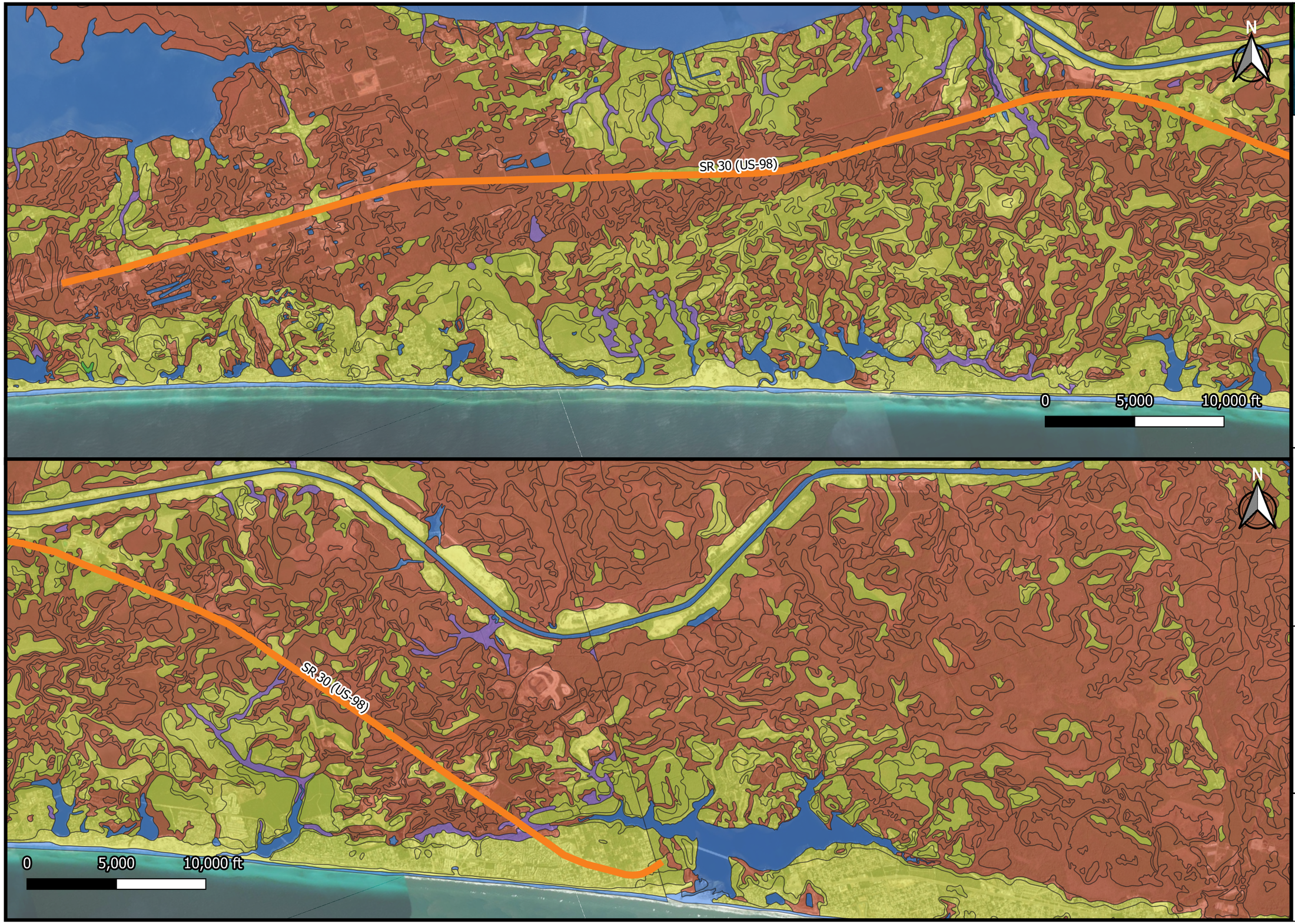
FIGURE 5
Land Cover Map

Sources:
Esri, DigitialGlobe, GeoEye, FDOT, and Walton County Future Land Use

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us





Legend

Project Limits

Hydro. Group

- A
- A/D
- B/D
- C/D

FIGURE 6

Soils Maps

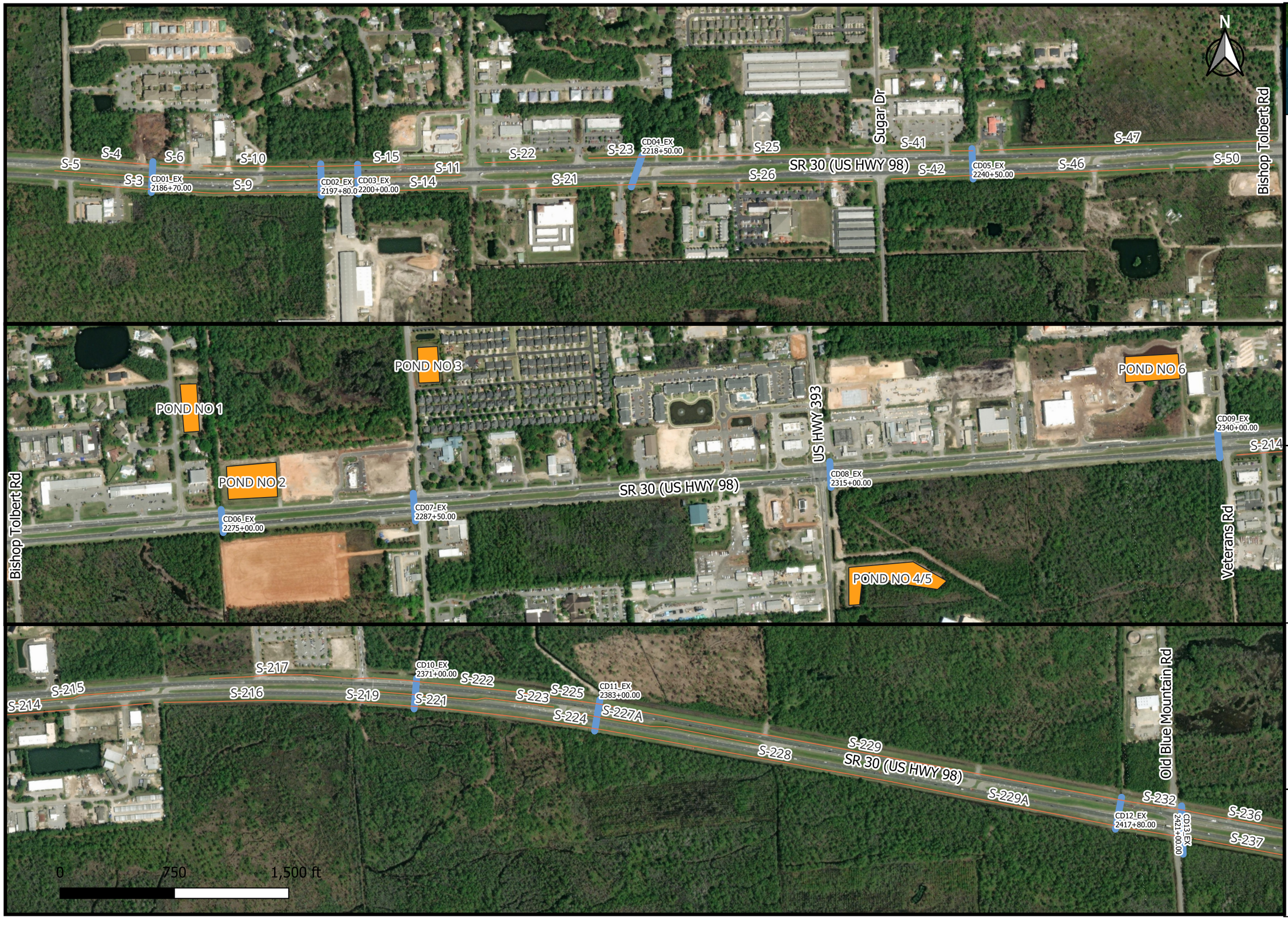
Sources:
NRCS soils, Esri, DigitalGlobe, GeoEye, FDOT, and the GIS User Community

FDOT

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge

FDOT District 3
Walton County
(FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Avenue
Winter Park, FL 32789
Phone: (407) 629-2185
www.balmoralgroup.us



Legend

- ExistingPonds
- ExistingSwales
- Existing CD

Figure 7A
Existing SMFs

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us





Legend

- ExistingPonds
- ExistingSwales
- Existing CD

Figure 7B
Existing SMFs

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us





Legend

- ExistingPonds
- ExistingSwales
- Existing CD

Figure 7C
Existing SMFs

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us



Legend

Existing CD

Figure 7D
Existing SMFs

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us





Legend

- ExistingPonds
- ExistingSwales
- Existing CD

Figure 7E
Existing SMFs

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us

Appendix B

Pond Calculations

Wet Detention Pond Calculations

Project:	SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge	**Designer:**	JN	**Date:**	11/8/2023
FPID:	437179-1-22-01	**Reviewer:**	LCS	**Checked:**	12/19/2023
County:	Walton County, Florida				

Contributing Basin Calculations for Existing Wet Detention Ponds

Pond	Location		Length	Type of Typical Section	Total Impervious Area (Existing)*	Basin Area*	Proposed Impervious Width Total			Total Impervious Area (Proposed)	Net Impervious Area	1" over the Basin Area
	Begin (m)	End (m)	(m)		(ac)	(ac)	Travel Lanes	Shoulders/ C&G	Sidewalks / Bikes / Curbs	(ac)	(ac)	(ac-ft)
			(ft)				(ft)	(ft)	(ft)			
Pond 1 (Permitted)	1146+51	1150+50	399	Urban	3.27	4.81	--	--	--	--	**-0.45**	**0.40**
Pond 1 (Post)			1,309	Urban	--	--	72.00	4.00	18	2.82		
Pond 2 (Permitted)	1150+50	1154+55	405	Urban	2.66	5.25	--	--	--	--	**0.21**	**0.44**
Pond 2(Post)			1,328	Urban	--	--	72.00	4.00	18	2.87		
Pond 3 (Permitted)	154+55	157+60	305	Urban	2.44	3.64	--	--	--	--	**-0.28**	**0.30**
Pond 3 (Post)			1,000	Urban	--	--	72.00	4.00	18	2.16		
Pond 4/5 (Permitted)	1157+60	1165+60	800	Urban	5.69	8.73	--	--	--	--	**-0.03**	**0.73**
Pond 4/5 (Post)			2,624	Urban	--	--	72.00	4.00	18	5.66		
Pond 6 (Permitted)	1165+50	1170+68	518	Urban	3.57	5.73	--	--	--	--	**0.10**	**0.48**
Pond 6 (Post)			1,699	Urban	--	--	72.00	4.00	18	3.67		

*Values from Permitted Pond Calculations, includes Pond Area

Project: SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge

FPID: 437179-1-22-01 **Designer:** LCM **Date:** 12/19/2023

County: Walton County, Florida **Reviewer:** JN **Checked:** 12/19/2023

Rainfall: **11.1** inches (25-yr/24-hour)

Attenuation Calculations for Existing Wet Detention Ponds

	Existing				Proposed				Results	
Basin	**Area (ac)**	**Weighted CN**	**Runoff (in)**	**Runoff (ac-ft)**	**Area**	**Weighted CN**	**Runoff (in)**	**Runoff (ac-ft)**	**Required Attenuation Volume (ac-ft)**	**Classification**
Pond 2	5.25	95.9	10.60	4.64	5.25	99.8	11.08	4.85	0.21	Wet Pond
Pond 6	5.73	95.8	10.59	5.06	5.73	97.4	10.79	5.15	0.09	Wet Pond

Project:	SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge	**Designer:**	JN	**Date:**	11/8/2023
FPID:	437179-1-22-01	**Reviewer:**	LCS	**Checked:**	12/19/2023
County:	Walton County, Florida				

EXISTING POND 2

Total Impervious Area

Permitted impervious area =	2.66 Ac	
Additional impervious area =	0.21 Ac	
Total impervious area (6 Lanes) =	**2.87 Ac**	
Total Drainage area =	**5.25 Ac**	(includes Pond)

Required Treatment Volume

1.0" runoff from drainage area = 0.44 Ac-Ft

Required Treatment Volume =	**0.44**	**Ac-ft**

Existing Pond Stage Area

Elevation (ft NGVD)	Elevation (ft NAVD)	Depth (ft)	Area (sq.m)	Area (ac)	Inc. Volume (Ac-ft)	Treatment Vol (Ac-ft)	Remark
17.39	17.00	0.98	9,285	2.29	2.01	5.32	Top of Berm
16.40	16.01	0.33	7,215	1.78	0.58	3.31	
16.08	15.69	0.33	7,085	1.75	0.57	2.73	
15.75	15.36	0.33	6,856	1.69	0.56	2.17	
15.42	15.03	0.33	6,828	1.69	0.55	1.61	
15.09	14.70	0.33	6,701	1.66	0.54	1.07	
14.76	14.37	0.02	6,575	1.62	0.03	0.53	
14.75	14.36	0.31	6,569	1.62	0.50	0.50	Existing TV
14.44	14.05	0.00	6,450	1.59	0.00	0.00	NWL

Required Treatment Volume

Required Treatment Elevation =	**14.32**	**ft NAVD**
Required Treatment Volume =	**0.44**	**Ac-ft**
Required Attenuation Volume =	**0.21**	**Ac-ft**
Required Volume (TV + Attenuation) =	**0.65**	**Ac-ft**

Existing Treatment Volume

Existing Weir Elevation =	**14.36**	**ft NAVD**
Provided Treatment Volume =	**0.50**	**Ac-ft**

Top of Pond Elevation:	**17.00**	**ft NAVD**
Freeboard:	**1**	**ft**
Maximum Stage Elevation:	**16.00**	**ft NAVD**
Pond Volume Capacity @ Max. Stage:	**3.29**	**Ac-ft**

Project:	SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge	**Designer:**	JN	**Date:**	11/8/2023
FPID:	437179-1-22-01	**Reviewer:**	LCS	**Checked:**	12/19/2023
County:	Walton County, Florida				

EXISTING POND 6

Total Impervious Area

Permitted impervious area =	3.57 Ac	
Additional impervious area =	0.10 Ac	
Total impervious area (6 Lanes) =	**3.67 Ac**	
Total Drainage area =	**5.73 Ac**	(includes Pond)

Required Treatment Volume

1.0" runoff from drainage area = 0.48 Ac-Ft

Required Treatment Volume = 0.48 Ac-ft

Existing Pond Stage Area

Elevation (ft NGVD)	Elevation (ft NAVD)	Depth (ft)	Area (sq.m)	Area (ac)	Inc. Volume (Ac-ft)	Treatment Vol. (Ac-ft)	Remark
18.37	17.98	0.39	7,230	1.79	0.61	3.32	Top of Berm
17.98	17.59	0.43	5,278	1.30	0.55	2.72	
17.55	17.16	0.33	5,129	1.27	0.41	2.17	
17.22	16.83	0.33	5,015	1.24	0.40	1.76	
16.90	16.51	0.33	4,903	1.21	0.39	1.36	
16.57	16.18	0.33	4,791	1.18	0.38	0.96	
16.24	15.85	0.17	4,681	1.16	0.20	0.58	
16.07	15.68	0.16	4,624	1.14	0.18	0.38	Existing TV
15.91	15.52	0.33	4,571	1.13	0.20	0.20	
15.58	15.19	0.00	4,462	0.10	0.00	0.00	NWL

Required Treatment Volume

Required Treatment Elevation =	**15.76**	**ft NAVD**
Required Treatment Volume =	**0.48**	**Ac-ft**
Required Attenuation Volume =	**0.09**	**Ac-ft**
Required Volume (TV + Attenuation) =	**0.57**	**Ac-ft**

Existing Treatment Volume

Existing Weir Elevation =	**15.68**	**ft NAVD**
Provided Treatment Volume =	**0.38**	**Ac-ft**

Top of Pond Elevation:	**17.98**	**ft NAVD**
Freeboard:	**1**	**ft**
Maximum Stage Elevation:	**16.98**	**ft NAVD**
Pond Volume Capacity @ Max. Stage:	**1.94**	**Ac-ft**

Adjust Weir Elevation by : 0.08 FT

Existing wet retention pond provides sufficient excess for additional impervious area.

Project: SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge

FPID:	437179-1-22-01	**Designer:**	JN	**Date:**	11/8/2023
County:	Walton County, Florida	**Reviewer:**	LCS	**Checked:**	12/19/2023

Summary of Additional Required Volume for Existing Wet Detention Ponds

Pond	Permitted Provided Treatment Volume (ac-ft)	Proposed Treatment Volume (ac-ft)	Additional 50% Treatment Volume (ac-ft)	Additional Attenuation Volume (ac-ft)	Total Required Additional Volume (ac-ft)
Pond 1	0.46	0.40	0.20	--	0.14
Pond 2	0.50	0.44	0.22	0.21	0.37
Pond 3	0.35	0.30	0.15	--	0.11
Pond 4/5	0.84	0.73	0.36	--	0.25
Pond 6	0.55	0.48	0.24	0.09	0.26

Linear Swale Calculations

Project:	SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge				
FPID:	437179-1-22-01	**Designer:**	JN	**Date:**	11/22/2023
County:	Walton County, Florida	**Reviewer:**	LCS	**Checked:**	12/19/2023

Summary of Additional Required Volume for Existing Linear Swales

Segment FPID	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
220642-1	14.96	1.39	2.11	18.46
220643-1	7.78	0.00	1.30	9.08
220644-1	1.53	1.65	1.07	4.25
Total	**24.27**	**3.04**	**4.47**	**31.78**

220642-1

9,861 feet x

Project: SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge
FPID: 437179-1-22-01
County: Walton County, Florida
Permitted Section: CR 30A to US 331 (FPID 220642-1)
Assumptions:

Designer: JN **Date:** 11/22/2023
Reviewer: LCS **Checked:** 12/19/2023

Rainfall	11.1	inches
Existing Pavement Width	30.5	ft (One Direction)
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Matches Permitted Post-Development Calculations)

Permitted Information													SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Swale ID	Structure ID	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
L1	S-4	1122+25	1123+85	160	525	0.73	0.32	0.41	5.41	1.08	64.9	0.03	6.51	14.5	0.49	0.24	2.66	0.53	79.0	8.44	1.93	0.12		0.02	0.13
L2	S-6	1123+85	1124+80	95	312	0.44	0.24	0.2	4.04	0.81	71.2	0.02	7.39	14.5	0.34	0.10	1.75	0.35	85.1	9.24	1.85	0.07		0.01	0.08
L3	S-10	1124+80	1128+02	322	1056	1.51	0.75	0.76	4.64	0.93	68.3	0.07	6.98	14.5	1.10	0.41	2.19	0.44	82.0	8.85	1.86	0.23		0.04	0.27
L4	S-15	1128+02	1130+35	233	764	1.15	0.57	0.58	4.66	0.93	68.2	0.05	6.97	14.5	0.82	0.33	2.30	0.46	81.3	8.75	1.78	0.17		0.03	0.20
L5	S-22	1130+35	1132+52	217	712	1.29	0.77	0.52	3.48	0.70	74.2	0.06	7.80	14.5	1.01	0.28	1.76	0.35	85.0	9.24	1.44	0.15		0.03	0.18
L6	S-23	1132+52	1134+02	150	492	0.94	0.53	0.41	3.83	0.77	72.3	0.04	7.54	14.5	0.69	0.25	2.12	0.42	82.5	8.91	1.37	0.11		0.02	0.13
L7	S-25	1134+02	1138+48	446	1463	2.45	1.33	1.12	4.08	0.82	71	0.11	7.36	14.5	1.82	0.63	2.08	0.42	82.7	8.94	1.58	0.32		0.06	0.38
L8	S-41	1138+48	1139+82	134	440	0.87	0.59	0.28	2.66	0.53	79	0.04	8.44	14.5	0.74	0.13	1.25	0.25	88.9	9.73	1.29	0.09		0.02	0.11
L9	S-44	1139+82	1140+44	62	203	0.35	0.21	0.14	3.44	0.69	74.4	0.02	7.83	14.5	0.28	0.07	1.65	0.33	85.8	9.34	1.51	0.04		0.01	0.05
L10	S-47	1140+44	1146+50	606	1988	2.89	1.73	1.16	3.46	0.69	74.3	0.12	7.81	14.5	2.39	0.50	1.39	0.28	87.8	9.59	1.78	0.43		0.06	0.49
L12	S-217	1176+00	1178+62	262	860	2.76	1.22	1.54	5.36	1.07	65.1	0.12	6.53	14.5	1.51	1.25	4.05	0.81	71.2	7.39	0.85	0.20		0.06	0.26
L13	S-220A	1178+62	1179+75	113	371	0.32	0.06	0.26	9.96	1.99	50.1	0.01	4.35	14.5	0.18	0.14	3.74	0.75	72.8	7.61	3.26	0.09		0.01	0.09
L14	S-222	1179+75	1182+00	225	738	0.62	0.1	0.52	10.62	2.12	48.5	0.03	4.11	14.5	0.35	0.27	3.91	0.78	71.9	7.48	3.37	0.17		0.02	0.19
L15	S-225	1182+00	1183+70	170	558	0.45	0.08	0.37	10.20	2.04	49.5	0.02	4.26	14.5	0.27	0.18	3.55	0.71	73.8	7.75	3.48	0.13		0.01	0.14
L16	S-229	1183+70	1194+33	1063	3488	5.47	2.8	2.67	4.45	0.89	69.2	0.19	7.11	14.5	3.96	1.51	2.24	0.45	81.7	8.80	1.69	0.77		0.10	0.87
L17	S-232	1194+33	1195+45	112	367	0.57	0.32	0.25	3.87	0.77	72.1	0.03	7.51	14.5	0.44	0.13	1.80	0.36	84.8	9.20	1.69	0.08		0.02	0.10
L18	S-236	1195+45	1201+00	555	1821	3.25	1.98	1.27	3.28	0.66	75.3	0.14	7.95	14.5	2.59	0.66	1.64	0.33	85.9	9.35	1.40	0.38	0.02	0.07	0.47
L19	S-240	1201+00	1203+76	276	906	1.43	0.74	0.69	4.39	0.88	69.5	0.07	7.15	14.5	1.04	0.39	2.20	0.44	82.0	8.84	1.68	0.20		0.04	0.24
L20	S-244	1203+76	1205+00	124	407	0.74	0.44	0.3	3.50	0.70	74.1	0.03	7.78	14.5	0.58	0.16	1.78	0.36	84.9	9.21	1.43	0.09		0.02	0.10
L21	S-247	1205+00	1209+80	480	1575	3.03	1.79	1.24	3.48	0.70	74.2	0.14	7.80	14.5	2.31	0.72	1.90	0.38	84.1	9.11	1.31	0.33		0.07	0.40
L22	S-250	1209+80	1210+71	91	299	0.34	0.22	0.12	2.95	0.59	77.2	0.01	8.20	14.5	0.32	0.02	0.59	0.12	94.4	10.42	2.22	0.06	0.01	0.01	0.08
L23	S-251	0091+60	0093+84	224	735	1.83	0.97	0.86	4.22	0.84	70.3	0.09	7.26	14.5	1.21	0.62	2.80	0.56	78.2	8.33	1.07	0.16	0.09	0.04	0.29
L24	S-252	1211+48	1213+96	248	814	1.41	0.77	0.64	4.04	0.81	71.2	0.01	7.39	14.5	1.04	0.37	2.11	0.42	82.5	8.91	1.52	0.18	0.01	0.00	0.19
L25	S-256	1213+96	1216+20	224	735	1.44	0.78	0.66	4.08	0.82	71	0.04	7.36	14.5	1.02	0.42	2.35	0.47	81.0	8.71	1.35	0.16	0.04	0.02	0.22
L26	S-258	1216+20	1220+80	460	1509	2.01	0.97	1.04	4.81	0.96	67.5	0.08	6.87	14.5	1.47	0.54	2.16	0.43	82.2	8.87	2.00	0.33	0.08	0.04	0.45
M1	S-5	1120+30	1125+94	564	1850	3.24	1.35	1.89	5.72	1.14	63.6	0.14	6.32	--	--	--	--	--	--	--	--	--	0.14	0.07	0.22
M2	S-11	1126+07	1130+21	414	1358	2.05	0.43	1.62	9.46	1.89	51.4	0.12	4.54	--	--	--	--	--	--	--	--	--	0.12	0.06	0.18
M3	S-215	1171+06	1174+75	369	1211	1.14	0.4	0.74	6.75	1.35	59.7	0.05	5.76	--	--	--	--	--	--	--	--	--	0.05	0.03	0.08
M4	S-223	1179+11	1182+90	379	1243	1.92	0.84	1.08	5.43	1.09	64.8	0.09	6.49	--	--	--	--	--	--	--	--	--	0.09	0.05	0.14
M5	S-227A	1183+25	1187+15	390	1280	2.07	0.83	1.24	5.95	1.19	62.7	0.1	6.19	--	--	--	--	--	--	--	--	--	0.10	0.05	0.15
M6	S-256	1214+82	1218+55	373	1224	1.74	0.65	1.09	6.39	1.28	61	0.43	5.95	--	--	--	--	--	--	--	--	--	0.43	0.22	0.65
R2	S-3	1120+47	1123+85	338	1109	1.29	0.57	0.72	5.36	1.07	65.1	0.06	6.53	26.5	1.24	0.05	0.43	0.09	95.9	10.60	4.07	0.44		0.03	0.47
R3	S-9	1123+85	1127+62	377	1237	1.27	0.27	1	9.42	1.88	51.5	0.06	4.56	26.5	1.02	0.25	1.56	0.31	86.5	9.42	4.86	0.51		0.03	0.54
R4	S-14	1127+62	1130+35	273	896	1.51	0.81	0.7	4.16	0.83	70.6	0.06	7.30	26.5	1.35	0.16	0.88	0.18	91.9	10.11	2.81	0.35		0.03	0.38
R5	S-21	1130+35	1134+00	365	1198	2.14	1.23	0.91	3.72	0.74	72.9	0.09	7.62	26.5	1.96	0.18	0.75	0.15	93.0	10.24	2.62	0.47		0.05	0.51
R6	S-26	1134+00	1138+48	448	1470	2.49	1.38	1.11	3.95	0.79	71.7	0.11	7.46	26.5	2.27	0.22	0.77	0.15	92.9	10.23	2.77	0.58		0.06	0.63
R7	S-42	1138+48	1140+30	182	597	0.93	0.46	0.47	4.66	0.93	68.2	0.04	6.97	26.5	0.82	0.11	0.96	0.19	91.2	10.02	3.05	0.24		0.02	0.26
R8	S-46	1140+30	1144+00	370	1214	2.11	1.16	0.95	4.01	0.80	71.4	0.1	7.41	26.5	1.90	0.21	0.86	0.17	92.1	10.13	2.72	0.48		0.05	0.53
R9	S-50	1144+00	1146+51	251	823	1.62	0.99	0.63	3.32	0.66	75.1	0.07	7.92	26.5	1.49	0.13	0.72	0.14	93.3	10.28	2.36	0.32		0.04	0.35
R11	S-214	1170+88	1174+85	397	1302	2.19	1.31	0.88	3.46	0.69	74.3	0.10	7.81	26.5	2.10	0.09	0.46	0.09	95.6	10.57	2.76	0.50		0.05	0.55
R12	S-216	1174+85	1178+65	380	1247	1.89	1.02	0.87	4.12	0.82	70.8	0.09	7.33	26.5	1.78	0.11	0.58	0.12	94.5	10.43	3.10	0.49		0.05	0.53
R13	S-219	1178+65	1180+00	135	443	0.75	0.39	0.36	4.35	0.87	69.7	0.03	7.18	26.5	0.66	0.09	1.01	0.20	90.9	9.98	2.80	0.17		0.02	0.19
R14	S-221	1180+00	1182+00	200	656	1.09	0.52	0.57	4.90	0.98	67.1	0.05	6.82	26.5	0.92	0.17	1.27	0.25	88.7	9.71	2.89	0.26		0.03	0.29
R15	S-224	1182+00	1183+70	170	558	1.04	0.54	0.5	4.37	0.87	69.6	0.05	7.17	26.5	0.88	0.16	1.25	0.25	88.9	9.73	2.56	0.22		0.03	0.25
R16	S-228	1183+70	1189+50	580	1903	3.11	1.51	1.6	4.79	0.96	67.6	0.14	6.89	26.5	2.67	0.44	1.16	0.23	89.6	9.82	2.93	0.76		0.07	0.83
R17	S-229A	1189+50	1194+33	483	1585	3.03	1.55	1.48	4.45	0.89	69.2	0.13	7.11	26.5	2.51	0.52	1.37	0.27	87.9	9.61	2.50	0.63		0.07	0.70

Permitted Section: CR 30A to US 331 (FPID 220642-1)

Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	30.5	ft (One Direction)
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Matches Permitted Post-Development Calculations)

Permitted Information													SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Swale ID	Structure ID	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
R18	S-231	1194+33	1195+45	112	367	0.96	0.62	0.34	2.97	0.59	77.1	0.04	8.19	26.5	0.84	0.12	1.01	0.20	90.8	9.97	1.78	0.14	0.04	0.02	0.20
R19	S-237	1195+45	1201+00	555	1821	3.19	1.62	1.57	4.49	0.90	69	0.15	7.08	26.5	2.73	0.46	1.18	0.24	89.4	9.80	2.72	0.72		0.07	0.80
R20	S-242	1201+00	1204+78	378	1240	2.15	1.1	1.05	4.45	0.89	69.2	0.10	7.11	26.5	1.85	0.30	1.13	0.23	89.9	9.85	2.74	0.49		0.05	0.54
R21	S-246	1204+78	1209+55	477	1565	2.7	1.46	1.24	4.10	0.82	70.9	0.10	7.35	26.5	2.41	0.29	0.91	0.18	91.7	10.08	2.74	0.62	0.10	0.05	0.77
R22	S-246	1209+55	1212+12	257	843	1.55	0.83	0.72	4.16	0.83	70.6	0.04	7.30	26.5	1.34	0.21	1.10	0.22	90.1	9.88	2.58	0.33	0.04	0.02	0.39
R23	S-246	1212+12	1213+95	183	600	1.03	0.56	0.47	4.06	0.81	71.1	0.02	7.37	26.5	0.93	0.10	0.87	0.17	92.0	10.12	2.75	0.24	0.02	0.01	0.27
R24	S-246	1213+95	1216+16	221	725	1.06	0.53	0.53	4.60	0.92	68.5	0.02	7.01	26.5	0.97	0.09	0.75	0.15	93.0	10.25	3.24	0.29	0.02	0.01	0.32
R25	S-246	1216+16	1220+86	470	1542	1.65	0.54	1.11	7.15	1.43	58.3	0.07	5.56	26.5	1.48	0.17	0.89	0.18	91.8	10.10	4.54	0.62		0.04	0.66
																					Totals	**14.96**	**1.39**	**2.11**	**18.46**

Project: SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge
FPID: 437179-1-22-01
County: Walton County, Florida
Permitted Section: US 331 to Peack Creek (FPID 220643-1)
Assumptions:

Designer: JN **Date:** 11/22/2023
Reviewer: LCS **Checked:** 12/19/2023

Rainfall	11.1	inches
Existing Pavement Width	30.5	ft (One Direction)
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)
Assumed R/W Width	277	ft (Half = 138.5 ft)

Permitted Information											SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Location Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
RT	216+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.03	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
LT	216+08	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.03	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
RT	216+15	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.02	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
LT	216+25	90	295	0.94	0.21	0.73	9.23	1.85	52.0	0.02	4.63	26.5	0.39	0.55	5.80	1.16	63.3	6.28	1.64	0.13		0.01	0.14
LT	217+16	85	279	0.89	0.20	0.69	9.23	1.85	52.0	0.05	4.63	26.5	0.36	0.52	5.80	1.16	63.3	6.28	1.64	0.12		0.03	0.15
RT	217+16	85	279	0.89	0.20	0.69	9.23	1.85	52.0	0.05	4.63	26.5	0.36	0.52	5.80	1.16	63.3	6.28	1.64	0.12		0.03	0.15
LT	219+27	85	279	0.89	0.20	0.69	9.23	1.85	52.0	0.06	4.63	26.5	0.36	0.52	5.80	1.16	63.3	6.28	1.64	0.12		0.03	0.15
RT	219+27	85	279	0.89	0.20	0.69	9.23	1.85	52.0	0.06	4.63	26.5	0.36	0.52	5.80	1.16	63.3	6.28	1.64	0.12		0.03	0.15
LT	220+34	117	384	1.22	0.27	0.95	9.23	1.85	52.0	0.05	4.63	26.5	0.50	0.72	5.80	1.16	63.3	6.28	1.64	0.17		0.02	0.19
RT	220+34	117	384	1.22	0.27	0.95	9.23	1.85	52.0	0.05	4.63	26.5	0.50	0.72	5.80	1.16	63.3	6.28	1.64	0.17		0.02	0.19
RT	221+59	125	410	1.30	0.29	1.02	9.23	1.85	52.0	0.03	4.63	26.5	0.54	0.77	5.80	1.16	63.3	6.28	1.64	0.18		0.01	0.19
LT	221+67	133	436	1.39	0.31	1.08	9.23	1.85	52.0	0.03	4.63	26.5	0.57	0.82	5.80	1.16	63.3	6.28	1.64	0.19		0.01	0.20
RT	221+73	102	335	1.06	0.23	0.83	9.23	1.85	52.0	0.03	4.63	26.5	0.44	0.63	5.80	1.16	63.3	6.28	1.64	0.15		0.01	0.16
LT	221+83	92	302	0.96	0.21	0.75	9.23	1.85	52.0	0.03	4.63	26.5	0.39	0.56	5.80	1.16	63.3	6.28	1.64	0.13		0.01	0.15
LT	222+75	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	222+75	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	223+75	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
RT	223+75	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
LT	225+50	75	246	0.78	0.17	0.61	9.23	1.85	52.0	0.04	4.63	26.5	0.32	0.46	5.80	1.16	63.3	6.28	1.64	0.11		0.02	0.13
RT	225+50	75	246	0.78	0.17	0.61	9.23	1.85	52.0	0.04	4.63	26.5	0.32	0.46	5.80	1.16	63.3	6.28	1.64	0.11		0.02	0.13
LT	226+50	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	226+50	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	227+56	105	344	1.10	0.24	0.85	9.23	1.85	52.0	0.02	4.63	26.5	0.45	0.64	5.80	1.16	63.3	6.28	1.64	0.15		0.01	0.16
RT	227+56	105	344	1.10	0.24	0.85	9.23	1.85	52.0	0.02	4.63	26.5	0.45	0.64	5.80	1.16	63.3	6.28	1.64	0.15		0.01	0.16
LT	227+70	58	190	0.61	0.13	0.47	9.23	1.85	52.0	0.01	4.63	26.5	0.25	0.36	5.80	1.16	63.3	6.28	1.64	0.08		0.00	0.09
RT	227+70	58	190	0.61	0.13	0.47	9.23	1.85	52.0	0.01	4.63	26.5	0.25	0.36	5.80	1.16	63.3	6.28	1.64	0.08		0.00	0.09
LT	228+80	110	361	1.15	0.25	0.89	9.23	1.85	52.0	0.03	4.63	26.5	0.47	0.68	5.80	1.16	63.3	6.28	1.64	0.16		0.01	0.17
RT	228+80	110	361	1.15	0.25	0.89	9.23	1.85	52.0	0.03	4.63	26.5	0.47	0.68	5.80	1.16	63.3	6.28	1.64	0.16		0.01	0.17
LT	229+90	68	223	0.71	0.16	0.55	9.23	1.85	52.0	0.03	4.63	26.5	0.29	0.42	5.80	1.16	63.3	6.28	1.64	0.10		0.01	0.11
RT	229+90	68	223	0.71	0.16	0.55	9.23	1.85	52.0	0.03	4.63	26.5	0.29	0.42	5.80	1.16	63.3	6.28	1.64	0.10		0.01	0.11
LT	232+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.03	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
RT	232+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.03	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
RT	232+59	59	194	0.62	0.14	0.48	9.23	1.85	52.0	0.04	4.63	26.5	0.25	0.36	5.80	1.16	63.3	6.28	1.64	0.08		0.02	0.10
LT	232+81	114	374	1.19	0.26	0.93	9.23	1.85	52.0	0.03	4.63	26.5	0.49	0.70	5.80	1.16	63.3	6.28	1.64	0.16		0.01	0.18
LT	233+29	101	331	1.05	0.23	0.82	9.23	1.85	52.0	0.04	4.63	26.5	0.43	0.62	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.16
RT	233+29	101	331	1.05	0.23	0.82	9.23	1.85	52.0	0.04	4.63	26.5	0.43	0.62	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.16
LT	234+30	80	262	0.83	0.18	0.65	9.23	1.85	52.0	0.05	4.63	26.5	0.34	0.49	5.80	1.16	63.3	6.28	1.64	0.11		0.03	0.14
RT	234+30	80	262	0.83	0.18	0.65	9.23	1.85	52.0	0.05	4.63	26.5	0.34	0.49	5.80	1.16	63.3	6.28	1.64	0.11		0.03	0.14
RT	235+65	85	279	0.89	0.20	0.69	9.23	1.85	52.0	0.05	4.63	26.5	0.36	0.52	5.80	1.16	63.3	6.28	1.64	0.12		0.03	0.15
LT	238+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	239+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.07	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.04	0.18
LT	240+00	108	354	1.13	0.25	0.88	9.23	1.85	52.0	0.06	4.63	26.5	0.46	0.66	5.80	1.16	63.3	6.28	1.64	0.15		0.03	0.19

Permitted Section: US 331 to Peack Creek (FPID 220643-1)

Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	30.5	ft (One Direction)
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)
Assumed R/W Width	277	ft (Half = 138.5 ft)

Permitted Information											SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Location Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
LT	240+98	98	322	1.02	0.23	0.80	9.23	1.85	52.0	0.05	4.63	26.5	0.42	0.60	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.16
LT	241+22	78	256	0.81	0.18	0.63	9.23	1.85	52.0	0.02	4.63	26.5	0.33	0.48	5.80	1.16	63.3	6.28	1.64	0.11		0.01	0.12
LT	242+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	243+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	244+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	245+80	80	262	0.83	0.18	0.65	9.23	1.85	52.0	0.05	4.63	26.5	0.34	0.49	5.80	1.16	63.3	6.28	1.64	0.11		0.03	0.14
LT	247+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	248+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	248+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	249+20	119	390	1.24	0.27	0.97	9.23	1.85	52.0	0.02	4.63	26.5	0.51	0.73	5.80	1.16	63.3	6.28	1.64	0.17		0.01	0.18
LT	249+28	128	420	1.34	0.29	1.04	9.23	1.85	52.0	0.03	4.63	26.5	0.55	0.79	5.80	1.16	63.3	6.28	1.64	0.18		0.01	0.20
RT	249+34	66	217	0.69	0.15	0.54	9.23	1.85	52.0	0.03	4.63	26.5	0.28	0.41	5.80	1.16	63.3	6.28	1.64	0.09		0.02	0.11
LT	249+46	54	177	0.56	0.12	0.44	9.23	1.85	52.0	0.02	4.63	26.5	0.23	0.33	5.80	1.16	63.3	6.28	1.64	0.08		0.01	0.09
LT	250+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
RT	250+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
LT	251+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
RT	251+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
LT	252+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
RT	252+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	254+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	254+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	255+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	255+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	256+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	256+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	257+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	257+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	257+83	88	289	0.92	0.20	0.72	9.23	1.85	52.0	0.02	4.63	26.5	0.38	0.54	5.80	1.16	63.3	6.28	1.64	0.13		0.01	0.13
LT	257+92	92	302	0.96	0.21	0.75	9.23	1.85	52.0	0.02	4.63	26.5	0.39	0.56	5.80	1.16	63.3	6.28	1.64	0.13		0.01	0.14
LT	259+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
RT	259+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
LT	260+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
RT	260+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.17
LT	260+57	57	187	0.59	0.13	0.46	9.23	1.85	52.0	0.02	4.63	26.5	0.24	0.35	5.80	1.16	63.3	6.28	1.64	0.08		0.01	0.09
RT	261+80	106	348	1.11	0.24	0.86	9.23	1.85	52.0	0.03	4.63	26.5	0.46	0.65	5.80	1.16	63.3	6.28	1.64	0.15		0.02	0.17
LT	261+90	114	374	1.19	0.26	0.93	9.23	1.85	52.0	0.03	4.63	26.5	0.49	0.70	5.80	1.16	63.3	6.28	1.64	0.16		0.02	0.18
RT	262+03	97	318	1.01	0.22	0.79	9.23	1.85	52.0	0.04	4.63	26.5	0.42	0.60	5.80	1.16	63.3	6.28	1.64	0.14		0.02	0.16
LT	262+14	86	282	0.90	0.20	0.70	9.23	1.85	52.0	0.03	4.63	26.5	0.37	0.53	5.80	1.16	63.3	6.28	1.64	0.12		0.01	0.14
LT	263+00	140	459	1.46	0.32	1.14	9.23	1.85	52.0	0.07	4.63	26.5	0.60	0.86	5.80	1.16	63.3	6.28	1.64	0.20		0.04	0.24
RT	263+00	140	459	1.46	0.32	1.14	9.23	1.85	52.0	0.07	4.63	26.5	0.60	0.86	5.80	1.16	63.3	6.28	1.64	0.20		0.04	0.24
LT	264+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	264+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	266+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.07	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.18
RT	266+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.07	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.18
LT	267+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17

Permitted Section: US 331 to Peack Creek (FPID 220643-1)

Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	30.5	ft (One Direction)
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)
Assumed R/W Width	277	ft (Half = 138.5 ft)

Permitted Information											SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Location Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-ft)	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
RT	267+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	268+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	268+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	269+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	269+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	270+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	270+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	271+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	271+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.05	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	271+60	60	197	0.63	0.14	0.49	9.23	1.85	52.0	0.03	4.63	26.5	0.26	0.37	5.80	1.16	63.3	6.28	1.64	0.09		0.01	0.10
RT	271+95	95	312	0.99	0.22	0.77	9.23	1.85	52.0	0.05	4.63	26.5	0.41	0.58	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.16
LT	272+21	79	259	0.82	0.18	0.64	9.23	1.85	52.0	0.02	4.63	26.5	0.34	0.48	5.80	1.16	63.3	6.28	1.64	0.11		0.01	0.12
RT	272+21	79	259	0.82	0.18	0.64	9.23	1.85	52.0	0.02	4.63	26.5	0.34	0.48	5.80	1.16	63.3	6.28	1.64	0.11		0.01	0.12
LT	273+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	273+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	274+00	110	361	1.15	0.25	0.89	9.23	1.85	52.0	0.06	4.63	26.5	0.47	0.68	5.80	1.16	63.3	6.28	1.64	0.16		0.03	0.19
RT	274+00	110	361	1.15	0.25	0.89	9.23	1.85	52.0	0.06	4.63	26.5	0.47	0.68	5.80	1.16	63.3	6.28	1.64	0.16		0.03	0.19
LT	276+00	90	295	0.94	0.21	0.73	9.23	1.85	52.0	0.06	4.63	26.5	0.39	0.55	5.80	1.16	63.3	6.28	1.64	0.13		0.03	0.16
RT	276+00	90	295	0.94	0.21	0.73	9.23	1.85	52.0	0.06	4.63	26.5	0.39	0.55	5.80	1.16	63.3	6.28	1.64	0.13		0.03	0.16
LT	277+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
RT	277+00	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.06	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.03	0.17
LT	278+24	105	344	1.10	0.24	0.85	9.23	1.85	52.0	0.02	4.63	26.5	0.45	0.64	5.80	1.16	63.3	6.28	1.64	0.15		0.01	0.16
RT	278+24	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.03	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
RT	278+46	100	328	1.04	0.23	0.81	9.23	1.85	52.0	0.03	4.63	26.5	0.43	0.61	5.80	1.16	63.3	6.28	1.64	0.14		0.01	0.16
LT	278+64	164	538	1.71	0.38	1.33	9.23	1.85	52.0	0.03	4.63	26.5	0.70	1.01	5.80	1.16	63.3	6.28	1.64	0.23		0.01	0.25
RT	283+40	110	361	1.15	0.25	0.89	9.23	1.85	52.0	0.03	4.63	26.5	0.47	0.68	5.80	1.16	63.3	6.28	1.64	0.16		0.01	0.17
RT	284+50	136	446	1.42	0.31	1.11	9.23	1.85	52.0	0.06	4.63	26.5	0.58	0.83	5.80	1.16	63.3	6.28	1.64	0.19		0.03	0.22
																			Totals	**7.78**	**0.00**	**1.30**	**9.08**

Project: SR 30 (US 98) Near San Destin from West CR 30A to West of Phillips Inlet Bridge
FPID: 437179-1-22-01
County: Walton County, Florida
Permitted Section: Peach Creek to Bay County Line (FPID 220644-1)
Assumptions:

Designer: JN **Date:** 11/22/2023
Reviewer: LCS **Checked:** 12/19/2023

Rainfall	11.1	inches
Existing Pavement Width	28.5	ft (One Direction) (Pervious = 10.5m (34.4ft))
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)

*Blue cells were manually overridden to avoid negative areas or CN higher than 100

Permitted Information												SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)*	S	Ia	CN*	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
RT	285+81	286+60	79.33	260	0.41	0.17	0.21	6.71	1.34	59.9	0.02	5.78	28.5	0.34	0.07	1.40	0.28	87.7	9.58	3.79	0.13	0.02	0.01	0.16
RT	286+60	287+65	105.00	344	0.46	0.23	0.27	4.00	0.80	71.4	0.03	7.42	28.5	0.45	0.01	0.30	0.06	97.1	10.75	3.33	0.13	0.03	0.01	0.17
RT	287+65	288+70	105.00	344	0.46	0.23	0.27	3.94	0.79	71.7	0.03	7.46	28.5	0.45	0.01	0.27	0.05	97.3	10.78	3.32	0.13	0.03	0.01	0.17
RT	288+70	290+00	130.00	427	0.56	0.28	0.34	3.86	0.77	72.1	0.05	7.52	28.5	0.56	0.00	0.24	0.05	97.7	10.82	3.30	0.15	0.05	0.02	0.23
RT	290+00	292+00	200.00	656	0.87	0.43	0.52	3.90	0.78	72.0	0.05	7.49	28.5	0.86	0.01	0.25	0.05	97.5	10.80	3.31	0.24	0.05	0.02	0.31
RT	292+00	293+00	100.00	328	0.50	0.21	0.26	6.10	1.22	62.1	0.02	6.11	28.5	0.43	0.07	1.17	0.23	89.5	9.81	3.70	0.15	0.02	0.01	0.19
RT	293+00	293+80	80.00	262	0.42	0.17	0.21	6.71	1.34	59.8	0.02	5.78	28.5	0.34	0.07	1.41	0.28	87.7	9.57	3.79	0.13	0.02	0.01	0.16
RT	293+80	294+70	90.00	295	0.44	0.19	0.23	5.65	1.13	63.9	0.02	6.36	28.5	0.39	0.05	0.99	0.20	91.0	9.99	3.63	0.13	0.02	0.01	0.16
RT	294+70	295+65	95.00	312	0.41	0.20	0.25	3.94	0.79	71.7	0.02	7.46	28.5	0.41	0.00	0.27	0.05	97.3	10.78	3.32	0.11	0.02	0.01	0.15
RT	295+65	296+90	125.00	410	0.54	0.27	0.32	3.90	0.78	71.9	0.03	7.49	28.5	0.54	0.00	0.25	0.05	97.5	10.80	3.31	0.15	0.03	0.02	0.20
RT	296+90	298+15	125.00	410	0.54	0.27	0.32	3.90	0.78	72.0	0.03	7.49	28.5	0.54	0.00	0.25	0.05	97.5	10.80	3.31	0.15	0.03	0.02	0.20
RT	298+15	299+30	115.00	377	0.50	0.25	0.30	3.90	0.78	72.0	0.03	7.49	28.5	0.49	0.00	0.25	0.05	97.5	10.80	3.31	0.14	0.03	0.01	0.18
RT	299+30	299+75	45.00	148	0.19	0.10	0.12	3.90	0.78	71.9	0.01	7.49	28.5	0.19	0.00	0.25	0.05	97.5	10.80	3.31	0.05	0.01	0.00	0.07
RT	299+75	300+05	30.00	98	0.13	0.06	0.08	3.75	0.75	72.7	0.01	7.60	28.5	0.13	0.00	0.18	0.04	98.3	10.89	3.29	0.04	0.01	0.00	0.05
RT	300+05	300+35	30.00	98	0.13	0.06	0.08	3.57	0.71	73.7	0.01	7.73	28.5	0.13	0.00	0.04	0.01	99.6	11.05	3.32	0.04	0.01	0.00	0.05
RT	300+35	300+65	30.00	98	0.13	0.06	0.08	3.90	0.78	71.9	0.01	7.49	28.5	0.13	0.00	0.25	0.05	97.5	10.80	3.31	0.04	0.01	0.00	0.05
RT	300+65	300+95	30.00	98	0.13	0.06	0.08	3.90	0.78	71.9	0.01	7.49	28.5	0.13	0.00	0.25	0.05	97.5	10.80	3.31	0.04	0.01	0.00	0.05
RT	300+95	301+25	30.00	98	0.13	0.06	0.08	3.92	0.78	71.8	0.01	7.47	28.5	0.13	0.00	0.26	0.05	97.4	10.79	3.32	0.04	0.01	0.00	0.05
RT	301+25	301+55	30.00	98	0.15	0.06	0.08	6.27	1.25	61.4	0.01	6.01	28.5	0.13	0.02	1.24	0.25	89.0	9.74	3.73	0.05	0.01	0.00	0.06
RT	301+55	302+00	45.00	148	0.23	0.10	0.12	6.75	1.35	59.7	0.01	5.76	28.5	0.19	0.04	1.42	0.28	87.6	9.56	3.80	0.07	0.01	0.00	0.09
RT	302+00	302+63	62.50	205	0.33	0.13	0.16	6.74	1.35	59.7	0.01	5.76	28.5	0.27	0.06	1.42	0.28	87.6	9.56	3.80	0.10	0.01	0.01	0.12
RT	302+63	303+95	132.50	435	0.64	0.28	0.34	5.53	1.11	64.4	0.04	6.44	28.5	0.57	0.07	0.94	0.19	91.4	10.04	3.61	0.19	0.04	0.02	0.25
RT	303+95	305+50	155.00	509	0.67	0.33	0.40	3.98	0.80	71.5	0.05	7.43	28.5	0.67	0.01	0.29	0.06	97.2	10.76	3.33	0.19	0.05	0.03	0.27
RT	305+50	307+50	200.00	656	0.88	0.43	0.52	4.11	0.82	70.9	0.04	7.34	28.5	0.86	0.02	0.35	0.07	96.7	10.70	3.35	0.25	0.04	0.02	0.31
RT	307+50	308+90	140.00	459	0.61	0.30	0.36	3.95	0.79	71.7	0.03	7.46	28.5	0.60	0.01	0.28	0.06	97.3	10.78	3.32	0.17	0.03	0.02	0.22
RT	308+90	310+30	140.00	459	0.61	0.30	0.36	3.95	0.79	71.7	0.03	7.46	28.5	0.60	0.01	0.28	0.06	97.3	10.78	3.32	0.17	0.03	0.02	0.21
RT	310+30	311+20	90.00	295	0.48	0.19	0.23	7.24	1.45	58.0	0.03	5.51	28.5	0.39	0.10	1.60	0.32	86.2	9.38	3.87	0.16	0.03	0.01	0.20
RT	311+20	312+07	87.00	285	0.48	0.19	0.23	7.83	1.57	56.1	0.03	5.23	28.5	0.37	0.11	1.82	0.36	84.6	9.18	3.95	0.16	0.03	0.01	0.20
RT	312+07	312+95	88.00	289	0.66	0.19	0.23	14.13	2.83	41.4	0.03	3.06	28.5	0.38	0.28	3.75	0.75	72.7	7.59	4.54	0.25	0.03	0.02	0.30
RT	312+95	313+89	93.72	307	0.40	0.20	0.24	3.68	0.74	73.1	0.02	7.65	28.5	0.40	0.00	0.13	0.03	98.7	10.95	3.30	0.11	0.02	0.01	0.14
RT	313+89	315+12	123.25	404	0.53	0.26	0.32	3.77	0.75	72.6	0.02	7.58	28.5	0.53	0.00	0.20	0.04	98.1	10.87	3.29	0.14	0.02	0.01	0.17
RT	315+12	316+30	118.03	387	0.53	0.25	0.31	4.38	0.88	69.5	0.02	7.16	28.5	0.51	0.02	0.47	0.09	95.6	10.56	3.40	0.15	0.02	0.01	0.18
RT	316+30	317+05	75.00	246	0.33	0.16	0.19	4.03	0.81	71.3	0.02	7.40	28.5	0.32	0.01	0.31	0.06	97.0	10.74	3.34	0.09	0.02	0.01	0.12
RT	317+05	317+80	75.00	246	0.33	0.16	0.19	3.98	0.80	71.6	0.02	7.44	28.5	0.32	0.00	0.29	0.06	97.2	10.76	3.33	0.09	0.02	0.01	0.12
RT	317+80	318+61	80.71	265	0.39	0.17	0.21	5.60	1.12	64.1	0.02	6.39	28.5	0.35	0.05	0.97	0.19	91.1	10.01	3.62	0.12	0.02	0.01	0.15
RT	318+61	319+50	89.29	293	0.47	0.19	0.23	6.84	1.37	59.4	0.02	5.72	28.5	0.38	0.08	1.45	0.29	87.3	9.53	3.81	0.15	0.02	0.01	0.19
RT	319+50	320+64	114.00	374	0.62	0.24	0.30	7.57	1.51	56.9	0.02	5.36	28.5	0.49	0.13	1.73	0.35	85.3	9.27	3.91	0.20	0.02	0.01	0.23
RT	320+64	321+60	96.00	315	0.45	0.21	0.25	5.20	1.04	65.8	0.02	6.63	28.5	0.41	0.04	0.81	0.16	92.5	10.18	3.55	0.13	0.02	0.01	0.16
RT	321+60	322+65	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.02	7.44	28.5	0.45	0.01	0.29	0.06	97.2	10.76	3.33	0.13	0.02	0.01	0.16
RT	322+65	323+63	98.22	322	0.43	0.21	0.25	3.97	0.79	71.6	0.02	7.44	28.5	0.42	0.01	0.29	0.06	97.2	10.76	3.33	0.12	0.02	0.01	0.15
RT	323+63	325+00	136.79	449	0.60	0.29	0.35	3.97	0.79	71.6	0.02	7.44	28.5	0.59	0.01	0.29	0.06	97.2	10.76	3.33	0.16	0.02	0.01	0.19
RT	325+00	325+95	95.00	312	0.41	0.20	0.25	3.92	0.78	71.8	0.02	7.47	28.5	0.41	0.00	0.26	0.05	97.4	10.79	3.31	0.11	0.02	0.01	0.14

Permitted Section: Peach Creek to Bay County Line (FPID 220644-1)

Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	28.5	ft (One Direction) (Pervious = 10.5m (34.4ft))
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)

*Blue cells were manually overridden to avoid negative areas or CN higher than 100

Permitted Information												SCS Calculation	0.23						SCS Calculation	Required Additional Volume Calculations				
Side	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)*	S	Ia	CN*	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
RT	325+95	327+10	115.00	377	0.54	0.25	0.30	5.13	1.03	66.1	0.02	6.67	28.5	0.49	0.05	0.78	0.16	92.8	10.21	3.54	0.16	0.02	0.01	0.19
RT	327+10	328+00	90.00	295	0.47	0.19	0.23	6.82	1.36	59.4	0.03	5.72	28.5	0.39	0.09	1.45	0.29	87.4	9.53	3.81	0.15	0.03	0.01	0.19
RT	328+00	329+05	105.00	344	0.56	0.23	0.27	7.19	1.44	58.2	0.03	5.54	28.5	0.45	0.11	1.58	0.32	86.3	9.40	3.86	0.18	0.03	0.01	0.22
RT	329+05	330+10	105.00	344	0.46	0.23	0.27	4.00	0.80	71.4	0.03	7.42	28.5	0.45	0.01	0.30	0.06	97.1	10.75	3.33	0.13	0.03	0.01	0.17
RT	330+10	331+00	90.00	295	0.39	0.19	0.23	3.96	0.79	71.6	0.03	7.44	28.5	0.39	0.01	0.28	0.06	97.2	10.77	3.32	0.11	0.03	0.01	0.15
RT	331+00	331+46	45.58	150	0.20	0.10	0.12	3.97	0.79	71.6	0.02	7.44	28.5	0.20	0.00	0.28	0.06	97.2	10.77	3.32	0.05	0.02	0.01	0.08
RT	331+46	332+50	104.42	343	0.45	0.22	0.27	3.97	0.79	71.6	0.02	7.44	28.5	0.45	0.01	0.28	0.06	97.2	10.77	3.32	0.13	0.02	0.01	0.16
RT	332+50	333+85	135.00	443	0.59	0.29	0.35	3.93	0.79	71.8	0.02	7.47	28.5	0.58	0.01	0.27	0.05	97.4	10.79	3.32	0.16	0.02	0.01	0.20
RT	333+85	334+75	90.00	295	0.39	0.19	0.23	4.02	0.80	71.3	0.02	7.40	28.5	0.39	0.01	0.31	0.06	97.0	10.74	3.33	0.11	0.02	0.01	0.14
RT	334+75	335+65	90.00	295	0.44	0.19	0.23	5.56	1.11	64.3	0.02	6.42	28.5	0.39	0.05	0.96	0.19	91.3	10.03	3.61	0.13	0.02	0.01	0.16
RT	335+65	336+30	65.15	214	0.34	0.14	0.17	6.82	1.36	59.5	0.02	5.73	28.5	0.28	0.06	1.45	0.29	87.4	9.53	3.81	0.11	0.02	0.01	0.14
RT	336+30	338+00	169.85	557	0.86	0.36	0.44	6.31	1.26	61.3	0.05	5.99	28.5	0.73	0.13	1.25	0.25	88.9	9.73	3.73	0.27	0.05	0.03	0.35
RT	338+00	340+10	210.00	689	0.91	0.45	0.54	3.89	0.78	72.0	0.05	7.50	28.5	0.90	0.01	0.25	0.05	97.6	10.81	3.31	0.25	0.05	0.02	0.32
RT	340+10	342+90	280.00	919	1.21	0.60	0.73	3.85	0.77	72.2	0.05	7.53	28.5	1.20	0.01	0.23	0.05	97.7	10.83	3.30	0.33	0.05	0.03	0.41
RT	342+90	345+00	210.00	689	1.03	0.45	0.54	5.73	1.15	63.6	0.07	6.32	28.5	0.90	0.13	1.02	0.20	90.7	9.96	3.64	0.31	0.07	0.04	0.42
RT	345+00	346+95	195.00	640	0.91	0.42	0.51	5.07	1.01	66.4	0.07	6.71	28.5	0.84	0.08	0.75	0.15	93.0	10.24	3.53	0.27	0.07	0.04	0.38
RT	346+95	349+55	260.00	853	1.13	0.56	0.67	3.97	0.79	71.6	0.08	7.44	28.5	1.12	0.01	0.28	0.06	97.2	10.77	3.32	0.31	0.08	0.04	0.43
RT	349+55	350+75	120.00	394	0.52	0.26	0.31	3.97	0.79	71.6	0.02	7.44	28.5	0.52	0.01	0.28	0.06	97.2	10.77	3.32	0.14	0.02	0.01	0.17
RT	350+75	351+50	75.00	246	0.34	0.16	0.19	4.36	0.87	69.6	0.02	7.17	28.5	0.32	0.01	0.46	0.09	95.6	10.57	3.40	0.10	0.02	0.01	0.12
RT	351+50	354+26	276.14	906	1.42	0.59	0.72	6.47	1.29	60.7	0.04	5.91	28.5	1.19	0.23	1.31	0.26	88.4	9.67	3.76	0.44	0.04	0.02	0.50
RT	354+26	355+85	158.86	521	0.69	0.34	0.41	4.04	0.81	71.2	0.05	7.39	28.5	0.68	0.01	0.32	0.06	96.9	10.73	3.34	0.19	0.05	0.03	0.27
RT	355+85	357+95	210.00	689	0.91	0.45	0.54	3.97	0.79	71.6	0.05	7.44	28.5	0.90	0.01	0.28	0.06	97.2	10.77	3.32	0.25	0.05	0.03	0.33
RT	357+95	359+90	195.00	640	0.85	0.42	0.51	3.97	0.79	71.6	0.05	7.44	28.5	0.84	0.01	0.28	0.06	97.2	10.77	3.32	0.23	0.05	0.03	0.31
RT	359+90	362+15	225.00	738	1.11	0.48	0.58	5.87	1.17	63.0	0.05	6.23	28.5	0.97	0.15	1.08	0.22	90.2	9.90	3.66	0.34	0.05	0.02	0.41
RT	362+15	364+25	210.00	689	1.01	0.45	0.54	5.39	1.08	65.0	0.05	6.52	28.5	0.90	0.10	0.89	0.18	91.9	10.10	3.59	0.30	0.05	0.03	0.38
RT	364+25	366+35	210.00	689	0.91	0.45	0.54	3.97	0.79	71.6	0.05	7.44	28.5	0.90	0.01	0.28	0.06	97.2	10.77	3.32	0.25	0.05	0.03	0.33
RT	366+35	368+45	210.00	689	0.96	0.45	0.54	4.72	0.94	67.9	0.05	6.93	28.5	0.90	0.06	0.61	0.12	94.3	10.40	3.47	0.28	0.05	0.03	0.36
RT	368+45	370+50	205.00	673	0.96	0.44	0.53	5.08	1.02	66.3	0.05	6.71	28.5	0.88	0.08	0.76	0.15	92.9	10.24	3.53	0.28	0.05	0.03	0.36
RT	370+50	371+50	100.00	328	0.49	0.21	0.26	5.57	1.11	64.2	0.03	6.41	28.5	0.43	0.06	0.96	0.19	91.2	10.02	3.62	0.15	0.03	0.02	0.20
RT	371+50	372+50	100.00	328	0.49	0.21	0.26	5.57	1.11	64.2	0.03	6.41	28.5	0.43	0.06	0.96	0.19	91.2	10.02	3.62	0.15	0.03	0.02	0.20
RT	372+50	373+55	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	28.5	0.45	0.01	0.28	0.06	97.2	10.77	3.32	0.13	0.03	0.01	0.17
RT	373+55	374+60	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	28.5	0.45	0.01	0.28	0.06	97.2	10.77	3.32	0.13	0.03	0.01	0.17
RT	374+60	375+65	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	28.5	0.45	0.01	0.28	0.06	97.2	10.77	3.32	0.13	0.03	0.01	0.17
RT	375+65	376+70	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	28.5	0.45	0.01	0.28	0.06	97.2	10.77	3.32	0.13	0.03	0.01	0.17
RT	376+70	379+79	308.75	1013	1.57	0.66	0.80	6.31	1.26	61.3	0.05	6.00	28.5	1.33	0.24	1.25	0.25	88.9	9.73	3.73	0.49	0.05	0.03	0.57
RT	379+79	382+40	261.25	857	1.14	0.56	0.68	3.97	0.79	71.6	0.11	7.44	28.5	1.12	0.01	0.28	0.06	97.2	10.77	3.32	0.31	0.11	0.06	0.49
RT	382+40	385+55	315.00	1033	1.37	0.68	0.82	3.97	0.79	71.6	0.08	7.44	28.5	1.35	0.02	0.28	0.06	97.2	10.77	3.32	0.38	0.08	0.04	0.50
RT	385+55	388+46	290.83	954	1.49	0.62	0.75	6.47	1.29	60.7	0.08	5.91	28.5	1.25	0.24	1.31	0.26	88.4	9.67	3.76	0.47	0.08	0.04	0.58
RT	388+46	389+00	54.17	178	0.23	0.12	0.14	3.43	0.69	74.5	0.02	7.83	28.5	0.23	0.00	0.00	0.00	100.0	11.10	3.27	0.06	0.02	0.01	0.09
RT	389+00	389+50	50.00	164	0.23	0.11	0.13	4.55	0.91	68.7	0.02	7.05	28.5	0.21	0.01	0.54	0.11	94.9	10.48	3.44	0.06	0.02	0.01	0.09
RT	389+50	389+90	40.00	131	0.17	0.09	0.10	3.96	0.79	71.6	0.01	7.44	28.5	0.17	0.00	0.28	0.06	97.2	10.77	3.32	0.05	0.01	0.01	0.07
RT	389+90	390+60	70.00	230	0.26	0.15	0.18	1.97	0.39	83.5	0.01	9.04	28.5	0.30	0.00	0.00	0.00	100.0	11.10	2.06	0.04	0.01	0.00	0.05
RT	390+60	391+00	40.00	131	0.22	0.09	0.10	7.46	1.49	57.3	0.01	5.41	28.5	0.17	0.05	1.68	0.34	85.6	9.31	3.90	0.07	0.01	0.01	0.09
RT	391+00	391+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	391+50	392+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08

Permitted Section: Peach Creek to Bay County Line (FPID 220644-1)

Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	28.5	ft (One Direction) (Pervious = 10.5m (34.4ft))
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)

*Blue cells were manually overridden to avoid negative areas or CN higher than 100

Permitted Information												SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)*	S	Ia	CN*	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
RT	392+00	392+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	392+50	393+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	393+00	393+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	393+50	394+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	394+00	394+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	394+50	395+00	50.00	164	0.25	0.11	0.13	5.98	1.20	62.6	0.01	6.17	28.5	0.21	0.03	1.12	0.22	89.9	9.86	3.68	0.08	0.01	0.01	0.09
RT	395+00	395+50	50.00	164	0.26	0.11	0.13	6.82	1.36	59.4	0.01	5.72	28.5	0.21	0.05	1.45	0.29	87.3	9.53	3.81	0.08	0.01	0.01	0.10
RT	395+50	396+00	50.00	164	0.26	0.11	0.13	6.82	1.36	59.4	0.01	5.72	28.5	0.21	0.05	1.45	0.29	87.3	9.53	3.81	0.08	0.01	0.01	0.10
RT	396+00	396+50	50.00	164	0.29	0.11	0.13	8.59	1.72	53.8	0.01	4.90	28.5	0.21	0.07	2.09	0.42	82.7	8.94	4.04	0.10	0.01	0.01	0.12
RT	396+50	397+00	50.00	164	0.25	0.11	0.13	6.18	1.24	61.8	0.01	6.07	28.5	0.21	0.04	1.20	0.24	89.3	9.78	3.71	0.08	0.01	0.01	0.10
RT	397+00	397+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	397+50	398+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	398+00	398+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	398+50	399+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	399+00	399+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	28.5	0.21	0.00	0.28	0.06	97.2	10.77	3.32	0.06	0.01	0.01	0.08
RT	399+50	400+45	95.00	312	0.42	0.20	0.25	4.15	0.83	70.7	0.02	7.32	28.5	0.41	0.01	0.36	0.07	96.5	10.68	3.36	0.12	0.02	0.01	0.15
RT	400+45	401+43	97.61	320	0.42	0.21	0.25	3.77	0.75	72.6	0.02	7.58	28.5	0.42	0.00	0.19	0.04	98.1	10.87	3.29	0.11	0.02	0.01	0.15
RT	401+43	402+45	102.39	336	1.13	0.22	0.27	25.30	5.06	28.3	0.05	1.16	28.5	0.44	0.69	6.12	1.22	62.0	6.10	4.93	0.46	0.05	0.02	0.54
RT	402+45	403+50	105.00	344	1.13	0.23	0.27	24.42	4.88	29.1	0.05	1.26	28.5	0.45	0.67	5.97	1.19	62.6	6.18	4.92	0.46	0.05	0.02	0.54
RT	403+50	406+20	270.00	886	1.30	0.58	0.70	5.44	1.09	64.8	0.07	6.49	28.5	1.16	0.14	0.91	0.18	91.7	10.08	3.59	0.39	0.07	0.04	0.50
RT	406+20	406+50	30.00	98	0.12	0.06	0.08	2.80	0.56	78.1	0.00	8.33	28.5	0.13	0.00	0.00	0.00	100.0	11.10	2.77	0.03	0.00	0.00	0.03
RT	406+50	406+75	25.00	82	0.12	0.05	0.06	5.36	1.07	65.1	0.00	6.53	28.5	0.11	0.01	0.88	0.18	92.0	10.11	3.58	0.04	0.00	0.00	0.04
RT	406+75	407+00	25.00	82	0.11	0.05	0.06	3.97	0.79	71.6	0.00	7.44	28.5	0.11	0.00	0.28	0.06	97.2	10.77	3.32	0.03	0.00	0.00	0.04
RT	407+00	407+25	25.00	82	0.11	0.05	0.06	3.97	0.79	71.6	0.00	7.44	28.5	0.11	0.00	0.28	0.06	97.2	10.77	3.32	0.03	0.00	0.00	0.04
RT	407+25	407+50	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	28.5	0.11	0.00	0.28	0.06	97.3	10.77	3.32	0.03	0.00	0.00	0.04
RT	407+50	407+75	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	28.5	0.11	0.00	0.28	0.06	97.3	10.77	3.32	0.03	0.00	0.00	0.04
RT	407+75	408+00	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.01	7.45	28.5	0.11	0.00	0.28	0.06	97.3	10.77	3.32	0.03	0.01	0.00	0.04
RT	408+00	408+25	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.01	7.45	28.5	0.11	0.00	0.28	0.06	97.3	10.77	3.32	0.03	0.01	0.00	0.04
RT	408+25	408+50	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.01	7.45	28.5	0.11	0.00	0.28	0.06	97.3	10.77	3.32	0.03	0.01	0.00	0.04
RT	408+50	408+75	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.01	7.45	28.5	0.11	0.00	0.28	0.06	97.3	10.77	3.32	0.03	0.01	0.00	0.04
RT	408+75	409+21	45.66	150	0.22	0.10	0.12	5.29	1.06	65.4	0.02	6.58	28.5	0.20	0.02	0.85	0.17	92.2	10.15	3.57	0.06	0.02	0.01	0.09
LT	366+35	368+45	210.00	689	0.90	0.45	0.54	3.80	0.76	72.5	0.05	7.56	16.5	0.71	0.19	1.69	0.34	85.5	9.30	1.74	0.13		0.03	0.16
LT	368+45	370+50	205.00	673	0.90	0.44	0.53	4.14	0.83	70.7	0.05	7.32	16.5	0.69	0.21	1.84	0.37	84.4	9.16	1.83	0.14		0.03	0.16
LT	370+50	371+50	100.00	328	0.53	0.21	0.26	7.17	1.43	58.2	0.03	5.55	16.5	0.34	0.20	3.09	0.62	76.4	8.10	2.55	0.11		0.02	0.13
LT	371+50	372+50	100.00	328	0.53	0.21	0.26	7.17	1.43	58.2	0.03	5.55	16.5	0.34	0.20	3.09	0.62	76.4	8.10	2.55	0.11		0.01	0.13
LT	372+50	373+55	105.00	344	0.49	0.23	0.27	4.93	0.99	67.0	0.03	6.80	16.5	0.36	0.13	2.19	0.44	82.0	8.84	2.04	0.08		0.01	0.10
LT	373+55	374+60	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	16.5	0.36	0.10	1.77	0.35	85.0	9.23	1.79	0.07		0.01	0.08
LT	374+60	375+65	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	16.5	0.36	0.10	1.77	0.35	85.0	9.23	1.79	0.07		0.01	0.08
LT	375+65	376+70	105.00	344	0.46	0.23	0.27	3.97	0.79	71.6	0.03	7.44	16.5	0.36	0.10	1.77	0.35	85.0	9.23	1.79	0.07		0.01	0.08
LT	376+70	378+25	155.00	509	0.72	0.33	0.40	4.85	0.97	67.3	0.05	6.85	16.5	0.53	0.19	2.16	0.43	82.2	8.87	2.02	0.12		0.03	0.15
LT	378+25	379+79	153.75	504	0.72	0.33	0.40	4.97	0.99	66.8	0.05	6.77	16.5	0.52	0.20	2.21	0.44	81.9	8.83	2.05	0.12		0.03	0.15
LT	379+79	382+40	261.25	857	2.71	0.56	0.68	23.26	4.65	30.1	0.08	1.40	16.5	0.89	1.82	7.15	1.43	58.3	5.56	4.16	0.94		0.04	0.98
LT	382+40	385+55	315.00	1033	1.37	0.68	0.82	3.97	0.79	71.6	0.08	7.44	16.5	1.07	0.30	1.77	0.35	85.0	9.23	1.79	0.20		0.04	0.24
LT	385+55	388+46	290.83	954	1.37	0.62	0.75	5.10	1.02	66.2	0.07	6.69	16.5	0.99	0.38	2.27	0.45	81.5	8.78	2.09	0.24		0.04	0.27
LT	388+46	389+01	55.00	180	0.27	0.12	0.14	5.93	1.19	62.8	0.01	6.20	16.5	0.19	0.09	2.61	0.52	79.3	8.49	2.28	0.05		0.01	0.06

Permitted Section: Peach Creek to Bay County Line (FPID 220644-1)

Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	28.5	ft (One Direction) (Pervious = 10.5m (34.4ft))
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)

*Blue cells were manually overridden to avoid negative areas or CN higher than 100

Permitted Information												SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)*	S	Ia	CN*	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
LT	389+01	389+50	49.17	161	0.27	0.11	0.13	7.82	1.56	56.1	0.01	5.24	16.5	0.17	0.11	3.33	0.67	75.0	7.91	2.67	0.06		0.01	0.07
LT	389+50	390+00	50.00	164	0.25	0.11	0.13	5.98	1.20	62.6	0.01	6.17	16.5	0.17	0.08	2.63	0.53	79.2	8.47	2.29	0.05		0.01	0.05
LT	390+00	390+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.00	0.04
LT	390+50	391+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	391+00	391+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	391+50	392+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	392+00	392+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	392+50	393+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	393+00	393+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	393+50	394+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	394+00	394+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	394+50	395+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	395+00	395+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	395+50	396+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	396+00	396+25	25.00	82	0.13	0.05	0.06	6.17	1.23	61.8	0.01	6.07	16.5	0.08	0.04	2.71	0.54	78.7	8.40	2.34	0.02		0.01	0.03
LT	396+25	396+50	25.00	82	0.13	0.05	0.06	6.17	1.23	61.8	0.01	6.07	16.5	0.08	0.04	2.71	0.54	78.7	8.40	2.34	0.02		0.01	0.03
LT	396+50	397+00	50.00	164	0.29	0.11	0.13	8.59	1.72	53.8	0.01	4.90	16.5	0.17	0.12	3.60	0.72	73.5	7.71	2.81	0.07		0.01	0.07
LT	397+00	397+50	50.00	164	0.26	0.11	0.13	6.82	1.36	59.4	0.01	5.72	16.5	0.17	0.09	2.96	0.59	77.2	8.20	2.48	0.05		0.01	0.06
LT	397+50	398+00	50.00	164	0.26	0.11	0.13	6.82	1.36	59.4	0.01	5.72	16.5	0.17	0.09	2.96	0.59	77.2	8.20	2.48	0.05		0.01	0.06
LT	398+00	398+50	50.00	164	0.25	0.11	0.13	5.98	1.20	62.6	0.01	6.17	16.5	0.17	0.08	2.63	0.53	79.2	8.47	2.29	0.05		0.01	0.05
LT	398+50	399+00	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	399+00	399+50	50.00	164	0.22	0.11	0.13	3.97	0.79	71.6	0.01	7.44	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.79	0.03		0.01	0.04
LT	399+50	401+43	192.61	632	0.84	0.41	0.50	3.97	0.79	71.6	0.03	7.44	16.5	0.65	0.19	1.77	0.35	85.0	9.23	1.79	0.12		0.01	0.14
LT	401+43	403+50	207.39	680	0.90	0.45	0.54	3.97	0.79	71.6	0.07	7.44	16.5	0.70	0.20	1.77	0.35	85.0	9.23	1.79	0.13		0.04	0.17
LT	403+50	406+20	270.00	886	1.36	0.58	0.70	6.20	1.24	61.7	0.08	6.05	16.5	0.92	0.45	2.72	0.54	78.6	8.40	2.34	0.27		0.04	0.31
LT	406+20	406+50	30.00	98	0.13	0.06	0.08	3.58	0.72	73.6	0.00	7.72	16.5	0.10	0.03	1.59	0.32	86.3	9.40	1.67	0.02		0.00	0.02
LT	406+50	406+75	25.00	82	0.13	0.05	0.06	6.29	1.26	61.4	0.00	6.00	16.5	0.08	0.04	2.75	0.55	78.4	8.37	2.36	0.02		0.00	0.03
LT	406+75	407+00	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	16.5	0.08	0.02	1.76	0.35	85.0	9.23	1.78	0.02		0.00	0.02
LT	407+00	407+25	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	16.5	0.08	0.02	1.76	0.35	85.0	9.23	1.78	0.02		0.00	0.02
LT	407+25	407+50	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	16.5	0.08	0.02	1.76	0.35	85.0	9.23	1.78	0.02		0.00	0.02
LT	407+50	407+75	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	16.5	0.08	0.02	1.76	0.35	85.0	9.23	1.78	0.02		0.00	0.02
LT	407+75	408+00	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.00	7.45	16.5	0.08	0.02	1.76	0.35	85.0	9.23	1.78	0.02		0.00	0.02
LT	408+00	408+25	25.00	82	0.11	0.05	0.06	3.96	0.79	71.6	0.01	7.45	16.5	0.08	0.02	1.76	0.35	85.0	9.23	1.78	0.02		0.00	0.02
LT	408+25	408+75	50.00	164	0.22	0.11	0.13	3.96	0.79	71.6	0.01	7.45	16.5	0.17	0.05	1.77	0.35	85.0	9.23	1.78	0.03		0.00	0.04
LT	408+75	409+21	45.66	150	0.22	0.10	0.12	5.29	1.06	65.4	0.01	6.58	--	--	--	--	--	--	--	--		0.01	0.00	0.01
Median	285+80	287+45	165.00	541	1.05	0.35	0.43	10.40	2.08	49.0	0.05	4.19	--	--	--	--	--	--	--	--		0.05	0.02	0.07
Median	287+45	289+00	155.00	509	1.06	0.33	0.40	12.00	2.40	45.5	0.07	3.66	--	--	--	--	--	--	--	--		0.07	0.03	0.10
Median	289+00	294+95	595.00	1952	3.91	1.28	1.54	11.09	2.22	47.4	0.18	3.95	--	--	--	--	--	--	--	--		0.18	0.09	0.27
Median	294+95	296+60	165.00	541	1.13	0.35	0.43	12.08	2.42	45.3	0.08	3.63	--	--	--	--	--	--	--	--		0.08	0.04	0.12
Median	296+60	298+00	140.00	459	0.96	0.30	0.36	12.08	2.42	45.3	0.11	3.63	--	--	--	--	--	--	--	--		0.11	0.05	0.16
Median	298+00	300+65	265.00	869	1.82	0.57	0.69	12.08	2.42	45.3	0.11	3.63	--	--	--	--	--	--	--	--		0.11	0.05	0.16
Median	300+65	301+35	70.00	230	0.48	0.15	0.18	11.86	2.37	45.7	0.02	3.70	--	--	--	--	--	--	--	--		0.02	0.01	0.03
Median	301+35	301+80	45.00	148	0.27	0.10	0.12	9.24	1.85	52.0	0.01	4.63	--	--	--	--	--	--	--	--		0.01	0.01	0.02
Median	301+80	303+05	125.00	410	0.69	0.27	0.32	7.61	1.52	56.8	0.03	5.34	--	--	--	--	--	--	--	--		0.03	0.02	0.05
Median	303+22	304+45	123.00	404	0.51	0.26	0.32	3.20	0.64	75.8	0.05	8.01	--	--	--	--	--	--	--	--		0.05	0.03	0.08

Permitted Section: Peach Creek to Bay County Line (FPID 220644-1)

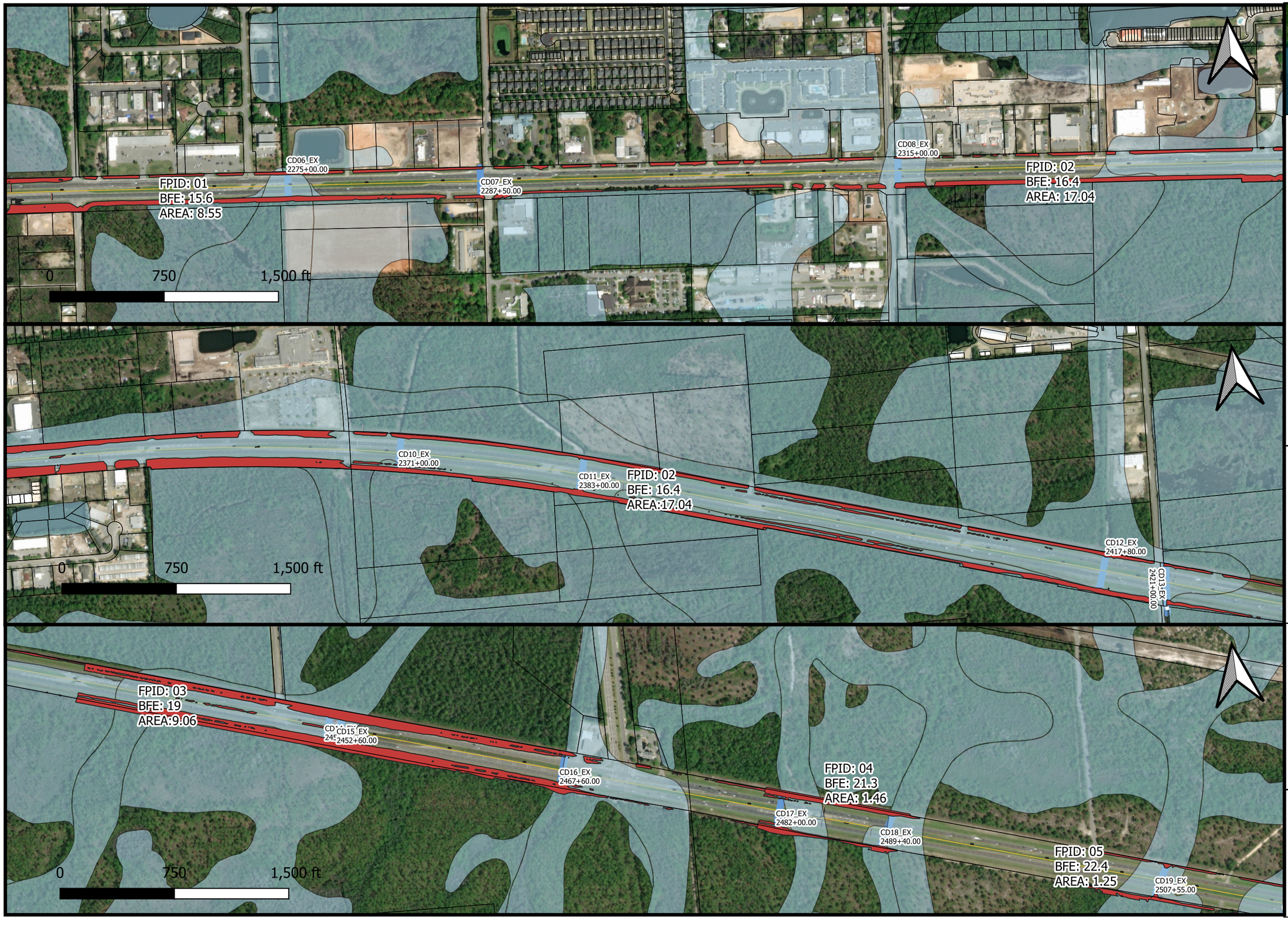
Assumptions:

Rainfall	11.1	inches
Existing Pavement Width	28.5	ft (One Direction) (Pervious = 10.5m (34.4ft))
Proposed Pavement Width	45	(12ft Shared Use Path Added on RT side)
Pavement (CN)	98	
Pervious Area (CN)	39	(Permitted Calculations used Rational Method, Utilized information from FPID 220642-1)

*Blue cells were manually overridden to avoid negative areas or CN higher than 100

Permitted Information												SCS Calculation	Proposed Condition						SCS Calculation	Required Additional Volume Calculations				
Side	Station (m)	Station (m)	Length (m)	Length (ft)	Total Area (AC)	Impervious Area (AC)	Pervious Area (AC)	S	Ia	CN	TV Storage (ac-ft)	Qpre (in.)	Additional Width of Imp. (ft)	Impervious Area (AC)	Pervious Area (AC)*	S	Ia	CN*	Qpost (in.)	Diff (Qpost-Qpre) (in.)	Required Additional Attenuation Volume (ac-	Required Replacement Swale Volume (ac-ft)	50% Additional Treatment Volume (ac-ft)	Total Required Additional Volume (ac-ft)
Median	304+45	306+50	205.00	673	1.09	0.44	0.53	7.07	1.41	58.6	0.13	5.60	--	--	--	--	--	--	--	--		0.13	0.07	0.20
Median	306+50	307+33	82.79	272	0.57	0.18	0.21	12.23	2.45	45.0	0.11	3.59	--	--	--	--	--	--	--	--		0.11	0.06	0.17
Median	307+33	309+00	167.21	549	1.15	0.36	0.43	12.01	2.40	45.4	0.12	3.65	--	--	--	--	--	--	--	--		0.12	0.06	0.19
Median	309+00	311+90	290.00	951	1.78	0.62	0.75	9.75	1.95	50.6	0.11	4.43	--	--	--	--	--	--	--	--		0.11	0.05	0.16
Median	336+92	337+80	88.00	289	0.28	0.19	0.23	0.29	0.06	97.2	0.05	10.76	--	--	--	--	--	--	--	--		0.05	0.03	0.08
Median	337+80	342+50	470.00	1542	3.03	1.01	1.22	10.73	2.15	48.2	0.18	4.07	--	--	--	--	--	--	--	--		0.18	0.09	0.27
Median	342+50	342+98	48.00	157	0.31	0.10	0.12	10.74	2.15	48.2	0.06	4.07	--	--	--	--	--	--	--	--		0.06	0.03	0.09
Median	342+98	343+50	52.00	171	0.34	0.11	0.13	10.86	2.17	47.9	0.08	4.03	--	--	--	--	--	--	--	--		0.08	0.04	0.13
Median	343+50	347+88	438.44	1438	2.27	0.94	1.14	6.65	1.33	60.1	0.08	5.81	--	--	--	--	--	--	--	--		0.08	0.04	0.12
																				Totals	**1.53**	**1.65**	**1.07**	**4.25**

Floodplain Impact Calculations





Legend

- FP Impacts
- R/W
- Existing CD

FEMA Flood Area

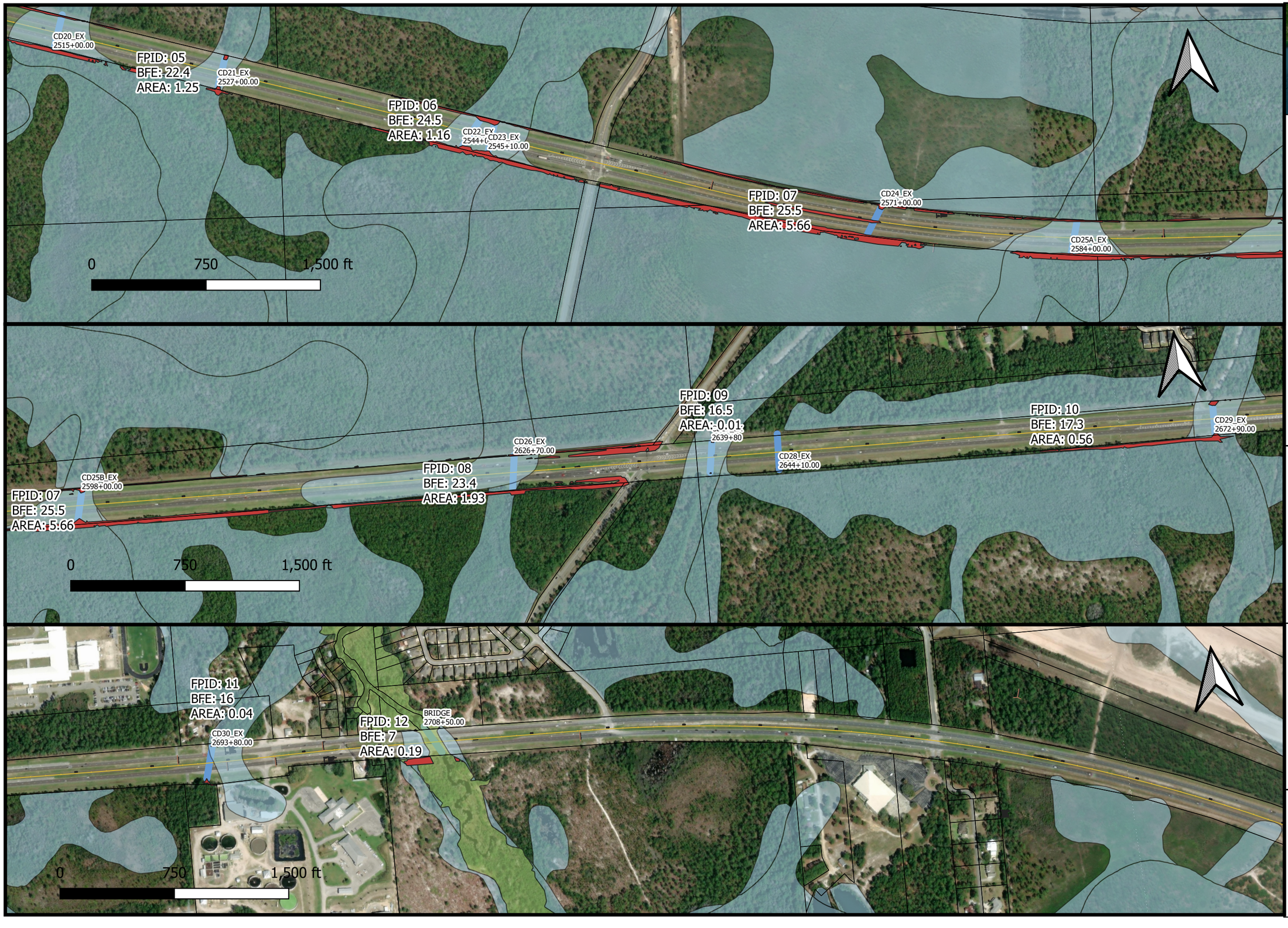
- A
- AE

Figure B1
Floodplain Impacts Map

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us





Legend

- FP Impacts
- R/W
- Existing CD

FEMA Flood Area

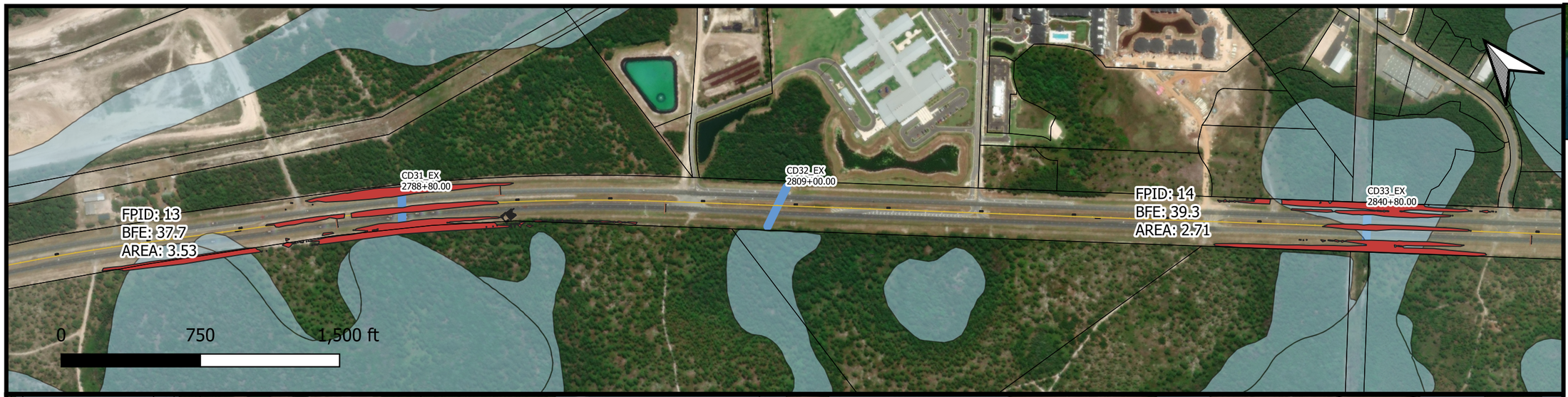
- A
- AE

Figure B2
Floodplain Impacts Map

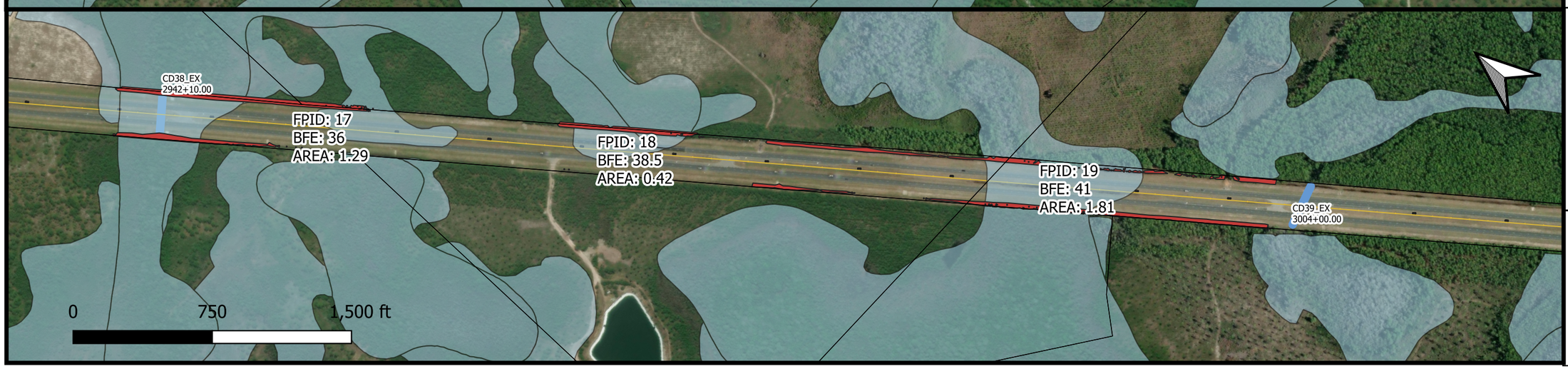
Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us









Legend

- FP Impacts
- R/W
- Existing CD

FEMA Flood Area

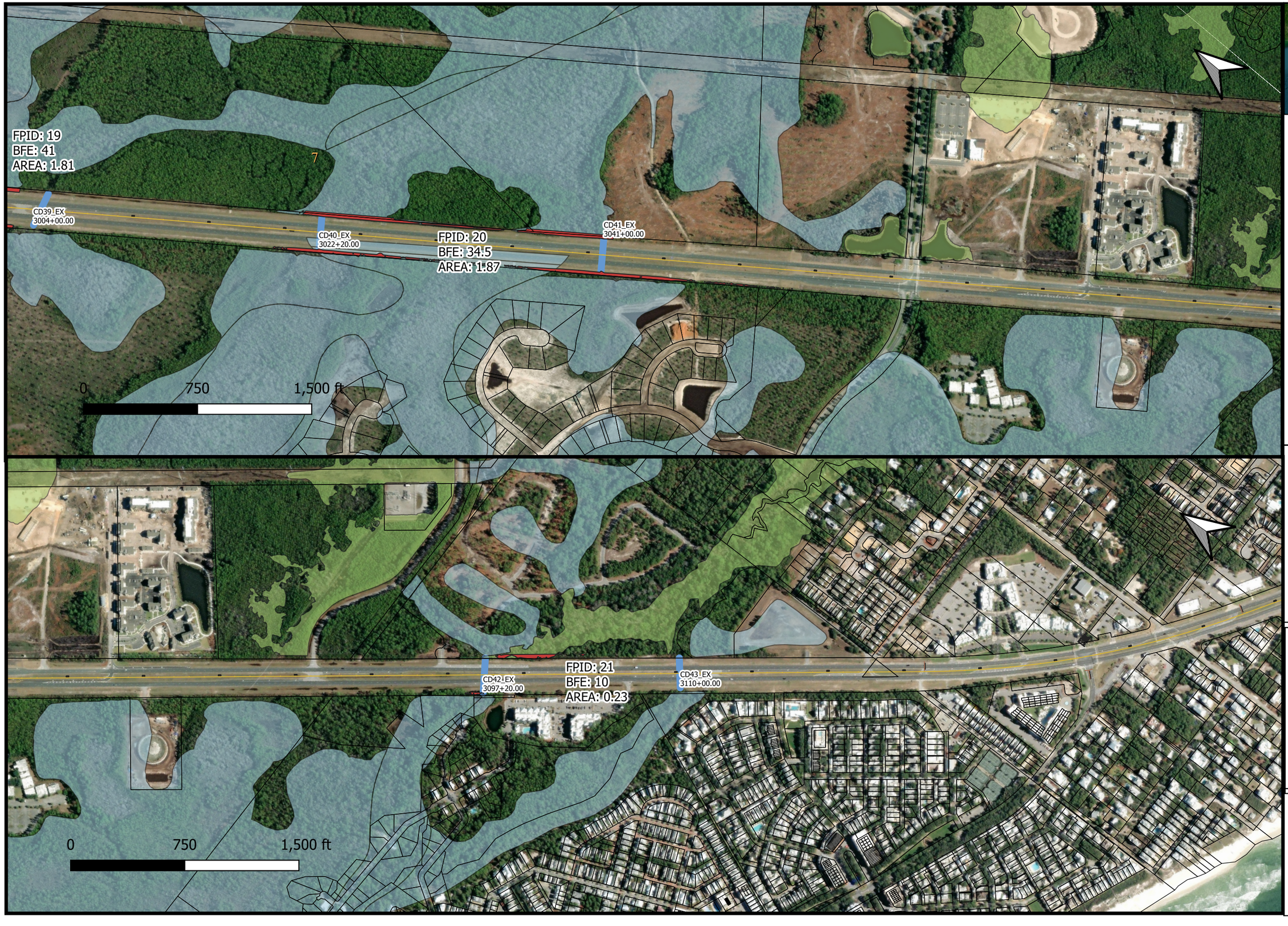
- A
- AE

Figure B3
Floodplain Impacts Map

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group
165 Lincoln Ave
Winter Park, FL 32789
Phone (407) 629-2185
www.balmoralgroup.us





Legend

- FP Impacts
- R/W
- Existing CD

FEMA Flood Area

- A
- AE

Figure B4
Floodplain Impacts Map

Sources: FEMA FIS
Walton County
Effective: 10/05/2017
Revised: 12/30/2020

PD&E Study for SR 30 (US 98) Near San Desin from W CR 30A to W of Phillips Inlet Bridge FDOT District 3 Walton County (FPID: 437179-1-22-01)

The Balmoral Group 165 Lincoln Ave Winter Park, FL 32789 Phone (407) 629-2185
www.balmoralgroup.us

Project:	SR 30 PD&E	**Designer:**	JN	**Date:**	11/9/2023
County:	Walton County	**Reviewer:**	LCS	**Checked:**	1/4/2024

Floodplain Impact Estimates Using Effective FEMA Floodplain

FEMA Floodplain ID	FEMA Flood Zone	BFE Estimate (ft NAVD)	BFE Source*	Estimated Floodplain Depth (ft)	Area of Inundation at Est. BFE (ac)	Estimated Impact Volume (ac-ft)
1	A	15.6	FDB	1.0	8.55	8.55
2	A	16.4	FDB	1.0	17.04	17.04
3	A	19.0	FDB	1.0	9.06	9.06
4	A	21.3	FDB	1.0	1.46	1.46
5	A	22.4	FDB	1.0	1.25	1.25
6	A	24.5	FDB	1.0	1.16	1.16
7	A	25.5	FDB	1.0	5.66	5.66
8	A	23.4	FDB	1.0	1.93	1.93
9	A	16.5	FDB	1.0	0.01	0.01
10	A	17.3	FDB	1.0	0.56	0.56
11	A	16.0	FDB	1.0	0.04	0.04
12	AE	7.0	BFE	1.0	0.19	0.19
13	A	37.7	FDB	1.0	3.53	3.53
14	A	39.3	FDB	1.0	2.71	2.71
15	A	38.5	FDB	1.0	2.11	2.11
16	A	40.0	FDB	1.0	3.32	3.32
17	A	36.0	FDB	1.0	1.29	1.29
18	A	38.5	FDB	1.0	0.42	0.42
19	A	41.0	FDB	1.0	1.81	1.81
20	A	34.5	FDB	1.0	1.87	1.87
21	AE	10.0	BFE	1.0	0.23	0.23
					Total Impact Volume	**64.23**

***BFE Source Legend**

FDB - Flood Data Box 100-year stage

BFE - Zone AE with an established BFE

Appendix C

Existing Permitted Documents

SR 30 (US 98) from CR 30A to East of SR 83 (US 3310) (220642-1)

Construction Plans and Drainage Report

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	34

GENERAL NOTES

1. EXISTING DRAINAGE STRUCTURES WITHIN THE CONSTRUCTION LIMITS SHALL BE REMOVED UNLESS OTHERWISE NOTED.
2. 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 ENGINEER SHOULD NOTIFY THE DISTRICT LOCATION SURVEYOR, WITHOUT DELAY, BY TELEPHONE.
3. GRADES SHOWN ARE FINISHED GRADES.
4. B.M. DATA IS NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD-'29).
5. BUILDINGS TO BE REMOVED BY OTHERS UNLESS OTHERWISE NOTED.
6. CONTRACTOR SHALL CLEAR, GRUB, DEMUCK, AND BACKFILL WITH SUITABLE MATERIAL PRIOR TO CHELCO POLE RELOCATIONS.
7. ALL PERMANENT GRASS AREAS ARE TO RECEIVE A 150 mm TOPSOIL TREATMENT.
8. EXISTING STREET AND ROAD NAME SIGNS ON THIS PROJECT ARE TO BE TEMPORARILY RELOCATED DURING CONSTRUCTION AND KEPT VISIBLE AT ALL TIMES FOR THE FACILITATION OF ACCESS BY EMERGENCY VEHICLE TRAFFIC.
9. THIS PROJECT WILL REQUIRE AN NPDES CONSTRUCTION PERMIT AND MUST REMAIN IN COMPLIANCE WITH NPDES REGULATIONS.
10. THE CONTRACTOR SHALL NOT BRING ANY HAZARDOUS MATERIALS ONTO THE PROJECT. SHOULD THE CONTRACTOR REQUIRE SUCH FOR PERFORMING THE CONTRACTED WORK, THE CONTRACTOR SHALL REQUEST, IN WRITING, WRITTEN PERMISSION FROM THE PROJECT ENGINEER. THE CONTRACTOR SHALL PROVIDE A COPY TO THE DISTRICT CONTAMINATION IMPACTS COORDINATOR (DCIC). THE CONTRACTOR SHALL PROVIDE THE DCIC WITH A COPY OF THE MATERIAL SAFETY DATA SHEET (MSDS) FOR EACH HAZARDOUS MATERIAL PROPOSED FOR USE. THE PROJECT ENGINEER SHALL COORDINATE WITH THE DCIC PRIOR TO ISSUING WRITTEN APPROVAL TO THE CONTRACTOR. BECAUSE STATE LAW DOES NOT TREAT PETROLEUM PRODUCTS THAT ARE PROPERLY CONTAINERIZED AND INTENDED FOR EQUIPMENT USE AS A HAZARDOUS MATERIAL, SUCH PRODUCTS DO NOT NEED A MSDS SUBMITTAL.
11. ANY KNOWN OR SUSPECTED HAZARDOUS MATERIAL FOUND ON THE PROJECT BY THE CONTRACTOR SHALL BE IMMEDIATELY REPORTED TO THE PROJECT ENGINEER, WHO SHALL DIRECT THE CONTRACTOR TO PROTECT THE AREA OF KNOWN OR SUSPECTED CONTAMINATION FROM FURTHER ACCESS. THE PROJECT ENGINEER IS TO NOTIFY THE DCIC OF THE DISCOVERY. THE DCIC WILL ARRANGE FOR INVESTIGATION, IDENTIFICATION, AND REMEDIATION OF THE HAZARDOUS MATERIAL. THE CONTRACTOR SHALL NOT RETURN TO THE AREA OF CONTAMINATION UNTIL APPROVAL IS PROVIDED BY THE PROJECT ENGINEER; THE DCIC WILL ADVISE THE PROJECT ENGINEER.
12. CONTRACTOR SHALL NOTIFY PROPERTY OWNERS 60 (SIXTY) DAYS PRIOR TO COMMENCEMENT OF MODIFICATIONS TO PRIVATE DRIVEWAYS THROUGHOUT THE PROJECT.
13. EXISTING DRIVEWAYS WITHIN THE LIMITS OF THE PROJECT HAVE BEEN EVALUATED FOR CONFORMANCE WITH FAC RULE 14-97.003(1)(b). THOSE THAT ARE IN SUBSTANTIAL CONFORMANCE WITH THE RULE AND THAT ARE TO REMAIN AT THEIR EXISTING LOCATIONS, ARE NOT SHOWN ON THE PLANS BUT ARE TO BE RECONSTRUCTED IN CONFORMANCE TO STANDARDS. THOSE THAT ARE TO BE RELOCATED OR CLOSED ARE DETAILED ON THE PLANS.
14. THE CONTRACTOR SHALL NOT EXCAVATE IN THE AREA AROUND THE EXISTING DRAIN FIELD.
15. THE LOCATION OF THE UTILITIES SHOWN IN THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL COORDINATE EXACT LOCATION WITH UTILITY COMPANY AND THROUGH FIELD VERFICATION.
16. UTILITIES ARE TO BE ADJUSTED BY OTHERS AS DIRECTED BY THE ENGINEER.
17. FOR UTILITY ADJUSTMENT SYMBOLS, SEE INDEX NO. 002.
18. 48 HOURS PRIOR TO DIGGING THE CONTRACTOR SHALL CALL SUNSHINE STATE ONE CALL OF FLORIDA, TELEPHONE NUMBER (1-800-432-4770) AND THE UTILITY OWNER AND REQUEST UTILITY LOCATIONS. A CONTRACTOR'S REPRESENTATIVE MUST BE PRESENT WHEN UTILITY COMPANIES LOCATE THEIR FACILITIES.
19. UTILITY ADJUSTMENTS SHOWN ARE SUBJECT TO CHANGE BASED ON ADDITIONAL FIELD VERIFICATION AND DESIGN MODIFICATIONS BY THE RESPECTIVE UTILITY OWNERS.
20. UTILITY OWNERS.

