

Pond Siting Report

**118th Avenue (CR 296) Connector PD&E Study
From US 19 to East of the Roosevelt/CR 296 Connector**

Pinellas County, Florida

WPI Segment No.: 413622-1

FAP No.: 9045-054C

This Study evaluated improvement alternatives for 118th Avenue (CR 296) from US 19 to east of the Roosevelt/CR 296 Connector in Pinellas County, Florida.

Prepared for:

Florida Department of Transportation

District Seven

11201 North McKinley Drive

Tampa, Florida 33612-6456

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Prepared by:

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December 2005

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SECTION 1 - EXECUTIVE SUMMARY

The Florida Department of Transportation conducted a Project Development and Environment (PD&E) Study to evaluate alternative improvements along 118th Avenue (CR 296), from US 19 to east of the Roosevelt/CR 296 Connector in Pinellas County. The limits of this Study are mostly within the City of Pinellas Park with the remaining area within unincorporated Pinellas County, Florida. Proposed improvements include reconstructing 118th Avenue as a 4-lane controlled-access arterial with parallel 2-lane one-way frontage roads. This facility would provide a flyover for motorists traveling southbound from US 19 to 118th Avenue, and provide turn lanes for motorists traveling from 118th Avenue to US 19.

The purpose of this report is to preliminarily analyze the appropriate location and size of storm water drainage ponds to account for the potential increase of storm water runoff due to the proposed roadway expansion. The water quality and quantity parameters for each drainage basin were reviewed and appropriate analysis method was addressed for each watershed. The total project length is approximately 2 miles, and crosses two drainage basins encompassing a total drainage area of 46.8 acres. The pond sizes were determined by considering the water quantity and quality parameters from the Southwest Florida Water Management District (SWFWMD) permitting criteria. The ponds were preliminary sized to provide water quality treatment for the first inch of runoff and to regulate the stormwater discharge rate so that the post-development discharge rate equals to the pre-development discharge rate for the 25-year, 24-hour storm event. The attenuation volume was calculated using the ICPR model's hydrological feature. The preliminary pond size estimate was based on the difference between the pre and post run-off volumes and also the estimated treatment volume. No stormwater routing was modeled for this study.

A total of five (5) alternative pond sites (3 for basin 1 and 2 for basin 2) were evaluated for their potential to serve as stormwater management facilities, as shown in **Appendix C**. The recommended pond sites were selected based on hydraulic and environmental considerations and preliminary right-of-way cost estimates. The dimensions of the proposed ponds include 1) 20-ft wide maintenance berm 2) embankment slopes for both interior and exterior sides of

the pond 3) 6-inch of free board and 4) the embankment top is about 2 ft above natural grade.

Table 1-1 summarizes the recommended pond sites and contamination risk rating.

Additionally, the pond sites were evaluated for potential contamination and a “hazmat” rating for each site was developed and is summarized in **Table 1-1** below.

TABLE 1-1: SUMMARY OF ALTERNATIVE POND SITES

Basin No.	Pond No.	Area (ac)	Hazmat Rating
1	1-1	3.42	Medium
	1-2	3.42	Low
	**1-3	3.42	Medium
2	**2-1	2.09	None
	2-2	2.09	Medium

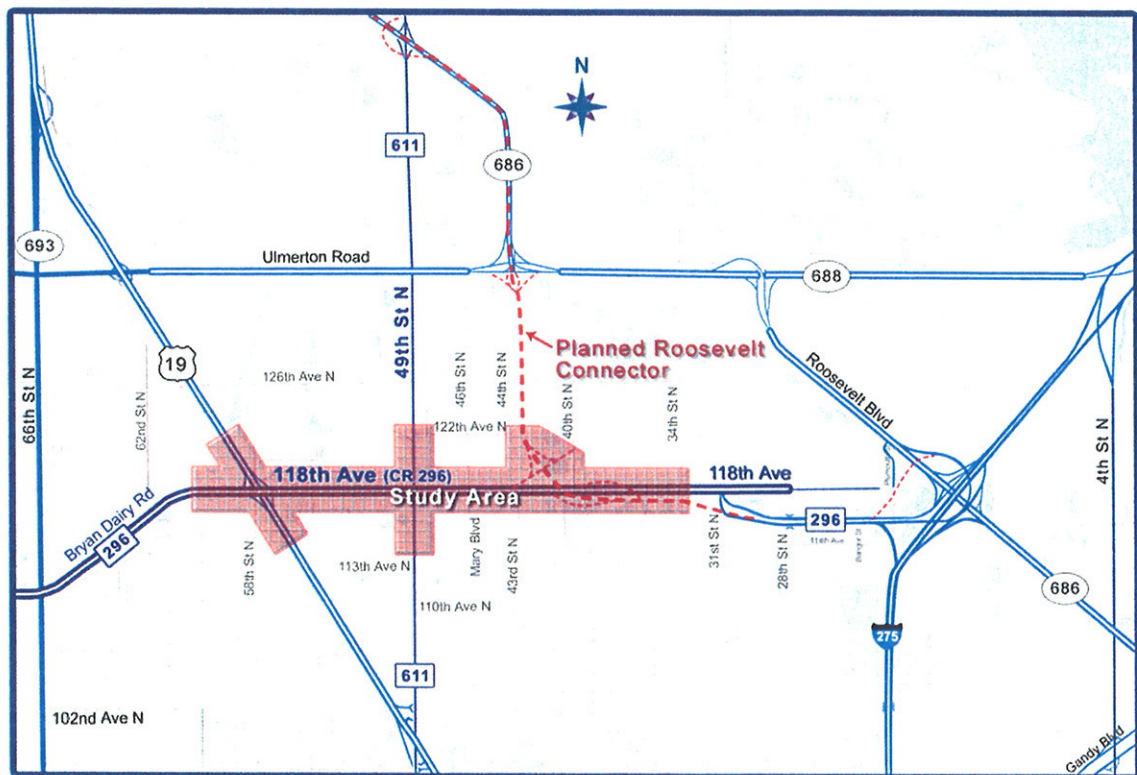
** Recommended pond sites

SECTION 2 - INTRODUCTION

2.1 PROJECT DESCRIPTION

The Florida Department of Transportation (FDOT) conducted a Project Development and Environment (PD&E) Study to evaluate improvements along 118th Avenue (CR 296) from US 19 to east of the Roosevelt/CR 296 Connector in Pinellas County, Florida. The location map illustrates the study area (**Figure 1**).

FIGURE 1: PROJECT LOCATION MAP



There are additional projects underway on either side of this proposed project. At the 118th Avenue intersection with US 19, (FPID No. 257070-1) the FDOT plans to convert the intersection to a tight urban interchange. Another FDOT project consists of FPID Nos. 256994-1 and 256995-1, which will extend the Roosevelt Connector.

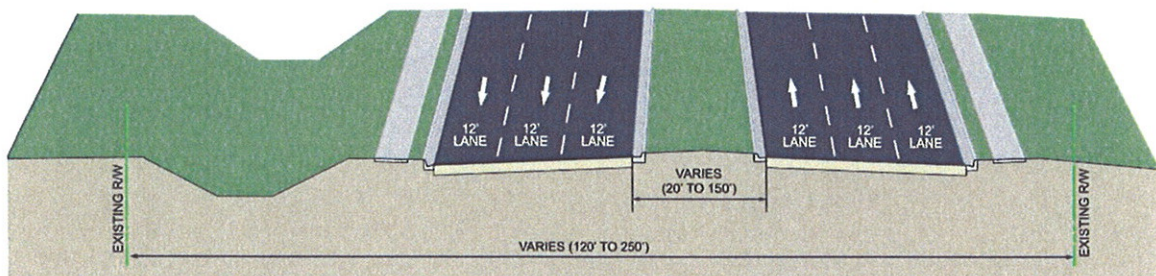
2.2 REPORT PURPOSE

The purpose of this report is to preliminarily analyze the appropriate location and size of stormwater drainage ponds to account for the potential increase of storm water runoff due to the proposed roadway improvement. Further, this report evaluates potential wetland impacts that may result from the proposed roadway improvements and associated drainage systems.

2.3 EXISTING FACILITY AND PROPOSED IMPROVEMENTS

Existing 118th Avenue is a 6-lane divided urban county roadway that is classified as a minor arterial by the Pinellas County Metropolitan Planning Organization. It has 12-foot lanes and 5-foot sidewalks on both sides (**Figure 2**). The storm sewer systems convey runoff to existing roadside ditches and stormwater management facilities. The curbed grassed raised median is generally 20 feet wide. The typical section changes between 40th Street and 34th Street where the median widens to over 150 feet. This creates separate intersections with 40th Street and 34th Street for westbound and eastbound 118th Avenue.