AT&T
MR. BOB WADLEY
212 N. MARION ST. SUITE 117
LAKE CITY, FL 32055
(904) 755-3414

CHOCTAWHATCHEE ELECTRIC CO.
MR. DARRELL L. SMITH
P.O. BOX 512
DEFUNIAK SPRINGS, FL. 32435
(850) 892-2111

MEDIACOM
SHAYNE ROUTH
4435 GULF BREEZE PRKWY.
GULF BREEZE, FL. 32561
(850) 932 9233

BELLSOUTH
MR. HAL HINOTE
PO BOX 2488
PANAMA CITY, FL 32402
(850) 784-3721

SPRINT/FL.
MR. WILLIAM T. BELLAMY
P.O. BOX 1778
650 DENTON BLVD.
FT. WALTON BEACH, FL 32549
(850) 664-3763

REGIONAL UTILITIES, INC.
MR. BRICE NIST
70 LOGAN LN.
SANTA ROSA BEACH, FL 32459
(850) 231-5114

21. ALL HAY BALES, SILT FENCES, AND STAKED TURBIDITY BARRIERS SHALL BE REMOVED AT THE COMPLETION OF THE PROJECT.
22. ALL SOD MATERIALS SHALL BE SUBJECT TO INSPECTION BY THE DEPARTMENT PRIOR TO PLACEMENT. ANY SOD WITH NOXIOUS WEEDS AND GRASSES, INCLUDING TROPICAL SODA APPLE SHALL BE REJECTED FOR USE ON THIS PROJECT. THE CONTRACTOR SHALL FURNISH TO THE ENGINEER, PRIOR TO INCORPORATION INTO THE PROJECT, A CERTIFICATE FROM THE FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES DIVISION OF PLAN INDUSTRY, STATING THAT THE SOD, HAY STRAW, AND MULCH MATERIALS ARE FREE FROM NOXIOUS WEEDS, INCLUDING TROPICAL APPLE.
23. ALL PAVEMENT MARKINGS WILL BE REMOVED BY HYDROBLASTING.

1/7/00

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

GENERAL NOTES

n:/design/sr30met/gnotes01.dgn Jan. 08, 2000 16:56:29

Station No.	Structure No.	DESIGN FLOOD 2% Prob 50 Yr. Freq.		BASE FLOOD 1% Prob. 100 Yr. Freq.		OVERTOPPING FLOOD				GREATEST FLOOD			
		Discharge	Stage	Discharge	Stage	Discharge	Stage	Prob. %	Freq. Yr.	Discharge	Stage	Prob. %	Freq. Yr.
1123+89.3	S-5	1.150	4.74	1.246	4.79					1.492	4.89	0.2	500
1128+02.0	S-13	1.625	4.70	1.758	4.76					2.110	4.90	0.2	500
1130+22.6	S-16	1.110	4.56	1.212	4.58					1.444	4.68	0.2	500
1133+59.7	S-24	1.860	4.77	2.027	4.83					2.441	5.00	0.2	500
1139+97.9	S-43	1.038	4.60	1.134	4.66					1.303	4.78	0.2	500
1140+30.8	S-45	1.944	4.60	2.126	4.66					2.577	4.78	0.2	500
1146+64.4	S-54	0.685	4.76	0.742	4.82					0.872	4.95	0.2	500
1150+74.1	S-78	2.373	4.65	2.585	4.75					3.098	4.99	0.2	500
1154+62.7	S-95	1.048	5.15	1.127	5.26					1.331	5.59	0.2	500
1162+94.45	S-157	10.944	4.92	12.998	5.25	15.702	5.79	0.65	153				
1170+73.1	S-202	0.966	4.22	1.053	4.22					1.266	4.23	0.2	500
1178+62.0	S-218	1.422	4.77	1.563	4.82					1.892	4.98	0.2	500
1180+02.0	S-220	0.663	5.06	0.714	5.11					0.818	5.21	0.2	500
1183+69.1	S-226	4.950	5.04	5.426	5.10					6.499	5.23	0.2	500
1194+35.1	S-230	1.957	5.16	2.135	5.19					2.549	5.28	0.2	500
1195+62.9	S-235	0.739	5.26	0.799	5.28					0.960	5.32	0.2	500
1204+78.0	S-244	1.547	5.65	1.669	5.71					2.010	5.89	0.2	500
1205+02.5	S-245	0.707	5.65	0.764	5.71					0.934	5.89	0.2	500
1209+54.7	S-248	3.701	5.73	4.066	5.84					4.876	6.12	0.2	500
1213+95.3	S-254	1.028	6.40	1.124	6.50					1.359	6.84	0.2	500
1216+13.4	S-257	2.540	7.60	2.775	7.83	3.143	8.08	0.35	285				

DESIGN FLOOD: THE FLOOD SELECTED BY F.D.O.T. TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PREFORMANCE.

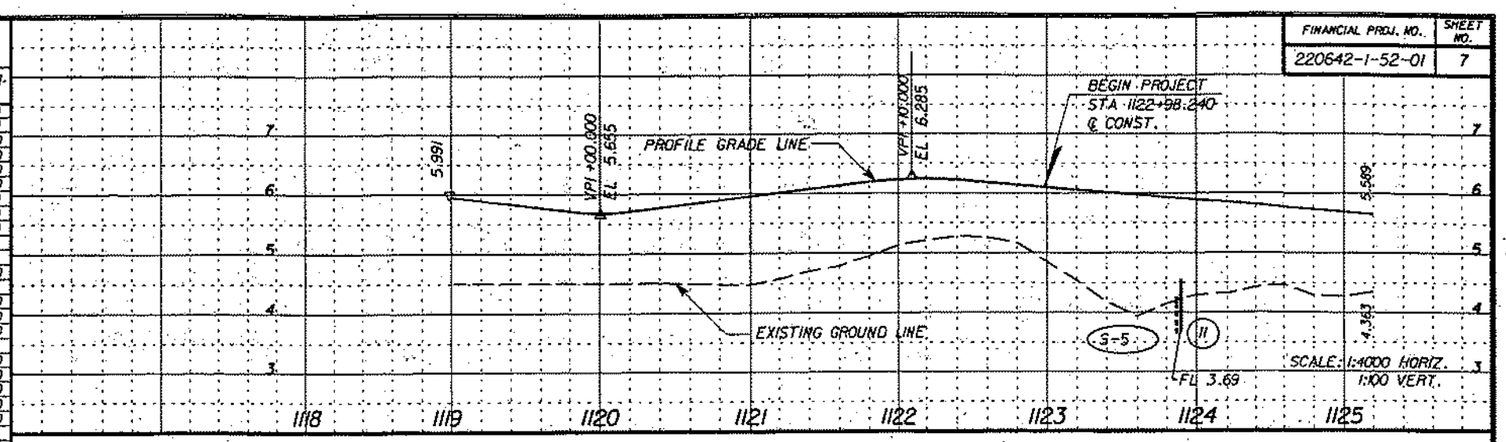
BASE FLOOD: THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY)

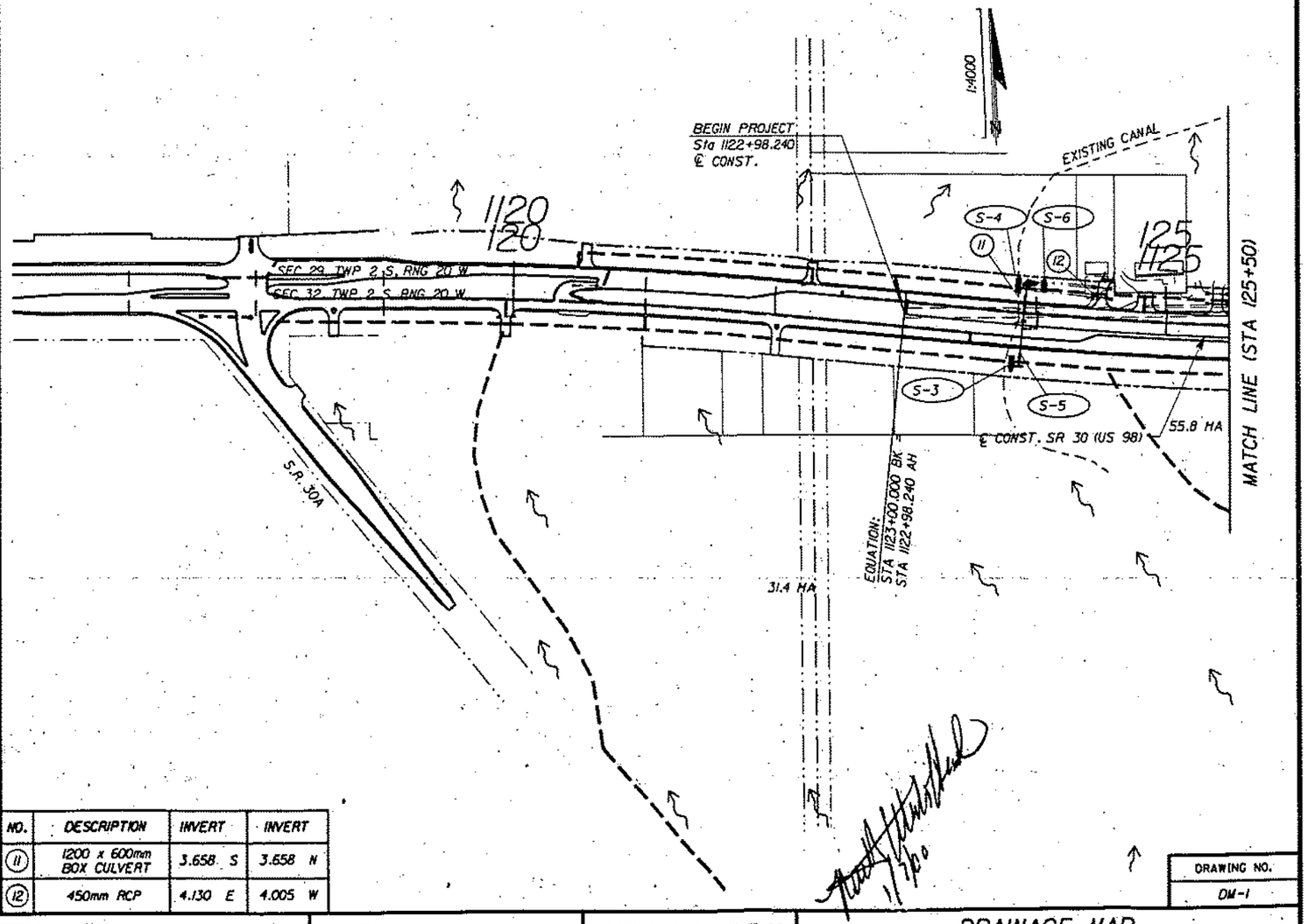
OVERTOPPING FLOOD: THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THROUGH EMERGENCY RELIEF STRUCTURES.

GREATEST FLOOD: THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT PRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY)

NOTE:
HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY BASED ON CONDITIONS AND JUDGMENTS AT THE TIME OF DESIGN. ESPECIALLY IN URBAN AREAS AND SMALL WATERSHEDS, THE VALUES SHOWN ARE VARIABLE AND HIGHLY DEPENDENT ON ANTECEDENT CONDITIONS, RAINFALL INTENSITY, LAND-USE AND OVERLAND FLOW.

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	7





NO.	DESCRIPTION	INVERT	INVERT
11	1200 x 600mm BOX CULVERT	3.658 S	3.658 N
12	450mm RCP	4.130 E	4.005 W

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

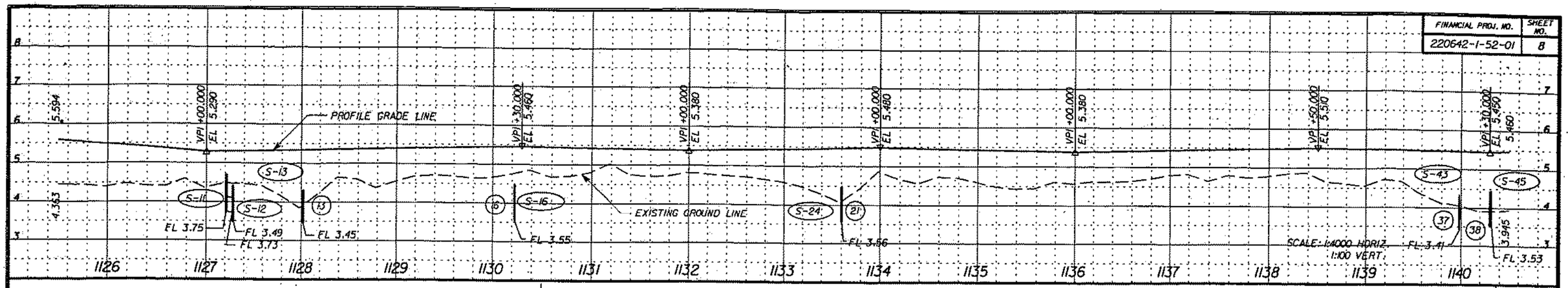
Moreland Altobelli Associates, Inc.

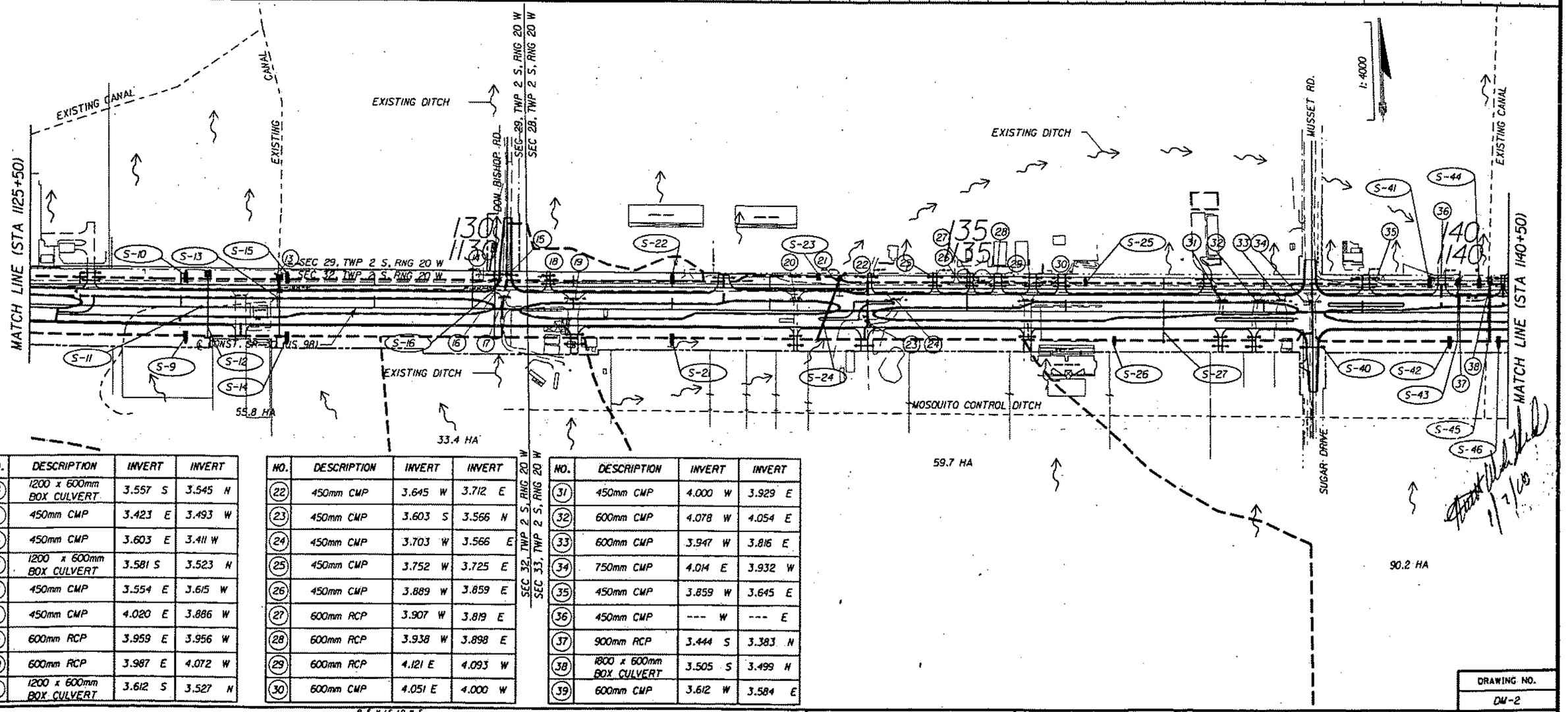
FLORIDA DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP
STA. 1120+00 TO STA. 1125+50

DRAWING NO.
DM-1

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	8





NO.	DESCRIPTION	INVERT	INVERT
13	1200 x 600mm BOX CULVERT	3.557 S	3.545 N
14	450mm CMP	3.423 E	3.493 W
15	450mm CMP	3.603 E	3.411 W
16	1200 x 600mm BOX CULVERT	3.581 S	3.523 N
17	450mm CMP	3.554 E	3.615 W
18	450mm CMP	4.020 E	3.886 W
19	600mm RCP	3.959 E	3.956 W
20	600mm RCP	3.987 E	4.072 W
21	1200 x 600mm BOX CULVERT	3.612 S	3.527 N

NO.	DESCRIPTION	INVERT	INVERT
22	450mm CMP	3.645 W	3.712 E
23	450mm CMP	3.603 S	3.566 N
24	450mm CMP	3.703 W	3.566 E
25	450mm CMP	3.752 W	3.725 E
26	450mm CMP	3.889 W	3.859 E
27	600mm RCP	3.907 W	3.819 E
28	600mm RCP	3.938 W	3.898 E
29	600mm RCP	4.121 E	4.093 W
30	600mm CMP	4.051 E	4.000 W

NO.	DESCRIPTION	INVERT	INVERT
31	450mm CMP	4.000 W	3.929 E
32	600mm CMP	4.078 W	4.054 E
33	600mm CMP	3.947 W	3.816 E
34	750mm CMP	4.014 E	3.932 W
35	450mm CMP	3.859 W	3.645 E
36	450mm CMP	--- W	--- E
37	900mm RCP	3.444 S	3.383 N
38	1800 x 600mm BOX CULVERT	3.505 S	3.499 N
39	600mm CMP	3.612 W	3.584 E

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

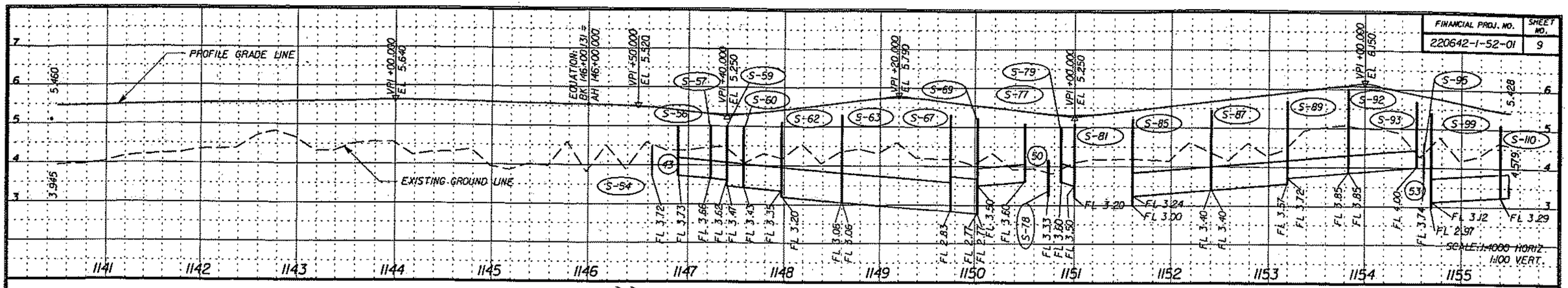
FLORIDA DEPARTMENT OF TRANSPORTATION

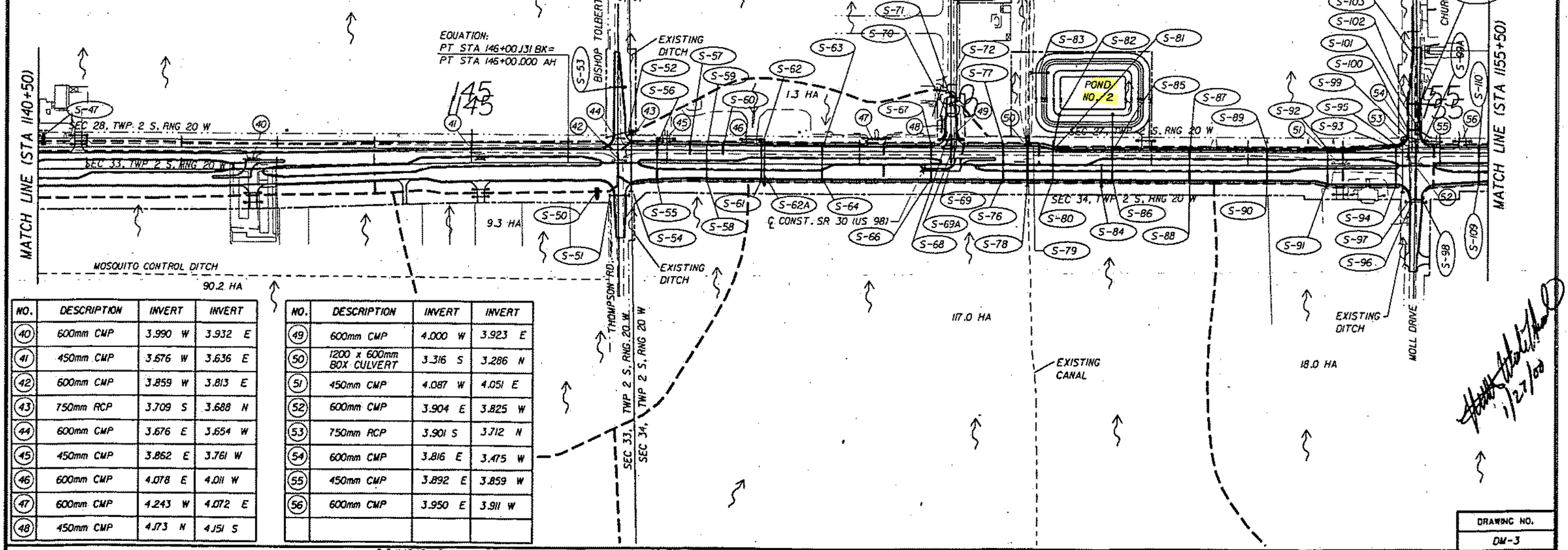
DRAINAGE MAP

STA. 1125+50 TO STA. 1140+50

DRAWING NO.
DM-2

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	9





NO.	DESCRIPTION	INVERT	INVERT
40	600mm CMP	3.990 W	3.932 E
41	450mm CMP	3.676 W	3.636 E
42	600mm CMP	3.859 W	3.813 E
43	750mm RCP	3.709 S	3.688 N
44	600mm CMP	3.676 E	3.654 W
45	450mm CMP	3.862 E	3.761 W
46	600mm CMP	4.078 E	4.011 W
47	600mm CMP	4.243 W	4.072 E
48	450mm CMP	4.173 N	4.151 S

NO.	DESCRIPTION	INVERT	INVERT
49	600mm CMP	4.000 W	3.923 E
50	1200 x 600mm BOX CULVERT	3.316 S	3.286 N
51	450mm CMP	4.087 W	4.051 E
52	600mm CMP	3.904 E	3.825 W
53	750mm RCP	3.901 S	3.712 N
54	600mm CMP	3.816 E	3.475 W
55	450mm CMP	3.892 E	3.859 W
56	600mm CMP	3.950 E	3.911 W

1/27/00

DRAWING NO.
DM-3

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

STA. 1140+50 TO STA. 1155+50

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	10

PROFILE GRADE LINE

EXISTING GROUND LINE

VPI +60.000 EL 5.250
VPI +60.000 EL 6.150
VPI +00.000 EL 5.430
VPI +00.000 EL 6.030
VPI +80.000 EL 5.490
VPI 60.000 EL 6.390
VPI +40.000 EL 5.850
VPI +20.000 EL 6.390

SCALE: 1:4000 HORIZ.
1:100 VERT.

1156 1157 1158 1159 1160 1161 1162 1163 1164 1165 1166 1167 1168 1169 1170

MATCH LINE (STA 1155+50)

MATCH LINE (STA 1170+50)

SEC 27, TWP 2 S, RNG 20 W

SEC 34, TWP 2 S, RNG 20 W

SEC 35, TWP 2 S, RNG 20 W

SEC 26, TWP 2 S, RNG 20 W

EXISTING CANAL

POND NO. 6

POND NO. 4/5

EXISTING DITCH

℄ CONST. SR 30 (US 98)

C.R. 393

18.0 HA

69.8 HA

218.7 HA

25.1 HA

1:4000

NO.	DESCRIPTION	INVERT	INVERT
57	600mm RCP	4.084 E	4.039 W
58	450mm CMP	3.965 E	3.962 W
59	450mm CMP	4.090 E	4.084 W
60	450mm CMP	4.045 E	3.959 W
61	450mm CMP	4.237 W	4.203 E
62	450mm CMP	4.188 W	4.161 E
63	450mm CMP	4.231 W	4.206 E
64	450mm CMP	4.179 W	4.164 E
65	450mm CMP	3.911 E	4.014 W
66	600mm CMP	4.112 E	4.000 W

NO.	DESCRIPTION	INVERT	INVERT
67	300mm CMP	4.115 S	4.039 N
68	600mm CMP	4.029 E 4.023 E	4.011 W 3.981 W
69	600mm CMP	4.099 W	4.048 E
70	600mm RCP	3.856 W	3.661 E
71	1050mm RCP	3.082 S 3.088 S 3.060 S 3.057 S	2.743 N 2.923 N 2.911 N 2.896 N
72	600mm CMP	4.008 W	3.286 E
73	600mm CMP	3.429 W	3.609 E
74	600mm CMP INLET	3.615 W GRATE EL 4.569	3.633 E
75	600mm CMP GRATE	3.648 W 4.801	3.700 E

NO.	DESCRIPTION	INVERT	INVERT
76	600mm CMP GRATE	3.719 W 4.880	3.743 E
77	450mm CMP GRATE	3.798 W 4.551	3.968 E
78	450mm CMP GRATE	3.975 W 4.846	3.975 E
79	450mm CMP GRATE	- - - W 4.621	- - - E
80	450mm CMP GRATE	4.154 W 4.907	4.087 E
81	450mm CMP GRATE	4.099 W 4.685	4.151 E
82	375mm CMP	4.066 W	3.975 E
83	900mm CMP	3.883 W	3.904 E
84	450mm CMP	3.618 W	3.493 E

NO.	DESCRIPTION	INVERT	INVERT
84A	750mm RCP	3.460 W	3.280 E
84B	600mm CMP		
84C	900mm CMP	3.600 W	3.520 E
84D	375mm CMP		

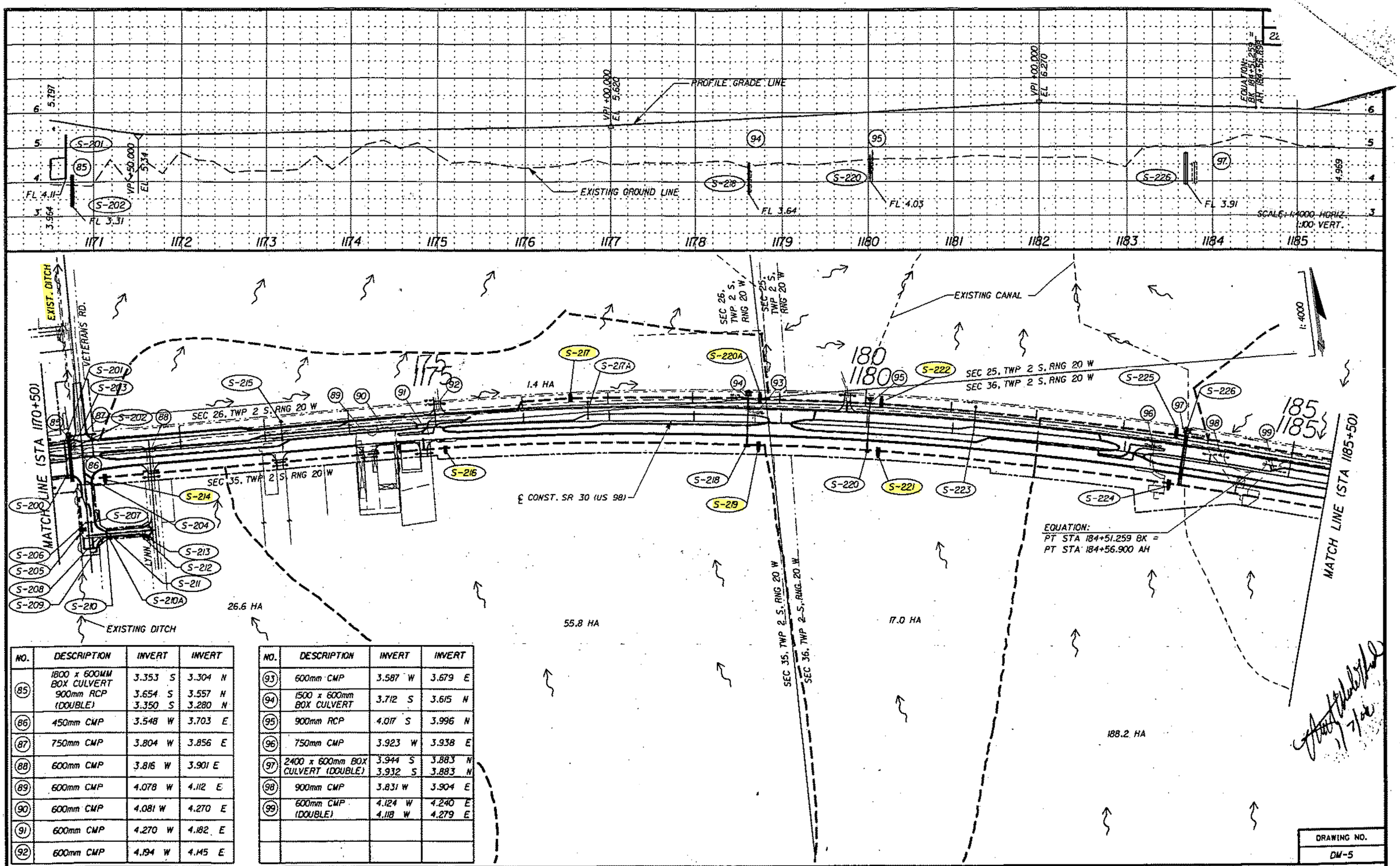
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

DRAWING NO. DM-4

DRAINAGE MAP
STA. 1155+50 TO STA. 1170+50



NO.	DESCRIPTION	INVERT	INVERT
85	1800 x 600MM BOX CULVERT	3.353 S	3.304 N
	900mm RCP	3.654 S	3.557 N
	(DOUBLE)	3.350 S	3.280 N
86	450mm CMP	3.548 W	3.703 E
87	750mm CMP	3.804 W	3.856 E
88	600mm CMP	3.816 W	3.901 E
89	600mm CMP	4.078 W	4.112 E
90	600mm CMP	4.081 W	4.270 E
91	600mm CMP	4.270 W	4.182 E
92	600mm CMP	4.194 W	4.145 E

NO.	DESCRIPTION	INVERT	INVERT
93	600mm CMP	3.587 W	3.679 E
94	1500 x 600mm BOX CULVERT	3.712 S	3.615 N
95	900mm RCP	4.017 S	3.996 N
96	750mm CMP	3.923 W	3.938 E
97	2400 x 600mm BOX	3.944 S	3.883 N
	CULVERT (DOUBLE)	3.932 S	3.883 N
98	900mm CMP	3.831 W	3.904 E
99	600mm CMP	4.124 W	4.240 E
	(DOUBLE)	4.118 W	4.279 E

REVISIONS

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

Moreland Altobelli Associates, Inc.

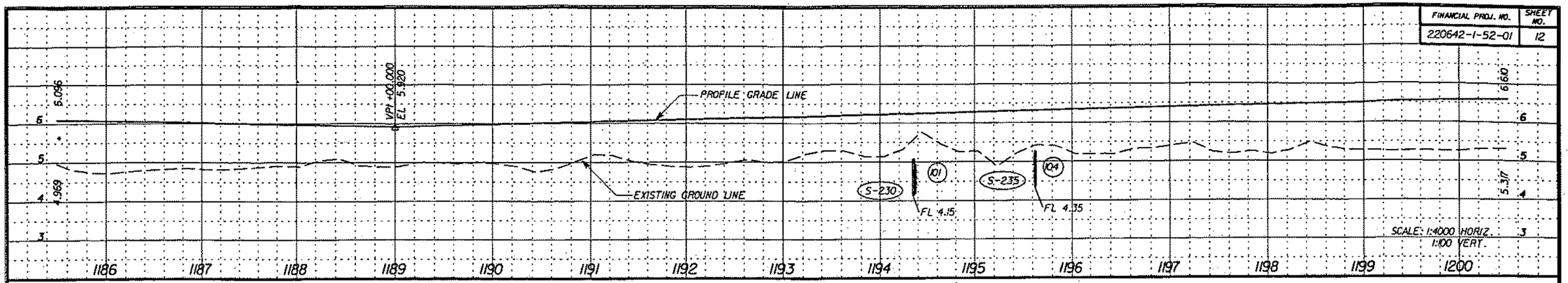
FLORIDA DEPARTMENT OF TRANSPORTATION

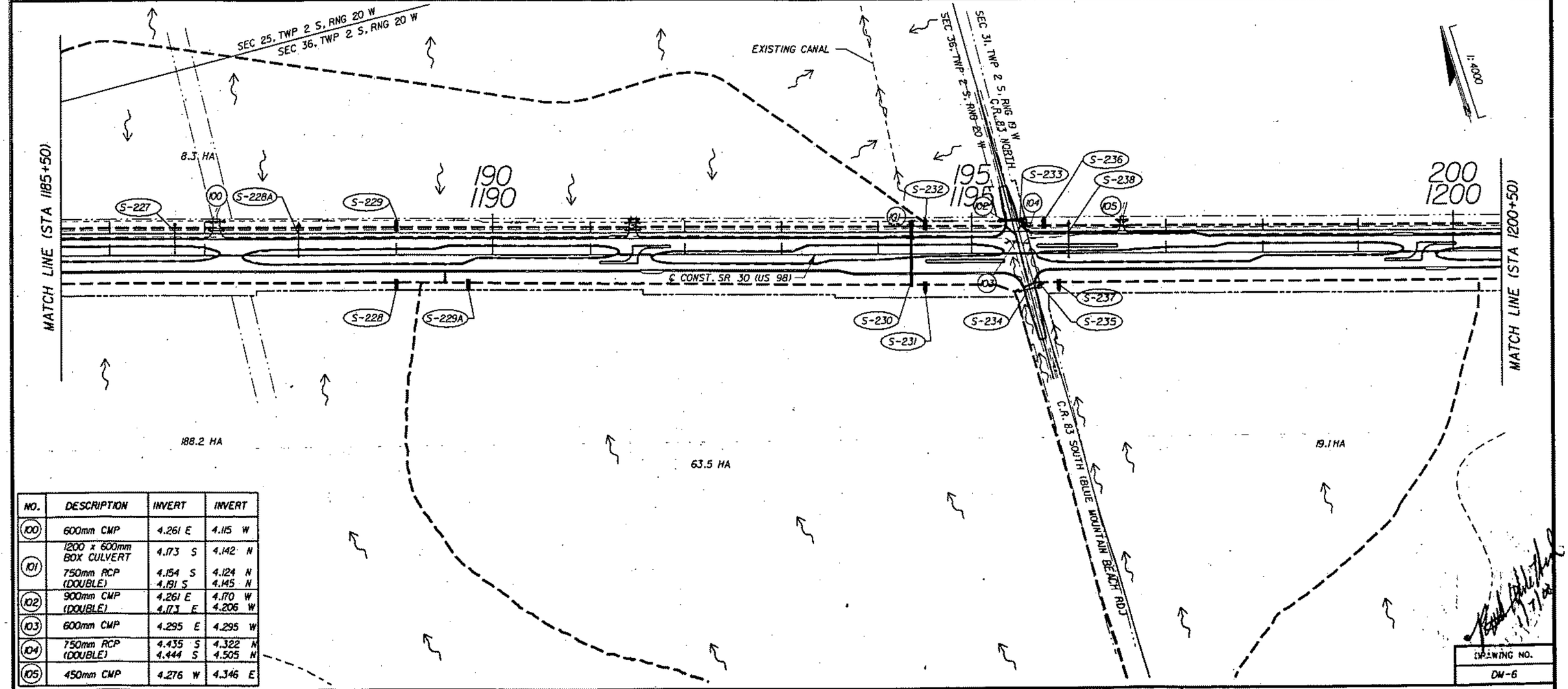
DRAWING NO. DM-5

DRAINAGE MAP
STA. 1170+50 TO STA. 1185+50

n:/design/sr30mat/dmprd05.dgn Jan. 07, 2000 16:11:53

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	12





NO.	DESCRIPTION	INVERT	INVERT
100	600mm CMP	4.261 E	4.115 W
101	1200 x 600mm BOX CULVERT	4.173 S	4.142 N
	750mm RCP (DOUBLE)	4.154 S 4.191 S	4.124 N 4.145 N
102	900mm CMP (DOUBLE)	4.261 E 4.173 E	4.170 W 4.206 W
103	600mm CMP	4.295 E	4.295 W
104	750mm RCP (DOUBLE)	4.435 S 4.444 S	4.322 N 4.505 N
105	450mm CMP	4.276 W	4.346 E

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

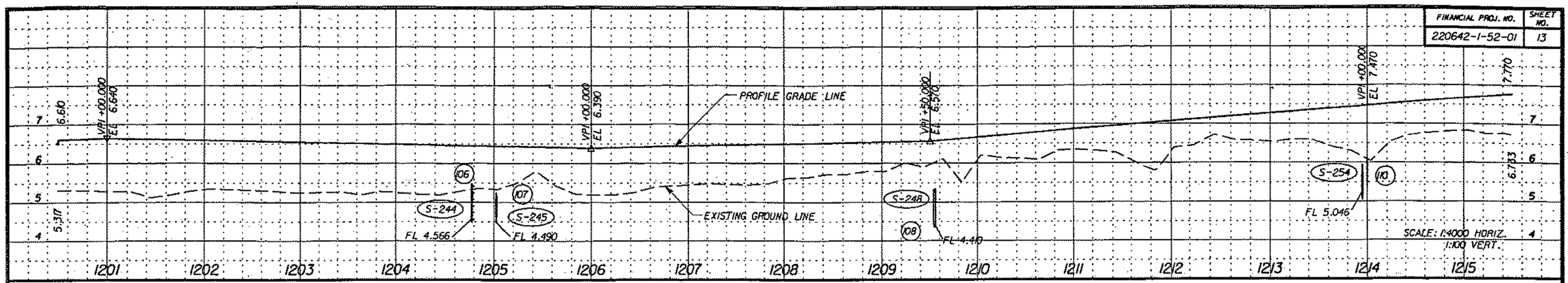
Moreland Altobelli Associates, Inc.

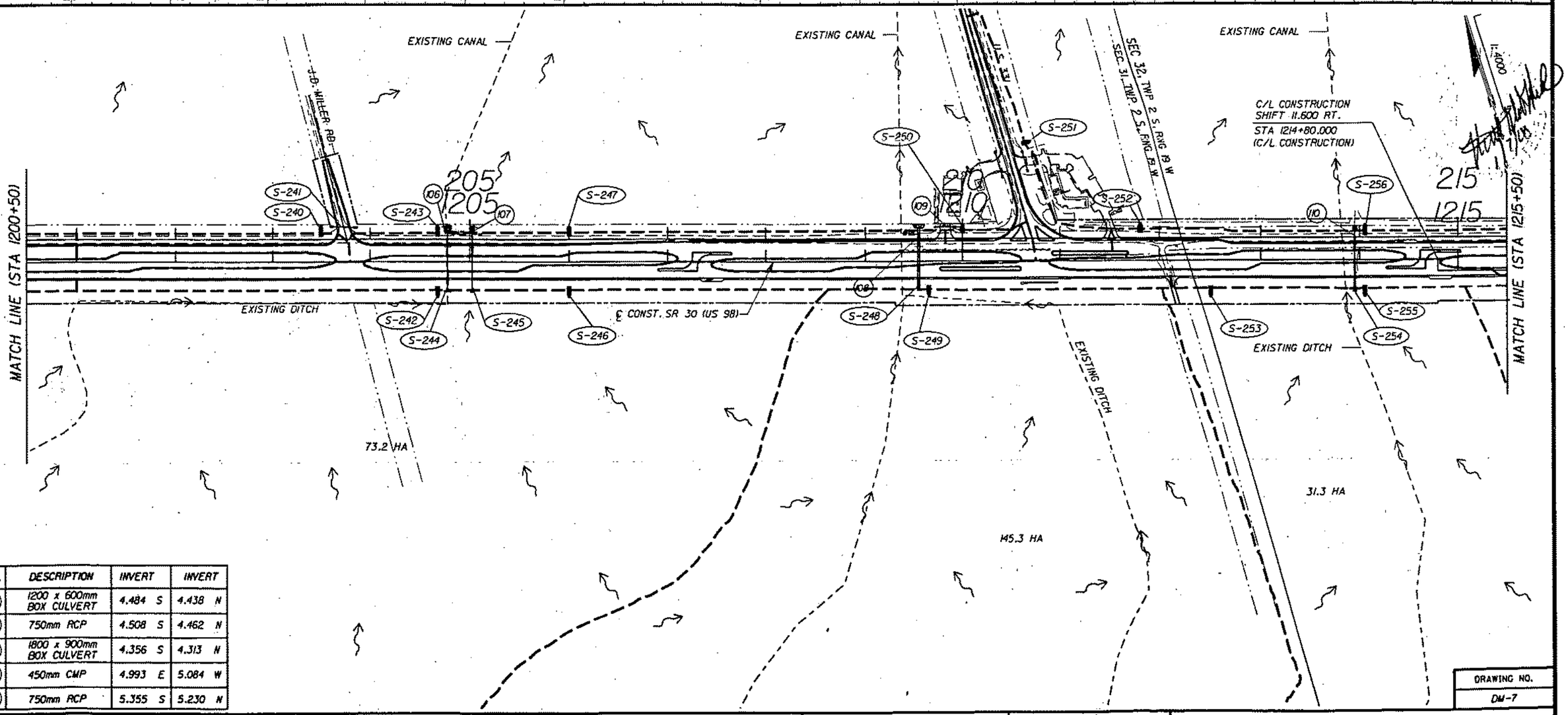
FLORIDA DEPARTMENT OF TRANSPORTATION

DRAWING NO. DM-6

DRAINAGE MAP
STA. 1185+50 TO STA. 1200+50

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	13





NO.	DESCRIPTION	INVERT	INVERT
106	1200 x 600mm BOX CULVERT	4.484 S	4.438 N
107	750mm RCP	4.508 S	4.462 N
108	1800 x 900mm BOX CULVERT	4.356 S	4.313 N
109	450mm CMP	4.993 E	5.084 W
110	750mm RCP	5.355 S	5.230 N

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

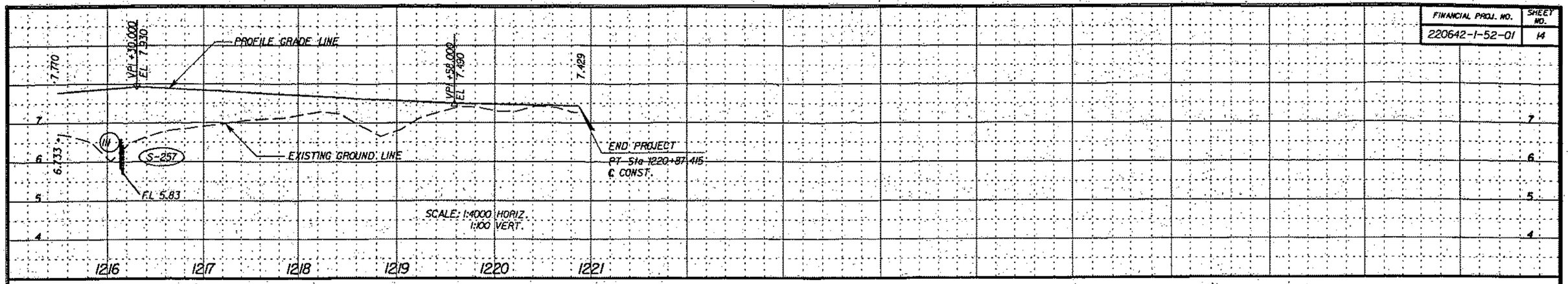
FLORIDA DEPARTMENT OF TRANSPORTATION

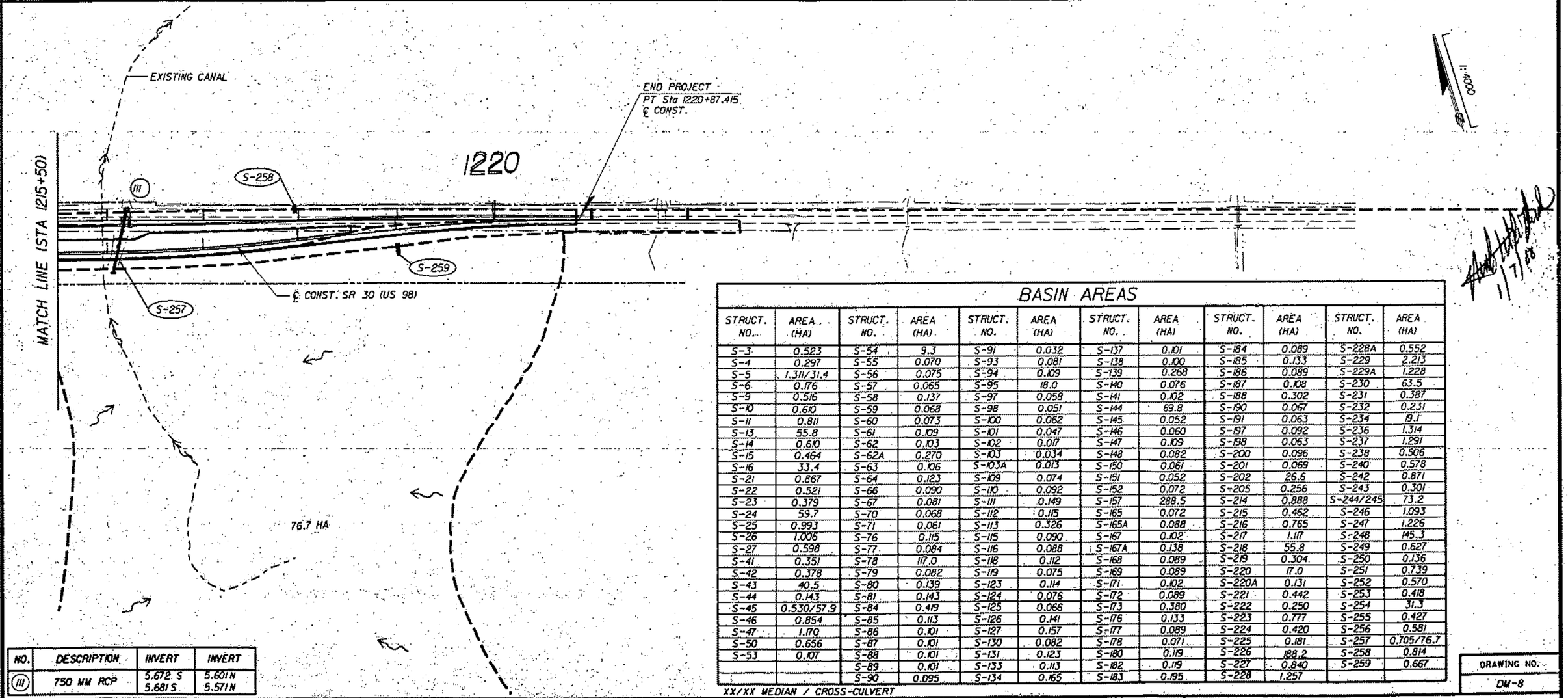
DRAINAGE MAP
STA. 1200+50 TO STA. 1215+50

DRAWING NO.
DM-7

n:/design/sr30mst/drmprd07.dgn Jan. 07, 2000 18:12:06

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	14





NO.	DESCRIPTION	INVERT	INVERT
(III)	750 MM RCP	5.672 S 5.681 S	5.601 N 5.571 N

BASIN AREAS

STRUCT. NO.	AREA (HA)	STRUCT. NO.	AREA (HA)	STRUCT. NO.	AREA (HA)	STRUCT. NO.	AREA (HA)	STRUCT. NO.	AREA (HA)	STRUCT. NO.	AREA (HA)
S-3	0.523	S-54	9.3	S-91	0.032	S-137	0.101	S-184	0.089	S-228A	0.552
S-4	0.297	S-55	0.070	S-93	0.081	S-138	0.100	S-185	0.133	S-229	2.213
S-5	1.311/31.4	S-56	0.075	S-94	0.109	S-139	0.268	S-186	0.089	S-229A	1.228
S-6	0.176	S-57	0.065	S-95	18.0	S-140	0.076	S-187	0.108	S-230	63.5
S-9	0.516	S-58	0.137	S-97	0.058	S-141	0.102	S-188	0.302	S-231	0.387
S-10	0.610	S-59	0.068	S-98	0.051	S-144	69.8	S-190	0.067	S-232	0.231
S-11	0.811	S-60	0.073	S-100	0.062	S-145	0.052	S-191	0.063	S-234	19.1
S-13	55.8	S-61	0.109	S-101	0.047	S-146	0.060	S-197	0.092	S-236	1.314
S-14	0.610	S-62	0.103	S-102	0.017	S-147	0.109	S-198	0.063	S-237	1.291
S-15	0.464	S-62A	0.270	S-103	0.034	S-148	0.082	S-200	0.096	S-238	0.506
S-16	33.4	S-63	0.106	S-103A	0.013	S-150	0.061	S-201	0.069	S-240	0.578
S-21	0.867	S-64	0.123	S-109	0.074	S-151	0.052	S-202	26.6	S-242	0.871
S-22	0.521	S-66	0.090	S-110	0.092	S-152	0.072	S-205	0.256	S-243	0.301
S-23	0.379	S-67	0.081	S-111	0.149	S-157	288.5	S-214	0.888	S-244/245	73.2
S-24	59.7	S-70	0.068	S-112	0.115	S-165	0.072	S-215	0.462	S-246	1.093
S-25	0.993	S-71	0.061	S-113	0.326	S-165A	0.088	S-216	0.765	S-247	1.226
S-26	1.006	S-76	0.115	S-115	0.090	S-167	0.102	S-217	1.117	S-248	145.3
S-27	0.598	S-77	0.084	S-116	0.088	S-167A	0.138	S-218	55.8	S-249	0.627
S-41	0.351	S-78	117.0	S-118	0.112	S-168	0.089	S-219	0.304	S-250	0.136
S-42	0.378	S-79	0.082	S-119	0.075	S-169	0.089	S-220	17.0	S-251	0.739
S-43	40.5	S-80	0.139	S-123	0.114	S-171	0.102	S-220A	0.131	S-252	0.570
S-44	0.143	S-81	0.143	S-124	0.076	S-172	0.089	S-221	0.442	S-253	0.418
S-45	0.530/57.9	S-84	0.419	S-125	0.066	S-173	0.380	S-222	0.250	S-254	31.3
S-46	0.854	S-85	0.113	S-126	0.141	S-176	0.133	S-223	0.777	S-255	0.427
S-47	1.170	S-86	0.101	S-127	0.157	S-177	0.089	S-224	0.420	S-256	0.581
S-50	0.656	S-87	0.101	S-130	0.082	S-178	0.071	S-225	0.181	S-257	0.705/76.7
S-53	0.107	S-88	0.101	S-131	0.123	S-180	0.119	S-226	188.2	S-258	0.814
		S-89	0.101	S-133	0.113	S-182	0.119	S-227	0.840	S-259	0.667
		S-90	0.095	S-134	0.165	S-183	0.195	S-228	1.257		

XX/XX MEDIAN / CROSS-CULVERT

1/7/08

DRAWING NO.
DM-8

REVISIONS

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

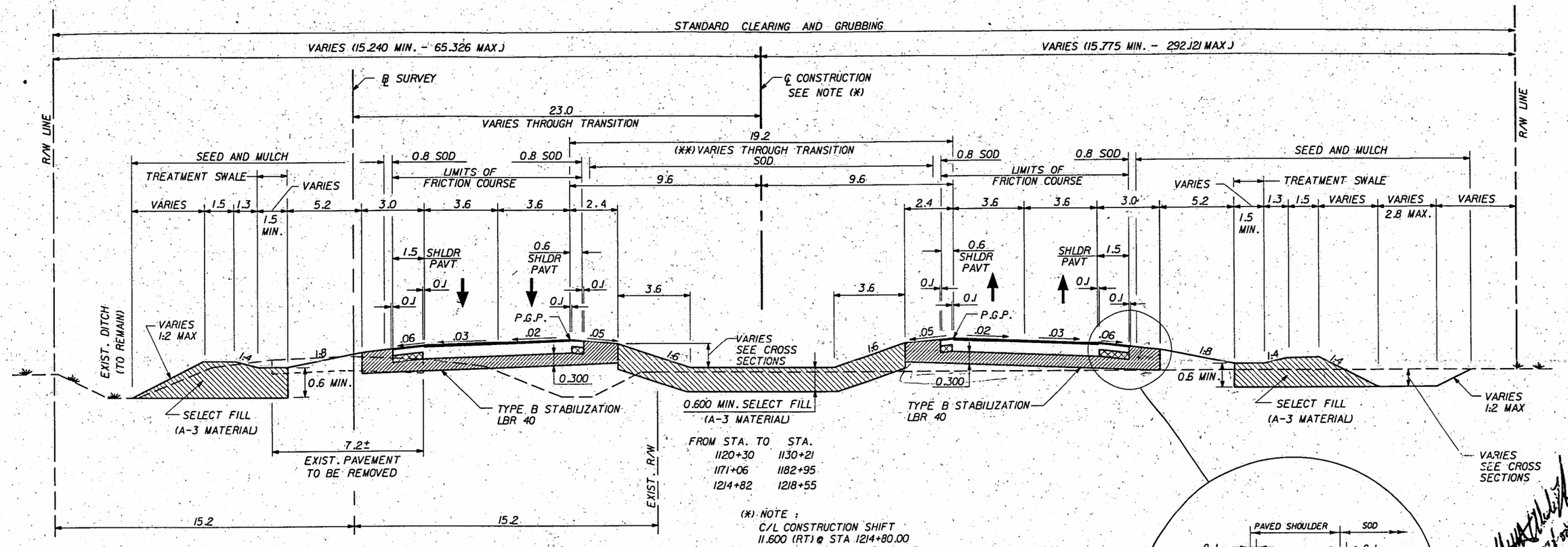
Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP
STA. 1215+50 TO STA. 1220+87.415

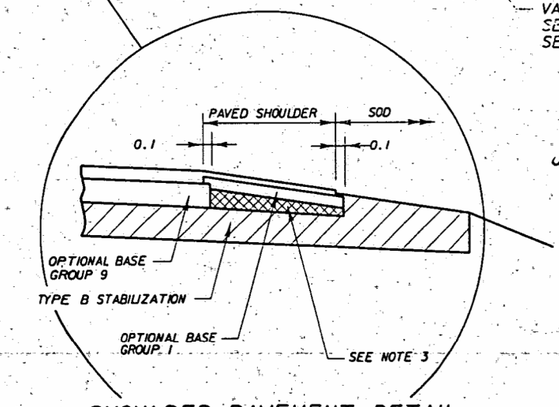
p:/design/sr30mar/dgnmar08.dgn Jan 07, 2008 18:12:09

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	15



FROM STA. TO STA.
1120+30 1130+21
1171+06 1182+95
1214+82 1218+55

(*) NOTE :
C/L CONSTRUCTION SHIFT
11.600 (RT) @ STA 1214+80.00



SHOULDER PAVEMENT DETAIL

TRAFFIC DATA
MAINLINE

1991 AADT = 10,250
2000 AADT = 16,600
2020 AADT = 34,850
K30 = 10.98% D30 = 51% T = 7% (24-HR.)
DESIGN SPEED 105 KMH

RURAL TYPICAL SECTION
S.R. 30
STA. 1122+98.240 TO STA. 1146+51.016 C/L CONST.
(**) STA. 1170+87.709 TO STA. 1220+87.415 C/L CONST.

EQUATION STATION: STA. 1123+00.000 BK = STA 1122+98.240 AH
STA. 1146+00.131 BK = STA 1146+00.000 AH
STA. 1184+51.259 BK = STA 1184+56.898 AH

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. ▨ AT THE CONTRACTOR'S OPTION, THIS AREA MAY BE CONSTRUCTED OF BASE MATERIAL AT NO ADDITIONAL COMPENSATION.
4. ALL GRASSING AREAS WILL RECEIVE A 150 MM FINISH SOIL LAYER TREATMENT.
5. SELECT FILL (A-3) SHALL HAVE A HORIZONTAL PERMEABILITY BETWEEN 20 & 30 FT/DAY WITH A SAFETY FACTOR OF 2, AND A COEFFICIENT OF UNIFORMITY BETWEEN 1.2 TO 2.0.

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
SUPERPAVE ASPHALTIC CONCRETE (TRAFFIC 4) (80mm) AND
FRICTION COURSE FC-5 (44kg/M2) (RUBBER)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
SUPERPAVE ASPHALTIC CONCRETE (TRAFFIC 4) (40mm) AND
FRICTION COURSE FC-5 (44kg/M2) (RUBBER)

NOT TO SCALE

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

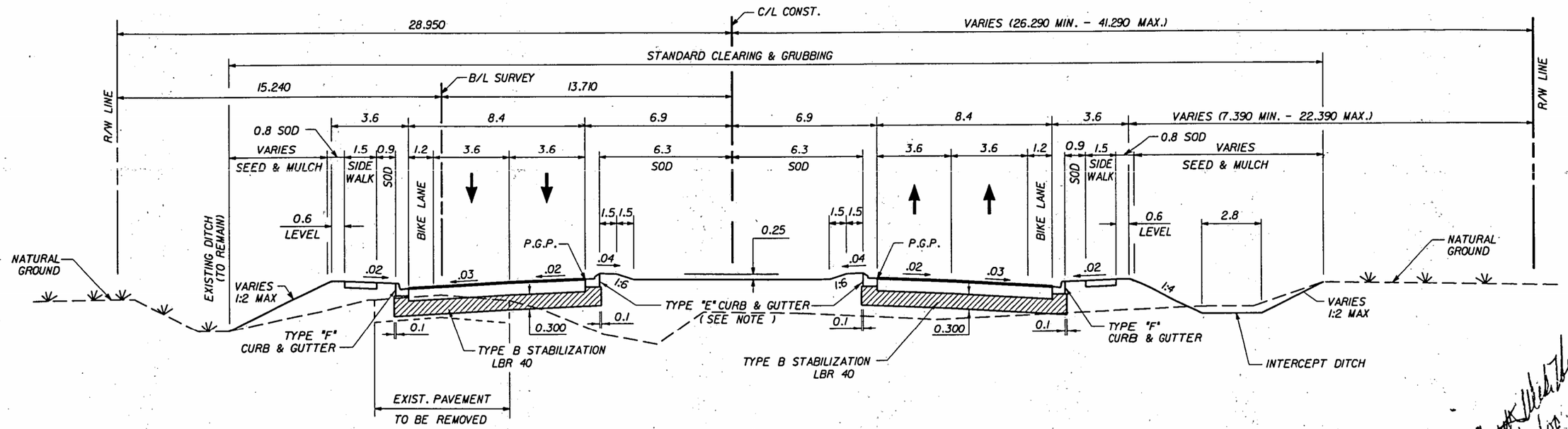
Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION

n:/design/sr30met/typsrd01.dgn Jan. 20, 2000 15:27:39

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	16



URBAN TYPICAL SECTION
S.R. 30
STA. 1146+51.016 TO STA. 1170+87.709 C/L CONST.

NOTE :
CURB & GUTTER TYPE E (MEDIAN)
BEGIN STA. 1144+41.656
END STA. 1172+95.448

TRAFFIC DATA
MAINLINE
1991 AADT = 10,250
2000 AADT = 16,600
2020 AADT = 34,850
K30 = 10.98% D30 = 51% T = 7% (24-HR.)
DESIGN SPEED 80 KMH

NEW CONSTRUCTION

OPTIONAL BASE GROUP 9 WITH
SUPERPAVE ASPHALTIC CONCRETE (TRAFFIC 4)(80 mm) AND
FRICTION COURSE FC-5 (44kg/M2)(RUBBER)

NOT TO SCALE

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION

n:/design/sr30met/typsrd03.dgn Jan. 07, 2000 20:10:09

FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	165

NOTES:

1. SKIMMER TO BE FABRICATED FROM 7 mm STEEL FLAT PLATE AND BOLTED TO THE SIDE OF THE STRUCTURE WITH A MINIMUM OF FOUR (4) 13 mm DIA. BOLTS. SKIMMER TO BE HOT-DIP GALVANIZED AFTER FABRICATION AND DRILLING OF BOLT HOLES.
2. STEEL GRATES SHALL BE CONSTRUCTED PER INDEX 261 WITH F=1150.
3. ALL OTHER STEEL GRATE SPECIFICATIONS ARE TO BE AS INDICATED BY INDEX 261.
4. PLACE SOD AROUND THE ENTIRE STRUCTURE. INCLUDING THE RUBBLE RIPRAP, FOR A DISTANCE OF 1500 IN EACH DIRECTION. SOD BLOCKS ARE TO BE PLACED WITH STAGGERED TRANSVERSE JOINTS. SEE THE PATTERN DETAIL OF INDEX 105.
5. ALL COST FOR OVERFLOW STRUCTURE INCLUDING, CLASS II CONCRETE, REINFORCING STEEL, GRATES, VAPOR BARRIER, AND FOR SKIMMER TO BE INCLUDED IN COST FOR INLET (SPECIAL)
6. THE RUBBLE RIPRAP SHALL EXTEND 2000 FROM THE TOE OF THE BERM AS SHOWN ON SHEET NO. 166
7. ELEVATION "F" SHALL BE EQUAL TO ELEVATION "D" FOR ALL STRUCTURES EXCEPT AS NOTED IN THE "COMMENTS" COLUMN OF THE TABLE ON SHEET NO. 166
8. CONSTRUCT A DITCH BLOCK BERM AS SHOWN IN THE PLAN VIEW SHEET NO. 166. THE TOP OF BERM SHALL BE AT ELEVATION "B". THE BERM SHALL BE CONSTRUCTED SUCH THAT SPECIAL OVERFLOW STRUCTURE(S) IS(ARE) FLUSH WITH THE BERM.

SUMMARY OF DIMENSIONS AND LOCATIONS OF OVERFLOW STRUCTURES

Structure No.	Station	Offset	Conc. Pad (EL. A)	Top of Berm (EL. B)	Weir Elevation (EL. C)	Conc. Pad (EL. D)	Convey. Ditch (EL. E)	Weir Width W (M)	Comments
S-3	1123+83	28.55 RT	5.08	5.50	5.17	3.88	3.88	0.60	
S-4	1123+83	28.55 LT	4.88	5.21	5.06	3.77	3.77	0.23	
S-6	1124+03	30.90 LT	4.65	4.97	4.78	3.75	3.75	0.23	
S-9	1127+05	28.55 RT	4.45	4.78	4.66	3.82	3.82	0.45	
S-10	1127+05	28.55 LT	4.28	4.61	4.50	3.74	3.74	0.50	
S-14	1128+10	28.55 RT	4.33	4.66	4.53	3.61	3.61	0.35	
S-15	1128+10	28.55 LT	4.33	4.66	4.50	3.54	3.54	0.30	
S-21	1132+00	28.55 RT	4.37	4.70	4.58	3.92	3.93	0.60	
S-22	1132+00	29.50 LT	4.37	4.70	4.56	4.30	4.30	0.30	
S-23	1133+50	31.29 LT	4.45	4.77	4.60	3.58	3.58	0.30	
S-25	1136+20	28.55 LT	4.38	4.70	4.58	4.10	4.10	0.75	
S-26	1136+50	28.55 RT	4.40	4.70	4.57	3.91	3.91	0.60	
S-41	1139+70	28.55 LT	4.44	4.76	4.68	3.70	3.70	0.45	
S-42	1139+90	28.55 RT	4.45	4.77	4.62	3.45	3.45	0.23	
S-44	1140+20	28.55 LT	4.45	4.78	4.67	3.55	3.55	0.23	
S-46	1140+40	28.55 RT	4.45	4.78	4.66	3.60	3.60	0.75	
S-47	1140+55	28.55 LT	4.45	4.78	4.66	3.75	3.75	0.75	
S-50	1146+30	29.90 RT	4.42	4.74	4.66	3.75	3.75	1.00	
S-205	8+15	6.35 LT	4.02	4.90	4.41	3.93	3.93	0.18	VETERANS (SOUTH)
S-214	1171+10	26.00 RT	4.41	4.73	4.56	4.17	4.17	0.75	
S-216	1175+10	26.45 RT	4.50	4.82	4.68	4.31	4.31	0.30	
S-217	1176+55	27.00 LT	4.45	5.00	4.73	4.25	4.25	0.30	
S-219	1178+75	26.20 RT	4.83	5.16	5.03	3.82	3.82	0.30	
S-220A	1178+75	27.30 LT	5.19	5.51	5.33	4.10	4.10	0.23	
S-221	1180+15	27.00 RT	5.00	5.32	5.21	4.08	4.08	0.30	
S-222	1180+15	28.00 LT	5.36	5.68	5.55	4.20	4.20	0.23	
S-224	1183+57	29.30 RT	5.18	5.51	5.32	4.15	4.15	0.23	
S-225	1183+57	28.50 LT	5.54	5.87	5.65	4.25	4.25	0.23	
S-228	1189+00	29.90 RT	4.91	5.23	5.10	4.75	4.75	1.00	
S-229	1189+00	28.55 LT	4.91	5.24	5.13	4.40	4.40	1.00	
S-229A	1189+75	29.90 RT	4.94	5.25	5.15	4.88	4.88	1.00	
S-231	1194+50	33.50 RT	5.13	5.46	5.29	4.33	4.33	0.23	
S-232	1194+50	28.55 LT	5.24	5.57	5.40	4.14	4.14	0.23	
S-236	1195+75	29.60 LT	5.32	5.66	5.57	4.46	4.46	1.00	
S-237	1195+90	31.90 RT	5.32	5.68	5.54	4.47	4.47	0.80	
S-240	1203+50	29.50 LT	5.51	5.84	5.66	5.00	5.00	1.00	
S-242	1204+68	28.90 RT	5.44	5.76	5.64	4.64	4.64	0.60	
S-243	1204+68	29.60 LT	5.45	5.77	5.60	4.45	4.45	0.23	
S-246	1206+00	28.55 RT	5.38	5.70	5.55	5.05	5.05	0.60	
S-247	1206+00	30.10 LT	5.36	5.69	5.55	4.65	4.65	0.75	
S-249	1209+65	28.55 RT	5.58	5.91	5.79	4.80	4.80	1.00	
S-250	1210+00	32.30 LT	5.66	5.99	5.85	5.40	5.40	0.23	
S-251	92+40	20.75 RT	4.63	5.33	4.83	4.88	4.88	0.60	℄ SR 83 (US 331)
S-252	1211+80	32.30 LT	5.98	6.30	6.25	5.62	5.62	1.00	
S-253	1212+50	30.15 RT	6.16	6.48	6.26	5.90	5.90	0.23	
S-255	1214+05	29.90 RT	6.46	6.79	6.63	5.35	5.35	0.23	
S-256	1214+05	28.55 LT	6.46	6.79	6.68	4.95	4.95	0.60	
S-258	1218+00	31.90 LT	6.70	7.02	6.74	6.67	6.67	0.45	
S-259	1219+00	18.50 RT	6.56	6.89	6.74	6.60	6.60	0.23	

Calculated average weir height = 2.8 feet

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

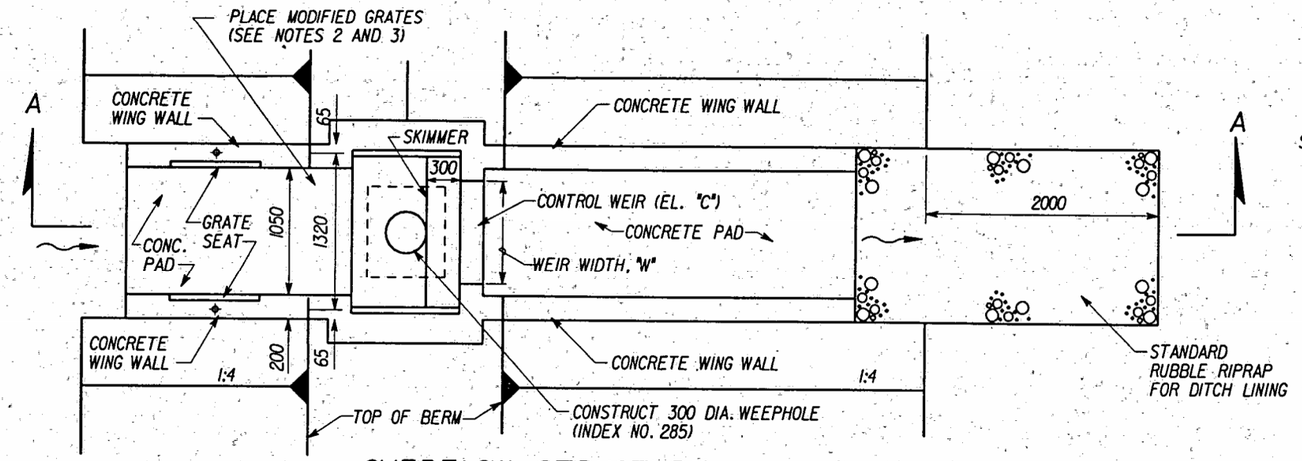
Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

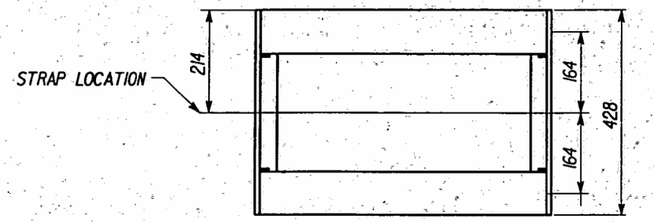
MISCELLANEOUS DRAINAGE DETAILS

n:/design/sr30met/miscdtls.dgn Jan. 07, 2000 18:17:55

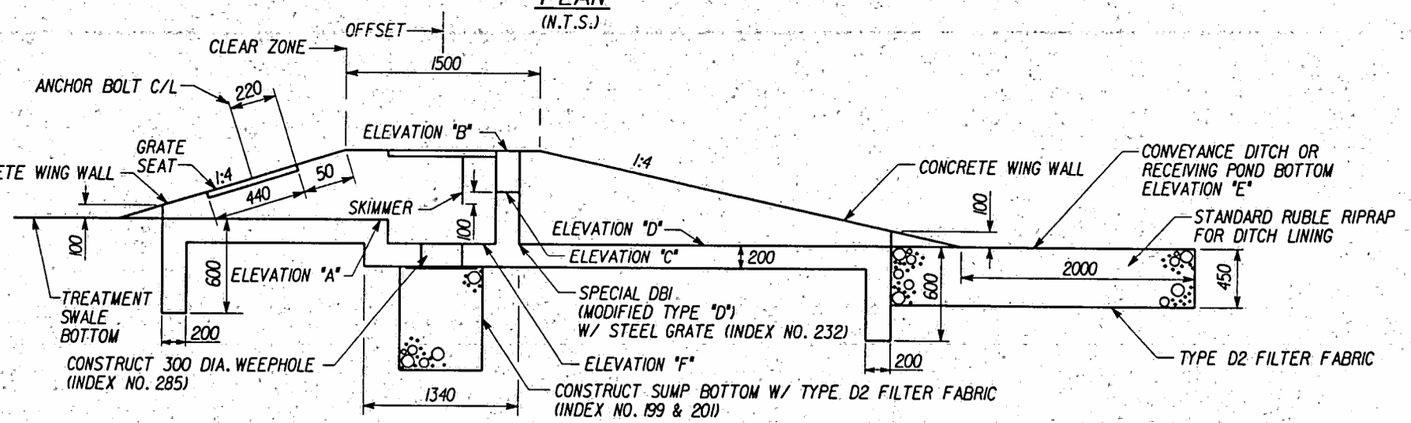
FINANCIAL PROJ. NO.	SHEET NO.
220642-1-52-01	166



OVERFLOW STRUCTURE
PLAN
(N.T.S.)

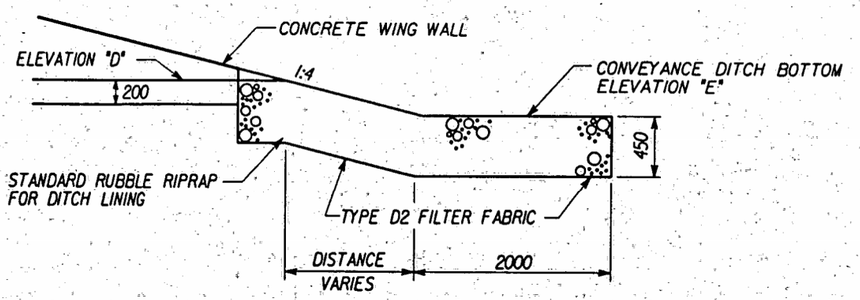


STEEL GRATE
PLAN
(N.T.S.)



OVERFLOW STRUCTURE
SECTION A-A
(N.T.S.)

DITCH BLOCK DETAIL



SECTION A-A
N.T.S.

DITCH BLOCKS FOR TREATMENT DITCHES				
Station	Side	Berm Elev.	Berm Depth	Sod
1124+90	RT	5.25	0.20	30
1125+90	RT	5.05	0.20	30
1144+00	RT	4.83	0.20	30
1182+00	RT	5.46	0.20	39
1182+00	LT	5.81	0.20	30
1185+20	LT	5.30	0.20	39
1189+50	RT	5.24	0.30	62
1201+00	RT	5.83	0.20	39
1201+00	LT	5.85	0.20	36
1210+80	RT	6.00	0.20	39
1212+75	LT	6.41	0.20	36
1213+05	RT	6.47	0.20	62
1214+70	RT	6.86	0.20	62
1215+40	RT	7.00	0.20	62
			TOTAL	596

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DRAINAGE DETAILS

n:/design/sr30met/miscdtls.dgn Jan. 07, 2000 18:37:58

Drainage Report

SR 30

STATE PROJECT NO. 60020-1520
WORK PROGRAM NO. 3119122

2206421320 1

Prepared for:

Florida Department of Transportation
District Three

Submitted by:

Moreland Altobelli Associates, Inc.

October 1999

SR 30/US 98 Widening Project
Walton County, Florida
State Project No. 60020-3520
W.P.I. No. 319122
October 15.1999

STORMWATER MANAGEMENT NARRATIVE

INTRODUCTION

State Road 30/US 98 widening project will be constructed using rural and urban typical sections beginning east of CR 30A at Station 1123+00 and terminating east of SR 38/US 331 at Station 1220+87. The project lies within nineteen (19) primary drainage sub-basins and will utilize fifty-five (55) dry retention/detention ditches in the rural area and five (5) ponds in the urban area for the treatment and attenuation of stormwater runoff.

The total off-site drainage area of 3489 acres is divided into 19 drainage sub-basins which conveys runoff from the south to the north under S.R. 30 via circular pipes or concrete box culverts. New cross drains will mimic the location of the existing cross drains and cross slopes in order to maintain the existing drainage patterns to the outfall canals located on the north side of the project.

The rural sections of the project will drain stormwater runoff to treatment swales located in the median where the roadway is in superelevation and between the proposed roadway and off-site conveyance ditches. Stormwater runoff from Station 1146+51 to Station 1170+68, urban section, will be collected via storm sewer system to one of five ponds. The proposed retention/detention ditches and ponds will have outfall structures which discharge to the off-site ditches and will provide water quality treatment for on-site contributing areas according to the requirements by Florida Department of Environmental Regulation (F.D.E.R.) and Florida Department of Transportation (F.D.O.T.).

STORMWATER TREATMENT

Rural Section

Stormwater for that portion of the project from Station 1123+00 to Station 1146+51 will be collected in 1.5 meter wide swales with 1:8 front slopes and 1:4 back slopes adjacent to the roadway and 1:6 slopes with varying bottom widths in the median. From Station 1170+68 to Station 1220+87, stormwater will be collected in swales varying from 1.0 to 3.1 meter bottom widths for the median and roadside ditches. Side slopes are 1:6 slopes for the median ditches and 1:8 front slopes and 1:4 back slopes for ditches adjacent to the roadway. Although these swales have sufficient volume, due to the low permeabilities of the existing soils, a minimum 0.6 meters of select fill shall be used in treatment ditches to allow for the ditches to drawdown. However, for median ditches not collecting stormwater runoff from the adjacent roadway (ie. normal crown), no select fill will be used. All treatment swales were designed to retain and treat the first 1.27 centimeter (0.5 inch) of runoff from contributing area.

Urban Section

Stormwater for the portion of the project from Station 1146+51 to 1170+68 will be collected by curb and gutter to curb inlets where the stormwater runoff will be conveyed through pipes to one of five retention/detention ponds. The design of the proposed five (5) ponds address two issues: water quality and water quantity. For water quality, the wet detention ponds are designed to provide a treatment volume of 2.54 centimeters (1.0 inch) of runoff from the contributing drainage area. For water quantity, the ponds are designed to comply with the FDOT Rule Chapter 14-86, F.A.C. The Rule states that the ponds must attenuate the post-development peak rate to the pre-development peak rate for the most critical rainfall duration (1-hour through 10-day) of all storm frequencies (2-year through 100-year). In addition, each pond and outfall structure was designed for the ultimate 6-lane section which adds an additional 3.6 meter lane towards the median in each direction.

Pond 1, located on La Canosa Road north of SR 30, will collect stormwater runoff from the portion of the project between Station 1146+51 to Station 1150+50. In the analysis of the basin, post development's contributing area was greater than pre development. The pond was designed to treat basin runoff and accommodate the additional volume of runoff such that post development discharge was equal to or less than pre development discharge. (See Table 1 for Basin Summary)

Pond 2, located on the north side of SR 30, will collect stormwater runoff from the portion of the project between Station 1150+50 to Station 1154+50. In the analysis of the basin, post development's contributing area was greater than pre development. The pond was designed to treat basin runoff and accommodate the additional volume of runoff such that post development discharge was equal to or less than pre development discharge.

Pond 3, located on Church Road north of SR 30, will collect stormwater runoff from the portion of the project between Station 1154+50 to Station 1157+60. In the analysis of the basin, post development's contributing area was less than pre development. The pond was designed to treat basin runoff and assure post development discharge was equal to or less than pre development discharge.

Pond 4/5, located on CR 393 south of SR 30, will collect stormwater runoff from the portion of the project between Station 1157+60 to Station 1165+60. In the analysis of the basin, post development's contributing area was less than pre development. The pond was designed to treat basin runoff and assure post development discharge was equal to or less than pre development discharge.

Pond 6, located on Veterans Road north of SR 30, will collect stormwater runoff from the portion of the project between Station 1165+60 to Station 1170+68. In the analysis of the basin, post development's contributing area was greater than pre development. The pond was designed to treat basin runoff and accommodate the additional volume of runoff such that post development discharge was equal to or less than pre development discharge.

SUMMARY OF BASIN CONTRIBUTING AREAS

	4 LANE		6 LANE	
	PRE	POST	PRE	POST
POND 1	1.09 HA/2.69 AC	1.43 HA/3.53 AC	1.23 HA/3.03 AC	1.69 HA/4.17 AC
POND 2	0.68 HA/1.69 AC	1.20 HA/2.96 AC	0.80 HA/1.97 AC	1.49 HA/3.69 AC
POND 3	1.48 HA/3.65 AC	1.07 HA/2.64 AC	1.81 HA/1.97 AC	1.27 HA/3.15 AC
POND 4/5	2.76 HA/6.82 AC	2.54 HA/6.27 AC	3.31 HA/8.18 AC	3.05 HA/7.53 AC
POND 6	1.51 HA/3.74 AC	1.59 HA/3.94 AC	1.82 HA/4.49 AC	1.91 HA/4.73 AC

Note: Areas do not include pond areas.

Due to existing cross drains and roadway profile, the pre-development and post-development basins areas could not be duplicated. In addition, to assure drawdown of one half the treatment volume will be recovered within 72 hours, the orifice size ranged from 0.03 to 0.05 meters (1.25 to 2.00 inches). To assure the orifice would not clog a minimum size of 0.65 meters (2.5 inch) diameter was used.

CROSS CULVERT ANALYSIS

The off-site stormwater overland runoff for S.R. 30 flows from south to north along the entire length of the project. The total off-site drainage area of 3489 acres is divided into 19 drainage sub-basins with each sub-basin being drained under S.R. 30 by either circular pipes or concrete box culverts. There are presently 21 existing conveyances under S.R. 30 which will be replaced during new construction. With no existing drainage problems of flooding or roadway overtopping, the location of the new cross drains will mimic the capacity and locations of the existing drains in order to maintain the existing drainage patterns. The downstream inverts of the existing drains will be duplicated by the new drains so that the existing outfall ditches to the north will retain their present configurations.

The proposed cross drains were sized to ensure that the 100-year storm event does not overtop the proposed roadway grade. The 25-year storm event was also checked for the rural portion of the project to ensure that the roadside treatment swale berm elevations are not overtopped.

Table of Contents

Section	Description
1	Introduction Existing Site Condition Retention/Detention Ditch and Pond Design Criteria Storm Sewer System Pond Analysis Cross Culvert Analsis On-Site Ditch Design Corrosion Analysis
2	Retention/Detention Pond - Proposed Conditions (4-Lane) Summary of Discharges - 10 Year and 25 Year Pre-Development Routing 10 Year / 24 Hour Storm 25 Year / 24 Hour Storm Post-Development Routing 10 Year / 24 Hour Storm 25 Year / 24 Hour Storm Pond Volume Curve Number (CN) Analysis Time of Concentration References
3	FDOT Critical Duration Analyses - Proposed Conditions (4-Lane) Pond Summaries Critical Duration Analysis - Pre-Development Critical Duration Analysis - Post Development 100 Year / 10 Day Input Data
4	Secondary System Analysis - Proposed Conditions (4-Lane) Storm Tabulation Sheet 3 Year / 24 Hour Networx Analysis
5	Retention/Detention Pond - Future Conditions (6-Lane) Summary of Discharges - 10 Year and 25 Year Pre-Development Routing - 10 Year & 25 Year / 24 Hour Storm Post-Development Routing - 10 Year & 25 Year / 24 Hour Storm Drawdown Analysis Pond Volume With Treatment Volume Calculations Curve Number (CN) Analysis

6 FDOT Critical Duration Analyses - Future Conditions (6-Lane)
Pond Summaries
Critical Duration Analysis - Pre-Development
Critical Duration Analysis - Post Development
100 Year / 10 Day Input Data

7 Secondary System Analysis - Future Conditions (6-Lane)
Spread Analysis
3 Year / 24 Hour Networx Analysis

8 Cross Culvert Analysis
HY-8 Analysis
Cross Culvert Calculations

9 Ditch Analysis
Summary of Critical Duration
100 Year / 10 Day Pre-Development Routing
100 Year / 10 Day Post-Development Routing
100 Year / 10 Day Post-Development Input Data

Appendix
A Correspondence
Geotechnical Report

STORMWATER SYSTEMS

Design and Analysis

SR 30/US 98 Widening Project

Walton County, Florida

I. INTRODUCTION

State Road 30/US 98 widening project will be constructed using rural and urban typical sections. The project consists of nineteen (19) primary drainage sub-basins and will utilize fifty-five (55) dry retention/detention ditches in the rural area and five (5) ponds in the urban area. All proposed retention/detention ditches and ponds will have outfall structures which discharge to the off-site ditches. All of the treatment ditches and ponds will provide water quality treatment for on-site contributing areas according to the requirements by Florida Department of Environmental Regulation (F.D.E.R.) and Florida Department of Transportation (F.D.O.T.).

The entire contributing off-site drainage areas will be intercepted by off-site ditches (ditches adjacent to the proposed right-of-way), and off-site runoff will not be co-mingled with on-site generated runoff. There are presently 21 existing conveyances under S.R. 30 which will be replaced during construction. The locations of the new cross drains will mimic the location of the existing cross drains and cross slopes in order to maintain the existing drainage patterns to the outfall canals located on the north side of the project.

During the data gathering phase of the project, Moreland Altobelli Associates, Inc. attended a meeting with F.D.E.R. to discuss the stormwater permit requirements for the aforementioned project. As a result of this meeting, several innovative stormwater design concepts were developed which have been utilized to design drainage systems along the corridor of study.

II. EXISTING SITE CONDITION

SR 30/US 98 project limits begin just east of CR 30A and continue eastward with the project terminating east of SR 38/US 331. This section of SR 30 passes through an urbanized section of the Santa Rosa Beach community.

SR 30 provides access to the beach area and to the residential and commercial developments in the urbanized section. The project is generally located in the gulf coastal low lands of Walton County. East of the Santa Rosa Beach community, the project passes through the Point Washington Wildlife Management Area, which exhibits a relatively high groundwater table with wetland vegetation.

The existing off-site stormwater runoff for S.R. 30 flows from south to north along the entire length of the project. The total off-site drainage area of 3489 acres is divided into 19 drainage sub-basins with each sub-basin being drained under S.R. 30 by either circular pipes or concrete box culvert. Presently, all the off-site runoff is being intercepted and co-mingled with the on-site runoff. Currently, all untreated stormwater runoff drains to the outfall ditches which are extended northwardly. The current stormwater system does not comply with F.D.E.R. water quality standards.

Within the southern drainage basins are mosquito control ditches which intercept and convey some of this stormwater runoff directly into streams that flow south to north through the existing roadway culvert system. From site field investigations, it appears that these mosquito control ditches offset the existing roadway from approximately 150 meters to 600 meters to the south.

III. RETENTION/DETENTION DITCH AND POND DESIGN CRITERIA

The proposed stormwater retention/detention ditches and ponds for the project have been designed to meet or exceed the drainage criteria established by the F.D.E.R. and the F.D.O.T. These design criteria include requirements for providing physical treatment for water quality protection as well as restrictions on off-site discharges. The minimum design criteria established by these agencies is summarized below:

- Florida Department of Environmental Regulation (F.D.E.R.), Water Management Office, 160 Government Center, Pensacola, Florida, has jurisdiction over SR 30 project.

From our research and pre-application stormwater permit meeting with Cliff Street (Supervisor Stormwater Permit, F.D.E.R.), in order to earn a general stormwater permit, F.D.E.R. is requiring treatment of all intermingled runoff, unless runoff of new pavement can be effectively separated and treated prior to discharge with off-site runoff. The applicant must treat the combined runoff in one of the following methods:

1. Treatment swales to be designed such as to retain and treat the first 1.27 centimeter (0.5 inch) of runoff from contributing area.
2. FDER does not have pre- and post-development peak discharge criteria.
3. FDOT has pre- and post-development peak discharge criteria. "There should be zero increase in the peak flow rate/runoff volume for all frequencies (100-year maximum) for the Critical Duration Events (maximum of 10 days)." The allowable discharge/volume is the pre-development peak flow rate/volume for the frequency and duration being analyzed.
4. Treatment ditches and wet detention ponds to be designed such that the retained pollution abatement volume will be recovered within 72 hours with a Factor of Safety of 2.
5. Wet detention ponds to be designed to provide a treatment volume of 2.54 centimeters (1.0 inch) of runoff from the contributing drainage area.
6. Pollution abatement depth in wet detention ponds will not to exceed 0.46 meter (1.5 feet).
7. Wet detention ponds to be designed with minimum depth of 0.91 meter (3 feet) and maximum of 2.44 - 3.05-meters (8 - 10 feet) below SHWT.
8. If littoral shelf is not provided, 50% more permanent pool must be provided. In this case, a Construction Permit will be required instead of an Individual Permit.

IV. STORM SEWER SYSTEM

The storm sewer system was designed by the methodologies outlined in the FDOT ***Drainage Manual, Volumes 1-3***. The construction details conform to the FDOT ***Roadway and Traffic Design Standards.*** Standard FDOT Storm Sewer Tabulation Forms were used to summarize the pipe network design for each system. In conjunction, the computer program "NETWORX," by Streamline Technologies, Inc., was used to determine the hydraulic grade line for the proposed system. The program takes into account minor losses to ensure that surcharge of the system does not occur.

The storm sewer system was designed to convey the 3-year/24 hour storm event for Zone 1. Inlets were placed in all continuous and sag points along the proposed urban section of the project to ensure that the roadway spread resulting from a rainfall intensity of 10 centimeters per hour (4.0 inches per hour) did not exceed the design limits specified in the FDOT ***Drainage Manual***..

Runoff Coefficients (C) were determined using the methodologies described in the SCS Technical Release 55, (TR-55) ***Urban Hydrology for Small Watersheds*** for both pre-development and post-development.

Time of concentration (Tc) was determined using TR-55 for each basin using the overall post-development basin boundary. In all instances, the travel distance for pre-development was via sheet flow and channel flow through existing ditches to an outfall ditch. Shallow concentrated flow was not considered since existing ditches are well defined adjacent to the roadway. Post-development time of concentration was determined from the storm sewer tabulation calculations; however, travel times to a particular inlet had a minimum travel time of 10 minutes.

V. POND ANALYSIS

The design of the proposed five (5) ponds address two issues: water quality and water quantity. For water quality, the wet detention ponds are designed to provide a treatment volume of 2.54 centimeters (1.0 inch) of runoff from the contributing drainage area. For water quantity, the ponds are designed to comply with the FDOT Rule Chapter 14-86, F.A.C. The Rule states that the ponds must attenuate the post-development peak rate to the pre-development peak rate for the most critical rainfall duration (1-hour through 10-day) of all storm frequencies (2-year through 100-year). In addition, each pond and outfall structure was designed for additional impervious area for the ultimate 6-lane section through the urban section.

Curve number (CN) were determined using the methodologies described in the SCS Technical Release 55, (TR-55) ***Urban Hydrology for Small Watersheds*** for both pre-development and post-development.

Modeling of the pre-development and post-development runoff hydrographs for each basin was performed using the computer program titled "Advanced Runoff Hydrograph Program," (RUNHYD) by Streamline Technologies, Inc. For this project, the Rule used FDOT Unit Hydrograph Method and the 10-year/24-hour and 25-year/24-hour storm events utilized the

SCSIII Hydrograph Method.

The post-development hydrographs were routed through the proposed stormwater management facilities. The interactive program utilized for flood routing was "Advanced Interconnected Channel and Pond Routing," (adICPR), by Streamline Technologies, Inc. Maximum stage elevation from the 10-year/24-hour storm event was utilized as the tail water condition for storm sewer systems.

VI. CROSS CULVERT ANALYSIS

The off-site stormwater overland runoff for S.R. 30 flows from south to north along the entire length of the project. The total off-site drainage area of 3489 acres is divided into 19 drainage sub-basins with each sub-basin being drained under S.R. 30 by either circular pipes or concrete box culverts.

There are presently 21 existing conveyances under S.R. 30 which will be replaced during new construction. The location of the new cross drains will mimic the locations of the existing drains in order to maintain the existing drainage patterns. The downstream inverts of the existing drains will be duplicated by the new drains so that the existing outfall ditches to the north will retain their present configurations.

Conversations with the District indicated that there were no existing drainage problems and no flooding or roadway overtopping along the proposed corridor. Field investigation of the project site verifies that all of the existing culverts are functioning with no signs of excessive scour or erosion.

To define offsite drainage areas, the U.S.G.S. Quad maps (for Miramar Beach, Grayton Beach, Choctaw Beach, and Freeport) were utilized along with the roadway cross section survey to determine ridge lines and drainage divides.

The rational method, using a runoff coefficient of 0.20, was used to determine stormwater runoff for all of the drainage basins except for Basin No. 9 (Station 1162+97), which was calculated using U.S.G.S. regression equation because it has 590 acres of contributing drainage area.

The time of concentration for all of the cross culvert drainage basins was determined by calculating the average slope of the longest overland run in the basin with 'wooded-low storage' and utilizing Figure 5-19 (Overland Flow) of the FDOT ***Drainage Manual*** for the velocity of runoff. Channel flow was not considered for this analysis because of the lack of detailed information about offsite conditions and the fact that there are numerous existing mosquito control ditches which bisect the drainage basins.

The 24-hour design high water (DHW) was determined by using the estimated seasonal high ground water table at each culvert crossing as reported by FTE in a report dated October 28 to 30, 1992.

The proposed cross drains were sized by using the F.H.W.A. culvert analysis program "HY-8," version 4.1, to ensure that the 100-year storm event does not overtop the proposed roadway grade. The 25-year storm event was also checked for the rural portion of the project to ensure that the roadside treatment swale berm elevations are not overtopped.

A summary of the hydraulic parameters and proposed cross drain sizes are presented in Table 1

TABLE 1

BASIN NO.	STATION	LENGTH (FT)	SLOPE %	VELOCITY (FT/MIN)	TIME (HRS)	AREA (AC)	DHW M (FT)	I (intensity) / Q (cfs)				M (FT)	
								25 YR	50 YR	100 YR	500 YR	SIZE	
1	1123+89.3	3400	0.26	25.6	2.21	78	4.33(14.2)	2.23/34.8	2.60/40.6	2.82/44.0	/52.7	855x1345 (34"x53")	CD_01
2	1128+02.0	4800	0.32	26.0	3.08	138	3.72(12.2)	1.80/49.7	2.08/57.4	2.25/62.1	/74.5	855x1345 (34"x53")	CD_02
3	1130+22.6	4000	0.35	26.2	2.54	83	3.78(12.4)	2.05/34.0	2.36/39.2	2.58/42.8	/51.0	855x1345 (34"x53")	CD_03
4	1133+59.7	4300	0.35	26.2	2.74	148	3.87(12.7)	1.92/56.8	2.22/65.7	2.42/71.6	/86.2	1250x900 (4'x3')	CD_04
5	1139+97.9 1140+30.8	4000	0.32	26.0	2.56	223	3.57(11.7) 3.57(11.7)	2.05/91.4	2.36/105.3	2.58/115.1	/137.0	900 (3') 1500x900 (5'X3')	CD_05
~~6~~	~~1146+64.40~~	~~950~~	~~0.11~~	~~24.6~~	~~0.64~~	~~23~~	~~3.78(12.4)~~	~~4.70/21.6~~	~~5.25/24.2~~	~~5.70/26.2~~	~~/30.8~~	~~750 (30")~~	
7	1150+74.1	7800	0.19	25.2	5.16	289	3.44(11.3)	1.25/72.3	1.45/83.8	1.58/91.3	/109.4	1250x900 (4'x3')	CD_06
8	1154+62.7	1500	0.13	24.7	1.01	44	4.42(14.5)	3.70/32.6	4.18/37.0	4.52/39.8	/47.0	750 (30")	CD_07
9	1162+94.45	8200	0.34	U.S.G.S Regression Equation		713	3.66(12.0)	/311.8	/386.5	/459.0	/641.9	(2)1500x1250 (5'X4')	CD_08
10	1170+73.1	2900	0.02	24.1	2.01	62	3.96(13.0)	2.38/29.5	2.75/34.1	3.00/37.2	/44.7	(2)1500x900 (5'X3')	CD_09
11	1178+62.0	6000	0.48	27.0	3.70	138	4.08 (13.4)	1.58/43.6	1.82/50.2	2.00/55.2	/66.8	855x1345 (34"x53")	CD_10
~~12~~	~~1180+02.0~~	~~3000~~	~~0.20~~	~~25.1~~	~~1.99~~	~~42~~	~~4.27 (14.0)~~	~~2.40/20.2~~	~~2.78/23.4~~	~~3.00/25.2~~	~~/28.9~~	~~750 (30")~~	
13	1183+69.1	5750	0.45	26.8	3.58	465	4.15 (13.6)	1.63/151.6	1.88/174.8	2.06/191.6	/229.5	(2)1800x900 (6'x3')	CD_11
14	1194+35.1	4800	0.67	28.4	2.82	157	4.36 (14.3)	1.90/59.7	2.20/69.1	2.40/75.4	/90.0	1800x900 (6'x3')	CD_12
15	1195+62.9	3100	0.35	26.2	1.97	47	4.51(14.8)	2.40/22.6	2.78/26.1	3.00/28.2	/33.9	855x1345 (34"x53")	CD_13
16	1204+78.0 1205+02.5	4400	0.30	25.9	2.83	180	4.69(15.4) 4.72(15.5)	1.90/68.8	2.20/79.6	2.40/86.9	/104.0	855x1345 (34"x53") 750 (30")	CD_14 CD_15
17	1209+54.7	5800	0.34	26.1	3.70	359	5.24(17.2)	1.58/113.4	1.82/130.7	2.00/143.6	/172.2	1800x900 (6'x3')	CD_16
18	1213+95.3	4150	0.46	26.95	2.57	77	6.07(19.9)	2.05/31.6	2.36/36.3	2.58/39.7	/48.0	900 (36")	CD_17
19	1216+13.4	4100	0.46	26.95	2.54	190	6.07(19.9)	2.05/77.9	2.36/89.7	2.58/98.0	/117.4	(2) 750 (30")	CD_18

VII. ON-SITE DITCH DESIGN ASSUMPTIONS AND METHODOLOGY

Design and analysis of the proposed fifty-five (55) on-site retention/detention ditch facilities address the issues of water quality and water quantity. For water quality, the ditches were designed to provide a treatment volume of a full 1.27 centimeter (0.5 inch) of runoff from the contributing drainage area. For water quantity, the ditches were designed to comply with the FDOT Rule Chapter 14-86, F.A.C. Table 2 shows a summary of on-site ditches with ditch locations. Due to the size of the Rule files, the 100-year/10-day pre-development and post-development input and output files are shown in their entirety. A summary of all the storm events and durations are shown in Section 9 - Ditch Calculation.

VIII CORROSION ANALYSIS

Culvert Service Life Estimator (CSLE) was used to analyze optional materials. With the existing soil conditions, concrete and aluminum clad are the only two materials suitable for S.R. 30. However, aluminum clad ranged from 16 gage to 10 gage (N/A per FDOT Index No. 205) with clean backfill only. Due to proposed pond size, location, high ground water elevations and an increased manning's coefficient, aluminum pipe was not considered for the project.

TABLE 2
SUMMARY OF ONSITE DITCHES AND MEDIANS

CNpre IMP = 98 PERV = 84 SOILS = TYPE 'D'

CNpost IMP = 98 PERV =39 SOILS = TYPE 'A'

BASIN No.	STR. No.	STATION TO STATION	TOTAL AREA AC.	PRE			POST		
				IMPERVIOUS AREA, AC.	PERVIOUS AREA, AC.	CN	IMPERVIOUS AREA, AC.	PERVIOUS AREA, AC.	CN
L1	S-4	1122+25 - 1123+85	0.73	0.02	0.71	84.4	0.32	0.41	64.9
L2	S-6	1123+85 - 1124+80	0.44	0.20	0.24	90.4	0.24	0.20	71.2
L3	S-10	1124+80 - 1128+02	1.51	0.68	0.83	90.3	0.75	0.76	68.3
L4	S-15	1128+02 - 1130+35	1.15	0.43	0.72	89.2	0.57	0.58	68.2
L5	S-22	1130+35 - 1132+52	1.29	0.49	0.80	89.3	0.77	0.52	74.2
L6	S-23	1132+52 - 1134+02	0.94	0.40	0.54	90.0	0.53	0.41	72.3
L7	S-25	1134+02 - 1138+48	2.45	0.91	1.54	89.2	1.33	1.12	71.0
L8	S-41	1138+48 - 1139+82	0.87	0.26	0.61	88.2	0.59	0.28	79.0
L9	S-44	1139+82 - 1140+44	0.35	0.12	0.23	88.8	0.21	0.14	74.4
L10	S-47	1140+44 - 1146+50	2.89	1.22	1.67	89.9	1.73	1.16	74.3
L12	S-217	1176+00 - 1178+62	2.76	0.50	2.26	86.5	1.22	1.54	65.1
L13	S-220A	1178+62 - 1179+75	0.32	0.21	0.11	93.2	0.06	0.26	50.1
L14	S-222	1179+75 - 1182+00	0.62	0.38	0.24	92.6	0.10	0.52	48.5
L15	S-225	1182+00 - 1183+70	0.45	0.29	0.16	93.0	0.08	0.37	49.5
L16	S-229	1183+70 - 1194+33	5.47	1.98	3.49	89.1	2.80	2.67	69.2
L16A		1183+70 - 1185+20	0.51				0.14	0.37	55.2
L16B		1185+20 - 1194+33	4.96				2.66	2.30	70.6
L17	S-232	1194+33 - 1195+45	0.57	0.27	0.30	90.6	0.32	0.25	72.1
L18	S-236	1195+45 - 1201+00	3.25	1.05	2.20	88.5	2.00	1.25	75.3
L19	S-240	1201+00 - 1203+76	1.43	0.50	0.93	88.9	0.74	0.69	69.5
L20	S-244	1203+76 - 1205+00	0.74	0.22	0.52	88.2	0.44	0.30	74.1
L21	S-247	1205+00 - 1209+80	3.03	0.98	2.05	88.5	1.81	1.22	74.2
L22	S-250	1209+80 - 1210+71	0.34	0.17	0.17	91.0	0.22	0.12	77.2
L23	S-251	91+80 - 93+84	1.83	0.58	1.25	88.4	0.97	0.86	70.3
L24	S-252	1211+48 -1213+96	1.41	0.55	0.86	89.5	0.77	0.64	71.2
L24A		1211+48 -1212+75	0.69				0.38	0.31	71.5
L24B		1212+75 -1213+96	0.72				0.39	0.33	71.1
L25	S-256	1213+96 - 1216+20	1.44	0.40	1.04	87.9	0.78	0.66	71.0
L25A		1213+96 - 1215+10	0.81				0.51	0.30	76.1
L25B		1215+10 - 1216+20	0.60				0.26	0.34	64.7
L26	S-258	1216+20 - 1220+80	2.01	0.80	1.21	89.6	0.97	1.04	67.5
M1	S-5	1120+30 - 1125+94	3.24	0.40	2.84	85.7	1.35	1.89	63.6
M2	S-11	1125+94 - 1130+21	2.05	0.05	2.00	84.3	0.43	1.62	51.4
M3	S-215	1171+06 - 1175+50	1.14	0.31	0.83	87.8	0.40	0.74	59.7
M4	S-223	1179+11 - 1182+90	1.92	0.00	1.92	84.0	0.84	1.08	64.8
M5	S-227A	1182+75 - 1187+16	2.07	0.19	1.88	85.3	0.83	1.24	62.7
M6	S-256	1214+82 - 1218+55	1.74	0.00	1.74	84.0	0.65	1.09	61.0
R2	S-3	1120+47 - 1123+85	1.29	0.16	1.13	85.7	0.57	0.72	65.1
R3	S-9	1123+85 - 1127+62	1.27	0.00	1.27	84.0	0.27	1.00	51.5
R4	S-14	1127+62 - 1130+35	1.51	0.00	1.51	84.0	0.81	0.70	70.6
R5	S-21	1130+35 - 1134+00	2.14	0.03	2.11	84.2	1.23	0.91	72.9
R6	S-26	1134+00 - 1138+48	2.49	0.03	2.46	84.2	1.38	1.11	71.7
R7	S-42	1138+48 - 1140+30	0.93	0.00	0.93	84.0	0.46	0.47	68.2
R8	S-46	1140+30 - 1144+00	2.11	0.17	1.94	85.1	1.16	0.95	71.4
R9	S-50	1144+00 - 1146+51	1.62	0.00	1.62	84.0	0.99	0.63	75.1
R10	S-205	VETERANS SOUTH	0.63	0.00	0.63	84.0	0.45	0.18	94.0
R11	S-214	1170+88 - 1174+85	2.19	0.60	1.59	87.8	1.31	0.88	74.3
R12	S-216	1174+85 - 1178+65	1.89	0.04	1.85	84.3	1.02	0.87	70.8
R13	S-219	1178+65 - 1180+00	0.75	0.00	0.75	84.0	0.39	0.36	69.7
R14	S-221	1180+00 -1182+00	1.09	0.00	1.09	84.0	0.52	0.57	67.1
R15	S-224	1182+00 - 1183+70	1.04	0.04	1.00	84.5	0.54	0.50	69.6
R16	S-228	1183+70 - 1189+50	3.11	0.12	2.99	84.5	1.51	1.60	67.6
R16A		1183+70 - 1185+20	0.74				0.32	0.42	64.7
R16B		1185+20 - 1189+50	2.37				1.19	1.18	68.6
R17	S-229A	1189+50 - 1194+33	3.03	0.00	3.03	84.0	1.55	1.48	69.2
R18	S-231	1194+33 - 1195+45	0.96	0.04	0.92	84.6	0.62	0.34	77.1
R19	S-237	1195+45 - 1201+00	3.19	0.03	3.16	84.1	1.62	1.57	69.0
R20	S-242	1201+00 - 1204+78	2.15	0.00	2.15	84.0	1.10	1.05	69.2
R21	S-246	1204+78 - 1209+55	2.70	0.00	2.70	84.0	1.46	1.24	70.9
R22	S-246	1209+55 - 1212+12	1.55	0.00	1.55	84.0	0.83	0.72	70.6
R22A		1212+12 - 1213+05	0.66				0.29	0.37	65.1
R22B		1213+05 - 1213+95	0.89				0.54	0.35	74.8
R23	S-246	1212+12 - 1213+95	1.03	0.00	1.03	84.0	0.56	0.47	71.1
R23A		1212+12 - 1213+05	0.58				0.31	0.27	70.5
R23B		1213+05 - 1213+95	0.45				0.25	0.20	71.8
R24	S-246	1213+95 - 1216+16	1.06	0.00	1.06	84.0	0.53	0.53	68.5
R24A	S-254	1213+95 - 1214+70	0.52				0.31	0.21	74.2
R24B	S-254	1214+70 - 1215+40	0.36				0.19	0.17	70.1
R24C	S-254	1215+40 - 1216+16	0.18				0.03	0.15	48.8
R25	S-246	1216+16 - 1220+88	1.65	0.05	1.60	84.4	0.54	1.11	58.3

SR 30

SUMMARY OF DISCHARGES

10 YEAR / 24 HOUR

	PRE (CFS)	POST (CFS)
POND 1	22.47	5.36
POND 2	22.46	2.72
POND 3	26.87	13.77
POND 4/5	44.27	22.39
POND 6	26.87	10.91

25 YEAR / 24 HOUR

	PRE (CFS)	POST (CFS)
POND 1	26.52	9.76
POND 2	26.61	5.42
POND 3	31.67	15.59
POND 4/5	52.33	24.00
POND 6	31.76	15.20

POND 1

POND 1

Proposed Pond 1 is designed as a wet pond with 1:4 side slope. This pond is designed for ultimate Six lanes. All on-site contributing drainage area will be collected by a Storm Sewer System and will be conveyed to Pond 1.