FIGURE 2: EXISTING TYPICAL SECTION

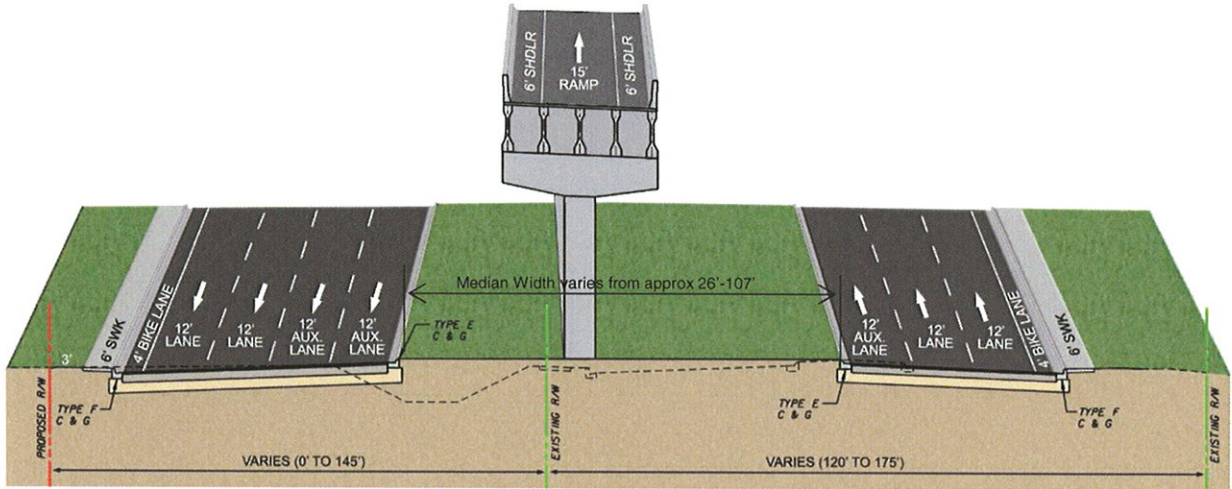


Two alternatives were considered for this project, namely: 1) No-Build and 2) Recommended Build Alternative. The Recommended Build Alternative (Alternative “Dmod-G”) includes constructing a 4-lane controlled-access facility with 2-lane frontage roads for local access along 118th Avenue from US 19 to east of the Roosevelt/CR 296 Connector. This alternative includes a flyover ramp from southbound US 19 to eastbound 118th Avenue and ramp connections with the Roosevelt/CR 296 Connector as well as an urban interchange at 49th Street (CR 611). This alternative would allow the intersection at 43rd Street to remain connected to the 118th Avenue frontage roads. Additional right-of-way would be required for the proposed improvements, mostly along the north side of 118th Avenue.

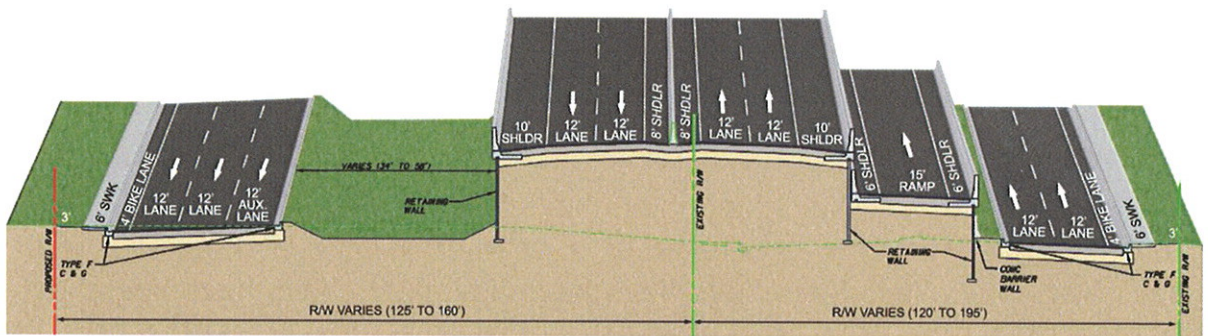
The proposed typical sections for 118th Avenue are shown in **Figure 3**. The typical section west of 49th Street includes four 12-foot lanes (two in each direction) with auxiliary lanes for the ramp connections to the elevated express lanes and a 4-foot bicycle lane and 6-foot sidewalk on each side. The at-grade roadways will collect stormwater via a curb and gutter closed pipe system. The elevated section will contain scuppers that will drain to the at-grade travel lanes. As a result of input received during the Public Hearing phase, the Recommended Build Alternative (described above) has been selected as the Preferred Alternative for future project production phases.

The proposed typical section east of 49th street includes frontage roads with 12-foot lanes, including auxiliary lanes for the ramp connections to the elevated express lanes, and 4-foot bike lanes and 6-foot sidewalks. The elevated express lane portion includes 10-foot outside shoulders and two 12-foot lanes in each direction separated by an 18-foot median. A slip ramp from the frontage road system to the mainline is shown in this typical section.

FIGURE 3: PROPOSED TYPICAL SECTIONS



West of 49th Street



East of 49th Street

SECTION 3 - STORMWATER MANAGEMENT REQUIREMENTS

This project lies within the jurisdiction of the SWFWMD and will require an Environmental Resource Permit (ERP) for the stormwater management systems. The systems must be designed to provide the required water quality treatment and peak discharge attenuation. The FDOT has published facility operation and maintenance guidelines that provide policy on pond construction and design.

3.1 WATER QUALITY REQUIREMENTS

The water quality requirements, as defined in Chapter 40D.4 of the Florida Administrative Code (FAC) and the SWFWMD *Environmental Resource Permitting (ERP) Information Manual, 1999*, are used to quantify treatment volumes for wet detention, on-line, and off-line ponds.

The following water quality requirements were derived from Chapter 5 of the SWFWMD ERP Manual:

- (1) The treatment volume will be required for the entire directly connected impervious areas (DCIA) for onsite and offsite.
- (2) A wet detention system shall treat one inch of runoff from the contributing area.

The stormwater management facilities selected for this project have been analyzed as on-line wet detention treatment systems because the SWFWMD will only permit wet detention pond systems. As a design option, the future drainage engineer may utilize the pool volume to provide water quality treatment below the seasonal high water table (SHWT), if the site is consistent with the guidelines provided for a conservation design pool facility.

The regulations require that the project attenuate the post-development discharge to a flow rate equal to or lower than the pre-development peak discharge rate. The regulations require

that the project impound the water quality treatment volume within the stormwater management system. This volume will provide treatment for the first inch of runoff over impervious areas. The SHWT for the proposed pond sites is approximately one foot below ground surface (bgs), and often have SHWT approaching zero foot bgs at wetland areas. The Pinellas County soil survey was utilized to approximate the SHWT within this project. During the design, the designer should also reference soil-boring information.

3.2 WATER QUANTITY REQUIREMENTS

There are two jurisdictional criteria for determining water quantity volumes: Chapter 14-86 F.A.C., Rules of the Department of Transportation and SWFWMD F.A.C. Chapter 40D-4. For this report, the ponds were preliminary sized using the SWFWMD criteria and no critical duration storm analysis was conducted. During the design phase of the project, the ponds' sizes will need to be evaluated using both criteria, and the final pond size should be based on the criteria yielding the more conservative size. For this report, the ponds storage volume was based on the difference between the pre and post-development runoff volumes resulting from a 25-year, 24-hour storm event. No stormwater routing was performed for this study.

SECTION 4 - EXISTING CONDITIONS

4.1 DESIGN INFORMATION SOURCES

The design information sources used for the Pond Siting Report are listed below.

- (1) FDOT Drainage Manual, Volume 1 - Standards, 2003
- (2) SWFWMD Permit Information Manual, September 2002
- (3) SWFWMD aerials, 1977
- (4) Soil Survey of Pinellas County, Florida, 1972
- (5) Field reviews by American Consulting Engineers staff
- (6) FEMA Flood Insurance Rate Map Panel Nos. 12103C1039G, 12103C0143G, 12103C0202G, and 12103C0206G (September 2003).
- (7) Aerial Photographic Maps, 2004
- (8) USGS Quadrangle Map, Pinellas Park
- (9) Draft Location Hydraulic Report 118th Avenue from US 19 to East of the Roosevelt/CR 296 Connector
- (10) Interviews with County and Pinellas Park maintenance personnel
- (11) PD&E Manual; Part 2, Chapter 24-Floodplains
- (12) Draft Preliminary Engineering Report, May 2005
- (13) Department of Environmental Protection, Division of Waste Management - Contaminated Site Listing (Level I Hazardous Materials Investigation is expected May 2005)

4.2 SOILS DATA

The soils within the limits of the project are categorized according to the U.S. Department of Agriculture Soil Conservation Service (SCS) *Soil Survey of Pinellas County*, (1972) **Figure 4**. The predominant soil categories located within the project limits are identified in **Table 4-1** below.

FIGURE 4: SOILS MAP
SCS Soils Survey of Pinellas County, Sheet 18

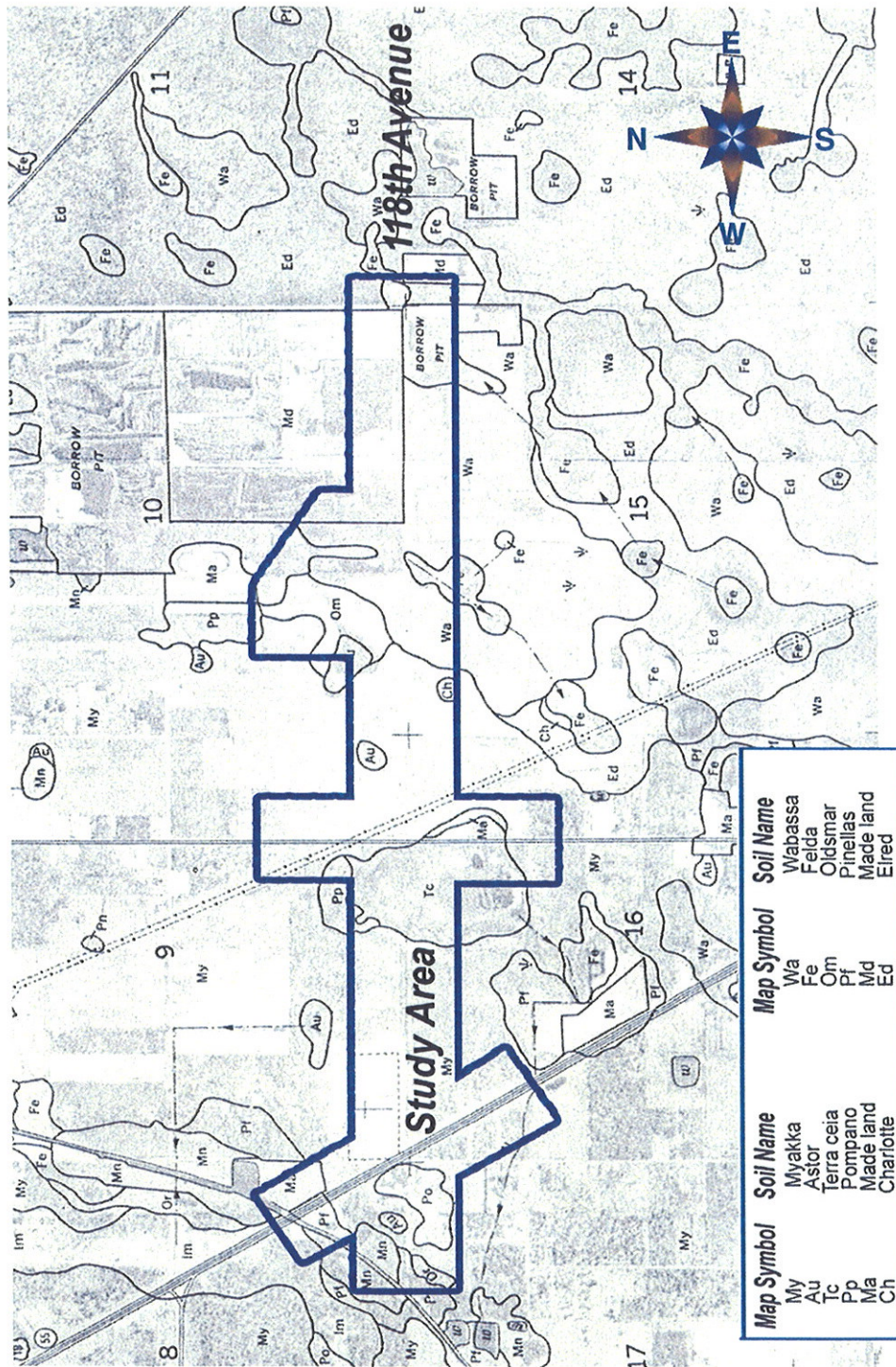


Table 4-1: Summary of Pinellas County SCS Soil Survey

USDA Map Symbol and Soil Name	USDA Classification	Seasonal High Water Table	
		Depth (in)	# of Months
My - Myakka	Fine Sand	<10	1 to 4
Au - Astor	Fine Sand	<10	>6
Tc – Terra Ceia	Muck (0-42" below surface)	<10	6 to 12
Pp - Pompano	Fine Sand	<10	1 to 2
Po - Pomello	Fine Sand	10 – 40	1 to 2
Ma, Md - Made Land	N/A	--	--
Ch - Charlotte	Fine Sand	<15	2 to 6
Wa – Wabassa	Fine Sand (0-38" below surface)	<10	1 to 2
Fe – Felda	Fine Sand (0-30" below surface)	<10	2 to 6
Om – Oldsmar	Fine Sand (0-44" below surface)	<10	1 to 2
Pf - Pinellas	Fine Sand (0-35" below surface)	<10	1 to 2
Ed - Elred	Fine Sand (0-30" below surface)	<10	1 to 2

For this report, no boring information for the pond sites was available; therefore the SCS map for Pinellas County was used to determine the type of soils present and the depth to groundwater. According to the SCS, the predominant soil types within the project corridor are Myakka and Elred Land Complex that is characterized by heavy urbanization in this location. Myakka and Elred soils are level, poorly drained sandy soils. These soils have a SHWT that is typically at a depth of 1 foot or less from ground surface. The establishment of an accurate SHWT is critical to the proper design of a stormwater management facility, and it is therefore recommended that a geotechnical investigation be performed at each site to accurately determine the soils type and the depth to groundwater during the design phase.

4.3 EXISTING DRAINAGE PATTERNS AND LOCAL DRAINAGE RELATED PROBLEMS

The existing drainage patterns and basin limits were determined using several sources, including USGS quadrangle maps and SWFWMD aerial photography (included in **Appendix B**). The study area is included within the Cross Bayou Canal and the Roosevelt basins. In general, the project is divided into two existing basins with the ridgeline being approximately 700 feet east of 49th Street. The existing drainage pattern is illustrated in **Appendix C**.

The FDOT Maintenance Department, the City of Pinellas Park, and Pinellas County were contacted to identify any historic flooding problems in the vicinity of this project corridor, and it was determined that drainage deficiencies that existed between 40th and 49th streets in the past were corrected.

4.4 EXISTING STORMWATER MANAGEMENT FACILITIES

An inventory of the existing stormwater management facilities was conducted as part of this report. For simplicity, the naming convention of the ponds will remain consistent with the Preliminary Engineering Report, which classified all wetlands and other surface waters (OSW) as “wetlands,” W1 through W17. Following is a description of each wetland/surface water body inventoried.

Existing Pond (W1) is located directly off of Bryan Dairy Road to the south, just east of the overhead pedestrian crossing. This 4.84-acre pond is in good condition and will not be impacted by the project.

Existing Stormwater Pond (W2) is a 0.42 acre storm water facility located south of 118th Avenue, east of US 19. The pond is within Pinellas County limits.

Existing Stormwater Pond (W3) is a 0.18 acre storm water drainage pond found within the limits of the Breyer’s Ice Cream plant, northwest of the building.

Existing Stormwater Pond (W4) is a 0.56 acre stormwater facility located south of pond W2.

Existing Stormwater Facility (W10) is a 0.64 acre stormwater facility located northeast of the intersection of 49th Street and 118th Avenue.

Existing Stormwater Pond (W11) is a 1.75 acre stormwater facility located south of 118th Avenue, east of Suntrust Bank.

Existing Stormwater Pond (W12) is a 2.47 acre stormwater facility located south of 118th Avenue and pond W11, northeast of 47th Street.

Existing Stormwater Pond (W16) is a 0.10 acre stormwater facility located north of 118th Avenue on the Mobile Storage Group Property, south of the building.

4.5 WETLANDS

There are two natural wetlands, Wetland 7 and Wetland 8, that were identified within the project corridor during field inspections between April and June 2003, and later in February 2005. Determination of wetlands was based upon the presence of accepted wetland indicator floral species (Chapter 17-301, Florida Administrative Code (FAC) and U.S. Army Corps of Engineers, Manual for Identifying and Delineating Jurisdictional Wetlands, 1987), hydric soils, fauna present, and evidence of inundation and/or saturation. Wetlands and other surface waters locations are shown in **Appendix C**. A summary of the potential wetland impacts is shown in **Table 4-2**. This potential impact to wetlands is considered minor since these wetlands were impacted during the original roadway construction. The recommended method of mitigation would be to utilize Chapter 373.437 of the Florida Statutes that allows the FDOT to offset wetland impacts with a monetary payment through the Department of Environmental Protection to SWFWMD. SWFWMD will then provide a regional wetland mitigation plan on an annual basis to be approved by the Florida Legislature, which will include mitigation for specific department project impacts.