A wet retention/detention pond is designed to provide a treatment volume of one inch of runoff from the contributing drainage area.

All off-site contributing drainage area to this basin will be bypassed by means of proposed culverts. The runoff generated by proposed roadway will not be intermingled with off-site runoff.

CONTRIBUTING AREA

From station 1146+51.016 through station 1150+50.00. The proposed six lane improvements will add an additional lane to the inside lane of MAAI's proposed four lane road.

WATER TABLE

According to PSI Geotechnical Report, two power auger borings were performed within Pond 1. (Please see enclosed roadway soil survey report.)

Average Encountered Water Table Elevation = 3.60 Meters

Average Estimated Seasonal High Groundwater Elevation = 3.90 Meters

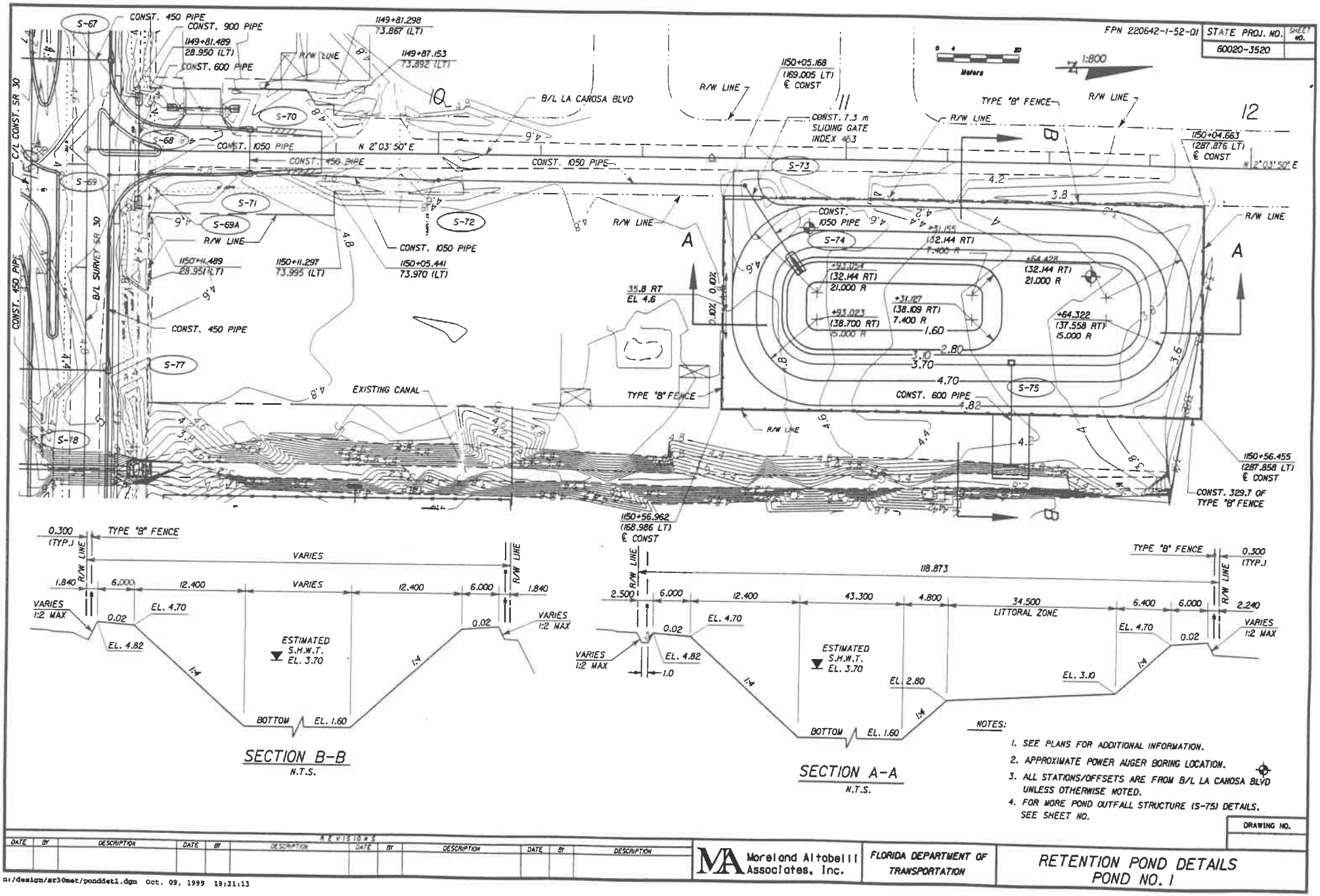
WATER QUALITY

Current Department of Environmental Regulation criteria for wet retention/detention ponds are listed as follows:

a. One inch of runoff storage above the control (bleed down) elevation of the permanent pool.

b. This volume is to be recovered at a slow rate. No more than one half the volume may be discharged in the first sixty hours following an event.

c. If littoral shelf is not provided with the proposed wet pond, permanent pool provided must be 150% more than required for wet ponds with littoral shelf. The volume in the permanent pool must provide for a residence time of at least twenty-one days.



SECTION B-B
N.T.S.

SECTION A-A
N.T.S.

NOTES:

1. SEE PLANS FOR ADDITIONAL INFORMATION.
2. APPROXIMATE POWER AUGER BORING LOCATION.
3. ALL STATIONS/OFFSETS ARE FROM B/L LA CANOSA BLVD UNLESS OTHERWISE NOTED.
4. FOR MORE POND OUTFALL STRUCTURE (S-75) DETAILS, SEE SHEET NO.

REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

RETENTION POND DETAILS POND NO. 1

DRAWING NO.

n:/design/sr30met/ponddet1.dgn Oct. 09, 1999 19:21:13

POND 1 - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
3.70	12.14	0.00	0.00	2504.89	0.00	0.00	0.00
3.90	12.80	0.20	0.66	2685.72	519.06	519.06	0.42
					43.09	562.15	0.46
3.916	12.848	0.02	0.05	2700.43			
4.00	13.12	0.08	0.28	2777.68	273.17	792.23	0.64
4.10	13.45	0.10	0.33	2870.63	282.42	1074.65	0.87
4.50	14.76	0.40	1.31	3252.47	1224.62	2299.27	1.86
4.60	15.09	0.10	0.33	3350.47	330.15	2629.41	2.13
4.70	15.42	0.10	0.33	3449.47	340.00	2969.41	2.41
4.82	15.81	0.12	0.39	5167.30	517.01	3486.42	2.83

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 1
TYPE OF EVALUATION, PRE/POST		POST
BASIN SIZE (ACRES)		4.81
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	3.27	320.46
GRASS			84	0.26	21.84
POND			84	0.66	55.44
WATER			100	0.62	62.00

WEIGHTED CN = $\frac{\text{SUM PRODUCTS}}{\text{SUM AREAS}}$ = CN = 95.6

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 0.462

(DETERMINE RUNOFF); R

R = $\frac{(P-0.2*S)^2}{(P+0.8S)}$ = R(INCHES) = 10.564

(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 4.234

POND 2

POND 2

Proposed Pond 2 is designed as a wet pond with 1:4 side slope. This pond is designed for ultimate Six lanes. All on-site contributing drainage area will be collected by a Storm Sewer System and will be conveyed to Pond 2.

A wet retention/detention pond is designed to provide a treatment volume of one inch of runoff from the contributing drainage area.

All off-site contributing drainage area to this basin will be bypassed by means of proposed culverts. The runoff generated by proposed roadway will not be intermingled with off-site runoff.

CONTRIBUTING DRAINAGE AREA TO POND NO. 2 (FOUR LANES)

Contributing drainage area to Pond No. 2 begins at station 1150+50 and ends at station 1154+55. The proposed six lane improvements will add and additional lane to the inside lane of MAAI's proposed four lane road.

WATER TABLE

According to PSI Geotechnical Report, two power auger borings were performed within Pond 2. (Please see enclosed roadway soil survey report.)

Average Encountered Water Table Elevation = 3.90 Meters

Average Estimated Seasonal High Groundwater Elevation = 4.40 Meters

WATER QUALITY

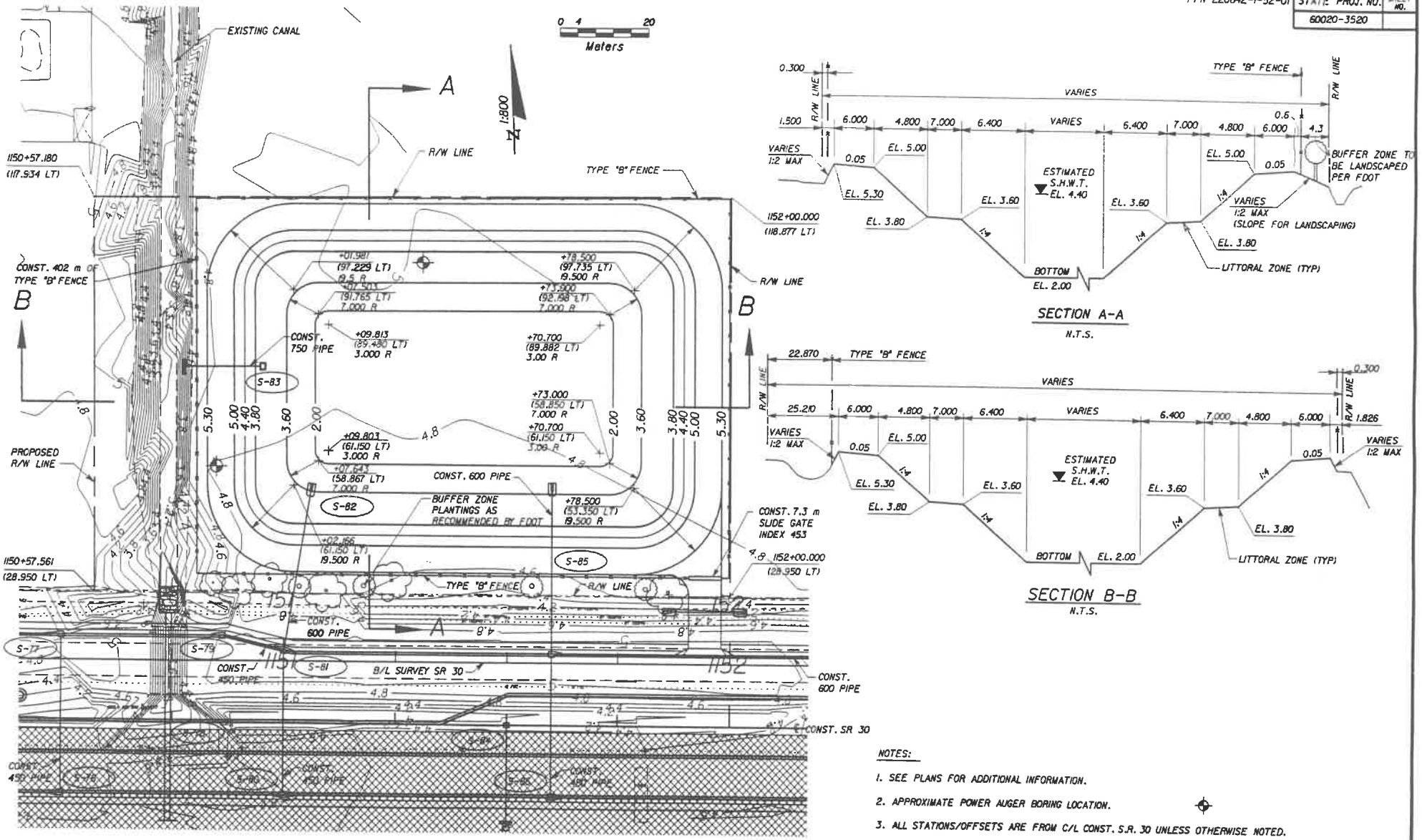
Current Department of Environmental Regulation criteria for wet retention/detention ponds are listed as follows:

a. One inch of runoff storage above the control (bleed down) elevation of the permanent pool.

b. This volume is to be recovered at a slow rate. No more than one half the volume may be discharged in the first sixty hours following an event.

c. If littoral shelf is not provided with the proposed wet pond, permanent pool provided must be 150% more than required for wet ponds with littoral shelf. The volume in the permanent pool must provide for a residence time of at least twenty-one days.

FPN 220642-1-52-01 | STATE PROJ. NO. 60020-3520 | SHEET NO.



SECTION A-A
N.T.S.

SECTION B-B
N.T.S.

NOTES:

1. SEE PLANS FOR ADDITIONAL INFORMATION.
2. APPROXIMATE POWER AUGER BORING LOCATION.
3. ALL STATIONS/OFFSETS ARE FROM C/L CONST. S.R. 30 UNLESS OTHERWISE NOTED.
4. FOR MORE POND OUTFALL STRUCTURE (S-83) DETAILS, SEE SHEET NO.

REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

RETENTION POND DETAILS
POND NO. 2

n:/design/sr30mat/ponddet2.dgn Oct. 09, 1999 13:21:39

POND 2 - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.40	14.44	0.00	0.00	6450.07	0.00	0.00	0.00
					618.39	618.39	0.50
4.495	14.747	0.09	0.31	6568.73			
4.50	14.76	0.10	0.33	6574.97	651.25	651.25	0.53
4.60	15.09	0.10	0.33	6700.88	663.79	1315.04	1.07
4.70	15.42	0.10	0.33	6827.80	676.43	1991.48	1.61
4.80	15.75	0.10	0.33	6955.75	689.18	2680.66	2.17
4.90	16.08	0.10	0.33	7084.68	702.02	3382.68	2.74
5.00	16.40	0.10	0.33	7214.62	714.96	4097.64	3.32
5.30	17.39	0.30	0.98	9284.59	2474.88	6572.52	5.33

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 1
TYPE OF EVALUATION, PRE/POST		PRE
BASIN SIZE (ACRES)		3.97
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	0.89	87.22
WETLANDS			92	1.08	99.36
GRASS			84	0.72	60.48
POND			84	1.28	107.52

WEIGHTED CN = SUM PRODUCTS / SUM AREAS = CN = 89.3

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 1.196

(DETERMINE RUNOFF); R

R = (P-0.2*S)^2 / (P+0.8S) = R(INCHES) = 9.783

(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 3.237

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 2
TYPE OF EVALUATION, PRE/POST		POST
BASIN SIZE (ACRES)		5.25
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	2.66	260.68
GRASS			84	0.30	25.20
POND			84	0.70	58.80
WATER			100	1.59	159.00

WEIGHTED CN = SUM PRODUCTS / SUM AREAS = CN = 95.9

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 0.423

(DETERMINE RUNOFF); R

R = (P-0.2*S)^2 / (P+0.8S) = R(INCHES) = 10.608

(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 4.641

POND 3

POND 3

Proposed Pond 3 is designed as a wet pond with 1:4 side slope. This pond is designed for ultimate Six lanes. Littoral shelf is not provided within this pond, instead 50% more permanent pool will be provided.

A wet retention/detention pond is designed to provide a treatment volume of one inch of runoff from the contributing drainage area.

All off-site contributing drainage area to this basin will be bypassed by means of proposed culverts. The runoff generated by proposed roadway will not be intermingled with off-site runoff.

CONTRIBUTING AREA

Contributing drainage area to Pond No. 3 begins at station 154+55 and ends at station 157+60. All on-site contributing drainage area will be collected by a Storm Sewer System and will be conveyed to Pond No. 3.

WATER TABLE

According to PSI Geotechnical Report, two power auger borings were performed within Pond 3. (Please see enclosed roadway soil survey report.)

Average Encountered Water Table Elevation = 3.55 Meters

Average Estimated Seasonal High Groundwater Elevation = 3.80 Meters

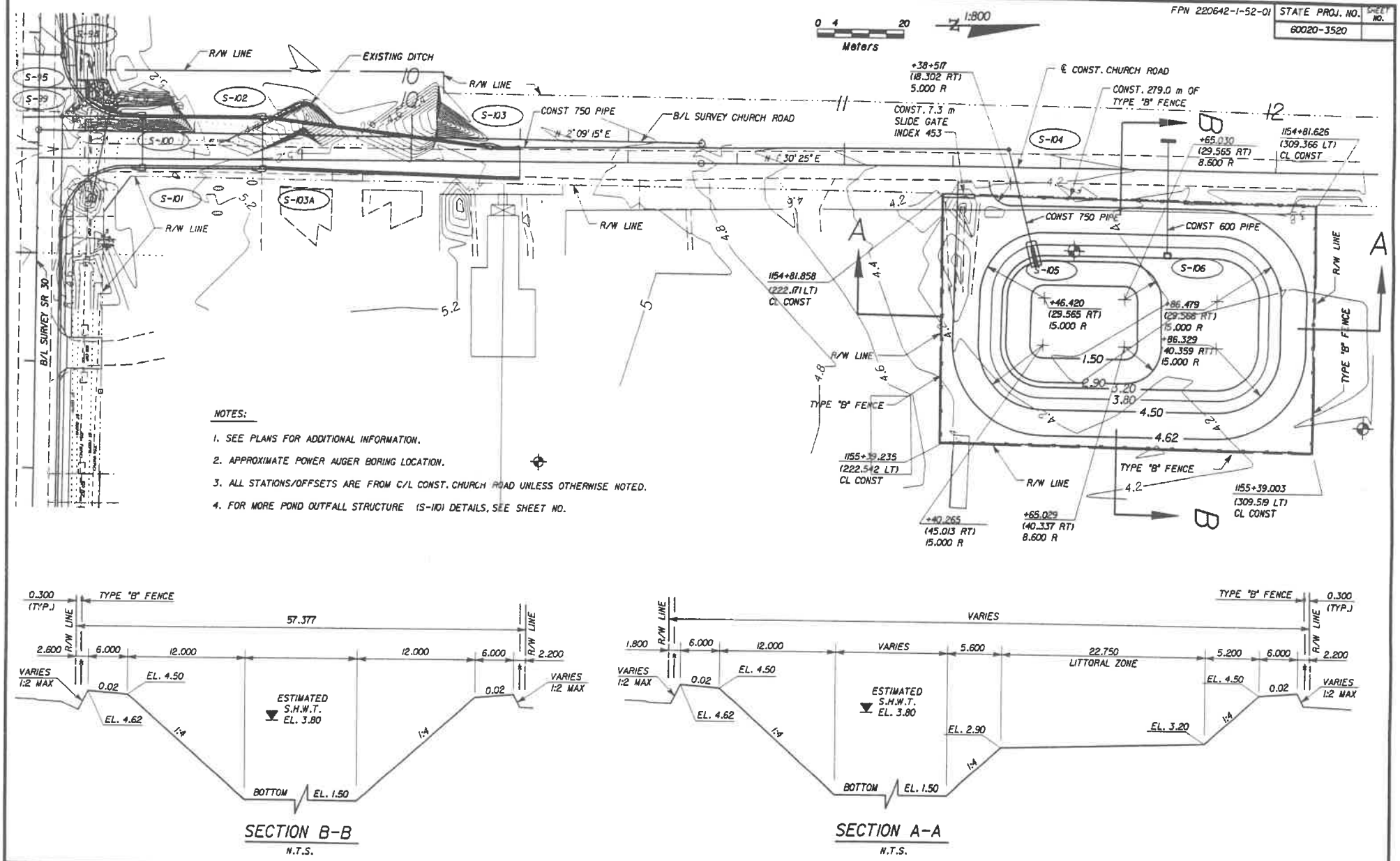
WATER QUALITY

Current Department of Environmental Regulation criteria for wet retention/detention ponds are listed as follows:

a. One inch of runoff storage above the control (bleed down) elevation of the permanent pool.

b. This volume is to be recovered at a slow rate. No more than one half the volume may be discharged in the first sixty hours following an event.

c. If littoral shelf is not provided with the proposed wet pond, permanent pool provided must be 150% more than required for wet ponds with littoral shelf. The volume in the permanent pool must provide for a residence time of at least twenty-one days.


FPN 220642-1-52-01
STATE PROJ. NO. 60020-3520
SHEET NO.
0 4 20
Meters
1:800
R/W LINE
EXISTING DITCH
CONST 750 PIPE
B/L SURVEY CHURCH ROAD
N 2°09'15" E
N 30°25" E
CONST. CHURCH ROAD
CONST. 279.0 m OF TYPE "B" FENCE
CONST. 7.3 m SLIDE GATE INDEX 453
+38+517 (18.302 RT) 5.000 R
+65.030 (29.565 RT) 8.600 R
1154+81.626 (309.366 LT) CL CONST
1154+81.858 (222.171 LT) CL CONST
CONST 600 PIPE
+46.420 (29.565 RT) 15.000 R
+86.479 (29.566 RT) 15.000 R
+86.329 40.359 RT 15.000 R
1155+39.235 (222.542 LT) CL CONST
1155+39.003 (309.519 LT) CL CONST
+40.265 (45.013 RT) 15.000 R
+65.029 (40.337 RT) 8.600 R
TYPE "B" FENCE
B/L SURVEY SR 30
S-15
S-99
S-98
S-100
S-101
S-102
S-103
S-103A
S-104
S-105
S-106
NOTES:
1. SEE PLANS FOR ADDITIONAL INFORMATION.
2. APPROXIMATE POWER AUGER BORING LOCATION.
3. ALL STATIONS/OFFSETS ARE FROM C/L CONST. CHURCH ROAD UNLESS OTHERWISE NOTED.
4. FOR MORE POND OUTFALL STRUCTURE (S-110) DETAILS, SEE SHEET NO.
0.300 (TYP.)
TYPE "B" FENCE
R/W LINE
57.377
2.600
6.000
12.000
12.000
6.000
2.200
VARIES 1:2 MAX
0.02
EL. 4.50
EL. 4.62
1:4
ESTIMATED S.H.W.T. EL. 3.80
BOTTOM EL. 1.50
SECTION B-B
N.T.S.
VARIES
1.800
5.600
22.750
LITTORAL ZONE
5.200
EL. 2.90
EL. 3.20
SECTION A-A
N.T.S.
REVISIONS
DATE
BY
DESCRIPTION
Moreland Altobelli Associates, Inc.
FLORIDA DEPARTMENT OF TRANSPORTATION
RETENTION POND DETAILS
POND NO. 3
n:/design/sr30mat/ponddet3.dgn Oct. 09, 1999 19:22:10

POND 3 - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
3.80	12.47	0.00	0.00	2164.21	0.00	0.00	0.00
3.90	12.80	0.10	0.33	2236.59	220.04	220.04	0.18
					211.18	431.22	0.35
3.993	13.100	0.09	0.31	2304.82			
4.00	13.12	0.01	0.02	2309.96	227.33	447.37	0.36
4.10	13.45	0.10	0.33	2384.36	234.72	682.08	0.55
4.20	13.78	0.10	0.33	2459.75	242.21	924.29	0.75
4.30	14.11	0.10	0.33	2536.15	249.79	1174.08	0.95
4.40	14.44	0.10	0.33	2613.55	257.49	1431.57	1.16
4.50	14.76	0.10	0.33	2691.98	265.28	1696.85	1.38
4.62	15.16	0.12	0.39	4075.68	406.06	2102.91	1.70

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 3
TYPE OF EVALUATION, PRE/POST		POST
BASIN SIZE (ACRES)		3.64
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	2.44	239.12
GRASS			84	0.20	16.80
POND			84	0.46	38.64
WATER			100	0.54	54.00

WEIGHTED CN = $\frac{\text{SUM PRODUCTS}}{\text{SUM AREAS}}$ = CN = 95.8

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 0.443

(DETERMINE RUNOFF); R

R = $\frac{(P-0.2*S)^2}{(P+0.8S)}$ = R(INCHES) = 10.586

(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 3.211

POND 4/5

POND 4/5

Proposed Pond 4/5 is designed as a wet pond with 1:4 side slope. This pond is designed for ultimate Six lanes. All on-site contributing drainage area will be collected by a Storm Sewer System and will be conveyed to Pond 4/5.

A wet retention/detention pond is designed to provide a treatment volume of one inch of runoff from the contributing drainage area.

All off-site contributing drainage area to this basin will be bypassed by means of proposed culverts. The runoff generated by proposed roadway will not be intermingled with off-site runoff.

CONTRIBUTING DRAINAGE

Contributing drainage area to Pond No. 4/5 begins at station 1157+60 and ends at station 1165+60. The proposed improvements will add an additional lane to the inside lane of MAAI's proposed four lane road.

WATER TABLE

According to PSI Geotechnical Report, one power auger boring was performed within Pond 4/5. (Please see enclosed roadway soil survey report.)

Average Encountered Water Table Elevation = 4.25 Meters

Average Estimated Seasonal High Groundwater Elevation = 4.40 Meters

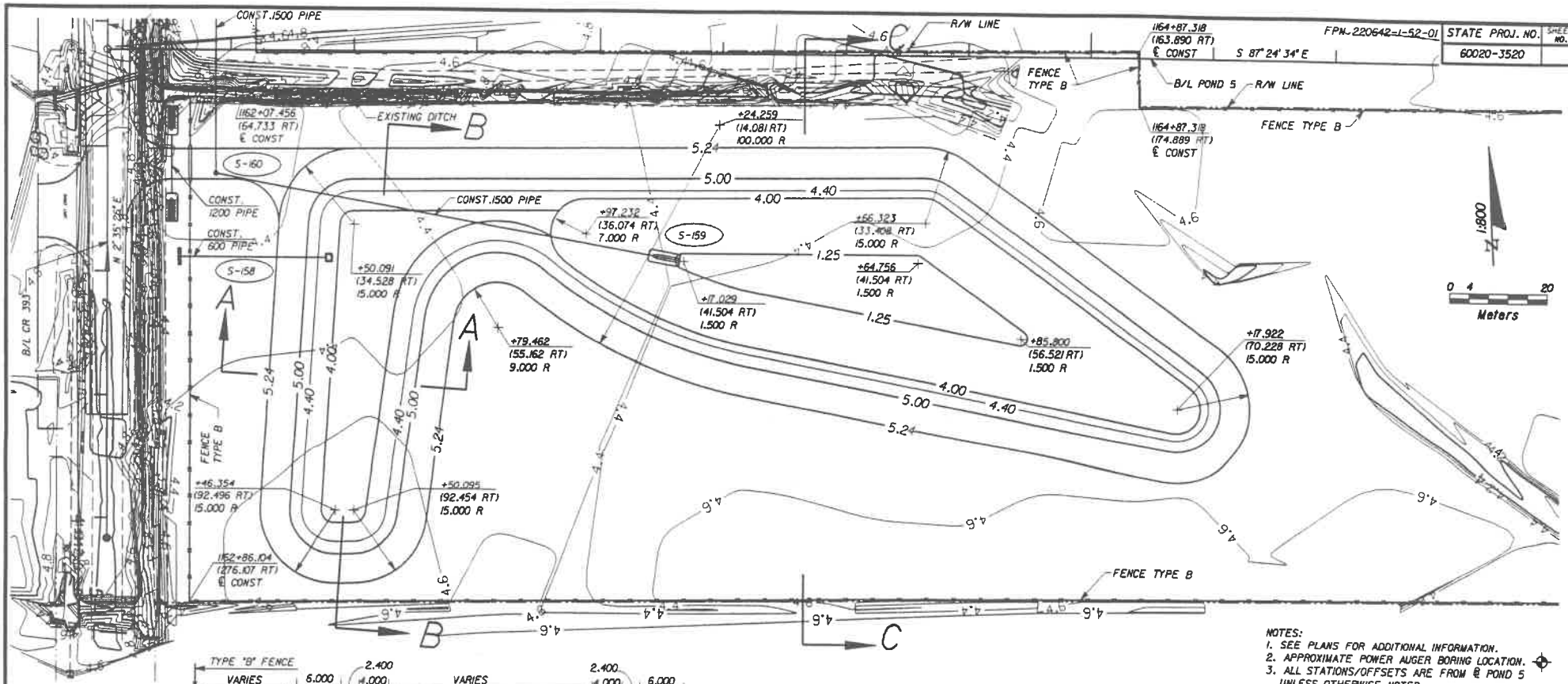
WATER QUALITY

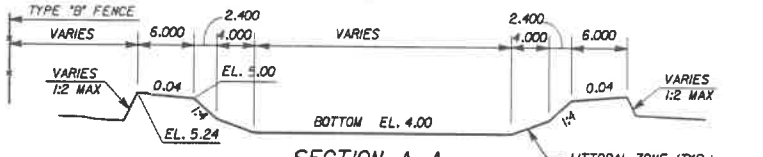
Current Department of Environmental Regulation criteria for wet retention/detention ponds are listed as follows:

a. One inch of runoff storage above the control (bleed down) elevation of the permanent pool.

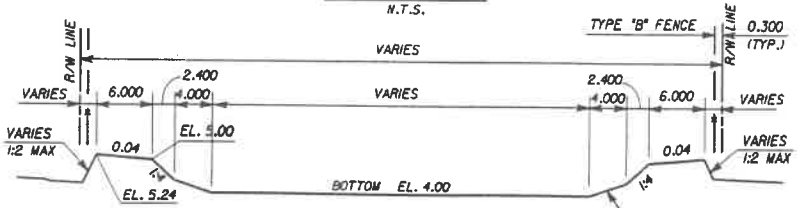
b. This volume is to be recovered at a slow rate. No more than one half the volume may be discharged in the first sixty hours following an event.

c. If littoral shelf is not provided with the proposed wet pond, permanent pool provided must be 150% more than required for wet ponds with littoral shelf. The volume in the permanent pool must provide for a residence time of at least twenty-one days.

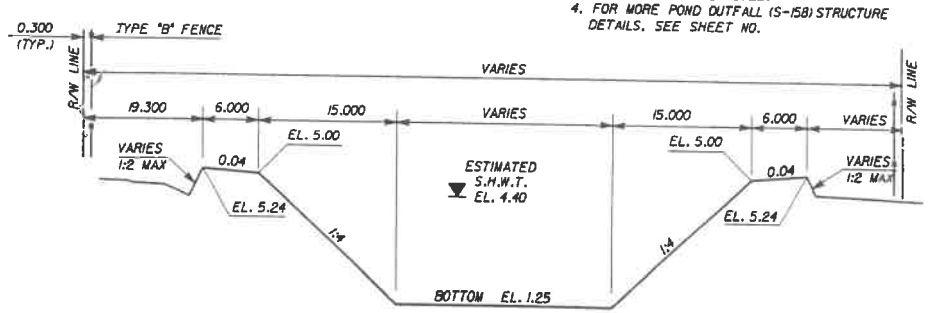




SECTION A-A
N.T.S.



SECTION B-B



SECTION C-C
N.T.S.

NOTES:
1. SEE PLANS FOR ADDITIONAL INFORMATION.
2. APPROXIMATE POWER AUGER BORING LOCATION.
3. ALL STATIONS/OFFSETS ARE FROM ℄ POND 5 UNLESS OTHERWISE NOTED.
4. FOR MORE POND OUTFALL (S-158) STRUCTURE DETAILS, SEE SHEET NO.

REVISIONS N.T.S.											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

RETENTION POND DETAILS POND NO. 4/5

n:/design/sr30mat/ponddet5.dgn Oct. 09, 1999 19:22:37

POND 45

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.40	14.44	0.00	0.00	5521.30	0.00	0.00	0.00
4.50	14.76	0.10	0.33	5722.91	562.21	562.21	0.46
					470.22	1032.43	0.84
4.58	15.030	0.08	0.27	5887.46			
4.70	15.42	0.12	0.39	6129.20	1185.21	1747.42	1.42
4.90	16.08	0.20	0.66	6539.55	1266.88	3014.30	2.44
5.00	16.40	0.10	0.33	6746.60	664.31	3678.60	2.98
5.24	17.19	0.24	0.79	9967.79	2005.73	5684.33	4.61

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 4/5
TYPE OF EVALUATION, PRE/POST		POST
BASIN SIZE (ACRES)		8.73
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	5.69	557.62
GRASS			84	0.58	48.72
POND			84	1.10	92.40
WATER			100	1.36	136.00

WEIGHTED CN = SUM PRODUCTS / SUM AREAS = CN = 95.6

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 0.458

(DETERMINE RUNOFF); R

R = (P-0.2*S)^2 / (P+0.8S) = R(INCHES) = 10.568

(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 7.688

POND 6

POND 6

Proposed Pond 6 is designed as a wet pond with 1:4 side slope. This pond is designed for ultimate Six lanes. All on-site contributing drainage area will be collected by a Storm Sewer System and will be conveyed to Pond 6.

A wet retention/detention pond is designed to provide a treatment volume of one inch of runoff from the contributing drainage area.

All off-site contributing drainage area to this basin will be bypassed by means of proposed culverts. The runoff generated by proposed roadway will not be intermingled with off-site runoff.

CONTRIBUTING AREA

Contributing drainage area to Pond No. 6 begins from station 1165+50 through station 1170+68. The proposed improvements will add an additional lane to the inside lane of MAAI's proposed four lane road.

WATER TABLE

According to PSI Geotechnical Report, two power auger borings were performed within Pond 6. (Please see enclosed roadway soil survey report.)

Average Encountered Water Table Elevation = 4.50 Meters

Average Estimated Seasonal High Groundwater Elevation = 4.75 Meters

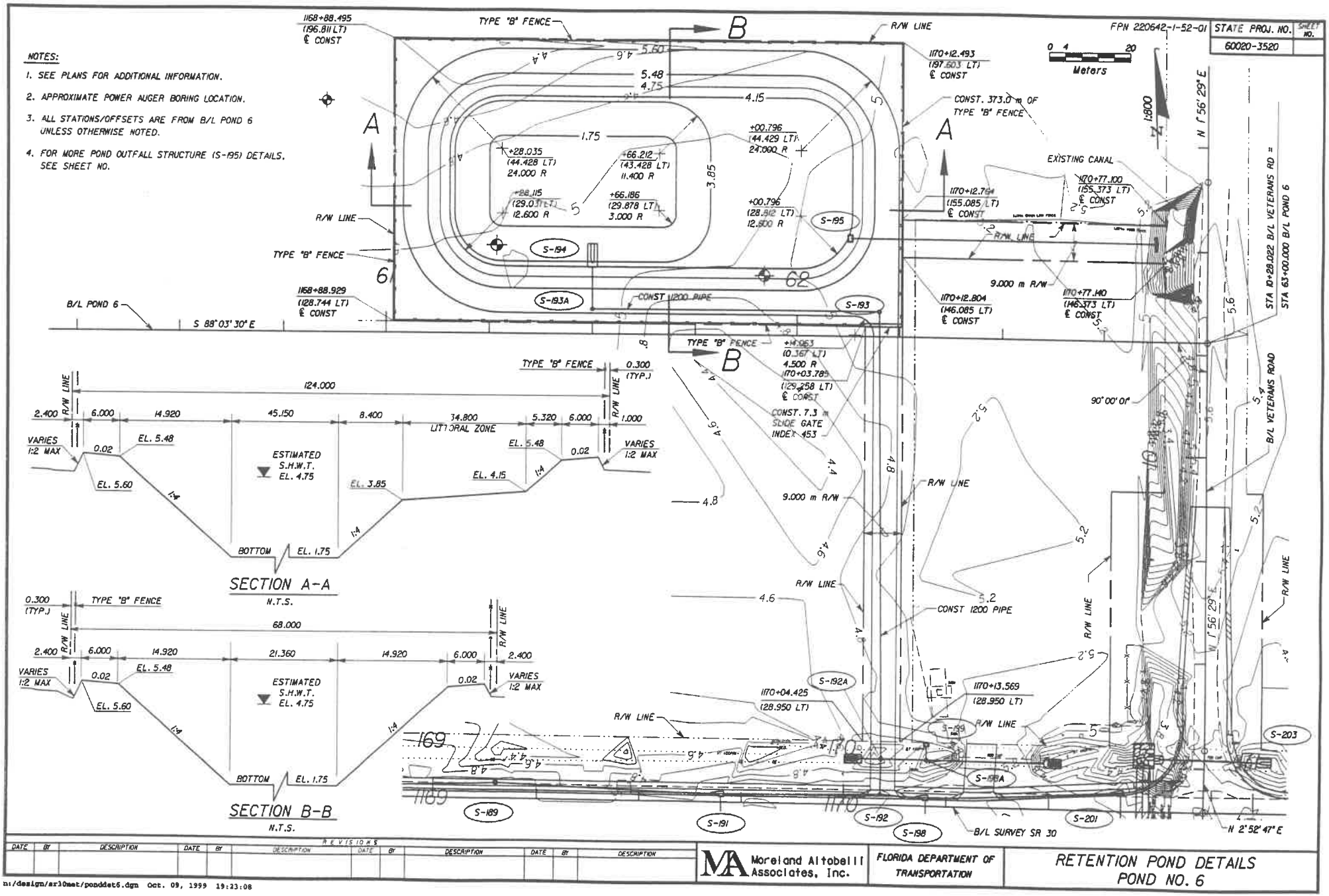
WATER QUALITY

Current Department of Environmental Regulation criteria for wet retention/detention ponds are listed as follows:

a. One inch of runoff storage above the control (bleed down) elevation of the permanent pool.

b. This volume is to be recovered at a slow rate. No more than one half the volume may be discharged in the first sixty hours following an event.

c. If littoral shelf is not provided with the proposed wet pond, permanent pool provided must be 150% more than required for wet ponds with littoral shelf. The volume in the permanent pool must provide for a residence time of at least twenty-one days.


NOTES:
1. SEE PLANS FOR ADDITIONAL INFORMATION.
2. APPROXIMATE POWER AUGER BORING LOCATION.
3. ALL STATIONS/OFFSETS ARE FROM B/L POND 6 UNLESS OTHERWISE NOTED.
4. FOR MORE POND OUTFALL STRUCTURE (S-195) DETAILS, SEE SHEET NO.
FPN 220642-1-52-01
STATE PROJ. NO. 60020-3520
SHEET NO.
1168+88.495 (196.811 LT) ℄ CONST
TYPE "B" FENCE
R/W LINE
1170+12.493 (197.603 LT) ℄ CONST
CONST. 373.0 m OF TYPE "B" FENCE
EXISTING CANAL
1170+77.100 (155.373 LT) ℄ CONST
1170+12.764 (155.085 LT) ℄ CONST
1170+12.804 (146.085 LT) ℄ CONST
1170+77.140 (146.373 LT) ℄ CONST
9.000 m R/W
B/L POND 6
S 88°03'30" E
1168+88.929 (128.744 LT) ℄ CONST
CONST 1200 PIPE
S-193A
S-193
S-194
S-195
+28.035 (44.428 LT) 24.000 R
+66.212 (43.428 LT) 11.400 R
+28.115 (29.031 LT) 12.600 R
+66.186 (29.878 LT) 3.000 R
+00.796 (44.429 LT) 24.000 R
+00.796 (28.912 LT) 12.600 R
+41.963 (0.367 LT) 4.500 R
1170+03.789 (129.258 LT) ℄ CONST
CONST. 7.3 m SLIDE GATE INDEX 453
90°00'00"
N 1°56'29" E
1:800
0 4 20 Meters
STA 10+28.022 B/L VETERANS RD = STA 63+00.000 B/L POND 6
B/L VETERANS ROAD
SECTION A-A
N.T.S.
124.000
2.400 R/W LINE 6.000 14.920 45.150 8.400 14.800 LITTORAL ZONE 5.320 6.000 1.000 R/W LINE
0.300 (TYP.)
VARIES 1:2 MAX
EL. 5.48
0.02
EL. 5.60
1:4
ESTIMATED S.H.W.T. EL. 4.75
EL. 3.85
EL. 4.15
BOTTOM EL. 1.75
SECTION B-B
N.T.S.
68.000
2.400 6.000 14.920 21.360 14.920 6.000 2.400
1170+04.425 (28.950 LT)
1170+13.569 (28.950 LT)
S-192A
S-198A
S-203
S-189
S-191
S-192
S-198
S-201
B/L SURVEY SR 30
N 2°52'47" E
CONST 1200 PIPE
REVISIONS
DATE BY DESCRIPTION
Moreland Altobelli Associates, Inc.
FLORIDA DEPARTMENT OF TRANSPORTATION
RETENTION POND DETAILS
POND NO. 6
n:/design/sr10mst/ponddet6.dgn Oct. 09, 1999 19:23:08

POND 6 - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.75	15.58	0.00	0.00	4462.34	0.00	0.00	0.00
4.85	15.91	0.10	0.33	4570.92	451.66	451.66	0.37
					220.67	672.33	0.55
4.898	16.070	0.05	0.16	4623.53			
4.95	16.24	0.05	0.17	4680.53	462.57	914.24	0.74
5.05	16.57	0.10	0.33	4791.14	473.58	1387.82	1.13
5.15	16.90	0.10	0.33	4902.76	484.70	1872.51	1.52
5.25	17.22	0.10	0.33	5015.38	495.91	2368.42	1.92
5.35	17.55	0.10	0.33	5129.01	507.22	2875.64	2.33
5.48	17.98	0.13	0.43	5278.25	676.47	3552.11	2.88
5.60	18.37	0.12	0.39	7230.00	750.49	4302.61	3.49

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 6
TYPE OF EVALUATION, PRE/POST		PRE
BASIN SIZE (ACRES)		5.53
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	0.91	89.18
WETLANDS			92	1.83	168.36
GRASS			84	1.00	84.00
POND			84	1.79	150.36

WEIGHTED CN = SUM PRODUCTS / SUM AREAS = CN = 89.0

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 1.242

(DETERMINE RUNOFF); R

R = (P-0.2*S)^2 / (P+0.8S) = R(INCHES) = 9.737

(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 4.487

MORELAND ALTOBELLI ASSOCIATES
CONSULTING ENGINEERS

SR 30 (FOUR LANE)
(PROJECT NAME)
K.L.D.
(BY)
SHEET 1 OF 1

SUB-BASIN ANALYSIS

BASIN DESIGNATION		POND 6
TYPE OF EVALUATION, PRE/POST		POST
BASIN SIZE (ACRES)		5.73
RAINFALL DEPTH (INCHES)	P=	11.1

ESTIMATE RUNOFF VOLUME

(DETERMINE BASIN RUNOFF CURVE NUMBER; CN)

LAND USE DESCRIPTION	SOIL NAME	SOIL GROUP	CN	AREA	PRODUCT
PAVEMENT			98	3.57	349.86
GRASS			84	0.37	31.08
POND			84	0.69	57.96
WATER			100	1.10	110.00

WEIGHTED CN = SUM PRODUCTS / SUM AREAS = CN = 95.8

(DETERMINE SOIL STORAGE); S

S = (1000/CN) - 10 = S (INCHES) = 0.439

(DETERMINE RUNOFF); R

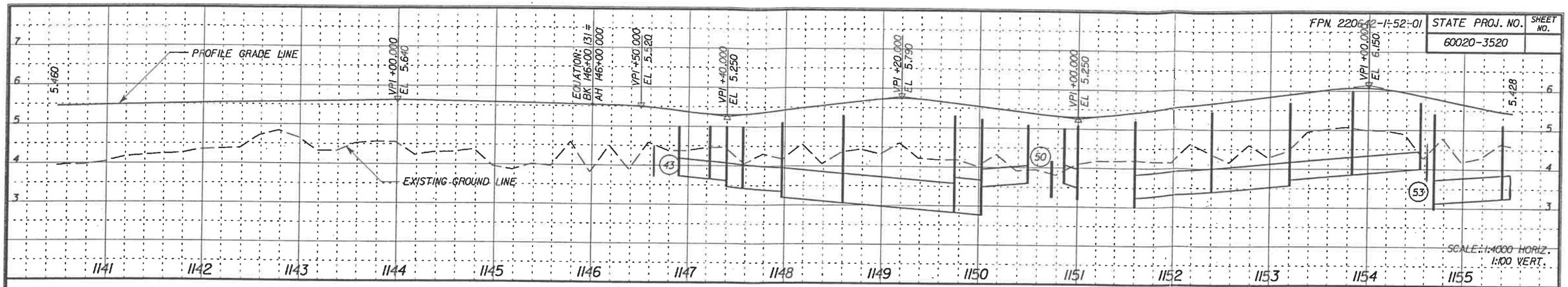
R = (P-0.2*S)^2 / (P+0.8S) = R(INCHES) = 10.590

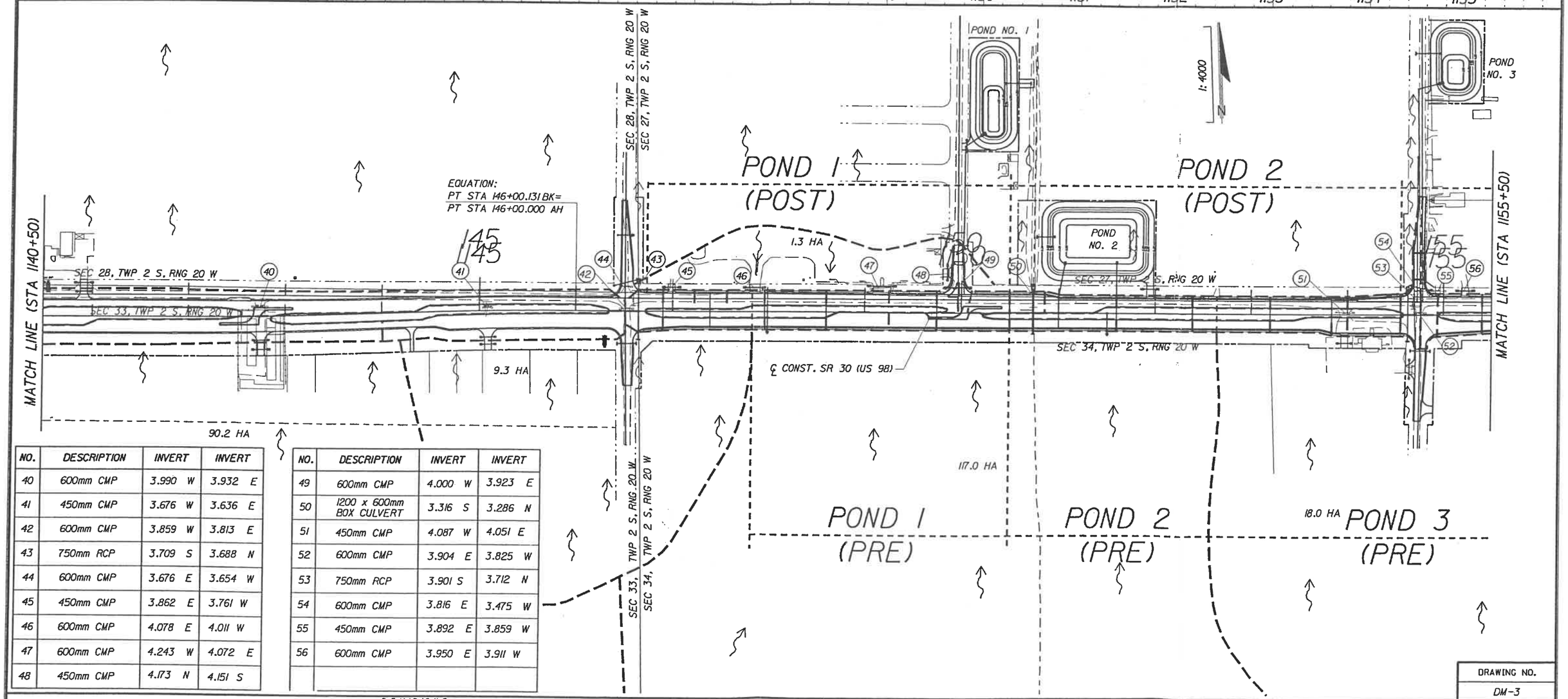
(DETERMINE RUNOFF VOLUME); VR [WATER QUALITY]

VR = R * AREA /12 = VR (ACRE-FT) = 5.057

FPN. 220642-1-52-01

STATE PROJ. NO.	SHEET NO.
60020-3520	





NO.	DESCRIPTION	INVERT	INVERT
40	600mm CMP	3.990 W	3.932 E
41	450mm CMP	3.676 W	3.636 E
42	600mm CMP	3.859 W	3.813 E
43	750mm RCP	3.709 S	3.688 N
44	600mm CMP	3.676 E	3.654 W
45	450mm CMP	3.862 E	3.761 W
46	600mm CMP	4.078 E	4.011 W
47	600mm CMP	4.243 W	4.072 E
48	450mm CMP	4.173 N	4.151 S

NO.	DESCRIPTION	INVERT	INVERT
49	600mm CMP	4.000 W	3.923 E
50	1200 x 600mm BOX CULVERT	3.316 S	3.286 N
51	450mm CMP	4.087 W	4.051 E
52	600mm CMP	3.904 E	3.825 W
53	750mm RCP	3.901 S	3.712 N
54	600mm CMP	3.816 E	3.475 W
55	450mm CMP	3.892 E	3.859 W
56	600mm CMP	3.950 E	3.911 W

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

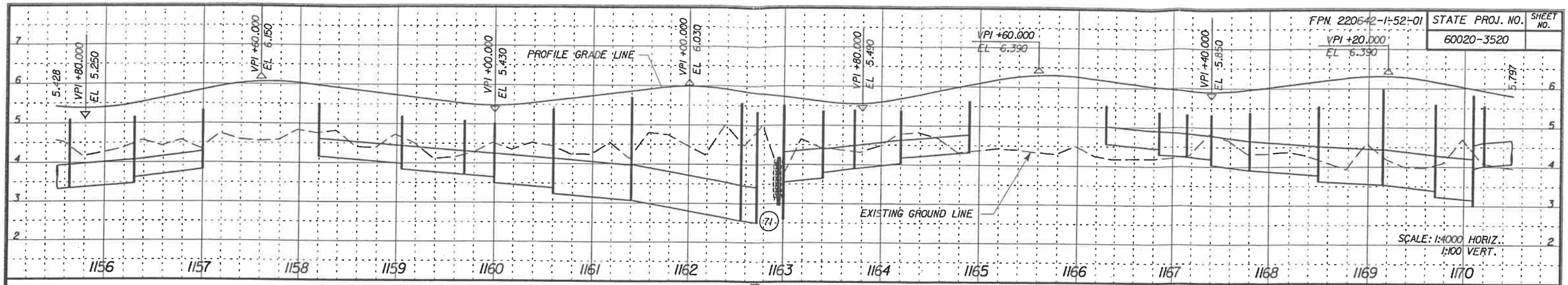
FLORIDA DEPARTMENT OF TRANSPORTATION

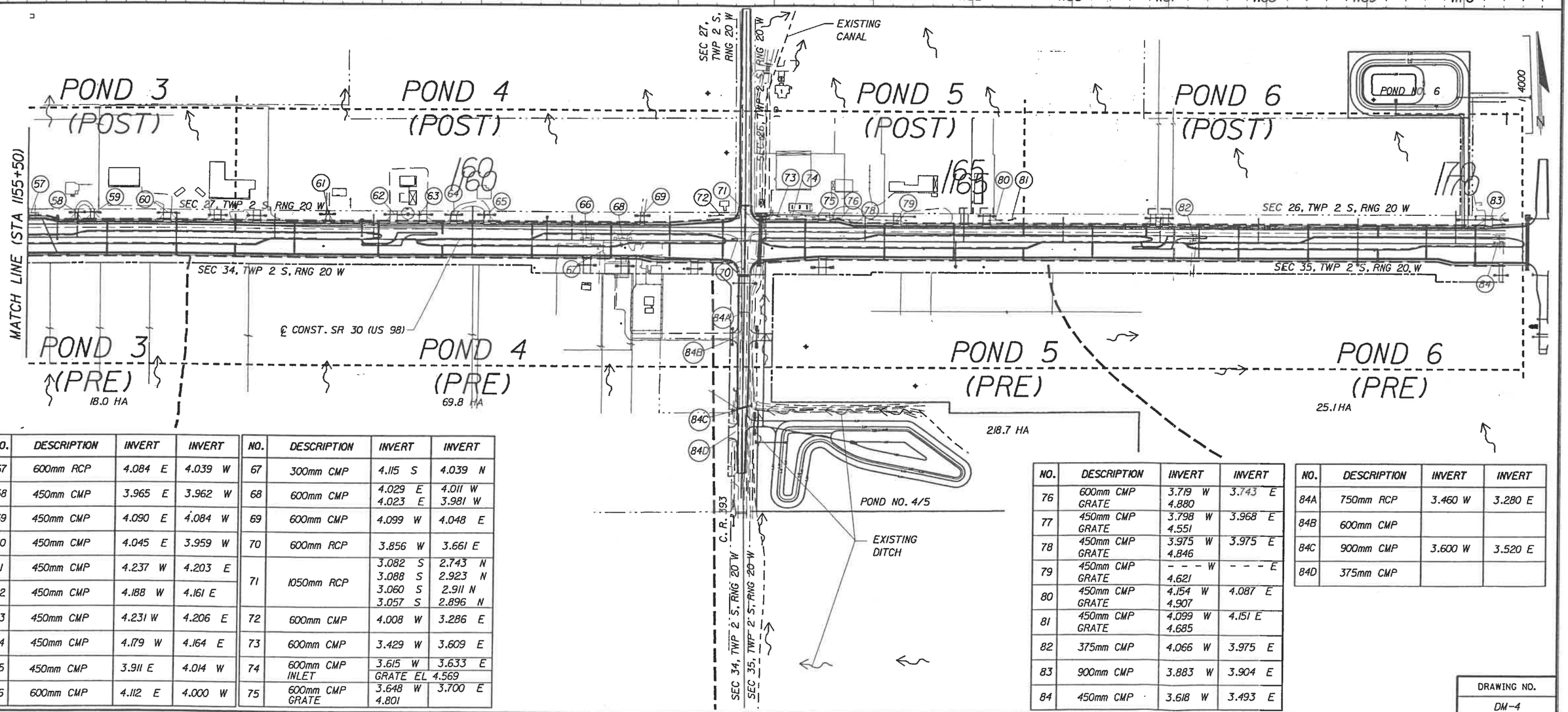
DRAWING NO. DM-3

DRAINAGE MAP
STA. 1140+50 TO STA. 1155+50

n:/design/sr30met/drmprd03.dgn Oct. 13, 1999 16:06:07

FPN 220642-1-52-01 | STATE PROJ. NO. 60020-3520 | SHEET NO.





NO.	DESCRIPTION	INVERT	INVERT
57	600mm RCP	4.084 E	4.039 W
58	450mm CMP	3.965 E	3.962 W
59	450mm CMP	4.090 E	4.084 W
60	450mm CMP	4.045 E	3.959 W
61	450mm CMP	4.237 W	4.203 E
62	450mm CMP	4.188 W	4.161 E
63	450mm CMP	4.231 W	4.206 E
64	450mm CMP	4.179 W	4.164 E
65	450mm CMP	3.911 E	4.014 W
66	600mm CMP	4.112 E	4.000 W

NO.	DESCRIPTION	INVERT	INVERT
67	300mm CMP	4.115 S	4.039 N
68	600mm CMP	4.029 E 4.023 E	4.011 W 3.981 W
69	600mm CMP	4.099 W	4.048 E
70	600mm RCP	3.856 W	3.661 E
71	1050mm RCP	3.082 S 3.088 S 3.060 S 3.057 S	2.743 N 2.923 N 2.911 N 2.896 N
72	600mm CMP	4.008 W	3.286 E
73	600mm CMP	3.429 W	3.609 E
74	600mm CMP INLET	3.615 W GRATE EL 4.569	3.633 E
75	600mm CMP GRATE	3.648 W 4.801	3.700 E

NO.	DESCRIPTION	INVERT	INVERT
76	600mm CMP GRATE	3.719 W 4.880	3.743 E
77	450mm CMP GRATE	3.798 W 4.551	3.968 E
78	450mm CMP GRATE	3.975 W 4.846	3.975 E
79	450mm CMP GRATE	- - - W 4.621	- - - E
80	450mm CMP GRATE	4.154 W 4.907	4.087 E
81	450mm CMP GRATE	4.099 W 4.685	4.151 E
82	375mm CMP	4.066 W	3.975 E
83	900mm CMP	3.883 W	3.904 E
84	450mm CMP	3.618 W	3.493 E

NO.	DESCRIPTION	INVERT	INVERT
84A	750mm RCP	3.460 W	3.280 E
84B	600mm CMP		
84C	900mm CMP	3.600 W	3.520 E
84D	375mm CMP		

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Moreland Altobelli Associates, Inc.

FLORIDA DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP
STA. 1155+50 TO STA. 1170+50

DRAWING NO. DM-4

c:/bkup/sr30/drmprd04.dgn Oct. 13, 1999 17:06:11

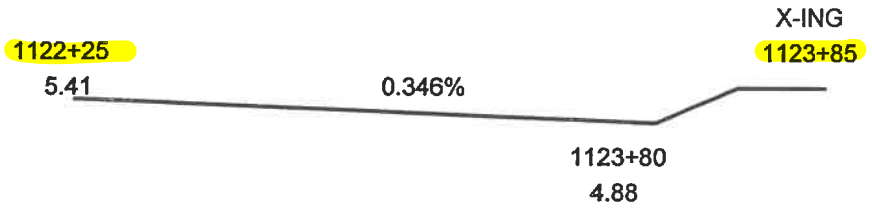
TABLE 2
SUMMARY OF ONSITE DITCHES AND MEDIANS

CNpre IMP = 98 PERV = 84 SOILS = TYPE 'D'

CNpost IMP = 98 PERV =39 SOILS = TYPE 'A'

BASIN No.	STR. No.	STATION TO STATION	TOTAL AREA AC.	PRE			POST		
				IMPERVIOUS AREA, AC.	PERVIOUS AREA, AC.	CN	IMPERVIOUS AREA, AC.	PERVIOUS AREA, AC.	CN
L1	S-4	1122+25 - 1123+85	0.73	0.02	0.71	84.4	0.32	0.41	64.9
L2	S-6	1123+85 - 1124+80	0.44	0.20	0.24	90.4	0.24	0.20	71.2
L3	S-10	1124+80 - 1128+02	1.51	0.68	0.83	90.3	0.75	0.76	68.3
L4	S-15	1128+02 - 1130+35	1.15	0.43	0.72	89.2	0.57	0.58	68.2
L5	S-22	1130+35 - 1132+52	1.29	0.49	0.80	89.3	0.77	0.52	74.2
L6	S-23	1132+52 - 1134+02	0.94	0.40	0.54	90.0	0.53	0.41	72.3
L7	S-25	1134+02 - 1138+48	2.45	0.91	1.54	89.2	1.33	1.12	71.0
L8	S-41	1138+48 - 1139+82	0.87	0.26	0.61	88.2	0.59	0.28	79.0
L9	S-44	1139+82 - 1140+44	0.35	0.12	0.23	88.8	0.21	0.14	74.4
L10	S-47	1140+44 - 1146+50	2.89	1.22	1.67	89.9	1.73	1.16	74.3
L12	S-217	1176+00 - 1178+62	2.76	0.50	2.26	86.5	1.22	1.54	65.1
L13	S-220A	1178+62 - 1179+75	0.32	0.21	0.11	93.2	0.06	0.26	50.1
L14	S-222	1179+75 - 1182+00	0.62	0.38	0.24	92.6	0.10	0.52	48.5
L15	S-225	1182+00 - 1183+70	0.45	0.29	0.16	93.0	0.08	0.37	49.5
L16	S-229	1183+70 - 1194+33	5.47	1.98	3.49	89.1	2.80	2.67	69.2
L16A		1183+70 - 1185+20	0.51				0.14	0.37	55.2
L16B		1185+20 - 1194+33	4.96				2.66	2.30	70.6
L17	S-232	1194+33 - 1195+45	0.57	0.27	0.30	90.6	0.32	0.25	72.1
L18	S-236	1195+45 - 1201+00	3.25	1.05	2.20	88.5	2.00	1.25	75.3
L19	S-240	1201+00 - 1203+76	1.43	0.50	0.93	88.9	0.74	0.69	69.5
L20	S-244	1203+76 - 1205+00	0.74	0.22	0.52	88.2	0.44	0.30	74.1
L21	S-247	1205+00 - 1209+80	3.03	0.98	2.05	88.5	1.81	1.22	74.2
L22	S-250	1209+80 - 1210+71	0.34	0.17	0.17	91.0	0.22	0.12	77.2
L23	S-251	91+60 - 93+84	1.83	0.58	1.25	88.4	0.97	0.86	70.3
L24	S-252	1211+48 -1213+96	1.41	0.55	0.86	89.5	0.77	0.64	71.2
L24A		1211+48 -1212+75	0.69				0.38	0.31	71.5
L24B		1212+75 -1213+96	0.72				0.39	0.33	71.1
L25	S-256	1213+96 - 1216+20	1.44	0.40	1.04	87.9	0.78	0.66	71.0
L25A		1213+96 - 1215+10	0.81				0.51	0.30	76.1
L25B		1215+10 - 1216+20	0.60				0.26	0.34	64.7
L26	S-258	1216+20 - 1220+80	2.01	0.80	1.21	89.6	0.97	1.04	67.5
M1	S-5	1120+30 - 1125+94	3.24	0.40	2.84	85.7	1.35	1.89	63.6
M2	S-11	1125+94 - 1130+21	2.05	0.05	2.00	84.3	0.43	1.62	51.4
M3	S-215	1171+06 - 1175+50	1.14	0.31	0.83	87.8	0.40	0.74	59.7
M4	S-223	1179+11 - 1182+90	1.92	0.00	1.92	84.0	0.84	1.08	64.8
M5	S-227A	1182+75 - 1187+16	2.07	0.19	1.88	85.3	0.83	1.24	62.7
M6	S-256	1214+82 - 1218+55	1.74	0.00	1.74	84.0	0.65	1.09	61.0
R2	S-3	1120+47 - 1123+85	1.29	0.16	1.13	85.7	0.57	0.72	65.1
R3	S-9	1123+85 - 1127+62	1.27	0.00	1.27	84.0	0.27	1.00	51.5
R4	S-14	1127+62 - 1130+35	1.51	0.00	1.51	84.0	0.81	0.70	70.6
R5	S-21	1130+35 - 1134+00	2.14	0.03	2.11	84.2	1.23	0.91	72.9
R6	S-26	1134+00 - 1138+48	2.49	0.03	2.46	84.2	1.38	1.11	71.7
R7	S-42	1138+48 - 1140+30	0.93	0.00	0.93	84.0	0.46	0.47	68.2
R8	S-46	1140+30 - 1144+00	2.11	0.17	1.94	85.1	1.16	0.95	71.4
R9	S-50	1144+00 - 1146+51	1.62	0.00	1.62	84.0	0.99	0.63	75.1
R10	S-205	VETERANS SOUTH	0.63	0.00	0.63	84.0	0.45	0.18	94.0
R11	S-214	1170+88 - 1174+85	2.19	0.60	1.59	87.8	1.31	0.88	74.3
R12	S-216	1174+85 - 1178+65	1.89	0.04	1.85	84.3	1.02	0.87	70.8
R13	S-219	1178+65 - 1180+00	0.75	0.00	0.75	84.0	0.39	0.36	69.7
R14	S-221	1180+00 -1182+00	1.09	0.00	1.09	84.0	0.52	0.57	67.1
R15	S-224	1182+00 - 1183+70	1.04	0.04	1.00	84.5	0.54	0.50	69.6
R16	S-228	1183+70 - 1189+50	3.11	0.12	2.99	84.5	1.51	1.60	67.6
R16A		1183+70 - 1185+20	0.74				0.32	0.42	64.7
R16B		1185+20 - 1189+50	2.37				1.19	1.18	68.6
R17	S-229A	1189+50 - 1194+33	3.03	0.00	3.03	84.0	1.55	1.48	69.2
R18	S-231	1194+33 - 1195+45	0.96	0.04	0.92	84.6	0.62	0.34	77.1
R19	S-237	1195+45 - 1201+00	3.19	0.03	3.16	84.1	1.62	1.57	69.0
R20	S-242	1201+00 - 1204+78	2.15	0.00	2.15	84.0	1.10	1.05	69.2
R21	S-246	1204+78 - 1209+55	2.70	0.00	2.70	84.0	1.46	1.24	70.9
R22	S-246	1209+55 - 1212+12	1.55	0.00	1.55	84.0	0.83	0.72	70.6
R22A		1212+12 - 1213+05	0.66				0.29	0.37	65.1
R22B		1213+05 - 1213+95	0.89				0.54	0.35	74.8
R23	S-246	1212+12 - 1213+95	1.03	0.00	1.03	84.0	0.56	0.47	71.1
R23A		1212+12 - 1213+05	0.58				0.31	0.27	70.5
R23B		1213+05 - 1213+95	0.45				0.25	0.20	71.8
R24	S-246	1213+95 - 1216+16	1.06	0.00	1.06	84.0	0.53	0.53	68.5
R24A	S-254	1213+95 - 1214+70	0.52				0.31	0.21	74.2
R24B	S-254	1214+70 - 1215+40	0.36				0.19	0.17	70.1
R24C	S-254	1215+40 - 1216+16	0.18				0.03	0.15	48.8
R25	S-246	1216+16 - 1220+86	1.65	0.05	1.60	84.4	0.54	1.11	58.3

ROADSIDE DITCH - L1



AREA:		SQ. M.	AC
PRE	PERV	2888.62	0.71
	IMP	82.06	0.02
PST	PERV	1680.66	0.41
	IMP	1290.02	0.32
A	TOTAL	2970.68	0.73

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

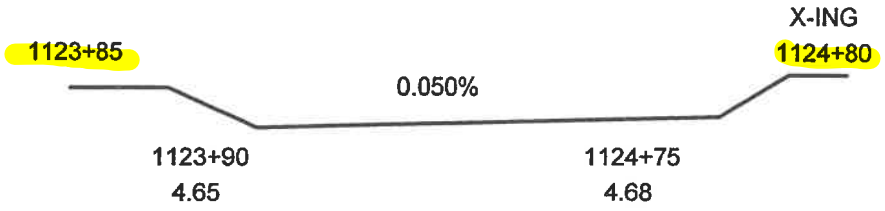
0.73 AC x 0.5 / 12 = **0.03** **AC-FT**
37.73 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.88	16.01	0.00	0.00	0.00	0.00	0.00	0.00
5.01	16.44	0.13	0.43	296.40	19.27	19.27	0.02
5.06	16.60	0.05	0.16	464.40	19.02	38.29	0.03
5.11	16.77	0.05	0.16	662.40	28.17	66.46	0.05
5.16	16.93	0.05	0.16	890.40	38.82	105.28	0.09
5.21	17.09	0.05	0.16	1148.40	50.97	156.25	0.13

	(METER)	(FEET)
SET WEIR	5.06	16.60
BERM EL	5.21	17.09
INITIAL EL	4.88	16.01

ROADSIDE DITCH - L2



AREA:		SQ. M.	AC
PRE	PERV	970.92	0.24
	IMP	793.18	0.20
PST	PERV	806.69	0.20
	IMP	957.41	0.24
A	TOTAL	1764.10	0.44

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

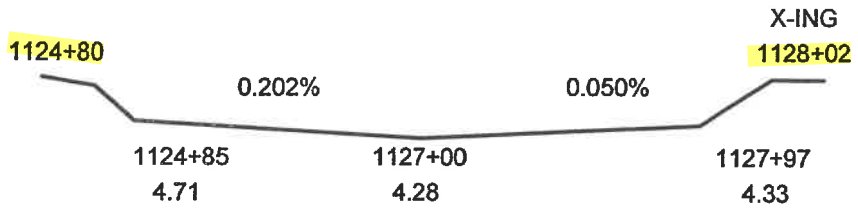
0.44 AC x 0.5 / 12 = **0.02** **AC-FT**
22.40 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.65	15.26	0.00	0.00	0.00	0.00	0.00	0.00
4.68	15.35	0.03	0.10	169.60	2.54	2.54	0.00
4.77	15.65	0.09	0.30	259.50	19.31	21.85	0.02
4.78	15.68	0.01	0.03	269.72	2.65	24.50	0.02
4.80	15.75	0.02	0.07	290.32	5.60	30.10	0.02
4.97	16.31	0.17	0.56	473.18	64.90	95.00	0.08

	(METER)	(FEET)
SET WEIR	4.78	15.68
BERM EL	4.97	16.31
INITIAL EL	4.65	15.26

ROADSIDE DITCH - L3



AREA:		SQ. M.	AC
PRE	PERV	3339.92	0.83
	IMP	2758.48	0.68
PST	PERV	3062.81	0.76
	IMP	3035.59	0.75
A	TOTAL	6098.40	1.51

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

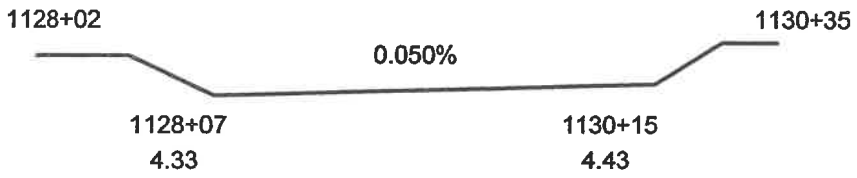
1.51 AC x 0.5 / 12 = **0.06** **AC-FT**
77.45 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.28	14.04	0.00	0.00	0.00	0.00	0.00	0.00
4.33	14.21	0.05	0.16	296.40	7.41	7.41	0.01
4.40	14.44	0.07	0.23	389.69	24.01	31.42	0.03
4.49	14.73	0.09	0.30	630.37	45.90	77.32	0.06
4.50	14.76	0.01	0.03	664.96	6.48	83.80	0.07
4.61	15.12	0.11	0.36	1031.40	93.30	177.10	0.14

	(METER)	(FEET)
SET WEIR	4.50	14.76
BERM EL	4.61	15.12
INITIAL EL	4.28	14.04

ROADSIDE DITCH - L4



AREA:		SQ. M.	AC
PRE	PERV	2901.22	0.72
	IMP	1738.92	0.43
PST	PERV	2346.01	0.58
	IMP	2294.13	0.57
A	TOTAL	4640.14	1.15

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

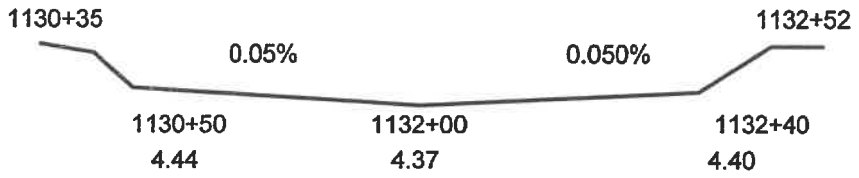
1.15 AC x 0.5 / 12 = **0.05** **AC-FT**
58.93 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.33	14.21	0.00	0.00	0.00	0.00	0.00	0.00
4.43	14.53	0.10	0.33	438.90	21.94	21.94	0.02
4.49	14.73	0.06	0.20	592.76	30.95	52.89	0.04
4.50	14.76	0.01	0.03	618.58	6.06	58.95	0.05
4.60	15.09	0.10	0.33	879.34	74.90	133.85	0.11
4.66	15.29	0.06	0.20	1038.10	57.52	191.37	0.16

	(METER)	(FEET)
SET WEIR	4.50	14.76
BERM EL	4.66	15.29
INITIAL EL	4.33	14.21

ROADSIDE DITCH - L5



AREA:		SQ. M.	AC
PRE	PERV	3238.31	0.80
	IMP	1972.02	0.49
PST	PERV	2082.98	0.52
	IMP	3127.35	0.77
A	TOTAL	5210.33	1.29

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

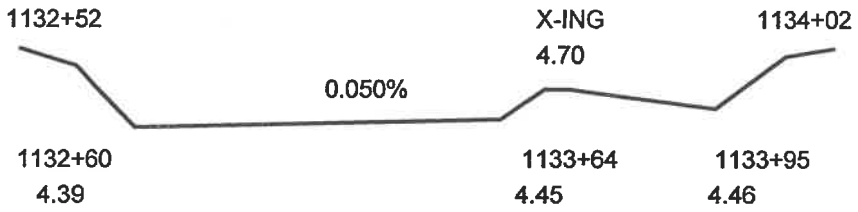
1.29 AC x 0.5 / 12 = **0.05** **AC-FT**
66.17 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.37	14.34	0.00	0.00	0.00	0.00	0.00	0.00
4.40	14.44	0.03	0.10	168.00	2.52	2.52	0.00
4.44	14.57	0.04	0.13	356.06	10.48	13.00	0.01
4.55	14.93	0.11	0.36	601.58	52.67	65.67	0.05
4.56	14.96	0.01	0.03	624.19	6.13	71.80	0.06
4.70	15.42	0.14	0.46	967.92	111.45	183.25	0.15

	(METER)	(FEET)
SET WEIR	4.56	14.96
BERM EL	4.70	15.42
INITIAL EL	4.37	14.34

ROADSIDE DITCH - L6



AREA:		SQ. M.	AC
PRE	PERV	2180.34	0.54
	IMP	1611.23	0.40
PST	PERV	1640.40	0.41
	IMP	2151.17	0.53
A	TOTAL	3791.57	0.94

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

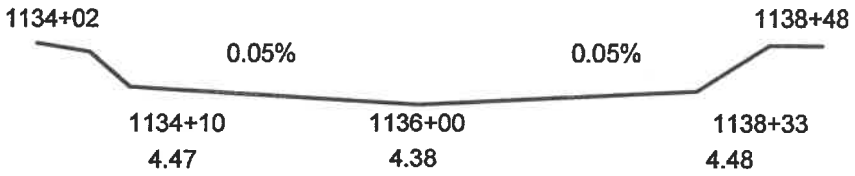
0.94 AC x 0.5 / 12 = **0.04** **AC-FT**
48.15 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.39	14.40	0.00	0.00	0.00	0.00	0.00	0.00
4.45	14.60	0.06	0.20	194.56	5.84	5.84	0.00
4.59	15.06	0.14	0.46	380.90	40.28	46.12	0.04
4.60	15.09	0.01	0.03	393.82	3.87	49.99	0.04
4.70	15.42	0.10	0.33	532.66	46.32	96.31	0.08
4.72	15.49	0.02	0.07	561.00	10.94	107.25	0.09

	(METER)	(FEET)
SET WEIR	4.60	15.09
BERM EL	4.72	15.49
INITIAL EL	4.39	14.40

ROADSIDE DITCH - L7



AREA:		SQ. M.	AC
PRE	PERV	6253.16	1.54
	IMP	3676.33	0.91
PST	PERV	4543.21	1.12
	IMP	5386.28	1.33
A	TOTAL	9929.49	2.45

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

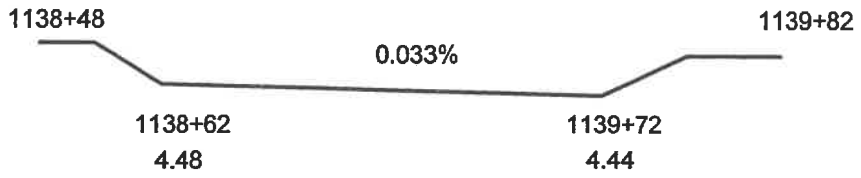
2.45 AC x 0.5 / 12 = **0.10** **AC-FT**
126.10 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.38	14.37	0.00	0.00	0.00	0.00	0.00	0.00
4.48	14.70	0.10	0.33	739.20	36.96	36.96	0.03
4.55	14.93	0.07	0.23	1036.06	62.13	99.09	0.08
4.57	14.99	0.02	0.07	1121.90	21.58	120.67	0.10
4.58	15.03	0.01	0.03	1164.90	11.43	132.10	0.11
4.70	15.42	0.12	0.39	2171.18	200.16	332.26	0.27

	(METER)	(FEET)
SET WEIR	4.58	15.03
BERM EL	4.70	15.42
INITIAL EL	4.38	14.37

ROADSIDE DITCH - L8



AREA:		SQ. M.	AC
PRE	PERV	2445.35	0.61
	IMP	1061.77	0.26
PST	PERV	1130.24	0.28
	IMP	2376.88	0.59
A	TOTAL	3507.12	0.87

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

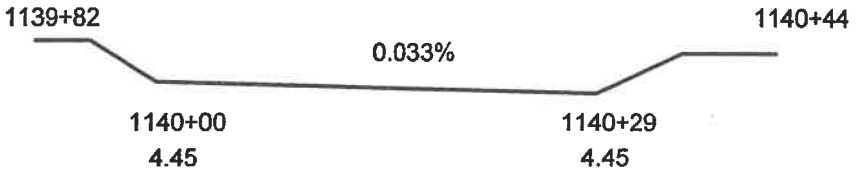
0.87 AC x 0.5 / 12 = **0.04** AC-FT
44.54 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.44	14.57	0.00	0.00	0.00	0.00	0.00	0.00
4.48	14.70	0.04	0.13	127.72	2.55	2.55	0.00
4.65	15.26	0.17	0.56	290.30	35.53	38.08	0.03
4.67	15.32	0.02	0.07	310.34	6.01	44.09	0.04
4.68	15.35	0.01	0.03	320.44	3.15	47.24	0.04
4.76	15.62	0.08	0.26	402.90	28.93	76.17	0.06

	(METER)	(FEET)
SET WEIR	4.68	15.35
BERM EL	4.76	15.62
INITIAL EL	4.44	14.57

ROADSIDE DITCH - L9



AREA:		SQ. M.	AC
PRE	PERV	946.55	0.23
	IMP	482.96	0.12
PST	PERV	562.45	0.14
	IMP	867.06	0.21
A	TOTAL	1429.51	0.35

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

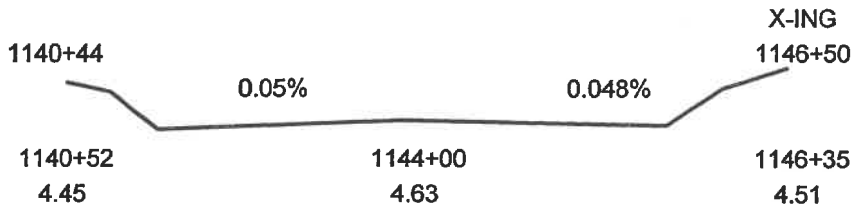
0.35 AC x 0.5 / 12 = **0.01** **AC-FT**
18.15 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.45	14.60	0.00	0.00	0.00	0.00	0.00	0.00
4.46	14.63	0.01	0.03	43.50	0.22	0.22	0.00
4.65	15.26	0.19	0.62	128.70	16.36	16.58	0.01
4.67	15.32	0.02	0.07	138.28	2.67	19.25	0.02
4.70	15.42	0.03	0.10	153.00	4.37	23.62	0.02
4.78	15.68	0.08	0.26	473.18	25.05	48.67	0.04

	(METER)	(FEET)
SET WEIR	4.67	15.32
BERM EL	4.78	15.68
INITIAL EL	4.45	14.60

ROADSIDE DITCH - L10



AREA:		SQ. M.	AC
PRE	PERV	6753.98	1.67
	IMP	4947.76	1.22
PST	PERV	4691.41	1.16
	IMP	7010.33	1.73
A	TOTAL	11701.74	2.89

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

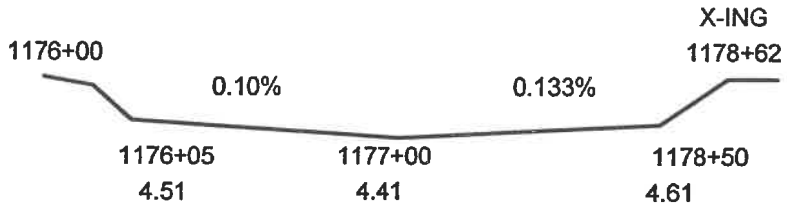
2.89 AC x 0.5 / 12 = **0.12** **AC-FT**
148.61 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.45	14.60	0.00	0.00	0.00	0.00	0.00	0.00
4.51	14.80	0.06	0.20	526.38	15.79	15.79	0.01
4.63	15.19	0.12	0.39	1146.79	100.39	116.18	0.09
4.65	15.26	0.02	0.07	1281.64	24.28	140.46	0.11
4.66	15.29	0.01	0.03	1352.98	13.17	153.63	0.12
4.78	15.68	0.12	0.39	2182.09	212.10	365.73	0.30

	(METER)	(FEET)
SET WEIR	4.66	15.29
BERM EL	4.78	15.68
INITIAL EL	4.45	14.60

ROADSIDE DITCH L12



AREA:		SQ. M.	AC
PRE	PERV	9152.69	2.26
	IMP	2018.05	0.50
PST	PERV	6225.93	1.54
	IMP	4944.81	1.22
A	TOTAL	11170.74	2.76

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

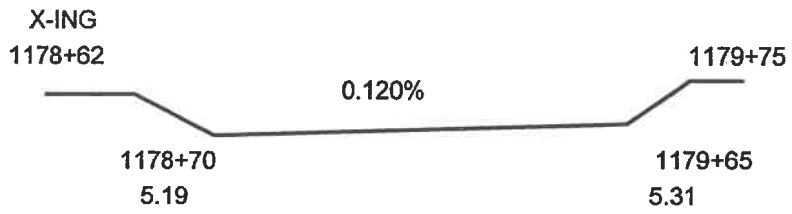
2.76 AC x 0.5 / 12 = **0.12** **AC-FT**
141.87 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.41	14.47	0.00	0.00	0.00	0.00	0.00	0.00
4.51	14.80	0.10	0.33	238.00	11.90	11.90	0.01
4.61	15.12	0.10	0.33	598.80	41.84	53.74	0.04
4.73	15.52	0.12	0.39	949.78	92.91	146.65	0.12
4.75	15.58	0.02	0.07	1023.78	19.74	166.39	0.13
4.95	16.24	0.20	0.66	1182.42	220.62	387.01	0.31

	(METER)	(FEET)
SET WEIR	4.73	15.52
BERM EL	4.95	16.24
INITIAL EL	4.41	14.47

ROADSIDE DITCH L13



AREA:		SQ. M.	AC
PRE	PERV	458.35	0.11
	IMP	855.26	0.21
PST	PERV	1079.40	0.26
	IMP	234.21	0.06
A	TOTAL	1313.61	0.32

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

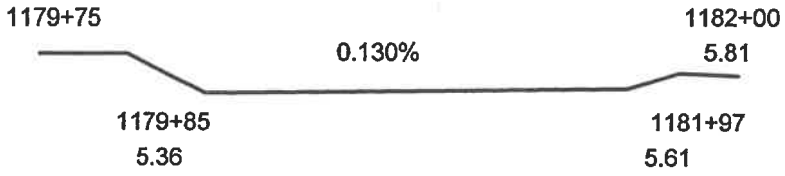
0.32 AC x 0.5 / 12 = **0.01** **AC-FT**
16.68 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.19	17.03	0.00	0.00	0.00	0.00	0.00	0.00
5.31	17.42	0.12	0.39	213.56	12.81	12.81	0.01
5.33	17.49	0.02	0.07	237.64	4.51	17.32	0.01
5.51	18.08	0.18	0.59	462.92	63.05	80.37	0.07

	(METER)	(FEET)
SET WEIR	5.33	17.49
BERM EL	5.51	18.08
INITIAL EL	5.19	17.03

ROADSIDE DITCH L14



AREA:		SQ. M.	AC
PRE	PERV	952.33	0.24
	IMP	1544.29	0.38
PST	PERV	2090.12	0.52
	IMP	406.50	0.10
A	TOTAL	2496.62	0.62

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

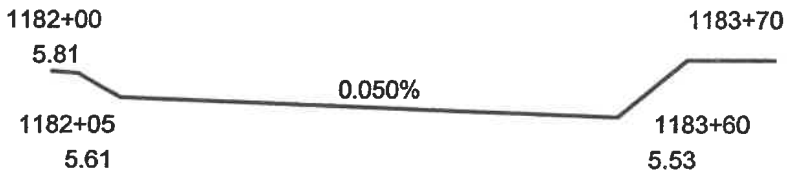
0.62 AC x 0.5 / 12 = **0.03** AC-FT
31.71 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.36	17.59	0.00	0.00	0.00	0.00	0.00	0.00
5.55	18.21	0.19	0.62	385.70	36.64	36.64	0.03
5.61	18.41	0.06	0.20	631.50	30.52	67.16	0.05
5.68	18.64	0.07	0.23	787.52	49.67	116.83	0.09

	(METER)	(FEET)
SET WEIR	5.55	18.21
BERM EL	5.68	18.64
INITIAL EL	5.36	17.59

ROADSIDE DITCH L15



AREA:		SQ. M.	AC
PRE	PERV	647.51	0.16
	IMP	1163.94	0.29
PST	PERV	1493.11	0.37
	IMP	318.34	0.08
A	TOTAL	1811.45	0.45

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

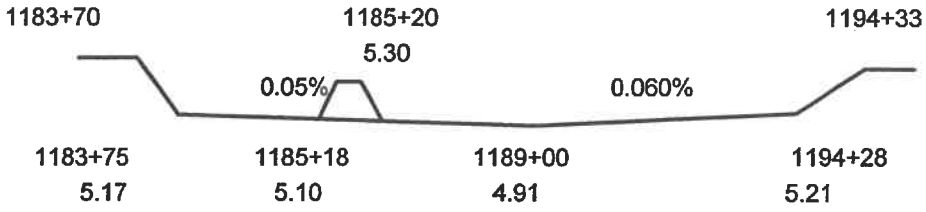
0.45 AC x 0.5 / 12 = **0.02** AC-FT
23.01 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.53	18.14	0.00	0.00	0.00	0.00	0.00	0.00
5.61	18.41	0.08	0.26	316.80	12.67	12.67	0.01
5.65	18.54	0.04	0.13	400.00	14.34	27.01	0.02
5.81	19.06	0.16	0.52	721.82	89.75	116.76	0.09

	(METER)	(FEET)
SET WEIR	5.65	18.54
BERM EL	5.81	19.06
INITIAL EL	5.53	18.14

ROADSIDE DITCH L16



AREA:		SQ. M.	AC
PRE	PERV	14132.00	3.49
	IMP	7996.07	1.98
PST	PERV	10779.39	2.67
	IMP	11348.68	2.80
A	TOTAL	22128.07	5.47

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

5.47 AC x 0.5 / 12 = **0.23** AC-FT

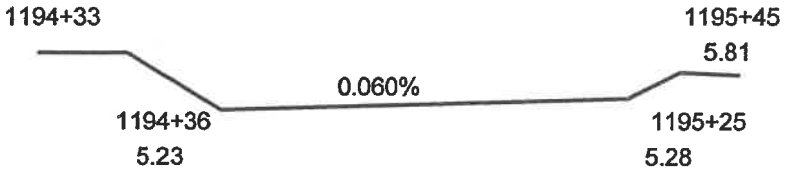
281.03 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.91	16.11	0.00	0.00	0.00	0.00	0.00	0.00
5.10	16.73	0.19	0.62	1839.29	174.73	174.73	0.14
5.13	16.83	0.03	0.10	2301.00	62.10	236.83	0.19
5.24	17.19	0.11	0.36	3347.44	310.66	547.49	0.44
5.10	16.73	0.00	0.00	0.00	0.00	0.00	0.00
5.17	16.96	0.07	0.23	275.90	9.66	9.66	0.01
5.30	17.39	0.13	0.43	509.12	51.03	60.69	0.05

	(METER)	(FEET)
SET WEIR	5.13	16.83
BERM EL	5.24	17.19
INITIAL EL	4.91	16.11

ROADSIDE DITCH L17



AREA:		SQ. M.	AC
PRE	PERV	1228.36	0.30
	IMP	1083.13	0.27
PST	PERV	997.59	0.25
	IMP	1313.90	0.32
A	TOTAL	2311.49	0.57

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

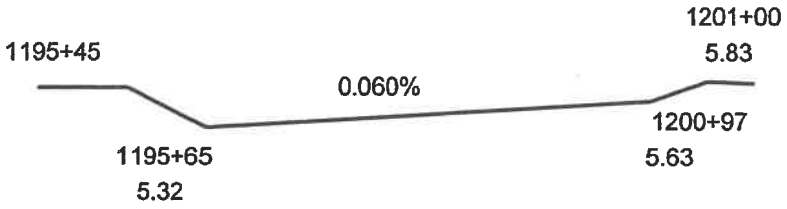
0.57 AC x 0.5 / 12 = **0.02** AC-FT
29.36 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.23	17.16	0.00	0.00	0.00	0.00	0.00	0.00
5.28	17.32	0.05	0.16	160.20	4.00	4.00	0.00
5.35	17.55	0.07	0.23	239.98	14.01	18.01	0.01
5.39	17.68	0.04	0.13	274.50	10.29	28.30	0.02
5.40	17.72	0.01	0.03	351.74	3.13	31.43	0.03
5.57	18.27	0.17	0.56	490.72	71.61	103.04	0.08

	(METER)	(FEET)
SET WEIR	5.40	17.72
BERM EL	5.57	18.27
INITIAL EL	5.23	17.16

ROADSIDE DITCH L18



AREA:		SQ. M.	AC
PRE	PERV	8871.63	2.20
	IMP	4267.14	1.05
PST	PERV	5136.63	1.27
	IMP	8002.14	1.98
A	TOTAL	13138.77	3.25

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

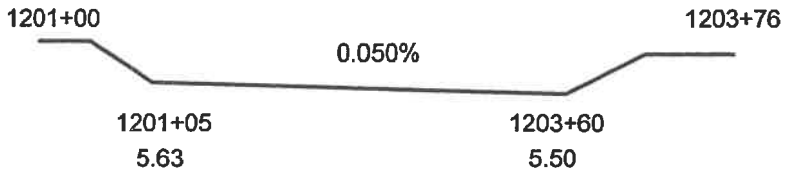
3.25 AC x 0.5 / 12 = **0.14** AC-FT
166.86 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.32	17.45	0.00	0.00	0.00	0.00	0.00	0.00
5.57	18.27	0.25	0.82	1424.94	178.12	178.12	0.14
5.63	18.47	0.06	0.20	2030.25	103.66	281.78	0.23
5.66	18.57	0.03	0.10	2216.98	63.71	345.49	0.28
5.83	19.13	0.17	0.56	3311.05	469.88	815.37	0.66

	(METER)	(FEET)
SET WEIR	5.57	18.27
BERM EL	5.66	18.57
INITIAL EL	5.32	17.45

ROADSIDE DITCH L19



AREA:		SQ. M.	AC
PRE	PERV	3750.25	0.93
	IMP	2025.77	0.50
PST	PERV	2799.89	0.69
	IMP	2976.13	0.74
A	TOTAL	5776.02	1.43

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

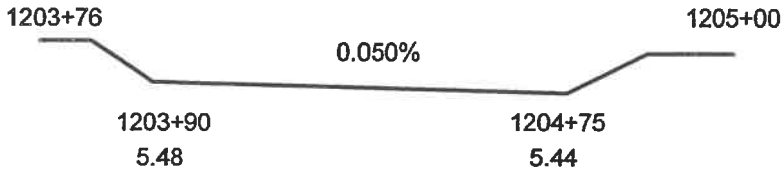
1.43 AC x 0.5 / 12 = **0.06** AC-FT
73.36 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.50	18.04	0.00	0.00	0.00	0.00	0.00	0.00
5.63	18.47	0.13	0.43	836.40	54.37	54.37	0.04
5.65	18.54	0.02	0.07	903.58	17.40	71.77	0.06
5.66	18.57	0.01	0.03	935.12	9.19	80.96	0.07
5.67	18.60	0.01	0.03	966.70	9.51	90.47	0.07
5.83	19.13	0.16	0.52	1477.37	195.53	286.00	0.23

	(METER)	(FEET)
SET WEIR	5.66	18.57
BERM EL	5.83	19.13
INITIAL EL	5.50	18.04

ROADSIDE DITCH L20



AREA:		SQ. M.	AC
PRE	PERV	2103.49	0.52
	IMP	909.19	0.22
PST	PERV	1236.21	0.30
	IMP	1776.47	0.44
A	TOTAL	3012.68	0.74

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

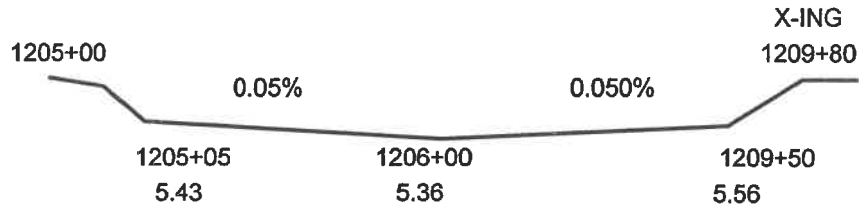
0.74 AC x 0.5 / 12 = **0.03** AC-FT
38.26 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.44	17.85	0.00	0.00	0.00	0.00	0.00	0.00
5.48	17.98	0.04	0.13	232.90	4.66	4.66	0.00
5.59	18.34	0.11	0.36	355.66	32.37	37.03	0.03
5.60	18.37	0.01	0.03	367.00	3.61	40.64	0.03
5.77	18.93	0.17	0.56	567.26	79.41	120.05	0.10

	(METER)	(FEET)
SET WEIR	5.60	18.37
BERM EL	5.77	18.93
INITIAL EL	5.44	17.85

ROADSIDE DITCH - L21



AREA:		SQ. M.	AC
PRE	PERV	8287.74	2.05
	IMP	3968.42	0.98
PST	PERV	5016.52	1.24
	IMP	7239.64	1.79
A	TOTAL	12256.16	3.03

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

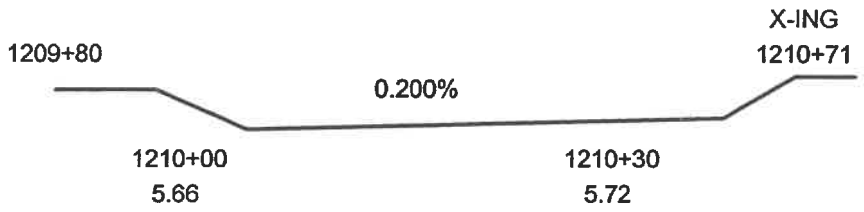
3.03 AC x 0.5 / 12 = **0.13** AC-FT
155.65 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.36	17.59	0.00	0.00	0.00	0.00	0.00	0.00
5.43	17.81	0.07	0.23	686.20	24.02	24.02	0.02
5.50	18.04	0.07	0.23	1295.03	69.34	93.36	0.08
5.55	18.21	0.05	0.16	1665.90	74.02	167.38	0.14
5.56	18.24	0.01	0.03	1726.42	16.96	184.34	0.15
5.69	18.67	0.13	0.43	5441.57	465.92	650.26	0.53

	(METER)	(FEET)
SET WEIR	5.55	18.21
BERM EL	5.69	18.67
INITIAL EL	5.36	17.59

ROADSIDE DITCH - L22



AREA:		SQ. M.	AC
PRE	PERV	660.67	0.17
	IMP	695.78	0.17
PST	PERV	486.12	0.12
	IMP	870.33	0.22
A	TOTAL	1356.45	0.34

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

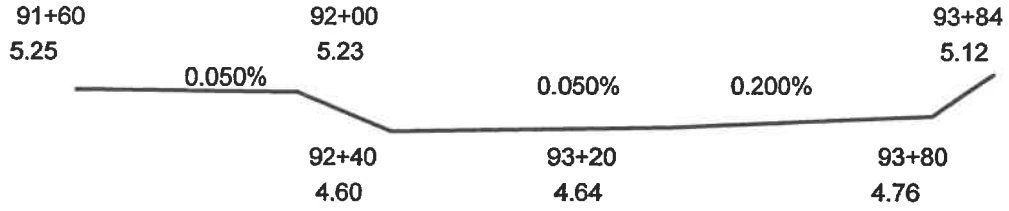
0.34 AC x 0.5 / 12 = **0.01** AC-FT
17.23 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.66	18.57	0.00	0.00	0.00	0.00	0.00	0.00
5.72	18.77	0.06	0.20	87.52	2.63	2.63	0.00
5.85	19.19	0.13	0.43	146.74	15.23	17.86	0.01
5.89	19.32	0.04	0.13	166.60	6.27	24.13	0.02
5.90	19.36	0.01	0.03	171.68	1.69	25.82	0.02
5.99	19.65	0.09	0.30	213.50	17.33	43.15	0.03

	(METER)	(FEET)
SET WEIR	5.85	19.19
BERM EL	5.99	19.65
INITIAL EL	5.66	18.57

ROADSIDE DITCH - L23



AREA:		SQ. M.	AC
PRE	PERV	5036.82	1.25
	IMP	2355.35	0.58
PST	PERV	3454.39	0.86
	IMP	3937.78	0.97
A	TOTAL	7392.17	1.83

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.83 AC x 0.5 / 12 = **0.08** **AC-FT**
93.88 **Cu.Meter**

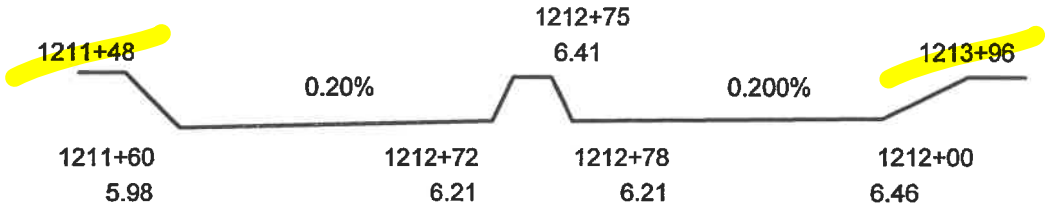
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.60	15.09	0.00	0.00	0.00	0.00	0.00	0.00
4.64	15.22	0.04	0.13	334.40	6.69	6.69	0.01
4.76	15.62	0.12	0.39	521.62	51.36	58.05	0.05
4.80	15.75	0.04	0.13	623.92	22.91	80.96	0.07
4.82	15.81	0.02	0.07	647.65	12.72	93.68	0.08
5.10	16.73	0.28	0.92	1106.62	245.60	339.28	0.28

Interpolated:
(4.83-4.82)/(5.1-4.82)*(.28-.08)+0.08= 0.09

	(METER)	(FEET)
SET WEIR	4.83	15.85
BERM EL	5.10	16.73
INITIAL EL	4.60	15.09

ROADSIDE DITCH - L24



AREA:		SQ. M.	AC
PRE	PERV	3455.89	0.86
	IMP	2241.64	0.55
PST	PERV	2579.29	0.64
	IMP	3118.24	0.77
A	TOTAL	5697.53	1.41

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.41 AC x 0.5 / 12 = **0.06** **AC-FT**

72.36 **Cu.Meter**

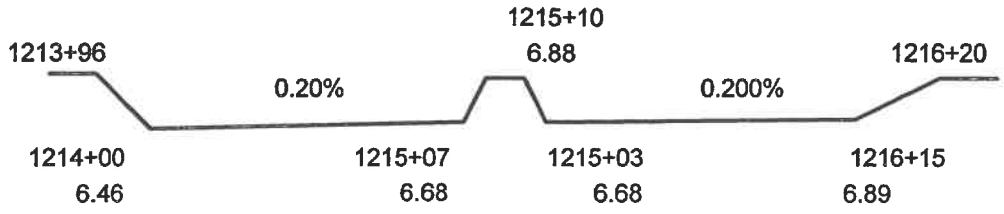
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.98	19.62	0.00	0.00	0.00	0.00	0.00	0.00
6.21	20.37	0.23	0.75	443.48	51.00	51.00	0.04
6.30	20.67	0.09	0.30	571.39	45.67	96.67	0.08
6.21	20.37	0.00	0.00	0.00	0.00	0.00	0.00
6.41	21.03	0.20	0.66	370.00	37.00	37.00	0.03
6.43	21.10	0.02	0.07	420.20	7.90	44.90	0.04

Interpolated:
(6.25-6.21)/(6.41-6.21)*(.03-0)+0=
0.01

	(METER)	(FEET)
SET WEIR	6.25	20.51
BERM EL	6.30	20.67
INITIAL EL	5.98	19.62

ROADSIDE DITCH - L25



AREA:		SQ. M.	AC
PRE	PERV	4188.12	1.04
	IMP	1619.67	0.40
PST	PERV	2633.12	0.66
	IMP	3174.67	0.78
A	TOTAL	5807.79	1.44

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

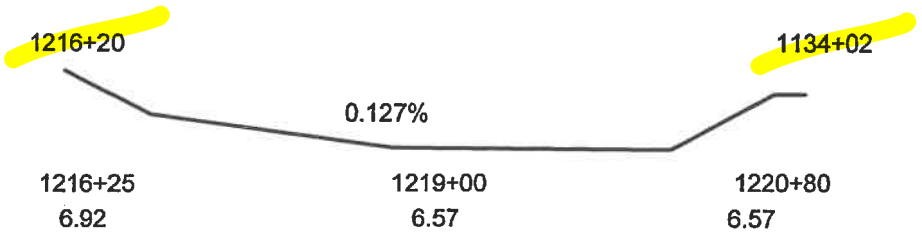
1.44 AC x 0.5 / 12 = **0.06** AC-FT
73.76 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
6.46	21.19	0.00	0.00	0.00	0.00	0.00	0.00
6.68	21.92	0.22	0.72	417.14	45.89	45.89	0.04
6.78	22.24	0.10	0.33	558.22	48.77	94.66	0.08
6.68	21.92	0.00	0.00	0.00	0.00	0.00	0.00
6.88	22.57	0.20	0.66	421.80	42.18	42.18	0.03
6.98	22.90	0.10	0.33	573.30	49.76	91.94	0.07

	(METER)	(FEET)
SET WEIR	6.68	21.92
BERM EL	6.78	22.24
INITIAL EL	6.46	21.19

ROADSIDE DITCH - L26



AREA:

		SQ. M.	AC
PRE	PERV	4926.22	1.21
	IMP	3218.63	0.80
PST	PERV	4206.70	1.04
	IMP	3938.15	0.97
A	TOTAL	8144.85	2.01

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

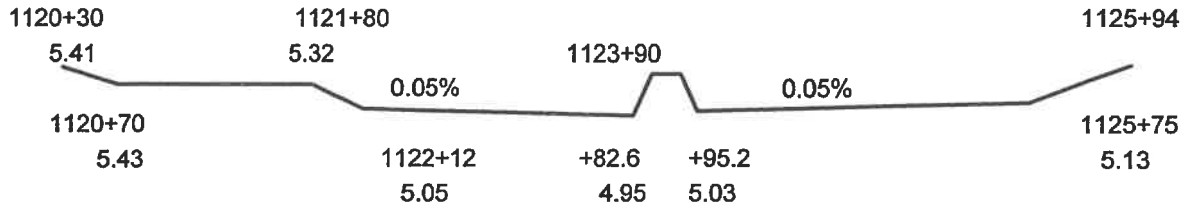
2.01 AC x 0.5 / 12 = **0.08** **AC-FT**
103.44 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
6.57	21.56	0.00	0.00	270.00	0.00	0.00	0.00
6.70	21.98	0.13	0.43	794.18	69.17	69.17	0.06
6.74	22.11	0.04	0.13	980.39	35.49	104.66	0.08
6.75	22.15	0.01	0.03	1030.97	10.06	114.72	0.09
6.92	22.70	0.17	0.56	2035.95	260.69	375.41	0.30

	(METER)	(FEET)
SET WEIR	6.74	22.11
BERM EL	6.92	22.70
INITIAL EL	6.57	21.56

ROADSIDE DITCH - M1



AREA:		SQ. M.	AC
PRE	PERV	11493.95	2.84
	IMP	1619.82	0.40
PST	PERV	7664.81	1.89
	IMP	5448.96	1.35
A	TOTAL	13113.77	3.24

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

3.24 AC x 0.5 / 12 = **0.14** AC-FT

166.54 Cu.Meter

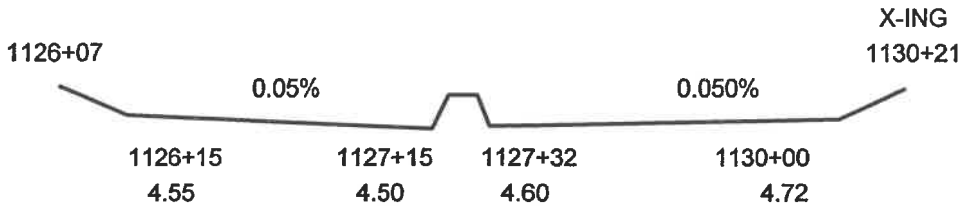
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.95	16.24	0.00	0.00	0.00	0.00	0.00	0.00
5.05	16.57	0.10	0.33	975.48	48.77	48.77	0.04
5.13	16.83	0.08	0.26	1247.84	88.93	137.70	0.11
5.15	16.90	0.02	0.07	1344.73	25.93	163.63	0.13
5.18	16.99	0.03	0.10	1532.08	43.15	206.78	0.17
5.32	17.45	0.14	0.46	2279.24	266.79	473.57	0.38