Table 4-2: Wetland Impacts

Wetland Number	Wetland Type & USFWS Classification	Impact Acreage
W1	Pond – PUBH	0
W2	Stormwater Facility – PUBHx	0
W3	Stormwater Facility - PUBHx	0
W4	Stormwater Facility - PUBHx	0
W5	Ditch – R2UBHx	0.77
W6	Ditch – R2UBHx	Secondary
W7	Willow Scrub – PSS1C	Secondary
W8*	Hardwood Forest – PFO1C	2.75
W9	Ditch – R2UBHx	0.55
W10	Stormwater Facility - PUBHx	0.28
W11	Stormwater Facility - PUBHx	Secondary
W12	Stormwater Facility - PUBHx	0
W13	Ditch – R2UBHx	Secondary
W14*	Freshwater Marsh – PEM1Cx/PAB4Hx	0.02
W15*	Ditch – R2UBHx	0
W16	Stormwater Facility – PUBHx	0
W17	Mangrove Swamp – E2SS3P	Secondary
Total Acreage		4.37
* = County Mitigation Site		

OSW = Other Surface Waters

4.6 CULTURAL AND HISTORICAL RESOURCES

Archaeological field surveys of the alternative pond sites were conducted in October 2005. Field investigations indicated that no cultural or historical sites will be impacted by the proposed project or associated pond alternatives. It is anticipated that the State Historic Preservation Officer (SHPO) will concur with the findings.

SECTION 5 - DRAINAGE BASINS

The project has been divided into two drainage basins (Basin 1 and 2) within the limits of the project area. These are the Cross Bayou Canal basin and the Roosevelt Drainage basin. The basin's delineation is shown in Figure C-1, included in **Appendix C**. The Cross Bayou Canal outfalls to Old Tampa Bay and Boca Ciega Bay. The Roosevelt Basin outfalls to Old Tampa Bay.

Alternative stormwater management facilities were evaluated based on estimated SHWT's (determined from Soil Survey) and ground surface elevations obtained from SWFWMD contour maps to determine the hydraulic capacity of each pond. The sites were evaluated using the Interconnected Channel and Pond Routing (ICPR) program.

This pond siting study analyzed pond sites by comparing the pre-development hydrology to the post-development hydrology. The difference between the pre-development runoff volume and the post-development runoff volume was evaluated as the required storage volume within this pond. A two-foot design storage depth was utilized within the pond design.

5.1 DESIGN CRITERIA

The design criteria that were used to analyze the proposed pond sites are listed below:

- Ideally, pond sites should not be located in potentially contaminated areas identified in the Contamination Screening Evaluation Report. However, the right-of-way availability within this corridor was limited because of urbanization. Therefore, at least one pond site alternative may be located within a medium risk area.
- SHWT elevations used for the pond analysis were estimated from the Pinellas County Soil Conservation Survey maps and no geotechnical borings were performed for this report. The vertical constraints that determine the allowable vertical volume are the estimated SHWT.

- The ponds' footprint areas include a 20-foot maintenance berm and 8-foot horizontal distance to tie-into existing ground.
- Offsite runoff was separated from on-site runoff for all calculations. The existing cross drains will continue to pass offsite runoff as in existing conditions.
- A time of concentration of 10 minutes was used in compliance with FDOT standards. A weighted CN value of 92 was used to account for the pavement areas and grassy areas within the project limits.

Refer to **Appendix A** for ICPR program output for the pre and post-development runoff volume. The pond storage volume was based on the difference between the pre and post-development runoff volumes and also the treatment volume required. **Table 5-1** summarizes the estimated storage volume required for each basin. The proposed basins and pond sites are described in the following section. The locations of the proposed stormwater management facilities for this proposed project are shown in **Appendix C**.

5.2 BASIN DESCRIPTIONS

Basin 1

Basin 1 extends from the Cross Bayou Canal (western limit) to east of 49th Street. In the existing condition, the runoff from 118th is collected by a closed pipe storm drain system, discharged into a westerly outfall ditch, which conveys surface water to the Cross Bayou Canal. The project within Basin 1 will require additional right-of-way in areas that currently have commercial land usage. Impacts to the 100-year floodplain occur transversely along 118th Avenue. The proposed pond areas for Basin 1 have been included in the total pre-developed and post-developed basin areas used in the pond sizing calculations as shown in **Table 5-1**. All pond alternatives for Basin 1 are described in **Table 5-2** and the locations are shown in the exhibits included in **Appendix C**.

Basin 2

Basin 2 extends from east of 49th street to 34th street. The alternative pond areas for Basin 2 have been included in the total pre-developed and post-developed basin areas used in the pond sizing calculations. All pond alternatives for basin 2 are described in **Table 5-3**.

Table 5-1: Estimated Required Storage Volumes

BASIN 1

Estimated Required Storage

Basin 1 Added Impervious Project Area = 21.23 AC

	CF	AC-FT	Remarks
Attenuation	67,518	1.55	25 year Pre/Post Volume for entire Basin Area
Water Quality Treatment	77,101	1.77	1" over Project Area (2.33 AC * (1"/12'))
Flood Plain Impact Compensation		3.44	
Total Volume Required	144,619	6.76	

BASIN 2

Estimated Required Storage

Basin 2 Added Impervious Area = 17.55 AC

	CF	AC-FT	Remarks
Attenuation	55,321	1.27	25 year Pre/Post Volume for entire Basin Area
Water Quality Treatment	63,598	1.46	1" over Project Area (17.55 AC * (1"/12'))
Total Volume Required	118,919	2.73	

Table 5-2: Basin 1 Pond Sites Design Summary

Basin 1 Area ≈ 21.23 acres

Pond Alt. No.	Approximate Location	Pond Area Top of Bank ¹ (AC)	Existing Land Use	Soils & Depth to SHWT	Est. Avg. Storage Depth	Required Storage Vol. For Basin 1	Comments
1-1	300' W. of US 19 North Side of Bryan Dairy Rd.	3.47	Vacant; w/truck trailers storage	Myakka Fine Sand <10"	2'	6.76 ac-ft	Pond would outfall to wetland W17
1-2	West side of US 19, approx. 1000' north of Bryan Dairy Rd.	3.46	Commercial Uses	Myakka & Pumello Fine Sand 1'-3.3'	2'	6.76 ac-ft	Pond would outfall to wetland W17
1-3	Northwest corner of Bryan Dairy Rd & US 19	3.48	Commercial Uses	Myakka & Pumello Fine Sand 1'-3.3'	2'	6.76 ac-ft	Pond would outfall to wetland W17

¹ Does not include a 20-ft berm with a 8-ft tie in distance around the perimeter of the pond

Table 5-3: Basin 2 Pond Sites Design Summary

Basin 2 Area ≈ 17.55 acres

Pond Alt. No.	Approximate Location	Pond Area Top of Bank ¹ (AC)	Existing Land Use	Soils & Depth to SHWT	Est. Avg. Storage Depth	Required Storage Vol. For Basin 2	Comments
2-1	North side of 118 th Ave., ≈ 660' east of 49 th St.	1.57	Commercial Uses	Myakka Fine Sand <10"	2'	2.73 ac-ft	Pond would outfall to wetland W14/W15
2-2	North side of 118 th Ave., ≈ 870' east of 49 th St.	2.12	Commercial Uses	Made Land Complex 1'	2'	2.73 ac-ft	Pond would outfall to wetland W14/W15

¹ Does not include a 20-ft berm with a 8-ft tie in distance around the perimeter of the pond.

SECTION 6 - BASE FLOODPLAIN INVOLVEMENT

The project spans both the 500-year and 100-year floodplain. The 100-year (base) floodplain has been established to be at elevation 9 ft NGVD as shown in **Figure 5**. The remainder of the 100-year floodplain elevation has not been determined by FEMA. The design of the proposed roadway improvements may entail the placement of fill within the 100-year flood plain. FDOT will be required to provide flood compensatory storage within the same basin to compensate for the loss of flood storage volume.

The Cross Bayou Canal floodplain is located adjacent to the canal (Wetland 17) and extends eastward to just west of U.S. 19. There is a floodplain area impacted for about 1,200 feet at center of the project, where 118th Avenue crosses between Wetland 7 and Wetland 8. The Roosevelt Drainage Basin floodplain starts at about 500 feet west of 40th street and extends to the end of the project. The flood profiles for have been developed and can be seen in the FEMA Flood Insurance Rate Map, City of Pinellas Park (September 2003).

Measures have been taken during conceptual design of the proposed roadway improvements for 118th Avenue to avoid or minimize roadway encroachments within the base floodplain. This report considers a floodplain encroachment volume estimated at one-foot depth over areas delineated as floodplain within the FEMA panels. Estimated floodplain encroachments are included in **Table 6-1**. The impacts to the floodplain volume can be compensated for in Basin 1 ponds. The ponds sizes include the acreage required to compensate for the floodplain storage volume.

SECTION 7 - EVALUATION AND RECOMMENDATIONS

Two basins were evaluated for pond siting alternatives. Numerous stormwater management facilities were considered for their potential to serve the basins. Currently, historical and archeological sites are not found within the project limits. Therefore, the recommended ponds were based largely on hydraulic adequacy, potential contamination or hazardous materials involvement, and preliminary cost estimates. The following conclusions and recommendations were made for each basin. **Table 7-1** is an evaluation matrix for all pond alternatives along with recommendations.