Interpolated:
(5.16-5.15)/(5.18-5.15)*(0.17-0.13)
+0.13= 0.14

	(METER)	(FEET)
SET WEIR	5.16	16.93
SHOULDER	5.31	17.42
INITIAL EL	4.95	16.24

ROADSIDE DITCH - M2



AREA:		SQ. M.	AC
PRE	PERV	8102.03	2.00
	IMP	209.02	0.05
PST	PERV	6579.60	1.62
	IMP	1731.45	0.43
A	TOTAL	8311.05	2.05

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

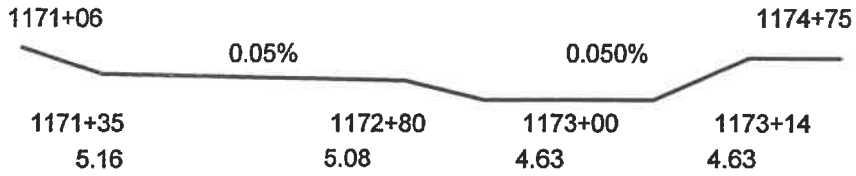
2.05 AC x 0.5 / 12 = **0.09** AC-FT
105.55 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.50	14.76	0.00	0.00	0.00	0.00	0.00	0.00
4.60	15.09	0.10	0.33	673.35	33.67	33.67	0.03
4.70	15.42	0.10	0.33	1557.65	111.55	145.22	0.12
4.72	15.49	0.02	0.07	1832.07	33.90	179.12	0.15
4.85	15.91	0.13	0.43	2436.15	277.43	456.55	0.37
4.90	16.08	0.05	0.16	2656.51	127.32	583.87	0.47

	(METER)	(FEET)
SET WEIR	4.70	15.42
SHOULDER	5.17	16.96
INITIAL EL	4.50	14.76

ROADSIDE DITCH - M3



AREA:		SQ. M.	AC
PRE	PERV	3367.36	0.83
	IMP	1248.50	0.31
PST	PERV	3008.97	0.74
	IMP	1606.89	0.40
A	TOTAL	4615.86	1.14

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.14 AC x 0.5 / 12 = **0.05** AC-FT

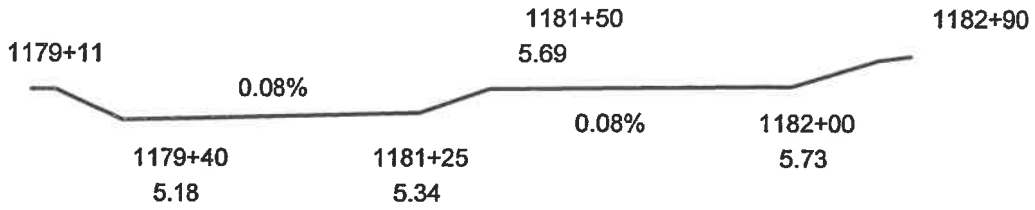
58.62 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.63	15.19	0.00	0.00	19.58	0.00	0.00	0.00
5.08	16.67	0.45	1.48	216.86	53.20	53.20	0.04
5.09	16.70	0.01	0.03	249.05	2.33	55.53	0.05
5.10	16.73	0.01	0.03	284.17	2.67	58.20	0.05
5.11	16.77	0.01	0.03	324.67	3.04	61.24	0.05
5.16	16.93	0.05	0.16	509.34	20.85	82.09	0.07

	(METER)	(FEET)
SET WEIR	5.11	16.77
SHOULDER	5.29	17.36
INITIAL EL	4.63	15.19

ROADSIDE DITCH - M4



AREA:		SQ. M.	AC
PRE	PERV	7772.55	1.92
	IMP	0.00	0.00
PST	PERV	4369.12	1.08
	IMP	3403.43	0.84
A	TOTAL	7772.55	1.92

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.92 AC x 0.5 / 12 = **0.08** AC-FT

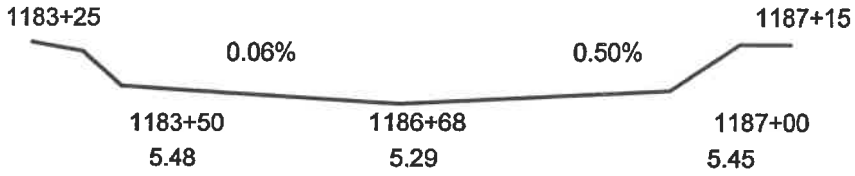
98.71 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.18	16.99	0.00	0.00	0.00	0.00	0.00	0.00
5.34	17.52	0.16	0.52	365.74	29.26	29.26	0.02
5.50	18.04	0.16	0.52	730.22	87.68	116.94	0.09
5.69	18.67	0.19	0.62	873.31	152.34	269.28	0.22
5.73	18.80	0.04	0.13	879.34	35.05	304.33	0.25

	(METER)	(FEET)
SET WEIR	5.50	18.04
SHOULDER	5.77	18.93
INITIAL EL	5.18	16.99

ROADSIDE DITCH - M5



AREA:		SQ. M.	AC
PRE	PERV	7616.65	1.88
	IMP	779.46	0.19
PST	PERV	5022.62	1.24
	IMP	3373.49	0.83
A	TOTAL	8396.11	2.07

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

2.07 AC x 0.5 / 12 = **0.09** **AC-FT**

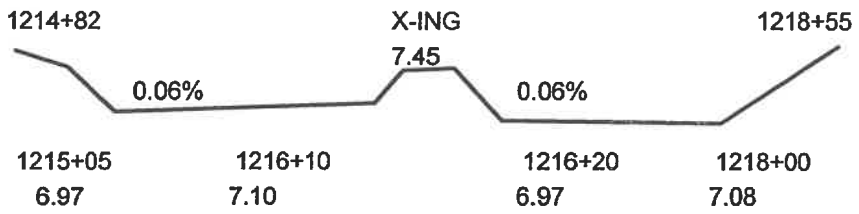
106.63 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.29	17.36	0.00	0.00	0.00	0.00	0.00	0.00
5.36	17.59	0.07	0.23	541.14	18.94	18.94	0.02
5.40	17.72	0.04	0.13	793.85	26.70	45.64	0.04
5.45	17.88	0.05	0.16	1049.45	46.08	91.72	0.07
5.48	17.98	0.03	0.10	1221.73	34.07	125.79	0.10
5.76	18.90	0.28	0.92	2270.50	488.91	614.70	0.50

	(METER)	(FEET)
SET WEIR	5.48	17.98
SHOULDER	5.95	19.52
INITIAL EL	5.29	17.36

ROADSIDE DITCH - M6



AREA:		SQ. M.	AC
PRE	PERV	7048.19	1.74
	IMP	0.00	0.00
PST	PERV	4431.01	1.09
	IMP	2617.18	0.65
A	TOTAL	7048.19	1.74

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.74 AC x 0.5 / 12 = **0.07** **AC-FT**

89.51 **Cu.Meter**

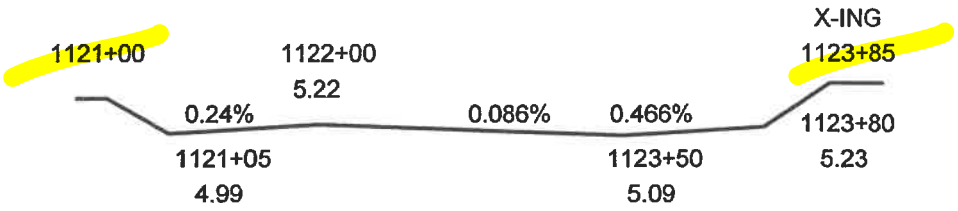
Total median TV provided = 0.14+0.09+0.05+0.08+0.09+0.07 = 0.52 ac-ft

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
6.97	22.87	0.00	0.00	0.00	0.00	0.00	0.00
7.08	23.23	0.11	0.36	569.86	31.34	31.34	0.03
7.10	23.29	0.02	0.07	627.41	11.97	43.31	0.04
7.16	23.49	0.06	0.20	840.89	44.05	87.36	0.07
7.17	23.52	0.01	0.03	876.81	8.59	95.95	0.08
7.45	24.44	0.28	0.92	2255.21	438.48	534.43	0.43

	(METER)	(FEET)
WEIR SET	7.45	24.44
SHOULDER	7.51	24.64
INITIAL EL	6.97	22.87

ROADSIDE DITCH - R2



AREA:

		SQ. M.	AC
PRE	PERV	4595.04	1.13
	IMP	632.55	0.16
PST	PERV	2929.03	0.72
	IMP	2298.56	0.57
A	TOTAL	5227.59	1.29

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.29 AC x 0.5 / 12 = **0.05** **AC-FT**

66.39 **Cu.Meter**

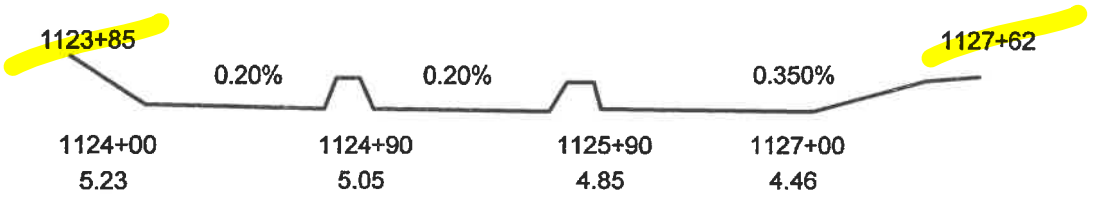
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.99	16.37	0.00	0.00	0.00	0.00	0.00	0.00
5.09	16.70	0.10	0.33	497.97	24.90	24.90	0.02
5.18	16.99	0.09	0.30	661.20	52.16	77.06	0.06
5.22	17.13	0.04	0.13	684.00	26.90	103.96	0.08
5.23	17.16	0.01	0.03	724.20	7.04	111.00	0.09
5.31	17.42	0.08	0.26	996.70	68.84	179.84	0.15

Interpolated:
(5.17-5.09)/(5.18-5.09)*(0.06-0.02)
+0.02= 0.06

	(METER)	(FEET)
SET WEIR	5.17	16.96
BERM EL	5.31	17.42
INITIAL EL	4.99	16.37

ROADSIDE DITCH - R3



AREA:		SQ. M.	AC
PRE	PERV	5157.79	1.27
	IMP	0.00	0.00
PST	PERV	4069.05	1.00
	IMP	1088.74	0.27
A	TOTAL	5157.79	1.27

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

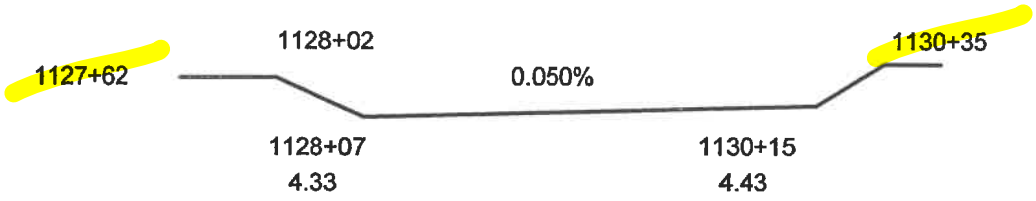
1.27 AC x 0.5 / 12 = **0.05** **AC-FT**
65.50 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.46	14.63	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL FOR 0.2 CHANGE IN DITCH ELEVATION					69.53	69.53	0.06
4.66	15.29	0.20	0.66	695.25			
TOTAL FOR 0.32 CHANGE IN ELEVATION TO BERM					107.93	177.46	0.14
4.78	15.68	0.12	0.39	1103.60			

	(METER)	(FEET)
SET WEIR	4.66	15.29
BERM EL	4.78	15.68
INITIAL EL	4.46	14.63

ROADSIDE DITCH - R4



AREA:

		SQ. M.	AC
PRE	PERV	6096.65	1.51
	IMP	0.00	0.00
PST	PERV	2811.35	0.70
	IMP	3285.30	0.81
A	TOTAL	6096.65	1.51

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.51 AC x 0.5 / 12 = **0.06** **AC-FT**

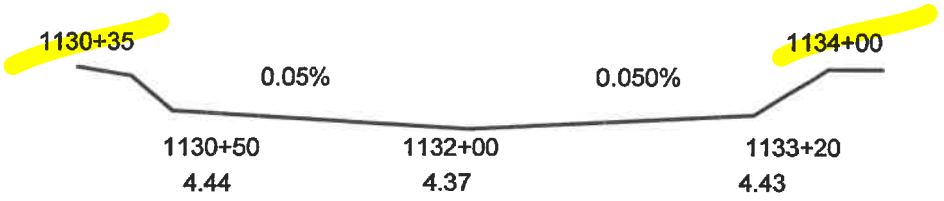
77.43 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.33	14.21	0.00	0.00	0.00	0.00	0.00	0.00
4.43	14.53	0.10	0.33	438.90	21.94	21.94	0.02
4.50	14.76	0.07	0.23	618.58	37.01	58.95	0.05
4.53	14.86	0.03	0.10	696.30	19.72	78.67	0.06
4.60	15.09	0.07	0.23	879.34	55.15	133.82	0.11
4.66	15.29	0.06	0.20	1038.10	57.52	191.34	0.16

	(METER)	(FEET)
SET WEIR	4.53	14.86
BERM EL	4.66	15.29
INITIAL EL	4.33	14.21

ROADSIDE DITCH - R5



AREA:		SQ. M.	AC
PRE	PERV	8536.48	2.11
	IMP	138.28	0.03
PST	PERV	3700.30	0.91
	IMP	4974.46	1.23
A	TOTAL	8674.76	2.14

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

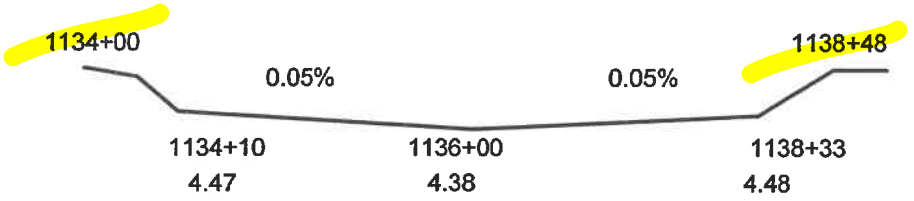
2.14 AC x 0.5 / 12 = **0.09** AC-FT
110.17 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.37	14.34	0.00	0.00	0.00	0.00	0.00	0.00
4.44	14.57	0.07	0.23	480.00	16.80	16.80	0.01
4.50	14.76	0.06	0.20	663.70	34.31	51.11	0.04
4.58	15.03	0.08	0.26	910.08	62.95	114.06	0.09
4.60	15.09	0.02	0.07	972.29	18.82	132.88	0.11
4.70	15.42	0.10	0.33	740.88	85.66	218.54	0.18

	(METER)	(FEET)
SET WEIR	4.58	15.03
BERM EL	4.70	15.42
INITIAL EL	4.37	14.34

ROADSIDE DITCH - R6



AREA:		SQ. M.	AC
PRE	PERV	9926.99	2.46
	IMP	137.37	0.03
PST	PERV	4473.15	1.11
	IMP	5591.21	1.38
A	TOTAL	10064.36	2.49

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

2.49 AC x 0.5 / 12 = **0.10** **AC-FT**

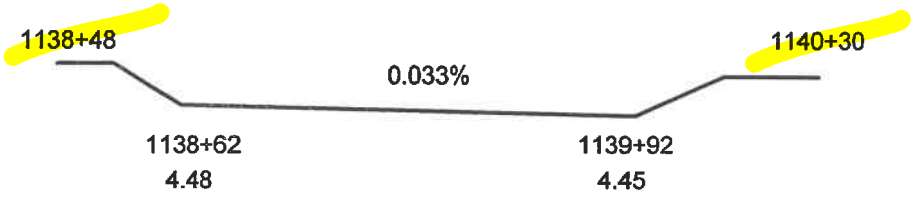
127.82 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.38	14.37	0.00	0.00	0.00	0.00	0.00	0.00
4.48	14.70	0.10	0.33	801.15	40.06	40.06	0.03
4.55	14.93	0.07	0.23	1125.73	67.44	107.50	0.09
4.57	14.99	0.02	0.07	1218.89	23.45	130.95	0.11
4.58	15.03	0.01	0.03	1265.55	12.42	143.37	0.12
4.70	15.42	0.12	0.39	2195.51	207.66	351.03	0.28

	(METER)	(FEET)
SET WEIR	4.57	14.99
BERM EL	4.70	15.42
INITIAL EL	4.38	14.37

ROADSIDE DITCH - R7



AREA:		SQ. M.	AC
PRE	PERV	3779.07	0.93
	IMP	0.00	0.00
PST	PERV	1921.14	0.47
	IMP	1857.93	0.46
A	TOTAL	3779.07	0.93

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

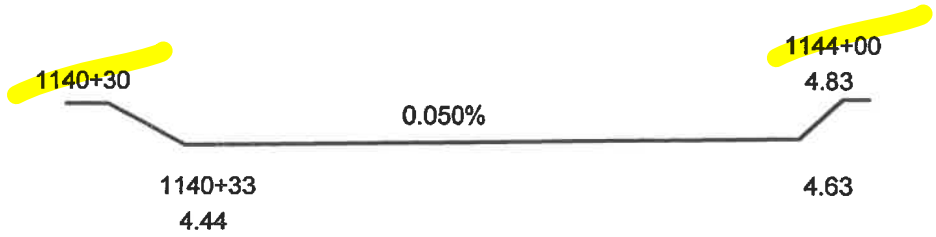
0.93 AC x 0.5 / 12 = **0.04** AC-FT
47.99 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.45	14.60	0.00	0.00	0.00	0.00	0.00	0.00
4.48	14.70	0.03	0.10	218.90	3.28	3.28	0.00
4.55	14.93	0.07	0.23	331.88	19.28	22.56	0.02
4.62	15.16	0.07	0.23	447.22	27.27	49.83	0.04
4.65	15.26	0.03	0.10	497.36	14.17	64.00	0.05
4.77	15.65	0.12	0.39	473.18	58.23	122.23	0.10

	(METER)	(FEET)
SET WEIR	4.62	15.16
BERM EL	4.77	15.65
INITIAL EL	4.45	14.60

ROADSIDE DITCH - R8



AREA:

		SQ. M.	AC
PRE	PERV	7867.49	1.94
	IMP	672.56	0.17
PST	PERV	3854.57	0.95
	IMP	4685.48	1.16
A	TOTAL	8540.05	2.11

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

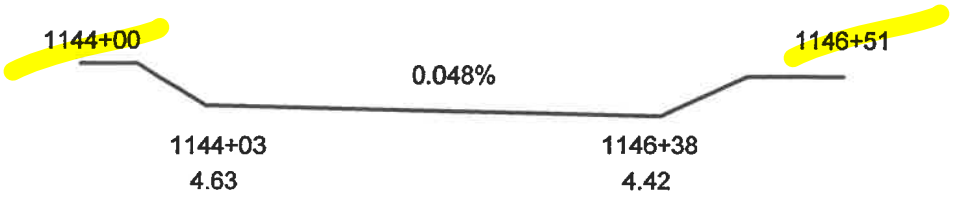
2.11 AC x 0.5 / 12 = **0.09** **AC-FT**
108.46 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.44	14.57	0.00	0.00	0.00	0.00	0.00	0.00
4.63	15.19	0.19	0.62	921.10	87.50	87.50	0.07
4.65	15.26	0.02	0.07	1048.50	19.70	107.20	0.09
4.66	15.29	0.01	0.03	1091.06	10.70	117.90	0.10
4.70	15.42	0.04	0.13	1219.04	46.20	164.10	0.13
4.77	15.65	0.07	0.23	1519.34	95.84	259.94	0.21

	(METER)	(FEET)
SET WEIR	4.66	15.29
BERM EL	4.77	15.65
INITIAL EL	4.44	14.57

ROADSIDE DITCH - R9



AREA:

		SQ. M.	AC
PRE	PERV	6559.69	1.62
	IMP	0.00	0.00
PST	PERV	2545.22	0.63
	IMP	4014.47	0.99
A	TOTAL	6559.69	1.62

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.62 AC x 0.5 / 12 = **0.07** **AC-FT**

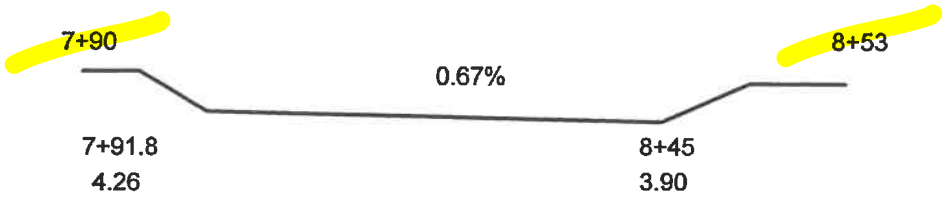
83.31 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.42	14.50	0.00	0.00	0.00	0.00	0.00	0.00
4.63	15.19	0.21	0.69	613.00	64.36	64.36	0.05
4.65	15.26	0.02	0.07	667.50	12.80	77.16	0.06
4.66	15.29	0.01	0.03	694.82	6.81	83.97	0.07
4.70	15.42	0.04	0.13	804.60	29.99	113.96	0.09
4.74	15.55	0.04	0.13	915.14	34.39	148.35	0.12

	(METER)	(FEET)
SET WEIR	4.66	15.29
BERM EL	4.74	15.55
INITIAL EL	4.42	14.50

ROADSIDE DITCH - R10
VETERANS ROAD SOUTH



AREA:		SQ. M.	AC
PRE	PERV	2559.41	0.63
	IMP	0.00	0.00
PST	PERV	723.56	0.18
	IMP	1835.85	0.45
A	TOTAL	2559.41	0.63

TREATMENT VOLUME:
RETENTION OF A FULL 1/2" OF PURE VOLUME

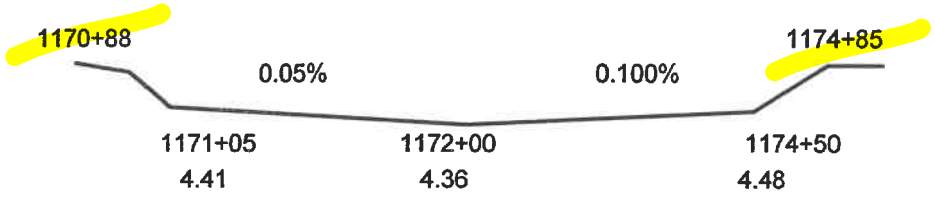
0.63 AC x 0.5 / 12 = **0.03** **AC-FT**
32.50 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
3.90	12.80	0.00	0.00	0.00	0.00	0.00	0.00
4.26	13.98	0.36	1.18	93.91	16.90	16.90	0.01
4.40	14.44	0.14	0.46	127.00	15.46	32.36	0.03
4.41	14.47	0.01	0.03	129.46	1.28	33.64	0.03
4.80	15.75	0.39	1.28	228.92	69.88	103.52	0.08

	(METER)	(FEET)
SET WEIR	4.41	14.47
BERM EL	4.80	15.75
INITIAL EL	3.90	12.80

ROADSIDE DITCH - R11



AREA:

		SQ. M.	AC
PRE	PERV	6466.22	1.59
	IMP	2414.36	0.60
PST	PERV	3570.18	0.88
	IMP	5310.40	1.31
A	TOTAL	8880.58	2.19

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

2.19 AC x 0.5 / 12 = **0.09** **AC-FT**
112.78 **Cu.Meter**

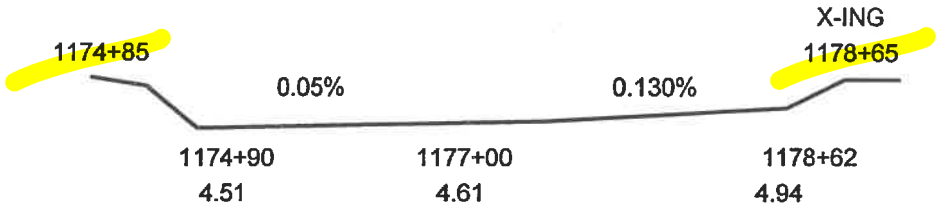
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.36	14.30	0.00	0.00	0.00	0.00	0.00	0.00
4.41	14.47	0.05	0.16	351.00	8.77	8.77	0.01
4.48	14.70	0.07	0.23	755.57	38.73	47.50	0.04
4.55	14.93	0.07	0.23	1102.61	65.04	112.54	0.09
4.68	15.35	0.13	0.43	1656.65	179.35	291.89	0.24

Interpolated:
(4.56-4.55)/(4.68-4.55)*(0.24-0.09)
+0.09= 0.10

	(METER)	(FEET)
SET WEIR	4.56	14.96
BERM EL	4.68	15.35
INITIAL EL	4.36	14.30

ROADSIDE DITCH - R12



AREA:		SQ. M.	AC
PRE	PERV	7494.38	1.85
	IMP	159.37	0.04
PST	PERV	3513.57	0.87
	IMP	4140.18	1.02
A	TOTAL	7653.75	1.89

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.89 AC x 0.5 / 12 = **0.08** **AC-FT**

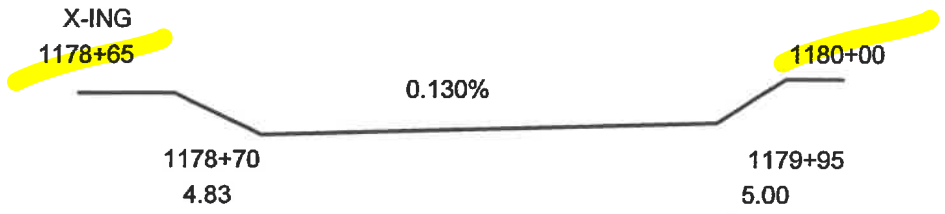
97.20 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.51	14.80	0.00	0.00	0.00	0.00	0.00	0.00
4.61	15.12	0.10	0.33	785.70	39.29	39.29	0.03
4.67	15.32	0.06	0.20	1110.80	56.89	96.18	0.08
4.68	15.35	0.01	0.03	1167.84	11.39	107.57	0.09
4.83	15.85	0.15	0.49	2139.01	248.01	355.58	0.29

	(METER)	(FEET)
SET WEIR	4.68	15.35
BERM EL	4.83	15.85
INITIAL EL	4.51	14.80

ROADSIDE DITCH - R13



AREA:

		SQ. M.	AC
PRE	PERV	3036.84	0.75
	IMP	0.00	0.00
PST	PERV	1445.91	0.36
	IMP	1590.93	0.39
A	TOTAL	3036.84	0.75

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

0.75 AC x 0.5 / 12 = **0.03** AC-FT
38.57 Cu.Meter

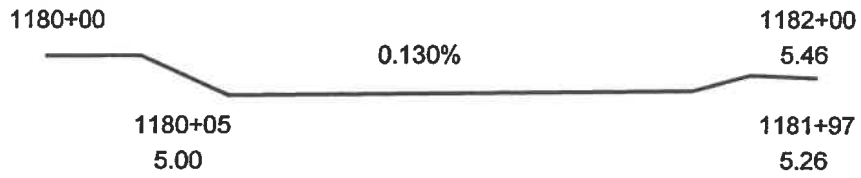
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.83	15.85	0.00	0.00	0.00	0.00	0.00	0.00
5.00	16.40	0.17	0.56	364.10	30.95	30.95	0.03
5.02	16.47	0.02	0.07	393.46	7.58	38.53	0.03
5.14	16.86	0.12	0.39	462.92	51.38	89.91	0.07

	(METER)	(FEET)
SET WEIR	5.03	16.50
BERM EL	5.14	16.86
INITIAL EL	4.83	15.85

Interpolated:
(5.03-5.02)/(5.14-5.02)*(0.07-0.03)
+0.03= 0.03

ROADSIDE DITCH - R14



AREA:		SQ. M.	AC
PRE	PERV	4418.80	1.09
	IMP	0.00	0.00
PST	PERV	2303.06	0.57
	IMP	2115.74	0.52
A	TOTAL	4418.80	1.09

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

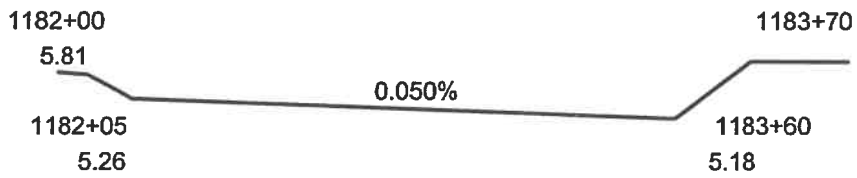
1.09 AC x 0.5 / 12 = **0.05** AC-FT
56.12 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.00	16.40	0.00	0.00	0.00	0.00	0.00	0.00
5.21	17.09	0.21	0.69	542.64	56.98	56.98	0.05
5.26	17.26	0.05	0.16	712.24	31.37	88.35	0.07
5.32	17.45	0.06	0.20	857.60	47.10	135.45	0.11

	(METER)	(FEET)
SET WEIR	5.21	17.09
BERM EL	5.32	17.45
INITIAL EL	5.00	16.40

ROADSIDE DITCH - R15



AREA:		SQ. M.	AC
PRE	PERV	4050.18	1.00
	IMP	145.50	0.04
PST	PERV	1999.14	0.50
	IMP	2196.54	0.54
A	TOTAL	4195.68	1.04

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

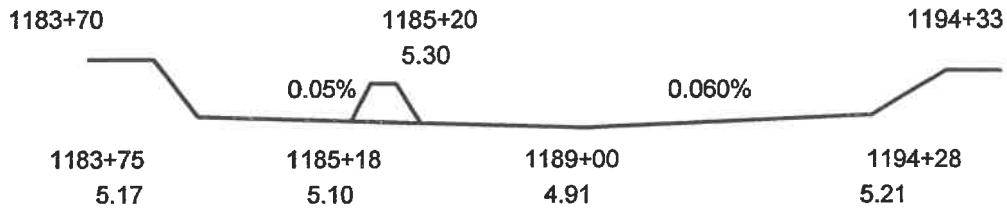
1.04 AC x 0.5 / 12 = **0.04** AC-FT
53.29 Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.18	16.99	0.00	0.00	0.00	0.00	0.00	0.00
5.26	17.26	0.08	0.26	557.76	22.31	22.31	0.02
5.32	17.45	0.06	0.20	675.10	36.99	59.30	0.05
5.50	18.04	0.18	0.59	1032.31	153.67	212.97	0.17

	(METER)	(FEET)
SET WEIR	5.32	17.45
BERM EL	5.50	18.04
INITIAL EL	5.18	16.99

ROADSIDE DITCH - R16



AREA:		SQ. M.	AC
PRE	PERV	12105.99	2.99
	IMP	466.26	0.12
PST	PERV	6452.05	1.60
	IMP	6120.20	1.51
A	TOTAL	12572.25	3.11

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

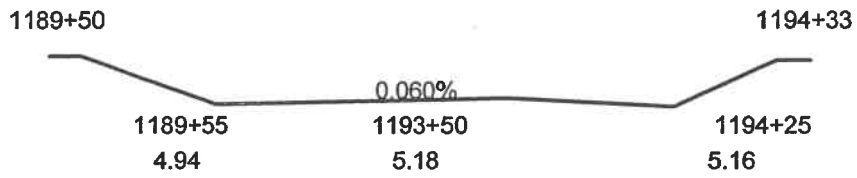
3.11 AC x 0.5 / 12 = **0.13** **AC-FT**
159.67 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.91	16.11	0.00	0.00	0.00	0.00	0.00	0.00
5.10	16.73	0.19	0.62	1839.29	174.73	174.73	0.14
5.13	16.83	0.03	0.10	2301.00	62.10	236.83	0.19
5.24	17.19	0.11	0.36	3347.44	310.66	547.49	0.44
5.10	16.73	0.00	0.00	0.00	0.00	0.00	0.00
5.17	16.96	0.07	0.23	275.90	9.66	9.66	0.01
5.30	17.39	0.13	0.43	509.12	51.03	60.69	0.05

	(METER)	(FEET)
SET WEIR	5.10	16.73
BERM EL	5.24	17.19
INITIAL EL	4.91	16.11

ROADSIDE DITCH - R17



AREA:		SQ. M.	AC
PRE	PERV	12280.91	3.03
	IMP	0.00	0.00
PST	PERV	5995.19	1.48
	IMP	6285.72	1.55
A	TOTAL	12280.91	3.03

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

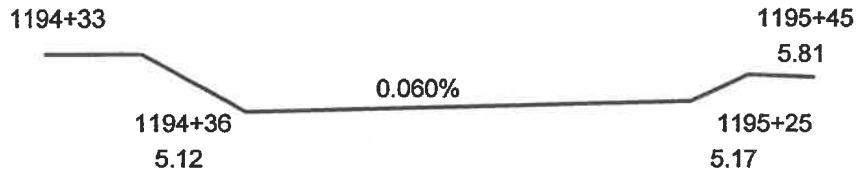
3.03 AC x 0.5 / 12 = **0.13** **AC-FT**
155.97 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
4.94	16.21	0.00	0.00	0.00	0.00	0.00	0.00
5.15	16.90	0.21	0.69	1526.00	160.23	160.23	0.13
5.18	16.99	0.03	0.10	1805.15	49.97	210.20	0.17
5.26	17.26	0.08	0.26	2432.25	169.50	379.70	0.31

	(METER)	(FEET)
SET WEIR	5.15	16.90
BERM EL	5.26	17.26
INITIAL EL	4.94	16.21

ROADSIDE DITCH - R18



AREA:		SQ. M.	AC
PRE	PERV	3720.19	0.92
	IMP	147.18	0.04
PST	PERV	1354.13	0.34
	IMP	2513.24	0.62
A	TOTAL	3867.37	0.96

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

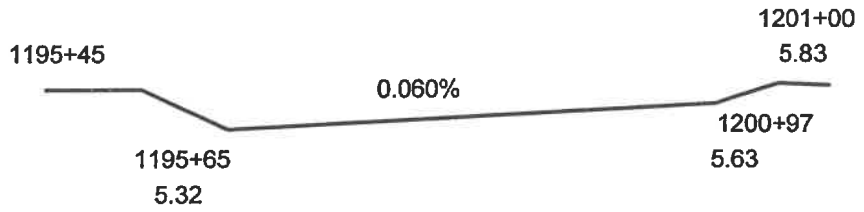
0.96 AC x 0.5 / 12 = **0.04** **AC-FT**
49.12 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.12	16.80	0.00	0.00	0.00	0.00	0.00	0.00
5.17	16.96	0.05	0.16	302.60	7.56	7.56	0.01
5.24	17.19	0.07	0.23	385.42	24.08	31.64	0.03
5.28	17.32	0.04	0.13	432.82	16.36	48.00	0.04
5.29	17.36	0.01	0.03	444.80	4.39	52.39	0.04
5.44	17.85	0.15	0.49	490.72	70.16	122.55	0.10

	(METER)	(FEET)
SET WEIR	5.29	17.36
BERM EL	5.44	17.85
INITIAL EL	5.12	16.80

ROADSIDE DITCH - R19



AREA:		SQ. M.	AC
PRE	PERV	12802.06	3.16
	IMP	119.69	0.03
PST	PERV	6348.89	1.57
	IMP	6572.86	1.62
A	TOTAL	12921.75	3.19

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

3.19 AC x 0.5 / 12 = **0.13** AC-FT
164.11 Cu.Meter

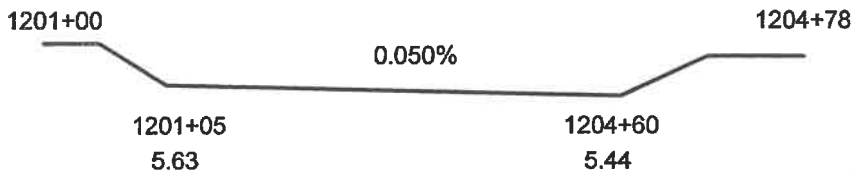
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.32	17.45	0.00	0.00	0.00	0.00	0.00	0.00
5.53	18.14	0.21	0.69	1526.00	160.23	160.23	0.13
5.63	18.47	0.10	0.33	2836.09	218.10	378.33	0.31
5.68	18.64	0.05	0.16	3177.26	150.33	528.66	0.43

Interpolated:
(5.54-5.53)/(5.63-5.53)*(0.31-0.13)
+0.13= 0.15

	(METER)	(FEET)
SET WEIR	5.54	18.18
BERM EL	5.68	18.64
INITIAL EL	5.32	17.45

ROADSIDE DITCH - R20



AREA:		SQ. M.	AC
PRE	PERV	8708.30	2.15
	IMP	0.00	0.00
PST	PERV	4262.89	1.05
	IMP	4445.41	1.10
A	TOTAL	8708.30	2.15

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

2.15 AC x 0.5 / 12 = **0.09** **AC-FT**
110.60 **Cu.Meter**

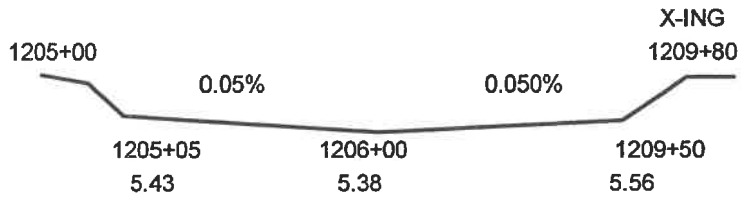
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.44	17.85	0.00	0.00	0.00	0.00	0.00	0.00
5.63	18.47	0.19	0.62	1150.20	109.27	109.27	0.09
5.67	18.60	0.04	0.13	1326.92	49.54	158.81	0.13
5.70	18.70	0.03	0.10	1456.97	41.76	200.57	0.16
5.71	18.73	0.01	0.03	1503.18	14.80	215.37	0.17
5.76	18.90	0.05	0.16	1728.48	80.79	296.16	0.24

Interpolated:
(5.64-5.63)/(5.67-5.63)*(0.13-0.09)
+0.09= 0.10

	(METER)	(FEET)
SET WEIR	5.64	18.50
BERM EL	5.76	18.90
INITIAL EL	5.44	17.85

ROADSIDE DITCH - R21



AREA:		SQ. M.	AC
PRE	PERV	10928.87	2.70
	IMP	0.00	0.00
PST	PERV	5026.12	1.24
	IMP	5902.75	1.46
A	TOTAL	10928.87	2.70

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

2.70 AC x 0.5 / 12 = **0.11** AC-FT
138.80 Cu.Meter

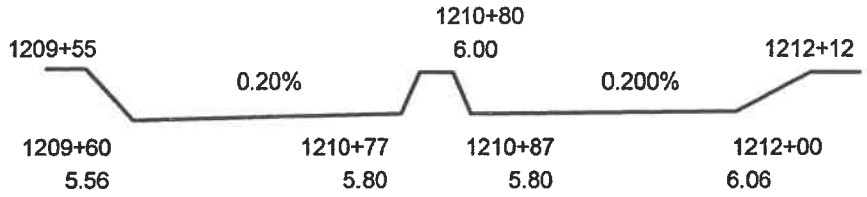
DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.38	17.65	0.00	0.00	0.00	0.00	0.00	0.00
5.43	17.81	0.05	0.16	468.00	11.70	11.70	0.01
5.52	18.11	0.09	0.30	1144.75	72.57	84.27	0.07
5.56	18.24	0.04	0.13	1494.35	52.78	137.05	0.11
5.57	18.27	0.01	0.03	1569.98	15.32	152.37	0.12
5.70	18.70	0.13	0.43	2258.83	248.87	401.24	0.33

Interpolated:
(5.55-5.52)/(5.56-5.52)*(0.11-0.07)
+0.07= 0.10

	(METER)	(FEET)
SET WEIR	5.55	18.21
BERM EL	5.70	18.70
INITIAL EL	5.38	17.65

ROADSIDE DITCH - R22



AREA:		SQ. M.	AC
PRE	PERV	6265.50	1.55
	IMP	0.00	0.00
PST	PERV	2894.45	0.72
	IMP	3371.05	0.83
A	TOTAL	6265.50	1.55

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

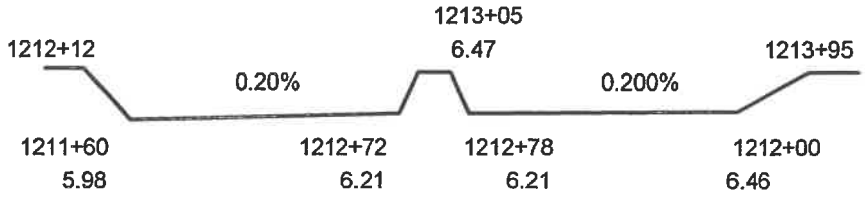
1.55 AC x 0.5 / 12 =	0.06	AC-FT
	79.57	Cu.Meter

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
5.56	18.24	0.00	0.00	0.00	0.00	0.00	0.00
5.79	19.00	0.23	0.75	408.20	46.94	46.94	0.04
5.88	19.29	0.09	0.30	540.90	42.71	89.65	0.07
5.80	19.03	0.00	0.00	0.00	0.00	0.00	0.00
6.00	19.69	0.20	0.66	430.00	43.00	43.00	0.03
6.12	20.08	0.12	0.39	646.68	64.60	107.60	0.09

	(METER)	(FEET)
SET WEIR	5.79	19.00
BERM EL	6.12	20.08
INITIAL EL	5.56	18.24

ROADSIDE DITCH - R23



AREA:		SQ. M.	AC
PRE	PERV	4178.16	1.03
	IMP	0.00	0.00
PST	PERV	1895.51	0.47
	IMP	2282.65	0.56
A	TOTAL	4178.16	1.03

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

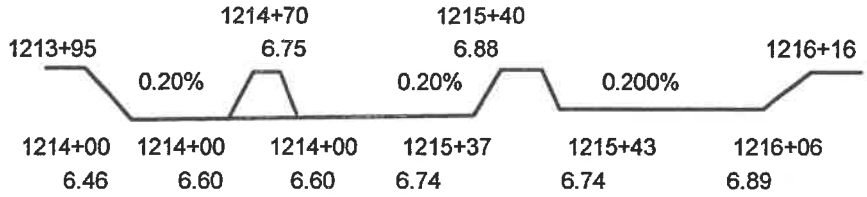
1.03 AC x 0.5 / 12 = **0.04** **AC-FT**
53.06 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
6.10	20.01	0.00	0.00	0.00	0.00	0.00	0.00
6.27	20.57	0.17	0.56	324.80	27.61	27.61	0.02
6.44	21.13	0.17	0.56	488.00	69.09	96.70	0.08
6.27	20.57	0.00	0.00	0.00	0.00	0.00	0.00
6.47	21.23	0.20	0.66	340.40	34.04	34.04	0.03
6.60	21.65	0.13	0.43	433.64	50.31	84.35	0.07

	(METER)	(FEET)
SET WEIR	6.27	20.57
BERM EL	6.44	21.13
INITIAL EL	6.10	20.01

ROADSIDE DITCH - R24



AREA:		SQ. M.	AC
PRE	PERV	4271.54	1.06
	IMP	0.00	0.00
PST	PERV	2130.60	0.53
	IMP	2140.94	0.53
A	TOTAL	4271.54	1.06

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

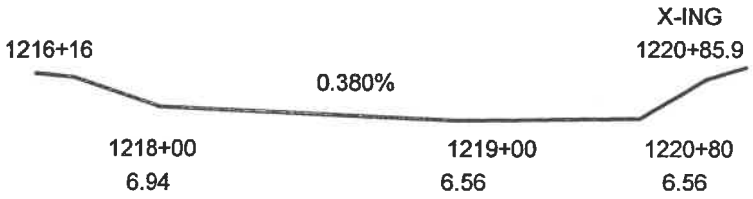
1.06 AC x 0.5 / 12 = **0.04** **AC-FT**
54.25 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	Δ'H (M)	Δ'H (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
6.46	21.19	0.00	0.00	0.00	0.00	0.00	0.00
6.63	21.75	0.17	0.56	260.77	22.17	22.17	0.02
6.78	22.24	0.15	0.49	400.84	49.62	71.79	0.06
6.60	21.65	0.00	0.00	0.00	0.00	0.00	0.00
6.74	22.11	0.14	0.46	233.80	16.37	16.37	0.01
6.86	22.51	0.12	0.39	343.77	34.65	51.02	0.04
6.74	22.11	0.00	0.00	0.00	0.00	0.00	0.00
6.88	22.57	0.14	0.46	233.80	16.37	16.37	0.01
7.00	22.97	0.12	0.39	343.77	34.65	51.02	0.04

	(METER)	(FEET)
SET WEIR	6.63	21.75
BERM EL	6.78	22.24
INITIAL EL	6.46	21.19

ROADSIDE DITCH - R25



AREA:		SQ. M.	AC
PRE	PERV	6464.04	1.60
	IMP	209.19	0.05
PST	PERV	4468.20	1.11
	IMP	2205.03	0.54
A	TOTAL	6673.23	1.65

TREATMENT VOLUME:

RETENTION OF A FULL 1/2" OF PURE VOLUME

1.65 AC x 0.5 / 12 = **0.07** **AC-FT**
84.75 **Cu.Meter**

DITCH - STAGE STORAGE

STAGE (METER)	STAGE (FEET)	ΔH (M)	ΔH (FT)	AREA (SQ.METER)	VOLinc (CU.METER)	VOLtot (CU.METER)	VOLtot (AC-FT)
6.56	21.52	0.00	0.00	270.00	0.00	0.00	0.00
6.70	21.98	0.14	0.46	662.96	65.31	65.31	0.05
6.73	22.08	0.03	0.10	755.86	21.28	86.59	0.07
6.89	22.60	0.16	0.52	1302.88	164.70	251.29	0.20

	(METER)	(FEET)
SET WEIR	6.73	22.08
BERM EL	6.89	22.60
INITIAL EL	6.56	21.52

SR 30 (US 98) from East of SR 83 (US 331) to East Side of Peak Creek (220643-1)

Construction Plans and Drainage Report

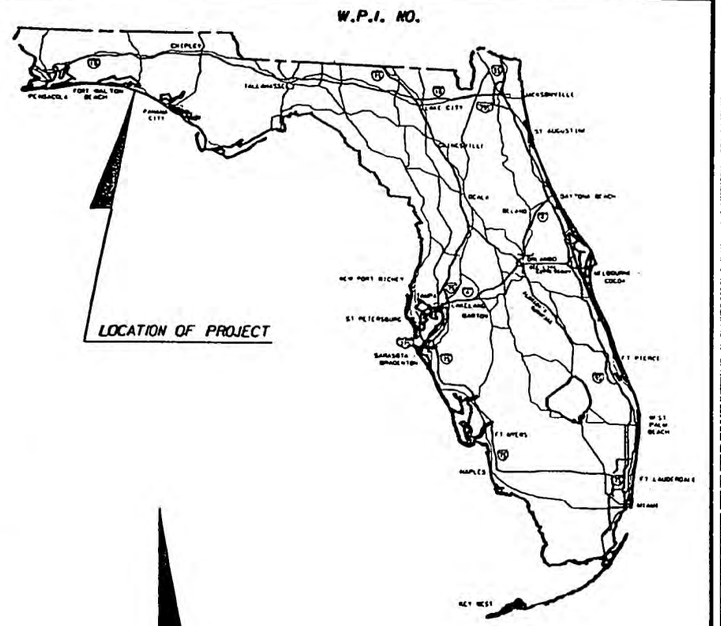
THIS CONTRACT PLAN SET INCLUDES

ROADWAY PLANS
SIGNING AND PAVEMENT MARKING PLANS
STRUCTURE PLANS

Phillip Wayne Gainer
PE No 43943
10-30-03

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
FINAL AS BUILT PLANS

W.P.I. NO.



FINANCIAL PROJECT ID 220643-1-52-01
STATE PROJECT NO. 60020-3521
(FEDERAL FUNDS)
WALTON COUNTY
STATE ROAD NO. 30
FROM EAST OF S.R. 83 (U.S. 331)
TO
EAST SIDE OF PEACH CREEK

CONTRACT NUMBER #C-4973

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

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2 - 2A	SUMMARY OF PAY ITEMS
3 - 5	TYPICAL SECTIONS
6 - 7	SUMMARY OF QUANTITIES
7A	TABULATION OF QUANTITIES
8 - 9	SUMMARY OF DRAINAGE STRUCTURES
10	DRAINAGE DETAIL SHEET
11	GENERAL NOTES
12 - 35	ROADWAY PLAN
36 - 48	ROADWAY PROFILES
49 - 56	DRAINAGE STRUCTURES
57	ROADWAY SOIL SURVEY
58 - 173	CROSS SECTIONS
174 - 184	TRAFFIC CONTROL SHEETS
185 - 207	UTILITY ADJUSTMENTS
208 - 233	EROSION CONTROL SHEETS

THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD. IF CHANGES WERE MADE, THOSE CHANGES ARE INDICATED BY BLACK INK REVISION AND BEAR THE SEAL AND SIGNATURE OF THE RESPONSIBLE ENGINEER.

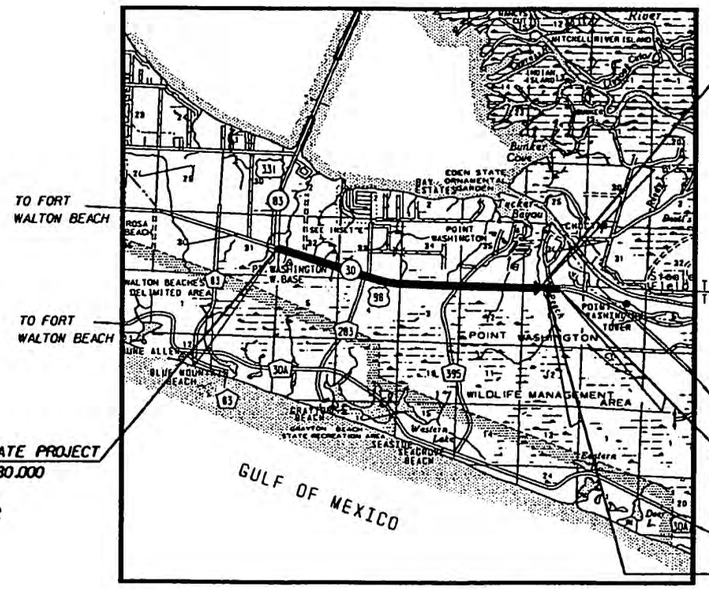
F.B. # 001 FINAL MEASUREMENTS
F.B. # 002 FINAL MEASUREMENTS
F.B. #003 ORIGINAL CHECK SECTIONS
F.B. #004 SUB SOIL
COMP. BOOK NO.1 ROADWAY ITEMS
COMP. BOOK NO.2 BRIDGE ITEMS
F.B.#005 FINAL CHECK SECTIONS

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION.
ROADWAY AND TRAFFIC DESIGN STANDARDS
DATED JANUARY 2000, AND
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE
CONSTRUCTION DATED 2000.
AS AMENDED BY CONTRACT DOCUMENTS.

REVISIONS

SHEET NO.	DATE	DESCRIPTION
1	9/26/01	REVISE KEY SHEET
12-15	9/18/01	ADDED FENCING FOR ENDANGERED SPECIES
18-20	9/18/01	ADDED FENCING FOR ENDANGERED SPECIES
23-24	9/18/01	ADDED FENCING FOR ENDANGERED SPECIES
57	9/26/01	SIGNED AND SEALED PLAN SHEET
B13-B20	9/26/01	SIGNED AND SEALED PLAN SHEETS
2-2A	10/05/01	REVISE CES QUANTITIES
7	10/05/01	REVISE PAY ITEM NOTE ABOUT ENDANGERED SPECIES
11	10/05/01	ADDED GENERAL NOTE ABOUT ENDANGERED SPECIES
229	10/05/01	REVISED IMPACTED WETLAND AREA TOTAL
233	10/05/01	REVISED WETLAND AREA CHART
3	10/08/01	REVISED TYPICAL SECTION NOTES
7A	10/08/01	REVISED CONDUIT AND FIBER NOTES
159-162	10/08/01	REVISED CROSS SECTIONS
18-21	7/24/02	REVISED SUPERELEVATION IN CURVE DATA
34-35	7/24/02	REVISED SUPERELEVATION IN CURVE DATA
13	3/18/03	REVISED MEDIAN CROSSOVER LOCATION
28	3/18/03	REVISED MEDIAN CROSSOVER LOCATION
30-31	8/05/03	ADDED LEFT TURN LANE, STA 281+20.000
P1-P2	10/15/02	Revised Profile Grade Change

FIELD REVISED SHEETS NO'S: 2, 56, S-12, S-20



0 1 2
Kilometers
1:50 000

ROADWAY SHOP DRAWINGS
TO BE SUBMITTED TO:
ROGER D. LEWIS, P.E.
701 CORPORATE CENTER DRIVE
SUITE 475
RALEIGH, NORTH CAROLINA 27607

PLANS PREPARED BY

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

VENDOR NUMBER 390246950-006

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED BY REPRODUCTION.

C.W. ROBERTS CONTRACTING, INC.
METRIC ENG. INC.
EDWARD PRESCOTT; DIST. SECT.
STAN SWIATEK; RES. ENGINEER
BOB SHAW; PROJECT MANAGER
PHILLIP GAINER; SR. PROJECT ENGINEER
J.B. YATES; PROJECT ADMINISTRATOR
CERTIFICATION FINAL PLANS
STAN SWIATEK _____

LENGTH OF PROJECT	METERS
ROADWAY	7 006.320
BRIDGES	43.00
NET LENGTH OF PROJ.	7 049.320
EXCEPTIONS	
GROSS LENGTH OF PROJ.	7 049.320

NOTE: C/L CONST. WAS USED TO CALCULATE LENGTH OF PROJECT.

FDOT PROJECT MANAGER : Hal W. Gore, Jr., P.E.

KEY SHEET REVISIONS

DATE	BY	DESCRIPTION
08/8/01	CRB	REVISE INDEX

NOTE: THIS IS A METRIC UNIT PROJECT

ROADWAY PLANS ENGINEER OF RECORD: ROGER D. LEWIS, P.E.

P.E. NO.: 52232

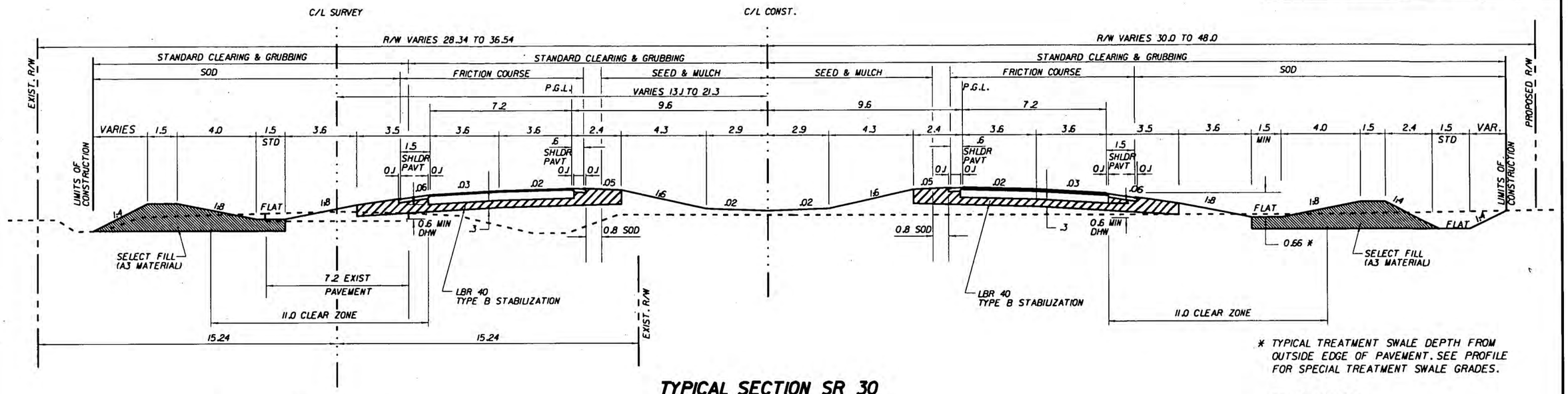
Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

8/5/03

FISCAL YEAR	SHEET NO.
02	1

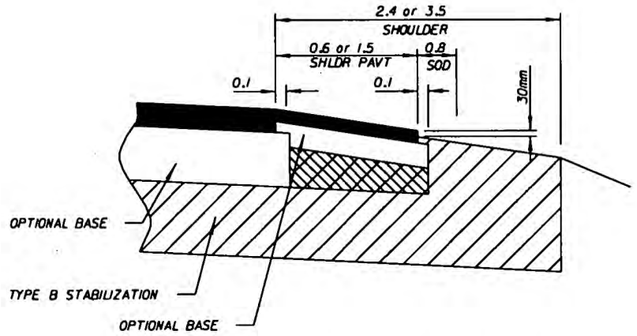
#####STTIME##### #####ROHSPECIFICATIONS#####
#####DATE##### #FILE#

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	3

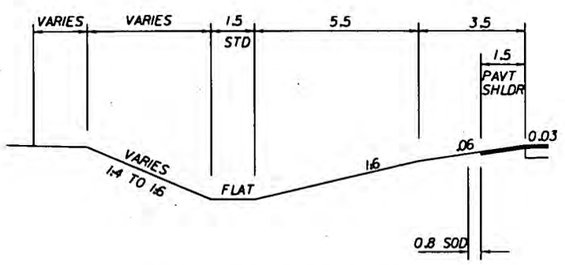


* TYPICAL TREATMENT SWALE DEPTH FROM OUTSIDE EDGE OF PAVEMENT. SEE PROFILE FOR SPECIAL TREATMENT SWALE GRADES.

TYPICAL SECTION SR 30



SHOULDER PAVEMENT DETAIL



ALTERNATE DITCH SECTION

NEW CONSTRUCTION

OPTIONAL BASE GROUP M9 WITH TYPE "SP" STRUCTURAL COURSE (TRAFFIC C)(198 kg/sm) AND FRICTION COURSE FC-5 (RUBBER)(44 kg/sm)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP M1WITH TYPE "SP" STRUCTURAL COURSE (TRAFFIC C)(66 kg/sm) AND FRICTION COURSE FC-5 (RUBBER)(44 kg/sm)

TYPICAL SECTION NOTES

1. AT THE CONTRACTOR'S OPTION, THE AREA UNDER PAVED SHOULDERS ADJACENT TO NEWLY CONSTRUCTED ROADWAY MAY BE CONSTRUCTED OF BASE MATERIAL AT NO ADDITIONAL COST.
2. THE PAVEMENT SLOPE SHALL MEET THE APPROVAL OF THE ENGINEER PRIOR TO PLACING THE FRICTION COURSE.
3. SOD SHALL BE PLACED ON ALL SLOPES 1:3 OR STEEPER, EXCEPT THOSE LOCATIONS INDICATED IN THE BRIDGE PLANS AS REQUIRING ALTERNATE PROTECTION MEASURES.
4. ALL SOD AND SEED AND MULCH AREAS TO RECIEVE A 150mm FINISH SOIL LAYER TREATMENT.
5. NONE OF THE EXISTING LIMEROCK BASE THAT IS REMOVED IS TO BE USED IN THE CONSTRUCTION OF THE NEW LIMEROCK BASE.
6. ALL OF THE EXISTING LIMEROCK BASE THAT IS REMOVED, MAY BE INCORPORATED IN THE STABILIZED PORTION OF THE SUBGRADE.
7. AT LOCATION WHERE OVERFLOW STRUCTURE ARE USED THERE IS A TRANSITION FROM 1:8 FRONT SLOPE TO 1:4 FRONT SLOPE.
8. CLEAR ZONE SHALL EXTEND 11.0 METERS FROM EDGE OF PAVEMENT.

SR-30 (US 98) TRAFFIC DATA

FROM SR 83 (U.S. 331) TO CR 283 SOUTH
CURRENT YEAR ESTIMATE = 1994 ADT = 9,400
OPENING YEAR ESTIMATE = 2002 ADT = 13,500
DESIGN YEAR ESTIMATE = 2021 ADT = 23,900
K = 11% D = 51% T = 7% (24 HR.)
DESIGN HR T = 4%
DESIGN SPEED = 110 Km/h

FROM CR 283 SOUTH TO CR 283 NORTH (BAY DRIVE)
CURRENT YEAR ESTIMATE = 1994 ADT = 7,900
OPENING YEAR ESTIMATE = 2002 ADT = 11,300
DESIGN YEAR ESTIMATE = 2021 ADT = 20,100
K = 11% D = 51% T = 7% (24 HR.)
DESIGN HR T = 4%
DESIGN SPEED = 110 Km/h

FROM CR 283 NORTH (BAY DRIVE) TO CR 395
CURRENT YEAR ESTIMATE = 1994 ADT = 7,600
OPENING YEAR ESTIMATE = 2002 ADT = 10,900
DESIGN YEAR ESTIMATE = 2021 ADT = 19,300
K = 11% D = 51% T = 7% (24 HR.)
DESIGN HR T = 4%
DESIGN SPEED = 110 Km/h

FROM CR 395 TO PEACH CREEK
CURRENT YEAR ESTIMATE = 1994 ADT = 5,600
OPENING YEAR ESTIMATE = 2002 ADT = 8,000
DESIGN YEAR ESTIMATE = 2021 ADT = 14,200
K = 11% D = 51% T = 7% (24 HR.)
DESIGN HR T = 4%
DESIGN SPEED = 110 Km/h

6/20/01

Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS

0: \29986\CADD\TYPSRD01.DGN 06/20/2001 12:44:51 PM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	6

SUMMARY OF DITCH BLOCKS

LOCATION	SIDE	DEPTH m	SOD P(m)²	SOD F(m)²
216+16.000	RT	0.50	62	
216+27.000	LT	0.50	62	
217+15.000	LT & RT	0.30	66	
218+00.000	LT & RT	0.30	66	
219+20.000	LT & RT	0.30	66	
219+96.000	LT & RT	0.30	66	
221+59.000	RT	0.50	62	
221+67.000	LT	0.50	62	
221+73.000	RT	0.50	62	
221+83.000	LT	0.50	62	
222+75.000	LT & RT	0.30	66	
223+75.000	LT & RT	0.30	66	
224+83.000	LT & RT	0.30	66	
225+50.000	LT & RT	0.30	66	
226+50.000	LT & RT	0.30	66	
227+56.000	LT & RT	0.50	124	
227+70.000	LT & RT	0.50	124	
228+50.000	LT & RT	0.31	68	
229+25.000	LT & RT	0.20	44	
229+40.000	LT & RT	0.30	44	
231+00.000	RT	0.30	33	
231+50.000	LT & RT	0.30	66	
232+00.000	LT & RT	0.30	66	
232+59.000	RT	0.50	62	
232+81.000	LT	0.50	62	
233+29.000	LT & RT	0.50	124	
234+30.000	LT & RT	0.30	66	
235+65.000	RT	0.30	33	
236+60.000	LT & RT	0.30	66	
238+00.000	LT	0.30	33	
239+00.000	LT	0.30	33	
240+00.000	LT	0.30	33	
240+98.000	LT	0.50	62	
241+22.000	LT	0.50	62	
242+00.000	LT	0.30	33	
243+00.000	LT	0.30	33	
244+00.000	LT	0.30	33	
245+00.000	LT	0.30	33	
245+80.000	LT	0.30	33	
247+00.000	LT	0.30	33	
248+00.000	LT & RT	0.30	66	
249+20.000	RT	0.50	62	
249+28.000	LT	0.50	62	
249+34.000	RT	0.50	62	
249+46.000	LT	0.50	62	
250+00.000	LT & RT	0.30	66	
251+00.000	LT & RT	0.30	66	
252+00.000	LT & RT	0.30	66	
253+02.000	LT & RT	0.30	66	
254+00.000	LT & RT	0.30	66	
255+00.000	LT & RT	0.30	66	
256+00.000	LT & RT	0.30	66	
257+00.000	LT & RT	0.30	66	
257+88.000	RT	0.50	62	
257+92.000	LT	0.50	62	
259+00.000	LT & RT	0.30	66	
260+00.000	LT & RT	0.30	66	
260+56.000	LT	0.50	62	
261+80.000	RT	0.50	62	
261+90.000	LT	0.50	62	
262+03.000	RT	0.50	62	
262+14.000	LT	0.50	62	
263+00.000	LT & RT	0.30	66	
264+00.000	LT	0.30	33	
264+75.000	LT	0.30	33	
266+00.000	LT & RT	0.30	66	
267+00.000	LT & RT	0.30	66	
268+00.000	LT & RT	0.30	66	
269+00.000	LT & RT	0.30	66	
270+00.000	LT & RT	0.30	66	

SUMMARY OF DITCH BLOCKS (CONT'D)

LOCATION	SIDE	DEPTH m	SOD P(m)²	SOD F(m)²
271+00.000	LT & RT	0.30	66	
271+60.000	LT	0.50	62	
271+95.000	RT	0.50	62	
272+22.000	LT & RT	0.50	124	
273+00.000	LT & RT	0.30	66	
274+00.000	LT & RT	0.30	66	
275+10.000	LT & RT	0.20	66	
276+00.000	LT & RT	0.30	66	
277+00.000	LT & RT	0.30	66	
278+24.000	LT	0.50	62	
278+24.000	RT	0.50	62	
278+46.000	RT	0.50	62	
283+40.000	RT	0.50	62	
284+50.000	RT	0.30	33	
	TOTALS :		5164	

SUMMARY OF SIDEDRAIN AND MITERED END SECTIONS

	LOCATION STA. TO STA.	SIDE	PIPE LENGTH (MI) 450 mm	MES (EA)	600 mm	MES (EA)
P	220+04.7 TO 220+22.4	LT	12.2	2		
F						
P	220+07.2 TO 220+20.0	LT	7.3	2		
F						
P	222+97.5 TO 223+10.3	LT	7.3	2		
F						
P	222+98.5 TO 223+11.3	RT	7.3	2		
F						
P	230+86.3 TO 231+04.0	LT	12.2	2		
F						
P	230+88.8 TO 231+01.6	LT	7.3	2		
F						
P	241+60.2 TO 241+80.3	LT	14.6	2		
F						
P	241+63.9 TO 241+76.7	LT	7.3	2		
F						
P	245+93.5 TO 246+11.2	LT	12.2	2		
F						
P	245+96.0 TO 246+08.8	LT	7.3	2		
F						
P	267+74.7 TO 267+94.8	LT	14.6	2		
F						
P	267+77.1 TO 267+92.4	LT	9.8	2		
F						
P	271+74.4 TO 271+91.5	LT	11.6	2		
F						
P	277+78.8 TO 277+96.5	LT	12.2	2		
F						
P	277+81.3 TO 277+94.1	LT	7.3	2		
F						
P	277+87.8 TO 278+12.2	RT			17.7	2
F						
P	277+91.4 TO 278+08.5	RT	11.6	2		
F						
P	278+26.8 TO 278+46.9	LT	14.6	2		
F						
P	281+01.6 TO 281+26.6	LT	19.5	2		
F						
P	281+33.5 TO 281+51.1	RT	12.1	2		
F						
P	TOTALS :		208.3	38	17.7	2
P	TOTALS :		220.1	40.0	17.7	2

STRUCTURE NO.	STATION	DESIGN FLOOD 2% PROB. DISCHARGE	DESIGN FLOOD 50 YR.FREQ. STAGE	BASE FLOOD 1% PROB. DISCHARGE	BASE FLOOD 100 YR.FREQ. STAGE	OVERTOPPING FLOOD DISCHARGE	OVERTOPPING FLOOD STAGE	OVERTOPPING FLOOD PROB. %	OVERTOPPING FLOOD FREQ. YR.	GREATEST FLOOD DISCHARGE	GREATEST FLOOD STAGE	GREATEST FLOOD PROB. %	GREATEST FLOOD FREQ. YR.
S-3	216+07.00	43.34	6.45	48.61	6.50					82.64	6.67	0.2	500
S-9	221+66.00	40.03	6.55	43.34	6.56					73.69	6.73	0.2	500
S-13	224+25.00	23.55	6.75	25.93	6.78					44.07	7.01	0.2	500
S-16	227+63.50	88.16	7.03	99.82	7.13	141.54	7.58	0.40	250				
S-22	232+67.00	30.59	7.41	37.38	7.47					61.16	7.90	0.2	500
S-24	233+18.00	96.84	7.41	108.74	7.47					185.19	7.90	0.2	500
S-27	35+33	48.98	7.63	55.27	7.69					93.95	8.23	0.2	500
S-30	240+91.00	52.04	7.50	59.53	7.55					101.26	7.84	0.2	500
S-33	244+97.50	41.71	7.97	47.40	8.05	62.87	8.32	0.50	200				
S-36	249+27.00	48.49	7.81	54.86	7.90	69.50	8.16	0.60	167				
S-40	252+03.00	54.37	7.49	62.86	7.54					107.04	7.85	0.2	500
S-43	257+96.50	51.48	7.05	59.47	7.14					101.09	7.77	0.2	500
S-46	48+95.20	10.81	6.18	12.28	6.21					20.88	6.38	0.2	500
S-48	36+40.60	5.08	5.47	5.81	5.47					9.87	5.49	0.2	500
S-51	261+92.00	93.80	5.94	104.50	5.99					155.48	6.45	0.2	500
S-54	263+32.00	13.76	5.94	16.48	5.99					50.13	6.45	0.2	500
S-59	272+08.50	180.09	5.18	210.68	5.28					358.49	5.95	0.2	500
S-65	278+53.00	52.67	5.11	59.47	5.14					101.94	5.47	0.2	500

DEFINITIONS:

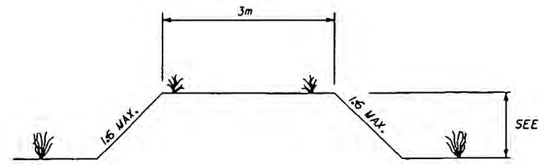
DESIGN FLOOD: THE FLOOD SELECTED BY F.D.O.T. TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PERFORMANCE.

BASE FLOOD: THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY).

OVERTOPPING FLOOD: THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THRU EMERGENCY RELIEF STRUCTURES.

GREATEST FLOOD: THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT PRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY).

NOTE: THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY, TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS SENSITIVE TO CHANGES, PARTICULARY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CANNOT BE ATTAINED. DISCHARGES ARE IN CUBIC METERS PER MINUTE AND STAGES ARE IN METERS, NGVD, 1929.



DITCH BLOCK DETAIL
LONGITUDINAL SECTION (N.T.S.)

11/6/01

REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	

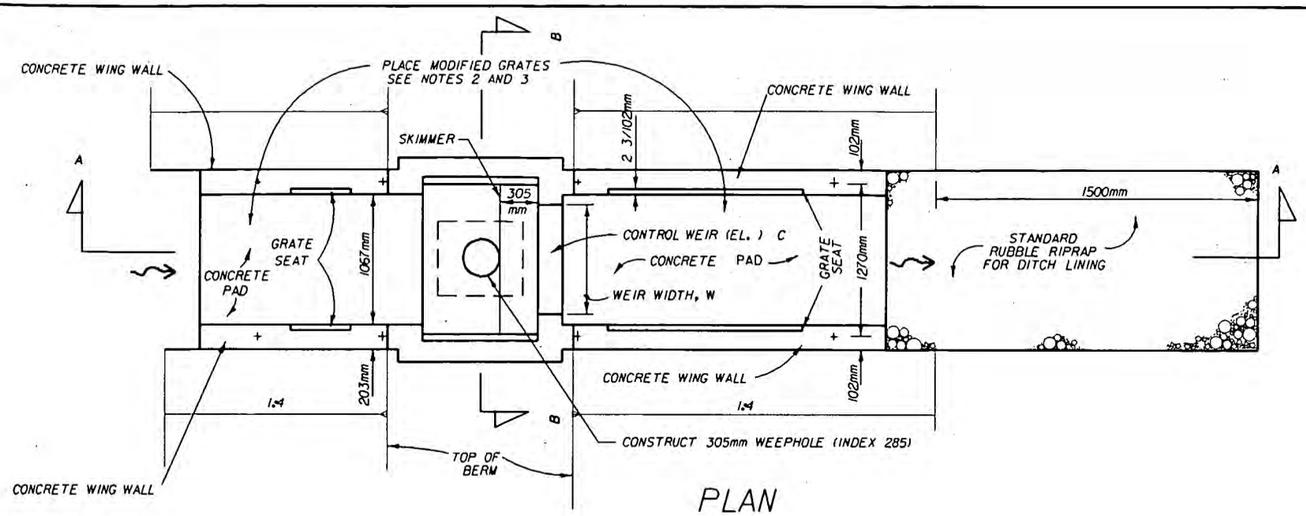
EARTH TECH
A tyco INTERNATIONAL LTD COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

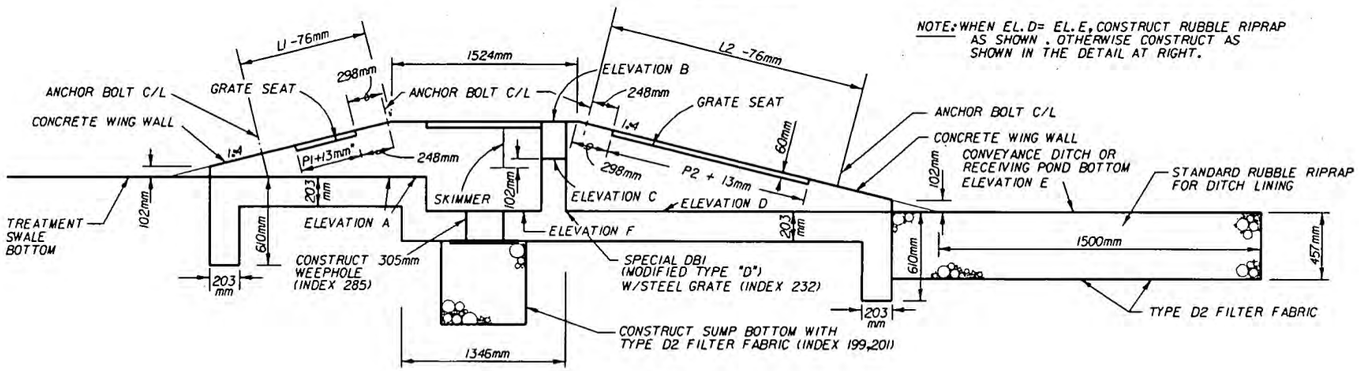
Fuller, Davis and Associates, Inc.

SUMMARY OF QUANTITIES

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	10

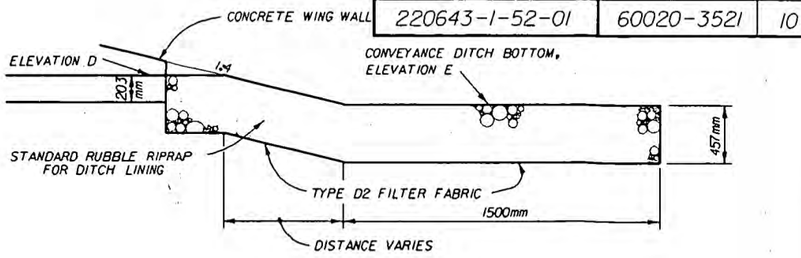


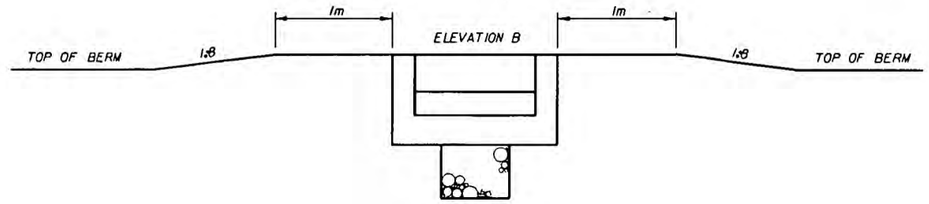
PLAN



NOTE: WHEN EL. D= EL. E, CONSTRUCT RUBBLE RIPRAP AS SHOWN, OTHERWISE CONSTRUCT AS SHOWN IN THE DETAIL AT RIGHT.

SECTION A-A





SECTION B-B

OVERFLOW STRUCTURE FOR ATTENUATION AND TREATMENT

NOTES:

1. SKIMMER TO BE FABRICATED FROM 6mm STEEL FLAT PLATE AND BOLTED TO THE SIDE OF THE STRUCTURE WITH A MINIMUM OF FOUR (4) 13mm DIA. BOLTS. SKIMMER TO BE HOT-DIP GALVANIZED AFTER FABRICATION AND DRILLING OF BOLT HOLES.
2. STEEL GRATES SHALL BE CONSTRUCTED PER INDEX 261 WITH F = 935mm. THE "P" AND "L" DIMENSIONS ARE SHOWN IN THE TABLE ON THIS SHEET. P1 AND U REFER TO THE SHORTER GRATE THAT IS ON THE UPSTREAM SIDE OF THE STRUCTURE. P2 AND L2 REFER TO THE LONGER GRATE THAT IS ON THE DOWNSTREAM SIDE OF THE STRUCTURE. THE CENTER-TO-CENTER LONGITUDINAL BOLT SPACINGS ARE TO BE U-3# AND L2-3# FOR THE SHORTER AND LONGER GRATE RESPECTIVELY ON EACH STRUCTURE. THE LENGTHS OF THE GRATE SEATS IN THE CONCRETE WINGWALLS ARE P1 + 13mm AND P2 + 13mm RESPECTIVELY. ALL LATERAL CENTER TO CENTER BOLT SAPCINGS ARE TO BE 1270mm.
3. ALL OTHER STEEL GRATE SPECIFICATIONS ARE TO BE AS INDICATED BY INDEX 261.
4. PLACE SOD AROUND THE ENTIRE STRUCTURE, INCLUDING THE RUBBLE RIPRAP, FOR A DISTANCE OF 600mm IN EACH DIRECTION. SOD BLOCKS ARE TO BE PLACED WITH STAGGERED TRANSVERSE JOINTS. SEE THE PATTERN DETAIL OF INDEX 105.
5. ALL COST FOR OVERFLOW STRUCTURE INCLUDING, CLASS II CONCRETE, REINFORCING STEEL, RATES, FILTER FABRIC, AND FOR SKIMMERS TO BE INCLUDED IN COST FOR INLET (SPECIAL).
6. THE RUBBLE RIPRAP SHALL EXTEND 2.74m FROM THE TOE OF THE BERM AS SHOWN ON THIS SHEET.
7. ELEVATION "F" SHALL BE EQUAL TO ELEVATION "D" FOR ALL STRUCTURES EXCEPT AS NOTED IN THE "COMMENTS" COLUMN OF THE TABLE ON THIS SHEET.
8. CONSTRUCT A DITCH BLOCK BERM AS SHOWN IN THE PLAN VIEW ABOVE. THE TOP OF BERM SHALL BE AT ELEVATION "B". THE BERM SHALL BE CONSTRUCTED SUCH THAT THE SPECIAL OVERFLOW STRUCTURE(S) IS(ARE) FLUSH WITH THE BERM.

SUMMARY OF DIMENSIONS AND LOCATIONS OF OVER FLOW STRUCTURES

STRUCT. NO.	STATION ℄ CONST.	OFFSET	CONC. PAD (EL. A)	TOP OF BERM (EL. B)	WEIR EL. (EL. C)	CONC. PAD (EL. D)	CONVEY. DITCH (EL. E)	WEIR WIDTH W (mm)	U	L2	P1	P2	COMMENTS
S-1	Not Used												
S-2	Not Used												
S-5	216+21	30.5 RT	7.09	7.80	7.29	6.71	6.20	915	1906	3431	1320	2845	
S-6	216+31	31 LT	7.11	7.82	7.31	6.71	6.20	915	1906	3431	1320	2845	
S-7	221+53	31 RT	7.21	7.92	7.41	6.81	6.30	915	1906	3431	1320	2845	
S-8	221+61	31 LT	7.21	7.92	7.41	6.81	6.50	915	1906	2821	1320	2235	
S-11	221+79	30 RT	7.19	7.90	7.39	6.79	5.87	610	1906	3431	1320	2845	
S-12	221+89	31 LT	7.19	7.90	7.39	6.79	6.00	610	1906	3431	1320	2845	
S-14	227+49	30.5 LT	7.33	8.04	7.53	6.93	6.00	915	1906	3431	1320	2845	
S-15	227+49	30.5 RT	7.32	8.03	7.52	6.92	6.32	915	1906	3431	1320	2845	
S-18	227+78	31 LT	7.39	8.10	7.59	6.99	5.90	610	1906	3431	1320	2845	
S-19	227+78	30.5 RT	7.39	8.10	7.59	6.99	6.18	610	1906	3431	1320	2845	
S-20	232+53	30.5 RT	7.89	8.60	8.09	7.49	6.64	915	1906	3431	1320	2845	
S-21	232+75	30.5 LT	7.86	8.57	8.06	7.46	6.20	915	1906	3431	1320	2845	
S-25	233+35	30.5 LT	7.85	8.56	8.05	7.45	7.00	915	1906	3431	1320	2845	
S-26	233+35	30.5 RT	7.85	8.56	8.05	7.45	6.67	915	1906	3431	1320	2845	
S-28	235+71	33 RT	8.20	8.91	8.40	7.80	7.04	915	1906	3431	1320	2845	
S-29	240+92	31 LT	7.93	8.64	8.13	7.71	7.60	915	1906	2821	1320	2235	
S-32	241+28	31 LT	8.01	8.71	8.21	7.59	7.10	915	1906	3431	1320	2845	
S-34	249+13	30.5 RT	7.96	8.67	8.16	7.56	6.95	915	1906	3431	1320	2845	
S-35	249+19	30.5 LT	7.96	8.67	8.16	7.56	7.20	915	1906	3431	1320	2845	
S-38	249+41	30.5 RT	7.96	8.67	8.16	7.56	7.50	915	1906	3431	1320	2845	
S-39	249+55	30.5 LT	7.96	8.67	8.16	7.56	7.00	915	1906	3431	1320	2845	
S-41	257+77	30.5 RT	7.62	8.33	7.82	7.41	6.41	915	1906	3431	1320	2845	
S-42	257+86	30.5 LT	7.59	8.29	7.79	7.40	6.45	915	1906	3431	1320	2845	
S-45	259+94	34 RT	6.94	7.65	7.14	6.56	5.90	915	1906	3431	1320	2845	
S-47	260+50	33.5 LT	6.84	7.55	7.04	6.44	5.25	915	1906	3431	1320	2845	
S-49	261+74	30.5 RT	6.65	7.36	6.85	6.25	5.08	915	1906	3431	1320	2845	
S-50	261+85	32 LT	6.55	7.26	6.85	6.25	4.80	915	1906	3431	1320	2845	
S-52	262+10	30.5 RT	6.65	7.36	6.85	6.25	5.06	915	1906	3431	1320	2845	
S-53	262+21	32 LT	6.55	7.26	6.75	6.15	5.80	915	1906	3431	1320	2845	
S-57	271+54	31 LT	5.83	6.54	6.03	5.88	5.60	915	1906	2821	1320	2235	
S-58	271+90	31 RT	5.86	6.57	6.06	5.46	4.90	1220	1906	3431	1320	2845	
S-61	272+27	30.5 LT	5.91	6.62	6.11	5.51	5.20	1220	1906	3431	1320	2845	
S-62	272+27	30.5 RT	5.91	6.62	6.11	5.51	4.44	915	1906	3431	1320	2845	
S-63	278+20	30.5 LT	5.83	6.04	6.03	5.75	5.20	915	1906	3431	1320	2845	
S-64	278+20	30.5 RT	5.83	6.04	6.03	4.92	4.39	915	1906	3431	1320	2845	
S-67	278+50	30.5 RT	5.76	6.46	5.96	5.43	4.63	915	1906	3431	1320	2845	
S-68	Not Used												
S-71	283+46	33 RT	5.01	5.72	5.21	4.63	1.80	915	1906	2516	1320	1930	

Kenneth E. Wright 7/3/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

Faller, Davis and Associates, Inc.

DRAINAGE DETAIL SHEET
SPECIAL DRAINAGE STRUCTURES

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	12

NOTE:

THE EXISTING 4 - LANE TO 2 - LANE TRANSITION SHOWN FROM ST.A 215+80 TO 220+60 MAY NOT BE IN PLACE. DEPENDING ON THE SCHEDULE OF PROJECT 60020-3520. THE CONTRACTOR SHALL COORDINATE THE TIE IN WITH PROJECT 60020-3520

Curve EOP-1
PI Sta. = 0+07.802
Delta = 01° 11' 39.699" (LT)
T = 7.802
L = 15.604
R = 4,600.000
PC Sta. = 0+00.000
PT Sta. = 0+15.604

Curve EOP-2
PI Sta. = 0+44.212
Delta = 1° 05' 04.868" (RT)
T = 44.212
L = 88.422
R = 4,600.000
PC Sta. = 0+00.000
PT Sta. = 0+88.422

BEGIN CONSTRUCTION
BEGIN PROJECT
STA. 215+80.000 C/L CONST. AH =
STA. 1215+80.000 MAAI C/L CONST. BK 13.3m RT.
STA. 215+80.000 C/L SURVEY
CONNECT TO STATE PROJ. NO. 60020-3520

0 10 20
Scale : 1:1000

DRAINAGE EASEMENT
+98.429
38.540 (LT) &
TIE TO EXIST. R/W

Basin 16

Woods

TO BE CONSTRUCTED
UNDER STATE PROJECT NO.
60020-3520

Endangered Species Temporary Fencing (orange 2-inch mesh)

Bottom of Ditch

Top of Bank

+90.00

Tree Line

Top of Bank

Bottom of Ditch

DRAINAGE EASEMENT
+34.429
38.540 (LT) &
TIE TO EXIST. R/W

Woods

1.5 Paved Shldr.

R/W Line

214

215

216

217

S 72°45'38" E

30" RCP

SR 30 (US 98)

C/L SURVEY

S-6

CURVE EOP-1

CURVE EOP-2

0.6 Paved Shldr.

7.2

21.3

36.5

9.4

19.2

7.2

45.3

214

215

216

217

MAAI C/L CONST.

S 72°45'38" E

C/L CONST.

MAAI C/L CONST.

+80.00
11.30

30" RCP

+43.77
8.48

PRC
+58.82
8.75

PT
+54.76
10.46

38.33 m

CURVE EOP-3

CURVE EOP-4

0.6 Paved Shldr.

RETAIN EXISTING

S-5

Bottom of Ditch

TO BE CONSTRUCTED
UNDER STATE PROJECT NO.
60020-3520

STA. 214+80.000 C/L CONST. AH =
STA. 1214+80.000 MAAI C/L CONST. BK 1.7m RT =
STA. 1214+80.000 MAAI C/L CONST AH 11.6 RT

00°05'+

R/W Line

Endangered Species Temporary Fencing (orange 2-inch mesh)

+80.000
45.300 (RT)

CD18

C.R.
8.696
C.R.
13.045
C.R.
18.358
90°
Sta. 214+59.98

27.420
18.229
90°00'27"
45.787
45.744
Sta. 215+55.650

Curve EOP-3
PI Sta. = 0+37.384
Delta = 0° 55' 52.538" (LT)
T = 37.384
L = 74.766
R = 4,600.000
PC Sta. = 0+00.000
PT Sta. = 0+74.766

Curve EOP-4
PI Sta. = 0+44.545
Delta = 1° 05' 32.083" (RT)
T = 44.545
L = 89.029
R = 4,600.000
PC Sta. = 0+00.000
PT Sta. = 0+89.029

Roger D. Lewis

9/26/01

Roger D. Lewis, P.E. No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
9/18/01	CRB	ADD ENDANGERED SPECIES FENCE									

EARTH TECH
A TYCO INTERNATIONAL LTD. COMPANY

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	14

Basin 17

Basin 18

0 10 20
Scale : 1"=10'-0"

Woods

Woods

Top of Bank

Bottom of Ditch

STAKED TURBIDITY BARRIER

Top of Bank

Pave To Here

1.5 Paved Shldr.

Top of Bank

R/W Line

Top of Bank

(TO BE REMOVED)

CONST 450 RCP

Bottom of Ditch

Bottom of Ditch

Unpaved Shoulder

Unpaved Shoulder

C/L SURVEY

221

222

223

224

30" RCP

30" RCP

Exist. Pavt

5.0 R

5.0 R

SR 30 (US 98)

S 72°45'38" E

Unpaved Shoulder

Unpaved Shoulder

Bottom of Ditch

221

222

223

S 72°45'38" E

224

0.6 Paved Shldr.

Tree Line & Top of Bank

C/L CONST.

Tree Line & Top of Bank

CONST 2-750 RCP

Bottom of Ditch

Woods

5.0 R

5.0 R

0.6 Paved Shldr.

1.5 Paved Shldr.

CONST 450 RCP

36.5

21.3

10.8

15.6

7.2

45.3

7.2

19.2

7.2

40.0

36.5

+90.50

+75.00

+20.00

S-8

S-12

S-9

S-10

S-7

S-11

R/W Line

Endangered Species Temporary Fencing (orange 2-inch mesh)

CD19

R/W Line

Pave To Here

Endangered Species Temporary Fencing (orange 2-inch mesh)

27.408

18.251

45.799

45.726

90°00'42"

C/L Sur.

Sta. 223+60.289

Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

ROGER DALE LEWIS
NORTH CAROLINA
SEAL 029232
PROFESSIONAL ENGINEER
Roger Lewis
9/26/01

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
09/19/01	CRB	ADD ENDANGERED SPECIES FENCE									

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

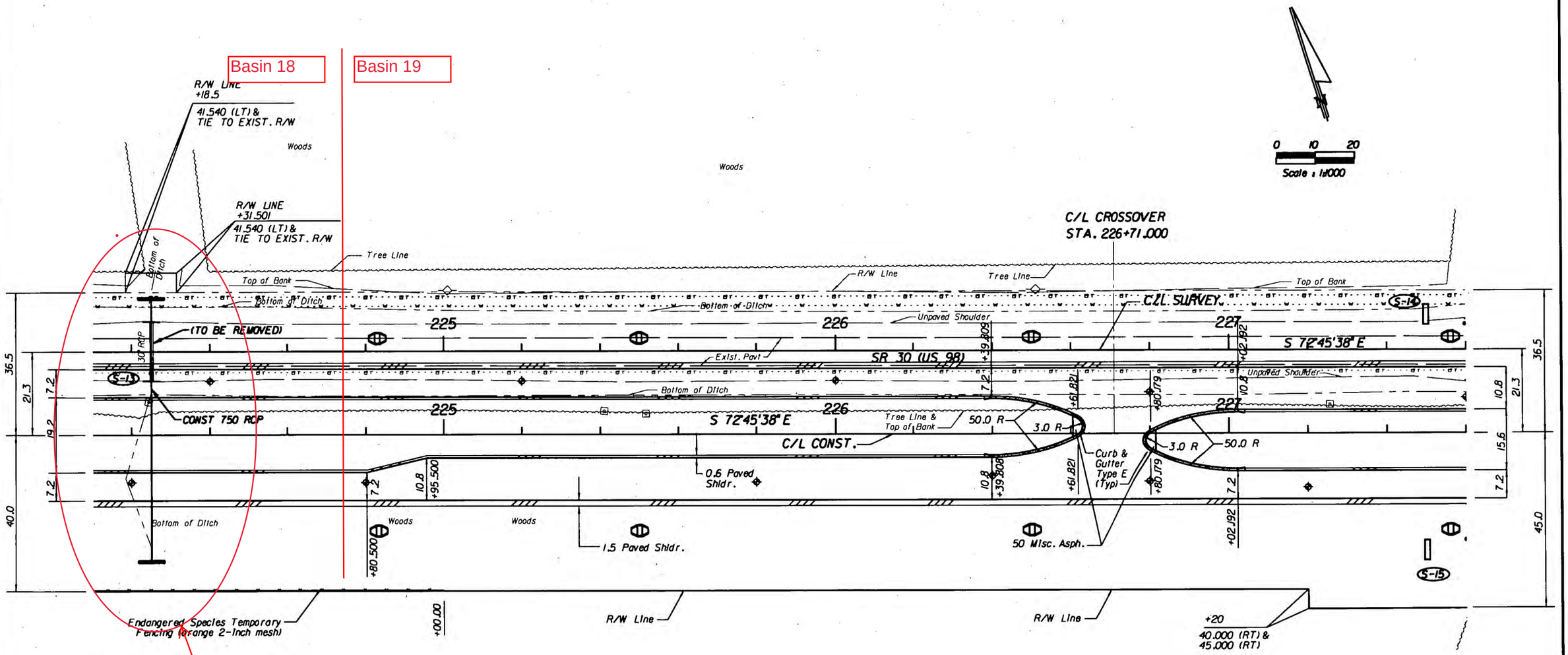
PLAN
SR 30

G:\29986\CADD\planrd03.dgn 09/19/2001 04:39:47 PM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	15

Basin 18

Basin 19



CD 20

0 10 20
Scale : 1"=10'00

Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

9/26/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
09/19/01	CRB	ADD ENDANGERED SPECIES FENCE									

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

Q:\29986\CADD\PLANRD04.DGN 09/19/2001 04:40:55 PM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	16

Basin 19

Basin 20

Basin 20

Basin 21

CD21

Section 33
Section 32

Sta. 228+76.059 C/L Survey

Woods

Woods

Bottom of Ditch

2' x 8' BOX CULVERT

1.5 Paved Shldr.

Top of Bank

S-18

(TO BE REMOVED)

228

229

230

231

C/L SURVEY

CONST 450 RCP

Pave To Here

R/W Line

Soil Line

50 R

S 72°45'38" E

SR 30 (US 98)

CONST 2-750 RCP

S-16

Bottom of Ditch

10.8

+46.506

+69.500

7.2

0.6 Paved Shldr.

Tree Line & Top of Bank

C/L CONST.

S-17

S-19

Top of Bank

36.5

21.3

15.6

19.2

45.0

0 10 20

Scale : 1:1000

1.5 Paved Shldr.

Woods

R/W Line

175°9'00"

90°00'00"

30.498

30.413

45.763

45.738

C/L Sur.

Sta. 227+63.793

Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

ROGER DALE LEWIS
REGISTERED
Colville
FLORIDA
PROFESSIONAL ENGINEER

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

q: \29986\cadd\planrd05.dgn 06/20/2001 11:45:07 AM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	19

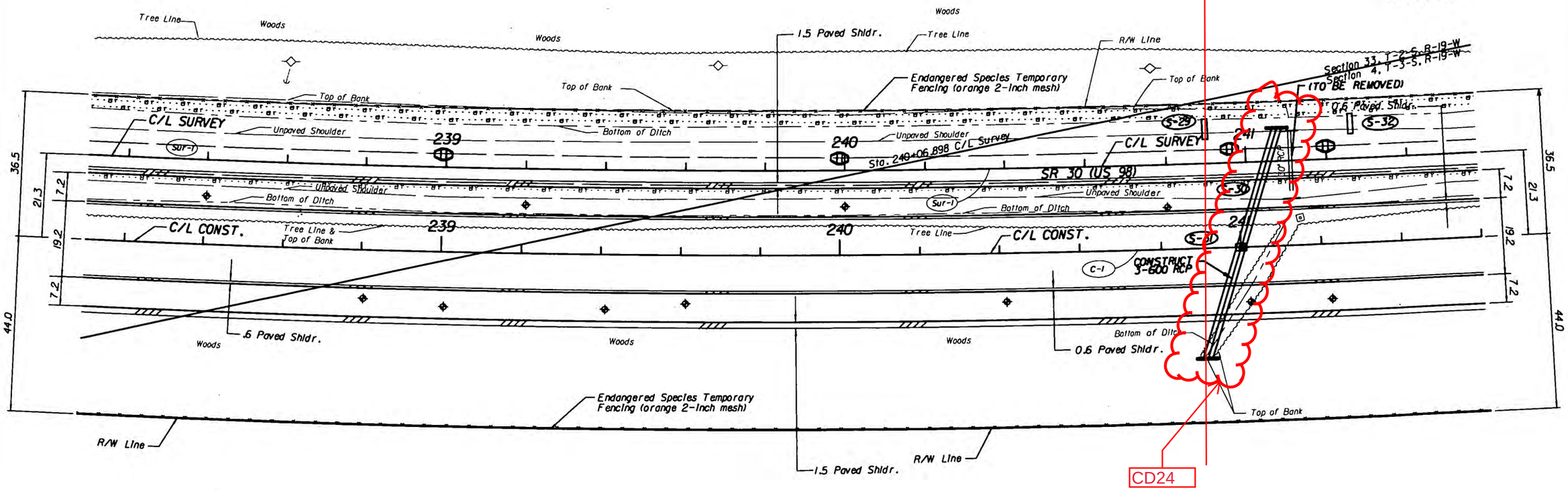
C-1 Curve Data
C/L CONST.
PI Sta. 242+26.24
Delta = 14°53'36" LT
T = 459.307
L = 913.436
R = 3514.058
PC Sta. 237+66.93
PT Sta. 246+80.37
e = NA

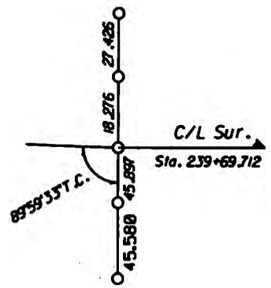
S-1 Curve Data
C/L SURVEY
PI Sta. 242+23.45
Delta = 14°53'36" LT
T = 456.523
L = 907.899
R = 3492.756
PC Sta. 237+66.93
PT Sta. 246+74.83
e = NA

Basin 23

Basin 24

0 10 20
Scale : 1"=100'





Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

PAUL E. LEWIS
STATE OF FLORIDA
Roger D. Lewis
9/26/01

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
09/19/01	CRB	ADD ENDANGERED SPECIES FENCE									

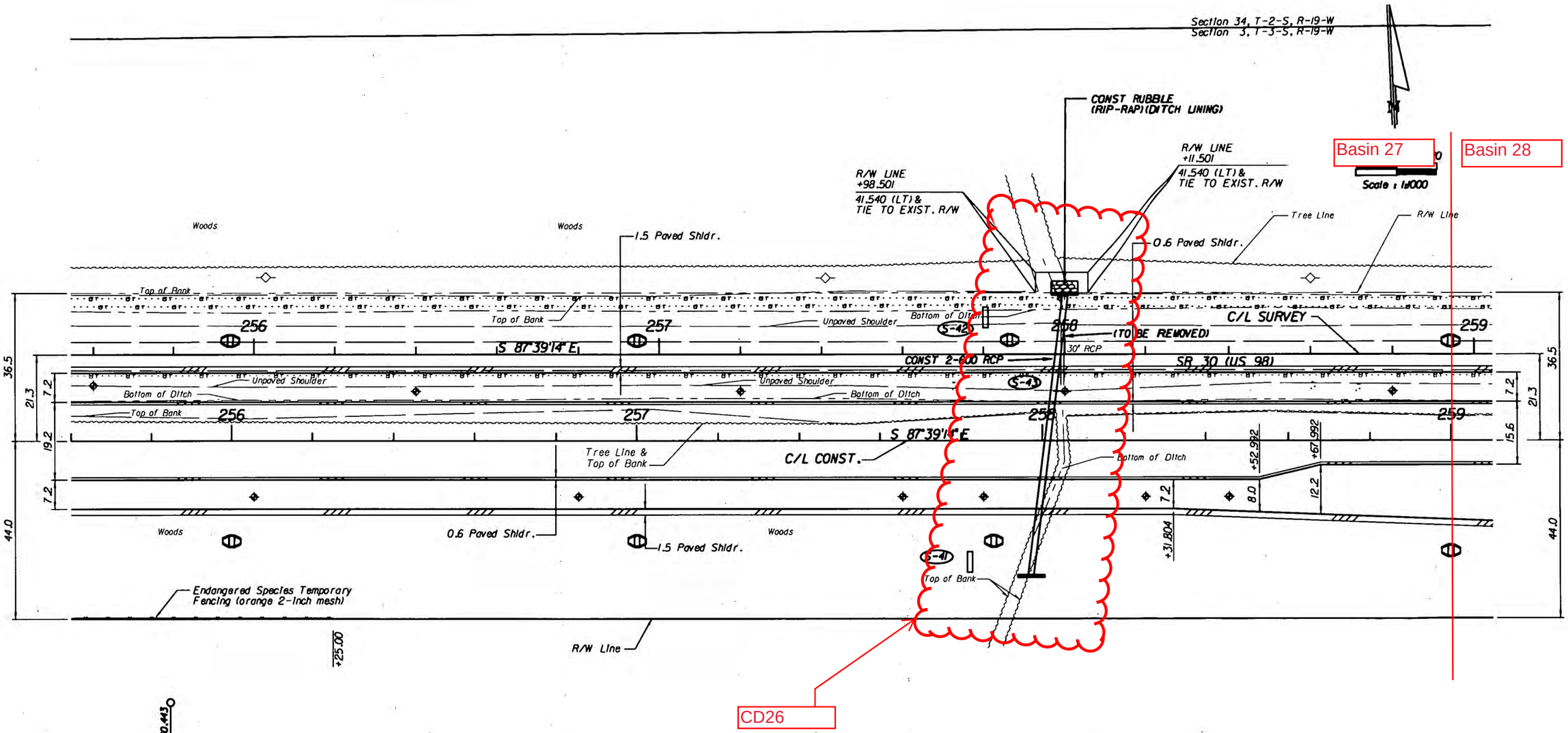
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

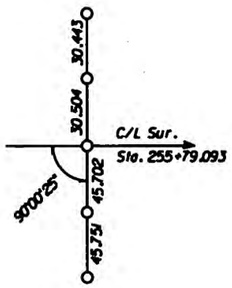
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

G:\29986\CADD\PLANRD08.DGN 09/19/2001 04:41:39 PM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	24





Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

ROGER DALE LEWIS
CERTIFICATE
No. 0052232
STATE OF FLORIDA
PROFESSIONAL ENGINEER
9/26/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
09/19/01	CRB	ADD ENDANGERED SPECIES FENCE									

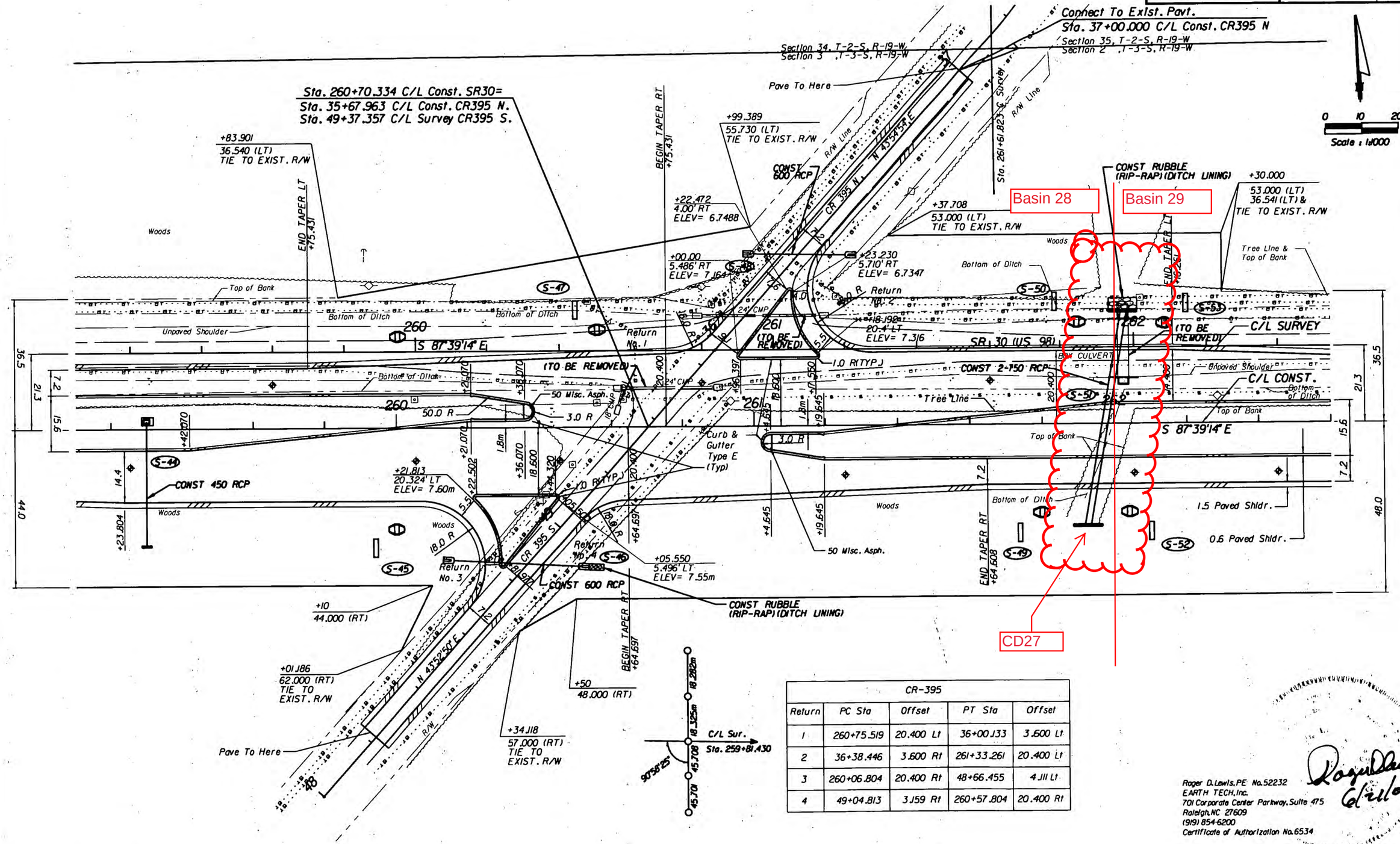
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

Q:\29986\CADD\PLANRD13.DGN 09/19/2001 04:42:48 PM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	25



CR-395				
Return	PC Sta	Offset	PT Sta	Offset
1	260+75.519	20.400 Lt	36+00.133	3.600 Lt
2	36+38.446	3.600 Rt	261+33.261	20.400 Lt
3	260+06.804	20.400 Rt	48+66.455	4.311 Lt
4	49+04.813	3.159 Rt	260+57.804	20.400 Rt

Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

6/11/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

q:\29986\cadd\planrd14.dgn 06/20/2001 11:45:18 AM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	26

Section 35, T-2-S, R-19-W
Section 2 , T-3-S, R-19-W

Basin 29

Basin 30

0 10 20
Scale : 1"=100'

0.6 Paved Shldr.
1.5 Paved Shldr.
BEGIN TAPER RT. +08.26
BEGIN TAPER MED. +11.76
R/W LINE +26
41.000 (LT) & TIE TO EXIST. R/W
R/W LINE +38
41.000 (LT) & TIE TO EXIST. R/W
Woods
R/W Line
(TO BE REMOVED)
CONST 750 RCP
S-50
S-55
263
264
265
266
Tree Line & Top of Bank
Bottom of Ditch
Unpaved Shoulder
S 87°39'14" E
SR 30 (US 98)
C/L SURVEY
C/L CONST.
12.263
+10.864
8.88
+85.87
7.2
21.3
15.6
36.5
48.0
5.0 R
5.0 R
+94.134
+09.134
10.8
8.01
Top of Bank
Pave To Here
R/W Line

CD28

45.696
18.355
45.708
45.696
90°00'00"
C/L Sur.
Sta. 263+83.849

Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

6/21/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

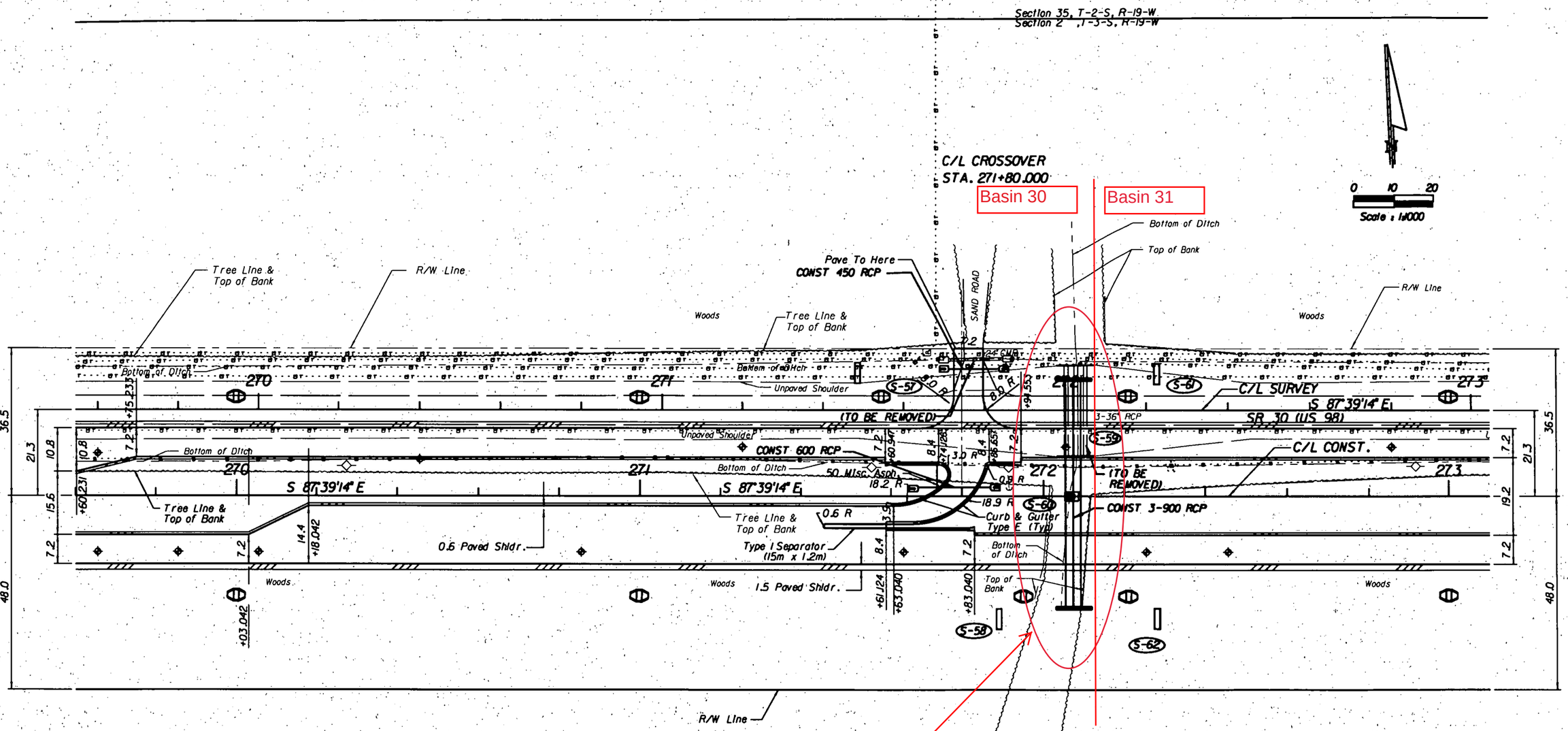
EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

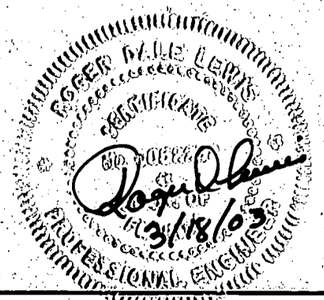
PLAN
SR 30

q:\29986\cadd\plnrd15.dgn 06/20/2001 11:45:20 AM

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	28



CD29



Roger D. Lewis, PE No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6534

REVISIONS

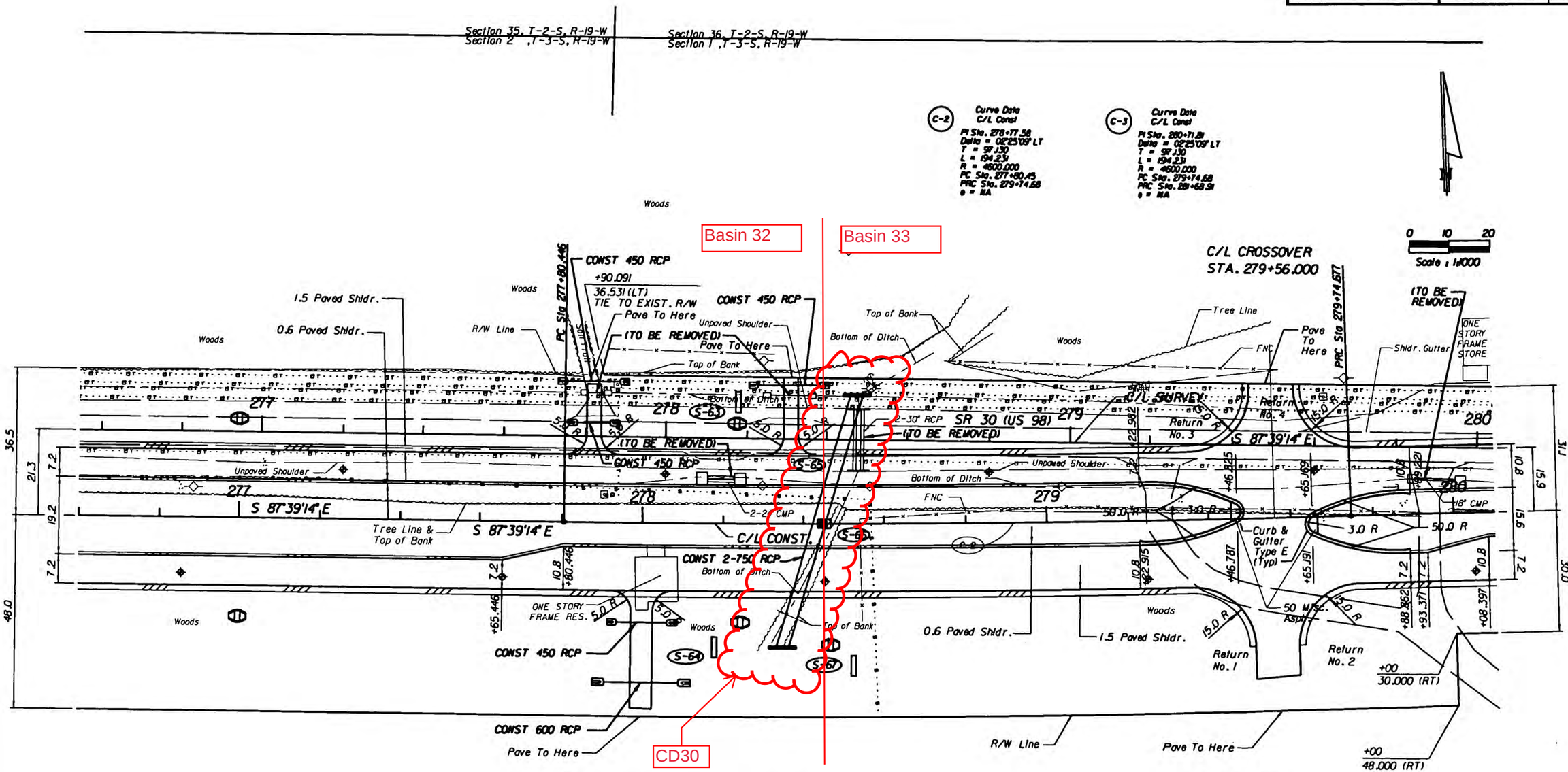
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
02/24/03	CRB	ADDED LEFT TURN LANE									

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

FINANCIAL PROJ. ID	STATE PROJ. NO.	SHEET NO.
220643-1-52-01	60020-3521	30



EASTBOUND AND WESTBOUND TURNOUTS				
Return	PC Sta	Offset	PT Sta	Offset
1	279+35.740	16.800 Rt	279+50.637	31.758 Rt
2	279+61.363	31.759 Rt	279+76.282	16.800 Rt
3	279+69.929	16.800 Lt	279+84.892	31.799 Lt
4	279+95.817	31.619 Lt	280+10.713	16.800 Lt

Roger D. Lewis, P.E. No. 52232
EARTH TECH, Inc.
701 Corporate Center Parkway, Suite 475
Raleigh, NC 27609
(919) 854-6200
Certificate of Authorization No. 6634

8/5/03



REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION
8/2/2003	CRB	ADDED LEFT TURN LANE									

EARTH TECH
A tyco INTERNATIONAL LTD. COMPANY
formerly: RUST ENVIRONMENT & INFRASTRUCTURE

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PLAN
SR 30

BEST AVAILABLE COPY

DRAINAGE CALCULATIONS

SR 30 From East of SR 83
(U.S. 331 to East Side of Peach Creek)
Walton County

Financial Project No. 220643-1-52-01
State Project No: 60020-3521
WPI No: 3119123

Submitted To:
Earth Tech
701 Corporate Center Drive #475
Raleigh, North Carolina 27607

Submitted By:
Faller Davis & Associates, Inc.