This project is located within a highly urbanized and “built-out” corridor with limited right-of-way availability for pond site alternatives. The proposed alignment involves the acquisition of several parcels along the northern side of 118th Avenue and this would reduce the right-of-way acquisition costs for several alternatives. The project corridor contains shallow SHWT and this made the available surface loading area a key element. There are numerous locations listed as potential contamination sites. The pond’s outfall length was used to evaluate pond sites with comparable elements. The pond site alternatives within Basin 2 may require a timing analysis to determine the availability of the pond’s storage volume during the peak flood event.

Basin 1

The proposed alignment will require right-of-way acquisition at all pond sites. Each pond alternative will provide sufficient storage volume to handle the requirements for this basin.

Basin 2

In Basin 2, a single pond site may be sufficient for the purpose of stormwater management. The proposed alignment will require partial right-of-way acquisition at all pond site alternatives. Based on this preliminary analysis during the PD&E Study phase, all pond alternatives will provide sufficient storage volume to handle the requirements for this basin.

Table 7-1: Evaluation Matrix for Alternative Pond Sites

Pond Alt. No.	Total Pond Size	Contam. Risk Rating 1	Likelihood of Cultural Resources Involvement	Est. Const. Cost ²	Est. Right-of-Way (ROW) Cost ³	Est. Total Cost	Comments
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Basin 1

1-1	3.42	Medium	Low	\$294,000	\$4,037,100	\$4,331,100	
1-2	3.42	Low	Low	\$294,000	\$2,425,000	\$2,719,000	
**1-3	3.42	Medium	Low	\$294,000	-\$280,000	\$14,000	Negative ROW costs are due to savings in business damages

Basin 2

**2-1	2.09	None	Low	\$209,000	-\$1,165,600	-\$956,600	Negative ROW costs are due to savings in business damages
2-2	2.09	Medium	Low	\$209,000	\$4,057,200	\$4,266,200	

¹ Based on a Risk Evaluation Summary table prepared by FDOT, received on August 2, 2005

² Based on \$100,000/ac for pond construction

³ Based on right-of-way cost estimates dated September 27, 2005

**** = Recommended pond site for selection**

APPENDICES

Appendix A ICPR Analysis for the Conceptual Pond Alternatives

Appendix B SWFWMD Aerials

Appendix C Existing Drainage Map and Alternative Pond Sites

APPENDIX A

**ICPR ANALYSIS
FOR THE
CONCEPTUAL
POND
ALTERNATES**

Basin Name: basinlex
Group Name: BASE
Simulation: 118
Node Name: basinlex
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256
Peaking Fator: 256.0
Spec Time Inc (min): 1.33
Comp Time Inc (min): 1.33
Rainfall File: Fdot-24
Rainfall Amount (in): 10.000
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 10.00
Time Shift (hrs): 0.00
Area (ac): 21.230
Vol of Unit Hyd (in): 1.000
Curve Number: 85.000
DCIA (%): 0.000

Time Max (hrs): 12.00
Flow Max (cfs): 19.826
Runoff Volume (in): 8.152
Runoff Volume (ft3): 628270.915

Basin Name: basinlpr
Group Name: BASE
Simulation: 118
Node Name: basinlpr
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256
Peaking Fator: 256.0
Spec Time Inc (min): 1.33
Comp Time Inc (min): 1.33
Rainfall File: Fdot-24
Rainfall Amount (in): 10.000
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 10.00
Time Shift (hrs): 0.00
Area (ac): 21.230
Vol of Unit Hyd (in): 1.000
Curve Number: 92.000
DCIA (%): 0.000

Time Max (hrs): 12.00
Flow Max (cfs): 20.906
Runoff Volume (in): 9.024
Runoff Volume (ft3): 695447.094

Area (ac): 17.550
Vol of Unit Hyd (in): 1.000
Curve Number: 85.000
DCIA (%): 0.000

Time Max (hrs): 12.00
Flow Max (cfs): 16.389
Runoff Volume (in): 8.152
Runoff Volume (ft3): 519366.677

Basin Name: basin2ex
Group Name: BASE
Simulation: 118
Node Name: basin2ex
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256
Peaking Fator: 256.0
Spec Time Inc (min): 1.33
Comp Time Inc (min): 1.33
Rainfall File: Fdot-24
Rainfall Amount (in): 10.000
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 10.00
Time Shift (hrs): 0.00

Basin Name: basin2pr
Group Name: BASE
Simulation: 118
Node Name: basin2pr
Basin Type: SCS Unit Hydrograph

Unit Hydrograph: Uh256
Peaking Fator: 256.0
Spec Time Inc (min): 1.33
Comp Time Inc (min): 1.33
Rainfall File: Fdot-24
Rainfall Amount (in): 10.000
Storm Duration (hrs): 24.00
Status: Onsite
Time of Conc (min): 10.00
Time Shift (hrs): 0.00
Area (ac): 17.550
Vol of Unit Hyd (in): 1.000
Curve Number: 92.000
DCIA (%): 0.000

Time Max (hrs): 12.00
Flow Max (cfs): 17.282
Runoff Volume (in): 9.024
Runoff Volume (ft3): 574898.563

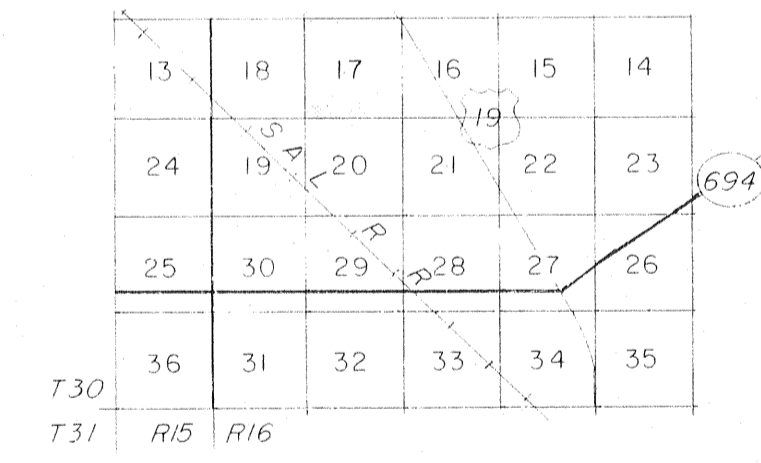
APPENDIX B

**SWFWMD
AERIALS**



LEGEND

HORIZONTAL CONTROL US&GS	
TRAVEL STATION	CP-14
VERTICAL CONTROL	BM-5
SECTION CORNERS	
CONTOURS	
DEPRESSION CONTOURS	
SPOT ELEVATIONS	



NOTE:

ACCURACY: IT IS INTENDED THAT THIS MAPPING COMPLY WITH U.S. NATIONAL MAP ACCURACY STANDARDS. HOWEVER, SUCH ACCURACY, OR ANY OTHER LEVEL OF ACCURACY, IS NOT GUARANTEED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT.

THE LAND LINE INFORMATION SHOWN HEREON IS COMPILED FROM THE BEST AVAILABLE DATA AND DOES NOT NECESSARILY REPRESENT TRUE LAND LINE LOCATION.

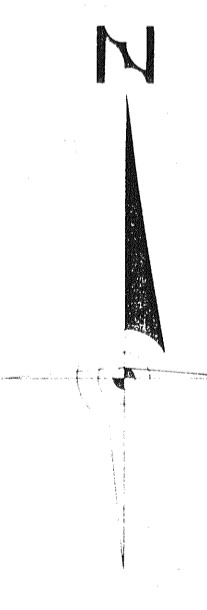
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GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE.

ELEVATIONS BASED ON U.S.C. & G.S. DATUM



SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY July 1977

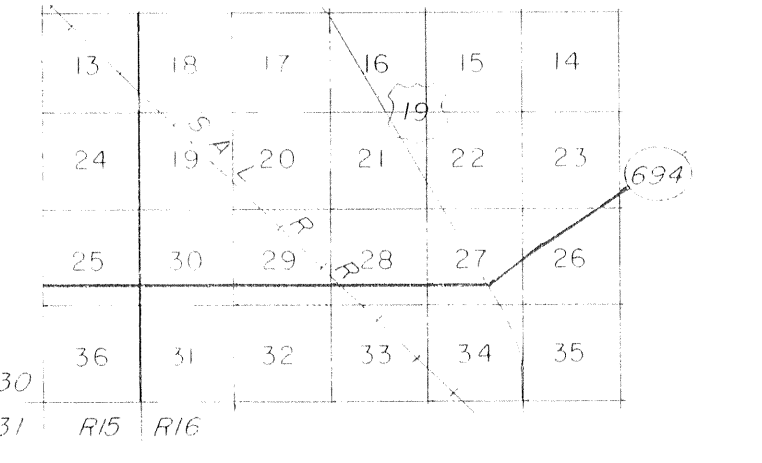
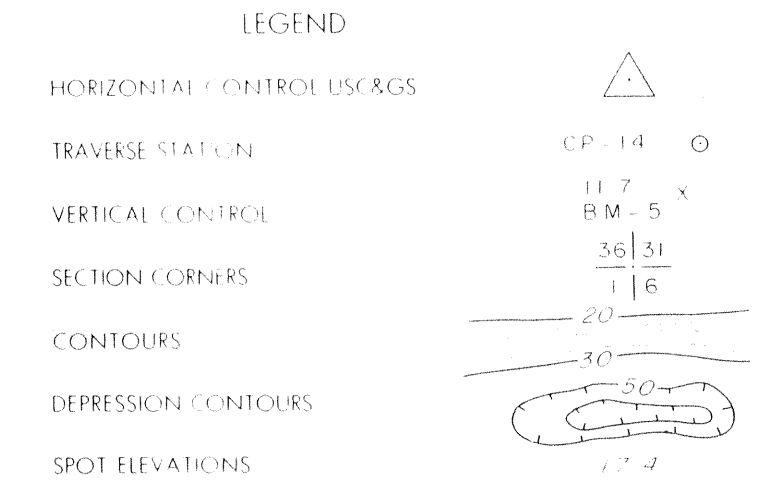
DATE OF MAPPING November 1977

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

PINELLAS - ANCLOTE RIVER BASIN

PINELLAS PARK

AERIAL PHOTOGRAPHY WITH CONTOURS
SHEET NO. 17-30-16



NOTE:

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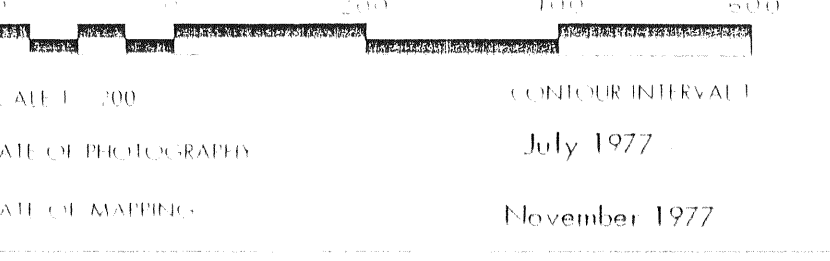
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GRIDS BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE.

ELEVATIONS BASED ON U.S.C.G.S. DATUM.

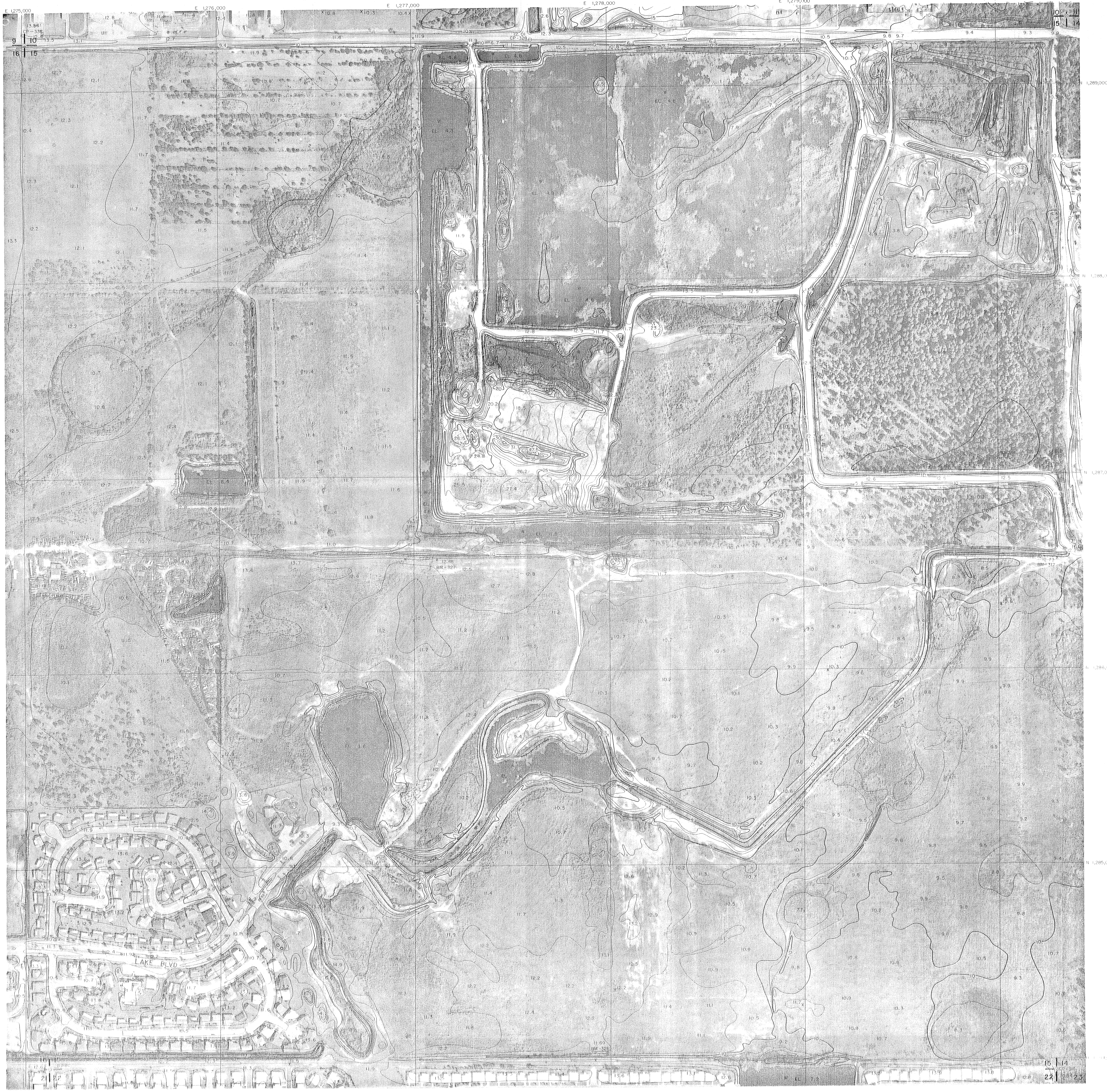


SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

PINELLAS PARK

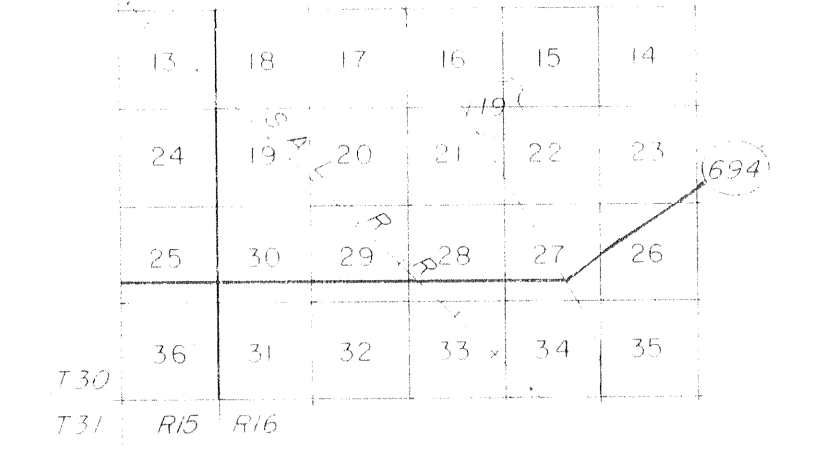
PINELLAS PARK

AERIAL PHOTOGRAPHY WITH CONTOURS
SHEET NO 16 30 16



LEGEND

HORIZONTAL CONTROL USRGS	
TRAVERSE STATION	CP-14
VERTICAL CONTROL	BM-31
SECTION CORNER	116
CONTOURS	
DEPRESSION CONTOURS	
SPOT ELEVATIONS	11.7



KEY MAP

NOTE:
ACCURACY: IT IS DETERMINED THAT THIS MAPPING COMPLIES WITH U.S. NATIONAL MAP ACCURACY STANDARDS. HOWEVER, SUCH ACCURACY, OR ANY OTHER LEVEL OF ACCURACY, IS NOT GUARANTEED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT.

THE LAND LINE INFORMATION SHOWN HEREON IS COMPILED FROM THE BEST AVAILABLE DATA AND DOES NOT NECESSARILY REPRESENT TRUE LAND LINE LOCATION.

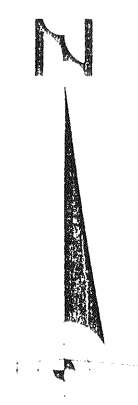
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GRID BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, NAD 83.

ELEVATIONS REDUCED TO MEAN SEA LEVEL.