RECEIVED
MAY 0 3 2001
NORTHWEST FLORIDA
DEP

NANCY R. FALLER
CERTIFICATE NO. 32867
STATE OF FLORIDA
REGISTERED

Revised April 2001

State Road 30 From East of State Road 83
(U.S. 331) to East Side of Peach Creek
W.P.I. No. 3119123
State Project No. 60020-3521
Financial Project ID 220643-1-52-01
Walton County. Florida

Table of Contents

Introduction

Basis of Analysis

List of Appendices

Attenuation Calculations	Appendix A
Treatment Calculations	Appendix B
Crossdrain Calculations	Appendix C
Proposed Ditch Calculations	Appendix D
Optional Material Analysis	Appendix E

PROPOSED DRAINAGE SYSTEM

The Proposed drainage systems for State Road 30 roadway improvements will consist of a collection swale, conveyance ditch system and cross drain improvements. The swale will be located adjacent to the grassed shoulder to collect stormwater runoff for treatment and attenuation and a conveyance ditch (where required) to direct runoff to existing outfalls.

Drainage basin boundaries were determined by using USGS quadrangle maps. Copies of the drainage basin boundaries are included in the crossdrain calculations (Appendix C). Crossdrains and conveyance ditches were designed using existing overland flow patterns and historic drainage basin boundaries.

BASIS OF ANALYSIS

Treatment volume was determined using ½ inch over each contributing sub-basin. Ditch blocks will be located in the swale to provide treatment before runoff is released offsite (See Summary and Calculations in Appendix B).

Treatment swales will be constructed using A-3 soils available on-site. A-3 soils have a high permeability rate, 12.0 feet per day. MODRET was used to determine drawdown time using a safety factor of 2.0.

The Critical Duration storm event (1hour through 10 day) was determined with the Route Programs Software. This program uses the Suwannee River Water Management District's dimenionless rainfall distributions. The total rainfall and SCS curvilinear unit hydrograph method to compute a runoff hydrograph. The hydrograph is routed through a retention/detention area using the Storage Indication Method. The critical duration storm event was determined to the 100 year – 1-hour storm. 2-year – 1 hour was also routed to determine stages that would occur on a regular basis. (See Appendix A for Summary and Calculations).

RECEIVED
MAY - 3 2001
NORTHWEST FLORIDA
DEP

CROSS DRAIN ANALYSIS METHODOLOGY

The methodology used for the analyses of the State Road 30 cross drains and the proposed cross drain replacements or extensions was based on Chapter 4 "Cross Drain Hydraulics" of the Florida Department of Transportation Drainage Manual, Volume 1- Standards.

Design Frequency – 50 years (hurricane evacuation route)

BACKWATER

- Consistent with Flood Insurance Study requirements
- Headwater for design frequency conditions shall be kept below the travel lanes, disregarding adjacent offsite conditions such as wetlands and other natural storage areas. The backwater analysis is therefore very conservative.

TAILWATER

- The highest tailwater elevation, which can be reasonably expected to occur coincident with the design storm, shall be used – if no existing high water information available, we use the crown elevation of the pipe.

HYDROLOGIC ANALYSIS

- Rational equation for drainage areas up to 600 acres.

HYDRAULICS

- Techniques in FHWA Hydraulic Design Series #5 and corresponding FHWA Culvert Analysis (HY-8) Software.

MANNINGS ROUGHNESS COEFFICIENT

- Concrete Pipes n = 0.012
- Metal Pipes 300-600 n = 0.020
  750-1350 n = 0.022
  1500 or larger n = 0.024

CULVERT MATERIALS

- Optional pipe material was considered for this project. Soils information in Appendix E indicates the soils to be extremely aggressive. The soils information was used with the culvert "Service Life Estimator" and determined that concrete pipe was the only option acceptable.
- Cross drains designed using Class II concrete pipe.

RECEIVED
MAY - 3 2001
NORTHWEST FLORIDA
DEP

MINIMUM CULVERT SIZES

- Cross drains – 450 mm

DOCUMENTATION

- Phone conversation with FDOT Maintenance Office indicating no flooding problems.

- Field review to document conditions.
- Estimate peak flow was determined using Rational Method.
- Estimate tailwater (crown of pipe)
- Hydraulic analysis computations and assumptions.

CLEAR ZONE REQUIREMENTS

- 11.0 meters from edge of pavement

ROADSIDE DITCHES

- No history of flooding problems
- No ditch erosion noted during field review

APPENDIX

APPENDIX A
Attenuation Calculations

Faller, Davis and Associates, Inc.

COMP. BY: C. BROWN
CK. BY:
DATE: 10-02-95
SHEET NO.:
JOB NO.: 182.03

SUBJECT: S.R. 30 - WALTON COUNTY
ATTENUATION - 2 YEAR, 100 YEAR

SUMMARY

DITCH SLOPE %	DITCH BLOCKS PER CONTROL	DEPTH (FT) (CREST TO T.O.B.)	DESIGN STORM	100 YR STAGE (FT)	2 YR STAGE (FT)
0.200%	4	0.98	100YR/1HR	0.78	0.45
0.200%	6	0.98	100YR/1HR	0.89	0.55
0.600%	3	0.98	100YR/1HR	0.65	0.34
0.250%	4	0.95	100YR/1HR	0.82	0.46
0.4756%	2	0.98	100YR/1HR	0.87	0.50
0.2327%	3	0.98	100YR/24HR	0.46	0.38

Faller, Davis and Associates, Inc.

COMP. BY: C. BROWN
CK. BY:
DATE: June 18, 1995
SHEET NO.:
JOB NO.: 182.03

SUBJECT: S.R. 30 - WALTON COUNTY
ATENUATION - 2YEAR, 100YEAR

EXISTING CONDITIONS (PER 100 METERS)

PAVEMENT $A = (100)(3.28)(12)(1/43560) = 0.09$ AC @ CN = 98
GRASS $A = (100)(11.2)(3.28)^2(1/43560) = 0.28$ AC @ CN = 77
WET DITCHES $A = (100)(3.28)(5)(1/43560) = 0.04$ AC @ CN = 98

TOTAL = 0.41 AC @ CN = 84

PROPOSED CONDITIONS (PER 100 METERS)

PAVEMENT $A = (100)(3.28)(8.7)(1/43560) = 0.21$ AC @ CN = 98
GRASS A = 0.16 AC @ CN = 77
WET DITCHES A = 0.04 AC @ CN = 98

TOTAL = 0.41 AC @ CN = 90

t_c = 10 MIN

STA. 283+40 TO STA. 285+86.32

PROPOSED CONDITIONS

PAVEMENT $(246.3)(3.28)(8.7)(1/43560) = 0.53$ AC @ CN = 98
GRASS $(246.3)(3.28)^2(6.4)(1/43560) = 0.39$ AC @ CN = 77
WET DITCHES $(246.3)(3.28)(5.0)(1/43560) = 0.09$ AC @ CN = 98

TOTAL = 1.01 AC @ CN = 90

Faller, Davis and Associates, Inc.

COMP. BY: C. BROWN
CK. BY:
DATE: 10-03-95
SHEET NO.:
JOB NO.:

SUBJECT: S.R. 30 - WALTON COUNTY
ATTENUATION - 2YEAR, 100YEAR

STAGE/AREA

@ 0.200% SLOPE 0.2 METER DITCH BLOCK

DEPTH		TOP WIDTH	LENGTH	AREA
METERS (FEET)	DIST FROM CREST	METERS (FEET)	METERS (FEET)	AC
0.20 (0.66)	0.0	4.70 (15.42)	100 (328.10)	0.12
0.40 (1.31)	0.45	7.90 (25.92)	100 (328.10)	0.20
0.41 (1.35)	0.69	8.06 (26.44)	205 (672.61)	0.41
0.50 (1.64)	0.98	9.50 (31.17)	250 (820.25)	0.59

@ 0.600% SLOPE 0.3 METER DITCH BLOCK (NOT USED)

DEPTH		TOP WIDTH	LENGTH	AREA
METERS (FEET)	DIST. FROM CREST	METERS (FEET)	METERS (FEET)	AC
0.30 (0.98)	0.00	6.30 (20.66)	50.00 (164.05)	0.08AC
0.45 (1.48)	0.50	8.70 (28.54)	75.00 (246.08)	0.16AC
0.50 (1.64)	0.66	9.50 (31.17)	83.33 (273.41)	0.20AC

Faller, Davis and Associates, Inc.

COMP. BY: C. BROWN
CK. BY:
DATE: 10-03-95
SHEET NO.:
JOB NO.: 182.03

SUBJECT: SR 30 - WALTON COUNTY
ATTENUATION - 2YEAR, 100YEAR

STAGE/AREA

@0.250% SLOPE 0.2 METER DITCH BLOCK

DEPTH		TOP WIDTH	LENGTH	AREA
METERS (FEET)	DIST FROM CREST	METERS (FEET)	METERS (FEET)	AC
0.20 (0.69)	0.00	4.86 (15.95)	84.0 (275.60)	0.10
0.42 (1.38)	0.69	8.22 (26.97)	100.0 (328.10)	0.20
0.43 (1.41)	0.72	8.38 (27.49)	172.0 (564.33)	0.36
0.50 (1.64)	0.95	9.50 (31.17)	200.0 (656.20)	0.47

@0.600% SLOPE 0.2 METER DITCH BLOCK

DEPTH		TOP WIDTH	LENGTH	AREA
METERS (FEET)	DIST FROM CREST	METERS (FEET)	METERS (FEET)	AC
0.20 (0.66)	0.00	4.70 (15.42)	33.33 (109.36)	0.04
0.30 (0.98)	0.32	6.30 (20.67)	50.00 (164.05)	0.08
0.40 (1.31)	0.65	7.90 (25.92)	66.67 (218.74)	0.13
0.50 (1.64)	0.98	9.50 (31.17)	83.33 (273.41)	0.20

Faller, Davis and Associates, Inc.

COMP. BY: C. BROWN
CK. BY:
DATE: 11-13-00
SHEET NO.:
JOB NO.: 182.03

SUBJECT: SR 30 - WALTON COUNTY
ATTENUATION - 2YEAR, 100YEAR

STAGE/AREA

@ 0.2327% SLOPE 0.2 METER DITCH BLOCK

DEPTH			TOP WIDTH		LENGTH		AREA
METERS	(FEET)	DIST FROM CREST	METERS	(FEET)	METERS	(FEET)	AC
0.2	(0.66)	0.0	4.7	(15.42)	86.0	(282.2)	0.10
0.3	(0.98)	0.32	6.3	(20.67)	100.0	(328.1)	0.16
0.4	(1.31)	0.65	7.9	(25.92)	100.0	(328.1)	0.16
0.43	(1.41)	0.75	8.4	(27.56)	184.8	(606.3)	0.38
0.5	(1.64)	0.98	9.5	(31.17)	200.0	(656.2)	0.47

Faller, Davis and Associates, Inc.

COMP. BY: TFS
CK. BY:
DATE: 11/15/00
SHEET NO.:
JOB NO.:

SUBJECT: SR 30 Walton County
Attenuation - 2 year, 100 year

Stage / Area

@ 0.4756 % 0.2 Meter Ditch Block

DEPTH			TOP WIDTH		LENGTH		AREA
METERS	(FEET)	DIST. FROM CREST	METERS	(FEET)	METERS	(FEET)	Ac.
0.2	(0.66)	0.0	4.70	(15.42)	42	(138.0)	0.05
0.4	(1.31)	0.65	7.90	(25.92)	80	(262.5)	0.16
0.5	(1.64)	0.98	9.50	(31.17)	80	(262.5)	0.19

Proposed Conditions - Sta 227+70 to 230+50

Pavement = (0.21 ac)(280÷100) = 0.59 Ac @ CN = 98

Grassed = (0.16 Ac)(280÷100) = 0.45 Ac @ CN = 77

Wet Ditches = (0.04 Ac)(280÷100) = 0.11 Ac @ CN = 98

1.15 Ac. @ CN = 90

APPENDIX B
Treatment Calculations

SUMMARY OF TREATMENT

LOCATION	SIDE	DEPTH m	TREATMENT VOLUMES m3	LOCATION	SIDE	DEPTH m	TREATMENT VOLUMES m3
216+15.000	RT	0.2	30	249+34.000	RT	0.2	38
216+25.000	LT	0.2	30	249+46.000	LT	0.22	29
217+16.000	LT & RT	0.3	124	250+00.000	LT & RT	0.3	116
218+00.000	LT & RT	0.3	144	251+00.000	LT & RT	0.3	116
219+96.000	LT & RT	0.3	116	252+00.000	LT & RT	0.3	142
221+59.000	RT	0.2	33	254+00.000	LT & RT	0.3	145
221+67.000	LT	0.2	33	255+00.000	LT & RT	0.3	118
221+73.000	RT	0.2	33	256+00.000	LT & RT	0.03	118
221+83.000	LT	0.2	45	257+00.000	LT & RT	0.3	118
222+75.000	LT & RT	0.3	122	257+88.000	RT	0.2	23
223+75.000	LT & RT	0.3	122	257+92.000	LT	0.2	23
225+50.000	LT & RT	0.3	108	259+00.000	LT & RT	0.3	122
226+50.000	LT & RT	0.3	134	260+00.000	LT & RT	0.3	118
227+56.000	LT & RT	0.2	134	260+57.000	LT	0.2	20
227+70.000	LT & RT	0.2	30	261+80.000	RT	0.22	38
228+50.000	LT & RT	0.3	66	261+90.000	LT	0.22	40
229+25.000	LT & RT	0.3	66	262+03.000	RT	0.2	45
231+00.000	RT	0.3	57	262+14.000	LT	0.2	37
231+50.000	LT	0.3	67	263+00.000	LT	0.3	67
231+50.000	RT	0.3	44	263+00.000	RT	0.3	77
232+00.000	LT & RT	0.3	88	264+00.000	LT	0.3	72
232+59.000	RT	0.2	24	266+00.000	LT & RT	0.3	161
232+81.000	LT	0.2	33	267+00.000	LT & RT	0.3	134
233+29.000	LT & RT	0.2	37	268+00.000	LT & RT	0.3	134
234+30.000	LT & RT	0.3	134	269+00.000	LT & RT	0.3	134
235+65.000	RT	0.3	65	270+00.000	LT & RT	0.3	134
238+00.000	LT	0.3	76	271+00.000	LT & RT	0.3	134
239+00.000	LT	0.3	67	271+60.000	LT	0.2	35
240+00.000	LT	0.3	37	271+95.000	RT	0.2	66
240+98.000	LT	0.22	56	272+21.000	LT & RT	0.2	52
241+22.000	LT	0.2	28	273+00.000	LT & RT	0.3	134
242+00.000	LT	0.3	67	274+00.000	LT & RT	0.3	162
243+00.000	LT	0.3	67	276+00.000	LT & RT	0.3	157
244+00.000	LT	0.3	82	277+00.000	LT & RT	0.3	134
245+80.000	LT	0.3	74	278+24.000	LT & RT	0.2	56
247+00.00	LT	0.3	78	278+46.000	RT	0.2	29
248+00.000	LT & RT	0.3	134	283+40.000	RT	0.2	23
249+20.000	RT	0.2	27	284+50.000	RT	0.3	63
249+28.000	LT	0.2	33				
		SUB	**2745**			**SUB**	**3364**
					TOTAL		**6109**

114 ponds total

Faller, Davis Assoc., Inc.
FDA # 182.03 WC
Summary of Treatment A.xlsB

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 216+16 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	325	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.67	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	325.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.67	[ft]	d1 = H
Depth at Le/2	d2	0.35	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.02	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.64	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.44	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	5.24	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.9	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.1	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,044	[cf]	V = (Le) (average (A1, A2, A3))
	V	30	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 216+27 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	325	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.67	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	325.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.67	[ft]	d1 = H
Depth at Le/2	d2	0.35	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.02	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.64	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.44	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	5.24	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.9	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.1	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,044	[cf]	V = (Le) (average (A1, A2, A3))
	V	30	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 217+15 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	279	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	279.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.70	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.42	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	16.14	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	11.67	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	7.4	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	3.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,175	[cf]	V = (Le) (average (A1, A2, A3))
	V	62	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 218+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	394	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	394.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.59	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.19	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.30	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.99	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.2	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,545	[cf]	V = (Le) (average (A1, A2, A3))
	V	72	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 219+96 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	250	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	250.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.73	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.48	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	16.60	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	12.60	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	7.9	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	4.2	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,047	[cf]	V = (Le) (average (A1, A2, A3))
	V	58	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 221+59 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	350	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.7	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	350.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.70	[ft]	d1 = H
Depth at Le/2	d2	0.35	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	16.12	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.52	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	7.4	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,174	[cf]	V = (Le) (average (A1, A2, A3))
	V	33	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 221+67 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.7	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.70	[ft]	d1 = H
Depth at Le/2	d2	0.37	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.04	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	16.12	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.87	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	5.62	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	7.4	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.9	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.2	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,152	[cf]	V = (Le) (average (A1, A2, A3))
	V	33	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 221+73 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.7	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.70	[ft]	d1 = H
Depth at Le/2	d2	0.37	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.04	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	16.12	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.87	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	5.62	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	7.4	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.9	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.2	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,152	[cf]	V = (Le) (average (A1, A2, A3))
	V	33	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 223+75 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.23%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.60	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.22	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.49	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	8.39	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.8	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,160	[cf]	V = (Le) (average (A1, A2, A3))
	V	61	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 225+50 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	221	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	221.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.76	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.54	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	17.06	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	13.53	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	8.3	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	5.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,901	[cf]	V = (Le) (average (A1, A2, A3))
	V	54	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 226+50 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.65	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.32	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.35	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.10	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,356	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 228+50 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	246	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.48%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	206.1	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.49	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	12.76	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.3	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,156	[cf]	V = (Le) (average (A1, A2, A3))
	V	33	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 229+25 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	206	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.48%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	206.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.49	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	12.76	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.3	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,156	[cf]	V = (Le) (average (A1, A2, A3))
	V	33	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 231+50 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	164	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	164.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.82	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.65	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	17.98	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	15.35	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	9.3	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	6.6	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,556	[cf]	V = (Le) (average (A1, A2, A3))
	V	44	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 232+00 (LT&RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	164	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	164.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.82	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.65	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	17.98	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	15.35	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	9.3	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	6.6	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,556	[cf]	V = (Le) (average (A1, A2, A3))
	V	44	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 234+30 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.65	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.32	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.35	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.10	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,356	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 235+65 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	312	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	312.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.67	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.36	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.61	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.62	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.9	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.8	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,301	[cf]	V = (Le) (average (A1, A2, A3))
	V	65	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 238+00 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	460	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	460.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.52	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.06	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	13.24	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	5.88	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.3	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,691	[cf]	V = (Le) (average (A1, A2, A3))
	V	76	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 239+00 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.65	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.32	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.35	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.10	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,356	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 240+98 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	322	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.7	[ft]
Channel Slope	S	0.05%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	322.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.70	[ft]	d1 = H
Depth at Le/2	d2	0.62	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.54	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	16.12	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.83	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	13.54	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	7.4	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.1	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	5.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,981	[cf]	V = (Le) (average (A1, A2, A3))
	V	56	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 241+22 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*	
Length between blocks	Lb	223	[ft]	reduced 10m for driveway
Bottom Width	W	4.92	[ft]	
X-sect Slope Factor	Z	8		
Max Treatment Depth	H	0.7	[ft]	
Channel Slope	S	0.20%	[ft/ft]	

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	223.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.70	[ft]	d1 = H
Depth at Le/2	d2	0.48	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.25	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	16.12	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	12.55	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	8.98	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	7.4	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.2	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.8	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	988	[cf]	V = (Le) (average (A1, A2, A3))
	V	28	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 242+00 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.65	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.32	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.35	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.10	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,356	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 243+00 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.65	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.32	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.35	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.10	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,356	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 247+00 (LT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	490	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	490.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.49	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	12.76	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.3	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,750	[cf]	V = (Le) (average (A1, A2, A3))
	V	78	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 248+00 (LT&RT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.92	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.98	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.65	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.32	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.60	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.35	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.10	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.5	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.6	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,356	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 250+00 (RT&LT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.26%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.56	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.13	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	13.84	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.02	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.2	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.8	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,034	[cf]	V = (Le) (average (A1, A2, A3))
	V	58	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 251+00 (RT&LT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.26%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.56	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.13	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	13.84	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.02	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.2	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.8	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,034	[cf]	V = (Le) (average (A1, A2, A3))
	V	58	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 255+00 (RT & LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.57	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.16	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.11	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.55	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,085	[cf]	V = (Le) (average (A1, A2, A3))
	V	59	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 256+00 (RT & LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.57	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.16	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.11	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.55	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,085	[cf]	V = (Le) (average (A1, A2, A3))
	V	59	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 257+00 (RT & LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.57	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.16	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.11	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.55	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,085	[cf]	V = (Le) (average (A1, A2, A3))
	V	59	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 257+88 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	289	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	262.4	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.33	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.17	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	800	[cf]	V = (Le) (average (A1, A2, A3))
	V	23	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 257+92 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	302	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	262.4	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.33	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.17	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	800	[cf]	V = (Le) (average (A1, A2, A3))
	V	23	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 259+00 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	354	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	354.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.54	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.10	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	13.59	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	6.51	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.0	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.6	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,143	[cf]	V = (Le) (average (A1, A2, A3))
	V	61	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 259+00 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	367	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	367.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.53	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.07	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	13.33	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	5.99	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.8	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,171	[cf]	V = (Le) (average (A1, A2, A3))
	V	61	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 260+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.57	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.16	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	14.11	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.55	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	5.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,085	[cf]	V = (Le) (average (A1, A2, A3))
	V	59	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 260+57 (LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	187	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	187.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.42	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.19	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	11.68	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.94	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	3.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	1.2	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	710	[cf]	V = (Le) (average (A1, A2, A3))
	V	20	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 263+00 (LT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 267+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 268+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 269+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 270+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 271+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 272+21 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	259	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	259.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.40	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.14	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	11.27	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	7.13	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	3.2	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.8	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	925	[cf]	V = (Le) (average (A1, A2, A3))
	V	26	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 273+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 277+00 (RT&LT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	328	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.66	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.33	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	15.42	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	10.17	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	6.7	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	2.5	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,376	[cf]	V = (Le) (average (A1, A2, A3))
	V	67	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 278+24 (LT&RT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	407	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.20%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	328.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.33	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.17	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,000	[cf]	V = (Le) (average (A1, A2, A3))
	V	28	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 278+46 (RT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	308	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.19%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	308.0	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.36	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.07	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.74	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	6.05	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.8	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.4	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	1,017	[cf]	V = (Le) (average (A1, A2, A3))
	V	29	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 283+40 (RT)
Date: 23-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	361	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.656	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	262.4	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.66	[ft]	d1 = H
Depth at Le/2	d2	0.33	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	15.42	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	10.17	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	6.7	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	2.5	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	800	[cf]	V = (Le) (average (A1, A2, A3))
	V	23	[m^3]	

DEP WORKSHEET
Blair F. Burleson

ESTIMATING THE STORAGE VOLUME IN A LINEAR RETENTION SWALE
WITH A NON-ZERO SLOPE.

TRAPEZOIDAL SWALE

Project: SR 30, Hwy 331 to Peach Creek, STA 284+50 (RT)
Date: 24-Apr-01

INPUT:

DESCRIPTION	*SYMBOL*	*INPUT VALUE*	*UNITS*
Length between blocks	Lb	426	[ft]
Bottom Width	W	4.921	[ft]
X-sect Slope Factor	Z	8	
Max Treatment Depth	H	0.984	[ft]
Channel Slope	S	0.25%	[ft/ft]

OUTPUT:

DESCRIPTION	*SYMBOL*	*VALUE*	*UNITS*	*FORMULA*
Effective Length	Le	393.6	[ft]	Le = MINIMUM (Lb, H/S)
Depth at swale block	d1	0.98	[ft]	d1 = H
Depth at Le/2	d2	0.49	[ft]	d2 = H - (S) (Le / 2)
Depth at Le	d3	0.00	[ft]	d3 = H - (S) (Le)
Top width at swale block	T1	20.67	[ft]	T1 = W + 2 x Z x d1
Top with at Le/2	T2	12.79	[ft]	T2 = W + 2 x Z x d2
Top width at Le	T3	4.92	[ft]	T3 = W + 2 x Z x d3
Cross-Sect Area at (Downstream) Berm	A1	12.6	[sf]	A1 = 0.5 (T1 + W) x d1
Cross-Sect Area midway between Le	A2	4.4	[sf]	A2 = 0.5 (T2 + W) x d2
Cross-Sect Area at Upstream end of Le	A3	0.0	[sf]	A3 = 0.5 (T3 + W) x d3
Volume per swale block	V	2,223	[cf]	V = (Le) (average (A1, A2, A3))
	V	63	[m^3]	

DEP WORKSHEET
Blair F. Burleson

SUMMARY OF TREATMENT LOCATIONS

LOCATION	SIDE	GROUP	*SCS WATER TABLE FT	ROADWAY FILL/CUT FT	WATER TABLE DEPTH FT	LOCATION	SIDE	GROUP	*SCS WATER TABLE FT	ROADWAY FILL/CUT FT	WATER TABLE DEPTH FT
216+16.000	RT	C	4.6	0.7	5.3	249+46.000	LT	B/D	1.0	3.3	4.3
216+27.000	LT	C	4.6	0.7	5.3	250+00.000	LT & RT	B/D	3.3/1.0	0.0/1.6	3.3/2.6
217+15.000	LT & RT	C	3.5	0.2	3.7	251+00.000	LT & RT	B/D	4.6/1.0	1.3/3.0	5.9/4.0
219+17.000	LT & RT	C	3.5	0.4	3.9	252+00.000	LT & RT	B/D	1.0	5.6	6.6
220+34.000	LT & RT	C	3.5	0.5	4.0	254+00.000	LT & RT	B/D	1.0	3.9	4.9
221+59.000	RT	B/D	1.0	1.0	2.0	255+00.000	LT & RT	B/D	1.0	3.2	4.2
221+67.000	LT	B/D	2.0	0.6	2.6	256+00.000	LT & RT	C	3.5	1.6	5.1
221+73.000	RT	B/D	1.7	0.7	2.4	257+00.000	LT & RT	C	3.5	1.0	4.5
221+83.000	LT	B/D	2.0	0.0	2.0	257+88.000	RT	C	3.5	3.0	6.5
222+75.000	LT & RT	C	3.5	1.0	4.5	257+92.000	LT	B/D	5.2	1.3	6.5
223+75.000	LT & RT	C	3.5	0.4/1.2	3.9/4.7	259+00.000	LT & RT	B/D	3.2/2.0	1.0/0.3	4.2/2.3
225+50.000	LT & RT	C	3.5	0.5	4.0	260+00.000	LT & RT	B/D	2.0/3.3	1.3/0.7	3.3/4.0
226+50.000	LT & RT	C	3.5	0.0/0.5	3.5/4.0	261+80.000	RT	B/D	3.9	1.3	5.2
227+56.000	LT & RT	C	3.5	0.0	3.5	261+90.000	LT	B/D	3.9	1.3	5.2
227+70.000	LT & RT	C	3.5	0.0	3.5	262+03.000	RT	B/D	3.9	1.3	5.2
228+80.000	LT & RT	C	3.5	0.1	3.6	262+14.000	LT	B/D	1.0	2.6	3.6
229+90.000	LT & RT	B/D	3.0/2.3	0.2	3.2/2.4	263+00.000	LT & RT	B/D	1.0	3.9	4.9
232+00.000	LT & RT	C	3.5	1.0	4.5	264+00.000	LT & RT	B/D	1.0	3.9	4.9
232+59.000	RT	C	3.5	3.3	6.8	266+00.000	LT & RT	B/D	1.0	3.9	4.9
232+81.000	LT	C	3.5	0.5	4.0	267+00.000	LT & RT	B/D	2.0	2.3	4.3
233+29.000	LT & RT	B/D	2.6	2.0	4.6	268+00.000	LT & RT	B/D	1.0	3.3	4.3
234+30.000	LT & RT	B/D	2.0	2.0	4.0	269+00.000	LT & RT	B/D	2.0	2.0	4.0
235+65.000	RT	B/D	2.0	1.6	3.6	270+00.000	LT & RT	B/D	3.9/2.6	0.0/1.6	3.9/4.2
238+00.000	LT	B/D	1.0	1.3	2.3	271+00.000	LT & RT	B/D	3.3/3.3	-1/-1.3	2.3/4.6
239+00.000	LT	B/D	2.6	0.0	2.6	271+60.000	LT	B/D	3.3	-1.0	2.3
240+00.000	LT	B/D	2.6	0.0	2.6	271+95.000	RT	B/D	2.6	2.6	5.2
240+98.000	LT	B/D	1.0	1.0	2.0	272+21.000	LT & RT	B/D	1.0/3.9	3.0/0.7	4.0/4.6
241+22.000	LT	B/D	3.2	0.0	3.2	273+00.000	LT & RT	B/D	3.6/3.9	-0.7/1.0	2.9/4.9
242+00.000	LT	B/D	1.0	3.0	4.0	274+00.000	LT & RT	B/D	3.9/3.3	-0.5	3.2/4.6
243+00.000	LT	B/D	1.0	0.7	1.7	276+00.000	LT & RT	B/D	3.3/3.3	1.3/2.6	4.6/5.9
244+00.000	LT	B/D	2.0	1.6	3.6	277+00.000	LT & RT	C	3.5	2.3	5.8
246+00.000	LT	B/D	1.0	1.6	2.6	278+20.000	LT	C	3.5	2.3	5.8
247+00.000	LT	B/D	1.0	1.0	2.0	278+24.000	RT	C	3.5	2.3	5.8
248+00.000	LT & RT	B/D	2.3	0.4	2.7	278+46.000	RT	C	3.5	2.3	5.8
249+20.000	RT	B/D	1.0	2.6	3.6	278+64.000	LT	C	3.5	2.3	5.8
249+28.000	LT	B/D	3.6	0.0	3.6	283+40.000	RT	A			>6.0
249+34.000	RT	B/D	1.0	1.6	2.6	284+50.000	RT	A			>6.0

* WATER TABLE DEPTH FROM EXISTING GROUND OPTAINED FROM "SOIL SURVEY OF WALTON COUNTY" OR DEPTH OF ADJACENT CONVEYANCE DITCH

[ ] - SEE MODRET FOR MOUNDING ANALYSIS

APPENDIX C
Crossdrain Calculations

Faller, Davis and Associates, Inc.

COMP. BY: C. BROWN
CK. BY:
DATE: 5-26-99
SHEET NO.:
JOB NO.:

SUBJECT: STATE ROAD 30
ENGLISH / METRIC CROSSDRAIN STAGES

STRUCTURE NO.	50YR		100YR		OVERTOPPING		500YR	
	ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC	ENGLISH	METRIC
S-3	21.17	6.45	21.32	6.50			21.87	6.67
S-9	21.49	6.55	21.52	6.56			22.08	6.73
S-13	22.14	6.74	22.24	6.78			23.00	7.01
S-16	23.08	7.03	23.40	7.13	24.87	7.58		
S-22	24.33	7.41	24.52	7.47			25.93	7.90
S-24	24.33	7.41	24.52	7.47			25.93	7.90
S-27	25.05	7.63	25.24	7.69			26.99	8.23
S-30	24.62	7.50	24.76	7.55			25.71	7.84
S-33	26.16	7.97	26.42	8.05	27.29	8.32		
S-36	25.62	7.81	25.93	7.90	26.77	8.16		
S-40	24.58	7.49	24.75	7.54			25.76	7.85
S-43	23.15	7.05	23.42	7.14			25.49	7.77
S-46	20.28	6.18	20.38	6.21			20.93	6.38
S-48	17.94	5.47	17.95	5.47			18.01	5.49
S-51	19.49	5.94	19.64	5.99			21.16	6.45
S-54	19.49	5.94	19.64	5.99			21.16	6.45
S-59	17.00	5.18	17.33	5.28			19.52	5.95
S-65	16.75	5.11	16.87	5.14			17.96	5.47

SR 30 (US 98) from East Side of Peach Creek to Bay County Line (220644-1)

Construction Plans and Drainage Report

COMPONENTS OF CONTRACT PLANS SET

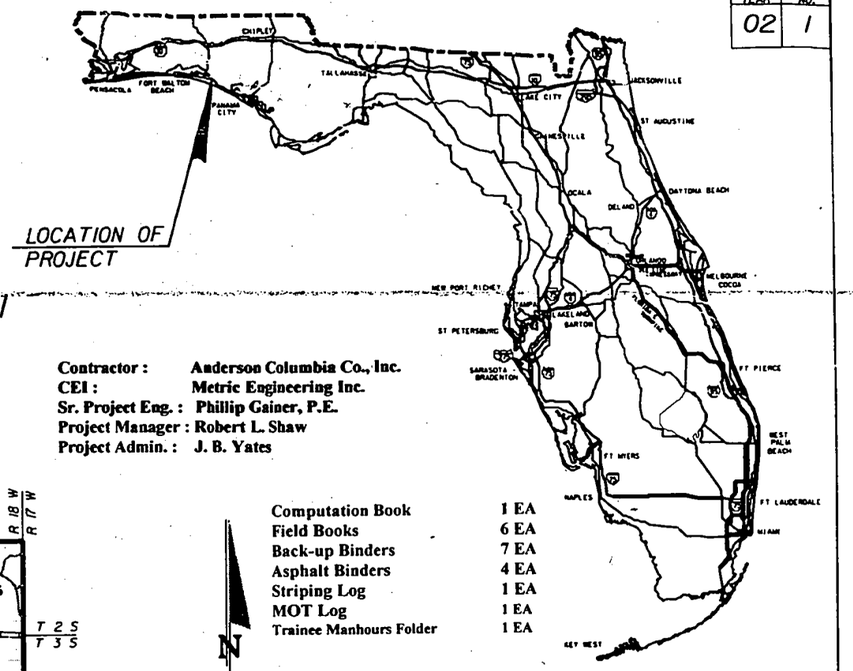
ROADWAY PLANS
SIGNING AND PAVEMENT MARKING PLANS
SIGNALIZATION PLANS

Phillip Wayne Gainer
PE No. 43943
8/5/04

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

Final "As Built" Plans

FISCAL YEAR	SHEET NO.
02	1



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

THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD. IF CHANGES WERE MADE, THOSE CHANGES ARE INDICATED BY BLACK INK REVISION AND BEAR THE SEAL AND SIGNATURE OF THE RESPONSIBLE ENGINEER.

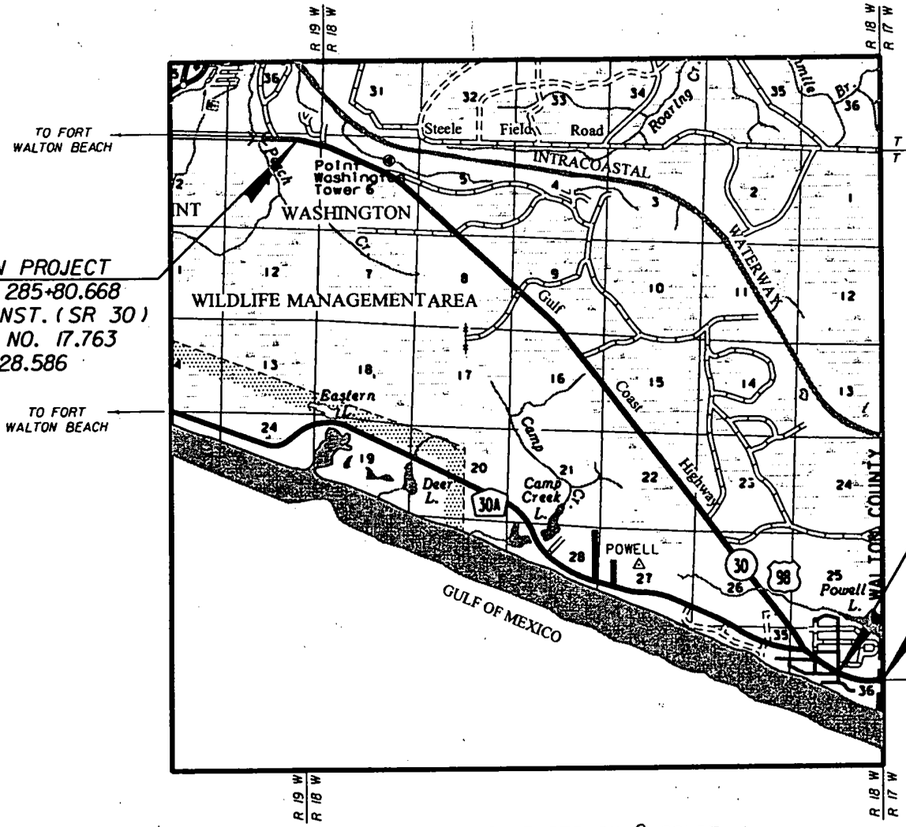
FINANCIAL PROJECT ID 220644-1-52-01
(FEDERAL FUNDS)
WALTON COUNTY
STATE ROAD NO. 30 / US 98

Contractor : Anderson Columbia Co., Inc.
CEI : Metric Engineering Inc.
Sr. Project Eng. : Phillip Gainer, P.E.
Project Manager : Robert L. Shaw
Project Admin. : J. B. Yates

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2A-2E	SUMMARY OF PAY ITEMS
3-6	TYPICAL SECTIONS
7	TYPICAL SECTIONS DETAILS
8	FRICTION COURSE DETAIL
9-11	SUMMARY OF QUANTITIES
12	SUMMARY OF UNDERDRAIN
13	OPTIONAL MATERIAL TABULATION
14-18	SUMMARY OF DRAINAGE STRUCTURES
19	GENERAL NOTES
20-61	ROADWAY PLANS
62-83	ROADWAY PROFILES
84-88	SPECIAL PROFILES
89-94	INTERSECTION DETAILS
94A	DRIVEWAY DETAIL
95-123	DRAINAGE STRUCTURES
124-127	MISCELLANEOUS DRAINAGE DETAILS
128	UNDERDRAIN DETAILS
129-130	CROSSOVER DRAINAGE PIPE DETAILS
131	ROADWAY SOIL SURVEY
132-239	CROSS SECTIONS
240-261	TRAFFIC CONTROL PLANS
262-304	UTILITY ADJUSTMENTS
305-307	NPDES/SWPPP

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
ROADWAY AND TRAFFIC DESIGN STANDARDS
DATED JANUARY 2000, AND
STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE
CONSTRUCTION DATED 2000,
AS AMENDED BY CONTRACT DOCUMENTS.



BEGIN PROJECT
STA. 285+80.668
℄ CONST. (SR 30)
M.P. NO. 17.763
K.P. 28.586

EQUATION:
STA. 416+74.793 ℄ CONST. (BK) =
STA. 416+66.456 ℄ CONST. (AH)

END PROJECT
STA. 428+62.988
℄ CONST. (SR 30)
MP = 26.638
K.P. 42.870

Computation Book	1 EA
Field Books	6 EA
Back-up Binders	7 EA
Asphalt Binders	4 EA
Striping Log	1 EA
MOT Log	1 EA
Trainee Manhours Folder	1 EA

0 1 2
KILOMETERS
1 : 100 000

ROADWAY SHOP DRAWINGS
TO BE SUBMITTED TO:

Victor Lee, P.E.
David Plummer & Associates, Inc.
1750 PONCE DE LEON BOULEVARD
Coral Gables, Florida 33134

PLANS PREPARED BY:

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134
VENDOR NO. F591810619001
CONTRACT NO. C4976

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

NOTE: THIS IS A METRIC UNIT PROJECT

REVISIONS

FINANCIAL PROJECT ID 220644-1-52-01
Roadway Sheets 9, 13, 19 & 239 (Revised 12-28-01)
Signing & Pavement Marking Sheets S-1, S-3 & S-5 (Revised 12-28-01)
Summary Of Pay Items Sheets 2A & 2B (Revised 12-21-01)
Roadway Sheets 7, 9, 11, 16, 17, 18, 54, 55, 57, 58, 60, 79, 81, 86, 92, 101, 111, 118, 121, 211, 212, 213, 214, 226, 227, 228, 239, 246, 254, 259, 297, 298, 300, 301 & 303 (Revised 6-21-02)
Signing & Pavement Marking Sheets S-1, S-8, S-9, S-10 & S-14 (Revised 6-21-02)
Roadway Sheets 9, 56, 89, 217, 218, 228, 239, 253, 258, 261 & 299 (Revised 9-05-02)
Signing & Pavement Marking Sheets S-1, S-2, S-3, S-9 & S-13 (Revised 9-05-02)
Signalization Sheets T-1, T-2, T-4, T-6 & T-7 (Revised 9-05-02)
Roadway Sheets 9, 11, 17, 18, 60, 94A, 118, 226, 227, 228, 239 & 303 (Revised 9-19-02)
Signing & Pavement Marking Sheets S-1 & S-11 (Revised 9-19-02)
Revisions to Side Camp Rd. Connection (2 sheets)

PROJECT LENGTH BASED ON ℄ CONST.

LENGTH OF PROJECT	METERS
ROADWAY	14 290.657
BRIDGES	0.000
NET LENGTH OF PROJ.	14 290.657
EXCEPTIONS	0.000
GROSS LENGTH OF PROJ.	14 290.657

FDOT PROJECT MANAGER : KIM WOLIVER, P.E.

REVISIONS		
DATE	BY	DESCRIPTION

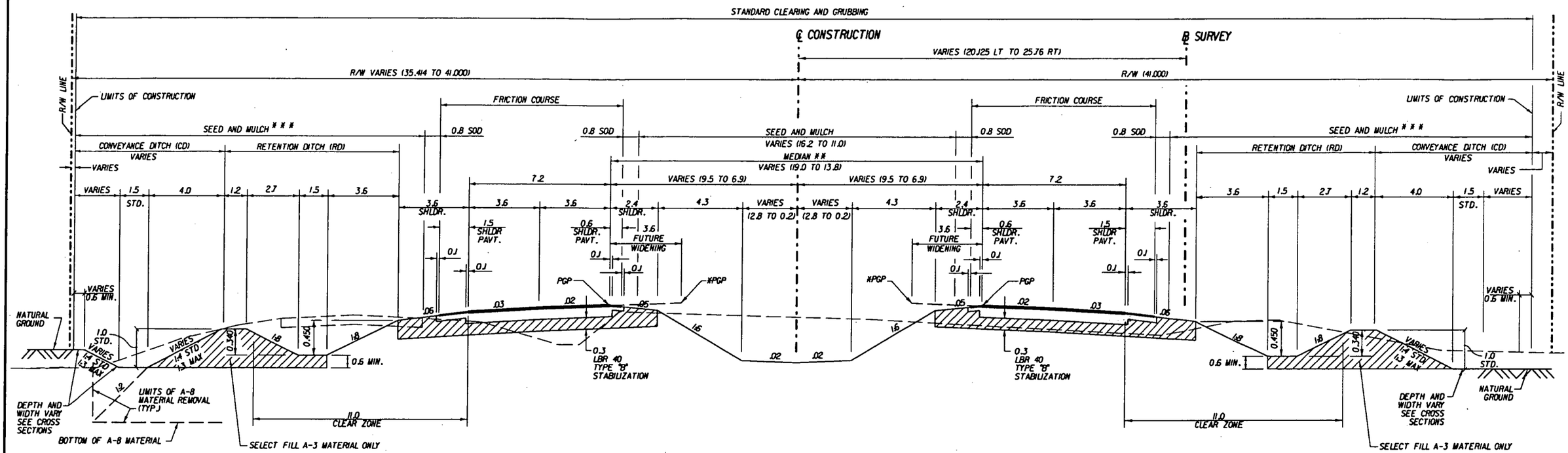
SR 30 / US 98 FROM PEACH CREEK TO BAY COUNTY LINE

FINAL SUBMITTAL

ROADWAY PLANS ENGINEER OF RECORD: VICTOR LEE, PE
DATE: 9/20/02
P.E. NO.: P.E. 35233

dwg name
d:\proj\99599259\220644-1-52-01\plans\tsys1d01.dgn

FINANCIAL PROJECT ID	SHEET NO.
220644-1-52-01	4



TRAFFIC DATA

MAINLINE

1993 AADT = 5 900
2002 AADT = 8 800
2022 AADT = 16 300
K_{30} = 11% D_{30} = 51% T = 4% (24 HR)
DESIGN SPEED 110 km/h

ACCESS MANAGEMENT CLASSIFICATION NO. 3

* * * SOD, INSTEAD OF SEED AND MULCH, WILL BE PLACED WITHIN THE LIMITS SHOWN BELOW (SALAMANDER HABITAT AREAS). NO FERTILIZER SHALL BE PLACED IN THESE SODDING AREAS.

SOD	
STATION TO STATION	SIDE
317+50 TO 319+00	RT
320+90 TO 325+85	LT
321+10 TO 325+60	RT
330+80 TO 338+05	RT
332+00 TO 337+75	LT
341+25 TO 353+25	LT
341+60 TO 353+00	RT
354+10 TO 357+40	RT
354+75 TO 357+00	LT
359+80 TO 371+80	RT
360+00 TO 371+90	LT
379+00 TO 391+90	RT
379+60 TO 392+60	LT
393+50 TO 398+70	RT
393+90 TO 398+50	LT

TYPICAL SECTION SR 30 (US 98)

FROM STA. 303+50.000 TO STA. 409+28.352

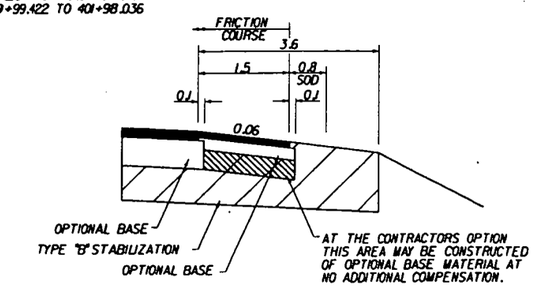
OPTIONAL BASE GROUP-9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC LEVEL C) (176 KG/M2)
AND FRICTION COURSE FC-5 (44 Kg/M2) (RUBBER)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP-1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC LEVEL C) (88KG/M2)
AND FRICTION COURSE FC-5 (44 KG/M2) (RUBBER)

* STARTING AT STA. 399+99.422 L CONST.
PGP IS BASED ON FUTURE WIDENING.
3.6 M AT 2% CROSS SLOPE.

** MEDIAN WIDTH VARIES FROM 19.0 TO 13.8
BETWEEN STA 399+99.422 TO 401+98.036



SHOULDER PAVEMENT DETAIL

Victor Lee 10/10/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

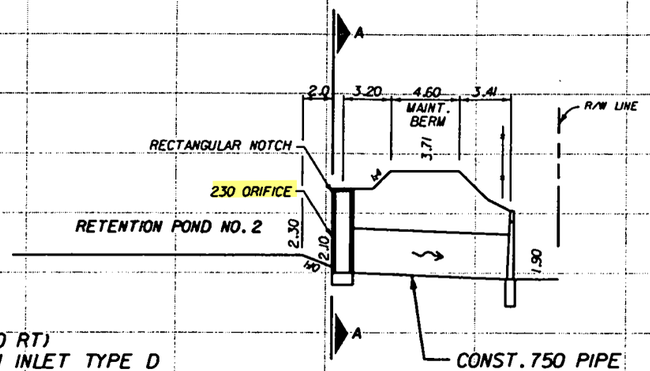
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

TYPICAL SECTIONS
SR 30 (US 98)

11:30:54 AM 10/09/01
u:\pro\99.99126\plans\typsrd01.dgn

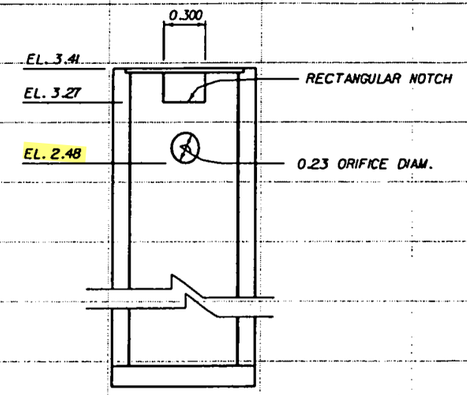
FINANCIAL PROJECT ID	SHEET NO.
220644-1-52-01	123



(OS-2)
STA. 427+30.00 (35.30 RT)
CONST. DITCH BOTTOM INLET TYPE D
(SPECIAL INLET)
WITH 230 ORIFICE, & RECTANGULAR NOTCH
AND SKIMMER* (LT)
STEEL GRATE EL 3.410
PIPE INVERT EL. 2.00
ORIFICE INVERT EL. 2.48
RECTANGULAR NOTCH INVERT EL. 3.27
INDEX NO. 232, 240

STA. 427+40.524 (34.085 RT)
CONST. STRAIGHT CONC. EW
FL 1.90
INDEX NO. 250

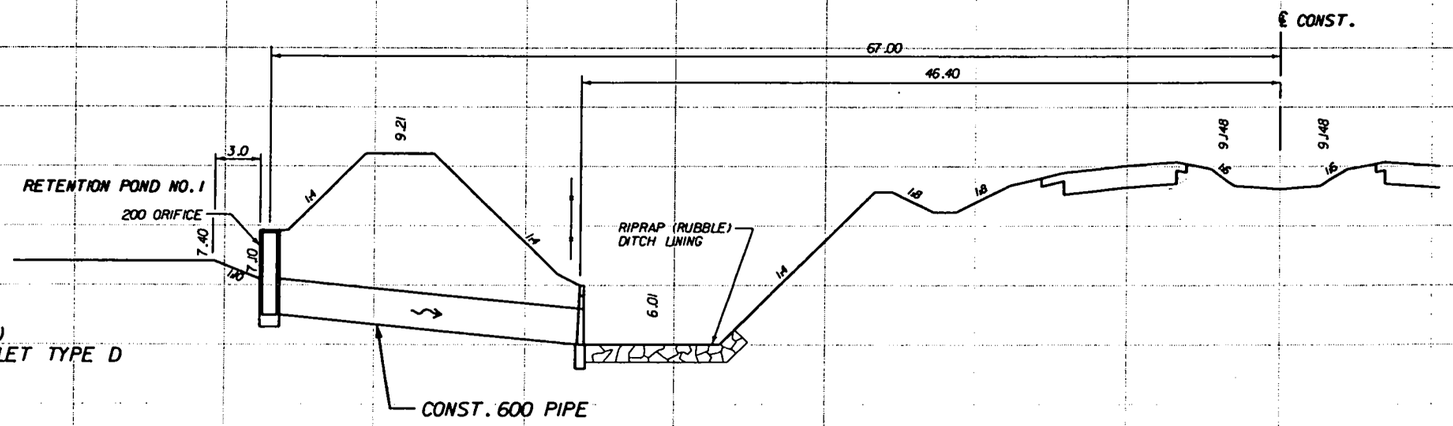
(SECTION CUT LONGITUDINALLY ALONG THE MAINLINE)



SECTION A-A
(N.T.S.)

(OS-2)
STA. 427+30.00

* SKIMMER INFORMATION
USE FDOT INDEX 240
H= 900
SKIMMER BOT. EL 2.48



(OS-1)
STA. 407+00.00 (67.00 LT)
CONST. DITCH BOTTOM INLET TYPE D
(SPECIAL INLET)
WITH 200 ORIFICE (LT)
AND SKIMMER* (LT))
STEEL GRATE EL 7.920
PIPE INVERT EL. 6.50
ORIFICE INVERT EL. 7.52
INDEX NO. 232, 240

STA. 407+00.00 (46.40 LT)
CONST. STRAIGHT CONC. EW
FL 6.01
INDEX NO. 250

(OS-1)
STA. 407+00.00

* SKIMMER INFORMATION:
USE FDOT INDEX 240
H= 400
SKIMMER BOT. EL 7.52

10/10/01

0 10 20 HORIZ.
0 5 VERT.

100 90 80 70 60 50 40 30 20 10 0 10

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

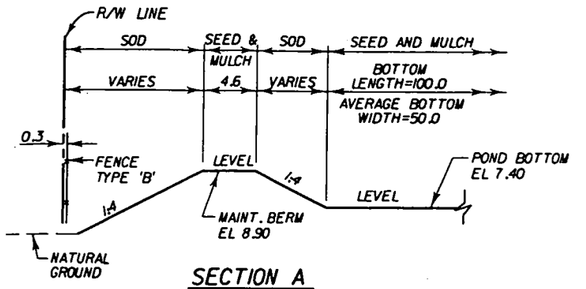
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

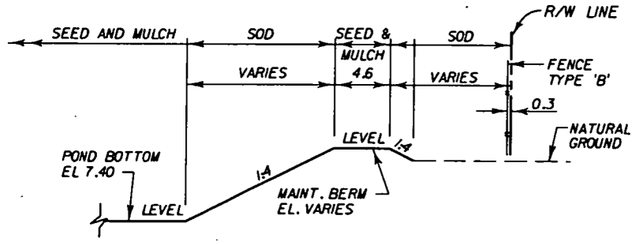
DRAINAGE STRUCTURES

06:10:37 PM 08/21/2001 u:\proj\99\99126\plans\drsirpnd.shg

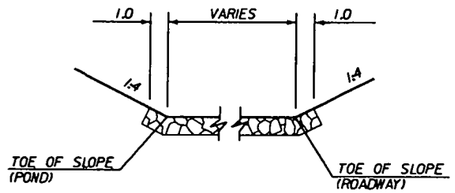
FINANCIAL PROJECT ID	SHEET NO.
220644-1-52-01	124



SECTION A
(N.T.S)



SECTION B
(N.T.S)



SECTION C
(N.T.S)

NOTE:
DURING CUT AND FILL OPERATIONS WITHIN THE POND LIMITS THE CONTRACTOR IS TO BACKFILL WITH A-2, A-3 MATERIAL OF A MINIMUM HYDRAULIC CONDUCTIVITY OF 0.01058 cm/sec (30 FPD ~ FEET PER DAY). NO PLASTIC OR MUCK MATERIALS SHALL BE USED WITHIN THE POND LIMITS.

BORING NO. B-1
STA. 407+10.00
OFFSET 71 M LT
OF ℄ SURVEY
BORING DATE 4/22/97

BORING NO. B-2
STA. 407+57.00
OFFSET 65 M LT
OF ℄ SURVEY
BORING DATE 4/22/97

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

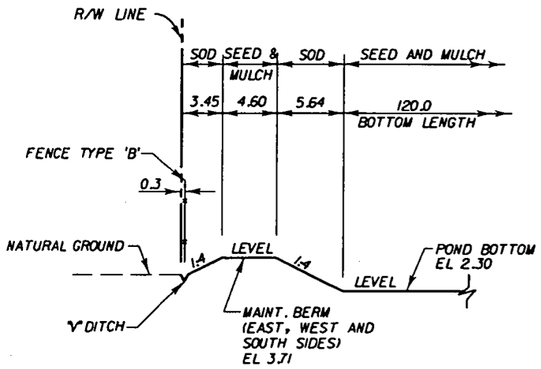
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

10/10/01

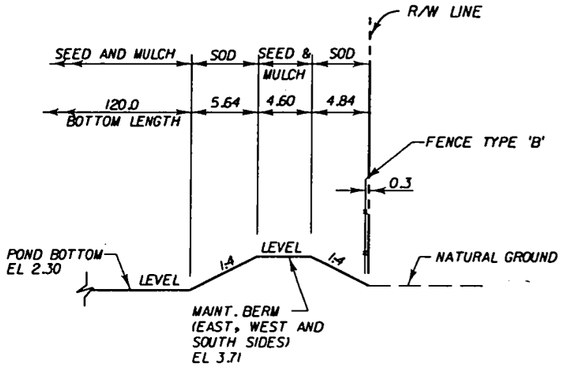
MISCELLANEOUS DRAINAGE DETAILS POND NO. 1

08:40:12 AM 10/10/01
u:\pro\99\99126\plans\pondet01.dgn

FINANCIAL PROJECT ID	NO.
220644-1-52-01	125



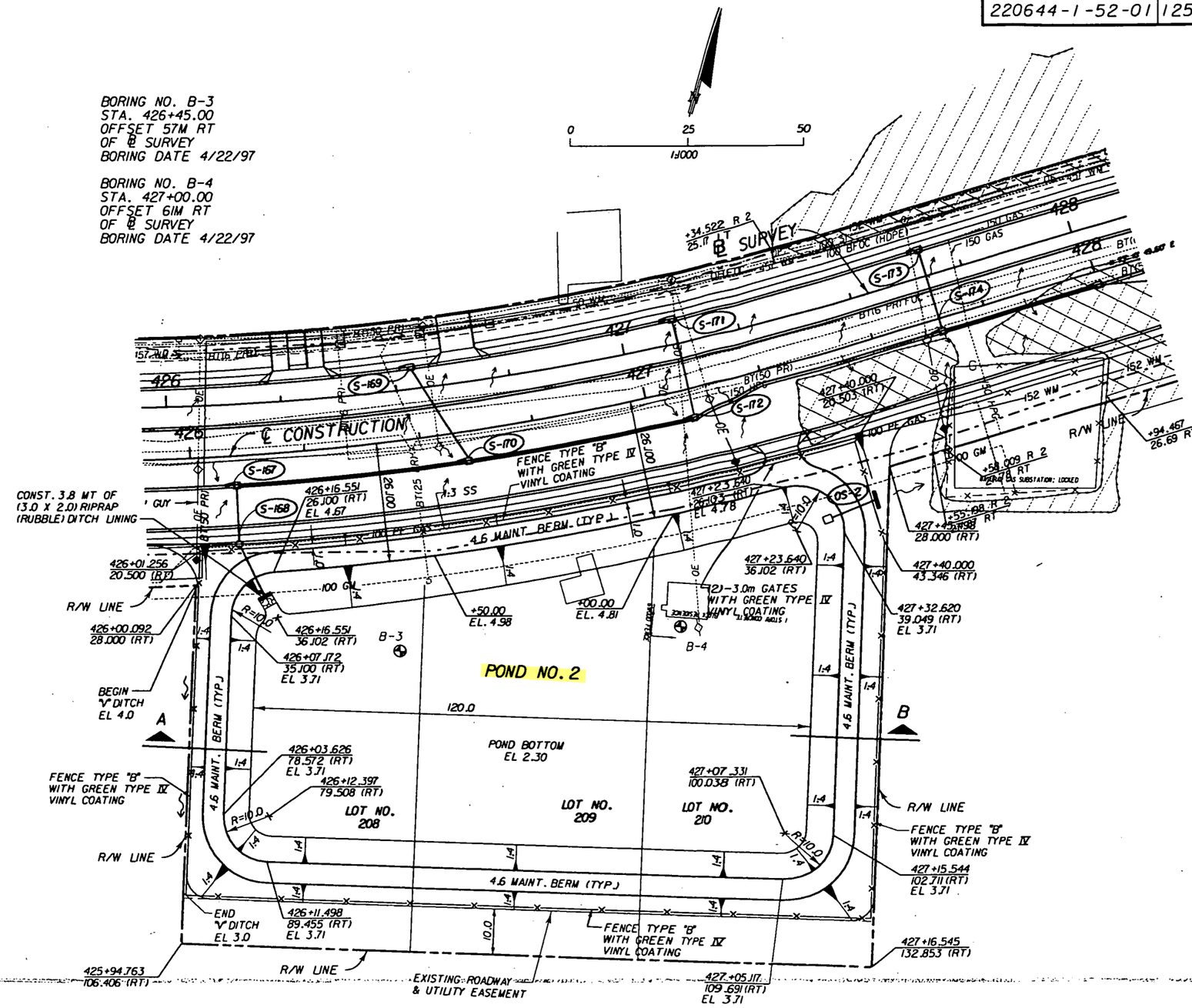
SECTION A
(N.T.S.)



SECTION B
(N.T.S.)

BORING NO. B-3
STA. 426+45.00
OFFSET 57M RT
OF ℄ SURVEY
BORING DATE 4/22/97

BORING NO. B-4
STA. 427+00.00
OFFSET 61M RT
OF ℄ SURVEY
BORING DATE 4/22/97



NOTE:
DURING CUT AND FILL OPERATIONS WITHIN THE POND LIMITS THE CONTRACTOR IS TO BACKFILL WITH A-2, A-3 MATERIAL OF A MINIMUM HYDRAULIC CONDUCTIVITY OF 0.01075 cm/sec (32.8 FPD - FEET PER DAY). NO PLASTIC OR MUCK MATERIALS SHALL BE USED WITHIN THE POND LIMITS.

10/10/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

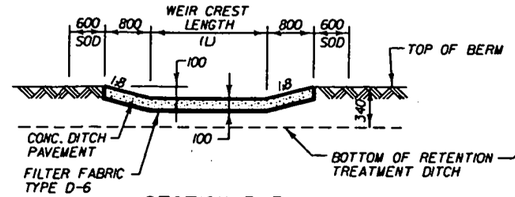
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

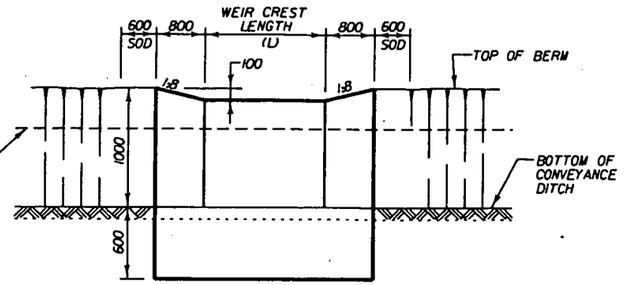
MISCELLANEOUS DRAINAGE DETAILS POND NO. 2

06:40:20 PM 08/27/2001
e:\dro\99\99126\plans\pond02.dgn

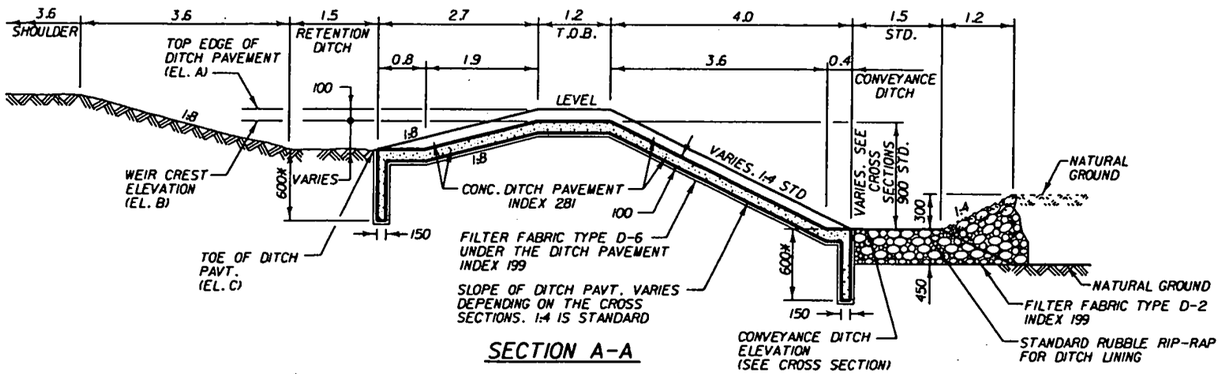
FINANCIAL PROJECT ID	SHEET NO.
220644-1-52-01	126



SECTION B-B

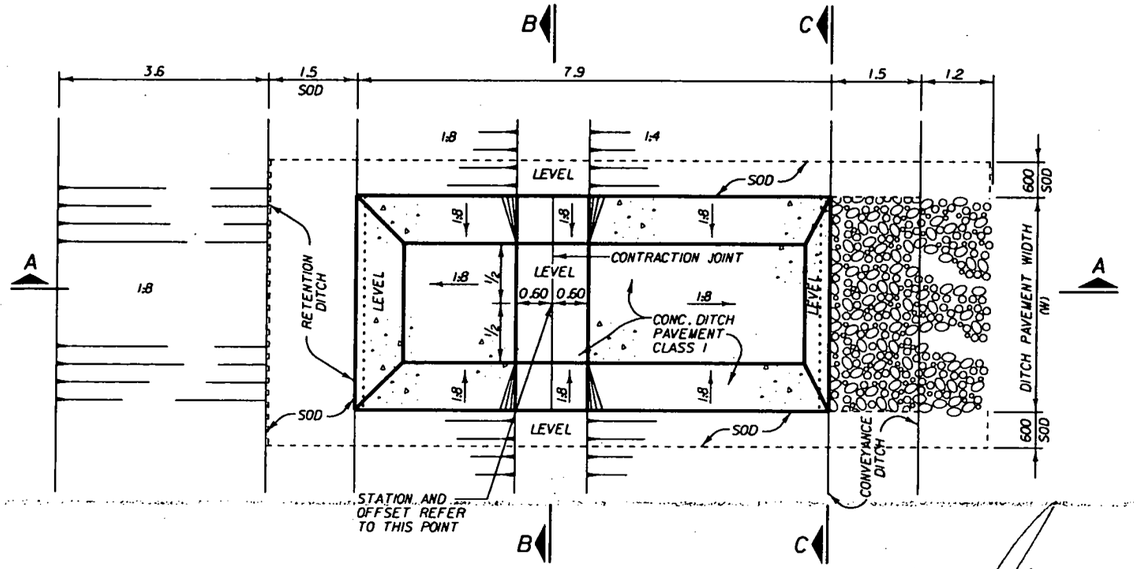


SECTION C-C



SECTION A-A

* COST OF 600 MM STEM TO BE INCLUDED IN COST OF OVERFLOW STRUCTURES



PLAN

DETAIL OF OVERFLOW STRUCTURE

10/10/01

NOTE: OVERFLOW STRUCTURES TO BE PAID FOR AS CONC. DITCH PAVT. (100 MM), 2524-1-2, M2. SEE SUMMARY OF DRAINAGE STRUCTURES FOR QUANTITIES.

DIMENSIONS AND LOCATIONS OF OVERFLOW STRUCTURES

STRUCT. NO.	STATION	OFFSET & SIDE	TOP EDGE OF DITCH PAVT. (EL A)	WEIR CREST (EL B)	TOE OF DITCH PAVT. (EL C)	WEIR CREST LENGTH (L) (m)	DITCH PAVT. WIDTH (W) (m)	COMMENTS
S - 1	285+91.00	RT	5.99	5.89	5.65	1.50	3.10	
S - 3	287+75.00	RT	6.54	6.44	6.20	2.00	3.60	
S - 4	290+10.00	RT	7.08	6.98	6.74	1.50	3.10	
S - 5	292+10.00	RT	7.54	7.44	7.20	3.00	4.60	
S - 7	294+80.00	RT	8.49	8.39	8.15	2.00	3.60	
S - 8	297+00.00	RT	9.06	8.96	8.72	3.00	4.60	
S - 9	300+15.00	RT	10.54	10.44	10.20	2.50	4.10	
S - 10	305+40.00	RT	12.82	12.72	12.48	3.00	4.60	
S - 11	305+95.00	LT	11.75	11.65	11.41	3.50	5.10	
S - 14	307+50.00	RT	11.51	11.41	11.17	5.00	6.60	
S - 17	313+86.72	LT	11.72	11.62	11.38	4.50	6.10	
S - 18	313+86.72	RT	11.72	11.62	11.38	6.00	7.60	
S - 19	316+40.00	LT	12.91	12.81	12.57	2.00	3.60	
S - 20	316+40.00	RT	12.91	12.81	12.57	2.00	3.60	
S - 22	320+45.00	LT	12.81	12.71	12.47	1.50	3.10	
S - 23	320+45.00	RT	12.81	12.71	12.47	2.00	3.60	
S - 26	323+63.22	LT	11.95	11.85	11.61	5.50	7.10	
S - 27	323+63.22	RT	11.95	11.85	11.61	5.00	6.60	
S - 28	326+00.00	LT	12.84	12.74	12.50	1.00	2.60	
S - 29	326+05.00	RT	12.86	12.76	12.52	1.00	2.60	
S - 32	328+95.00	LT	12.66	12.56	12.32	2.00	3.60	
S - 33	328+95.00	RT	12.66	12.56	12.32	2.00	3.60	
S - 36	331+45.00	LT	11.82	11.72	11.48	4.50	6.10	
S - 37	331+45.00	RT	11.82	11.72	11.48	4.00	5.60	
S - 38	333+95.00	LT	12.76	12.66	12.42	2.00	3.60	
S - 39	333+95.00	RT	12.76	12.66	12.42	2.50	4.10	
S - 40	337+90.00	LT	13.18	13.08	12.84	1.50	3.10	
S - 41	337+90.00	RT	13.18	13.08	12.84	1.50	3.10	
S - 42	340+00.00	RT	12.87	12.77	12.53	2.00	3.60	
S - 43	342+90.00	RT	12.44	12.34	12.10	7.50	9.10	
S - 47	345+80.00	LT	12.73	12.63	12.39	1.00	2.60	
S - 48	347+05.00	LT	12.86	12.76	12.52	2.50	4.10	
S - 49	347+05.00	RT	12.86	12.76	12.52	2.50	4.10	
S - 52	351+40.00	LT	12.59	12.49	12.25	1.50	3.10	
S - 53	351+40.00	RT	12.59	12.49	12.25	1.50	3.10	
S - 56	354+26.14	LT	11.61	11.51	11.27	4.50	6.10	
S - 58	354+26.14	RT	11.61	11.51	11.27	4.50	6.10	
S - 59	355+95.00	LT	11.85	11.75	11.51	2.00	3.60	
S - 60	355+95.00	RT	11.85	11.75	11.51	2.00	3.60	
S - 61	358+05.00	LT	12.17	12.07	11.83	2.00	3.60	
S - 62	358+05.00	RT	12.17	12.07	11.83	1.50	3.10	
S - 63	359+98.57	RT	12.50	12.40	12.16	2.50	4.10	
S - 64	360+15.00	LT	12.48	12.38	12.14	2.00	3.60	
S - 65	362+25.00	LT	12.80	12.70	12.46	2.50	4.10	
S - 66	362+25.00	RT	12.80	12.70	12.46	2.00	3.60	
S - 68	364+35.00	LT	13.11	13.01	12.77	2.00	3.60	
S - 69	364+35.00	RT	13.11	13.01	12.77	2.00	3.60	
S - 70	366+45.00	LT	13.43	13.33	13.09	4.00	5.60	
S - 71	366+45.00	RT	13.43	13.33	13.09	5.00	6.60	
S - 75	373+45.00	LT	13.07	12.97	12.73	3.50	5.10	
S - 76	373+45.00	RT	13.07	12.97	12.73	3.50	5.10	
S - 77	376+60.00	LT	12.12	12.02	11.78	3.00	4.60	
S - 78	376+60.00	RT	12.12	12.02	11.78	3.00	4.60	
S - 81	379+78.75	LT	11.30	11.20	10.96	10.00	11.60	
S - 82	379+78.75	RT	11.30	11.20	10.96	6.00	7.60	
S - 84	382+50.00	LT	11.55	11.45	11.21	3.00	4.60	
S - 85	382+50.00	RT	11.55	11.45	11.21	3.00	4.60	
S - 88	385+65.00	LT	11.89	11.79	11.55	3.00	4.60	
S - 89	385+65.00	RT	11.89	11.79	11.55	3.50	5.10	
S - 90	390+90.00	LT	11.03	10.93	10.69	2.50	4.10	
S - 91	390+90.00	RT	11.03	10.93	10.69	2.50	4.10	
S - 92	393+40.00	LT	9.48	9.38	9.14	2.50	4.10	
S - 93	393+40.00	RT	9.48	9.38	9.14	2.50	4.10	
S - 94	395+90.00	LT	7.93	7.83	7.59	2.50	4.10	
S - 95	395+90.00	RT	7.93	7.83	7.59	2.50	4.10	
S - 97	398+40.00	LT	6.12	6.02	5.78	3.00	4.60	
S - 98	398+40.00	RT	6.12	6.02	5.78	2.50	4.10	
S - 101	401+42.61	LT	4.80	4.70	4.46	5.00	6.60	
S - 102	401+42.61	RT	4.80	4.70	4.46	8.50	10.10	
S - 103	403+60.00	LT	5.09	4.99	4.75	7.00	8.60	
S - 104	403+60.00	RT	5.09	4.99	4.75	3.00	4.60	
S - 107	406+30.00	RT	7.25	7.15	6.91	3.00	4.60	

72 swales

SR 30 (US 98)

REVISIONS												
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

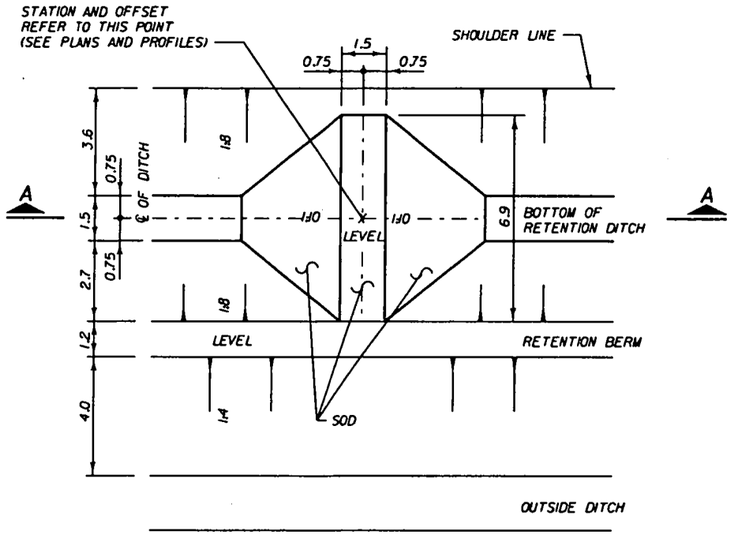
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

MISCELLANEOUS DRAINAGE DETAILS OVERFLOW STRUCTURES

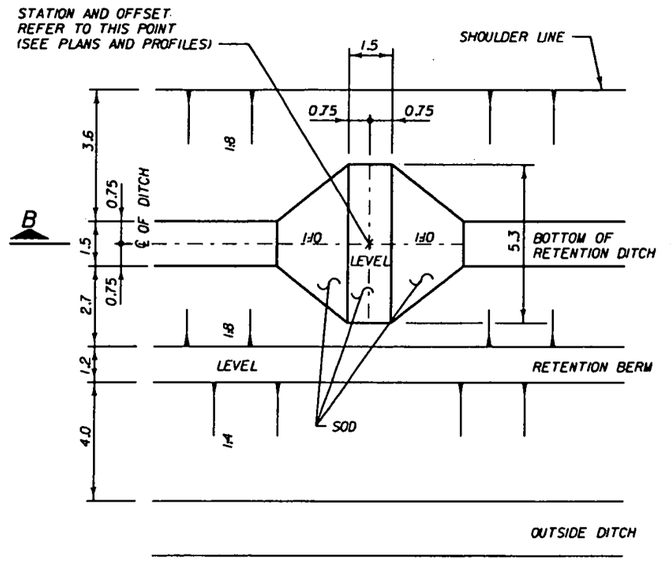
06:10:22 PM 08/27/2001

u:\pra\1999\99126\plans\misc\01.dgn

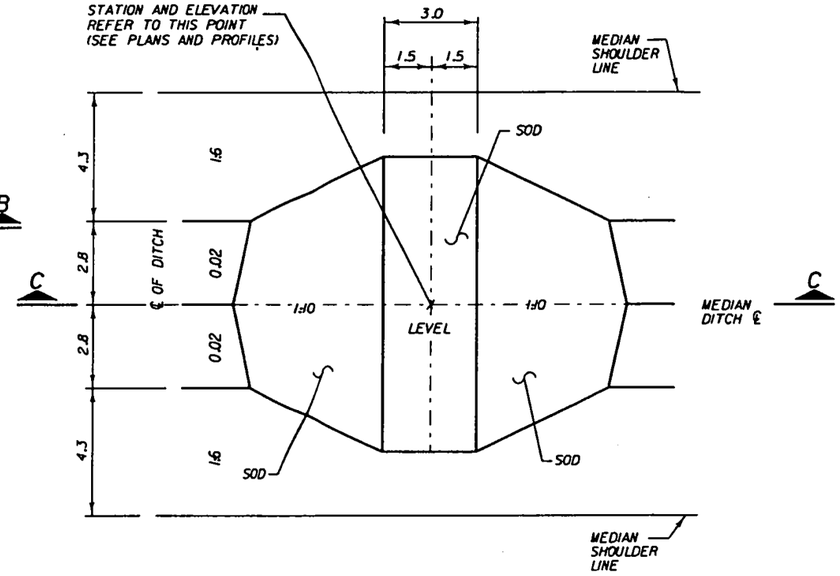
FINANCIAL PROJECT ID	SHEET NO.
220644-1-52-01	127



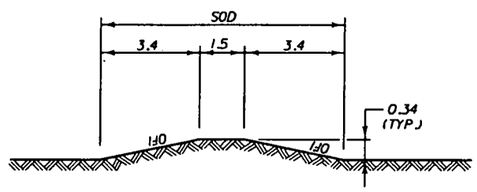
PLAN



PLAN



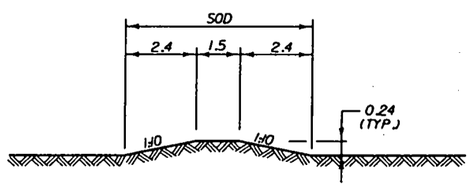
PLAN



SECTION A-A

TYPICAL RETENTION DITCH BLOCK

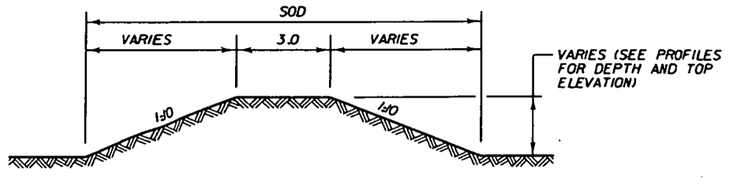
DEPTH 0.34M



SECTION B-B

TYPICAL RETENTION DITCH BLOCK

DEPTH 0.24M



SECTION C-C

TYPICAL MEDIAN DITCH BLOCK

NOTES:

1. SIMILAR DETAILS APPLY TO DITCH BLOCKS WITH DEPTHS NOT SPECIFICALLY DETAILED HEREIN

2. PAYMENT FOR DITCH BLOCK CONSTRUCTION IS INCLUDED UNDER PAY ITEM NO. 2120-6, EMBANKMENT, AND PAY ITEM NO. 2575-1, SODDING. SEE DITCH BLOCK TABLE, SUMMARY OF EARTHWORK, AND SUMMARY OF SODDING ON SHEET No. 9.

10/10/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

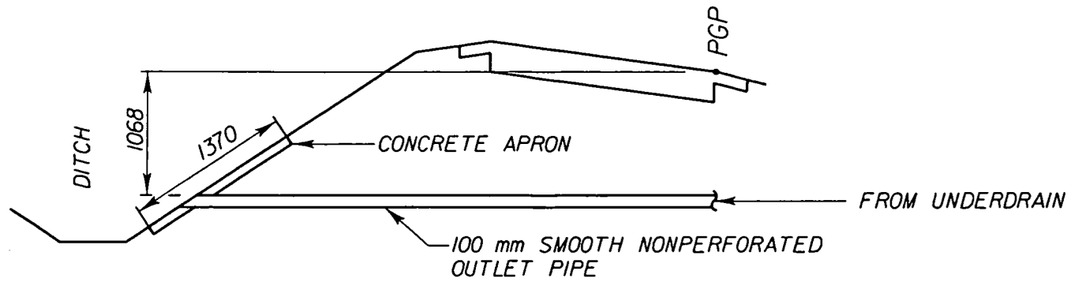
10:55:20 AM 09/10/2001

MISCELLANEOUS DRAINAGE DETAILS RETENTION DITCH BLOCKS

u:\dra\99\99126\plans\mlscd102.dgn

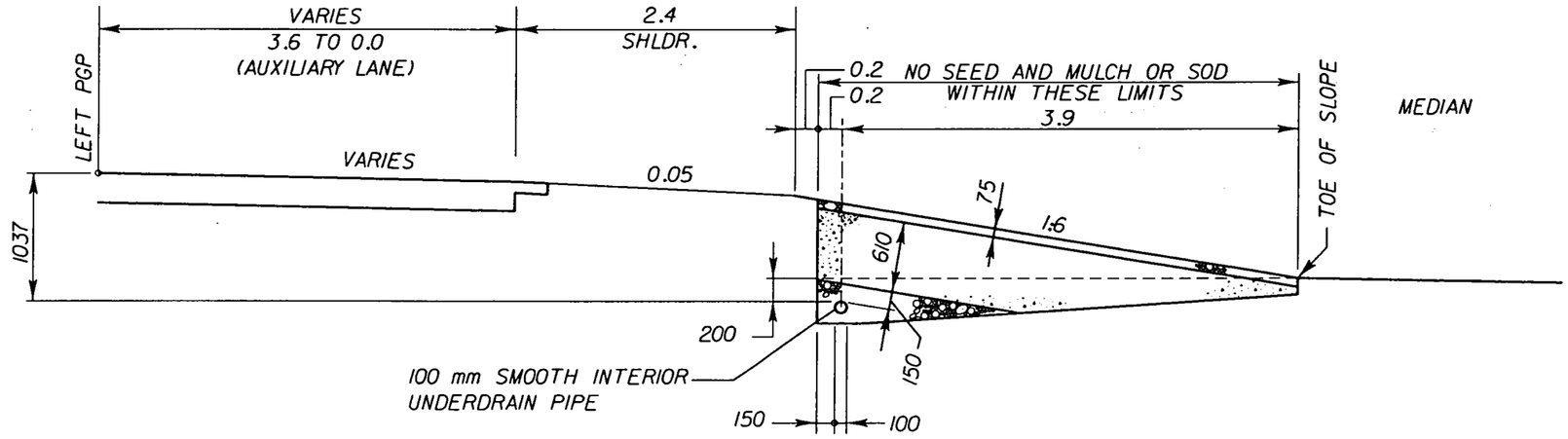
u:\dra\99\99126\plans\mlscd102.dgn 09/10/01 10:55:20 AM

FINANCIAL PROJECT ID	SHEET NO.
220644-1-52-01	128



UNDERDRAIN OUTLET LOCATION DETAIL

(SEE INDEX 286 AND 287 FOR ADDITIONAL INFORMATION REGARDING CONCRETE APRON, HARDWARE CLOTH, AND BORDERING SOD).



UNDERDRAIN TYPE Va LOCATION DETAIL

(SEE INDEX 286 FOR ADDITIONAL INFORMATION REGARDING COARSE AND FINE AGGREGATE, HARDWARE CLOTH, AND FILTER FABRIC TYPE AND INSTALLATION).

10/10/01

REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

UNDERDRAIN DETAIL

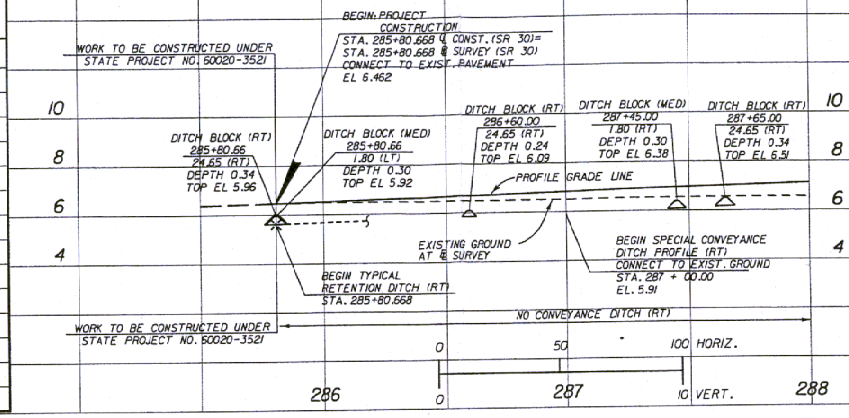
06:10:23 PM 08/27/2001 u:\ora\99\99126\plans\mlscd103.dgn

u:\ora\99\99126\plans\mlscd101.dgn 08/27/01 06:10:23 PM

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	1

FLOOD DATA TABLE

STRUCTURE NO.	STATION	DESIGN FLOOD		BASE FLOOD		OVERTOPPING FLOOD				GREATEST FLOOD			
		2% PROB. 50 YR.FREQ.		1% PROB. 100 YR.FREQ.									
		DISCHARGE (M^3/SEC)	STAGE (M)	DISCHARGE (M^3/SEC)	STAGE (M)	DISCHARGE (M^3/SEC)	STAGE (M)	PROB. %	FREQ. YR.	DISCHARGE (M^3/SEC)	STAGE (M)	PROB. %	FREQ. YR.
S-12	307+28	1.028	11.38	1.104	11.48	1.529	12.15	0.32	315	-	-	-	-
S-15	313+75	1.529	11.50	1.699	11.62	2.454	12.27	0.29	350	-	-	-	-
S-24	323+21	0.850	11.88	0.935	11.99	1.274	12.60	0.32	310	-	-	-	-
S-30	328+12	1.359	12.50	1.473	12.69	1.869	13.50	0.39	255	-	-	-	-
S-34	331+29	1.473	11.65	1.586	11.73	2.492	12.50	0.23	430	-	-	-	-
S-44	342+98	2.407	12.72	2.634	12.81	3.908	13.50	0.27	370	-	-	-	-
S-50	347+88	1.614	12.14	1.784	12.20	-	-	-	-	3.059	12.80	0.20	500
S-54	354+23	2.945	11.01	3.200	11.02	-	-	-	-	5.409	11.08	0.20	500
S-73	372+81	0.680	12.41	0.736	12.47	-	-	-	-	1.246	13.11	0.20	500
S-80	378+55	0.821	10.91	0.906	10.99	-	-	-	-	1.501	11.79	0.20	500
S-86	384+22	0.453	10.55	0.510	10.70	-	-	-	-	0.850	11.13	0.20	500
S-99	401+23	4.956	3.28	5.409	3.31	-	-	-	-	9.176	3.66	0.20	500
S-105	405+36	0.906	4.46	0.991	4.51	-	-	-	-	1.599	5.08	0.20	500



NOTE:

THE HYDRAULIC DATA IS SHOWN FOR INFORMATIONAL PURPOSES ONLY, TO INDICATE THE FLOOD DISCHARGES AND WATER SURFACE ELEVATIONS WHICH MAY BE ANTICIPATED IN ANY GIVEN YEAR. THIS DATA WAS GENERATED USING HIGHLY VARIABLE FACTORS DETERMINED BY A STUDY OF THE WATERSHED. MANY JUDGEMENTS AND ASSUMPTIONS ARE REQUIRED TO ESTABLISH THESE FACTORS. THE RESULTANT HYDRAULIC DATA IS ENSITIVE TO CHANGES. PARTICULARLY OF ANTECEDENT CONDITIONS, URBANIZATION, CHANNELIZATION, AND LAND USE. USERS OF THIS DATA ARE CAUTIONED AGAINST THE ASSUMPTION OF PRECISION WHICH CAN NOT BE ATTAINED. DISCHARGES ARE IN CUBIC FEET PER SECOND AND STAGES ARE IN METERS, NGVD, 1929.

DEFINITIONS:

DESIGN FLOOD: THE FLOOD SELECTED BY F.D.O.T. TO BE UTILIZED TO ASSURE A STANDARD LEVEL OF HYDRAULIC PERFORMANCE.

BASE FLOOD: THE FLOOD HAVING A 1% CHANCE OF BEING EXCEEDED IN ANY YEAR. (100 YR. FREQUENCY)

OVERTOPPING FLOOD: THE FLOOD WHERE FLOW OCCURS (A) OVER THE HIGHWAY (B) OVER A WATERSHED DIVIDE OR (C) THRU EMERGENCY RELIEF STRUCTURES.

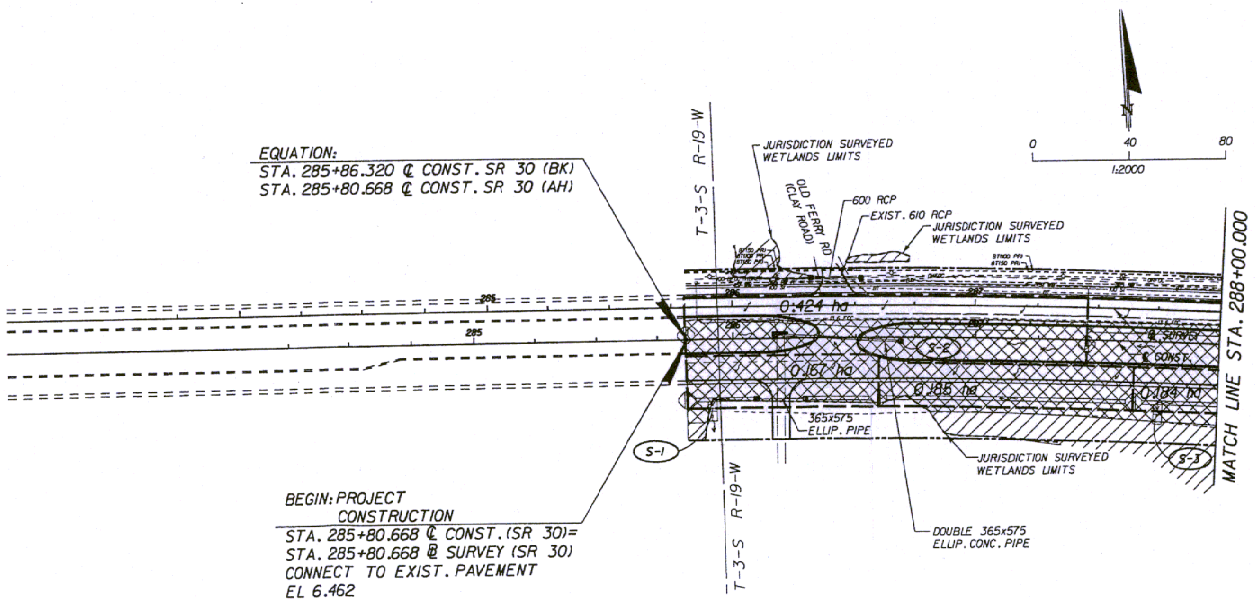
GREATEST FLOOD: THE MOST SEVERE FLOOD WHICH CAN BE PREDICTED WHERE OVERTOPPING IS NOT FRACTICABLE, NORMALLY ONE WITH A 0.2% CHANCE OF BEING EXCEEDED IN ANY YEAR. (500 YR. FREQUENCY)

LEGEND

——— SUB-BASIN BOUNDARY

↜ DIRECTIONAL FLOW ARROW

1.670 ha SUB BASIN AREA



SR 30 (US 98)

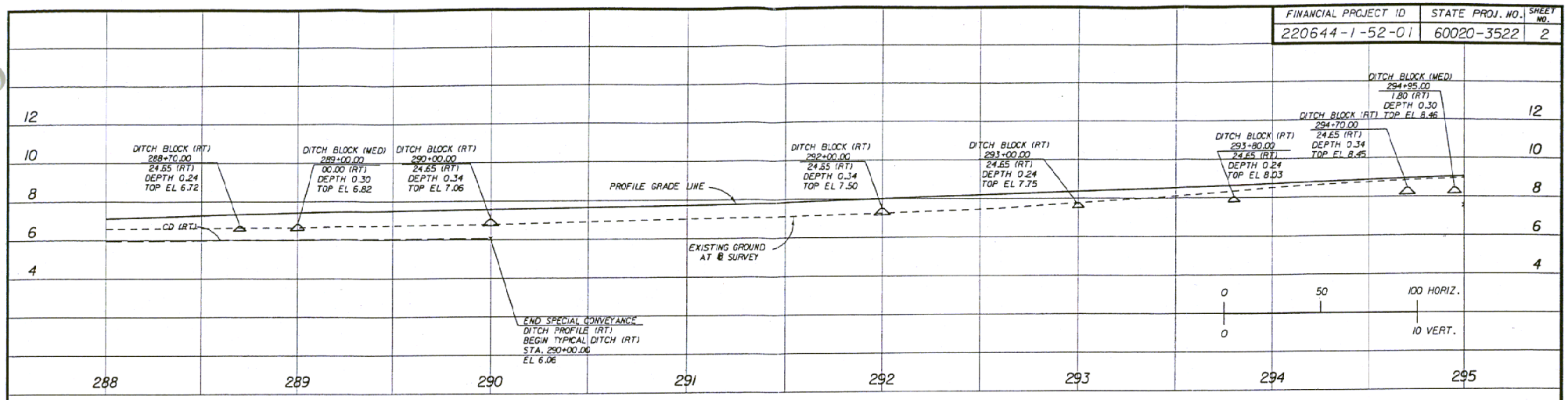
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

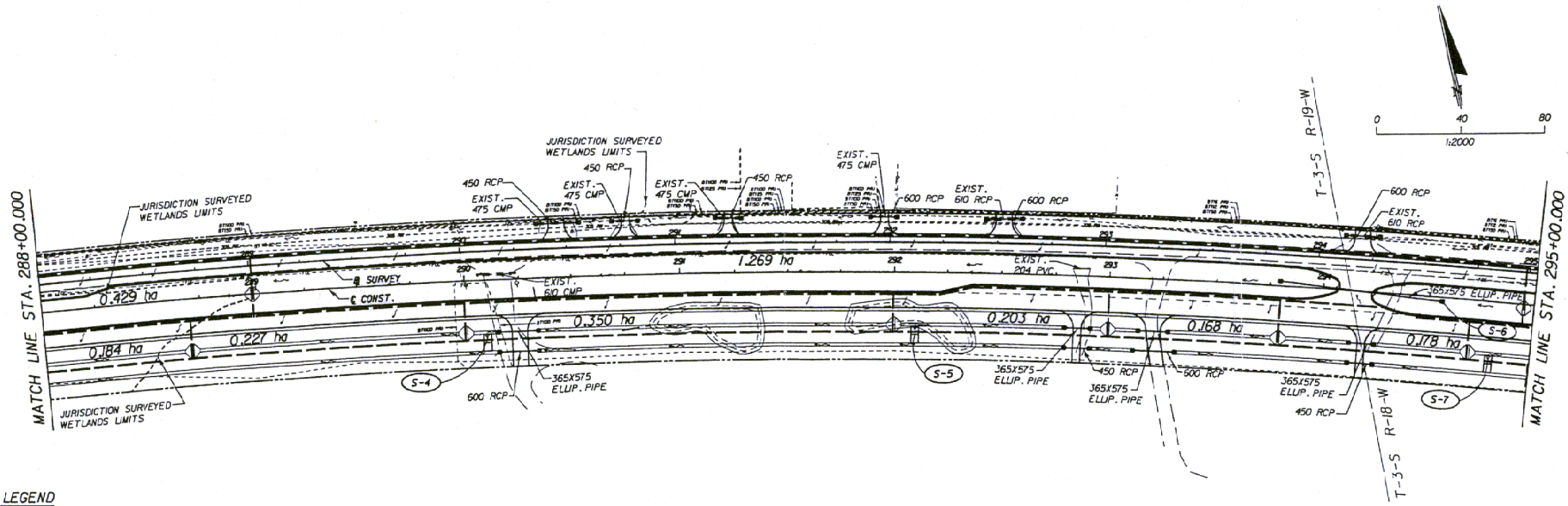
dpa DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	2





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.570 ha SUB BASIN AREA

SR 30 (US 98)

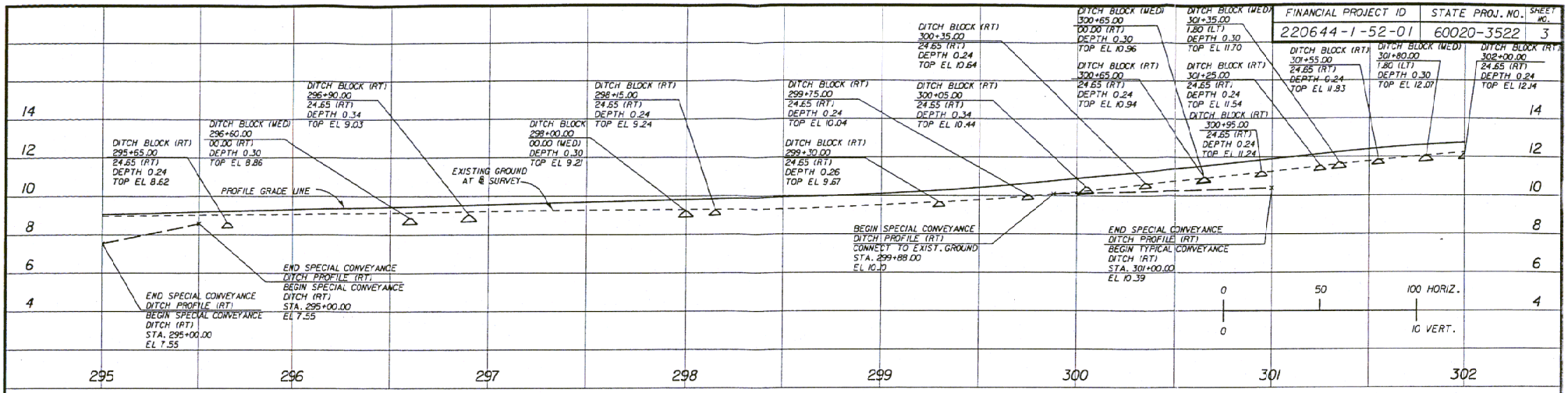
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

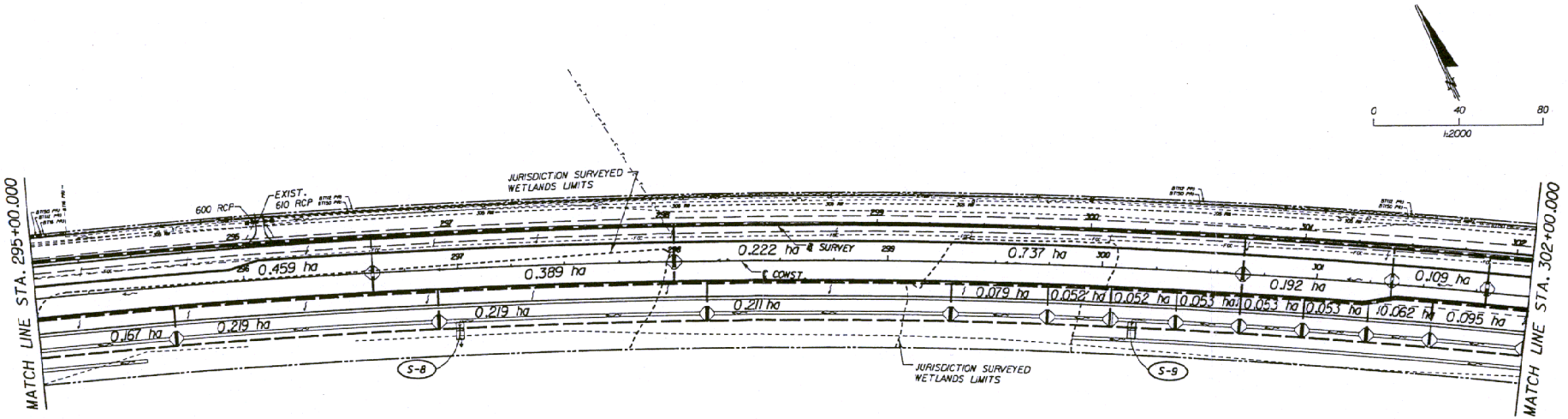
dpa DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	3





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

SR 30 (US 98)

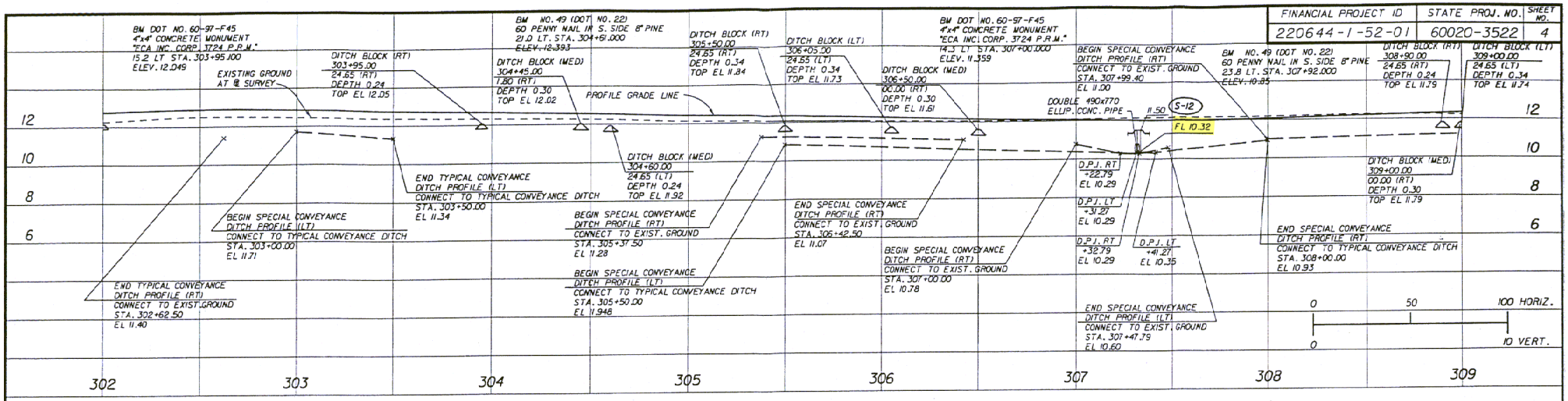
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

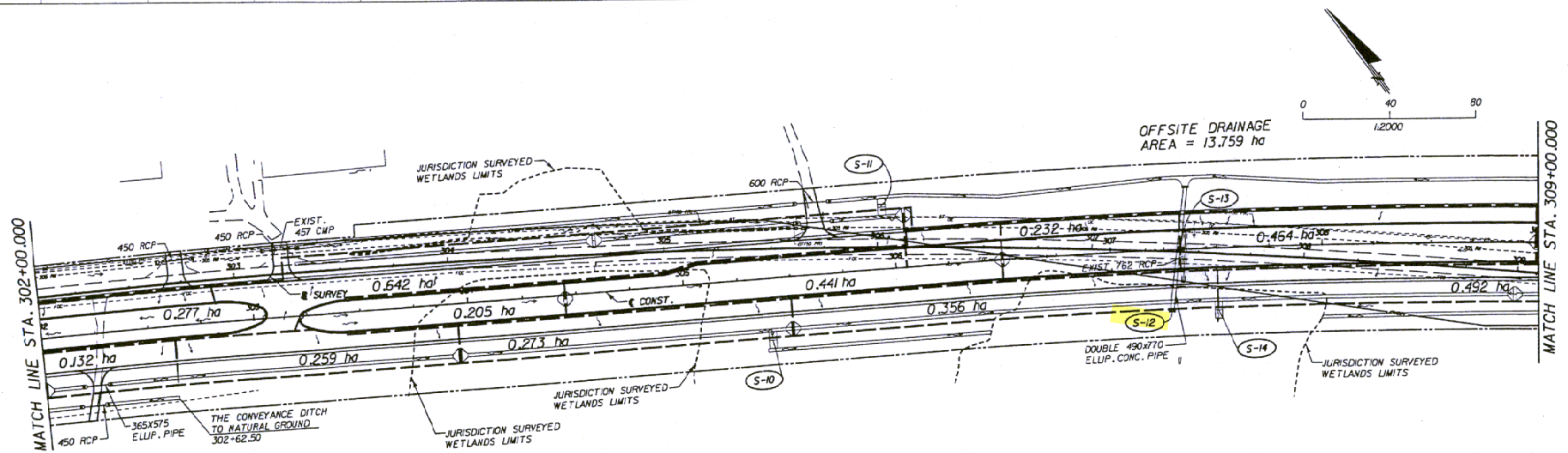
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	4





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

SR 30 (US 98)

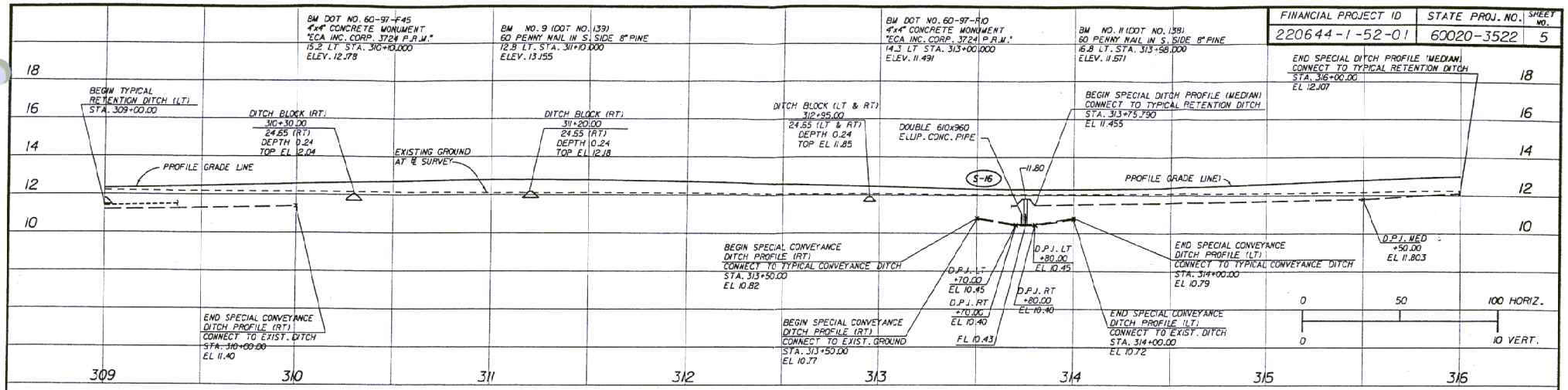
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

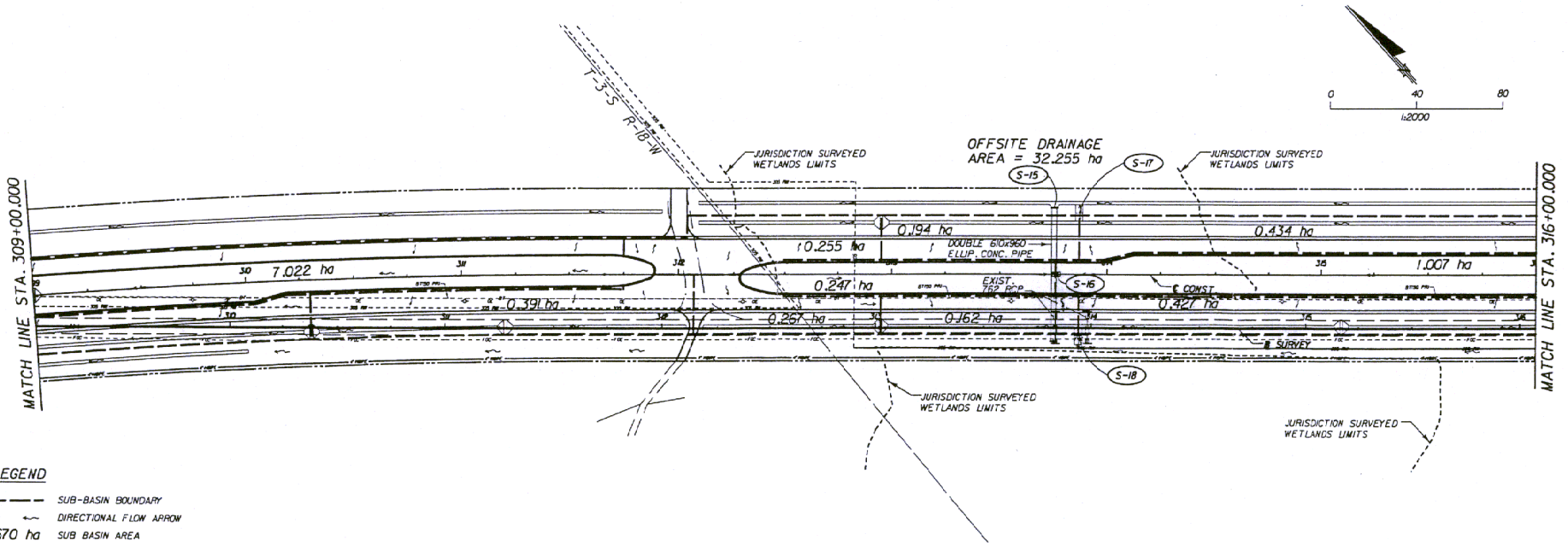
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	5





LEGEND

——— SUB-BASIN BOUNDARY

~~ DIRECTIONAL FLOW ARROW

1.670 ha SUB BASIN AREA

SR 30 (US 98)

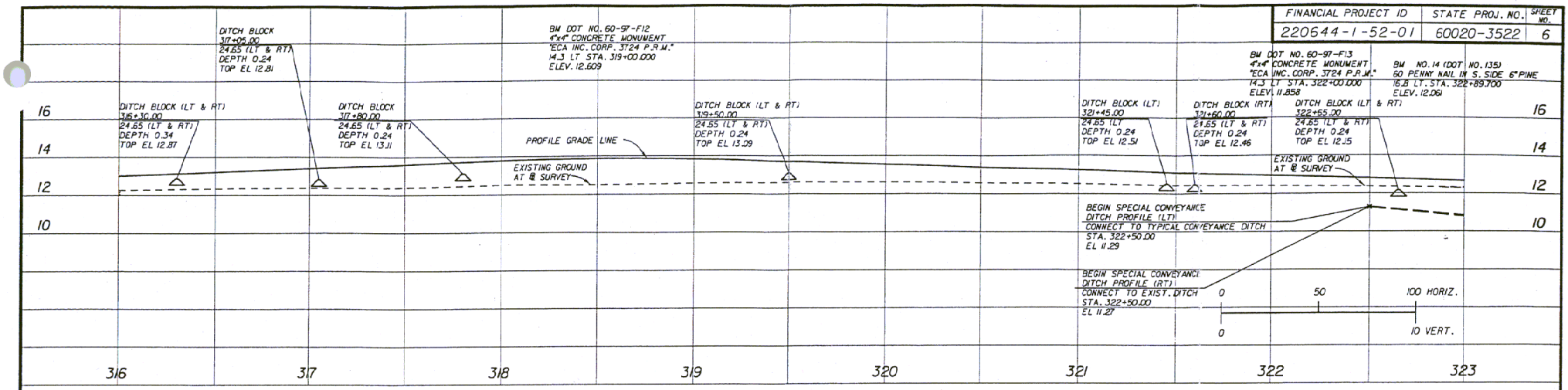
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

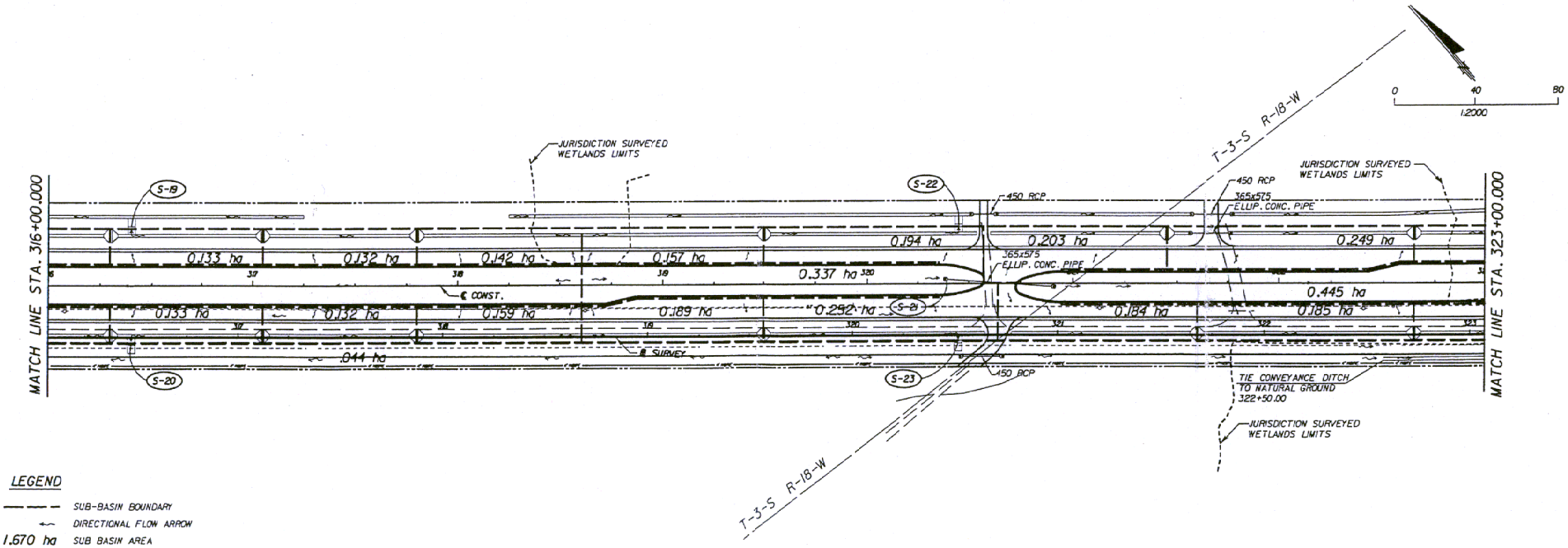
dpa DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	6





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

SR 30 (US 98)

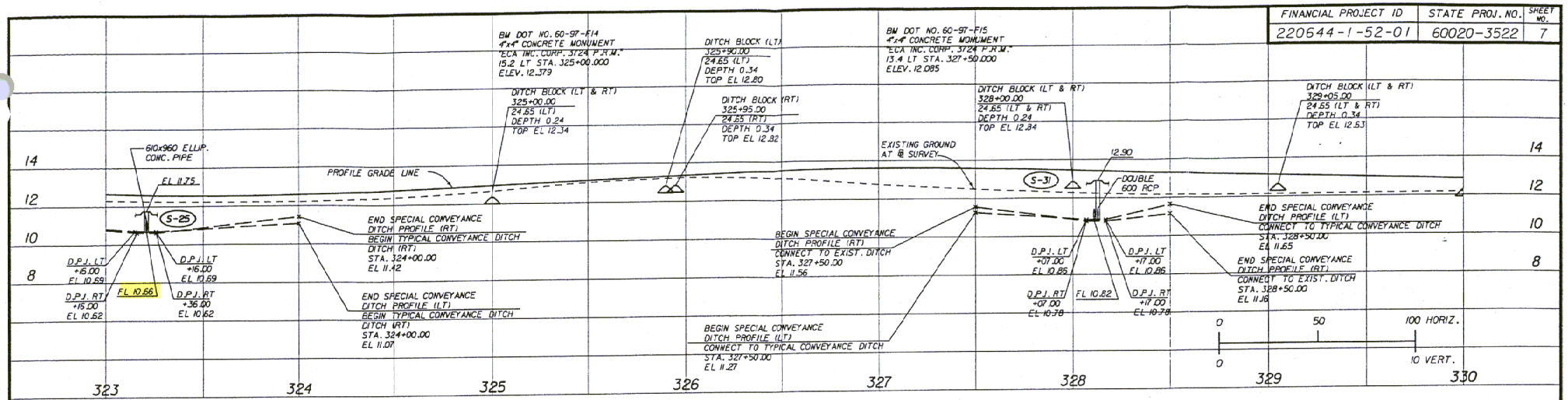
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

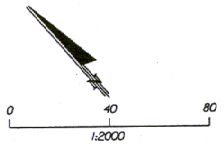
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

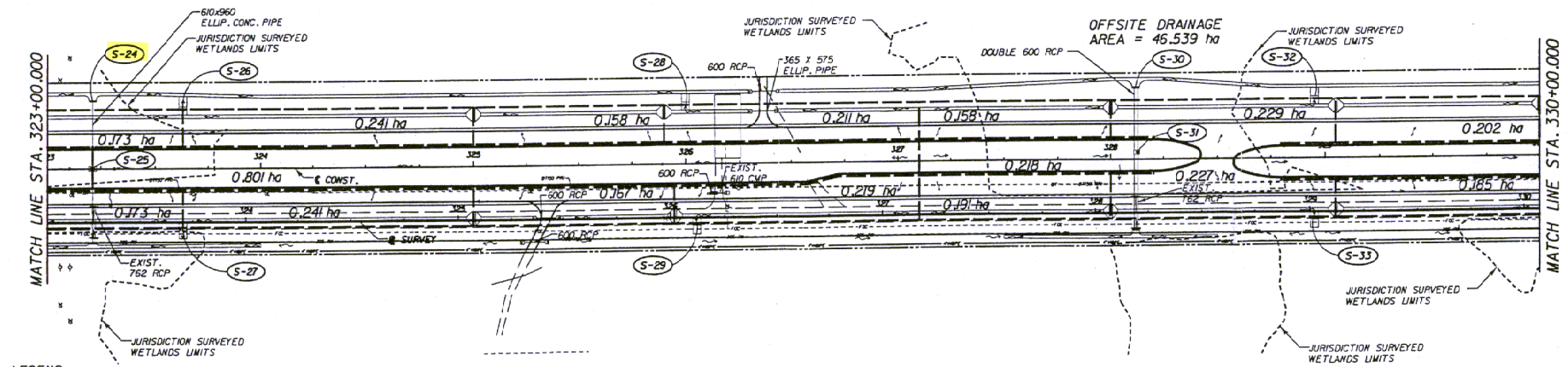
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220544-1-52-01	60020-3522	7







SR 30 (US 98)

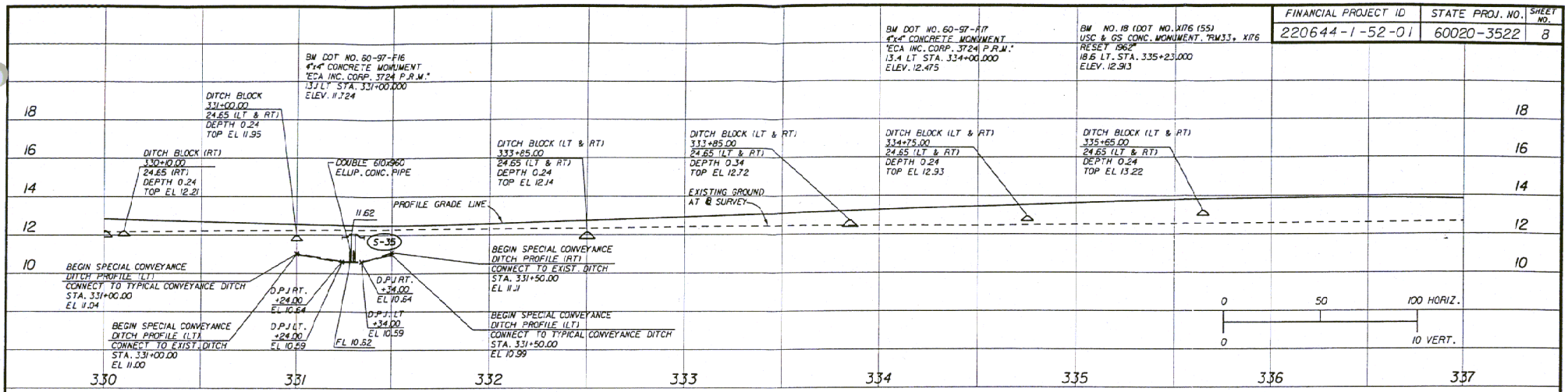
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

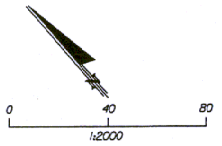
dpa DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

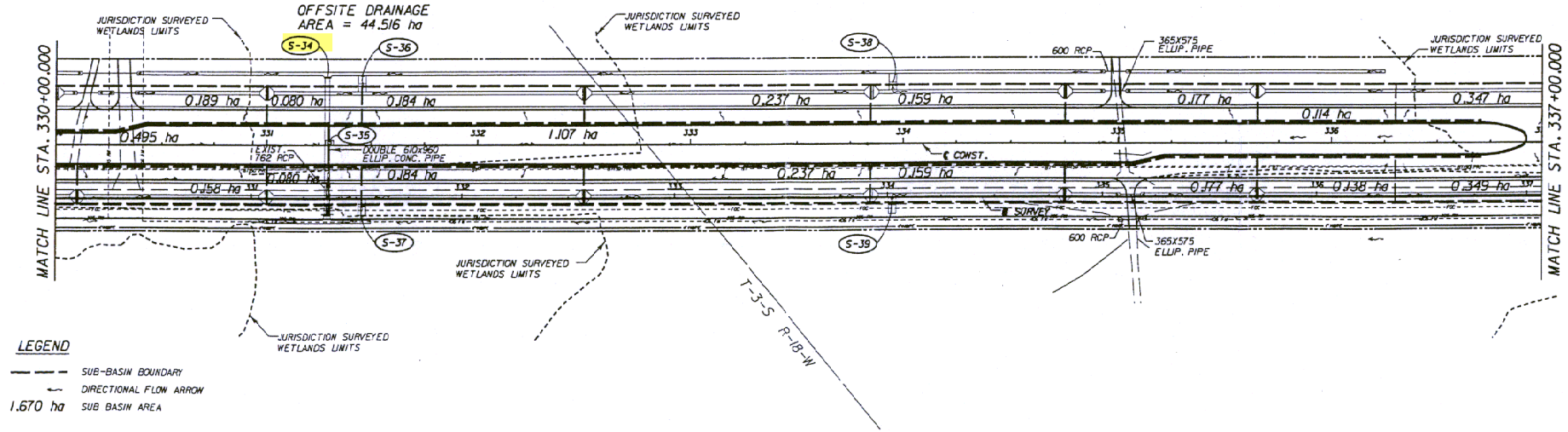
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	8







LEGEND

— — — SUB-BASIN BOUNDARY

DIRECTIONAL FLOW ARROW

1.670 ha SUB BASIN AREA

SR 30 (US 98)

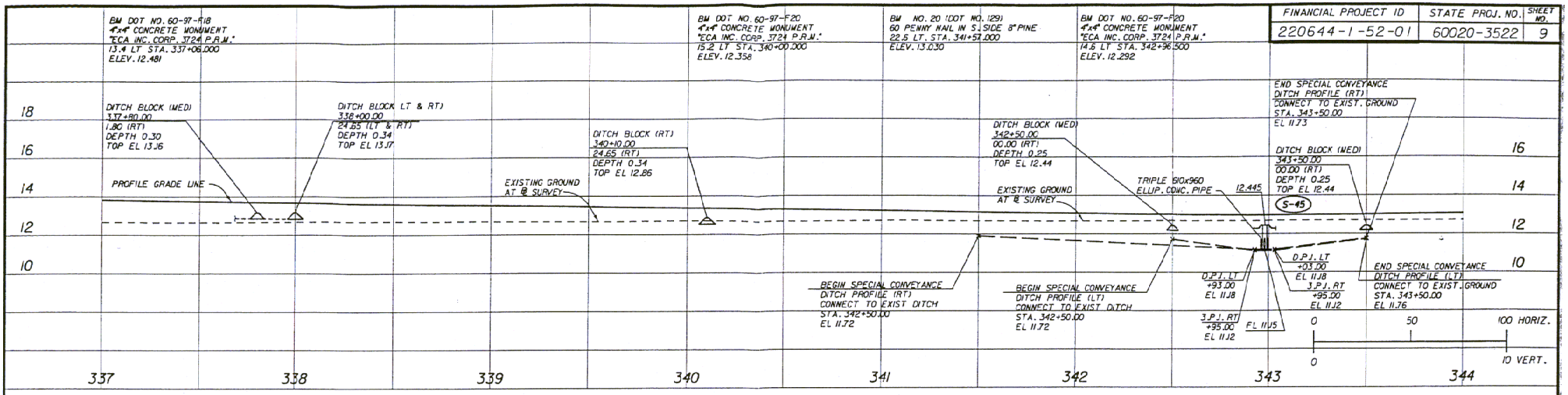
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

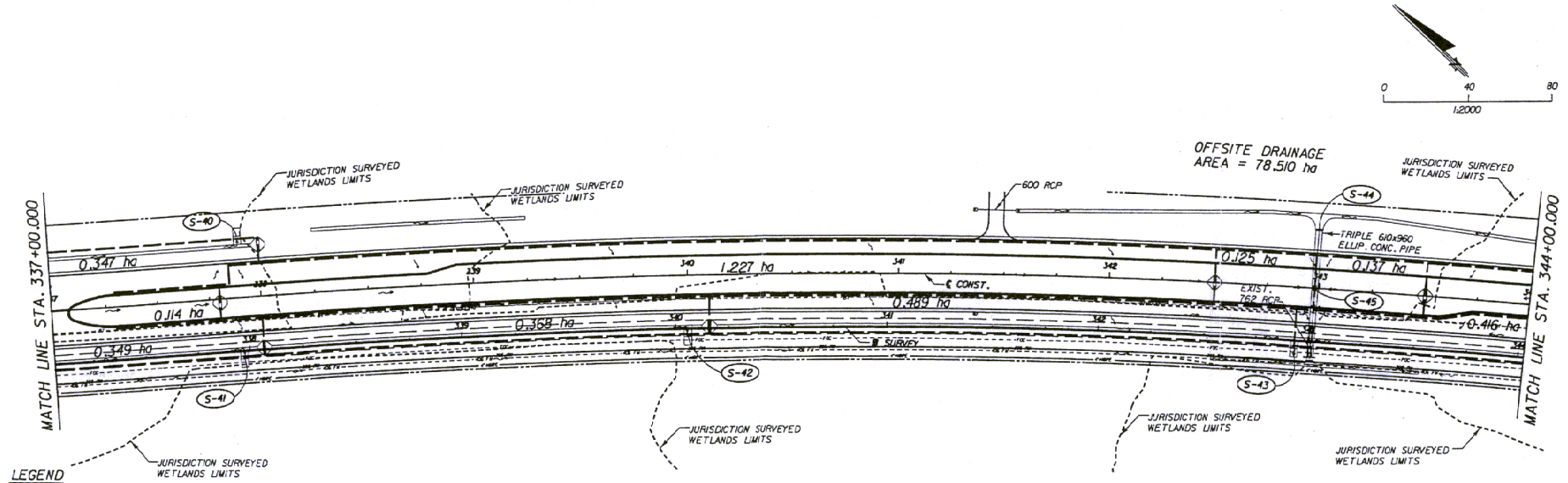
dpa DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	9





SR 30 (US 98)

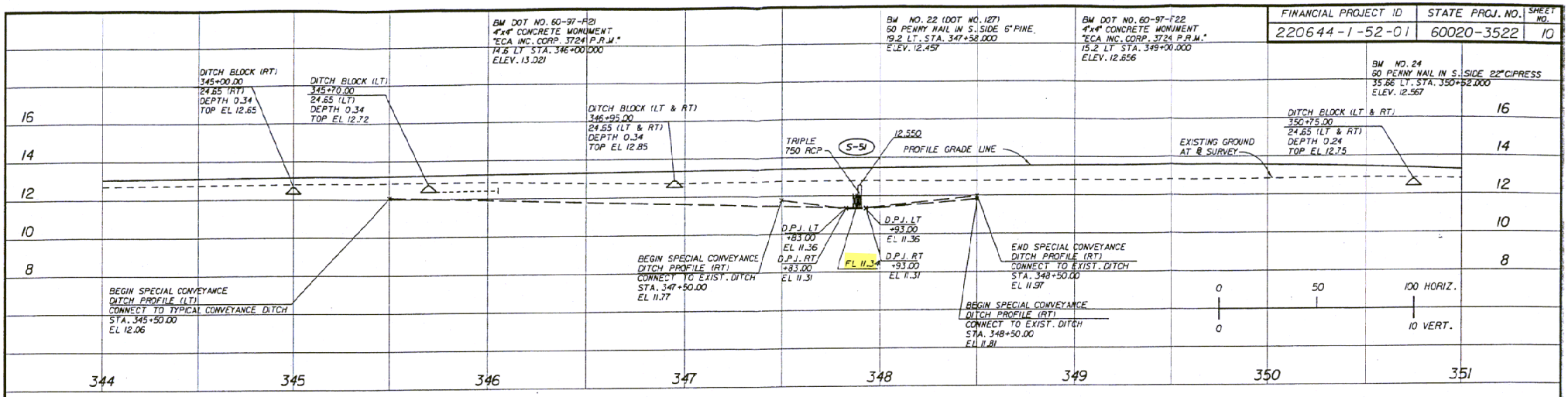
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

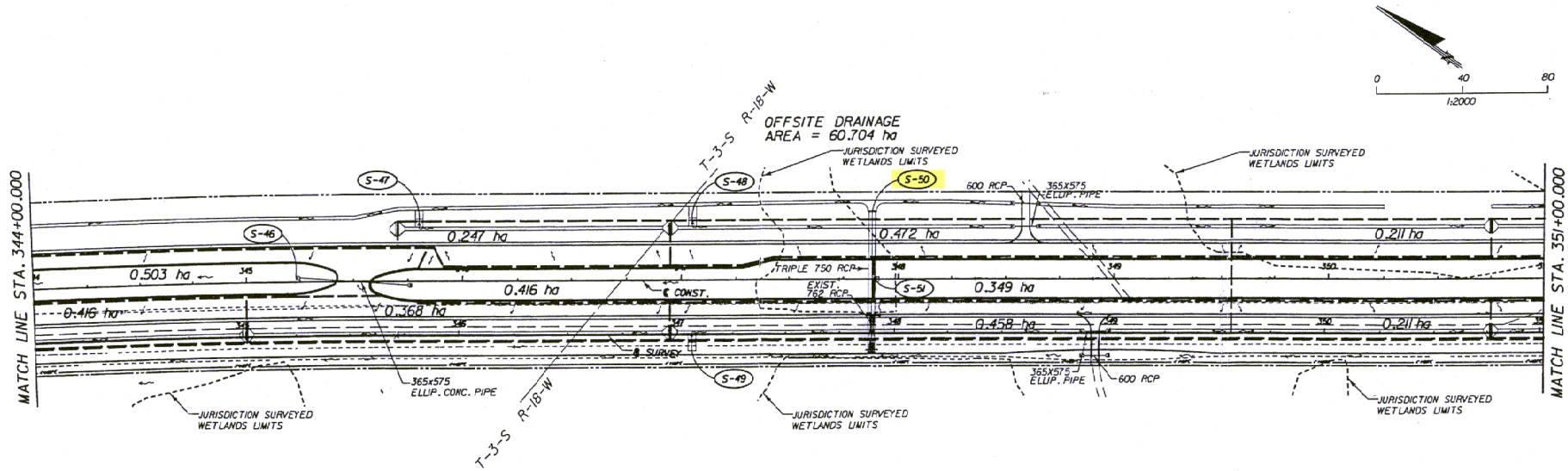
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	10





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

SR 30 (US 98)

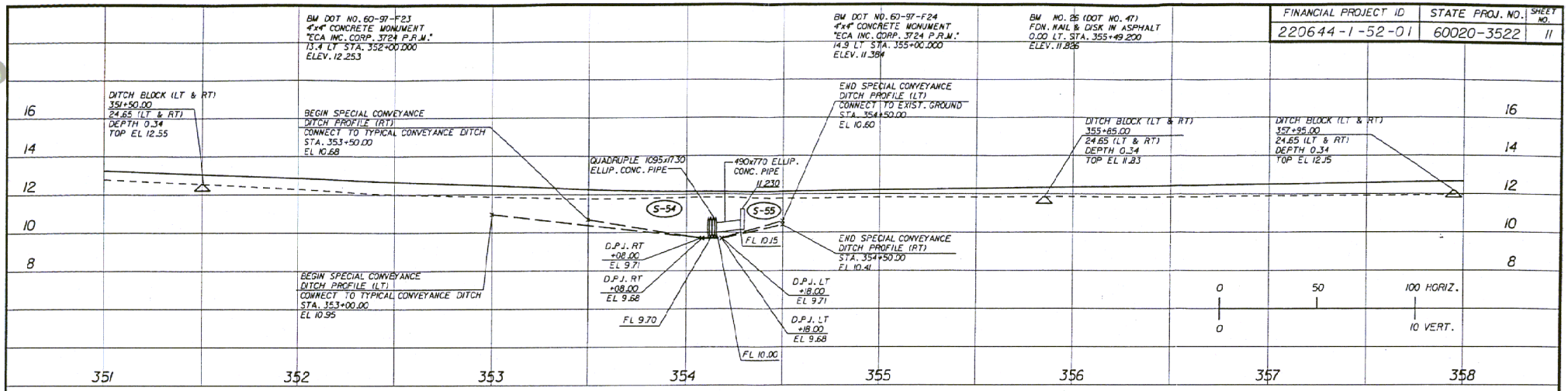
REVISIONS											
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

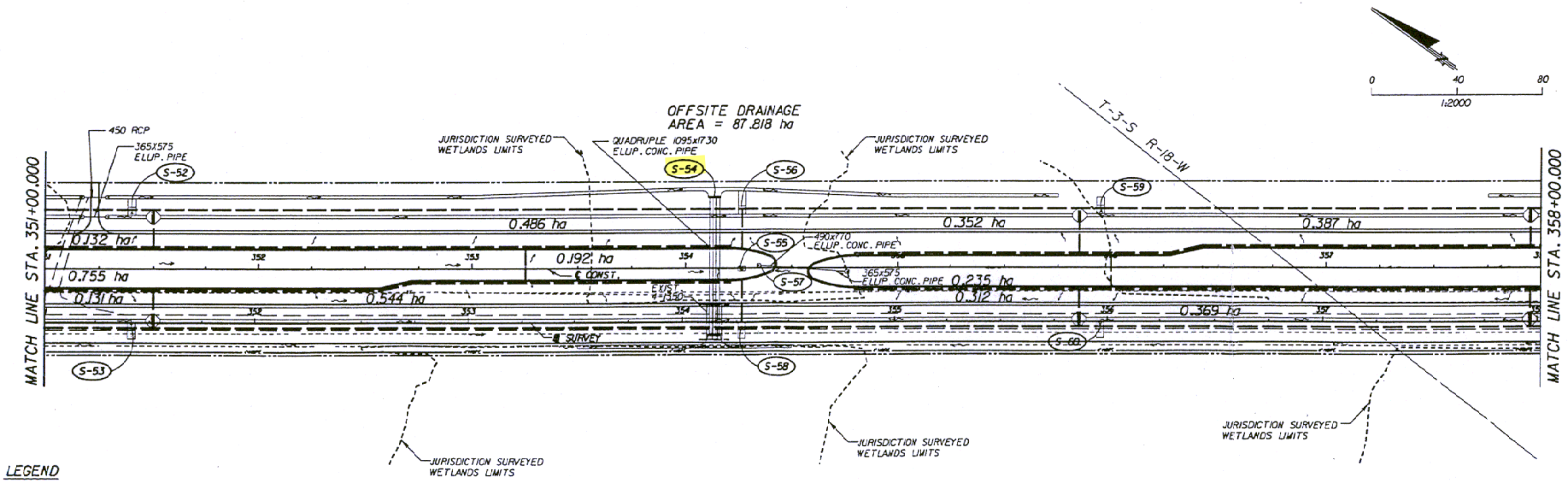
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	11





LEGEND

SUB-BASIN BOUNDARY

DIRECTIONAL FLOW ARROW

1.570 ha SUB BASIN AREA

SR 30 (US 98)

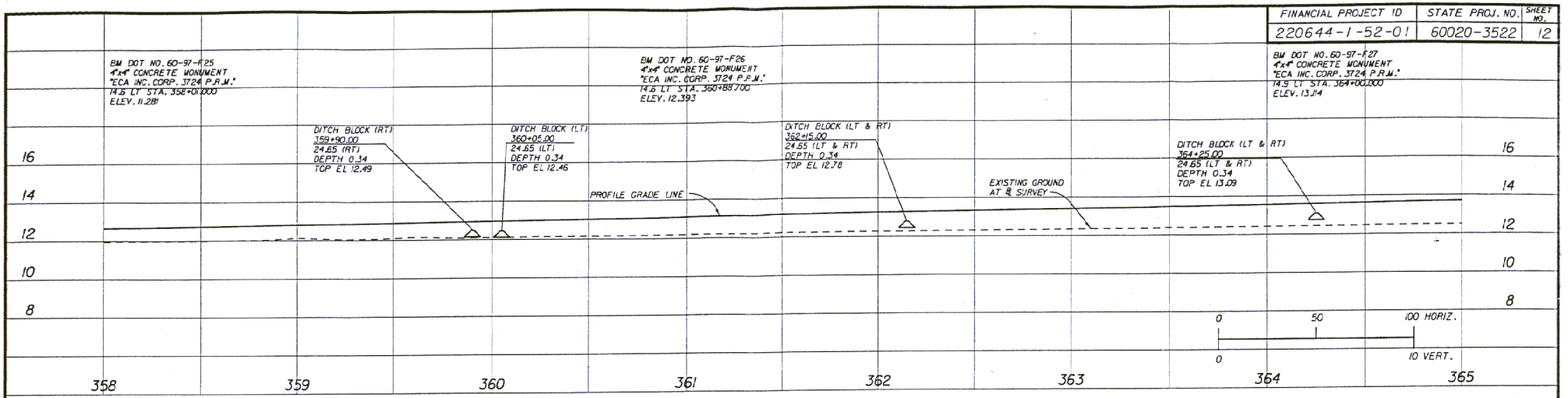
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

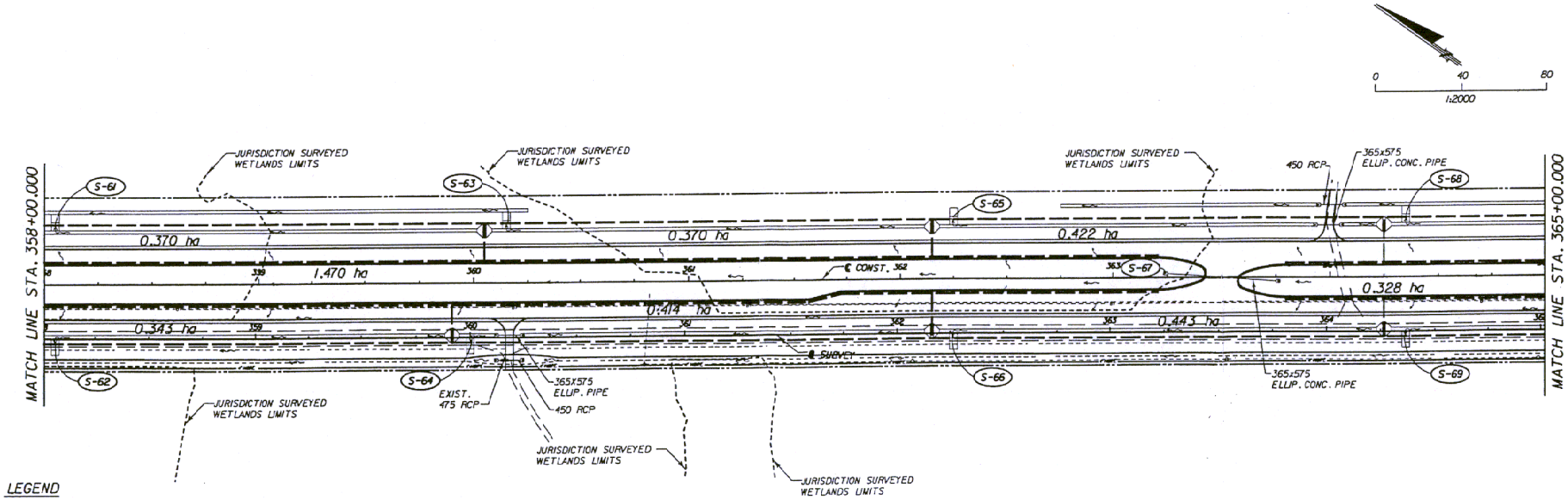
DAVID PLUMMER & ASSOCIATES, INC.
1150 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	12





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

SR 30 (US 98)

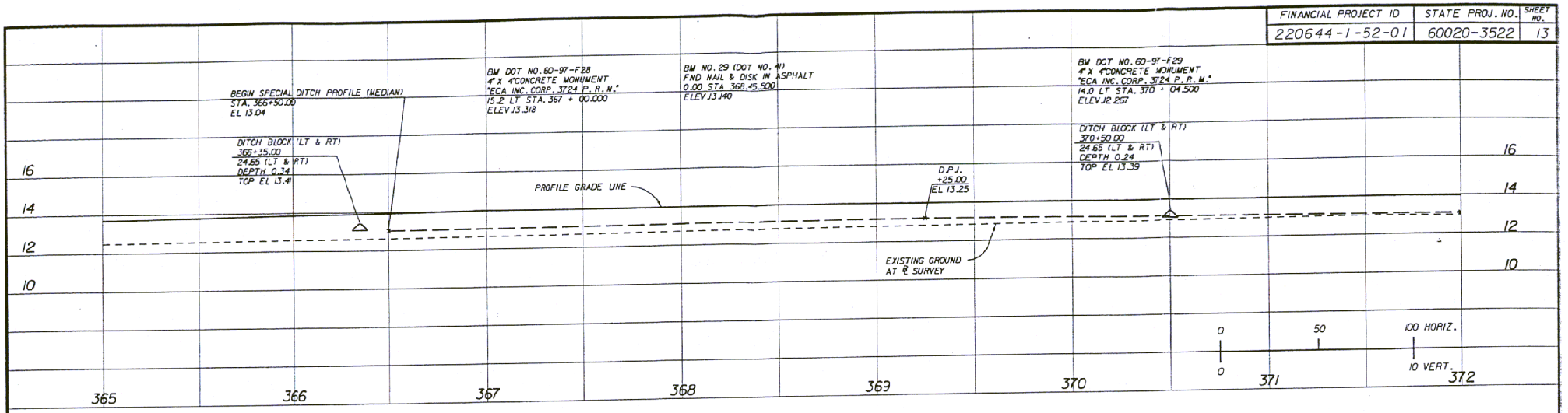
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

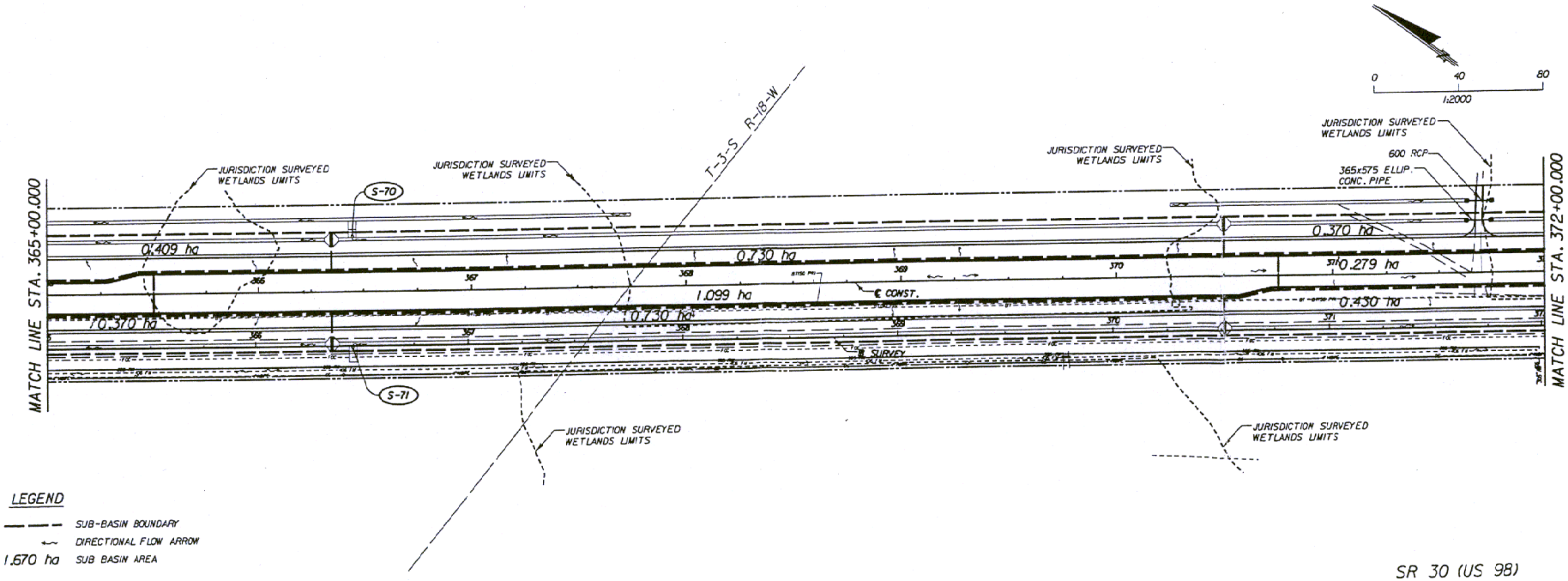
DAVID PLUMMER & ASSOCIATES, INC.
1720 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	13





SR 30 (US 98)

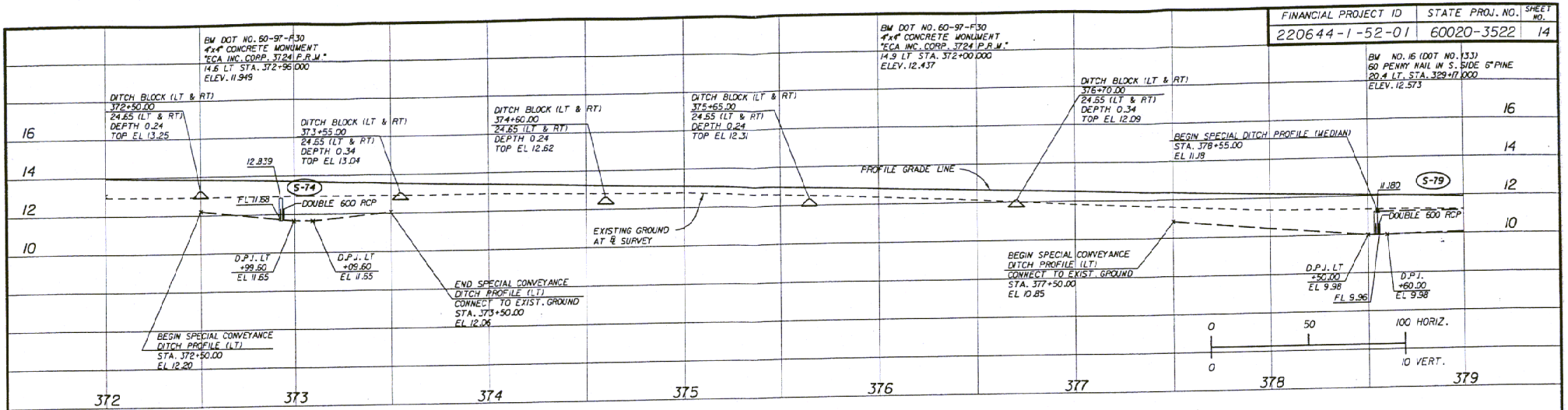
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

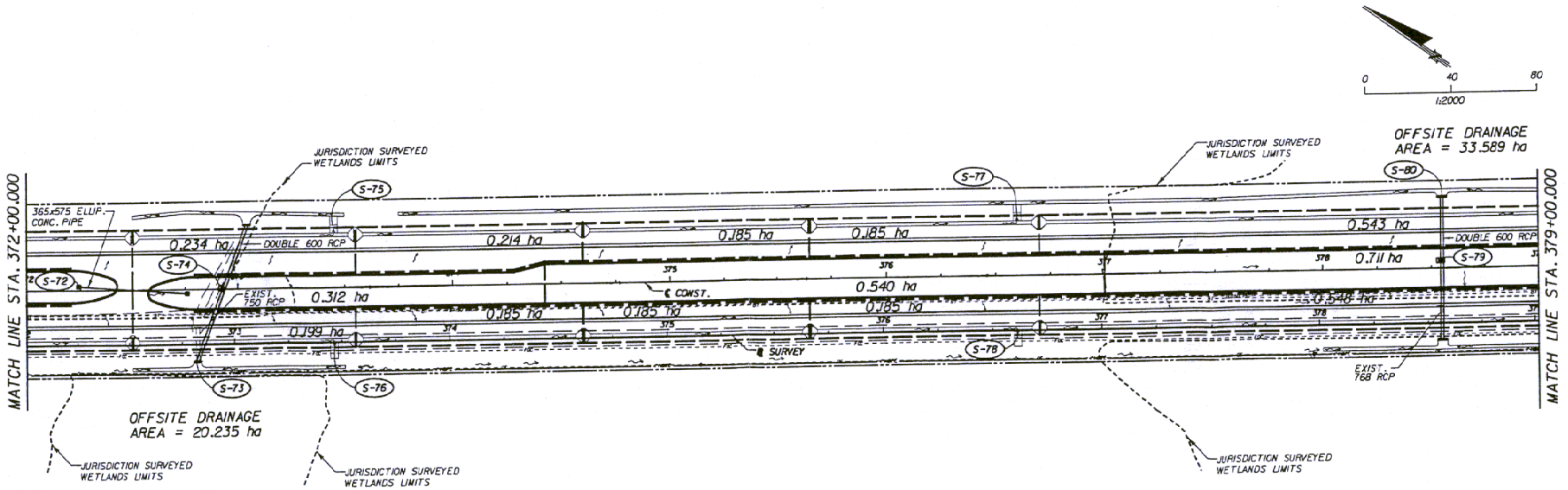
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	14





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.570 ha SUB BASIN AREA

SR 30 (US 98)

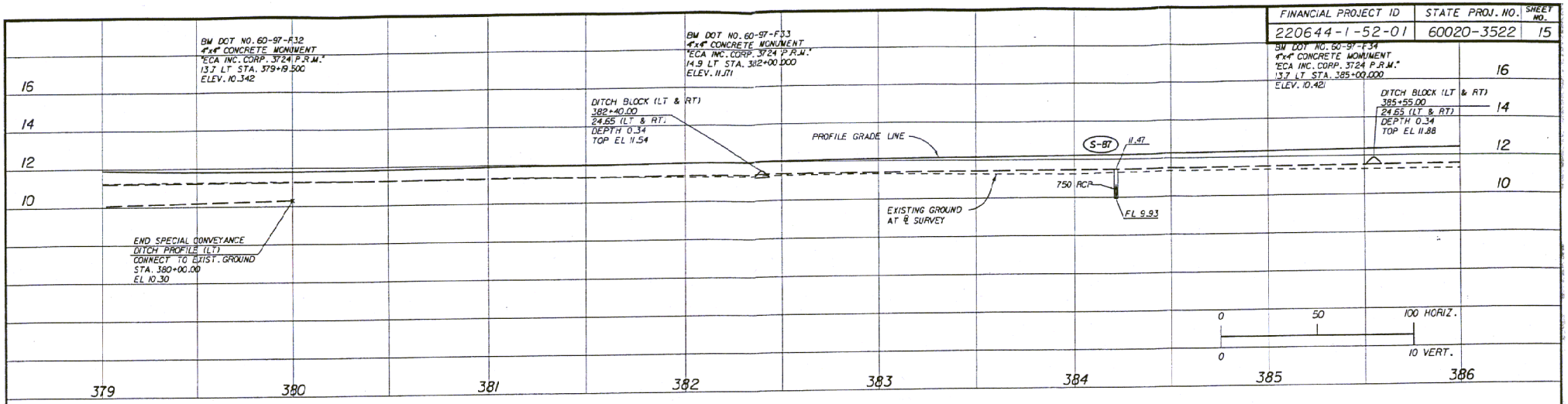
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

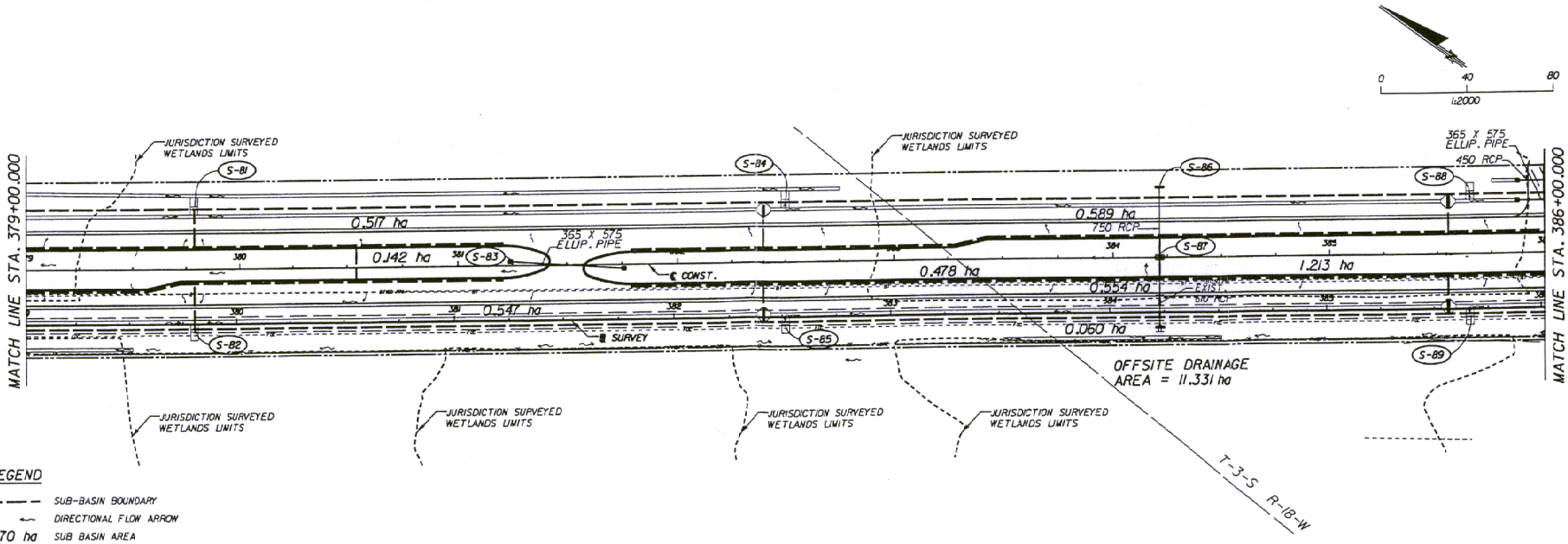
DAVID PLUMMER & ASSOCIATES, INC.
1150 PONCE DE LEON BOULEVARD
CORAL GABLES FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	15





SR 30 (US 98)

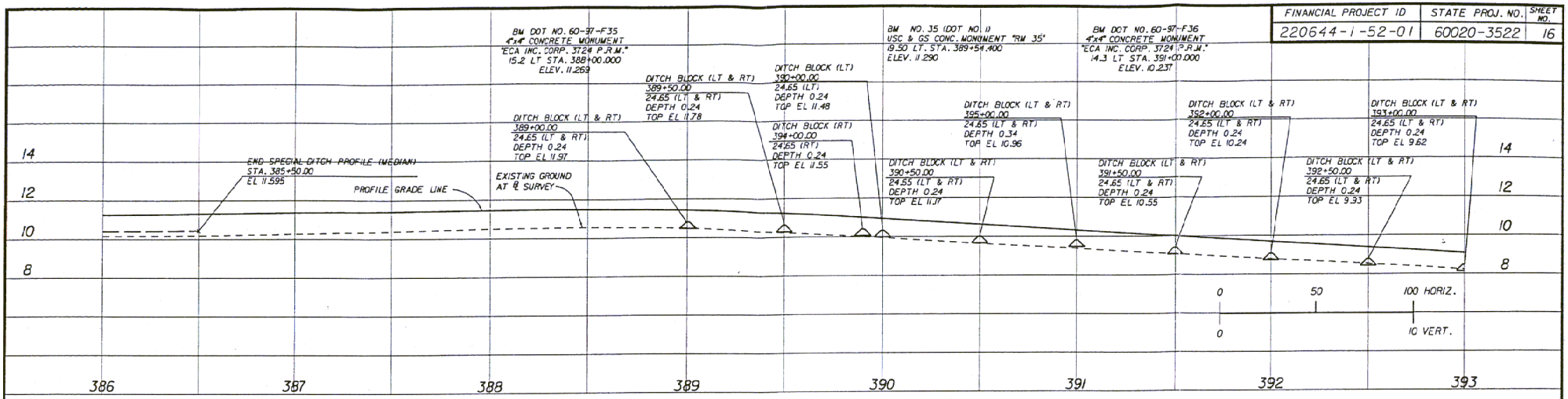
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

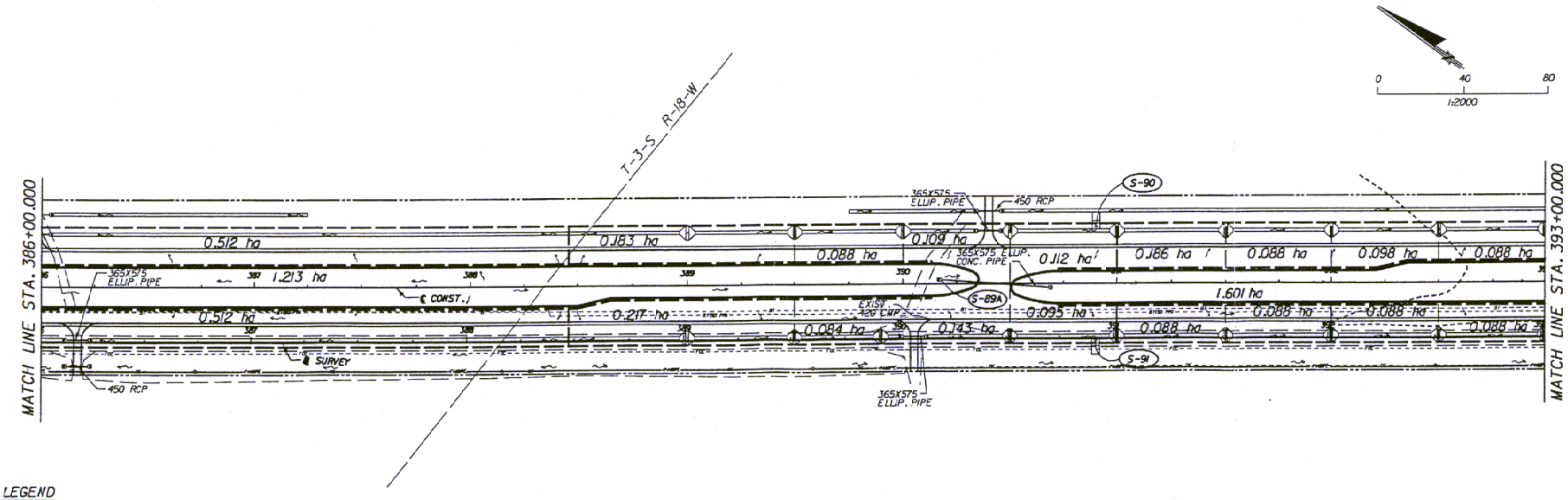
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	16





LEGEND

——— SUB-BASIN BOUNDARY

~ DIRECTIONAL FLOW ARROW

1.670 ha SUB BASIN AREA

SR 30 (US 98)

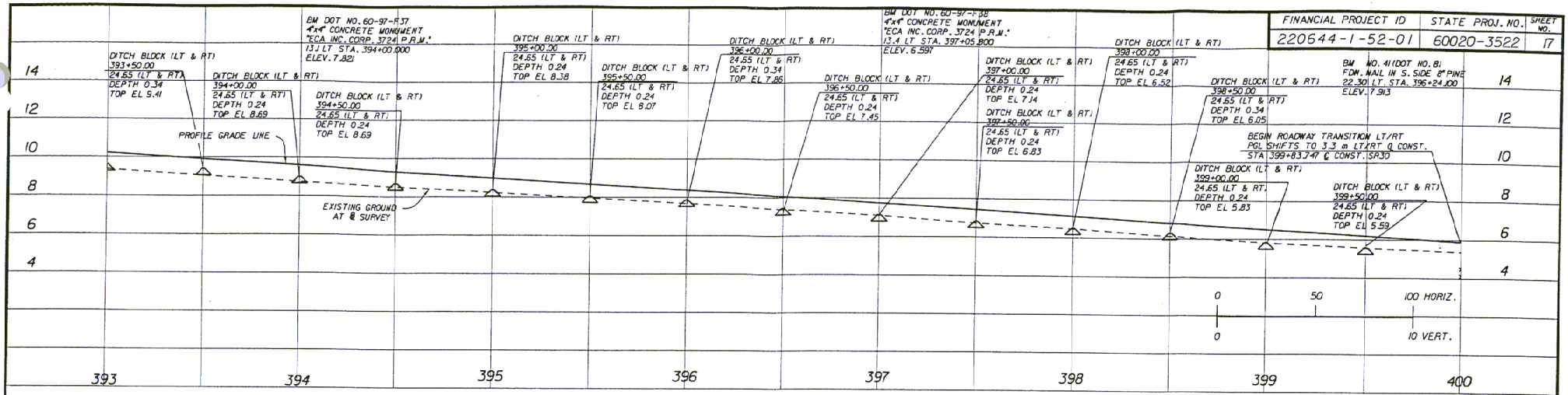
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

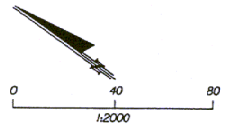
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

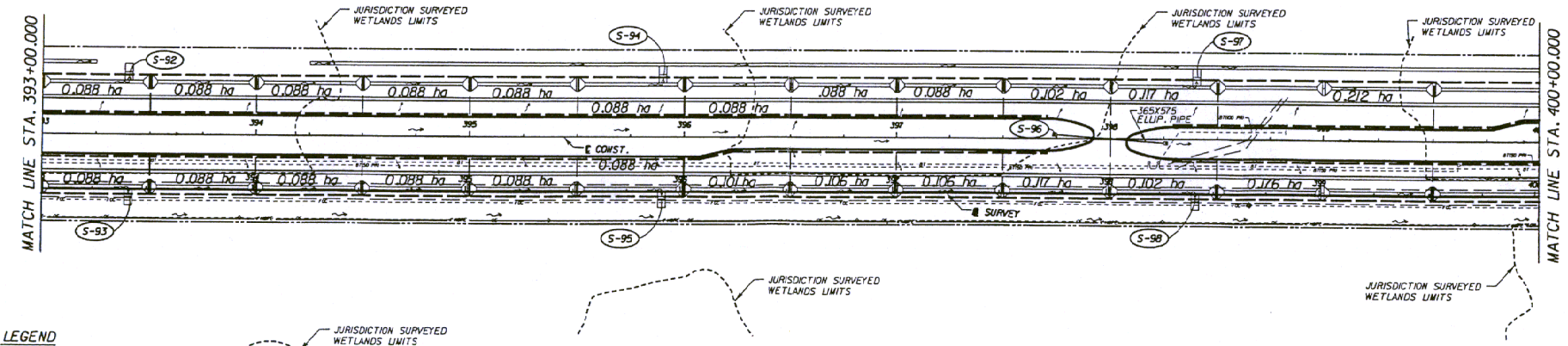
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220544-1-52-01	60020-3522	17







LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

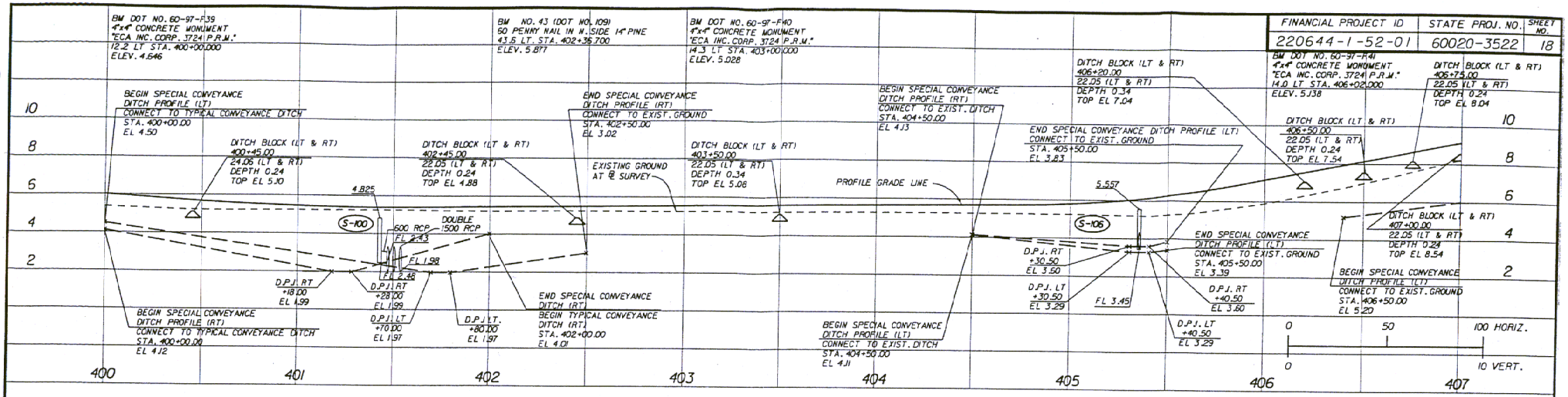
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

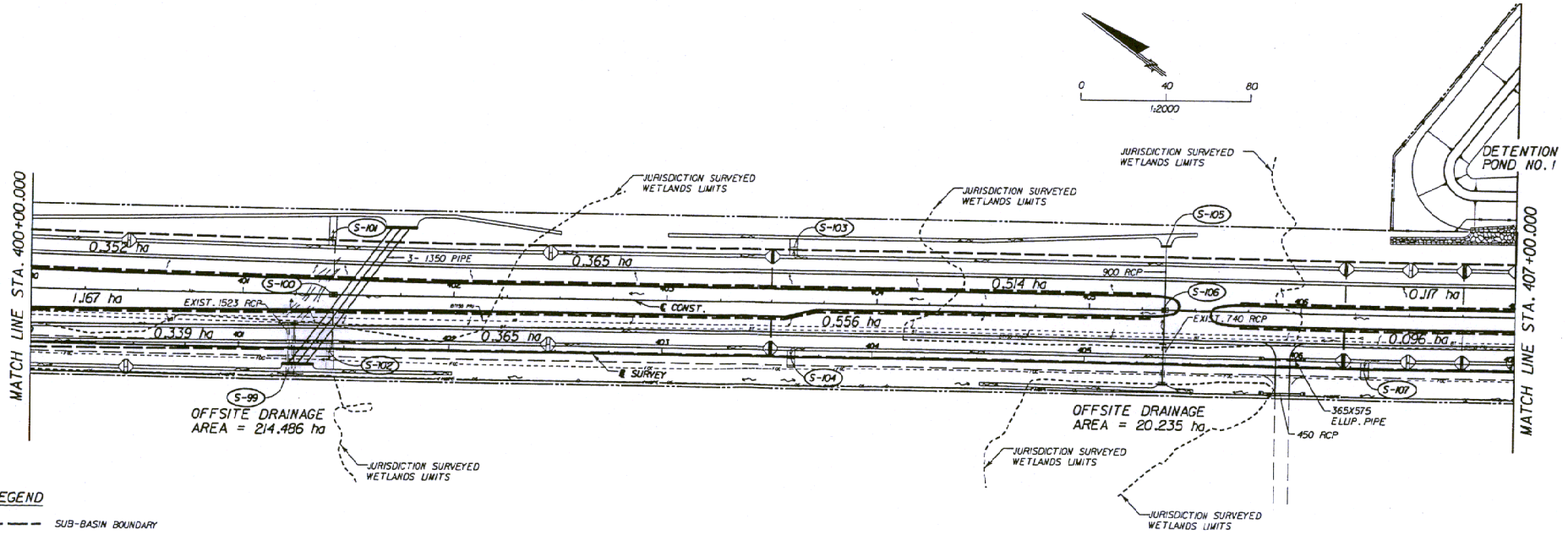
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	18





LEGEND

- SUB-BASIN BOUNDARY
- DIRECTIONAL FLOW ARROW
- 1.670 ha SUB BASIN AREA

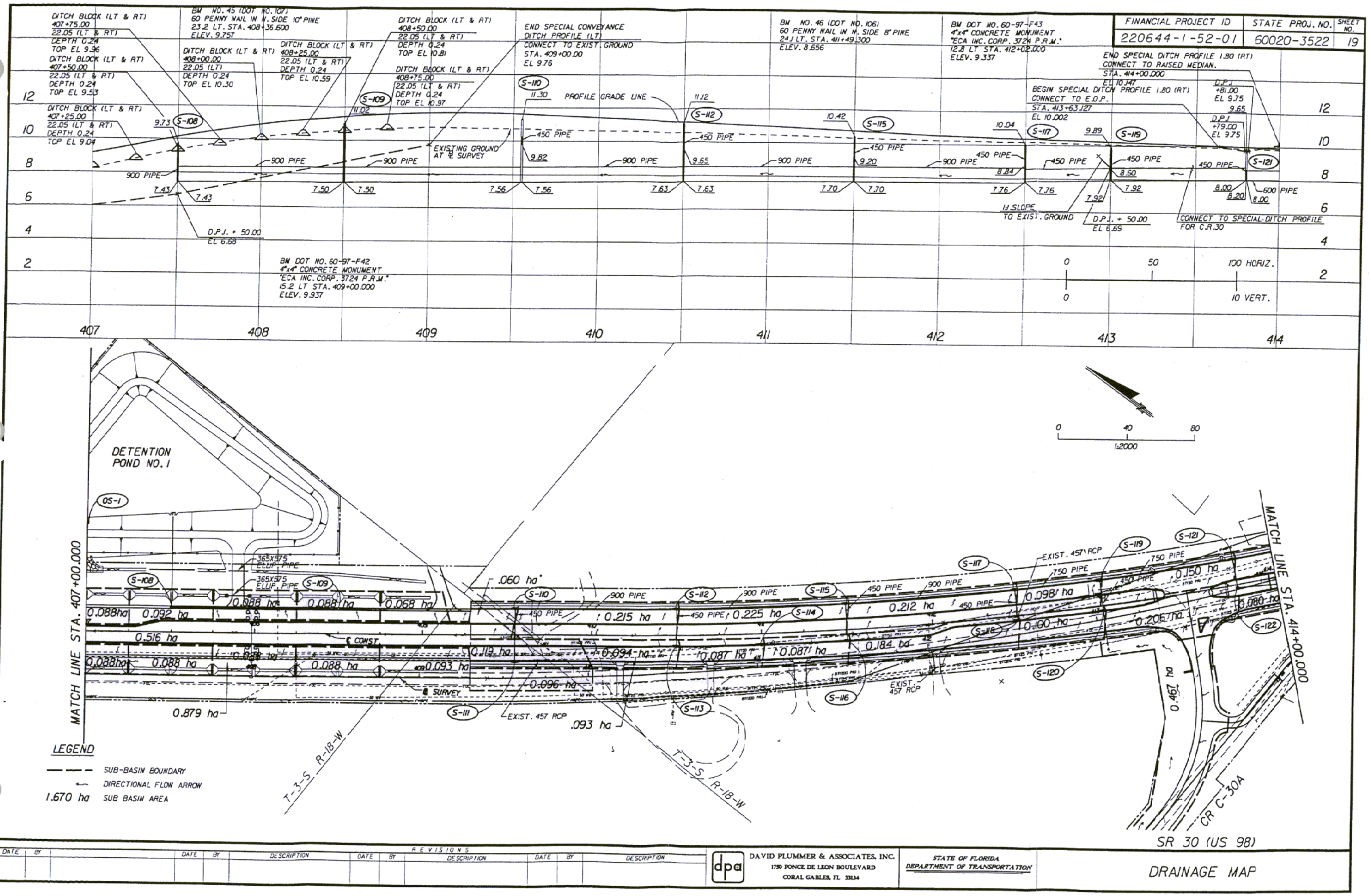
REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

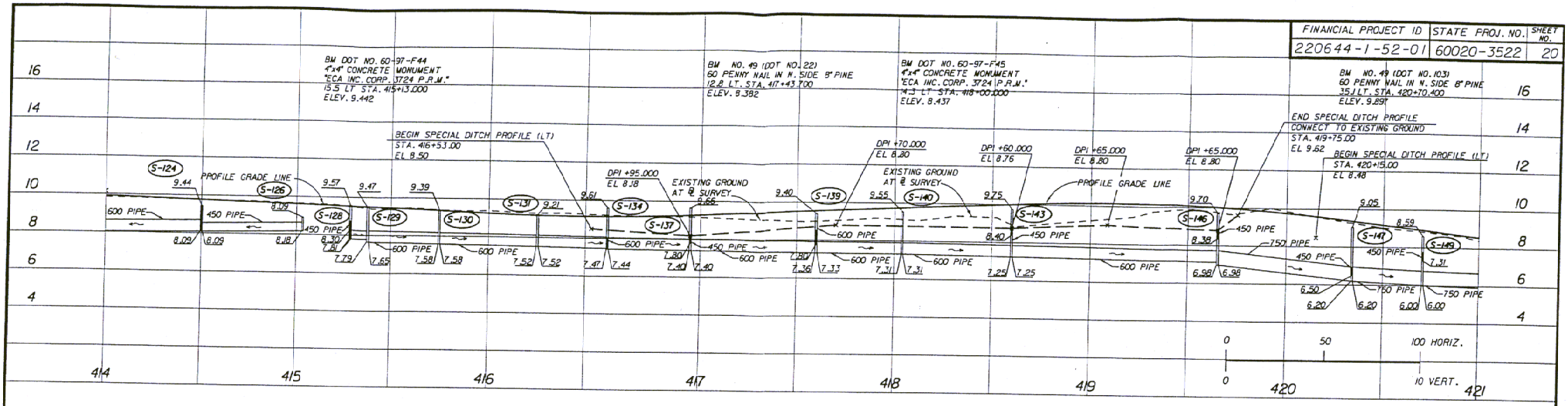
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

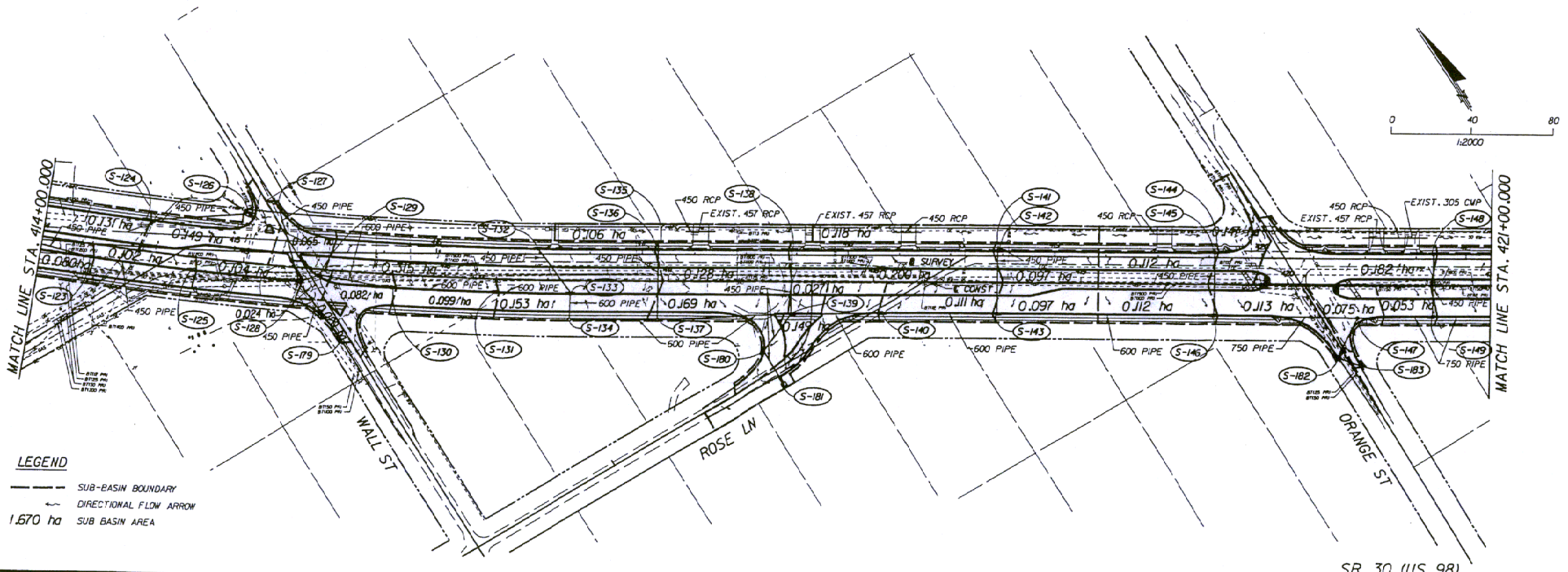
SR 30 (US 98)

DRAINAGE MAP


FINANCIAL PROJECT ID
220644-1-52-01
STATE PROJ. NO.
60020-3522
SHEET NO.
19
DETENTION POND NO. 1
MATCH LINE STA. 407+00.000
MATCH LINE STA. 414+00.000
LEGEND
SUB-BASIN BOUNDARY
DIRECTIONAL FLOW ARROW
1.670 ha SUB BASIN AREA
SR 30 (US 98)
CR C-30A
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	20



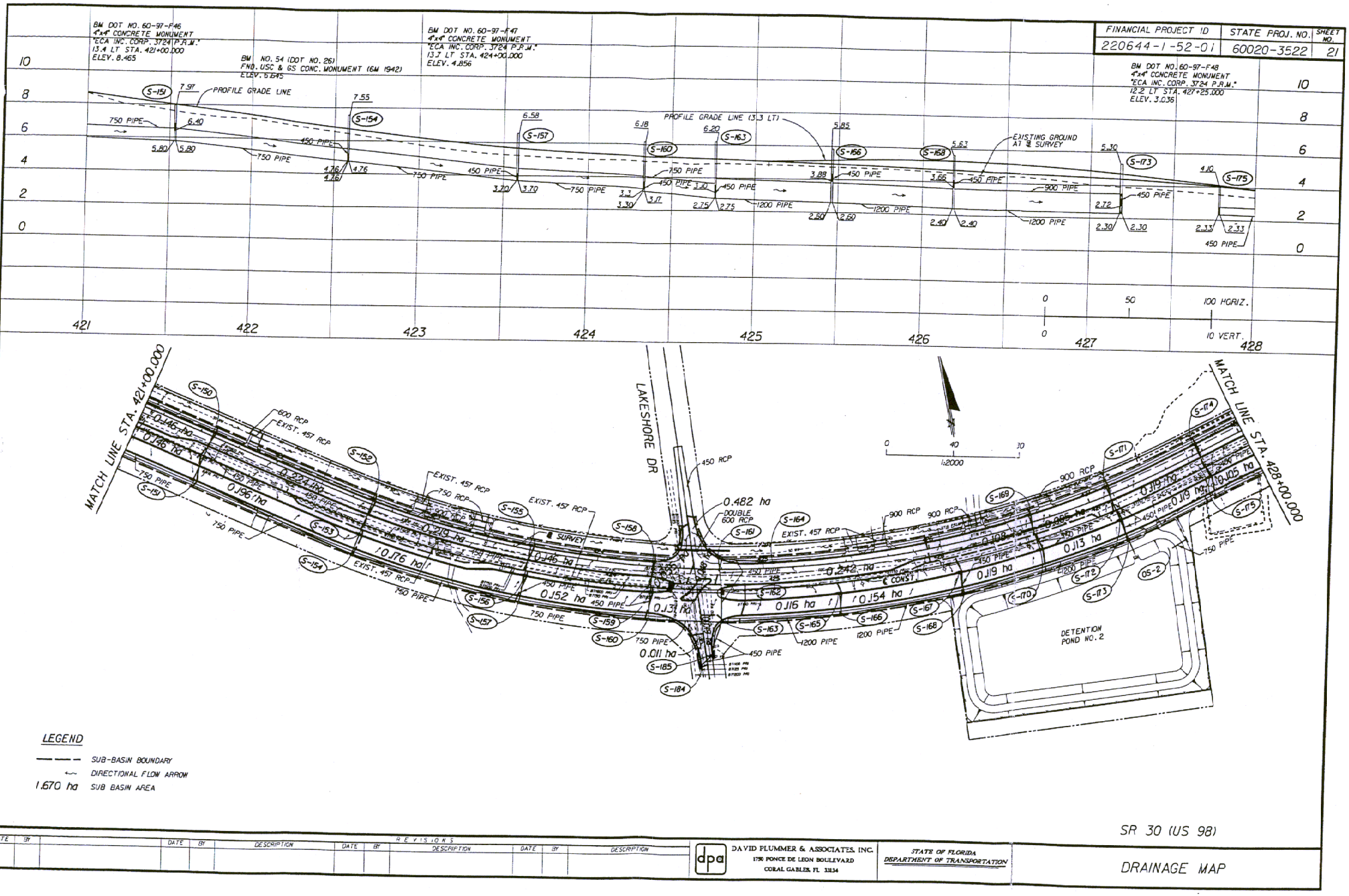


REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

DRAINAGE MAP



FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	21

REVISIONS

DATE	BY	DESCRIPTION

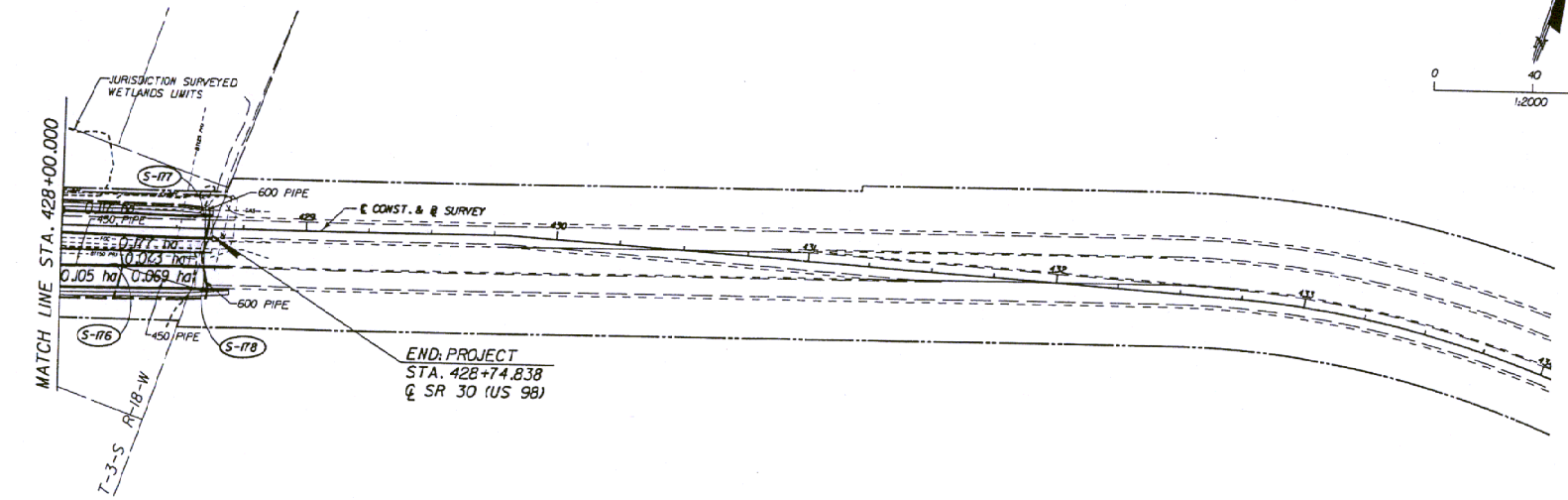
DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

SR 30 (US 98)

DRAINAGE MAP

FINANCIAL PROJECT ID	STATE PROJ. NO.	SHEET NO.
220644-1-52-01	60020-3522	22



REVISIONS								
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

DAVID PLUMMER & ASSOCIATES, INC.
1750 PONCE DE LEON BOULEVARD
CORAL GABLES, FL 33134

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

SR 30 (US 98)

DRAINAGE MAP

DRAINAGE REPORT
SR 30 (US 98)

TABLE OF CONTENTS
VOLUME I OF II

I PROJECT NARRATIVE

Introduction	I-2
Existing Conditions	
Roadway	I-2
Project Location Map	I-3
Topography	I-5
Soils	I-5
Flood Zones	I-5
Proposed Conditions	
Drainage Concept	I-6
Proposed Roadway Grades	I-6
Open Channel Hydraulics	I-7
Culvert Hydraulics	I-8
Storm Drain Hydrology and Hydraulics	I-9
Pavement Hydraulics	I-9
Stormwater Management	I-9
Optional Culvert Materials	I-10

II CALCULATIONS

II-1 Open Channel Hydraulics

Retention Ditch Calculations	II-3
Ditch Blocks/Overflow Structures Calculations	II-12
Conveyance Ditch Calculations	
Onsite Ditch Calculations	II-20
Offsite Ditch Calculations	II-23

II-2 Culvert Hydraulics

Cross Drain Analysis	
Basin Maps	II-30
Existing Cross Drain Analysis	II-36
Proposed Cross Drain Anaysis	II-76
Figures and Charts	II-116
Median Crossover Drain Calculations	II-121
Side Drain Calculations at Offsite Ditch	II-131



TABLE OF CONTENTS
VOLUME I OF II
Cont.

II-3 Storm Drain Calculations II-136

II-4 Pavement Hydraulics II-148

II-5 Stormwater Management II-169

II-6 Optional Material Analysis II-182

III EXHIBITS

III-1 Drainage Maps

III-2 USGS Quadrangle Maps

III-3 Report of Geotechnical Explorations

I

Project Narrative

I. INTRODUCTION.

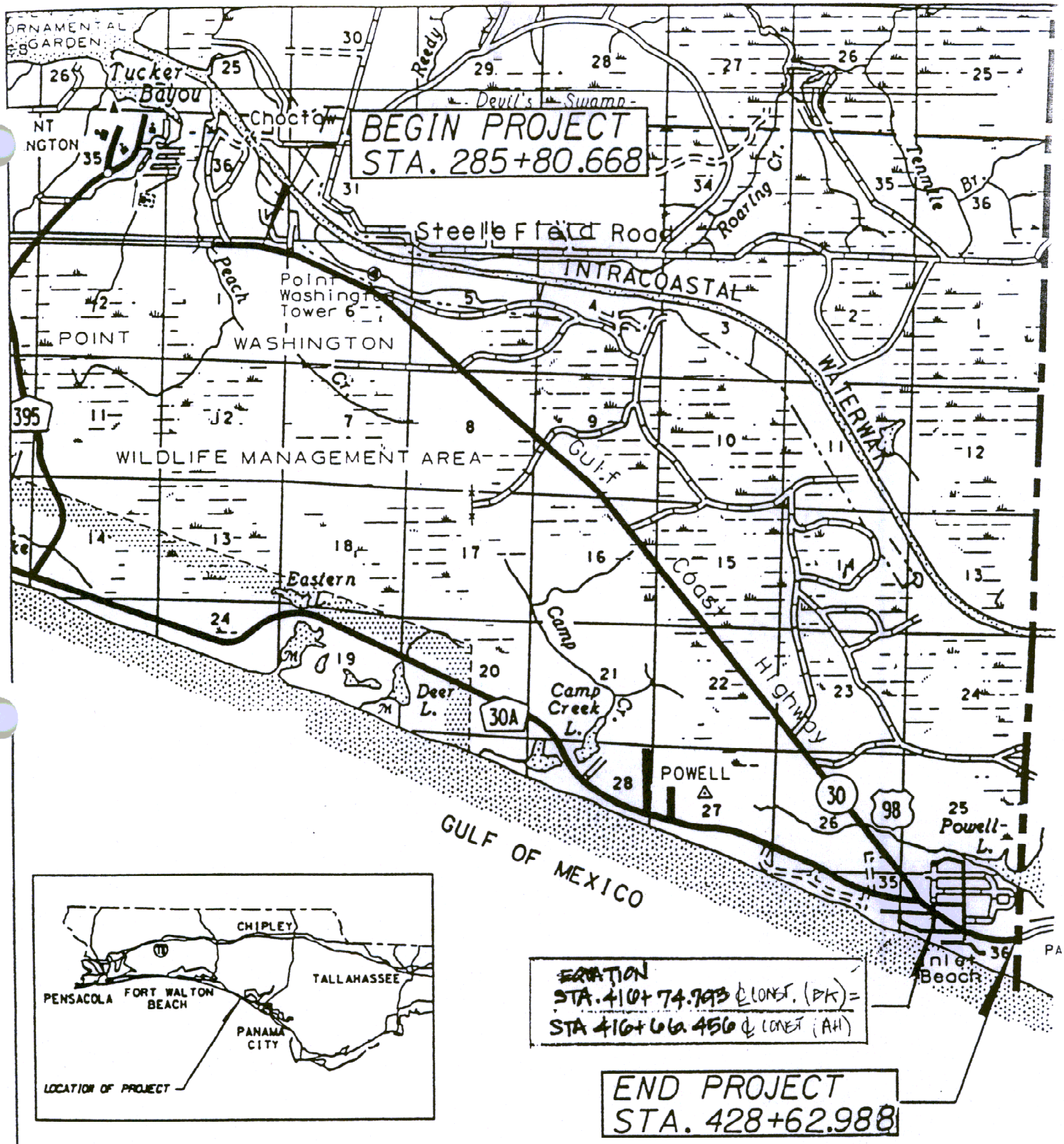
The proposed improvements for SR-30 (US-98) in Walton County consist of re-constructing the existing two-lane rural facility into a four-lane, divided highway. The limits of this project extend easterly from a point located approximately 250 meters east of Peach Creek (Sta. 285+80.668) to the Bay County - Walton County boundary line (Sta. 428+62.988) (See Location Map on Page No. 3). The total length of the project is 14.291 kilometers. The proposed roadway will generally follow the horizontal alignment of the existing facility, and will consist of a divided rural section for the first 12.347 kilometers to the entrance of Inlet Beach, where it will convert into a divided urban section highway for the last 1.943 kilometers. It is anticipated that in the future the roadway facility will be expanded to the inside to upgrade it to six lanes.

II. EXISTING CONDITIONS.

A. Roadway.

The existing roadway consists of a rural section with a crowned pavement measuring approximately 7.3 m wide and stabilized grassed shoulders measuring approximately 3.0 m wide on each side. The roadside ditches vary in depth from 0.6 to 0.9 m, with a standard bottom width of 0.9 m. The portion of the road from the beginning of the project to the entrance of Inlet Beach drains into roadside ditches that convey the stormwater runoff in a positive manner to cross drains located at 13 different locations along the project. The cross drains are constructed at places where creeks, channels and wetlands intersect the road. Most of the runoff conveyed by the cross drains is generated in the offsite which consists mostly of wooded flatlands with high stormwater storage. A relatively small portion of the total runoff carried by the cross drains, is generated in the existing roadway as it sheetflows from the existing pavement into the roadside ditches. The locations of the existing cross drains, as well as the extent of the roadway that contributes drainage to them, are indicated in the following table:

Cross Drain Description (Size in mm)	**Location (Sta. CL Const.)**	**Existing Roadway Draining to Cross Drain (From Sta. To Sta.)**
---	---	Begin of Project to 302+73
Single 750	307+35	302+73 to 310+35
Double 750	313+83	310+35 to 319+44
Single 750	323+22	319+44 to 326+22
Single 750	328+12	326+22 to 329+91
Double 750	331+29	329+91 to 340+68



PROJECT LOCATION MAP

Cross Drain Description (Size in mm)	Location (Sta. CL Const.)	Existing Roadway Draining to Cross Drain (From Sta. To Sta.)
Double 750	342+98	340+68 to 345+59
Double 750	347+88	345+59 to 350+77
Quadruple 1350	354+13	350+77 to 365+58
Single 750	372+81	365+58 to 372+65
Single 750	378+55	372+65 to 380+84
Single 600	384+21	380+84 to 388+63
Double 1500	401+23	388+63 to 405+32
Single 750	405+36	405+32 to 409+13

In the Inlet Beach area (Sta. 409+13 to Sta. 428+63) the existing roadway also drains into roadside ditches. The ditches in this portion convey only the runoff from the highway and from insignificant areas immediately adjacent to the right of way, except for a segment located between Sta. 420+00 and Sta. 428+63, where the offsite land to the left of the roadway contributes runoff to the ditch (See Section IV, "Open Channel Hydraulics, Offsite Ditch Calculations").

The topography of Inlet Beach creates four main points of discharge for the existing ditches:

1. The left ditch between Sta. 409+13 and Sta. 420+00 drains into an undeveloped, depressed area located between Sta. 415+25 and Sta. 417+00 (Lt), with eventual discharge into Powell Lake to the north.
2. The left ditch between Sta. 420+00 and Sta. 428+63 drains into a wetland located at the eastern end of the project. The limits of the wetland begin at approximately Sta. 427+25 (Lt.). The wetland eventually discharges into Powell Lake through a ditch located approximately 300 m beyond the east end of this project.
3. The right ditch between Sta. 409+13 and Sta.420+00 drains into undeveloped, depressed areas located between Sta. 411+00 and Sta. 414+00 (Rt.) and north of County Road C-30A. The flow crosses underneath C-30A through an existing culvert located approximately 300 m from the intersection of SR-30, and eventually discharges into the Gulf of Mexico.
4. The right ditch between Sta. 420+00 and Sta. 428+63 drains into an existing wetland located at the eastern end of the project. The limits of the wetland begin at Sta. 427+25 (Rt.), approximately, just west of an existing gas substation. The wetland drains through an existing culvert and channel located approximately 300 m from the eastern end of the project.

B. Topography

Topographic surveying data was collected by Emerald Coast Associates, Inc. and is presented in the form of cross sections every 50 meters in the Roadway Plans.

Another source of information, particularly for the offsite, were Quadrangle Maps, by the United States Department of the Interior, Geological Survey (USGS). The following maps are reproduced in Section III-2 for reference: "Point Washington, Florida," photorevised 1976, and "Seminole Hills, Florida", 1982.

C. Soils.

According to the Soils Conservation Service (SCS) Soil Survey of Walton County (1984), the following soils, with corresponding characteristics and classifications, exist along this project:

Soil Name	USDA Texture	AASHTO Classification
Dorovan	Muck	----
Foxworth	Fine Sand	A-3, A-2-4
Kureb	Coarse Sand	A-3
Leon	Fine Sand	A-3, A-2-4
Rutledge	Fine Sand	A-2, A-3
Mandarin	Fine Sand	A-3
Hurricane	Fine Sand	A-3
Pickney	Sand	A-2
Garcon	Loamy Fine Sand	A-3, A-2-4

In August of 1994 auger borings were taken throughout the project by Williams Earth Sciences, Inc. The results, descriptions, and water table depths are shown in the cross-sections portion of the roadway plans.

D. Flood Zones.

According to Flood Insurance Rate Maps, by the Federal Emergency Management Agency (FEMA), practically the entire corridor is located in areas subject to minimal flooding (Zone C). Areas located where creeks and bogs intersect the road, are subject to flooding during the 100 year storm (Zone A). The 100 year base flood elevations and flood hazard factors, have not yet been determined by FEMA. (Walton County Community Panel Numbers 120317 0355D, August 3, 1992; 120317 0360C, April 30, 1986; and, 120317 0370D, August 3, 1992).

III. PROPOSED CONDITIONS

A. Drainage Concept: Quality, Quantity, and Environmental Aspects.

Presently, throughout the length of the project, the runoff from the existing pavement sheeflows directly into roadside ditches without quality treatment. In the proposed rural segment of the project, the first flush of runoff (0.5 inches) will be intercepted and retained in continuous roadside grassed swales, where it will be allowed to infiltrate into the ground. For storms which yield runoff quantities greater than 0.5 inches, the excess stormwater will overtop the outside berm of the swales and will discharge into the outside conveyance ditches. The embankment will be protected at the overflow points by concrete ditch lining, shaped in the form of trapezoidal weirs.

In the rural segment of the project, thirteen cross drains convey offsite and onsite drainage flows across the existing roadway. Such drains will be replaced with hydraulically equivalent pipes which will be located at the new low points of the proposed profile. Such low points nearly coincide with the locations of the existing cross drains.

By ending the outside conveyance ditches at the boundaries of marshes and swamps wherever possible, impacts to the wetlands will be minimized: the flowline at the end of the ditches will coincide with the natural ground elevation at the limits of the wetlands, as to allow the conveyed stormwater to spread across the land at that point.

In the proposed urban portion of the project, the runoff will be collected by two networks of storm drains which will transport the runoff into two dry ponds. The ponds will retain the quality volume and will also supply sufficient additional storage to ensure that the quantity discharge rate in the post-development is always equal or less than in the pre-development. The ponds will be furnished with outfall structures that will discharge into nearby channels and wetlands.

B. Proposed Roadway Grades

For four-lane roadways of primary importance, the minimum standard roadway base clearance should be between 2-3 feet (0.61m to 0.91m) (FDOT Drainage Manual, Figure 6-1), as measured from the Design High Water Elevation (DHW). For this project, the DHW used is the August 1994 water table elevation, because particularly wet conditions occurred during that year (also considering additional high water data from the SCS Soil Survey), the water table encountered during the geotechnical survey by Williams Earth Sciences, Inc, was representative of seasonal high water levels. The left and right Profile Grade Lines (PGL) were then established based on protecting the base by providing a minimum clearance of 0.61 m from the DHW to the low point of the base.

C. Open Channel Hydraulics

Quality

Quality Volume Calculations. Detention Ditches (Right, Left, and Median): The detention ditches were designed to intercept and infiltrate the first 0.5 inch of runoff from the contributing sub-basin, according to Chapter 62-25 (FAC), Section 62-25.035 (Stormwater General Permits), of the Department of Environmental Protection (DEP). The typical sub-basin widths for calculating quality volumes in the rural segment are 19.2 m (each side) for the roadside retention ditches, as measured from the PGL to the middle of the retention ditch berm. This width includes two travel lanes (each side), the shoulder, and the retention swale area. When the roadway is expanded to 6 lanes (3 lanes each side), the retention ditches will be re-graded to have side slopes of 1: 6 to create additional storage to accommodate the increased sub-basin area. The medians are used as retention areas only at superelevated sections, where the full width of the travel lanes drain into it. Additional ditch blocks and/or modification of the existing ones will be necessary when the roadway is expanded to 6 lanes.

The procedure for the analysis was as follows: the PGL was divided into sections of different slope, taking into account the special ditch profiles. The drainage areas were computed using a varying width depending on whether the roadway was in superelevation. For each sub-basin a required storage volume was computed. By trial and error a larger provided storage was determined by altering the height of the ditch block and/or its location. The storage was also dependent on the shape of the ditch and the slope configuration of the basin. The ditch bottom inlets at the cross drains in the median were raised to act as ditch blocks to provide the required retention. See Section II-1, "Open Channel Hydraulics, Retention Ditch Calculations" for the design and location of roadside retention and median ditch blocks and volumes.

Quantity

Quantity Volume Calculations. Retention Ditches (Right, Left): According to the Florida Department of Transportation Drainage Manual, Volume 1, the roadside ditches are to be designed to convey, without damage, the stormwater flow produced by a 10-year frequency storm event. The procedure for the analysis was as follows: the PGL was divided into sections of different slope, taking into account the special profiles. The drainage areas were computed. The runoff coefficient was calculated as C=0.54 for the typical roadway [total width=19.2 m, out of which 8.7 m are paved (C=0.95) and 10.5 are grassed (C=0.20)]. Times of concentration of 10 minutes were used. The rain intensities for the 10-year storm for each sub-basin were computed from FDOT Drainage Manual,

table 5-2, Zone 1. The rational equation Q=CIA was used to compute the flow in the sub-basin. The weir equation Q = CLH^½ was used to obtain the flow depths over the overflow weir. The maximum depth of flow was evaluated to ensures that the discharge will only occur over the concrete overflow weir, protecting the stability of the embankment from eroding. See the Overflow Structure Details in the Roadway Plans. See also the Section II-1, "Open Channel Hydraulics, Ditch Blocks/Overflow Structures Calculations" for the ditch designs.

Offsite Ditch Calculations (Left Ditch, Sta. 420+00 to 427+50): There is a segment of highway located between Sta. 420+00 and Sta. 428+60, where the offsite land to the left of the roadway contributes runoff to the ditch. A special ditch section was designed to convey the offsite and onsite flows from the 10 year storm event. The section begins at the intersection of Orange Street (Sta. 420+00) and ends at the fringes of a wetland (Sta. 427+50). (See Section II-1, "Open Channel Hydraulics, Offsite Ditch Calculations").

D. Culvert Hydraulics

Cross Drains: The 13 existing cross drains in the rural segment of the road will be replaced with hydraulically equivalent culverts. In order to determine equivalency between the existing and proposed cross drains, the existing and proposed cross drains were analyzed for the 50 and 100 year storm event, then the peak stages were compared for similarity. The 500 year flows were calculated for the "Greatest Flood". The standard Culvert Hydraulics procedure of Chapter 8, FDOT Manual Vol. 2A, was used. Inlet and Outlet mode of control were analyzed utilizing the computer program from the Florida Department of Transportation (FDOT) "Hydraulic Design of Culverts". When the 500-year flood stage was above the top of the road, an Overtopping Flood was computed with controlling height being the top of the road. The 50 year flood stage did not encroached into the travel lanes in any of the cross culverts, neither the 100 year flood encroached beyond ½ the highest travel lane.

Because of clearance between the top of the pipes and the proposed median and retention ditches, and in an effort to keep the flowline elevations as similar as possible to the existing cross drains, elliptical concrete pipes were used in some instances. Such pipes are equivalent to the round pipes obtained in the calculations.

The hydrology of the basins was typical for wooded lands with high storage potential, sloping at rates of 0.1 to 0.4%, with overland velocities of flow between 20 and 22 feet per minute. Basin boundaries were determined utilizing USGS Maps, aerial photographs, SCS Soils Maps, and field observations. Observed high water stains were considered for establishing tailwater elevations.

See Section II-2, "Culvert Hydraulics - Cross Drain Analyses" for the analysis and calculation of each drain crossing. The locations and results from the cross drain analyses are also summarized in the Flood Data table

on the first sheet of the Drainage Maps.