SCALE: 1" = 100'

DATE: FEBRUARY 1977

DATE: 3/1977

July 1977

December 1977

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT

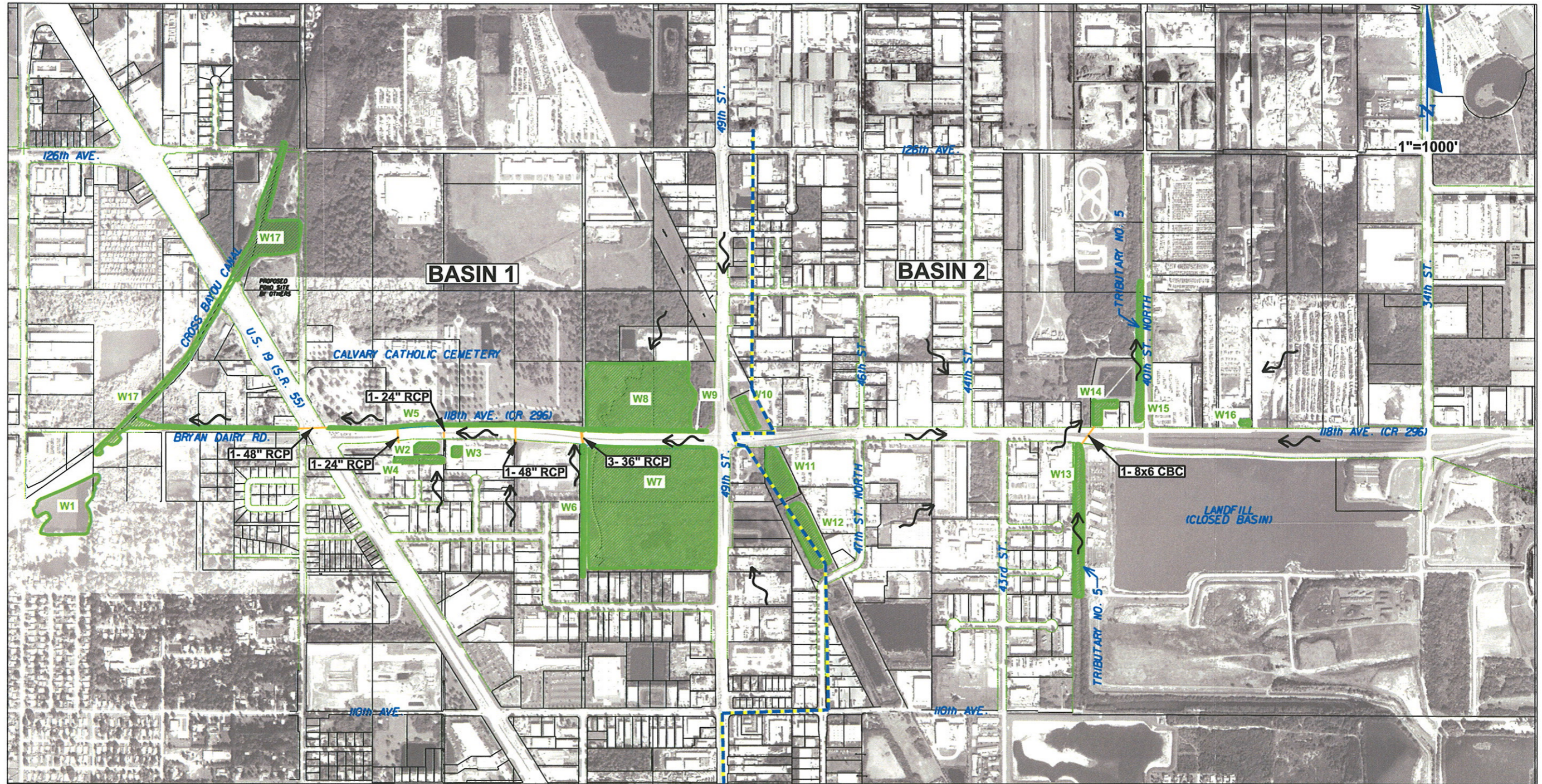
PUBLISHED BY THE DISTRICT

PINELLAS PARK

AERIAL PHOTOGRAPHY WITH CONTOURS
SHEET NO 15-30-16

APPENDIX C

**ALTERNATIVE
POND SITES**



LEGEND

- - - BASIN DIVIDE
- EXISTING DRAINAGE STRUCTURE
- EXISTING ROW
- PROPERTY LINES

DRAINAGE BASINS

- WETLAND AND OTHER SURFACE WATERS BOUNDARY
- CBC = CONCRETE BOX CULVERT
- RCP = REINFORCED CONCRETE PIPE

DATE OF AERIAL: October 4, 2004
 SOURCE: Field Reviews and drainage maps prepared by URS/Greiner in 1990 & 1991.

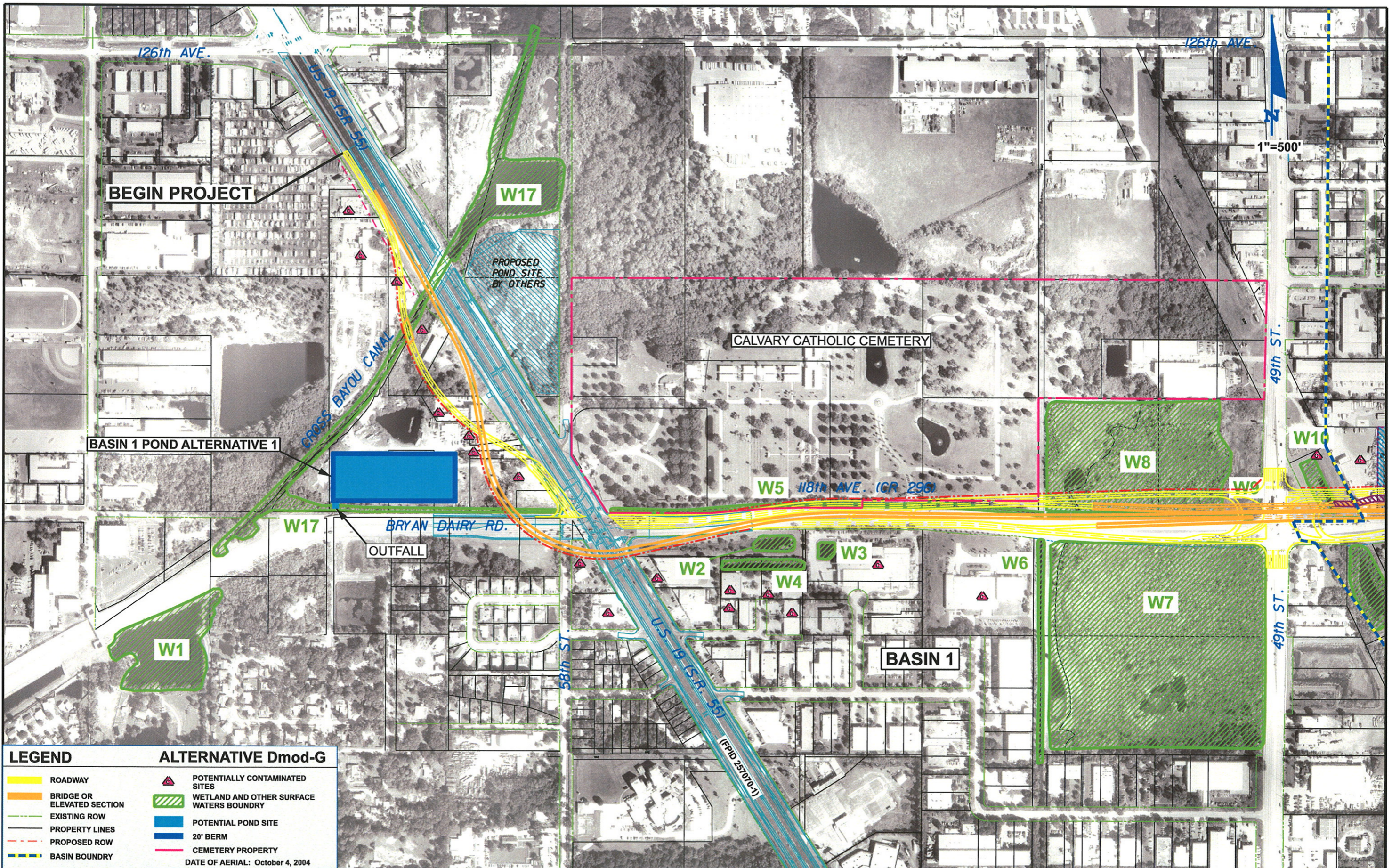
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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
CR 296	PINELLAS	413622-1-22-01

**118TH AVENUE (CR 296)
EXISTING DRAINAGE MAP**

FIGURE NO.
CI



LEGEND		ALTERNATIVE Dmod-G	
	ROADWAY		POTENTIALLY CONTAMINATED SITES
	BRIDGE OR ELEVATED SECTION		WETLAND AND OTHER SURFACE WATERS BOUNDARY
	EXISTING ROW		POTENTIAL POND SITE
	PROPERTY LINES		20' BERM
	PROPOSED ROW		CEMETERY PROPERTY
	BASIN BOUNDRY		DATE OF AERIAL: October 4, 2004

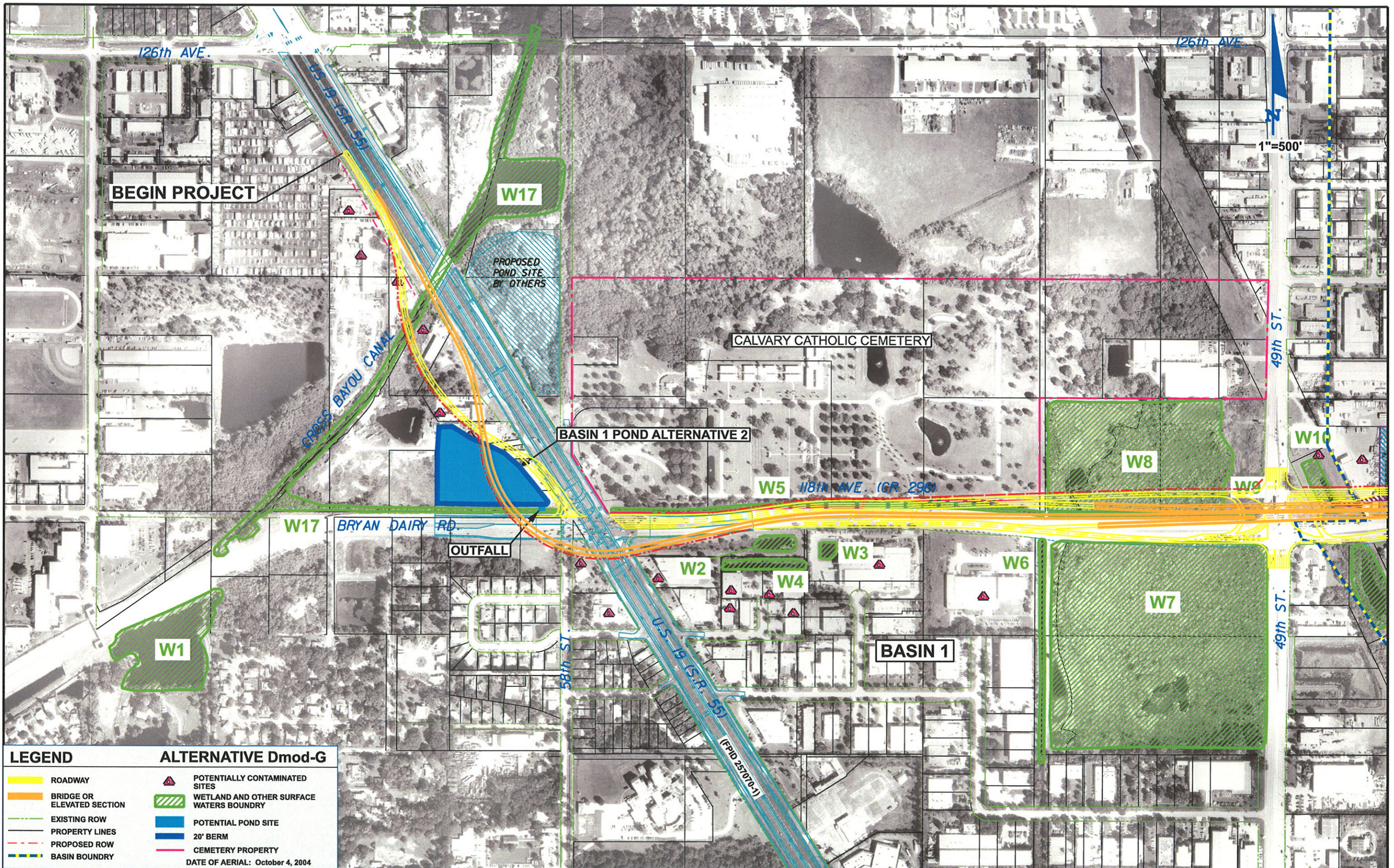
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CR 296	PINELLAS	413622-1-22-01

**118TH AVENUE (CR 296)
ALTERNATIVE POND SITES**

FIGURE
C2



LEGEND		ALTERNATIVE Dmod-G	
	ROADWAY		POTENTIALLY CONTAMINATED SITES
	BRIDGE OR ELEVATED SECTION		WETLAND AND OTHER SURFACE WATERS BOUNDARY
	EXISTING ROW		POTENTIAL POND SITE
	PROPERTY LINES		20' BERM
	PROPOSED ROW		CEMETERY PROPERTY
	BASIN BOUNDRY		DATE OF AERIAL: October 4, 2004

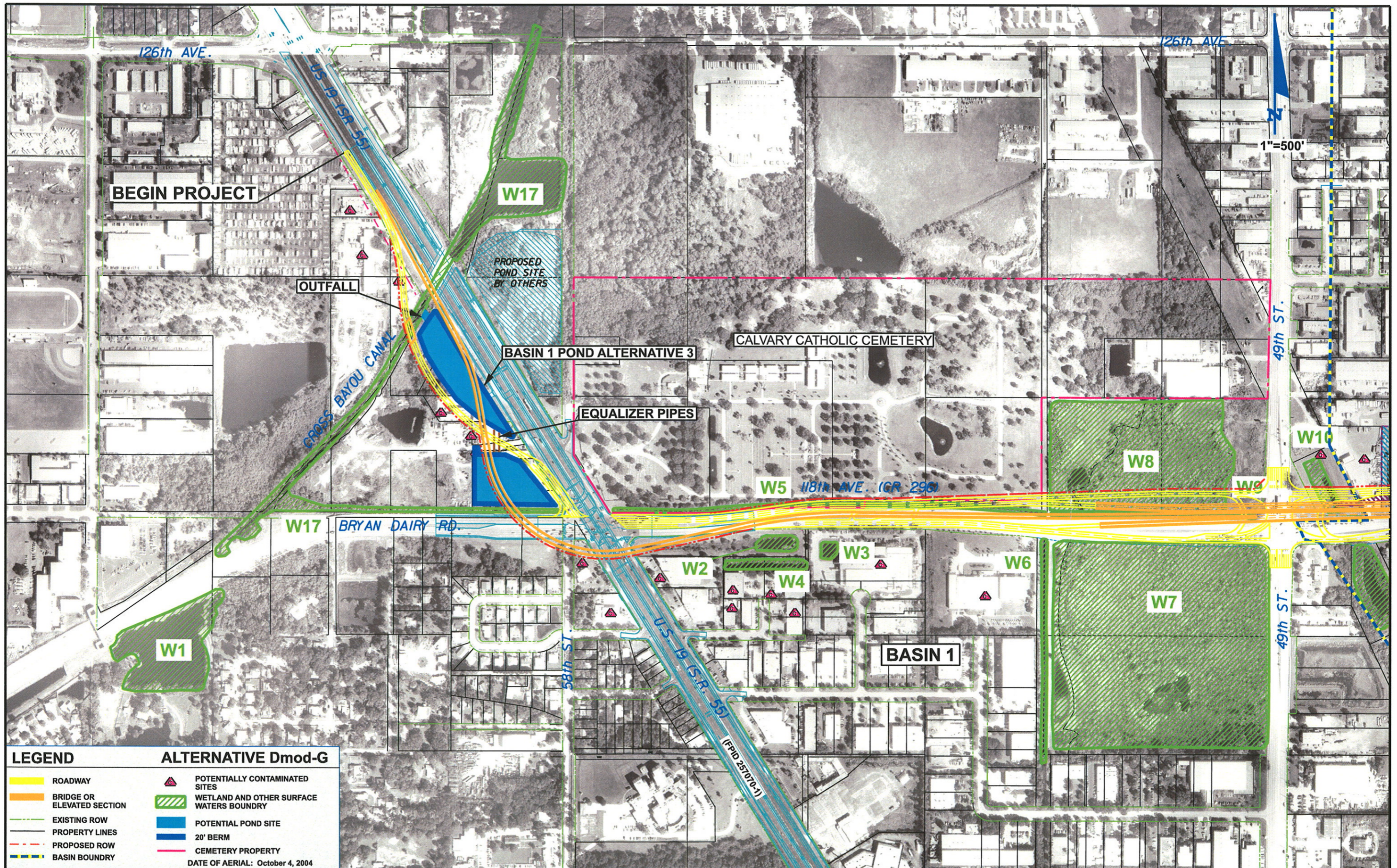
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CR 296	PINELLAS	413622-1-22-01

**118TH AVENUE (CR 296)
 ALTERNATIVE POND SITES**

FIGURE
C3



LEGEND

- | | | | |
|--|----------------------------|--|---|
| | ROADWAY | | POTENTIALLY CONTAMINATED SITES |
| | BRIDGE OR ELEVATED SECTION | | WETLAND AND OTHER SURFACE WATERS BOUNDARY |
| | EXISTING ROW | | POTENTIAL POND SITE |
| | PROPERTY LINES | | 20' BERM |
| | PROPOSED ROW | | CEMETERY PROPERTY |
| | BASIN BOUNDARY | | |

ALTERNATIVE Dmod-G

- DATE OF AERIAL: October 4, 2004