Median Crossover Drains: Culverts were provided at each of the median opening locations. Calculations for the drains were based on the 10 year storm event. With the FDOT program "Hydraulic Design of Culverts", the inlet headwater elevation was analyzed to ensure that there would be no overtopping of the crossing. Equivalent elliptical concrete pipes were used because of cover constraints. See Section II-2, "Culvert Hydraulics, Median Crossover Drain Calculations".

E. Storm Drain Hydrology and Hydraulics

Storm Drains: The storm drains were designed according to FDOT Drainage Manual Chapter 10. The storm event utilized was the 3-year recurrence interval, which is the standard criterion for general design of storm sewers. Ten-minute times of concentration were used for each inlet. Coefficients of runoff used were C=0.95 for asphalt and C=0.15 for pervious areas, since the existing soils in this area have a high coefficient of permeability (Kureb Sand). The storm drain flows were computed taking into consideration the future roadway expansion of 6 lanes, thus the weighted runoff coefficients take into account the pavement of the future lanes. Also, the sub-basins take into account the full width of the Right of Way considering a possible inward grading of the area behind the sidewalk when the adjacent lots become developed. The storm drains were divided into two networks (numbers 1 and 2) with outfalls at ponds number 1 and 2, respectively. Through an iterative process, the networks were designed to have acceptable velocities of flow, slopes, and minimum covers (0.76m). See the Storm Drain calculations in Section II-3.

F. Pavement Hydraulics

Spread: The spread that resulted from a rainfall intensity of 4.0 inches/hour did not exceed one-half the travel lane as measured from the inside face of the curb. The spread was calculated based on the future 6 lane roadway. See Section II-4, "Pavement Hydraulics."

G. Stormwater Management

Pond Site Selection Criteria: For the location of Pond Number 1, four study areas measuring 90 m x 150 m each were considered. The preferred alternative was the site located left of the Right of Way between Sta. 406+50 and Sta. 408+00. The area measures 1.35 hectares approximately. For the location of Pond Number 2, eighteen lots were considered. The preferred alternative was a combination of three lots (Numbers 208, 209, and 210), located right of the Right of Way between Sta. 426+00 and Sta. 427+50. The area measures 1.49 hectares approximately.

See Section II-5, "Storm Water Management - Pond Site Selection Criteria" for the complete analysis.

Detention Ponds: The two storm drain networks will discharge into dry detention ponds. The purpose of the ponds will be twofold: to intercept and treat the quality volume, and to attenuate the quantity volume so that the post-development discharges are less or equal than in the pre-development. The quality volume will be 0.5 of an inch over the contributing basin area (for drainage areas see the Storm Drain Calculations and the Drainage Map). For computing pre and post-development discharges and volumes of runoff, the 100 year storm event was used, with durations of 1, 2, 4, 8, 24, 72, 168, and 240 hours (See Drainage Report, Volume II of II, Chapter 14-86 Analysis). The pre-development area for Pond Number 1 refers only to the area of the land where the pond will be constructed, since no area from the R/W where the urban section will be constructed, contributes runoff presently (See Pre-development Node Diagram for Network 1, and Input Data). The pre-development area for Pond Number 2 refers to the southern one half of the existing Right of Way, between Sta. 420+00 and Sta. 427+00 plus the area of the land where the pond will be constructed. The total width of the existing R/W is 30.48 m, therefore half would be 15.24 m. (See Pre-Development Node Diagram for Network 2, and calculations). Both ponds will be furnished with drop structure outfalls (weir/pipe combination) which will regulate the amount of discharge. Pond Number 1 will outfall onto the existing left roadside ditch at Sta. 407 (+/-), for eventual discharge into an existing channel to the left of Sta. 405+20. Such channel leads into a creek that discharges into Powell Lake. Pond Number 2 will outfall into an existing ditch located just south of an existing gas sub-station Sta. 427+60 (Rt.), for eventual discharge into a wetland to the east. Such wetland is connected to Powell Lake by a channel and a cross drain under SR-30.

Both ponds will be constructed with flat bottoms (located 0.3 m minimum above the water table), 1: 4 side slopes, and maintenance berms around the periphery. The width of the top of the maintenance berms will be 4.6 m. The inside and outside side slopes will be sodded, while the top of the maintenance berm and the bottom of the ponds will be seeded and mulched. Both ponds will be fenced (See Pond Details in roadway plans).

H. Optional Culvert Materials

An analysis was performed to evaluate the different material options for all drains. The analysis takes into consideration the performance of each material with respect to durability, structural capacity and hydraulic capacity. For durability evaluation, a total of sixteen corrosion tests were taken by Williams Earth Sciences (See Section V); one at each of the thirteen cross drains in the rural section, and three at the urban section in Inlet Beach. The cross drains in the rural section were evaluated based on a design service life of 50 years, utilizing the corresponding corrosion test for each. The storm sewers within the Inlet Beach area were evaluated for a design service life of 100 years, and all side drains were evaluated based on a design service life of 25 years. The structural evaluation was performed based on a comparison between the required minimum cover (Index 205) and the available cover. Hydraulic evaluation was based on whether the

difference in performance were significant when using equivalent sections of pipe. See Section II-6 for the "Optional Materials Analysis" for the results.

II-5

Storm Water Management

POND SITE SELECTION CRITERIA

State Road 30 (US 98) From Peach Creek to Bay County Line
State Project No. 60020-3522

A) Regulatory Requirements

1) Stormwater Quality Standards

Ponds number 1 and 2 were designed to comply with the rules of the Florida Department of Environmental Protection (Chapter 62-25 F.A.C.) which require that stormwater discharge facilities with drainage areas less than 100 acres will provide sufficient volume to treat the first one half inch of runoff from the contributing basin. The retention ponds will again provide the capacity for the given quality volume within 72 hours following the storm event. The quality volume will be recovered by the effects of percolation through the soil, evaporation, and evapotranspiration.

2) Stormwater Quantity Standards

Ponds number 1 and 2 were designed to comply with the Rules of the Department of Transportation, Chapter 14-86 F.A.C. The ponds will provide sufficient detention storage to attenuate the peak rates of post-development runoff so that they do not exceed the pre-development peak rates of runoff of the 100 year storm event during the following durations: 1 hour, 2 hours, 4 hours, 8 hours, 24 hours, 72 hours, 168 hours, and 240 hours.

B) Conveyance of Drainage to the Sites

Stormwater from the urban section will be conveyed to the pond sites by means of storm drains. The drains were sized based on the runoff generated by the 3 year storm event. The greater flows associated with the 100 year storm will exceed the capacity of the pipes, causing temporary ponding in front of the inlets, however, this ponding is not expected to encroach beyond one half of the travel lane located on the high side of the roadway cross section. The topography of the land presents a depression at approximately Station 416+00. In order to minimize the potential ponding in this depression, and to distribute the flow according to the storage capacity of each pond, while maintaining acceptable pipe sizes, flow velocities, and depths of pipe trench excavation, it was considered desirable to provide two storm drain systems; one flowing west to Pond Number 1 from Station 415+00 to Station 407+50, and another flowing east to Pond Number 2 from Station 415+00 to Station 427+10.

C) Availability of the Land

1) Pond Number 1

Four possible locations for Pond Number 1 were considered. These are identified as "Pond 1 Study Areas Number 1, 2, 3, and 4" and are located on the left and right sides of the Right of Way, between Stations 406+50 and 409+50. These study areas are un-platted portions of land measuring 150 m x 90 m and are part of larger tracts of land adjacent to SR-30 (US-98).

2) Pond Number 2

Eighteen lots were considered for the possible location of Pond Number 2. These lots are located to the left and right of the Right of Way, between Lakeshore Drive (Station 424+50) and the end of the project (Station 428+50). The number of the lots, as they appear in the plat are: 159 through 168, and 205 through 212.

D) Suitability of the Sites.

The following parameters were used to measure the suitability of each lot or study area:

1) Existing ground elevation of the lot or study area.
2) Proposed road elevation in front of the lot or study area.
3) Pond excavation requirement based upon existing ground elevation and possible bottom elevation of proposed pond. These were classified as Low (0 to 1 m), Moderate (1 to 2 m) and High (> 2 m).
4) Depth to the water table as measured from the existing ground.
5) Potential pond type, whether dry or wet, based on the elevation of the water table, the PGL elevation of the road, and the invert of the last pipe discharging into the pond.
6) Wetlands on the site. Partial or total coverage of the lot or study area.
7) Existing building structures on the lots or study areas.
8) Distance of the lot or study area to the outfall point. In the case of Pond Number 1, the distance was measured to an existing receiving channel located at Station 405+20. For Pond Number 2, the distance considered was measured from the lot to the lowest point of the PGL, which coincides with the end of the project, implying total catchment of project runoff when the distance is zero.

The suitability of each lot or study area is listed in the Appendix in the tables labeled "Suitability of Sites".

E) Availability of Outlet Points

Excess flow water from Pond Number 1 would outfall into an existing channel that crosses the roadway at Station 405+20. The direction of the flow in this channel is to the Northeast with eventual discharge into Powell Lake.

Excess flow water from Pond Number 2 would outfall into a natural wetland located south, west, and east of the existing gas substation at Station 427+50 (approximately). Such wetland drains through an existing cross drain under SR-30 located at Station 41+00 (State Project No. 46010-3538). The direction of the flow through this cross drain is to the North, with eventual discharge into Powell Lake.

F) Soil infiltration Capabilities

Preliminary in situ testing and the Soil Survey of Walton County, indicate that all the lots and study areas considered in this study, are located within soils classified as Kureb and Mandarin Sands, which are soils with excellent infiltration capacities. The Geotechnical Engineer (Williams Earth Sciences), has recommended evaluating the selected sites with open-bottom, cased-borehole exfiltration tests to determine the horizontal and vertical conductivity of the soil. The number of tests per pond recommended by the Geotechnical Engineer is one per every half acre of pond area (See Williams Earth Sciences letter of January 14, 1997 in the Appendix).

G) Type of Facilities Proposed

Based on the preliminary hydraulic conductivity of the soils (SCS Soil Survey of Walton County), and using the computer hydraulic modeling program ADICPR, the following facilities are proposed:

1) Pond Number 1: A dry retention pond, located within a 1.4 hectare area. Such pond would be provided with an outfall structure, 1:4 side slopes and a perimeter maintenance berm measuring 4.6 m wide (See Roadway Plans for detail).

2) Pond Number 2: A dry retention pond, located within a 1.4 hectare area. Such pond would be provided with an outfall structure, 1:4 side slopes and a perimeter maintenance berm measuring 4.6 m wide (See Roadway Plans for detail).

H) Selected Pond Sites

1) The preferred site alternative for the location of Pond Number 1 is Study Area Number 1.

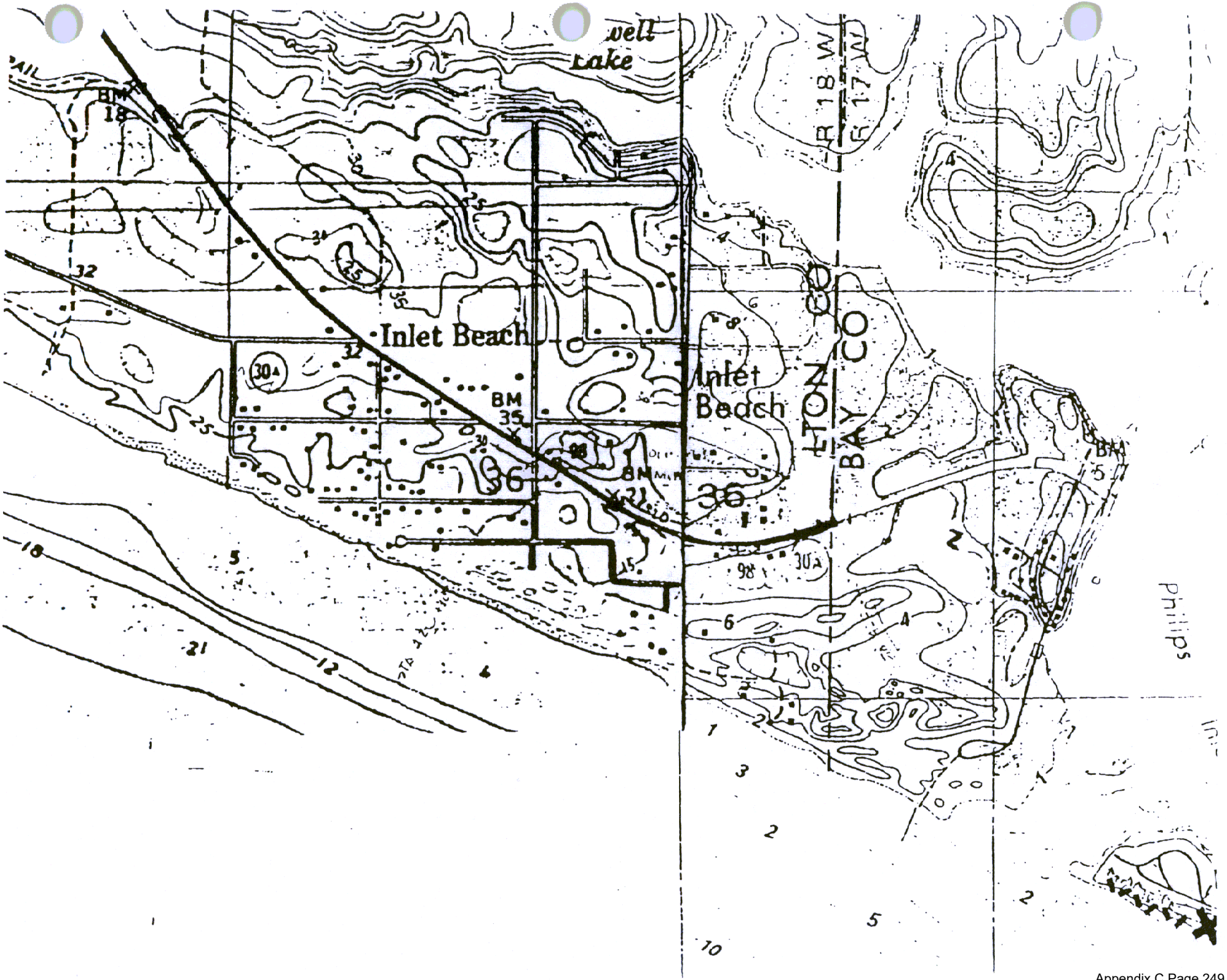
2) The preferred site alternative for the location of Pond Number 2 are lots number 208, 209 and 210.

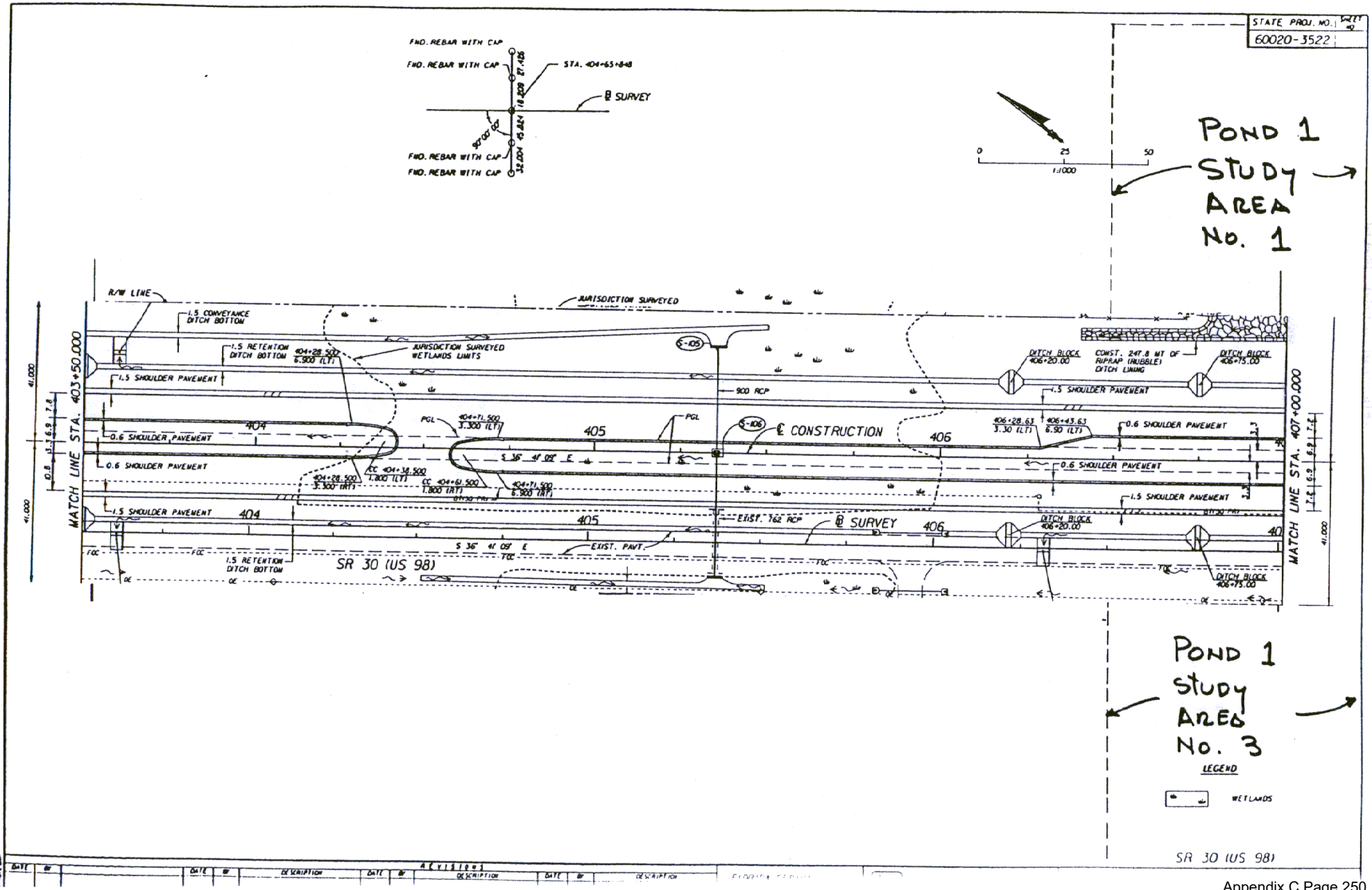
APPENDIX
TO THE POND SITE SELECTION CRITERIA

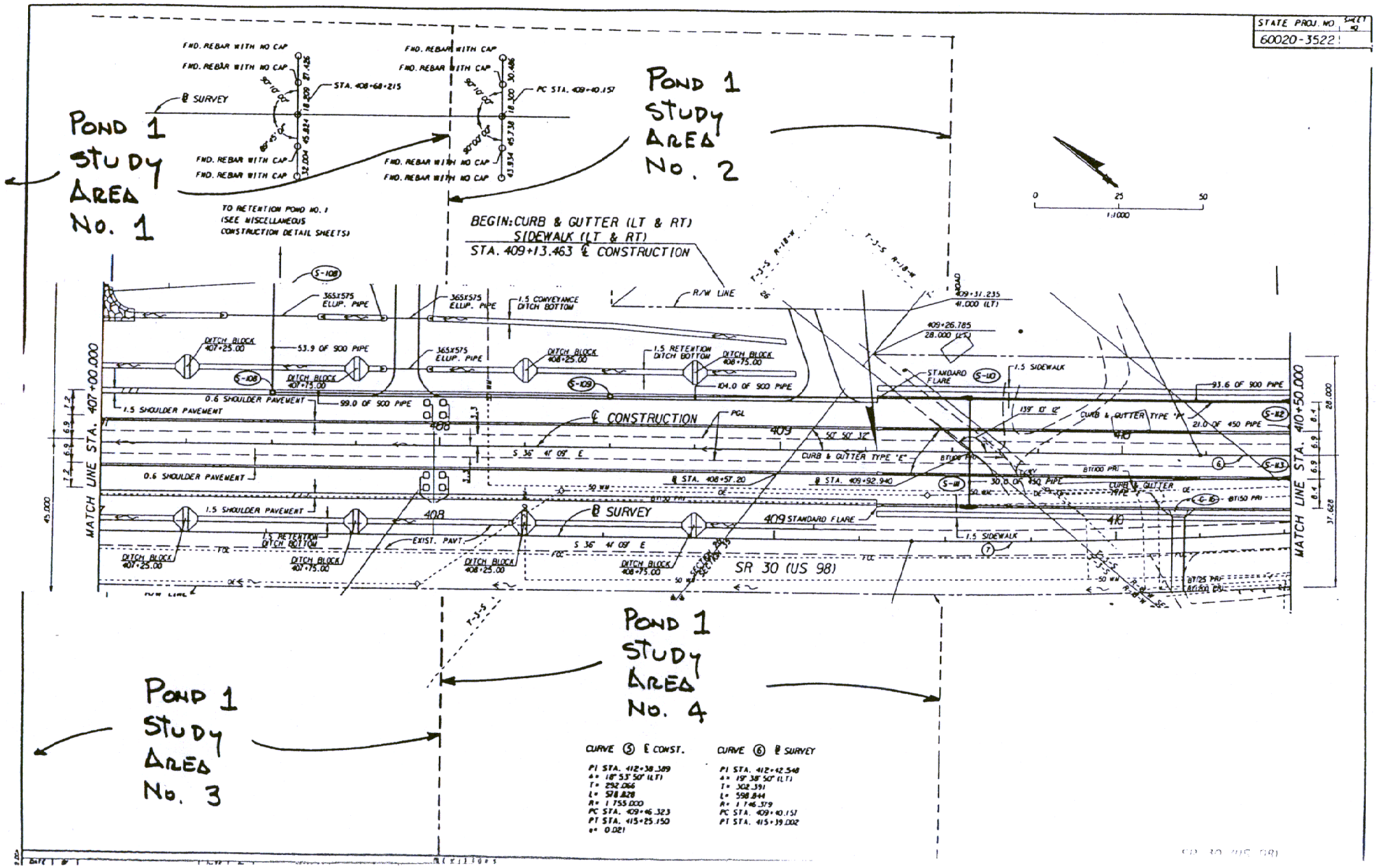
Contents:

TOPOGRAPHICAL MAP
PLANS SHOWING POND NUMBER 1 STUDY AREAS
POND NUMBER 1 "SUITABILITY OF SITES" TABLE
PLANS SHOWING POND NUMBER 2 POTENTIAL SITES
POND NUMBER 2 "SUITABILITY OF SITES" TABLE
LETTER FROM WILLIAMS EARTH SCIENCES, INC.

T- 171


well
Lake
R 18 W
R 17 W
Inlet Beach
Inlet Beach
BM
35
36
36
30A
30A
98
Phillips
T-17S

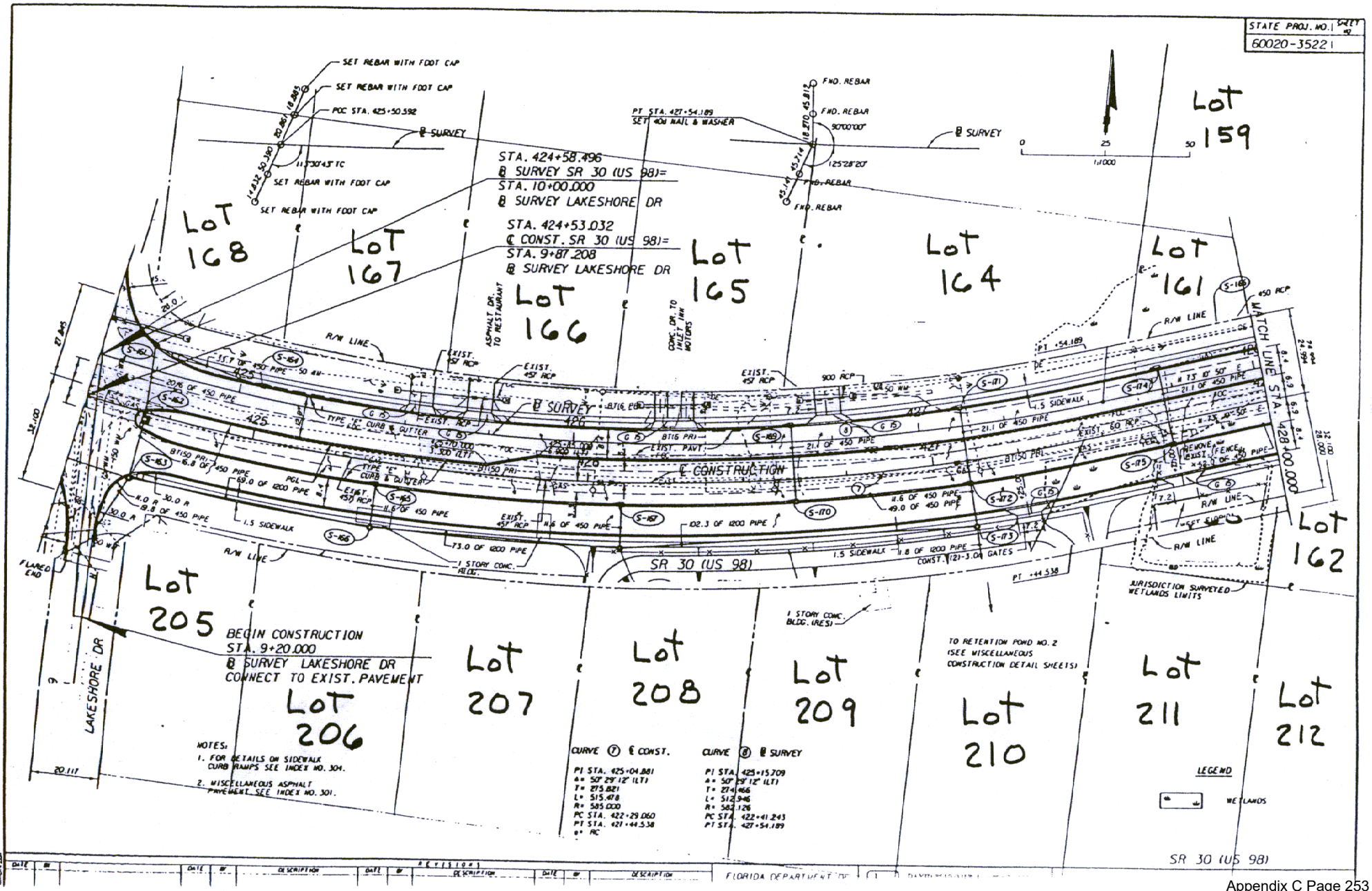

STATE PROJ. NO.
60020-3522
FND. REBAR WITH CAP
FND. REBAR WITH CAP
STA. 404+65.848
℄ SURVEY
FND. REBAR WITH CAP
FND. REBAR WITH CAP
POND 1 STUDY AREA No. 1
R/W LINE
JURISDICTION SURVEYED
1:1 CONVEYANCE DITCH BOTTOM
1:5 RETENTION DITCH BOTTOM
JURISDICTION SURVEYED WETLANDS LIMITS
1:5 SHOULDER PAVEMENT
0.6 SHOULDER PAVEMENT
MATCH LINE STA. 403+50.000
MATCH LINE STA. 407+00.000
404
405
406
S-105
S-106
900 RCP
℄ CONSTRUCTION
℄ SURVEY
EXIST. 762 RCP
EXIST. PAVT.
SR 30 (US 98)
DITCH BLOCK 406+20.00
DITCH BLOCK 406+75.00
CONST. 247.8 MT OF RIPRAP (RUBBLE) DITCH LINING
POND 1 STUDY AREA No. 3
LEGEND
WETLANDS
SR 30 (US 98)
Revisions
DATE
BY
DESCRIPTION

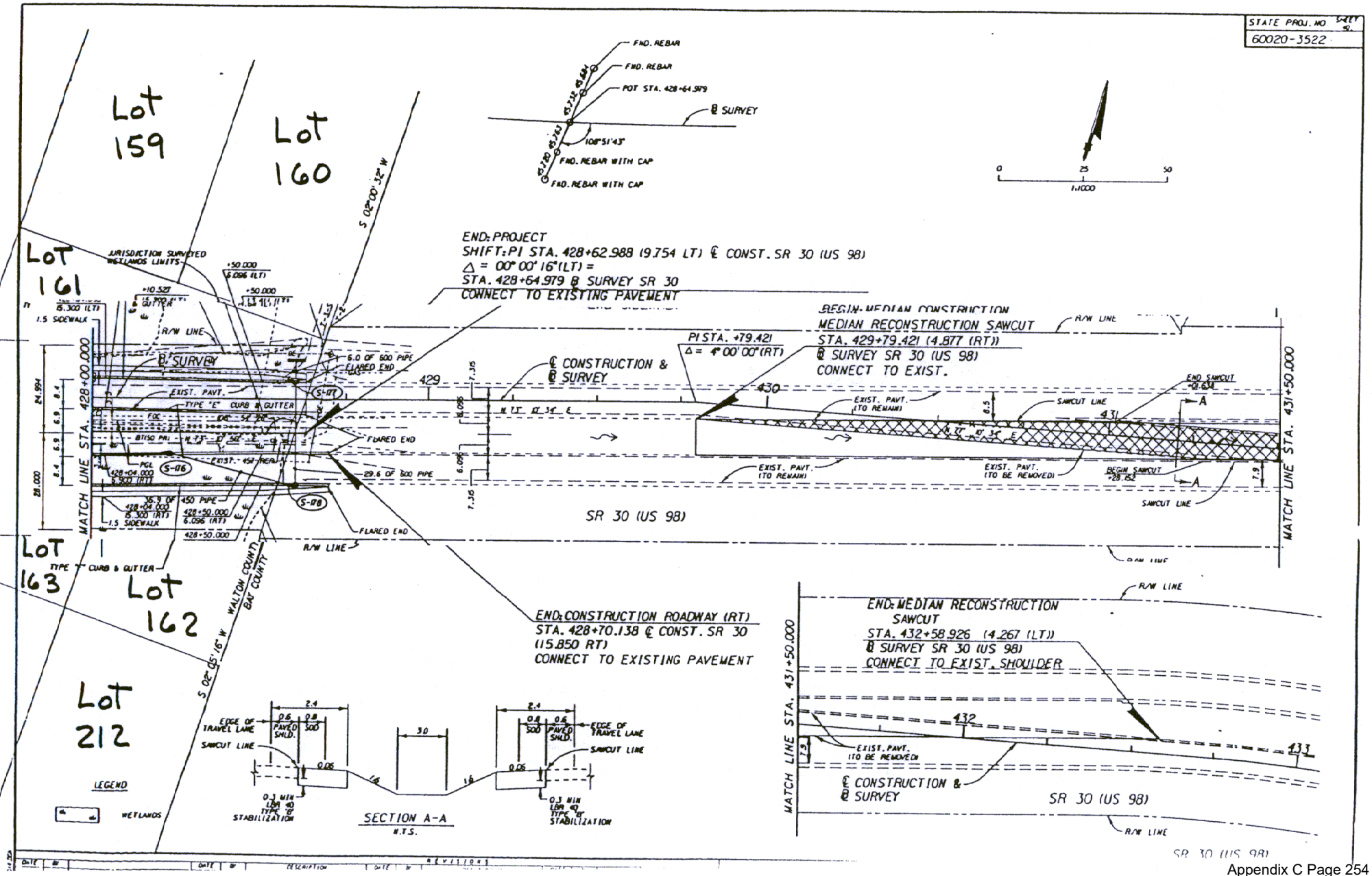

STATE PROJ. NO.
60020-3522
POND 1 STUDY AREA NO. 1
POND 1 STUDY AREA NO. 2
POND 1 STUDY AREA NO. 3
POND 1 STUDY AREA NO. 4
FND. REBAR WITH NO CAP
℄ SURVEY
STA. 408+68.215
PC STA. 409+40.157
TO RETENTION POND NO. 1 (SEE MISCELLANEOUS CONSTRUCTION DETAIL SHEETS)
BEGIN: CURB & GUTTER (LT & RT) SIDEWALK (LT & RT) STA. 409+13.463 ℄ CONSTRUCTION
R/W LINE
365X575 ELLIP. PIPE
1.5 CONVEYANCE DITCH BOTTOM
1.5 RETENTION DITCH BOTTOM
DITCH BLOCK 407+25.00
DITCH BLOCK 407+75.00
DITCH BLOCK 408+25.00
DITCH BLOCK 408+75.00
53.9 OF 900 PIPE
99.0 OF 900 PIPE
104.0 OF 900 PIPE
93.6 OF 900 PIPE
21.0 OF 450 PIPE
30.0 OF 450 PIPE
STANDARD FLARE
1.5 SIDEWALK
CURB & GUTTER TYPE 'E'
CURB & GUTTER TYPE 'A'
0.6 SHOULDER PAVEMENT
1.5 SHOULDER PAVEMENT
EXIST. PAVT.
℄ CONSTRUCTION
℄ SURVEY
℄ STA. 408+57.20
℄ STA. 409+92.940
SR 30 (US 98)
MATCH LINE STA. 407+00.000
MATCH LINE STA. 410+50.000
409+31.235
41.000 (LT)
409+26.785
28.000 (LT)
CURVE ⑤ ℄ CONST.
PI STA. 412+38.389
Δ= 18° 53' 50" (LT)
T= 292.066
L= 578.828
R= 1 755.000
PC STA. 409+46.323
PT STA. 415+25.150
e= 0.021
CURVE ⑥ ℄ SURVEY
PI STA. 412+42.548
Δ= 19° 38' 50" (LT)
T= 302.391
L= 598.844
R= 1 746.379
PC STA. 409+40.157
PT STA. 415+39.002

Pond Number 1
Suitability of Sites

Pond 1 Study Area Number	Approximate Station to Station	Side	Ground Elev. of Lot (m)	Prop. Road PGL Elev. (m)	Pond Excavation Requirement	Depth to Water Table (m)	Potential Pond Type	Wetlands On Site	Existing Structures On Site	Distance To Receiving Channel (m)
1	406+50 to 408+00	Lt	5.4 to 10.3	8.15 to 10.96	Low/Moderate	0.3 to 2.5	Dry	None	None	130
2	408+00 to 409+50	Lt	10.3 to 11	10.96 to 11.27	High	2.5	Dry	None	None	280
3	406+50 to 408+00	Rt	9.0 to10.4	8.15 to 10.96	High	2.5 to 3	Dry	None	None	130
4	408+00 to 409+50	Rt	10.4 to 10.4	10.96 to 11.27	High	2 to 2.5	Dry	None	None	200

Preferred Alternative For the Location of Pond Number 1


STATE PROJ. NO.
60020-3522
SET REBAR WITH FDOT CAP
SET REBAR WITH FDOT CAP
POC STA. 425+50.592
℄ SURVEY
SET REBAR WITH FDOT CAP
SET REBAR WITH FDOT CAP
STA. 424+58.496
℄ SURVEY SR 30 (US 98)=
STA. 10+00.000
℄ SURVEY LAKESHORE DR
STA. 424+53.032
℄ CONST. SR 30 (US 98)=
STA. 9+87.208
℄ SURVEY LAKESHORE DR
PT STA. 427+54.189
SET 40d NAIL & WASHER
FND. REBAR
FND. REBAR
FND. REBAR
90°00'00"
125°28'20"
Lot 159
Lot 168
Lot 167
Lot 166
Lot 165
Lot 164
Lot 161
Lot 162
Lot 205
Lot 206
Lot 207
Lot 208
Lot 209
Lot 210
Lot 211
Lot 212
R/W LINE
EXIST. 457 RCP
ASPHALT DR. TO RESTAURANT
CONC. DR. TO INLET IN MOTORS
EXIST. 452 RCP
900 RCP
450 RCP
MATCH LINE STA. 428+00.000
℄ SURVEY
℄ CONSTRUCTION
SR 30 (US 98)
EXIST. PAVT.
TYPE "E" CURB & GUTTER
EXIST. 60 RCP
REMOVE EXIST. FENCE
SET FLORIDA
JURISDICTION SURVEYED WETLANDS LIMITS
1.5 SIDEWALK
1 STORY CONC. BLDG. (RES.)
TO RETENTION POND NO. 2 (SEE MISCELLANEOUS CONSTRUCTION DETAIL SHEETS)
BEGIN CONSTRUCTION
STA. 9+20.000
℄ SURVEY LAKESHORE DR
CONNECT TO EXIST. PAVEMENT
LAKESHORE DR
FLARED END
CONST. (2)-3.0A GATES
PT +44.538
NOTES:
1. FOR DETAILS ON SIDEWALK CURB RAMPS SEE INDEX NO. 304.
2. MISCELLANEOUS ASPHALT PAVEMENT SEE INDEX NO. 301.
CURVE ⑦ ℄ CONST.
PI STA. 425+04.881
Δ= 50°29'12" (LT)
T= 275.821
L= 515.478
R= 585.000
PC STA. 422+29.060
PT STA. 427+44.538
℄ RC
CURVE ⑧ ℄ SURVEY
PI STA. 425+15.709
Δ= 50°29'12" (LT)
T= 274.956
L= 513.948
R= 583.126
PC STA. 422+41.243
PT STA. 427+54.189
LEGEND
WETLANDS
SR 30 (US 98)
FLORIDA DEPARTMENT OF


STATE PROJ. NO
60020-3522
Lot 159
Lot 160
Lot 161
Lot 163
Lot 162
Lot 212
FND. REBAR
FND. REBAR
POT STA. 428+64.979
℄ SURVEY
108°51'43"
FND. REBAR WITH CAP
FND. REBAR WITH CAP
S 02°00'32" W
0
25
50
1:1000
END: PROJECT
SHIFT: PI STA. 428+62.988 (9.754 LT) ℄ CONST. SR 30 (US 98)
Δ = 00° 00' 16" (LT) =
STA. 428+64.979 ℄ SURVEY SR 30
CONNECT TO EXISTING PAVEMENT
JURISDICTION SURVEYED WETLANDS LIMITS
+50.000 6.096 (LT)
+10.527
+50.000
1.5 SIDEWALK
R/W LINE
℄ SURVEY
EXIST. PAVT.
TYPE "E" CURB & GUTTER
FLARED END
EXIST. 45° HDWL
S-06
S-07
S-08
428+04.000 5.300 (RT)
428+50.000 6.096 (RT)
428+50.000
MATCH LINE STA. 428+00.000
TYPE "E" CURB & GUTTER
WALTON COUNTY
BAR COUNTY
S 02°05'16" W
℄ CONSTRUCTION & ℄ SURVEY
PI STA. +79.421
Δ = 4° 00' 00" (RT)
BEGIN MEDIAN CONSTRUCTION
MEDIAN RECONSTRUCTION SAWCUT
STA. 429+79.421 (4.877 (RT))
℄ SURVEY SR 30 (US 98)
CONNECT TO EXIST.
R/W LINE
EXIST. PAVT. (TO REMAIN)
SAWCUT LINE
END SAWCUT +01.634
BEGIN SAWCUT +28.852
EXIST. PAVT. (TO BE REMOVED)
MATCH LINE STA. 431+50.000
SR 30 (US 98)
END: CONSTRUCTION ROADWAY (RT)
STA. 428+70.138 ℄ CONST. SR 30
(15.850 RT)
CONNECT TO EXISTING PAVEMENT
END: MEDIAN RECONSTRUCTION SAWCUT
STA. 432+58.926 (4.267 (LT))
℄ SURVEY SR 30 (US 98)
CONNECT TO EXIST. SHOULDER
EDGE OF TRAVEL LANE
PAVED SHLD.
SOD
SAWCUT LINE
0.05
1.6
30
0.3 MIN LBR 40 TYPE 'B' STABILIZATION
SECTION A-A
N.T.S.
LEGEND
WETLANDS
REVISIONS
DATE
DESCRIPTION

Pond Number 2
Suitability of Sites

Lot Number	Approximate Station to Station	Side	Ground Elev. of Lot (m)	Prop. Road PGL Elev. (m)	Pond Excavation Requirement	Depth to Water Table (m)	Potential Pond Type	Wetlands On Site	Existing Structures On Site	Dist. To PGL's Lowest Point (m)
168	425+50 to 425+00	Lt	5.6 to 8.0	5.05	High	2 to 4	Dry	None	None	350
167	425+00 to 425+50	Lt	5.3 to 7.0	4.9	High	2 to 4	Dry	None	1 Sto. Small Bldg.	300
166	425+50 to 426+00	Lt	4.6 to 6.0	4.75	High	2 to 4	Dry	None	Restaurant	250
165	426+00 to 426+50	Lt	4.4 to 6.0	4.6	High	2 to3	Dry/Wet	None	Motel	200
164	426+50 to 427+50	Lt	2.5 to 5.5	4.15	Moderate	1 to 3	Dry/Wet	Partial	Restaurant	100
161	427+50 to 428+50	Lt	2.1 to 3.0	3.19	Moderate	0 to 0.5	Wet	Total	None	0
159	427+50 to 428+00	Lt	3.3 to 5.5	3.73	High	1 to 3	Wet	None	Residence	50
160	428+00 to 428+50	Lt	2.6 to 5.5	3.19	High	0 to3	Wet	None	Abandoned Residence	0
162	428+00 to 428+50	Rt	2.3 to 2.6	3.19	Moderate	0 to 0.1	Wet	Total	None	0
163	427+50 to 428+00	Rt	3.0 to 3.5	3.73	Moderate	1 to 1.5	Wet	Partial	Gas Substation	50
212	428+00 to 428+50	Rt	2.0 to 2.5	3.19	Moderate	0 to 0.5	Wet	Partial	None	0
211	427+50 to 428+00	Rt	2.0 to 2.6	3.73	Moderate	0 to 0.5	Dry/Wet	Partial	None	50
210	427+00 to 427+50	Rt	2.3 to 3.6	4.15	Low	0.3 to 1.5	Dry	None	Abandoned Residence	100
209	426+50 to 427+00	Rt	2.9 to 4.1	4.43	Low	0.5 to 1.5	Dry	None	Abandoned Residence	150
208	426+00 to 426+50	Rt	3.5 to 4.5	4.6	Moderate	1 to 2	Dry	None	None	200
207	425+50 to 426+00	Rt	4.0 to 4.6	4.75	Moderate	1.5 to 2	Dry	None	1 Sto. Small Bldg.	250
206	425+00 to 425+50	Rt	4.0 to 4.3	4.9	Moderate	1 to 1.5	Dry	None	1 Sto. Small Bldg.	300
205	424+50 to 425+00	Rt	4.0 to 4.3	5.05	Moderate	1 to 1.5	Dry	None	Residence	350

Preferred Alternative For The Location of Pond Number 2

H-1-81

RETENTION DITCH CALCULATIONS

DAVID PLUMMER & ASSOCIATES INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES • FT. MYERS • FT. LAUDERDALE • BOCA RATON

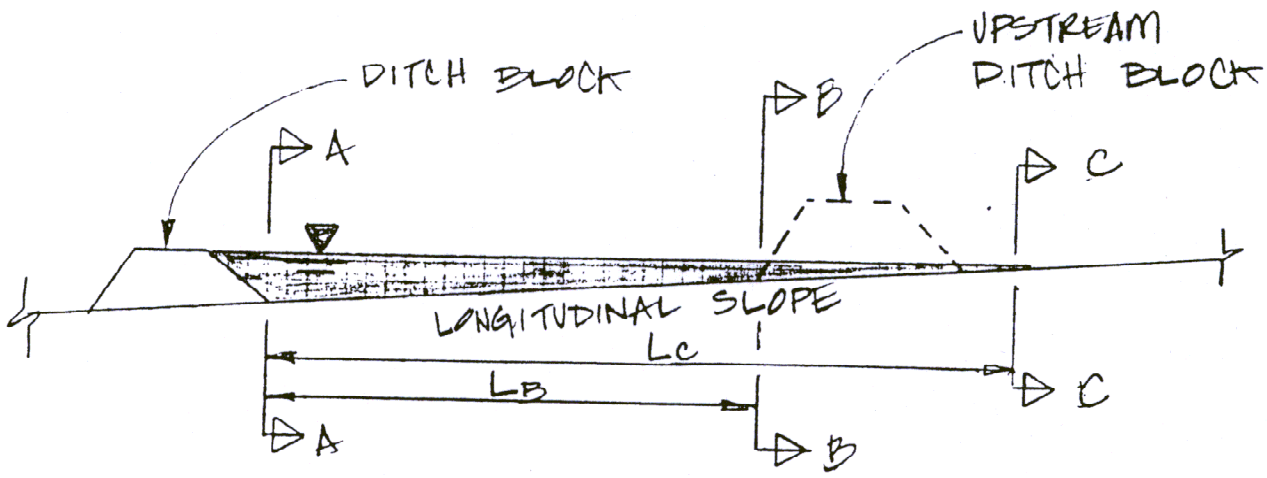
Project S.R. 30

Project No. 99126 Date 9/9/99

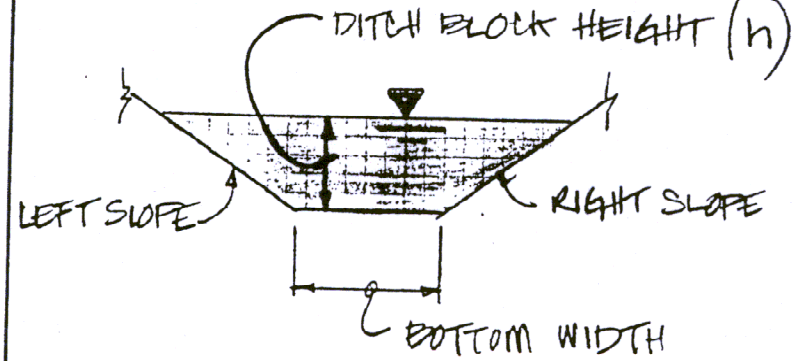
Name ARIEL MILLAN

WATER QUALITY CALCULATIONS

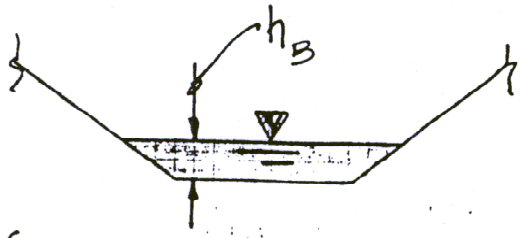
DITCH STORAGE CALCULATIONS



LONGITUDINAL SECTION

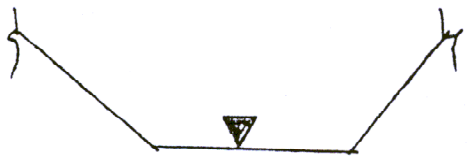


SECTION A-A



(DEPENDS ON LOCATION OF UPSTREAM DITCH BLOCK)

SECTION B-B



(NO STORAGE AT THIS POINT)

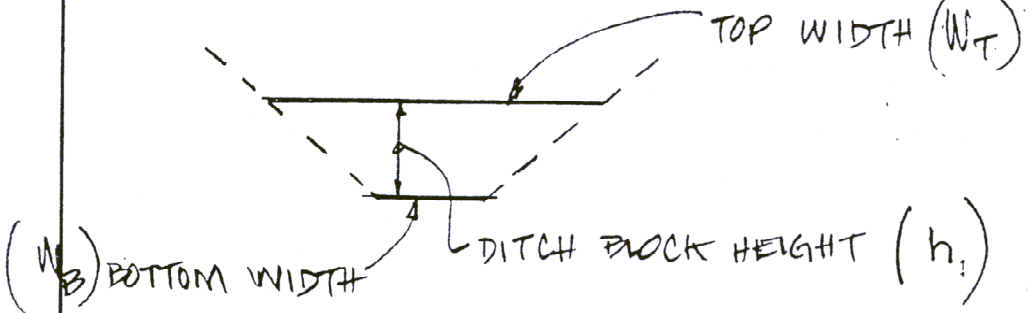
SECTION C-C

DAVID PLUMMER & ASSOCIATES INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES • FT. MYERS • FT. LAUDERDALE • BOCA RATON

Project S.R. 30
Project No. 99126 Date 9/9/99
Name ARIEL MILLAN

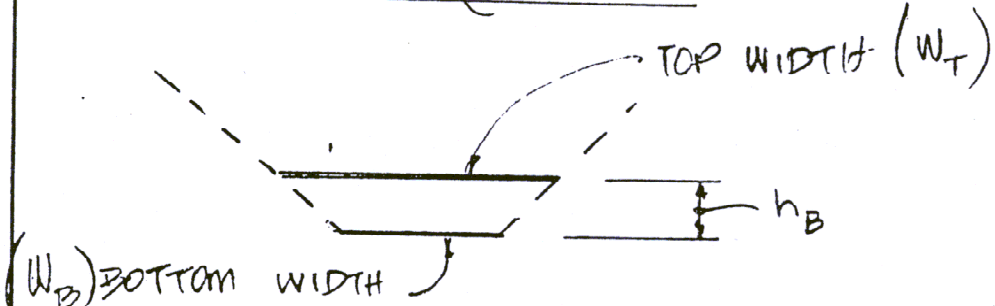
CALCULATION OF STORAGE

STORAGE AREA @ A-A:



$$A: \left(\frac{\text{BOTTOM WIDTH} + \text{TOP WIDTH}}{2}\right)(\text{DITCH BLOCK HEIGHT})$$

STORAGE AREA @ B-B:

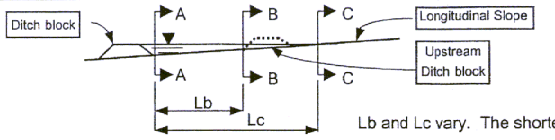


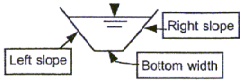
$$A: \left(\frac{\text{BOTTOM WIDTH} + \text{TOP WIDTH}}{2}\right)(h_B)$$

- BUT h_B DEPENDS ON THE LOCATION OF THE UPSTREAM DITCH BLOCK AND THE LONGITUDINAL SLOPE SUCH THAT IF $L_B \geq L_C$ THEN THE AREA OF STORAGE @ SECTION B-B = 0.

$$h_B = h - (\text{LONG. SLOPE})(L_B)$$

Water Quality Volume Calculations





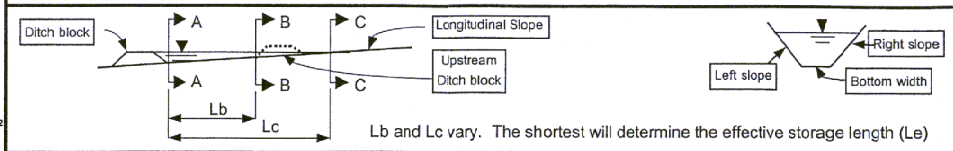
Lb and Lc vary. The shortest will determine the effective storage length (Le)

Station to Station	Contributing Area		Required Volume ($^1/_2$ in * Area)	Ditch Geometry: Station for Calculations (Section A-A)	Location of Upstream Ditch Block (Section B-B)	Long. Slope (S)	Weir Height (H_w)	Distance to Upstream Ditch Block L_b	Distance to Water Line L_c (H_w x S)	Effective Storage Length L_e	Left Slope	Right Slope	Bottom Width at Storage Section (avg.)	Area of Storage at A-A (A_1)	Area of Storage Upstream (A_2)	Retention Volume Provided $A_{ave} \times L_e = \frac{(A_1+A_2)L_e}{2}$	Approximate Total Length of Driveways or Median Openings Impacting Effective Storage Length (toe of slope to toe of slope) L_d	Volume Displaced by Driveways or Median Openings $A_{ave} \times L_d$	Total Water Quality Volume Provided
	m^2	ft^2	ft^3			ft/ft	m	m	m	ft	rise:run	rise:run	m	ft^2	ft^2	ft^3	m	ft^3	ft^3
285+80.668 to 286+60.000	1670.24	17978	**749**	Sta.285+80.668	Sta.286+60.000	0.003	0.24	79	80.00	260	1 : 8	1 : 8	1.5	8.8	0.0	1153	22	324	**829**
286+60.000 to 287+65.000	1852.26	19938	**831**	Sta.286+60.000	Sta.287+65.000	0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
287+65.000 to 288+70.000	1844.77	19857	**827**	Sta.287+65.000	Sta.288+70.000	0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
288+70.000 to 290+00.000	2271.33	24448	**1019**	Sta.288+70.000	Sta.290+00.000	0.0015	0.24	130	160.00	426	1 : 8	1 : 8	1.5	8.8	0.9	2075	0	0	**2075**
290+00.000 to 292+00.000	3502.71	37703	**1571**	Sta.290+00.000	Sta.292+00.000	0.0015	0.24	200	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	21	304	**2013**
292+00.000 to 293+00.000	2028.60	21836	**910**	Sta.292+00.000	Sta.293+00.000	0.0035	0.24	100	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	**993**
293+00.000 to 293+80.000	1684.74	18134	**756**	Sta.293+00.000	Sta.293+80.000	0.0035	0.24	80	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	16	232	**761**
293+80.000 to 294+70.000	1775.17	19108	**796**	Sta.293+80.000	Sta.294+70.000	0.0035	0.24	90	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	14	203	**790**
294+70.000 to 295+65.000	1668.93	17964	**749**	Sta.294+70.000	Sta.295+65.000	0.0035	0.24	95	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	**993**
295+65.000 to 296+90.000	2189.45	23567	**982**	Sta.295+65.000	Sta.296+90.000	0.0025	0.24	125	96.00	315	1 : 8	1 : 8	1.5	8.8	0.0	1390	0	0	**1390**
296+90.000 to 298+15.000	2189.17	23564	**982**	Sta.296+90.000	Sta.298+15.000	0.0025	0.24	125	96.00	315	1 : 8	1 : 8	1.5	8.8	0.0	1390	0	0	**1390**
298+15.000 to 299+30.000	2014.16	21680	**903**	Sta.298+15.000	Sta.299+30.000	0.0025	0.24	115	96.00	315	1 : 6	1 : 6	1.5	7.6	0.0	1195	0	0	**1195**
299+30.000 to 299+75.000	788.15	8484	**353**	Sta.299+30.000	Sta.299+75.000	0.01	0.24	45	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
299+75.000 to 300+05.000	519.82	5595	**233**	Sta.299+75.000	Sta.300+05.000	0.01	0.24	30	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
300+05.000 to 300+35.000	513.04	5522	**230**	Sta.300+05.000	Sta.300+35.000	0.01	0.24	30	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
300+35.000 to 300+65.000	525.43	5656	**236**	Sta.300+35.000	Sta.300+65.000	0.01	0.24	30	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
300+65.000 to 300+95.000	525.43	5656	**236**	Sta.300+65.000	Sta.300+95.000	0.01	0.24	30	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
300+95.000 to 301+25.000	526.37	5666	**236**	Sta.300+95.000	Sta.301+25.000	0.01	0.24	30	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
301+25.000 to 301+55.000	615.28	6623	**276**	Sta.301+25.000	Sta.301+55.000	0.01	0.24	30	24.00	79	1 : 8	1 : 8	1.5	8.8	0.0	348	0	0	**348**
301+55.000 to 302+00.000	949.73	10223	**426**	Sta.301+55.000	Sta.302+00.000	0.0086	0.24	45	27.91	92	1 : 8	1 : 8	1.5	8.8	0.0	404	0	0	**404**
302+00.000 to 302+62.500	1318.77	14195	**591**	Sta.302+00.000	Sta.302+62.500	0.005	0.24	63	48.00	157	1 : 8	1 : 8	1.5	8.8	0.0	695	14	203	**492**
302+62.500 to 303+95.000	2592.48	27905	**1163**	Sta.303+95.000	Sta.302+62.500	-0.002	0.24	133	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	0	0	**1738**
303+95.000 to 305+50.000	2730.54	29391	**1225**	Sta.305+50.000	Sta.303+95.000	-0.00149	0.24	155	160.75	508	1 : 8	1 : 8	1.5	8.8	0.1	2282	0	0	**2282**
305+50.000 to 307+50.000	3555.72	38273	**1595**	Sta.307+50.000	Sta.305+50.000	-0.002	0.24	200	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	0	0	**1738**
307+50.000 to 308+90.000	2460.79	26488	**1104**	Sta.307+50.000	Sta.308+90.000	0.0025	0.24	140	96.00	315	1 : 8	1 : 8	1.5	8.8	0.0	1390	0	0	**1390**
308+90.000 to 310+30.000	2460.79	26488	**1104**	Sta.308+90.000	Sta.310+30.000	0.0025	0.24	140	96.00	315	1 : 8	1 : 8	1.5	8.8	0.0	1390	0	0	**1390**
310+30.000 to 311+20.000	1955.38	21048	**877**	Sta.310+30.000	Sta.311+20.000	0.0025	0.24	90	96.00	295	1 : 8	1 : 8	1.5	8.8	0.3	1342	0	0	**1342**
311+20.000 to 312+07.000	1955.38	21048	**877**	Sta.312+07.000	Sta.311+20.000	-0.0025	0.24	87	96.00	285	1 : 8	1 : 8	1.5	8.8	0.4	1318	6	91	**1227**
312+07.000 to 312+95.000	2676.21	28807	**1200**	Sta.312+95.000	Sta.312+07.000	-0.0025	0.24	88	96.00	289	1 : 8	1 : 8	1.5	8.8	0.4	1326	6	90	**1236**
312+95.000 to 313+88.719	1616.00	17394	**725**	Sta.313+88.719	Sta.312+95.000	-0.0025	0.24	94	96.00	307	1 : 8	1 : 8	1.5	8.8	0.1	1372	0	0	**1372**
313+88.719 to 315+11.968	2139.44	23029	**960**	Sta.313+88.719	Sta.315+11.968	0.004	0.24	123	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
315+11.968 to 316+30.000	2139.44	23029	**960**	Sta.315+11.968	Sta.316+30.000	0.004	0.24	118	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
316+30.000 to 317+05.000	1325.77	14270	**595**	Sta.316+30.000	Sta.317+05.000	0.004	0.24	75	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
317+05.000 to 317+80.000	1320.87	14218	**592**	Sta.317+05.000	Sta.317+80.000	0.004	0.24	75	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
317+80.000 to 318+60.714	1586.90	17081	**712**	Sta.317+80.000	Sta.318+60.714	0.004	0.24	81	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
318+60.714 to 319+50.000	1894.44	20392	**850**	Sta.319+50.000	Sta.318+60.714	-0.003	0.24	89	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
319+50.000 to 320+64.000	2524.56	27174	**1132**	Sta.320+64.000	Sta.319+50.000	-0.003	0.24	114	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	6	87	**1072**
320+64.000 to 321+60.000	1839.00	19795	**825**	Sta.321+60.000	Sta.320+64.000	-0.003	0.24	96	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
321+60.000 to 322+65.000	1849.17	19904	**829**	Sta.322+65.000	Sta.321+60.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
322+65.000 to 323+63.215	1729.69	18618	**776**	Sta.323+63.215	Sta.322+65.000	-0.003	0.24	98	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**

C:\SR 30\[wtrqlty_lt_01rev.xls]Sheet1

II-6

Water Quality Volume Calculations



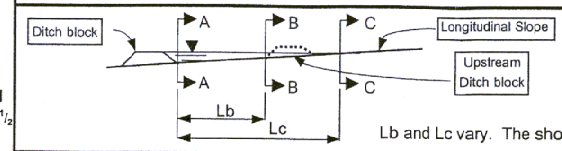
Lb and Lc vary. The shortest will determine the effective storage length (Le)

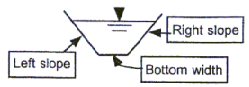
Station to Station	Contributing Area		Required Volume ($^1/_2$ in * Area)	Ditch Geometry															Retention Volume Provided $A_{ave} \times L_e = \frac{(A_1+A_2)L_e}{2}$	Approximate Total Length of Driveways or Median Openings Impacting Effective Storage Length (toe of slope to toe of slope) L_d	Volume Displaced by Driveways or Median Openings $A_{ave} \times L_d$	Total Water Quality Volume Provided
				Station for Calculations (Section A-A)	Location of Upstream Ditch Block (Section B-B)	Long. Slope (S)	Weir Height (H_w)	Distance to Upstream Ditch Block L_b	Distance to Water Line L_c ($H_w \times S$)	Effective Storage Length L_e	Left Slope	Right Slope	Bottom Width at Storage Section (avg.)	Area of Storage at A-A (A_1)	Area of Storage Upstream (A_2)						
	m^2	ft^2	ft^3			ft/ft	m	m	m	ft	rise:run	rise:run	m	ft^2	ft^2	ft^3	m	ft^3	ft^3
323+63.215 to 325+00.000	2408.96	25930	**1080**	Sta.323+63.215	Sta.325+00.000	0.004	0.24	137	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
325+00.000 to 325+95.000	1666.74	17941	**748**	Sta.325+00.000	Sta.325+95.000	0.004	0.24	95	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	14	203	**666**
325+95.000 to 327+10.000	2192.94	23605	**984**	Sta.325+95.000	Sta.327+10.000	0.004	0.24	115	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
327+10.000 to 328+00.000	1907.93	20537	**856**	Sta.328+00.000	Sta.327+10.000	-0.003	0.24	90	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
328+00.000 to 329+05.000	2273.96	24477	**1020**	Sta.329+05.000	Sta.328+00.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
329+05.000 to 330+10.000	1852.94	19945	**831**	Sta.330+10.000	Sta.329+05.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
330+10.000 to 331+00.000	1583.91	17049	**710**	Sta.331+00.000	Sta.330+10.000	-0.003	0.24	90	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
331+00.000 to 331+45.577	802.10	8634	**360**	Sta.331+45.577	Sta.331+00.000	-0.003	0.24	46	80.00	149	1 : 8	1 : 8	1.5	8.8	2.6	853	0	0	**853**
331+45.577 to 332+50.000	1837.89	19783	**824**	Sta.331+45.577	Sta.332+50.000	0.0035	0.24	104	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	**993**
332+50.000 to 333+85.000	2369.79	25508	**1063**	Sta.332+50.000	Sta.333+85.000	0.0035	0.24	135	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	**993**
333+85.000 to 334+75.000	1590.16	17116	**713**	Sta.333+85.000	Sta.334+75.000	0.0035	0.24	90	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	**993**
334+75.000 to 335+65.000	1765.04	18999	**792**	Sta.334+75.000	Sta.335+65.000	0.0035	0.24	90	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	14	203	**790**
335+65.000 to 336+30.153	1381.11	14866	**619**	Sta.335+65.000	Sta.336+30.153	0.0035	0.24	65	68.57	214	1 : 8	1 : 8	1.5	8.8	0.2	966	0	0	**966**
336+30.153 to 338+00.000	3491.92	37587	**1566**	Sta.338+00.000	Sta.336+30.153	-0.00149	0.24	170	160.75	527	1 : 8	1 : 8	1.5	8.8	0.0	2328	0	0	**2328**
338+00.000 to 340+10.000	3675.67	39565	**1649**	Sta.340+10.000	Sta.338+00.000	-0.00149	0.24	210	161.07	528	1 : 6	1 : 6	1.5	7.6	0.0	2005	0	0	**2005**
340+10.000 to 342+90.000	4887.26	52606	**2192**	Sta.342+90.000	Sta.340+10.000	-0.00149	0.24	280	161.07	528	1 : 8	1 : 8	1.5	8.8	0.0	2333	0	0	**2333**
342+90.000 to 345+00.000	4162.26	44802	**1867**	Sta.342+90.000	Sta.345+00.000	0.001	0.24	210	240.00	689	1 : 8	1 : 8	1.5	8.8	0.6	3235	0	0	**3235**
345+00.000 to 346+95.000	3702.51	39854	**1661**	Sta.345+00.000	Sta.346+95.000	0.001	0.24	195	240.00	640	1 : 8	1 : 8	1.5	8.8	0.9	3112	0	0	**3112**
346+95.000 to 349+55.000	4575.94	49255	**2052**	Sta.346+95.000	Sta.349+55.000	0.001	0.24	260	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	14	203	**3273**
349+55.000 to 350+75.000	2112.03	22734	**947**	Sta.350+75.000	Sta.349+55.000	-0.004	0.24	120	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
350+75.000 to 351+50.000	1357.12	14608	**609**	Sta.351+50.000	Sta.350+75.000	-0.004	0.24	75	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	**869**
351+50.000 to 354+26.136	5731.15	61690	**2570**	Sta.354+26.136	Sta.351+50.000	-0.002	0.24	276	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	0	0	**1738**
354+26.136 to 355+85.000	2810.89	30256	**1261**	Sta.354+26.136	Sta.355+85.000	0.0015	0.24	159	160.00	521	1 : 8	1 : 8	1.5	8.8	0.0	2308	0	0	**2308**
355+85.000 to 357+95.000	3695.99	39783	**1658**	Sta.355+85.000	Sta.357+95.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
357+95.000 to 359+90.000	3431.89	36941	**1539**	Sta.357+95.000	Sta.359+90.000	0.0015	0.24	195	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
359+90.000 to 362+15.000	4501.12	48450	**2019**	Sta.359+90.000	Sta.362+15.000	0.0015	0.24	225	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	14	203	**2115**
362+15.000 to 364+25.000	4072.93	43841	**1827**	Sta.362+15.000	Sta.364+25.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
364+25.000 to 366+35.000	3696.00	39783	**1658**	Sta.364+25.000	Sta.366+35.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
366+35.000 to 368+45.000	3895.55	41931	**1747**	Sta.366+35.000	Sta.368+45.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
368+45.000 to 370+50.000	3895.55	41931	**1747**	Sta.368+45.000	Sta.370+50.000	0.0015	0.24	205	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
370+50.000 to 371+50.000	1962.78	21127	**880**	Sta.371+50.000	Sta.370+50.000	-0.00243	0.24	100	98.77	324	1 : 8	1 : 8	1.5	8.8	0.0	1430	0	0	**1430**
371+50.000 to 372+50.000	1962.78	21127	**880**	Sta.372+50.000	Sta.371+50.000	-0.00243	0.24	100	98.77	324	1 : 8	1 : 8	1.5	8.8	0.0	1430	0	0	**1430**
372+50.000 to 373+55.000	1847.99	19892	**829**	Sta.373+55.000	Sta.372+50.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
373+55.000 to 374+60.000	1847.99	19892	**829**	Sta.373+55.000	Sta.374+60.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
374+60.000 to 375+65.000	1847.98	19891	**829**	Sta.375+65.000	Sta.374+60.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
375+65.000 to 376+70.000	1847.98	19892	**829**	Sta.376+70.000	Sta.375+65.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
376+70.000 to 379+78.750	6344.54	68292	**2846**	Sta.379+78.750	Sta.376+70.000	-0.0015	0.24	309	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
379+78.750 to 382+40.000	4598.42	49497	**2062**	Sta.379+78.750	Sta.382+40.000	0.0005	0.24	261	480.00	857	1 : 8	1 : 8	1.5	8.8	2.8	4981	0	0	**4981**
382+40.000 to 385+55.000	5543.90	59674	**2486**	Sta.382+40.000	Sta.385+55.000	0.001	0.24	315	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	0	0	**3476**

C:\SR 30\[wtrqlty_lt_01rev.xls]Sheet1

II-7

Water Quality Volume Calculations





Lb and Lc vary. The shortest will determine the effective storage length (Le)

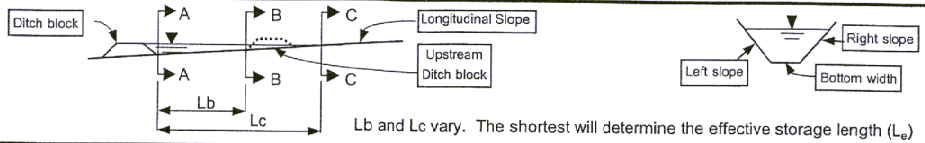
Station to Station	Contributing Area		Required Volume ($^1/_2$ in * Area)	Ditch Geometry															Retention Volume Provided $A_{ave} \times L_e = \frac{(A_1+A_2)L_e}{2}$	Approximate Total Length of Driveways or Median Openings Impacting Effective Storage Length (toe of slope to toe of slope) L_d	Volume Displaced by Driveways or Median Openings $A_{ave} \times L_d$	Total Water Quality Volume Provided
				Station for Calculations (Section A-A)	Location of Upstream Ditch Block (Section B-B)	Long. Slope (S)	Weir Height (H_w)	Distance to Upstream Ditch Block L_b	Distance to Water Line L_c ($H_w \times S$)	Effective Storage Length L_e	Left Slope	Right Slope	Bottom Width at Storage Section (avg.)	Area of Storage at A-A (A_1)	Area of Storage Upstream (A_2)						
	m^2	ft^2	ft^3			ft/ft	m	m	m	ft	rise:run	rise:run	m	ft^2	ft^2	ft^3	m	ft^3	ft^3
385+55.000 to 388+45.827	6036.52	64977	**2707**	Sta.385+55.000	Sta.388+45.827	0.001	0.24	291	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	14	203	**3273**
388+45.827 to 389+00.000	916.74	9868	**411**	Sta.389+00.000	Sta.388+45.827	-0.005	0.24	54	48.00	157	1 : 8	1 : 8	1.5	8.8	0.0	695	0	0	**695**
389+00.000 to 389+50.000	916.74	9868	**411**	Sta.389+50.000	Sta.389+00.000	-0.005	0.24	50	48.00	157	1 : 8	1 : 8	1.5	8.8	0.0	695	0	0	**695**
389+50.000 to 389+90.000	703.95	7577	**316**	Sta.389+90.000	Sta.389+50.000	-0.0062	0.24	40	38.70	127	1 : 8	1 : 8	1.5	8.8	0.0	560	0	0	**560**
389+90.000 to 390+60.000	1056.04	11367	**474**	Sta.390+60.000	Sta.389+90.000	-0.0065	0.24	70	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	18	261	**274**
390+60.000 to 391+00.000	880.00	9472	**395**	Sta.391+00.000	Sta.390+60.000	-0.0065	0.24	40	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
391+00.000 to 391+50.000	879.99	9472	**395**	Sta.391+50.000	Sta.391+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
391+50.000 to 392+00.000	880.00	9472	**395**	Sta.392+00.000	Sta.391+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
392+00.000 to 392+50.000	880.00	9472	**395**	Sta.392+50.000	Sta.392+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
392+50.000 to 393+00.000	879.97	9472	**395**	Sta.393+00.000	Sta.392+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
393+00.000 to 393+50.000	879.97	9472	**395**	Sta.393+50.000	Sta.393+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
393+50.000 to 394+00.000	879.98	9472	**395**	Sta.394+00.000	Sta.393+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
394+00.000 to 394+50.000	879.98	9472	**395**	Sta.394+50.000	Sta.394+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
394+50.000 to 395+00.000	1007.10	10840	**452**	Sta.395+00.000	Sta.394+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
395+00.000 to 395+50.000	1059.98	11410	**475**	Sta.395+50.000	Sta.395+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
395+50.000 to 396+00.000	1059.98	11410	**475**	Sta.396+00.000	Sta.395+50.000	-0.0065	0.24	50	36.92	121	1 : 6	1 : 6	1.5	7.6	0.0	460	0	0	**460**
396+00.000 to 396+50.000	1171.72	12612	**526**	Sta.396+50.000	Sta.396+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
396+50.000 to 397+00.000	1019.22	10971	**457**	Sta.397+00.000	Sta.396+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
397+00.000 to 397+50.000	879.97	9472	**395**	Sta.397+50.000	Sta.397+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
397+50.000 to 398+00.000	879.98	9472	**395**	Sta.398+00.000	Sta.397+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
398+00.000 to 398+50.000	879.97	9472	**395**	Sta.398+50.000	Sta.398+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
398+50.000 to 399+00.000	879.95	9472	**395**	Sta.399+00.000	Sta.398+50.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
399+00.000 to 399+50.000	879.95	9472	**395**	Sta.399+50.000	Sta.399+00.000	-0.0065	0.24	50	36.92	121	1 : 8	1 : 8	1.5	8.8	0.0	535	0	0	**535**
399+50.000 to 400+45.000	1693.74	18231	**760**	Sta.400+45.000	Sta.399+50.000	-0.00336	0.24	95	71.43	234	1 : 8	1 : 8	1.5	8.8	0.0	1035	0	0	**1035**
400+45.000 to 401+42.614	1693.74	18231	**760**	Sta.401+42.614	Sta.400+45.000	-0.00336	0.24	98	71.43	234	1 : 8	1 : 8	1.5	8.8	0.0	1035	0	0	**1035**
401+42.614 to 402+45.000	4554.75	49027	**2043**	Sta.401+42.614	Sta.402+45.000	0.001	0.24	102	240.00	336	1 : 8	1 : 8	1.5	8.8	3.9	2130	0	0	**2130**
402+45.000 to 403+50.000	4554.75	49027	**2043**	Sta.402+45.000	Sta.403+50.000	0.001	0.24	105	240.00	344	1 : 8	1 : 8	1.5	8.8	3.7	2166	0	0	**2166**
403+50.000 to 406+20.000	5253.85	56552	**2356**	Sta.403+50.000	Sta.406+20.000	0.001	0.24	270	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	22	319	**3157**
406+20.000 to 406+50.000	483.97	5209	**217**	Sta.406+20.000	Sta.406+50.000	0.02	0.24	30	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
406+50.000 to 406+75.000	483.97	5209	**217**	Sta.406+50.000	Sta.406+75.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
406+75.000 to 407+00.000	439.98	4736	**197**	Sta.406+75.000	Sta.407+00.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+00.000 to 407+25.000	439.98	4736	**197**	Sta.407+00.000	Sta.407+25.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+25.000 to 407+50.000	439.83	4734	**197**	Sta.407+25.000	Sta.407+50.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+50.000 to 407+75.000	439.83	4734	**197**	Sta.407+50.000	Sta.407+75.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+75.000 to 408+00.000	439.84	4734	**197**	Sta.407+75.000	Sta.408+00.000	0.01554	0.24	25	15.44	51	1 : 8	1 : 8	1.5	8.8	0.0	224	0	0	**224**
408+00.000 to 408+25.000	439.84	4734	**197**	Sta.408+00.000	Sta.408+25.000	0.01554	0.24	25	15.44	51	1 : 8	1 : 8	1.5	8.8	0.0	224	0	0	**224**
408+25.000 to 408+50.000	439.84	4734	**197**	Sta.408+25.000	Sta.408+50.000	0.0102	0.24	25	23.53	77	1 : 8	1 : 8	1.5	8.8	0.0	341	0	0	**341**
408+50.000 to 408+75.000	439.84	4734	**197**	Sta.408+50.000	Sta.408+75.000	0.0102	0.24	25	23.53	77	1 : 8	1 : 8	1.5	8.8	0.0	341	0	0	**341**
408+75.000 to 409+20.659	879.67	9469	**395**	Sta.408+75.000	Sta.409+20.659	0.00487	0.24	46	49.28	150	1 : 8	1 : 8	1.5	8.8	0.3	685	0	0	**685**

C:\SR 30\[wtrqlty_lt_01rev.xls]Sheet1

II-8

Water Quality Volume Calculations

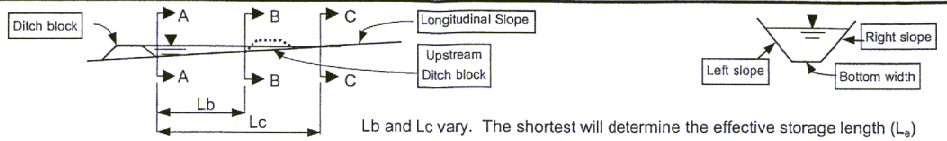
Station to Station	Contributing Area		Required Volume ($^1/_2$ in * Area)	Ditch Geometry												Retention Volume Provided $A_{ave} \times L_e = \frac{(A_1+A_2)L_e}{2}$	Approximate Total Length of Driveways or Median Openings Impacting Effective Storage Length (toe of slope to toe of slope) L_d	Volume Displaced by Driveways or Median Openings $A_{ave} \times L_d$	Total Water Quality Volume Provided
				Station for Calculations (Section A-A)	Location of Upstream Ditch Block (Section B-B)	Long. Slope (S)	Weir Height (H_w)	Distance to Upstream Ditch Block L_b	Distance to Water Line L_c ($H_w \times S$)	Effective Storage Length L_e	Left Slope	Right Slope	Bottom Width at Storage Section (avg.)	Area of Storage at A-A (A_1)	Area of Storage Upstream (A_2)				
	m^2	ft^2	ft^3			ft/ft	m	m	m	ft	rise:run	rise:run	m	ft^2	ft^2	ft^3	m	ft^3	ft^3
303+15.000 to 304+60.000	3208.75	34539	1439	Sta.304+60.000	Sta.303+15.000	-0.002	0.24	145	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	11	159	1579
304+60.000 to 306+05.000	3208.75	34539	1439	Sta.306+05.000	Sta.304+60.000	-0.002	0.24	145	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	18	261	1477
312+04.000 to 312+95.000	2554.75	27499	1146	Sta.312+95.000	Sta.312+04.000	-0.0025	0.24	91	96.00	298	1 : 8	1 : 8	1.5	8.8	0.2	1350	0	0	1350
312+95.000 to 313+86.719	1944.94	20935	872	Sta.313+86.719	Sta.312+95.000	-0.0013	0.24	92	192.00	301	1 : 8	1 : 8	1.5	8.8	3.4	1836	0	0	1836
313+86.719 to 316+30.000	4341.40	46730	1947	Sta.313+86.719	Sta.316+30.000	0.002	0.24	243	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	0	0	1738
316+30.000 to 317+05.000	1326.00	14273	595	Sta.316+30.000	Sta.317+05.000	0.004	0.24	75	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
317+05.000 to 317+80.000	1319.87	14207	592	Sta.317+05.000	Sta.317+80.000	0.004	0.24	75	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
317+80.000 to 318+60.714	1420.16	15286	637	Sta.317+80.000	Sta.318+60.714	0.004	0.24	81	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
318+60.714 to 319+50.000	1571.54	16916	705	Sta.319+50.000	Sta.318+60.714	-0.003	0.24	89	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
319+50.000 to 320+57.000	1937.76	20858	869	Sta.320+57.000	Sta.319+50.000	-0.003	0.24	107	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
320+57.000 to 321+45.000	2031.46	21866	911	Sta.321+45.000	Sta.320+57.000	-0.003	0.24	88	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
321+45.000 to 322+65.000	2491.20	26815	1117	Sta.322+65.000	Sta.321+45.000	-0.003	0.24	120	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
322+65.000 to 323+63.215	1729.69	18618	776	Sta.323+63.215	Sta.322+65.000	-0.003	0.24	98	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	22	319	840
323+63.215 to 325+00.000	2408.17	25921	1080	Sta.323+63.215	Sta.325+00.000	0.004	0.24	137	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
325+00.000 to 325+90.000	1584.02	17050	710	Sta.325+00.000	Sta.325+90.000	0.004	0.24	90	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
325+90.000 to 326+50.000	1056.02	11367	474	Sta.325+90.000	Sta.326+50.000	0.004	0.24	60	60.00	197	1 : 6	1 : 6	1.5	7.6	0.0	747	14	174	573
326+50.000 to 327+10.715	1056.02	11367	474	Sta.326+50.000	Sta.327+10.715	0.004	0.24	61	60.00	197	1 : 6	1 : 6	1.5	7.6	0.0	747	0	0	747
327+10.715 to 328+00.000	1584.06	17051	710	Sta.328+00.000	Sta.327+10.715	-0.003	0.24	89	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
328+00.000 to 329+05.000	2290.82	24658	1027	Sta.329+05.000	Sta.328+00.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
329+05.000 to 330+00.000	2020.06	21744	906	Sta.330+00.000	Sta.329+05.000	-0.003	0.24	95	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	1159
330+00.000 to 331+00.000	1887.42	20316	846	Sta.331+00.000	Sta.330+00.000	-0.003	0.24	100	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	28	406	753
331+00.000 to 331+45.577	802.10	8634	360	Sta.331+45.577	Sta.331+00.000	-0.003	0.24	46	80.00	149	1 : 8	1 : 8	1.5	8.8	2.6	853	0	0	853
331+45.577 to 332+50.000	1837.89	19783	824	Sta.331+45.577	Sta.332+50.000	0.0035	0.24	104	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	993
332+50.000 to 333+20.000	1184.90	12754	531	Sta.332+50.000	Sta.333+20.000	0.0035	0.24	70	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	993
333+20.000 to 333+85.000	1184.90	12754	531	Sta.333+20.000	Sta.333+85.000	0.0035	0.24	65	68.57	213	1 : 8	1 : 8	1.5	8.8	0.2	964	0	0	964
333+85.000 to 334+75.000	1590.30	17118	713	Sta.333+85.000	Sta.334+75.000	0.0035	0.24	90	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	0	0	993
334+75.000 to 335+65.000	1584.03	17050	710	Sta.334+75.000	Sta.335+65.000	0.0035	0.24	90	68.57	225	1 : 8	1 : 8	1.5	8.8	0.0	993	14	203	790
335+65.000 to 336+30.153	1146.63	12342	514	Sta.335+65.000	Sta.336+30.153	0.0025	0.24	65	96.00	214	1 : 8	1 : 8	1.5	8.8	1.8	1131	0	0	1131
336+30.153 to 338+00.000	3466.61	37336	1556	Sta.338+00.000	Sta.336+30.153	-0.0015	0.24	170	160.75	527	1 : 8	1 : 8	1.5	8.8	0.0	2328	0	0	2328
345+70.000 to 346+95.000	2479.93	26694	1112	Sta.345+70.000	Sta.346+95.000	0.001	0.24	125	240.00	410	1 : 8	1 : 8	1.5	8.8	3.0	2424	0	0	2424
346+95.000 to 349+55.000	4721.24	50819	2117	Sta.346+95.000	Sta.349+55.000	0.001	0.24	260	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	14	203	3273
349+55.000 to 350+15.000	1056.05	11367	474	Sta.350+15.000	Sta.349+55.000	-0.004	0.24	60	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
350+15.000 to 350+75.000	1056.05	11367	474	Sta.350+75.000	Sta.350+15.000	-0.004	0.24	60	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	0	0	869
350+75.000 to 351+50.000	1320.03	14209	592	Sta.351+50.000	Sta.350+75.000	-0.004	0.24	75	60.00	197	1 : 8	1 : 8	1.5	8.8	0.0	869	14	203	666
351+50.000 to 354+26.136	5514.67	59359	2473	Sta.354+26.136	Sta.351+50.000	-0.002	0.24	276	120.00	394	1 : 8	1 : 8	1.5	8.8	0.0	1738	0	0	1738
354+26.136 to 355+85.000	3101.83	33388	1391	Sta.354+26.136	Sta.355+85.000	0.0015	0.24	159	160.00	521	1 : 8	1 : 8	1.5	8.8	0.0	2308	0	0	2308
355+85.000 to 357+95.000	3696.12	39785	1658	Sta.355+85.000	Sta.357+95.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	2317
357+95.000 to 360+05.000	3696.08	39784	1658	Sta.357+95.000	Sta.360+05.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	2317
360+05.000 to 362+15.000	3696.06	39784	1658	Sta.360+05.000	Sta.362+15.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	2317
362+15.000 to 364+25.000	4577.03	49267	2053	Sta.362+15.000	Sta.364+25.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	2317
364+25.000 to 366+35.000	3695.99	39783	1658	Sta.364+25.000	Sta.366+35.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	2317



C:\SR 30\[wtrqlty_lt_01rev.xls]Sheet1

II-9

Water Quality Volume Calculations



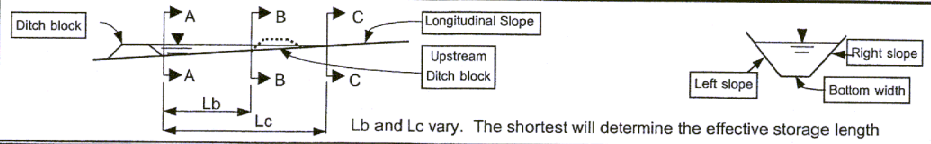
Lb and Lc vary. The shortest will determine the effective storage length (L_e)

Station to Station	Contributing Area		Required Volume (1/2 in * Area)	Ditch Geometry													Retention Volume Provided $A_{ave} \times L_e = \frac{(A_1+A_2)L_e}{2}$	Approximate Total Length of Driveways or Median Openings Impacting Effective Storage Length (toe of slope to toe of slope) L_d	Volume Displaced by Driveways or Median Openings $A_{ave} \times L_d$	Total Water Quality Volume Provided
				Station for Calculations (Section A-A)	Location of Upstream Ditch Block (Section B-B)	Long. Slope (S)	Weir Height (H_w)	Distance to Upstream Ditch Block L_b	Distance to Water Line L_c ($H_w \times S$)	Effective Storage Length L_e	Left Slope	Right Slope	Bottom Width at Storage Section (avg.)	Area of Storage at A-A (A_1)	Area of Storage Upstream (A_2)				
	m^2	ft^2	ft^3			ft/ft	m	m	m	ft	rise:run	rise:run	m	ft^2	ft^2	ft^3	m	ft^3	ft^3
366+35.000 to 368+45.000	3652.09	39311	**1638**	Sta.366+35.000	Sta.368+45.000	0.0015	0.24	210	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
368+45.000 to 370+50.000	3652.09	39311	**1638**	Sta.368+45.000	Sta.370+50.000	0.0015	0.24	205	160.00	525	1 : 8	1 : 8	1.5	8.8	0.0	2317	0	0	**2317**
370+50.000 to 371+50.000	2163.93	23292	**971**	Sta.371+50.000	Sta.370+50.000	-0.00243	0.24	100	98.77	324	1 : 8	1 : 8	1.5	8.8	0.0	1430	0	0	**1430**
371+50.000 to 372+50.000	2163.93	23292	**971**	Sta.372+50.000	Sta.371+50.000	-0.00243	0.24	100	98.77	324	1 : 8	1 : 8	1.5	8.8	0.0	1430	14	203	**1228**
372+50.000 to 373+55.000	1975.105	21260	**886**	Sta.373+55.000	Sta.372+50.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
373+55.000 to 374+60.000	1848.02	19892	**829**	Sta.374+60.000	Sta.373+55.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
374+60.000 to 375+65.000	1848.01	19892	**829**	Sta.375+65.000	Sta.374+60.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
375+65.000 to 376+70.000	1848.02	19892	**829**	Sta.376+70.000	Sta.375+65.000	-0.003	0.24	105	80.00	262	1 : 8	1 : 8	1.5	8.8	0.0	1159	0	0	**1159**
376+70.000 to 378+25.000	2900.54	31221	**1301**	Sta.378+25.000	Sta.376+70.000	-0.0015	0.24	155	160.00	508	1 : 8	1 : 8	1.5	8.8	0.1	2277	0	0	**2277**
378+25.000 to 379+78.750	2900.54	31221	**1301**	Sta.379+78.750	Sta.378+25.000	-0.0015	0.24	154	160.00	504	1 : 8	1 : 8	1.5	8.8	0.2	2267	0	0	**2267**
379+78.750 to 382+40.000	5236.82	117867	**4911**	Sta.379+78.750	Sta.382+40.000	0.001	0.24	261	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	0	0	**3476**
382+40.000 to 385+55.000	5544.152	59677	**2487**	Sta.382+40.000	Sta.385+55.000	0.001	0.24	315	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	0	0	**3476**
385+55.000 to 388+45.827	5534.524	59573	**2482**	Sta.385+55.000	Sta.388+45.827	0.001	0.24	291	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	20	290	**3186**
388+45.827 to 389+00.827	1104.269	11886	**495**	Sta.389+00.827	Sta.388+45.827	-0.0062	0.24	55	38.70	127	1 : 8	1 : 8	1.5	8.8	0.0	560	0	0	**560**
389+00.827 to 389+50.000	1104.269	11886	**495**	Sta.389+50.000	Sta.389+00.827	-0.0062	0.24	49	38.70	127	1 : 8	1 : 8	1.5	8.8	0.0	560	0	0	**560**
389+50.000 to 390+00.000	1007.125	10841	**452**	Sta.390+00.000	Sta.389+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
390+00.000 to 390+50.000	880.0266	9473	**395**	Sta.390+50.000	Sta.390+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	18	261	**300**
390+50.000 to 391+00.000	880.0306	9473	**395**	Sta.391+00.000	Sta.390+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
391+00.000 to 391+50.000	880.0338	9473	**395**	Sta.391+50.000	Sta.391+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
391+50.000 to 392+00.000	880.0323	9473	**395**	Sta.392+00.000	Sta.391+50.000	-0.0062	0.24	50	38.71	127	1 : 6	1 : 6	1.5	7.6	0.0	482	0	0	**482**
392+00.000 to 392+50.000	880.0212	9472	**395**	Sta.392+50.000	Sta.392+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
392+50.000 to 393+00.000	880.0332	9473	**395**	Sta.393+00.000	Sta.392+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
393+00.000 to 393+50.000	880.0321	9473	**395**	Sta.393+50.000	Sta.393+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
393+50.000 to 394+00.000	880.0338	9473	**395**	Sta.394+00.000	Sta.393+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
394+00.000 to 394+50.000	880.0323	9473	**395**	Sta.394+50.000	Sta.394+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
394+50.000 to 395+00.000	880.02	9472	**395**	Sta.395+00.000	Sta.394+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
395+00.000 to 395+50.000	880.031	9473	**395**	Sta.395+50.000	Sta.395+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
395+50.000 to 396+00.000	880.0252	9473	**395**	Sta.396+00.000	Sta.395+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
396+00.000 to 396+25.000	509.6154	5485	**229**	Sta.396+25.000	Sta.396+00.000	-0.0062	0.24	25	38.71	82	1 : 8	1 : 8	1.5	8.8	2.0	444	0	0	**444**
396+25.000 to 396+50.000	509.6154	5485	**229**	Sta.396+50.000	Sta.396+25.000	-0.0062	0.24	25	38.71	82	1 : 8	1 : 8	1.5	8.8	2.0	444	0	0	**444**
396+50.000 to 397+00.000	1171.735	12612	**526**	Sta.397+00.000	Sta.396+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
397+00.000 to 397+50.000	1059.979	11410	**475**	Sta.397+50.000	Sta.397+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
397+50.000 to 398+00.000	1059.98	11410	**475**	Sta.398+00.000	Sta.397+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
398+00.000 to 398+50.000	1007.10	10840	**452**	Sta.398+50.000	Sta.398+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
398+50.000 to 399+00.000	879.95	9472	**395**	Sta.399+00.000	Sta.398+50.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
399+00.000 to 399+50.000	879.95	9472	**395**	Sta.399+50.000	Sta.399+00.000	-0.0062	0.24	50	38.71	127	1 : 8	1 : 8	1.5	8.8	0.0	561	0	0	**561**
399+50.000 to 401+42.614	3391.85	36510	**1521**	Sta.401+42.614	Sta.399+50.000	-0.0031	0.24	193	77.42	254	1 : 8	1 : 8	1.5	8.8	0.0	1121	0	0	**1121**
401+42.614 to 403+50.000	3651.46	39304	**1638**	Sta.401+42.614	Sta.403+50.000	0.001	0.24	207	240.00	680	1 : 8	1 : 8	1.5	8.8	0.6	3214	0	0	**3214**
403+50.000 to 406+20.000	5512.61	59337	**2472**	Sta.403+50.000	Sta.406+20.000	0.001	0.24	270	240.00	787	1 : 8	1 : 8	1.5	8.8	0.0	3476	0	0	**3476**
406+20.000 to 406+50.000	513.36	5526	**230**	Sta.406+20.000	Sta.406+50.000	0.02	0.24	30	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
406+50.000 to 406+75.000	513.36	5526	**230**	Sta.406+50.000	Sta.406+75.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
406+75.000 to 407+00.000	439.83	4734	**197**	Sta.406+75.000	Sta.407+00.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+00.000 to 407+25.000	439.83	4734	**197**	Sta.407+00.000	Sta.407+25.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+25.000 to 407+50.000	439.83	4734	**197**	Sta.407+25.000	Sta.407+50.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+50.000 to 407+75.000	439.83	4734	**197**	Sta.407+50.000	Sta.407+75.000	0.02	0.24	25	12.00	39	1 : 8	1 : 8	1.5	8.8	0.0	174	0	0	**174**
407+75.000 to 408+00.000	439.83	4734	**197**	Sta.407+75.000	Sta.408+00.000	0.01554	0.24	25	15.44	51	1 : 8	1 : 8	1.5	8.8	0.0	224	12	174	**50**
408+00.000 to 408+25.000	439.83	4734	**197**	Sta.408+00.000	Sta.408+25.000	0.01554	0.24	25	15.44	51	1 : 8	1 : 8	1.5	8.8	0.0	224	0	0	**224**
408+25.000 to 408+75.000	879.67	9469	**395**	Sta.408+25.000	Sta.408+75.000	0.0102	0.24	50	23.53	77	1 : 8	1 : 8	1.5	8.8	0.0	341	0	0	**341**
408+75.000 to 409+20.659	879.67	9469	**395**	Sta.408+75.000	Sta.409+20.659	0.00487	0.24	46	49.28	150	1 : 8	1 : 8	1.5	8.8	0.3	685	18	270	**415**

C:\SR 30\[wtrqlty_lt_01rev.xls]Sheet1

II-10

Water Quality Volume Calculations



Station to Station	Contributing Area		Required Volume ($^1/_2$ in * Area)	Ditch Geometry													Retention Volume Provided $A_{ave} \times L_e = \frac{(A_1+A_2)L_e}{2}$	Approximate Total Length of Driveways or Median Openings Impacting Effective Storage Length (toe of slope to toe of slope) L_d	Volume Displaced by Driveways or Median Openings $A_{ave} \times L_d$	Total Water Quality Volume Provided
				Ditch Block Location	Location of Upstream Ditch Block (Section B-B)	Long. Slope (S)	Ditch Block Height (Hw)	Distance to Upstream Ditch Block L_b	Distance to Water Line L_c ($H_w \times S$)	Effective Storage Length L_e	Left Slope	Right Slope	Bottom Width at Storage Section (avg.)	Area of Storage at A-A (A_1)	Area of Storage Upstream (A_2)				
	m^2	ft^2	ft^3			ft/ft	m	m	m	ft	rise:run	rise:run	m	ft^2	ft^2	ft^3	m	ft^3	ft^3
285+80.000 to 287+45.000	4242.5	45666	**1903**	Sta.285+80.660	Sta.287+45.000	0.003	0.39	164.34	130.00	426	1 : 6	1 : 6	1.5	16.1	0.0	3435	54	1427	**2008**
287+45.000 to 289+00.000	4296.8	46250	**1927**	Sta.287+45.000	Sta.289+00.000	0.003	0.30	155	100.00	328	1 : 6	1 : 6	3.9	18.4	0.0	3017	0	0	**3017**
289+00.000 to 294+95.000	15811.6	170194	**7091**	Sta.289+00.000	Sta.294+95.000	0.0015	0.30	595	200.00	656	1 : 6	1 : 6	5.6	23.9	0.0	7835	0	0	**7835**
294+95.000 to 296+60.000	4592.2	49430	**2060**	Sta.294+95.000	Sta.296+60.000	0.0025	0.30	165	120.00	394	1 : 6	1 : 6	3.5	17.1	0.0	3367	0	0	**3367**
296+60.000 to 298+00.000	3895.9	41935	**1747**	Sta.296+60.000	Sta.298+00.000	0.0025	0.30	140	120.00	394	1 : 6	1 : 6	5.6	23.9	0.0	4701	0	0	**4701**
298+00.000 to 300+65.000	7374.3	79377	**3307**	Sta.298+00.000	Sta.300+65.000	0.0025	0.30	265	120.00	394	1 : 6	1 : 6	5.6	23.9	0.0	4701	0	0	**4701**
300+65.000 to 301+35.000	1928.4	20757	**865**	Sta.300+65.000	Sta.301+35.000	0.01	0.30	70	30.00	98	1 : 6	1 : 6	3.7	17.8	0.0	873	0	0	**873**
301+35.000 to 301+80.000	1091.2	11746	**489**	Sta.301+35.000	Sta.301+80.000	0.01	0.30	45	30.00	98	1 : 6	1 : 6	1.5	10.7	0.0	524	0	0	**524**
301+80.000 to 303+05.000	2774.2	29861	**1244**	Sta.301+80.000	Sta.303+05.000	0.004	0.30	125	75.00	246	1 : 6	1 : 6	1.5	10.7	0.0	1310	0	0	**1310**
303+22.000 to 304+45.000	2045.6	22018	**917**	Sta.304+45.000	Sta.303+22.000	0.002	0.30	123	150.00	403	1 : 6	1 : 6	1.5	10.7	1.1	2362	0	0	**2362**
304+45.000 to 306+50.000	4409.9	47468	**1978**	Sta.306+50.000	Sta.304+45.000	0.002	0.30	205	150.00	492	1 : 6	1 : 6	5.6	23.9	0.0	5876	0	0	**5876**
306+50.000 to 307+32.790	2319.5	24966	**1040**	Sta.307+32.790	Sta.306+50.000	0.002	0.32	82.79	160.00	272	1 : 6	1 : 6	5.6	25.9	10.8	4988	0	0	**4988**
307+32.790 to 309+00.000	4637.5	49918	**2080**	Sta.307+32.790	Sta.309+00.000	0.0025	0.32	167.21	128.00	420	1 : 6	1 : 6	5.6	25.9	0.0	5435	0	0	**5435**
309+00.000 to 311+90.000	7217.8	77691	**3237**	Sta.309+00.000	Sta.311+90.000	0.0025	0.30	290	120.00	394	1 : 6	1 : 6	5.6	23.9	0.0	4701	0	0	**4701**
336+92.000 to 337+80.000	1141.1	12282	**512**	Sta.337+80.000	Sta.336+92.000	0.00149	0.30	88	200.94	289	1 : 6	1 : 6	1.5	10.7	4.6	2195	0	0	**2195**
337+80.000 to 342+50.000	12278.4	132164	**5507**	Sta.342+50.000	Sta.337+80.000	0.00149	0.30	470	200.94	659	1 : 6	1 : 6	5.6	23.9	0.0	7871	0	0	**7871**
342+50.000 to 342+98.000	1254.7	13505	**563**	Sta.342+98.000	Sta.342+50.000	0.00149	0.25	48	167.45	157	1 : 6	1 : 6	5.6	19.1	12.8	2511	0	0	**2511**
342+98.000 to 343+50.000	1367.3	14717	**613**	Sta.342+98.000	Sta.343+50.000	0.001	0.30	52	300.00	171	1 : 6	1 : 6	5.6	23.9	18.9	3650	0	0	**3650**
343+50.000 to 347+88.440	9197.9	99005	**4125**	Sta.343+50.000	Sta.345+80.000	0.001	0.30	230	300.00	754	1 : 6	1 : 6	1.5	10.7	1.4	4563	54	1071	**3492**

71,417 CF = 1.64 ac-ft

C:\SR 30\[wtrqlty_lt_01rev.xls]Sheet1

II-11

DITCH BLOCKS/OVERFLOW STRUCTURES CALCULATIONS

DITCH BLOCKS/OVERFLOW STRUCTURES CALCULATIONS

Retention Ditch & Overflow Weir Hydraulic Calculations
Right Ditch

Ditch Section	% Slope	"C"	Drain Area "A" (ac)	Cumu-lative "CA"	I 10 (in/hr)	Q in Section (cfs)	Weir Crest Length (m)	Effective Crest Length (m)	Depth Over Crest (m)	Velocity Over Crest (fps)	Ditch Block Height (m)	Flow Direction
Start at 285+80.668											0.337	↓
285+80.668 to 286+60.000	0.300	0.540	0.41	0.47	6.97	3.27	1.50	2.16	0.08	1.68	0.237	↑
286+60.000 to 287+65.000	0.300	0.540	0.46	0.25	6.97	1.73		5.51	0.03	0.99	0.337	↑
287+65.000 to 288+70.000	0.300	0.540	0.46	0.55	6.97	3.84	2.00	2.63	0.08	1.66	0.237	↑
288+70.000 to 290+00.000	0.150	0.540	0.56	0.30	6.97	2.11		5.54	0.03	1.06	0.337	↑
290+00.000 to 292+00.000	0.150	0.540	0.87	0.47	6.97	3.27	1.50	2.16	0.08	1.68	0.337	↑
292+00.000 to 293+00.000	0.350	0.540	0.50	0.73	6.97	5.12	3.00	3.63	0.08	1.64	0.237	↑
293+00.000 to 293+80.000	0.350	0.540	0.42	0.46	6.97	3.24		5.63	0.04	1.21	0.237	↑
293+80.000 to 294+70.000	0.350	0.540	0.44	0.24	6.97	1.66		5.51	0.03	0.98	0.337	↑
294+70.000 to 295+65.000	0.350	0.540	0.41	0.51	6.97	3.58	2.00	2.61	0.08	1.62	0.237	↑
295+65.000 to 296+90.000	0.250	0.540	0.54	0.29	6.97	2.03		5.54	0.03	1.05	0.337	↑
296+90.000 to 298+15.000	0.250	0.540	0.54	0.73	6.97	5.12	3.00	3.63	0.08	1.64	0.237	↑
298+15.000 to 299+30.000	0.250	0.540	0.50	0.44	6.97	3.09		5.61	0.04	1.20	0.237	↑
299+30.000 to 299+75.000	1.000	0.540	0.19	0.17	6.97	1.20		5.46	0.02	0.88	0.237	↑
299+75.000 to 300+05.000	1.000	0.540	0.13	0.07	6.97	0.49		5.39	0.01	0.66	0.337	↑
300+05.000 to 300+35.000	1.000	0.540	0.13	0.66	6.97	4.63	2.50	3.13	0.08	1.66	0.237	↑
300+35.000 to 300+65.000	1.000	0.540	0.13	0.59	6.97	4.14		5.68	0.05	1.32	0.237	↑
300+65.000 to 300+95.000	1.000	0.540	0.13	0.52	6.97	3.65		5.66	0.05	1.26	0.237	↑
300+95.000 to 301+25.000	1.000	0.540	0.13	0.45	6.97	3.16		5.63	0.04	1.21	0.237	↑
301+25.000 to 301+55.000	1.000	0.540	0.15	0.38	6.97	2.67		5.58	0.04	1.14	0.237	↑
301+55.000 to 302+00.000	0.860	0.540	0.23	0.30	6.97	2.11		5.54	0.03	1.06	0.237	↑
302+00.000 to 302+62.500	0.500	0.540	0.33	0.18	6.97	1.24		5.46	0.02	0.89		↑
302+62.500 to 303+95.000	-0.200	0.540	0.64	0.35	6.97	2.41		5.56	0.04	1.11	0.237	↓
303+95.000 to 305+50.000	-0.149	0.540	0.67	0.71	6.97	4.93	3.00	3.61	0.08	1.62	0.337	↓
305+50.000 to 307+50.000	-0.200	0.540	0.88	0.48	6.97	3.31	1.50	2.16	0.08	1.69		↓
307+50.000 to 308+90.000	0.250	0.540	0.61	0.92	6.97	6.40	3.50	4.16	0.08	1.69	0.237	↑
308+90.000 to 310+30.000	0.250	0.540	0.61	0.59	6.97	4.10		5.68	0.05	1.31	0.237	↑
310+30.000 to 311+20.000	0.250	0.540	0.48	0.26	6.97	1.81		5.51	0.03	1.01		↑
311+20.000 to 312+07.000	-0.250	0.540	0.48	0.26	6.97	1.81		5.51	0.03	1.01	0.237	↓
312+07.000 to 312+95.000	-0.250	0.540	0.66	0.62	6.97	4.29		5.71	0.05	1.33	0.237	↓
312+95.000 to 313+86.751	-0.250	0.540	0.40	0.83	6.97	5.80	3.50	4.13	0.08	1.64		↓
313+86.751 to 315+10.000	0.400	0.540	0.53	0.57	6.97	3.99	2.50	3.09	0.08	1.59	0.237	↑
315+10.000 to 316+30.000	0.400	0.540	0.53	0.29	6.97	1.99		5.54	0.03	1.04	0.337	↑
316+30.000 to 317+05.000	0.400	0.540	0.33	0.57	6.97	3.95	2.00	2.66	0.08	1.67	0.237	↑
317+05.000 to 317+80.000	0.400	0.540	0.33	0.39	6.97	2.71		5.58	0.04	1.15	0.237	↑
317+80.000 to 318+60.714	0.400	0.540	0.39	0.21	6.97	1.47		5.49	0.03	0.94		↑
318+60.714 to 319+50.000	-0.300	0.540	0.47	0.25	6.97	1.77		5.51	0.03	1.00	0.237	↓
319+50.000 to 320+64.000	-0.300	0.540	0.62	0.59	6.97	4.10	2.00	2.66	0.08	1.69	0.337	↓
320+64.000 to 321+60.000	-0.300	0.540	0.45	0.24	6.97	1.69		5.51	0.03	0.99	0.237	↓

Notes:
- Effective Crest Length: the trapezoidal weirs -ditch blocks and overflow weirs- were transformed into equivalent rectangular weirs for computation.
- Depth Over Crest: water elevation above the crest.
- "C" = Weighted C = [0.95 x (1.5+7.2) + 0.20 (2.1+3.6+1.5+2.7+0.6)] / (1.5+7.2+2.1+3.6+1.5+2.7+0.6) Where C=0.95 for Pavement and 0.20 for Sod
- Cumulative "CA" = C x sum of areas separated by ditch blocks at height of .24m
- Q = CA x I
- Effective Crest Length (L): the trapezoidal weirs -ditch blocks and overflow weirs- were transformed into equivalent rectangular weirs for computation.
- Depth Over Crest: water elevation above the crest. $H = (Q / 3.2 / L)^{2/3}$
- Velocity over Crest = (Q / L / H)

Ditch Section	% Slope	"C"	Drain Area "A" (ac)	Cumu-lative "CA"	I 10 (in/hr)	Q in Section (cfs)	Weir Crest Length (m)	Effective Crest Length (m)	Depth Over Crest (m)	Velocity Over Crest (fps)	Ditch Block Height (m)	Flow Direction
321+60.000 to 322+65.000	-0.300	0.540	0.46	0.49	6.97	3.43		5.63	0.05	1.24	0.237	↓
322+65.000 to 323+63.215	-0.300	0.540	0.43	0.72	6.97	5.04	3.00	3.61	0.08	1.63		↓
323+63.215 to 325+00.000	0.400	0.540	0.60	0.55	6.97	3.80	2.00	2.63	0.08	1.65	0.237	↑
325+00.000 to 325+95.000	0.400	0.540	0.41	0.22	6.97	1.54		5.49	0.03	0.96	0.337	↑
325+95.000 to 327+10.000	0.400	0.540	0.54	0.29	6.97	2.03	1.00	1.59	0.08	1.59		↑
327+10.000 to 328+00.000	-0.300	0.540	0.47	0.25	6.97	1.77		5.51	0.03	1.00	0.237	↓
328+00.000 to 329+05.000	-0.300	0.540	0.56	0.56	6.97	3.88	2.00	2.63	0.08	1.66	0.337	↓
329+05.000 to 330+10.000	-0.300	0.540	0.46	0.25	6.97	1.73		5.51	0.03	0.99	0.237	↓
330+10.000 to 331+00.000	-0.300	0.540	0.39	0.46	6.97	3.20		5.63	0.04	1.21	0.237	↓
331+00.000 to 331+45.577	-0.300	0.540	0.20	0.57	6.97	3.95	2.00	2.66	0.08	1.67		↓
331+45.577 to 332+50.000	0.350	0.540	0.45	0.56	6.97	3.91	2.00	2.63	0.08	1.67	0.237	↑
332+50.000 to 333+85.000	0.350	0.540	0.59	0.32	6.97	2.22		5.56	0.03	1.08	0.337	↑
333+85.000 to 334+75.000	0.350	0.540	0.39	0.63	6.97	4.40	2.50	3.13	0.08	1.64	0.237	↑
334+75.000 to 335+65.000	0.350	0.540	0.44	0.42	6.97	2.94		5.61	0.04	1.18	0.237	↑
335+65.000 to 336+30.153	0.350	0.540	0.34	0.18	6.97	1.28		5.46	0.02	0.90		↑
336+30.153 to 338+00.000	-0.149	0.540	0.86	0.46	6.97	3.24	1.50	2.16	0.08	1.67	0.337	↓
338+00.000 to 340+10.000	-0.149	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↓
340+10.000 to 342+90.000	-0.149	0.540	1.21	0.65	6.97	4.55	2.50	3.13	0.08	1.66		↓
342+90.000 to 345+00.000	0.100	0.540	1.03	1.05	6.97	7.30	5.00	5.00	0.08	1.66	0.237	↑
345+00.000 to 346+95.000	0.100	0.540	0.91	0.49	6.97	3.43		5.63	0.05	1.24	0.337	↑
346+95.000 to 349+55.000	0.100	0.540	1.13	0.61	6.97	4.25	2.50	3.11	0.08	1.62		↑
349+55.000 to 350+75.000	-0.400	0.540	0.52	0.28	6.97	1.96		5.54	0.03	1.03	0.237	↓
350+75.000 to 351+50.000	-0.400	0.540	0.34	0.46	6.97	3.24	1.50	2.16	0.08	1.67	0.337	↓
351+50.000 to 354+26.136	-0.200	0.540	1.42	0.77	6.97	5.34	3.00	3.63	0.08	1.66		↓
354+26.136 to 355+85.000	0.150	0.540	0.69	0.37	6.97	2.60	1.50	2.09	0.07	1.57	0.337	↑
355+85.000 to 357+95.000	0.150	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↑
357+95.000 to 359+90.000	0.150	0.540	0.85	0.46	6.97	3.20	1.50	2.16	0.08	1.67	0.337	↑
359+90.000 to 362+15.000	0.150	0.540	1.11	0.60	6.97	4.18	2.50	3.11	0.08	1.61	0.337	↑
362+15.000 to 364+25.000	0.150	0.540	1.01	0.55	6.97	3.80	2.00	2.63	0.08	1.65	0.337	↑
364+25.000 to 366+35.000	0.150	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↑
366+35.000 to 368+45.000	0.150	0.540	0.96	1.04	6.97	7.23	5.00	5.00	0.08	1.65	0.237	↑
368+45.000 to 370+50.000	0.150	0.540	0.96	0.52	6.97	3.61		5.66	0.05	1.26		↑
370+50.000 to 371+50.000	-0.243	0.540	0.49	0.26	6.97	1.84		5.54	0.03	1.01	0.237	↓
371+50.000 to 372+50.000	-0.243	0.540	0.49	0.53	6.97	3.69		5.66	0.05	1.27	0.237	↓
372+50.000 to 373+55.000	-0.300	0.540	0.46	0.78	6.97	5.42	3.50	4.11	0.08	1.60	0.337	↓
373+55.000 to 374+60.000	-0.300	0.540	0.46	0.25	6.97	1.73		5.51	0.03	0.99	0.237	↓
374+60.000 to 375+65.000	-0.300	0.540	0.46	0.50	6.97	3.46		5.66	0.05	1.24	0.237	↓
375+65.000 to 376+70.000	-0.300	0.540	0.46	0.75	6.97	5.19	3.00	3.63	0.08	1.65	0.337	↓
376+70.000 to 379+78.750	-0.150	0.540	1.57	0.85	6.97	5.91	3.50	4.13	0.08	1.65		↓
379+78.750 to 382+40.000	0.050	0.540	1.14	0.62	6.97	4.29	2.50	3.11	0.08	1.63	0.337	↑
382+40.000 to 385+55.000	0.100	0.540	1.37	0.74	6.97	5.16	3.00	3.63	0.08	1.64	0.337	↑
385+55.000 to 388+45.827	0.100	0.540	1.49	0.80	6.97	5.61	3.50	4.11	0.08	1.62		↑
388+45.827 to 389+00.000	-0.500	0.540	0.23	0.12	6.97	0.87		5.44	0.02	0.79	0.237	↓
389+00.000 to 389+50.000	-0.500	0.540	0.23	0.25	6.97	1.73		5.51	0.03	0.99	0.237	↓
389+50.000 to 389+90.000	-0.620	0.540	0.17	0.34	6.97	2.37		5.56	0.04	1.10	0.237	↓
389+90.000 to 390+50.000	-0.650	0.540	0.26	0.48	6.97	3.35		5.63	0.04	1.23	0.237	↓
390+50.000 to 391+00.000	-0.650	0.540	0.22	0.60	6.97	4.18	2.50	3.11	0.08	1.61	0.337	↓
391+00.000 to 391+50.000	-0.650	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78	0.237	↓
391+50.000 to 392+00.000	-0.650	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↓
392+00.000 to 392+50.000	-0.650	0.540	0.22	0.36	6.97	2.48		5.58	0.04	1.12	0.237	↓
392+50.000 to 393+00.000	-0.650	0.540	0.22	0.48	6.97	3.31		5.63	0.04	1.22	0.237	↓
393+00.000 to 393+50.000	-0.650	0.540	0.22	0.59	6.97	4.14	2.50	3.11	0.08	1.61	0.337	↓
393+50.000 to 394+00.000	-0.650	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78	0.237	↓
394+00.000 to 394+50.000	-0.650	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↓
394+50.000 to 395+00.000	-0.650	0.540	0.25	0.37	6.97	2.60		5.58	0.04	1.13	0.237	↓
395+00.000 to 395+50.000	-0.650	0.540	0.26	0.51	6.97	3.58		5.66	0.05	1.25	0.237	↓
395+50.000 to 396+00.000	-0.650	0.540	0.26	0.65	6.97	4.55	2.50	3.13	0.08	1.66	0.337	↓
396+00.000 to 396+50.000	-0.650	0.540	0.29	0.16	6.97	1.09		5.46	0.02	0.85	0.237	↓

Ditch Section	% Slope	"C"	Drain Area "A" (ac)	Cumu-lative "CA"	I 10 (in/hr)	Q in Section (cfs)	Weir Crest Length (m)	Effective Crest Length (m)	Depth Over Crest (m)	Velocity Over Crest (fps)	Ditch Block Height (m)	Flow Direction
396+50.000 to 397+00.000	-0.650	0.540	0.25	0.29	6.97	2.03		5.54	0.03	1.05	0.237	↓
397+00.000 to 397+50.000	-0.650	0.540	0.22	0.41	6.97	2.86		5.61	0.04	1.17	0.237	↓
397+50.000 to 398+00.000	-0.650	0.540	0.22	0.53	6.97	3.69		5.66	0.05	1.27	0.237	↓
398+00.000 to 398+50.000	-0.650	0.540	0.22	0.65	6.97	4.52	2.50	3.13	0.08	1.65	0.337	↓
398+50.000 to 399+00.000	-0.650	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78	0.237	↓
399+00.000 to 399+50.000	-0.650	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↓
399+50.000 to 400+45.000	-0.336	0.540	0.42	0.46	6.97	3.24		5.63	0.04	1.21	0.237	↓
400+45.000 to 401+42.614	-0.336	0.540	0.42	0.69	6.97	4.82	2.50	3.16	0.08	1.68		↓
401+42.614 to 402+45.000	0.100	0.540	1.13	1.22	6.97	8.51	6.00	6.00	0.08	1.64	0.237	↑
402+45.000 to 403+50.000	0.100	0.540	1.13	0.61	6.97	4.25		5.71	0.05	1.33	0.337	↑
403+50.000 to 406+20.000	0.100	0.540	1.30	0.70	6.97	4.89	3.00	3.61	0.08	1.62	0.337	↑
406+20.000 to 406+50.000	2.000	0.540	0.12	0.72	6.97	5.04	3.00	3.61	0.08	1.63	0.237	↑
406+50.000 to 406+75.000	2.000	0.540	0.12	0.66	6.97	4.59		5.71	0.05	1.36	0.237	↑
406+75.000 to 407+00.000	2.000	0.540	0.11	0.59	6.97	4.14		5.68	0.05	1.32	0.237	↑
407+00.000 to 407+25.000	2.000	0.540	0.11	0.53	6.97	3.73		5.66	0.05	1.27	0.237	↑
407+25.000 to 407+50.000	2.000	0.540	0.11	0.48	6.97	3.31		5.63	0.04	1.22	0.237	↑
407+50.000 to 407+75.000	2.000	0.540	0.11	0.42	6.97	2.90		5.61	0.04	1.17	0.237	↑
407+75.000 to 408+00.000	1.554	0.540	0.11	0.36	6.97	2.48		5.58	0.04	1.12	0.237	↑
408+00.000 to 408+25.000	1.554	0.540	0.11	0.30	6.97	2.07		5.54	0.03	1.05	0.237	↑
408+25.000 to 408+50.000	1.020	0.540	0.11	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↑
408+50.000 to 408+75.000	1.020	0.540	0.11	0.18	6.97	1.24		5.46	0.02	0.89	0.237	↑
408+75.000 to 409+20.659	0.487	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78		↑

Retention Ditch & Overflow Weir Hydraulic Calculations
Left Ditch

Ditch Section	% Slope	"C"	Drain Area "A" (ac)	Cumu-lative "CA"	I 10 (in/hr)	Q in Section (cfs)	Weir Crest Length (m)	Effective Crest Length (m)	Depth Over Crest (m)	Velocity Over Crest (fps)	Ditch Block Height (m)	Flow Direction
303+15.000 to 304+60.000	-0.200	0.540	0.79	0.43	6.97	2.97		5.61	0.04	1.18	0.237	↓
304+60.000 to 306+05.000	-0.200	0.540	0.79	0.85	6.97	5.95	3.50	4.13	0.08	1.65	0.337	↓
311+90.000 to 312+95.000	-0.250	0.540	0.63	0.34	6.97	2.37		5.56	0.04	1.10	0.237	↓
312+95.000 to 313+86.719	-0.125	0.540	0.48	0.60	6.97	4.18	2.50	3.11	0.08	1.61		↓
313+86.719 to 316+29.000	0.200	0.540	1.07	0.58	6.97	4.03	2.00	2.66	0.08	1.68	0.337	↑
316+29.000 to 317+05.000	0.400	0.540	0.33	0.55	6.97	3.80	2.00	2.63	0.08	1.65	0.237	↑
317+05.000 to 317+80.000	0.400	0.540	0.33	0.37	6.97	2.56		5.58	0.04	1.13	0.237	↑
317+80.000 to 318+60.714	0.400	0.540	0.35	0.19	6.97	1.32		5.49	0.02	0.91		↑
318+60.714 to 319+50.000	-0.300	0.540	0.39	0.21	6.97	1.47		5.49	0.03	0.94	0.237	↓
319+50.000 to 320+57.000	-0.300	0.540	0.48	0.47	6.97	3.27	1.50	2.16	0.08	1.68	0.337	↓
320+57.000 to 321+45.000	-0.300	0.540	0.50	0.27	6.97	1.88		5.54	0.03	1.02	0.237	↓
321+45.000 to 322+65.000	-0.300	0.540	0.62	0.60	6.97	4.22		5.71	0.05	1.32	0.237	↓
322+65.000 to 323+63.215	-0.300	0.540	0.43	0.84	6.97	5.83	3.50	4.13	0.08	1.64		↓
323+63.215 to 325+00.000	0.400	0.540	0.60	0.53	6.97	3.73	2.00	2.63	0.08	1.64	0.237	↑
325+00.000 to 325+90.000	0.400	0.540	0.39	0.21	6.97	1.47		5.49	0.03	0.94	0.337	↑
325+90.000 to 326+50.000	0.400	0.540	0.26	0.28	6.97	1.96	1.00	1.59	0.07	1.57	0.237	↑
326+50.000 to 327+10.715	0.400	0.540	0.26	0.14	6.97	0.98		5.44	0.02	0.83		↑
327+10.715 to 328+00.000	-0.300	0.540	0.39	0.21	6.97	1.47		5.49	0.03	0.94	0.237	↓
328+00.000 to 329+05.000	-0.300	0.540	0.57	0.52	6.97	3.61	2.00	2.61	0.08	1.63	0.337	↓
329+05.000 to 330+00.000	-0.300	0.540	0.50	0.27	6.97	1.88		5.54	0.03	1.02	0.237	↓
330+00.000 to 331+00.000	-0.300	0.540	0.47	0.52	6.97	3.65		5.66	0.05	1.26	0.237	↓
331+00.000 to 331+45.577	-0.300	0.540	0.20	0.63	6.97	4.40	2.50	3.13	0.08	1.64		↓
331+45.577 to 332+50.000	0.350	0.540	0.45	0.56	6.97	3.88	2.00	2.63	0.08	1.66	0.237	↑
332+50.000 to 333+20.000	0.350	0.540	0.29	0.31	6.97	2.18		5.56	0.03	1.07	0.237	↑
333+20.000 to 333+85.000	0.350	0.540	0.29	0.16	6.97	1.09		5.46	0.02	0.85	0.337	↑
333+85.000 to 334+75.000	0.350	0.540	0.39	0.57	6.97	3.99	2.00	2.66	0.08	1.67	0.237	↑
334+75.000 to 335+65.000	0.350	0.540	0.39	0.36	6.97	2.52		5.58	0.04	1.12	0.237	↑
335+65.000 to 336+30.153	0.250	0.540	0.28	0.15	6.97	1.05		5.44	0.02	0.85		↑
336+30.153 to 338+00.000	-0.149	0.540	0.86	0.46	6.97	3.24	1.50	2.16	0.08	1.67	0.337	↓
345+70.000 to 346+95.000	0.100	0.540	0.61	0.33	6.97	2.30	1.00	1.63	0.08	1.64	0.337	↑
346+95.000 to 349+55.000	0.100	0.540	1.17	0.63	6.97	4.40	2.50	3.13	0.08	1.64		↑
349+55.000 to 350+15.000	-0.400	0.540	0.26	0.14	6.97	0.98		5.44	0.02	0.83	0.237	↓
350+15.000 to 350+75.000	-0.400	0.540	0.26	0.28	6.97	1.96		5.54	0.03	1.03	0.237	↓
350+75.000 to 351+50.000	-0.400	0.540	0.33	0.46	6.97	3.20	1.50	2.16	0.08	1.67	0.337	↓
351+50.000 to 354+26.136	-0.200	0.540	1.36	0.73	6.97	5.12	3.00	3.63	0.08	1.64		↓
354+26.136 to 355+85.000	0.150	0.540	0.77	0.42	6.97	2.90	1.50	2.11	0.08	1.62	0.337	↑
355+85.000 to 357+95.000	0.150	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↑
357+95.000 to 360+05.000	0.150	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↑
360+05.000 to 362+15.000	0.150	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↑

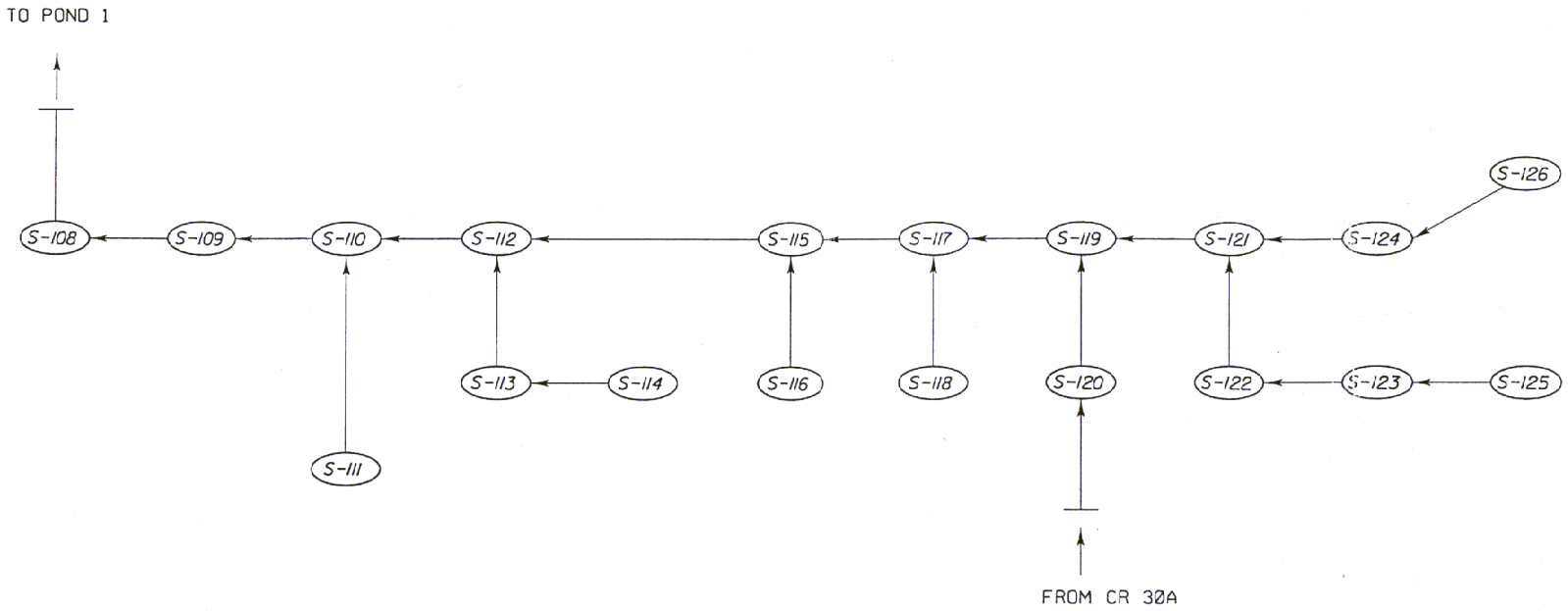
Notes:
- "C" = Weighted C = [0.95 x (1.5+7.2) + 0.20 (2.1+3.6+1.5+2.7+0.6)] / (1.5+7.2+2.1+3.6+1.5+2.7+0.6) Where C=0.95 for Pavement and 0.20 for Sod
- Cumulative "CA" = C x sum of areas separated by ditch blocks at height of .24m
- Q = CA x I
- Effective Crest Length (L): the trapezoidal weirs -ditch blocks and overflow weirs- were transformed into equivalent rectangular weirs for computation.
- Depth Over Crest: water elevation above the crest. $H = (Q / 3.2 / L)^{2/3}$
- Velocity over Crest = (Q / L / H)

II-16

Ditch Section	% Slope	"C"	Drain Area "A" (ac)	Cumu-lative "CA"	I 10 (in/hr)	Q in Section (cfs)	Weir Crest Length (m)	Effective Crest Length (m)	Depth Over Crest (m)	Velocity Over Crest (fps)	Ditch Block Height (m)	Flow Direction
362+15.000 to 364+25.000	0.150	0.540	1.13	0.61	6.97	4.25	2.50	3.11	0.08	1.62	0.337	↑
364+25.000 to 366+35.000	0.150	0.540	0.91	0.49	6.97	3.43	2.00	2.61	0.08	1.60	0.337	↑
366+35.000 to 368+45.000	0.150	0.540	0.90	0.97	6.97	6.77	4.00	4.54	0.08	1.67	0.237	↑
368+45.000 to 370+50.000	0.150	0.540	0.90	0.49	6.97	3.39		5.63	0.05	1.23		↑
370+50.000 to 371+50.000	-0.243	0.540	0.53	0.29	6.97	1.99		5.54	0.03	1.04	0.237	↓
371+50.000 to 372+50.000	-0.243	0.540	0.53	0.57	6.97	3.99		5.68	0.05	1.30	0.237	↓
372+50.000 to 373+55.000	-0.300	0.540	0.49	0.84	6.97	5.83	3.50	4.13	0.08	1.64	0.337	↓
373+55.000 to 374+60.000	-0.300	0.540	0.46	0.25	6.97	1.73		5.51	0.03	0.99	0.237	↓
374+60.000 to 375+65.000	-0.300	0.540	0.46	0.50	6.97	3.46		5.66	0.05	1.24	0.237	↓
375+65.000 to 376+70.000	-0.300	0.540	0.46	0.75	6.97	5.19	3.00	3.63	0.08	1.65	0.337	↓
376+70.000 to 378+25.000	-0.150	0.540	0.72	0.39	6.97	2.71		5.58	0.04	1.15	0.237	↓
378+25.000 to 379+78.750	-0.150	0.540	0.72	0.78	6.97	5.42	3.00	3.66	0.08	1.67		↓
379+78.750 to 382+40.000	0.100	0.540	2.71	1.46	6.97	10.20	7.00	7.00	0.08	1.66	0.337	↑
382+40.000 to 385+55.000	0.100	0.540	1.37	0.74	6.97	5.16	3.00	3.63	0.08	1.64	0.337	↑
385+55.000 to 388+45.000	0.100	0.540	1.37	0.74	6.97	5.16	3.00	3.63	0.08	1.64		↑
388+45.000 to 389+00.000	-0.620	0.540	0.27	0.15	6.97	1.02		5.44	0.02	0.84	0.237	↓
389+00.000 to 389+50.000	-0.620	0.540	0.27	0.29	6.97	2.03		5.54	0.03	1.05	0.237	↓
389+50.000 to 390+00.000	-0.620	0.540	0.25	0.43	6.97	2.97		5.61	0.04	1.18	0.237	↓
390+00.000 to 390+60.000	-0.620	0.540	0.22	0.55	6.97	3.80		5.66	0.05	1.28	0.237	↓
390+60.000 to 391+00.000	-0.620	0.540	0.22	0.66	6.97	4.63	2.50	3.13	0.08	1.66	0.337	↓
391+00.000 to 391+50.000	-0.620	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78	0.237	↓
391+50.000 to 392+00.000	-0.620	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↓
392+00.000 to 392+50.000	-0.620	0.540	0.22	0.36	6.97	2.48		5.58	0.04	1.12	0.237	↓
392+50.000 to 393+00.000	-0.620	0.540	0.22	0.48	6.97	3.31		5.63	0.04	1.22	0.237	↓
393+00.000 to 393+50.000	-0.620	0.540	0.22	0.59	6.97	4.14	2.50	3.11	0.08	1.61	0.337	↓
393+50.000 to 394+00.000	-0.620	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78	0.237	↓
394+00.000 to 394+50.000	-0.620	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↓
394+50.000 to 395+00.000	-0.620	0.540	0.22	0.36	6.97	2.48		5.58	0.04	1.12	0.237	↓
395+00.000 to 395+50.000	-0.620	0.540	0.22	0.48	6.97	3.31		5.63	0.04	1.22	0.237	↓
395+50.000 to 396+00.000	-0.620	0.540	0.22	0.59	6.97	4.14	2.50	3.11	0.08	1.61	0.337	↓
396+00.000 to 396+25.000	-0.620	0.540	0.13	0.07	6.97	0.49		5.39	0.01	0.66	0.237	↓
396+25.000 to 396+50.000	-0.620	0.540	0.13	0.14	6.97	0.98		5.44	0.02	0.83	0.237	↓
396+50.000 to 397+00.000	-0.620	0.540	0.29	0.30	6.97	2.07		5.54	0.03	1.05	0.237	↓
397+00.000 to 397+50.000	-0.620	0.540	0.26	0.44	6.97	3.05		5.61	0.04	1.19	0.237	↓
397+50.000 to 398+00.000	-0.620	0.540	0.26	0.58	6.97	4.03		5.68	0.05	1.30	0.237	↓
398+00.000 to 398+50.000	-0.620	0.540	0.25	0.71	6.97	4.97	3.00	3.61	0.08	1.63	0.337	↓
398+50.000 to 399+00.000	-0.620	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78	0.237	↓
399+00.000 to 399+50.000	-0.620	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↓
399+50.000 to 401+42.614	-0.310	0.540	0.84	0.69	6.97	4.82	3.00	3.61	0.08	1.61		↓
401+42.614 to 403+50.000	0.100	0.540	0.90	0.49	6.97	3.39	2.00	2.59	0.08	1.60	0.337	↑
403+50.000 to 406+20.000	0.100	0.540	1.36	1.47	6.97	10.24	7.00	7.00	0.08	1.66	0.237	↑
406+20.000 to 406+50.000	2.000	0.540	0.13	0.73	6.97	5.12		5.76	0.06	1.41	0.237	↑
406+50.000 to 406+75.000	2.000	0.540	0.13	0.66	6.97	4.63		5.73	0.06	1.36	0.237	↑
406+75.000 to 407+00.000	2.000	0.540	0.11	0.59	6.97	4.14		5.68	0.05	1.32	0.237	↑
407+00.000 to 407+25.000	2.000	0.540	0.11	0.53	6.97	3.73		5.66	0.05	1.27	0.237	↑
407+25.000 to 407+50.000	2.000	0.540	0.11	0.48	6.97	3.31		5.63	0.04	1.22	0.237	↑
407+50.000 to 407+75.000	2.000	0.540	0.11	0.42	6.97	2.90		5.61	0.04	1.17	0.237	↑
407+75.000 to 408+00.000	1.554	0.540	0.11	0.36	6.97	2.48		5.58	0.04	1.12	0.237	↑
408+00.000 to 408+25.000	1.554	0.540	0.11	0.30	6.97	2.07		5.54	0.03	1.05	0.237	↑
408+25.000 to 408+75.000	1.020	0.540	0.22	0.24	6.97	1.66		5.51	0.03	0.98	0.237	↑
408+75.000 to 409+20.659	0.487	0.540	0.22	0.12	6.97	0.83		5.41	0.02	0.78		↑

II-3

Storm Drain Calculations



SYSTEM 1
(N.T.S)

PLANS\SSD1ACRM.DGN

dpa
DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS WEST PALM BEACH TAMPA
150 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 444-0900 FAX (305) 444-4986

PROJECT: STATE ROAD 30 (US 98)

TITLE: STORM DRAIN DIAGRAM

FIGURE No. 1

TT-127

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 1 OF 2

NOTES: ZONE 1 FREQUENCY 3 YR. | n = 0.012 RCP | n = 0.020 CMP

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 / C= 0.00 / C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (M)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	REMARKS
C.L. S.R.30						53.40m	0.280	0.280	0.266									8.332	8.282	0.050		0.09	0.92	3.50	
			S-126	E	M	175.19ft	0.000	0.000	0.000	10.00	3.17	6.16	0.280	1.72	0.00	1.72	8.90m	8.637	8.547	0.090	18				
415+03.50	26.41	LT.					0.090	0.090	0.014								29.20ft	8.180	8.090	0.090	RCP	0.17	1.23	4.68	
C.L. S.R.30						69.00m	0.250	0.540	0.513									8.282	8.271	0.011		0.02	0.48	3.10	
			S-124	P-5	M	226.38ft	0.000	0.000	0.000	13.17	7.89	5.54	0.537	2.98	0.00	2.98	9.44m	8.700	8.610	0.090	24				
414+50.00		RT.					0.070	0.160	0.024								30.97ft	8.090	8.000	0.090	RCP	0.13	1.37	8.87	
C.L. S.R.30						49.00m	0.179	0.179	0.170									8.649	8.535	0.113		0.23	1.25	5.49	
			S-125	P-5	M	160.75ft	0.000	0.000	0.000	10.00	2.15	6.16	0.171	1.05	0.00	1.05	9.73m	8.987	8.837	0.150	18				
414+75.00		RT.					0.005	0.005	0.001								31.92ft	8.530	8.380	0.150	RCP	0.31	1.43	6.31	
C.L. S.R.30						54.40m	0.150	0.329	0.313									8.535	8.462	0.074		0.14	1.25	4.20	
			S-123	P-5	M	178.48ft	0.000	0.000	0.000	12.15	2.39	5.72	0.321	1.84	0.00	1.84	9.58m	8.837	8.687	0.150	18				
414+25.00		RT.					0.050	0.055	0.008								31.42ft	8.380	8.230	0.150	RCP	0.28	1.78	5.99	
C.L. S.R.30						16.50m	0.420	0.749	0.712									8.462	8.432	0.030		0.18	1.43	4.84	
			S-122	E	M	54.13ft	0.000	0.000	0.000	14.54	0.63	5.33	0.733	3.91	0.00	3.91	9.75m	8.687	8.657	0.030	18				
413+80.00	1.8	RT.					0.090	0.145	0.022								31.99ft	8.230	8.200	0.030	RCP	0.18	1.44	4.87	
C.L. S.R.30						79.00m	0.290	1.579	1.500									8.271	8.246	0.025		0.03	0.76	7.95	
			S-121	P-5	M	259.18ft	0.000	0.000	0.000	21.06	5.38	4.55	1.558	7.09	0.00	7.09	9.65m	8.762	8.682	0.080	30				
413+80.00		LT.					0.080	0.385	0.058								31.66ft	8.000	7.920	0.080	RCP	0.10	1.35	14.18	
C.L. S.R.30						20.60m	0.430	0.430	0.409									8.901	8.884	0.017		0.08	1.00	3.28	
			S-120	EW	M	67.58ft	0.000	0.000	0.000	10.00	1.13	6.16	0.520	3.20	0.00	3.20	9.14m	9.147	9.097	0.050	18				
413+00.00	23.93	RT.					0.740	0.740	0.111								29.99ft	8.690	8.640	0.050	RCP	0.24	1.71	5.62	
C.L. S.R.30						17.50m	0.220	0.650	0.618									8.884	8.844	0.040		0.23	1.66	5.44	
			S-120	P-5	M	57.41ft	0.000	0.000	0.000	11.13	0.58	5.92	0.733	4.34	0.00	4.34	10.18m	9.097	9.057	0.040	18				
413+00.00		RT.					0.030	0.770	0.116								33.40ft	8.640	8.600	0.040	RCP	0.23	1.66	5.46	
C.L. S.R.30						49.00m	0.170	2.399	2.279									8.246	8.206	0.040		0.08	1.22	12.75	
			S-119	P-5	M	160.75ft	0.000	0.000	0.000	26.44	2.20	4.10	2.463	10.10	0.00	10.10	9.89m	8.682	8.642	0.040	30				
413+00.00		LT.					0.070	1.225	0.184								32.45ft	7.920	7.880	0.040	RCP	0.08	1.21	12.73	
C.L. S.R.30						17.50m	0.180	0.180	0.171									9.249	8.959	0.290		1.66	2.73	14.69	
			S-118	P-5	M	57.41ft	0.000	0.000	0.000	10.00	0.35	6.16	0.177	1.09	0.00	1.09	10.33m	9.587	9.297	0.290	18				
412+50.00		RT.					0.040	0.040	0.006								33.89ft	9.130	8.840	0.290	RCP	1.66	2.74	14.69	
C.L. S.R.30						99.00m	0.420	2.999	2.849									8.098	8.051	0.048		0.05	1.00	15.92	
			S-117	P-5	M	324.80ft	0.000	0.000	0.000	28.64	5.62	3.95	3.055	12.07	0.00	12.07	10.04m	8.674	8.614	0.060	36				
412+50.00		LT.					0.110	1.375	0.206								32.94ft	7.760	7.700	0.060	RCP	0.06	1.12	17.84	
C.L. S.R.30						21.00m	0.180	0.180	0.171									9.699	9.319	0.380		1.81	2.86	15.35	
			S-116	P-5	M	68.90ft	0.000	0.000	0.000	10.00	0.40	6.16	0.177	1.09	0.00	1.09	10.78m	10.037	9.657	0.380	18				
411+75.00		RT.					0.040	0.040	0.006								35.36ft	9.580	9.200	0.380	RCP	1.81	2.86	15.35	

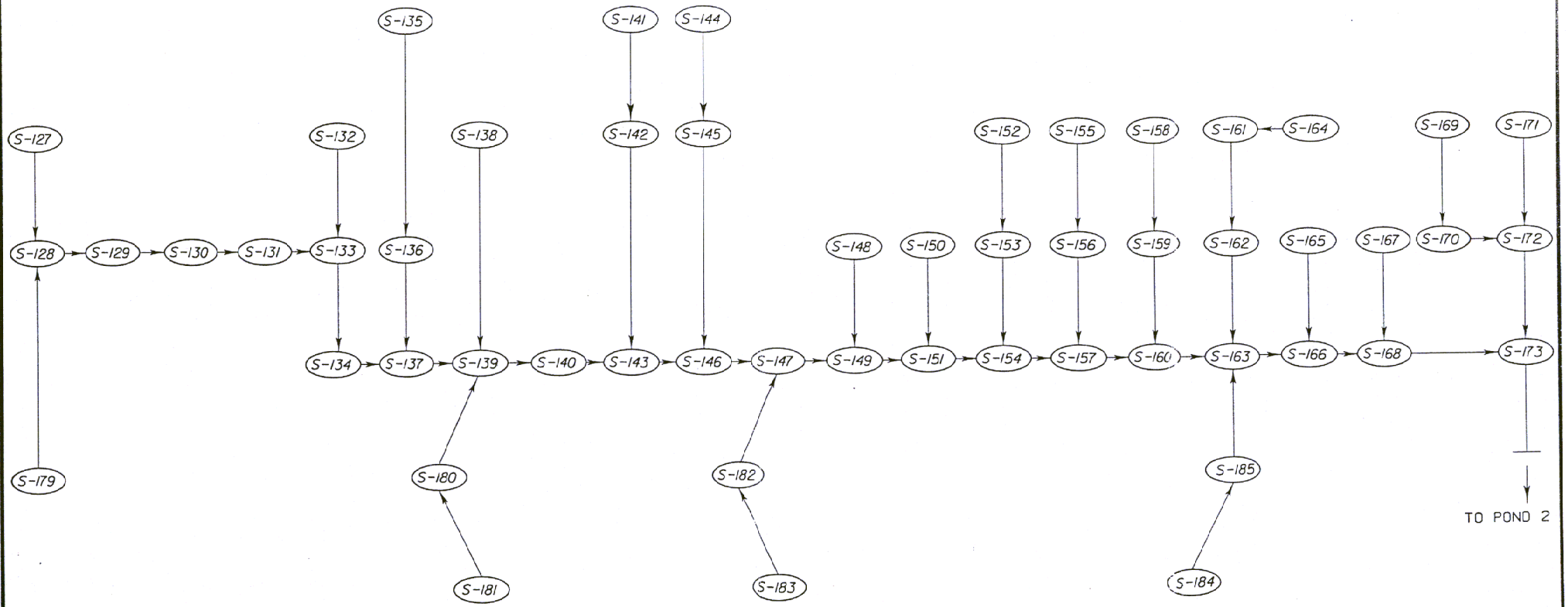
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 2 OF 2

NOTES: ZONE 1 FREQUENCY 3 YR. | n = 0.012 RCP | n = 0.020 CMP

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 / C= 0.00 / C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (M)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	REMARKS
C.L. S.R.30						99.00m	0.350	3.529	3.353									8.051	7.999	0.052		0.05	1.05	16.56	
			S-115	P-5	M	324.80ft	0.000	0.000	0.000	34.26	5.14	3.61	3.596	13.00	0.00	13.00	10.42m	8.614	8.544	0.070	36				
411+50.00		LT.					0.210	1.625	0.244								34.18ft	7.700	7.630	0.070	RCP	0.07	1.23	19.27	
C.L. S.R.30						49.00m	0.180	0.180	0.171									9.919	9.865	0.054		0.11	0.90	3.80	
			S-114	P-5	M	160.76ft	0.000	0.000	0.000	10.00	2.98	6.16	0.177	1.09	0.00	1.09	11.00m	10.257	10.157	0.100	18				
411+00.00		RT.					0.040	0.040	0.006								36.10ft	9.800	9.700	0.100	RCP	0.20	1.22	5.15	
C.L. S.R.30						21.00m	0.190	0.370	0.352									9.865	9.815	0.050		0.24	1.31	5.54	
			S-113	P-5	M	68.90ft	0.000	0.000	0.000	12.98	0.88	5.58	0.364	2.03	0.00	2.03	11.23m	10.157	10.107	0.050	18				
410+50.00		RT.					0.040	0.080	0.012								36.84ft	9.700	9.650	0.050	RCP	0.24	1.32	5.57	
C.L. S.R.30						93.60m	0.320	4.219	4.008									7.999	7.935	0.064		0.07	1.23	18.93	
			S-112	P-5	M	307.08ft	0.000	0.000	0.000	39.40	4.17	3.36	4.294	14.44	0.00	14.44	11.12m	8.544	8.474	0.070	36				
410+50.00		LT.					0.200	1.905	0.286								36.48ft	7.630	7.560	0.070	RCP	0.07	1.28	19.81	
C.L. S.R.30						30.00m	0.240	0.240	0.228									10.240	9.960	0.280		0.93	2.40	11.03	
			S-111	P-6	M	98.42ft	0.000	0.000	0.000	10.00	0.68	6.16	0.237	1.46	0.00	1.46	11.30m	10.557	10.277	0.280	18				
409+55.00		RT.					0.060	0.060	0.009								37.07ft	10.100	9.820	0.280	RCP	0.93	2.40	11.02	
C.L. S.R.30						104.00m	0.100	4.559	4.331									7.935	7.875	0.060		0.06	1.13	17.39	
			S-110	P-5	M	341.20ft	0.000	0.000	0.000	43.57	5.05	3.19	4.633	14.77	0.00	14.77	11.30m	8.474	8.414	0.060	36				
409+55.00		LT.					0.050	2.015	0.302								37.07ft	7.560	7.500	0.060	RCP	0.06	1.13	17.40	
C.L. S.R.30						99.00m	0.000	4.559	4.331									7.863	7.793	0.070		0.07	1.22	19.23	
			S-109	P-7	M	324.80ft	0.000	0.000	0.000	48.62	4.42	3.00	4.633	13.91	0.00	13.91	11.02m	8.414	8.344	0.070	36				
408+50.00	16.65	LT.					0.000	2.015	0.302								36.15ft	7.500	7.430	0.070	RCP	0.07	1.23	19.27	
C.L. S.R.30						53.90m	0.000	4.559	4.331									7.784	7.754	0.030		0.05	1.06	16.97	
			S-108	P-7	M	176.84ft	0.000	0.000	0.000	53.04	2.78	2.86	4.633	13.25	0.00	13.25	9.73m	8.344	8.314	0.030	36				
407+50.00	16.65	LT.					0.000	2.015	0.302								31.92ft	7.430	7.400	0.030	RCP	0.06	1.07	17.09	



SYSTEM 2
(N.T.S)

DAVID PLUMMER & ASSOCIATES, INC.
TRANSPORTATION • CIVIL • STRUCTURAL • ENVIRONMENTAL
CORAL GABLES FORT MYERS WEST PALM BEACH TAMPA
1150 PONCE DE LEON BLVD. CORAL GABLES FL 33134 TELEPHONE (305) 447 0900 FAX (305) 444 4986

PROJECT: STATE ROAD 30 (US 98)

TITLE: STORM DRAIN DIAGRAM

FIGURE No. 2

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 1 OF 5

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 C= 0.00 C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (M)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	NOTES / REMARKS
																									ZONE 1 FREQUENCY 3 YR.
																									n = 0.012 RCP
																									n = 0.020 CMP
C.L. WALL ST.							0.040	0.040	0.038									8.418	8.392	0.026		0.07	0.51	3.10	
			S-179	P-5	S	35.00m 114.83ft	0.000	0.000	0.000	10.00	4.19	6.16	0.039	0.24	0.00	0.24	9.55m 31.33ft	8.817	8.757	0.060	18				
10+50.00		LT.					0.008	0.008	0.001									8.360	8.300	0.060	RCP	0.17	0.77	4.72	
C.L. S.R.30							0.140	0.140	0.133									8.395	8.392	0.003		0.01	0.58	1.02	
			S-127	P-5	M	37.50m 123.03ft	0.000	0.000	0.000	10.00	3.55	6.16	0.138	0.85	0.00	0.85	9.07m 29.76ft	8.327	8.267	0.060	18				
415+15.00		LT.					0.030	0.030	0.005									7.870	7.810	0.060	RCP	0.16	2.58	4.56	
C.L. S.R.30						8.70m	0.280	0.460	0.437									8.392	8.387	0.005		0.06	1.55	2.74	
			S-128	P-5	M	28.54ft	0.000	0.000	0.000	14.19	0.31	5.38	0.461	2.48	0.00	2.48	9.47m 31.07ft	8.257	8.247	0.020	18				
415+29.00		RT.					0.120	0.158	0.024									7.810	7.790	0.020	RCP	0.23	3.10	5.47	
C.L. S.R.30						36.10m	0.060	0.520	0.494									8.387	8.382	0.005		0.01	0.92	2.89	
			S-129	P-5	M	118.44ft	0.000	0.000	0.000	14.50	2.14	5.33	0.519	2.77	0.00	2.77	9.47m 31.07ft	8.260	8.190	0.070	24				
415+38.00		RT.					0.007	0.165	0.025									7.650	7.580	0.070	RCP	0.19	3.44	10.82	
C.L. S.R.30						49.00m	0.170	0.690	0.656									8.382	8.372	0.010		0.02	1.12	3.51	
			S-130	P-5	M	160.76ft	0.000	0.000	0.000	16.65	2.40	5.04	0.686	3.46	0.00	3.46	9.39m 30.81ft	8.190	8.130	0.060	24				
415+75.00		RT.					0.040	0.205	0.031									7.580	7.520	0.060	RCP	0.12	2.74	8.60	
C.L. S.R.30						35.30m	0.174	0.864	0.821									8.372	8.362	0.010		0.03	1.32	4.14	
			S-131	P-5	M	115.81ft	0.000	0.000	0.000	19.04	1.40	4.76	0.862	4.10	0.00	4.10	9.21m 30.21ft	8.130	8.080	0.050	24				
416+61.33		RT.					0.070	0.275	0.041									7.520	7.470	0.050	RCP	0.14	2.94	9.25	
C.L. S.R.30						26.70m	0.550	0.550	0.523									8.387	8.362	0.025		0.09	1.98	3.49	
			S-132	P-6	M	87.50ft	0.000	0.000	0.000	10.00	0.74	6.16	0.557	3.43	0.00	3.43	8.90m 29.20ft	8.107	8.057	0.050	18				
416+25.00		RT.					0.230	0.230	0.035									7.650	7.600	0.050	RCP	0.19	2.79	4.94	
C.L. S.R.30						13.10m	0.270	1.684	1.600									8.362	8.348	0.014		0.11	2.56	8.03	
			S-133	P-6	M	42.98ft	0.000	0.000	0.000	20.44	0.28	4.61	1.694	7.81	0.00	7.81	9.10m 29.86ft	8.080	8.050	0.030	24				
416+61.33		RT.					0.120	0.625	0.094									7.470	7.440	0.030	RCP	0.23	3.74	11.76	
C.L. S.R.30						41.10m	0.000	1.684	1.600									8.348	8.306	0.042		0.10	2.50	7.86	
			S-134	P-7	M	134.84ft	0.000	0.000	0.000	20.72	0.90	4.59	1.694	7.77	0.00	7.77	9.61m 31.53ft	8.050	8.010	0.040	24				
416+61.33	19.4	RT.					0.000	0.625	0.094									7.440	7.400	0.040	RCP	0.10	2.44	7.67	
C.L. S.R.30						4.50m	0.030	0.030	0.029									8.315	8.314	0.001		0.02	0.67	1.70	
			S-135	EW	M	14.76ft	0.000	0.000	0.000	10.00	0.37	6.16	0.065	0.40	0.00	0.40	8.63m 28.31ft	8.537	8.397	0.240	18				
416+95.00	18.65	LT.					0.240	0.240	0.036									8.180	7.940	0.240	RCP	5.33	10.37	26.35	
C.L. S.R.30						30.00m	0.230	0.260	0.247									8.314	8.306	0.008		0.03	1.05	1.86	
			S-136	P-5	M	98.42ft	0.000	0.000	0.000	10.37	1.56	6.08	0.297	1.80	0.00	1.80	9.17m 30.08ft	8.397	8.257	0.140	18				
416+95.00		LT.					0.090	0.330	0.050									7.940	7.800	0.140	RCP	0.47	4.41	7.79	
C.L. S.R.30						64.10m	0.000	1.944	1.847									8.306	8.220	0.086		0.13	2.87	9.00	
			S-137	P-5	M	210.30ft	0.000	0.000	0.000	21.62	1.22	4.50	1.990	8.96	0.00	8.96	9.66m 31.69ft	8.410	7.940	0.470	24				
416+95.00	19.4	RT.					0.000	0.955	0.143									7.800	7.330	0.470	RCP	0.73	6.70	21.04	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 2 OF 5

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 C= 0.00 C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (M)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	REMARKS
C.L. S.R.30						30.30m	0.360	0.360	0.342									8.334	8.254	0.080		0.26	1.44	5.85	
			S-138	P-5	M	99.41ft	0.000	0.000	0.000	10.00	1.15	6.16	0.362	2.23	0.00	2.23	9.40m	8.617	8.537	0.080	18				
417+60.00		LT.					0.130	0.130	0.020								30.84ft	8.160	8.080	0.080	RCP	0.26	1.44	5.86	
B.L. WALTON ROSE LN						17.70m	0.210	0.210	0.200									8.314	8.240	0.074		0.42	2.77	7.38	
			S-181	E	M	58.07ft	0.000	0.000	0.000	10.00	0.36	6.16	0.224	1.38	0.00	1.38	9.10m	8.637	8.357	0.280	18				
3+90.696	8.00	RT.					0.160	0.160	0.024								29.86ft	8.180	7.900	0.280	RCP	1.58	5.38	14.35	
B.L. WALTON ROSE LN						22.50m	0.330	0.540	0.513									8.240	8.220	0.020		0.09	1.44	3.40	
			S-180	P-5	S	73.82ft	0.000	0.000	0.000	10.36	0.86	6.08	0.551	3.35	0.00	3.35	9.09m	8.357	8.257	0.100	18				
3+90.696		LT.					0.090	0.250	0.038								29.82ft	7.900	7.800	0.100	RCP	0.44	3.22	7.51	
C.L. S.R.30						43.00m	0.050	2.894	2.749									8.220	8.100	0.120		0.28	4.13	12.98	
			S-139	P-5	M	141.07ft	0.000	0.000	0.000	22.84	0.57	4.39	2.953	12.96	0.00	12.96	9.40m	7.970	7.920	0.050	24				
417+60.00		RT.					0.020	1.355	0.203								30.84ft	7.360	7.310	0.050	RCP	0.12	2.67	8.38	
C.L. S.R.30						55.00m	0.190	3.084	2.930									8.100	7.930	0.170		0.31	4.35	13.66	
			S-140	P-5	M	180.44ft	0.000	0.000	0.000	23.41	0.69	4.34	3.147	13.66	0.00	13.66	9.55m	7.920	7.860	0.060	24				
418+04.00		RT.					0.090	1.445	0.217								31.33ft	7.310	7.250	0.060	RCP	0.11	2.58	8.12	
C.L. S.R.30						4.50m	0.020	0.020	0.019									8.830	8.647	0.183		4.07	4.77	23.01	
			S-141	EW	M	14.75ft	0.000	0.000	0.000	10.00	0.05	6.16	0.061	0.38	0.00	0.38	9.21m	9.217	8.967	0.250	18				
418+60.00	18.65	LT.					0.280	0.280	0.042								30.22ft	8.760	8.510	0.250	RCP	5.56	5.57	26.89	
C.L. S.R.30						30.30m	0.170	0.190	0.181									8.647	8.537	0.110		0.36	1.43	5.88	
			S-142	P-5	M	99.41ft	0.000	0.000	0.000	10.05	1.16	6.15	0.233	1.43	0.00	1.43	9.75m	8.967	8.857	0.110	18				
418+60.00		LT.					0.070	0.350	0.053								31.99ft	8.510	8.400	0.110	RCP	0.36	1.42	5.88	
C.L. S.R.30						104.00m	0.180	3.454	3.281									7.930	7.530	0.400		0.38	3.11	15.24	
			S-143	P-5	M	341.20ft	0.000	0.000	0.000	24.10	1.82	4.28	3.560	15.25	0.00	15.25	9.75m	7.860	7.710	0.150	24				
418+60.00		RT.					0.060	1.855	0.278								31.99ft	7.250	7.100	0.150	RCP	0.14	1.91	9.33	
C.L. S.R.30						4.50m	0.130	0.130	0.124									8.913	8.634	0.279		6.20	6.98	28.41	
			S-144	EW	M	14.75ft	0.000	0.000	0.000	10.00	0.04	6.16	0.160	0.98	0.00	0.98	9.25m	9.257	8.917	0.340	18				
419+65.00	18.65	LT.					0.240	0.240	0.036								30.35ft	8.800	8.460	0.340	RCP	7.56	7.70	31.36	
C.L. S.R.30						30.30m	0.200	0.330	0.314									8.634	8.554	0.080		0.26	1.44	5.85	
			S-145	P-5	M	99.41ft	0.000	0.000	0.000	10.04	1.15	6.15	0.362	2.22	0.00	2.22	9.70m	8.917	8.837	0.080	18				
419+65.00		LT.					0.080	0.320	0.048								31.82ft	8.460	8.380	0.080	RCP	0.26	1.44	5.86	
C.L. S.R.30						68.00m	0.200	3.984	3.785									7.407	6.645	0.762		1.12	5.47	47.16	
			S-146	P-5	M	223.09ft	0.000	0.000	0.000	25.92	0.68	4.14	4.123	17.07	0.00	17.07	9.70m	7.742	6.962	0.780	30				
419+65.00		RT.					0.080	2.255	0.338								31.82ft	6.980	6.200	0.780	RCP	1.15	5.54	47.72	
B.L. ORANGE ST.						11.70m	0.170	0.170	0.162									6.916	6.880	0.036		0.31	1.55	5.33	
			S-183	P-5	S	38.39ft	0.000	0.000	0.000	10.00	0.41	6.16	0.166	1.02	0.00	1.02	7.99m	7.257	7.157	0.100	18				
10+64.90		LT.					0.030	0.030	0.005								26.21ft	6.800	6.700	0.100	RCP	0.85	2.59	10.55	

NOTES
ZONE 1 FREQUENCY 3 YR.
n = 0.012 RCP
n = 0.020 CMP

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 3 OF 5

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 / C= 0.00 / C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (M)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	NOTES / REMARKS
B.L. ORANGE ST.							0.230	0.400	0.360									6.880	6.680	0.200		0.96	2.84	11.16	ZONE 1 FREQUENCY 3 YR.
			S-182	P-5	S	20.90m	0.000	0.000	0.000	10.41	0.40	6.07	0.394	2.39	0.00	2.39	8.46m	7.157	6.957	0.200	18				n = 0.012 RCP
10+55.30		RT.				68.57ft	0.060	0.090	0.014								27.76ft	6.700	6.500	0.200	RCP	0.96	2.84	11.16	n = 0.020 CMP
C.L. S.R.30						36.00m	0.000	4.384	4.165									6.645	6.463	0.182		0.50	3.77	31.55	
			S-147	P-7	M	118.11ft	0.000	0.000	0.000	26.60	0.52	4.09	4.517	18.48	0.00	18.48	9.05m	6.962	6.762	0.200	30				
420+34.00	16.30	RT.					0.000	2.345	0.352								29.69ft	6.200	6.000	0.200	RCP	0.56	3.96	33.21	
C.L. S.R.30						30.30m	0.340	0.340	0.323									7.558	7.478	0.080		0.26	1.38	5.85	
			S-148	P-5	M	99.41ft	0.000	0.000	0.000	10.00	1.20	6.16	0.340	2.09	0.00	2.09	8.49m	7.847	7.767	0.080	18				
420+71.00		LT.					0.110	0.110	0.017								27.85ft	7.390	7.310	0.080	RCP	0.26	1.39	5.86	
C.L. S.R.30						73.00m	0.090	4.614	4.573									6.463	6.285	0.179		0.24	2.70	22.04	
			S-149	P-5	M	239.50ft	0.000	0.000	0.000	27.12	1.48	4.05	4.948	20.05	0.00	20.05	8.59m	6.762	6.562	0.200	30				
420+71.00		RT.					0.040	2.495	0.374								28.18ft	6.000	5.800	0.200	RCP	0.27	2.85	23.32	
C.L. S.R.30						30.30m	0.320	0.320	0.304									6.642	6.562	0.080		0.26	1.38	5.85	
			S-150	P-5	M	99.41ft	0.000	0.000	0.000	10.00	1.20	6.16	0.312	1.92	0.00	1.92	7.68m	6.937	6.857	0.080	18				
421+45.00		LT.					0.050	0.050	0.008								25.20ft	6.480	6.400	0.080	RCP	0.26	1.39	5.86	
C.L. S.R.30						104.10m	0.260	5.394	5.124									6.285	5.275	1.010		0.97	5.56	43.88	
			S-151	P-5	M	341.53ft	0.000	0.000	0.000	28.60	1.02	3.95	5.523	21.82	0.00	21.82	7.97m	6.562	5.522	1.040	30				
421+45.00		RT.					0.110	2.655	0.398								25.15ft	5.800	4.760	1.040	RCP	1.00	5.65	44.53	
C.L. S.R.30						21.10m	0.390	0.390	0.371									5.306	5.296	0.010		0.05	1.41	2.48	
			S-152	P-5	M	69.22ft	0.000	0.000	0.000	10.00	0.82	6.16	0.398	2.45	0.00	2.45	6.01m	5.277	5.237	0.040	18				
422+50.00		LT.					0.180	0.180	0.027								19.72ft	4.820	4.780	0.040	RCP	0.19	2.81	4.97	
C.L. S.R.30						11.90m	0.390	0.780	0.741									5.296	5.275	0.021		0.18	2.71	4.79	
			S-153	P-5	M	39.04ft	0.000	0.000	0.000	10.82	0.24	5.98	0.785	4.69	0.00	4.69	6.87m	5.237	5.217	0.020	18				
422+50.00		RT.					0.110	0.290	0.044								22.54ft	4.760	4.760	0.020	RCP	0.17	2.65	4.68	
C.L. S.R.30						102.10m	0.000	6.174	5.865									5.275	4.239	1.036		1.01	5.82	44.87	
			S-154	P-7	M	334.97ft	0.000	0.000	0.000	29.63	0.96	3.88	6.307	24.50	0.00	24.50	7.55m	5.522	4.462	1.060	30				
422+50.00	19.40	RT.					0.000	2.945	0.442								24.77ft	4.760	3.700	1.060	RCP	1.04	5.89	45.40	
C.L. S.R.30						17.50m	0.350	0.350	0.333									4.270	4.263	0.007		0.04	1.29	2.28	
			S-155	P-5	M	57.41ft	0.000	0.000	0.000	10.00	0.74	6.16	0.361	2.22	0.00	2.22	4.95m	4.217	4.187	0.030	18				
423+50.00		LT.					0.190	0.190	0.029								15.24ft	3.760	3.730	0.030	RCP	0.17	2.57	4.72	
C.L. S.R.30						15.50m	0.390	0.740	0.703									4.263	4.239	0.024		0.15	2.54	4.49	
			S-156	P-5	M	50.85ft	0.000	0.000	0.000	10.74	0.33	6.00	0.739	4.43	0.00	4.43	5.63m	4.187	4.157	0.030	18				
423+50.00		RT.					0.050	0.240	0.036								18.47ft	3.730	3.700	0.030	RCP	0.19	2.84	5.02	
C.L. S.R.30						76.50m	0.000	6.914	6.568									4.239	3.839	0.400		0.52	4.18	32.24	
			S-157	P-5	M	250.98ft	0.000	0.000	0.000	30.59	1.00	3.82	7.046	26.95	0.00	26.95	6.58m	4.462	4.062	0.400	30				
423+50.00	19.40	RT.					0.000	3.185	0.478								21.59ft	3.700	3.300	0.400	RCP	0.52	4.18	32.22	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 4 OF 5

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 / C= 0.00 / C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (M)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	NOTES / REMARKS
																									ZONE 1 FREQUENCY 3 YR.
																									n = 0.012 RCP
																									n = 0.020 CMP
C.L. S.R.30						17.50m	0.250	0.250	0.247									3.719	3.715	0.004		0.02	0.69	1.73	
			S-158	P-5	M	57.41ft	0.000	0.000	0.000	10.00	1.39	6.16	0.264	1.62	0.00	1.62	4.56m	3.817	3.787	0.030	18				
424+25.00		LT.					0.110	0.110	0.017								14.96ft	3.360	3.330	0.030	RCP	0.17	1.89	4.72	
C.L. S.R.30						15.20m	0.340	0.600	0.570									3.715	3.700	0.015		0.10	1.47	3.58	
			S-159	P-5	M	49.87ft	0.000	0.000	0.000	11.39	0.56	5.87	0.594	3.48	0.00	3.48	5.24m	3.787	3.757	0.030	18				
424+25.00		RT.					0.050	0.160	0.024								17.19ft	3.330	3.300	0.030	RCP	0.20	2.09	5.07	
C.L. S.R.30						42.00m	0.000	7.514	7.138									3.700	3.280	0.420		1.00	5.85	72.48	
			S-160	J-7	M	137.79ft	0.000	0.000	0.000	31.59	0.39	3.75	7.640	28.76	0.00	28.76	6.18m	4.084	3.664	0.420	36				
424+25.00	19.40	RT.					0.000	3.345	0.502								20.28ft	3.170	2.750	0.420	RCP	1.00	5.85	72.45	
C.L. S.R.30						33.70m	0.530	0.530	0.504									3.350	3.324	0.026		0.08	1.79	3.17	
			S-164	P-6	M	110.56ft	0.000	0.000	0.000	10.00	1.03	6.16	0.513	3.16	0.00	3.16	4.33m	3.597	3.277	0.320	18				
425+00.00		LT.					0.060	0.060	0.009								14.21ft	3.140	2.820	0.320	RCP	0.95	6.29	11.12	
C.L. S.R.30						20.60m	0.120	0.650	0.618									3.324	3.302	0.022		0.11	2.11	3.73	
			S-161	P-5	M	67.58ft	0.000	0.000	0.000	11.03	0.52	5.94	0.628	3.73	0.00	3.73	4.02m	3.277	3.237	0.040	18				
424+65.479		LT.					0.007	0.067	0.010								13.19ft	2.820	2.780	0.040	RCP	0.19	2.85	5.03	
C.L. S.R.30						16.80m	0.290	0.940	0.893									3.302	3.265	0.037		0.22	3.03	5.35	
			S-162	E	M	55.12ft	0.000	0.000	0.000	11.55	0.30	5.83	0.909	5.30	0.00	5.30	5.00m	3.237	3.207	0.030	18				
424+68.00	2.00	RT.					0.040	0.107	0.016								16.40ft	2.780	2.750	0.030	RCP	0.18	2.73	4.82	
B.L. S. WALTON LAKESHORE DR.						8.50m	0.030	0.030	0.029									4.759	4.553	0.206		2.42	2.47	17.75	
			S-184	P-5	S	27.89ft	0.000	0.000	0.000	10.00	0.19	6.16	0.029	0.18	0.00	0.18	5.70m	5.167	4.937	0.230	18				
9+41.64		LT.					0.005	0.005	0.001								18.70ft	4.710	4.480	0.230	RCP	2.71	2.61	18.77	
B.L. S. WALTON LAKESHORE DR.						19.80m	0.040	0.070	0.067									4.553	3.265	1.288		6.51	6.88	29.10	
			S-185	P-5	S	64.96ft	0.000	0.000	0.000	10.19	0.16	6.12	0.068	0.42	0.00	0.42	5.88m	4.937	3.557	1.380	18				
9+46.74		RT.					0.005	0.010	0.002								19.29ft	4.480	3.100	1.380	RCP	6.97	7.12	30.12	
C.L. S.R.30						69.00m	0.000	8.524	8.098									3.265	3.115	0.150		0.22	2.71	72.75	
			S-163	J-7	M	226.38ft	0.000	0.000	0.000	31.98	1.39	3.74	8.617	32.24	0.00	32.24	6.20m	3.969	3.819	0.150	48				
424+68.00	20.00	RT.					0.000	3.462	0.519								20.34ft	2.750	2.600	0.150	RCP	0.22	2.71	72.75	
C.L. S.R.30						11.60m	0.210	0.210	0.200									4.031	4.011	0.020		0.17	0.98	4.75	
			S-165	P-5	M	38.06ft	0.000	0.000	0.000	10.00	0.84	6.16	0.213	1.31	0.00	1.31	5.10m	4.357	4.337	0.020	18				
425+38.00		RT.					0.090	0.090	0.014								16.73ft	3.900	3.880	0.020	RCP	0.17	0.98	4.74	
C.L. S.R.30						73.00m	0.000	8.734	8.297									3.115	2.918	0.197		0.27	3.01	81.05	
			S-166	J-7	M	239.50ft	0.000	0.000	0.000	33.37	1.32	3.66	8.830	32.34	0.00	32.34	5.85m	3.819	3.619	0.200	48				
425+38.00	19.40	RT.					0.000	3.552	0.533								19.19ft	2.600	2.400	0.200	RCP	0.27	3.04	81.67	
C.L. S.R.30						11.60m	0.260	0.260	0.247									3.839	3.809	0.030		0.26	1.27	5.84	
			S-167	P-5	M	38.06ft	0.000	0.000	0.000	10.00	0.50	6.16	0.268	1.65	0.00	1.65	4.88m	4.147	4.117	0.030	18				
425+10.00		RT.					0.140	0.140	0.021								16.01ft	3.690	3.660	0.030	RCP	0.26	1.25	5.80	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STORM DRAIN TABULATION FORM

DATE: 1/24/00 PROJECT NO.: 87220-3511 ROAD: State Road 30 COUNTY: Walton BY: A.M. SHEET NO. 5 OF 5

NOTES: ZONE 1 FREQUENCY 3 YR. | n = 0.012 RCP | n = 0.020 CMP

LOCATION OF UPPER END (Sta.& off. are in Metric units) STATION	DIST.	SIDE	STR. NO.	TYPE OF STR.	TYPE OF LINE	LENGTH	DRAINAGE AREA (ACRES) C= 0.95 / C= 0.00 / C= 0.15 INCREMENT	SUB TOTAL	SUB TOTAL (CA)	TIME OF CONC. (MIN.)	TIME OF FLOW IN SECTION (MIN.)	RAINFALL INTENSITY (IN/HR)	TOTAL (CA)	INCREMENTAL RUNOFF (CFS)	ADDITIONAL RUNOFF (CFS)	TOTAL RUNOFF (CFS)	INLET ELEV.	ELEV. OF H.G. / CROWN ELEV. / FLOWLINE ELEV. UPPER END	LOWER END	FALL (FEET)	PIPE DIA. (IN)	SLOPE (%)	VELOCITY (FPS)	CAPACITY (CFS)	REMARKS
C.L. S.R.30						102.30m	0.000	8.994	8.544									2.916	2.830	0.088		0.09	1.74	45.71	
			S-168	J-7	M	335.63ft	0.000	0.000	0.000	34.70	3.21	3.59	9.098	32.68	0.00	32.68	5.53m	3.619	3.519	0.100	48				
426+10.00	19.40	RT.					0.000	3.692	0.554								18.47ft	2.400	2.300	0.100	RCP	0.10	1.86	48.78	
C.L. S.R.30						21.10m	0.230	0.230	0.219									3.321	3.317	0.004		0.02	0.39	1.57	
			S-169	P-5	M	69.22ft	0.000	0.000	0.000	10.00	2.99	6.16	0.225	1.38	0.00	1.38	4.37m	3.637	3.597	0.040	18				
416+60.00		LT.					0.040	0.040	0.006								14.34ft	3.180	3.140	0.040	RCP	0.19	1.22	4.97	
C.L. S.R.30						49.00m	0.180	0.410	0.390									3.317	2.991	0.326		0.67	2.83	9.31	
			S-170	P-5	M	160.76ft	0.000	0.000	0.000	12.99	0.95	5.57	0.412	2.30	0.00	2.30	4.73m	3.597	3.207	0.390	18				
426+60.00		RT.					0.110	0.150	0.023								15.52ft	3.140	2.750	0.390	RCP	0.80	3.10	10.18	
C.L. S.R.30						21.10m	0.180	0.180	0.171									2.993	2.991	0.002		0.01	0.34	1.11	
			S-171	P-5	M	69.22ft	0.000	0.000	0.000	10.00	3.41	6.16	0.177	1.09	0.00	1.09	3.98m	3.247	3.207	0.040	18				
427+10.00		LT.					0.040	0.040	0.006								13.06ft	2.790	2.750	0.040	RCP	0.19	1.51	4.97	
C.L. S.R.30						11.60m	0.180	0.770	0.732									2.991	2.961	0.030		0.26	1.76	5.78	
			S-172	P-5	M	38.06ft	0.000	0.000	0.000	13.94	0.36	5.42	0.775	4.20	0.00	4.20	4.55m	3.207	3.177	0.030	18				
427+10.00		RT.					0.100	0.290	0.044								14.93ft	2.750	2.720	0.030	RCP	0.26	1.77	5.80	
C.L. S.R.30						11.80m	0.000	9.764	9.276									2.830	2.790	0.040		0.34	3.48	91.24	
			S-173	J-7	M	38.71ft	0.000	0.000	0.000	37.91	0.19	3.43	9.873	33.89	0.00	33.89	5.30m	3.519	3.479	0.040	48				
427+10.00	19.40	RT.					0.000	3.982	0.597								17.39ft	2.300	2.260	0.040	RCP	0.34	3.46	90.85	

Appendix D

Correspondence and Project Information

FDOT Maintenance Coordination

From:	Hendrix, Timothy
To:	Luis Cruz-Miranda
Cc:	Williams, Chad; Jennifer Nunn; Greg Seidel; Lori Stanfill; Ellis, Robert; Rosnick, Eric; McKee, Dawne
Subject:	RE: History of Flooding - SR 30 (US 98)
Date:	Friday, December 9, 2022 11:06:59 AM
Attachments:	image001.png

Good Morning Luis,

Having looked in the database for historical flooding issues I do not see any issues along this segment of roadway. I am copying our area maintenance team in Ponce De Leon Operations who can opine on whether they have any issues that may not have been reported.

Thanks,

From: Luis Cruz-Miranda <LCruz@balmoralgroup.us>
Sent: Monday, December 5, 2022 5:39 PM
To: Hendrix, Timothy <Timothy.Hendrix@dot.state.fl.us>
Cc: Williams, Chad <Chad.Williams@dot.state.fl.us>; Jennifer Nunn <jnunn@balmoralgroup.us>; Greg Seidel <GSeidel@balmoralgroup.us>; Lori Stanfill <lstanfill@balmoralgroup.us>
Subject: History of Flooding - SR 30 (US 98)

EXTERNAL SENDER: Use caution with links and attachments.

Timothy Hendrix
District Maintenance Engineer
Florida Department of Transportation (FDOT)
District 3

Good Evening Mr. Hendrix:

The Balmoral Group (TBG) has subcontracted with H.W. Lochner, Inc. (Lochner), Prime Consultant to the FDOT, to provide drainage design services for the SR 30 (US 98) improvements from West CR 30A to West of Phillips Inlet Bridge (Financial Project ID No. 437179-1-22-01) in Walton County, FL.

I ask you if you have knowledge of any history of flooding or roadway overtopping during heavy rainfalls. Attached the project location map for your reference. If you have any information, please indicate it to us as it is very valuable for our report.

Thank you in advance,

Luis A. Cruz Miranda, P.E, M.S.C.E
Chief Engineer

WATERSS Meeting Notes and Followup Correspondence

FPID: 437179-1-22-01
PROJECT: S.R. 30 (US 98) PD&E Study from C.R. 30A to west of Phillips Inlet Bridge in Walton County
MEETING DATE: 9/18/2023 at 2:00 pm EST (1:00 pm CT) via Teleconference

Attendees:

Name	Organization	Phone Number	Email Address
Blake Chapman	FDEP	(850) 595-0611	Blake.A.Chapman@FloridaDEP.gov
Savannah Cowen	FDEP	(850) 595-0563	Savannah.Cowen@FloridaDEP.gov
Mark Kiser	Florida Forest Service	(850) 681-5885	Mark.Kiser@FDACS.gov
Charley Cotton	Walton County	(850) 892-8108	cotcharles@co.walton.fl.us
Chance Powell	Walton County	(850) 892-8108	PowChance@co.walton.fl.us
Alan Vann	FDOT D3 EMO PM	(850) 330-1523	Alan.Vann@dot.state.fl.us
Joy Swanson	FDOT D3	(850) 330-1505	Joy.SwansonPleas@dot.state.fl.us
Erica Brookman	FDOT D3	(850) 330-1506	erica.brookman@dot.state.fl.us
Natalie Nelson	FDOT D3	(850) 330-1515	Natalie.Nelson@dot.state.fl.us
Thomas Rogers	FDOT D3 Drainage	(850) 330-1441	thomas.rogers1@dot.state.fl.us
Tanya Kristoff	Lochner (PM)	(904) 512-7475	tkristoff@hwlochner.com
Trish Morris	Lochner	(904) 512-7475	tmorris@hwlochner.com
Jennifer Nunn	The Balmoral Group	(407) 629-2185 ext. 108	jnunn@balmoralgroup.us

INITIAL STAKEHOLDER MEETING NOTES

This initial Stakeholder Meeting (formerly known as the Environmental Look Around (ELA)) is the first step in the Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS) process. This is a process used by FDOT to proactively look for opportunities for joint stormwater management projects with agencies or stakeholders. The WATERSS process provides an opportunity for assessing and utilizing options for FDOT to partner in innovative, cooperative regional stormwater management projects. The WATERSS process leads to improved environmental benefit and/or reduced stormwater management costs.

OBJECTIVES –

- **Introductions and Project Overview**
  - Project Limits: Begin at CR 30A West (near Sandestin) and extend approximately 19.38-miles east and southeast to west of Phillips Inlet Bridge
  - Evaluating a 6-lane divided with a multiuse path

Figure 1: Proposed Rural Roadway Typical Section

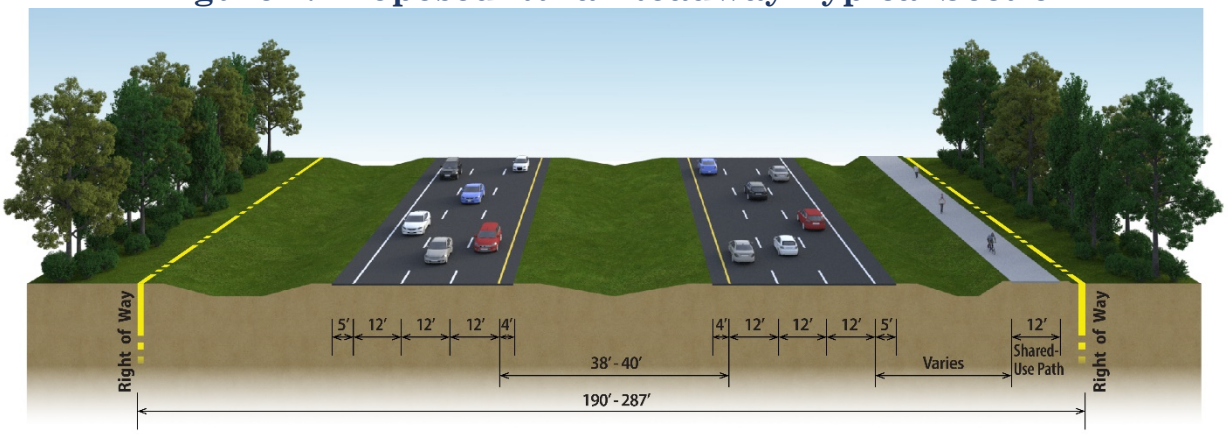


Figure 2: Proposed Suburban Roadway Typical Section

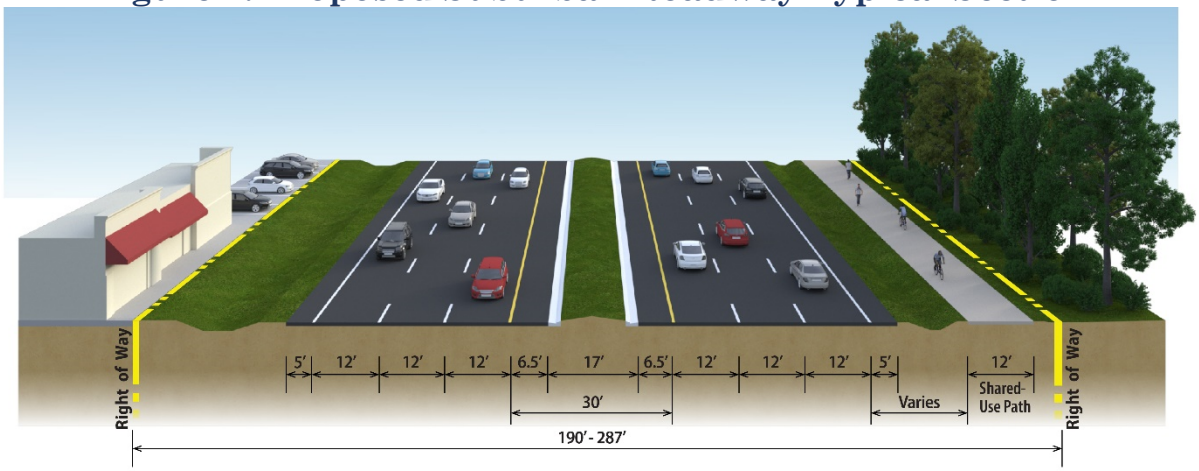


Figure 3: Proposed Urban Roadway Typical Section

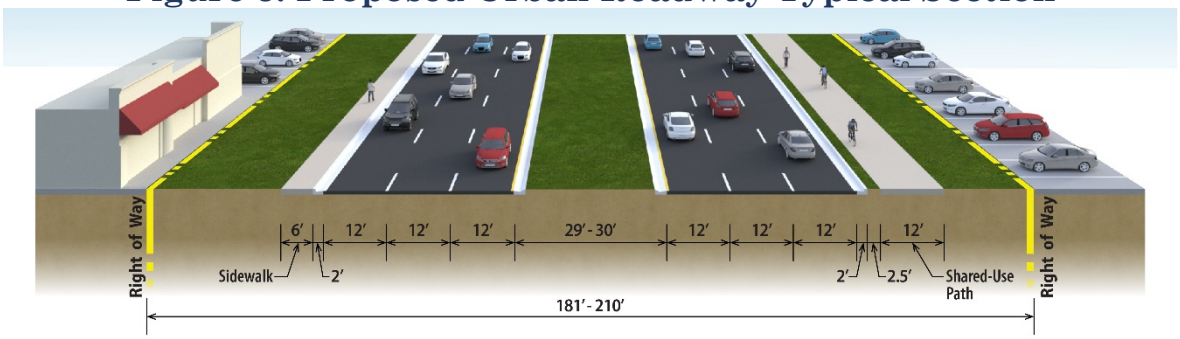
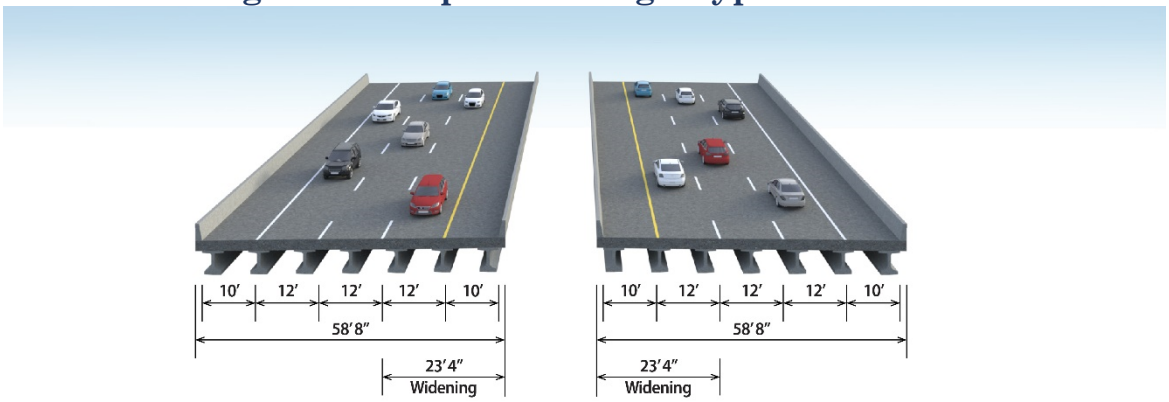


Figure 4: Proposed Bridge Typical Section



- U.S. 98/U.S. 331 Interchange Alternatives
  - U.S. 98 EB to U.S. 331 NB Flyover
  - Modified Tight Diamond-Inside Right
  - U.S. 331 SB to U.S. 98 EB Flyover

➢ **Existing Conditions**

- Ultimate discharge to Choctawhatchee Bay (impaired for nutrients) or Gulf
- WBIDs:
  - Hewett Bayou (944)
  - Mussett Bayou (957)
  - Direct Runoff to Bay (881) – Impaired for Nutrients
  - Bowman Bayou (972)
  - Littles Bayou (978)
  - McQuage Bayou (980)
  - Peach Creek (986)
  - Direct Runoff to Bay (981)
  - ICWW Walton County (963, 1008)
  - Camp Creek (1027B)
  - Lake Powell Drain (1055B)
- FEMA Floodplains – Zones X, A, AE; No Floodways
- Adjacent land use primarily consists of institutional, commercial use, wildlife management area, and future planned development
  - Point Washington Wildlife Management Area (PWWMA) borders ~ 11.5 miles of the corridor

➢ **Proposed Alternatives**

- Stormwater Management Facilities to treat and attenuate
- Conceptual Drainage Report prepared to document alternatives and BMP sizing
    - Treatment to be provided for entire basin impervious area
    - Attenuation considered if not direct discharge to tidally influenced waterbody
    - Jennifer discussed how a majority of the floodplains are Zone A and are considered transitional. For the purposes of the CDR, estimates will be provided for floodplain impacts based on the best available data; however, during design, the need for compensation could be further evaluated since majority of the floodplains occur on state lands and ultimately discharge to a tidal waterbody.

➢ **Stakeholder Opportunities**

- Flood Mitigation Projects
    - Any known flooding areas?
    - ❖ CR 393 Box Culvert – overtopping occurred in 2014
    - ❖ West of CR 393 Intersection (near large red dirt area in the aerial imagery) – Box Culvert potentially needs to be resized
- Alternative stormwater management strategies along PWWMA
    - ❖ Tanya mentioned that currently roadway improvements do not require additional right-of-way outside of the proposed interchange and some isolated areas at the innovative intersections.
    - ❖ Jennifer mentioned that the project's drainage needs are being estimated based on the best available data, but with criteria updates and more detailed information during design, its possible additional area may be needed for ponds within the state lands.
    - ❖ Jennifer asked Mark if there were any opportunities for pre-treatment within the right-of-way and providing attenuation (or slight increases in flood stages) within state lands in order to avoid the need for off-site ponds within the state lands. Mark was unaware of any alternative strategies, but was going to coordinate internally and circle back with any feedback.
    - ❖ Mark mentioned there are ten rare plant species found along roadway in PWSF lands. He will provide a map of element location occurrences.
- Stormwater Master Plan/Capital Improvement Projects

- Large Stormwater Management Facility being developed for mosquito control ditches running through the area – 220 acres of land owned by County northeast of CR 393 Intersection; currently under design by Halff & Associates
- CR 83 north of US 98 is being extended – may provide compensatory treatment to Highway 98 items
- CR 83 North is being extended from Nelly Dr to Chet Holly – not currently a paved road
- Moll Dr – private development pursuing adding a signal
- Thompson/Don Bishop, Mussel Bayou have plans for signal additions
- Team internally reviewed some of the potential innovative intersections with R-cuts and U-turns.

- Water Supply/Reuse Opportunities - No desire for more or less water in any specific areas
  - Wastewater facility updates within the watershed -No WWF opportunities identified
- Major Planned Developments – private joint-use opportunities

➢ **Miscellaneous**

- Permitting through NWFWMD/FDEP; Submerged Sovereign Lands at Peach Creek– any improvements in this location would require FDEP permitting
  - If project is broken up into sections, only the section including Peach Creek would need to be permitted through FDEP
- Schedule – Currently in Phase 2; LDCA anticipated in December 2024 with PD&E completion in January 2025
- Design currently funded in 2027

➢ **Action Items**

- Jennifer to coordinate with County/Halff on the design for the regional facility to obtain latest design/calculations/modeling to review
- Mark to send information regarding the locations of rare plant within Point Washington state lands. This was provided after the meeting on 9/18.
- Tanya to send innovative intersection information to the County for reference.

Project Location Map



Jennifer Nunn

From: Kiser, Mark <William.Kiser@fdacs.gov>
Sent: Monday, September 18, 2023 3:42 PM
To: Jennifer Nunn
Subject: FW: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)
Attachments: PWSF_2023.jpg

Hi Jennifer,

Please see response below about potential stormwater discharge onto PWSF lands.

Also attached is a map with Element Occurrence locations for 10 rare plants found on PWSF.

Let me know if you would like to discuss further.

Best,

Mark

Mark Kiser
Forest Ecologist
Florida Forest Service
Florida Department of Agriculture and Consumer Services

(850) 681-5885
(850) 681-5809 FAX
Mark.Kiser@FDACS.gov

3125 Conner Boulevard
Suite I-255, Mail Stop C-25
Tallahassee, FL 32399-1650

Please note that Florida has a broad public records law (Chapter 119, Florida Statutes). Most written communications to or from state employees are public records obtainable by the public upon request. Emails sent to me at this email address may be considered public and will only be withheld from disclosure if deemed confidential pursuant to the laws of the State of Florida.

From: Camposano, Brian <Brian.Camposano@fdacs.gov>
Sent: Monday, September 18, 2023 3:13 PM
To: Kiser, Mark <William.Kiser@fdacs.gov>
Subject: RE: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)

There are FDOT projects where we have allowed a form of direct run-off (it's not truly run-off, but sort of) into state forest uplands. But generally we do that to prevent the need for retention ponds on the forest. So we would need to talk about that potential tradeoff. But not unheard of or anything like that. We will need to sit down one on one with them and discuss what we would require for them to get an easement from us in terms of this and other considerations.

Brian Camposano
Assistant Bureau Chief
Forest Management Bureau
Florida Forest Service
Florida Department of Agriculture and Consumer Services

(850) 681-5890 Office
(850) 597-6919 State Cell
(850) 681-5809 Fax
Brian.Camposano@FDACS.gov

The Conner Building
3125 Conner Boulevard, I-267
Tallahassee, Florida 32399-1650

www.FDACS.gov

Please note that Florida has a broad public records law (Chapter 119, Florida Statutes). Most written communications to or from state employees are public records obtainable by the public upon request. Emails sent to me at this email address may be considered public and will only be withheld from disclosure if deemed confidential pursuant to the laws of the State of Florida.

From: Kiser, Mark <William.Kiser@fdacs.gov>
Sent: Monday, September 18, 2023 3:08 PM
To: Camposano, Brian <Brian.Camposano@fdacs.gov>
Subject: FW: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)

Brian,

During the discussion a question for FFS came up about stormwater management ponds along US 98/SR 30 – they may not all fit into the right-of-ways.

If not, some discharge of water might need to go onto PWSF.

Since that is not allowed in the mgmt. plan, what steps do we need to take next?

This is hypothetical at the moment, there are no specific pond locations yet.

Mark Kiser
Forest Ecologist
Florida Forest Service
Florida Department of Agriculture and Consumer Services

(850) 681-5885
(850) 681-5809 FAX
Mark.Kiser@FDACS.gov

3125 Conner Boulevard
Suite I-255, Mail Stop C-25
Tallahassee, FL 32399-1650

Please note that Florida has a broad public records law (Chapter 119, Florida Statutes). Most written communications to or from state employees are public records obtainable by the public upon request. Emails sent to me at this email address may be considered public and will only be withheld from disclosure if deemed confidential pursuant to the laws of the State of Florida.

From: Jennifer Nunn <jnunn@balmoralgroup.us>
Sent: Wednesday, September 6, 2023 2:38 PM
To: Camposano, Brian <Brian.Camposano@fdacs.gov>
Cc: Kiser, Mark <William.Kiser@fdacs.gov>
Subject: [External] RE: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Brian,
Awesome. I'm glad Mark will be able to attend. Thanks for your time.

Thanks,

Jennifer Nunn, P.E., D.WRE.
The Balmoral Group
Phone: 407-629-2185 x 108

From: Camposano, Brian <Brian.Camposano@fdacs.gov>
Sent: Wednesday, September 6, 2023 2:37 PM
To: Jennifer Nunn <jnunn@balmoralgroup.us>
Cc: Kiser, Mark <William.Kiser@fdacs.gov>
Subject: RE: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)

Jennifer,

I apologize that this slipped through the cracks. I have asked our forest ecologist, Mark Kiser (CC'd on this email) to respond to you with his availability as he is the point person for FFS. But as I type this, I see that you have sent the invite.

So, again, apologies and Mark will be participating with you all for this meeting.

Best,

Brian Camposano
Assistant Bureau Chief
Forest Management Bureau
Florida Forest Service
Florida Department of Agriculture and Consumer Services

(850) 681-5890 Office
(850) 597-6919 State Cell
(850) 681-5809 Fax
Brian.Camposano@FDACS.gov

The Conner Building
3125 Conner Boulevard, I-267
Tallahassee, Florida 32399-1650

www.FDACS.gov

Please note that Florida has a broad public records law (Chapter 119, Florida Statutes). Most written communications to or from state employees are public records obtainable by the public upon request. Emails sent to me at this email address may be considered public and will only be withheld from disclosure if deemed confidential pursuant to the laws of the State of Florida.

From: Jennifer Nunn <jnunn@balmoralgroup.us>
Sent: Thursday, August 31, 2023 10:08 AM
To: donald.rogers@dot.state.fl.us; eric.rosnick@dot.state.fl.us; Joy.SwansonPleas@dot.state.fl.us; erica.brookman@dot.state.fl.us; gragreg@co.walton.fl.us; cotcharles@co.walton.fl.us; Kiser, Mark <William.Kiser@fdacs.gov>; Camposano, Brian <Brian.Camposano@fdacs.gov>; Blake.A.Chapman@FloridaDEP.gov; Alan.Vann@dot.state.fl.us; tkristoff@hwlochner.com; tmorris@hwlochner.com
Subject: [External] RE: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

All,
Hope everyone made it safely through the storm. Just wanted to follow up. I've heard from some of you, but for others, please send me your availability by tomorrow 9/1 so we can schedule this meeting. Please see shortened date/time list to accommodate those who have already responded.

Monday September 11th after 11:00 Central
Monday September 18th after 11:00 Central
Tuesday September 19th
Wednesday September 20th morning
Monday September 26th

Thanks and let me know if you have any questions.

Jennifer Nunn, P.E., D.WRE.
The Balmoral Group
Phone: 407-629-2185 x 108

From: Jennifer Nunn
Sent: Friday, August 25, 2023 11:35 AM
To: 'donald.rogers@dot.state.fl.us' <donald.rogers@dot.state.fl.us>; 'eric.rosnick@dot.state.fl.us' <eric.rosnick@dot.state.fl.us>; 'Joy.SwansonPleas@dot.state.fl.us' <Joy.SwansonPleas@dot.state.fl.us>; 'erica.brookman@dot.state.fl.us' <erica.brookman@dot.state.fl.us>; 'gragreg@co.walton.fl.us' <gragreg@co.walton.fl.us>; 'cotcharles@co.walton.fl.us' <cotcharles@co.walton.fl.us>; 'Mark.Kiser@FDACS.gov' <Mark.Kiser@FDACS.gov>; 'Brian.Camposano@FDACS.gov' <Brian.Camposano@FDACS.gov>; 'Blake.A.Chapman@FloridaDEP.gov' <Blake.A.Chapman@FloridaDEP.gov>; 'Alan.Vann@dot.state.fl.us' <Alan.Vann@dot.state.fl.us>; 'tkristoff@hwlochner.com' <tkristoff@hwlochner.com>; 'tmorris@hwlochner.com' <tmorris@hwlochner.com>
Subject: 437179-1 SR 30 (US 98) PD&E Initial Stakeholder Coordination Meeting (WATERSS/ELA)

All,
We are currently working with Lochner and FDOT District 3 on the PD&E for SR 30 (US 98) from CR 30A to West of Phillips Inlet Bridge (see location snapshot below) in Walton County. As part of this study, we are hosting a remote meeting with stakeholders as part of the WATERSS process (formerly the Environmental Look Around (ELA)). The Watershed Approach to Evaluate Regional Stormwater Solutions (WATERSS) process is used by FDOT to proactively look for opportunities for joint stormwater management projects with agencies or stakeholders. This meeting is the initial step in identifying opportunities for FDOT to partner in innovative, cooperative regional stormwater management projects.

Please let me know your availability (morning/afternoon/any time) for the following dates. If times are specified, please use Central Time (CT). Please respond to me via email by **Wednesday Aug. 30th**.

A meeting invite will be sent out with an agenda once a date/time are selected. Thanks for your feedback. Let me know if you have any questions.



Jennifer Nunn, P.E., D.WRE.

The Balmoral Group
165 Lincoln Avenue | Winter Park, FL 32789
Phone: 407-629-2185 x 108 | Fax: 407-629-2183
Visit our website for more information!

Jennifer Nunn

From: Jennifer Nunn
Sent: Monday, November 6, 2023 1:32 PM
To: Chance Powell; Charley Cotton; Nick Grosso; Culton, Ryan; King, Bryant
Cc: Rogers, Donald; Vann, Alan; Tanya Kristoff-Powder
Subject: 437179-1 SR 30 (US 98) and Walton County Discussion - Meeting Notes

All,
Thanks for attending this morning's discussion on SR 30 (US 98) and the adjacent County projects. Here are some of my notes from the discussion; please let me know if you have any comments or questions.

1. Halff is preparing the design/plans/permitting for the Event Center property and Nelly Drive, while Chipola Engineering is preparing the design for the Old Blue Mountain Road improvements.
2. Status of the projects: 60% plans for Nelly Drive were recently submitted to the County for review; once approval is received, construction plans production will commence on the Event Center property (stormwater ponds, wetland impacts, trail etc.); Old Blue Mountain Road construction plans are trailing the Nelly Drive design/approval. Pre-application meetings with FDEP and NWFWMD have been held. Pre and post stormwater modeling has been completed for the project as part of the stormwater master plan.
3. SR 30 (US 98) has permitted existing treatment swales within the initial US 98 compensatory area to offset treatment for Old Blue Mountain Road improvements. According to permit documentation, the swales provide 0.5-inch of treatment over the contributing area. Based on these existing facilities and the future 6-laning, SR 30 (US 98) will not be used for compensatory treatment within the Event Center property for improvements associated with Old Blue Mountain Road. Mr. King mentioned that compensatory treatment will be provided for other untreated areas within the contributing area to the proposed stormwater ponds.
4. Currently, no future capacity is being accounted for within the proposed stormwater ponds within the Event Center property for improvements along SR 30 (US 98). However, both the County and FDOT are interested in continuing discussions on how the proposed improvements could benefit each project and the surrounding community. Ms. Nunn requested that Mr. King send the pre/post modeling information with figures for review to see what limits of SR 30 (US 98) could potentially be accommodated within the stormwater ponds and estimate the capacity that would be required for the 6-laning.
5. The County mentioned that Nelly Drive is on the critical path with construction anticipated to begin end of 2024, but that the stormwater ponds within the Event Center property have some flexibility within the schedule.

Please let me know if you need anything else from me. Also, I understand other adjacent County projects were mentioned in the WATERSS meeting (CR 83 improvements). Please let us know if there are any opportunities with any other County projects as well.

Thanks,

Jennifer Nunn, P.E., D.WRE.
The Balmoral Group

NOAA Point Precipitation Frequency Estimate

NOAA Atlas 14, Volume 9, Version 2
Location name: Santa Rosa Beach, Florida, USA*
Latitude: 30.3667°, Longitude: -86.1812°
Elevation: 19 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.541** (0.450-0.656)	**0.628** (0.522-0.763)	**0.767** (0.635-0.933)	**0.877** (0.721-1.07)	**1.02** (0.805-1.28)	**1.13** (0.868-1.44)	**1.23** (0.911-1.61)	**1.33** (0.939-1.79)	**1.45** (0.983-2.02)	**1.54** (1.02-2.19)
10-min	**0.792** (0.659-0.960)	**0.920** (0.765-1.12)	**1.12** (0.930-1.37)	**1.28** (1.06-1.57)	**1.50** (1.18-1.88)	**1.65** (1.27-2.11)	**1.80** (1.33-2.36)	**1.94** (1.38-2.63)	**2.12** (1.44-2.96)	**2.25** (1.49-3.21)
15-min	**0.966** (0.804-1.17)	**1.12** (0.933-1.36)	**1.37** (1.13-1.67)	**1.56** (1.29-1.91)	**1.82** (1.44-2.29)	**2.01** (1.55-2.57)	**2.20** (1.63-2.88)	**2.37** (1.68-3.20)	**2.59** (1.76-3.61)	**2.74** (1.81-3.91)
30-min	**1.47** (1.22-1.78)	**1.71** (1.42-2.08)	**2.10** (1.74-2.56)	**2.41** (1.98-2.95)	**2.82** (2.22-3.53)	**3.11** (2.40-3.97)	**3.40** (2.52-4.45)	**3.67** (2.59-4.95)	**4.00** (2.71-5.58)	**4.24** (2.80-6.05)
60-min	**2.06** (1.71-2.50)	**2.35** (1.95-2.85)	**2.83** (2.35-3.45)	**3.24** (2.66-3.96)	**3.80** (3.01-4.81)	**4.24** (3.28-5.45)	**4.68** (3.48-6.18)	**5.14** (3.65-6.99)	**5.75** (3.91-8.05)	**6.21** (4.11-8.86)
2-hr	**2.65** (2.22-3.19)	**2.99** (2.50-3.60)	**3.56** (2.97-4.31)	**4.06** (3.36-4.93)	**4.78** (3.83-6.04)	**5.37** (4.18-6.88)	**5.97** (4.48-7.86)	**6.61** (4.73-8.96)	**7.49** (5.14-10.5)	**8.18** (5.44-11.6)
3-hr	**3.05** (2.56-3.66)	**3.40** (2.85-4.08)	**4.02** (3.36-4.84)	**4.59** (3.82-5.56)	**5.45** (4.40-6.90)	**6.18** (4.85-7.92)	**6.95** (5.25-9.16)	**7.79** (5.62-10.6)	**8.99** (6.20-12.6)	**9.95** (6.64-14.0)
6-hr	**3.68** (3.11-4.38)	**4.11** (3.47-4.90)	**4.93** (4.14-5.89)	**5.70** (4.76-6.84)	**6.90** (5.63-8.74)	**7.94** (6.28-10.2)	**9.07** (6.91-11.9)	**10.3** (7.50-14.0)	**12.1** (8.44-16.9)	**13.6** (9.15-19.1)
12-hr	**4.20** (3.57-4.96)	**4.83** (4.10-5.72)	**6.00** (5.08-7.12)	**7.09** (5.96-8.46)	**8.78** (7.20-11.1)	**10.2** (8.14-13.0)	**11.8** (9.04-15.4)	**13.5** (9.90-18.2)	**16.0** (11.2-22.2)	**18.1** (12.2-25.2)
24-hr	**4.80** (4.11-5.64)	**5.62** (4.80-6.60)	**7.13** (6.07-8.40)	**8.55** (7.23-10.1)	**10.8** (8.89-13.5)	**12.7** (10.1-16.0)	**14.7** (11.3-19.1)	**17.0** (12.5-22.7)	**20.3** (14.3-27.9)	**22.9** (15.6-31.8)
2-day	**5.61** (4.83-6.54)	**6.50** (5.59-7.59)	**8.22** (7.04-9.62)	**9.87** (8.40-11.6)	**12.5** (10.4-15.6)	**14.8** (12.0-18.7)	**17.4** (13.5-22.5)	**20.2** (15.0-26.9)	**24.3** (17.3-33.3)	**27.7** (19.0-38.1)
3-day	**6.07** (5.24-7.05)	**7.02** (6.06-8.16)	**8.86** (7.61-10.3)	**10.6** (9.09-12.5)	**13.5** (11.3-16.8)	**16.0** (13.0-20.1)	**18.8** (14.7-24.2)	**21.9** (16.3-29.0)	**26.4** (18.8-36.0)	**30.1** (20.7-41.3)
4-day	**6.43** (5.57-7.44)	**7.41** (6.41-8.58)	**9.31** (8.02-10.8)	**11.2** (9.56-13.0)	**14.1** (11.9-17.6)	**16.7** (13.6-21.0)	**19.6** (15.3-25.2)	**22.8** (17.1-30.2)	**27.5** (19.7-37.5)	**31.4** (21.7-42.9)
7-day	**7.34** (6.39-8.45)	**8.34** (7.25-9.60)	**10.3** (8.90-11.9)	**12.2** (10.5-14.1)	**15.2** (12.8-18.8)	**17.9** (14.6-22.3)	**20.8** (16.4-26.6)	**24.1** (18.1-31.8)	**29.0** (20.8-39.2)	**33.0** (22.9-44.8)
10-day	**8.20** (7.16-9.40)	**9.23** (8.05-10.6)	**11.2** (9.74-12.9)	**13.1** (11.3-15.2)	**16.2** (13.7-19.8)	**18.8** (15.4-23.3)	**21.8** (17.2-27.7)	**25.1** (18.9-32.8)	**29.8** (21.5-40.1)	**33.8** (23.5-45.7)
20-day	**10.8** (9.53-12.3)	**12.2** (10.7-13.9)	**14.5** (12.7-16.6)	**16.6** (14.4-19.1)	**19.8** (16.7-23.8)	**22.4** (18.4-27.3)	**25.2** (20.0-31.6)	**28.3** (21.4-36.5)	**32.6** (23.6-43.3)	**36.0** (25.3-48.5)
30-day	**13.2** (11.6-15.0)	**14.8** (13.0-16.8)	**17.5** (15.4-19.9)	**19.8** (17.3-22.7)	**23.1** (19.5-27.5)	**25.8** (21.2-31.1)	**28.5** (22.6-35.3)	**31.4** (23.7-40.1)	**35.3** (25.6-46.5)	**38.3** (26.9-51.3)
45-day	**16.3** (14.5-18.4)	**18.3** (16.2-20.6)	**21.4** (18.9-24.3)	**24.0** (21.0-27.3)	**27.5** (23.2-32.3)	**30.2** (24.8-36.1)	**32.8** (26.0-40.3)	**35.5** (26.9-44.9)	**38.9** (28.3-50.8)	**41.5** (29.3-55.3)
60-day	**19.1** (16.9-21.5)	**21.3** (18.9-24.0)	**24.8** (21.9-28.1)	**27.7** (24.3-31.4)	**31.3** (26.4-36.5)	**34.0** (28.0-40.4)	**36.6** (29.1-44.7)	**39.1** (29.7-49.2)	**42.2** (30.7-54.8)	**44.4** (31.5-59.1)

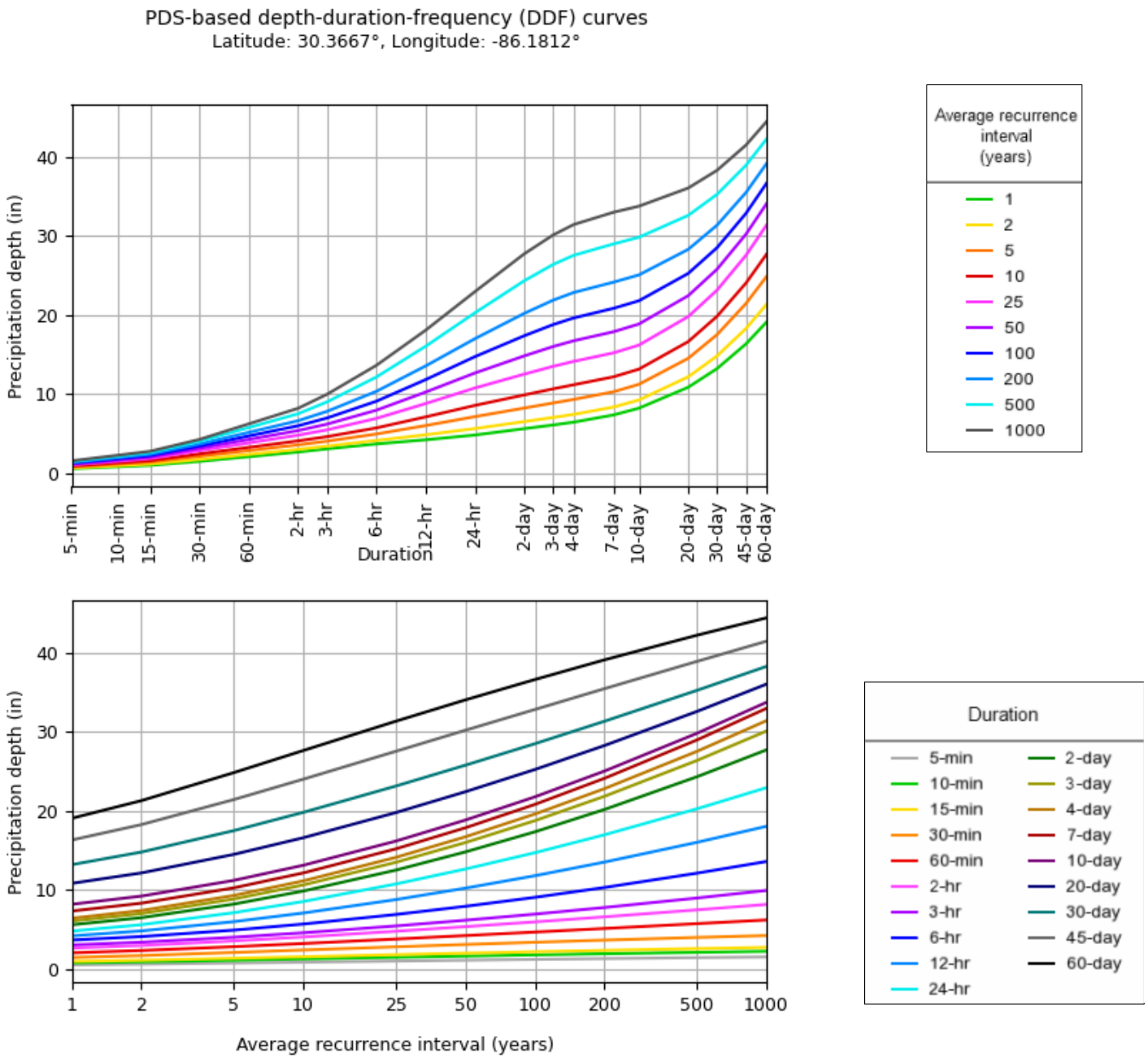
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 9, Version 2

Created (GMT): Wed Nov 22 13:36:35 2023

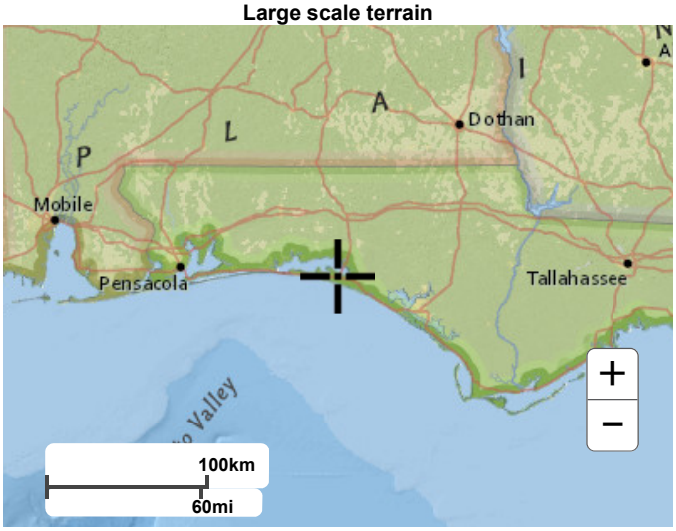
Back to Top

Maps & aerials

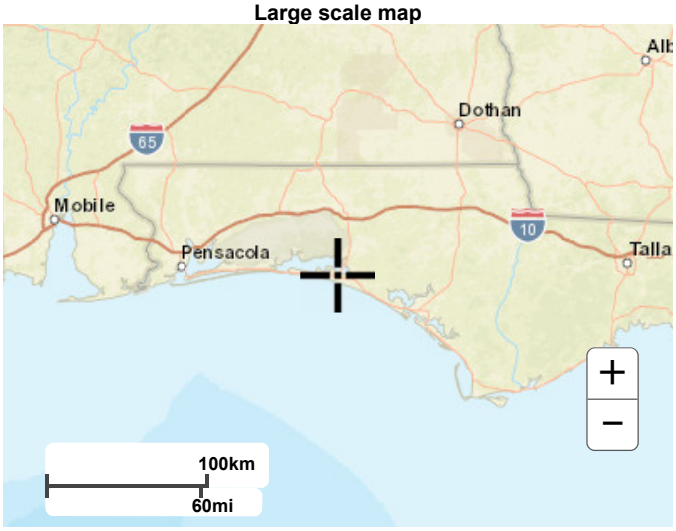
Small scale terrain



Large scale terrain



Large scale map



Large scale aerial



Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer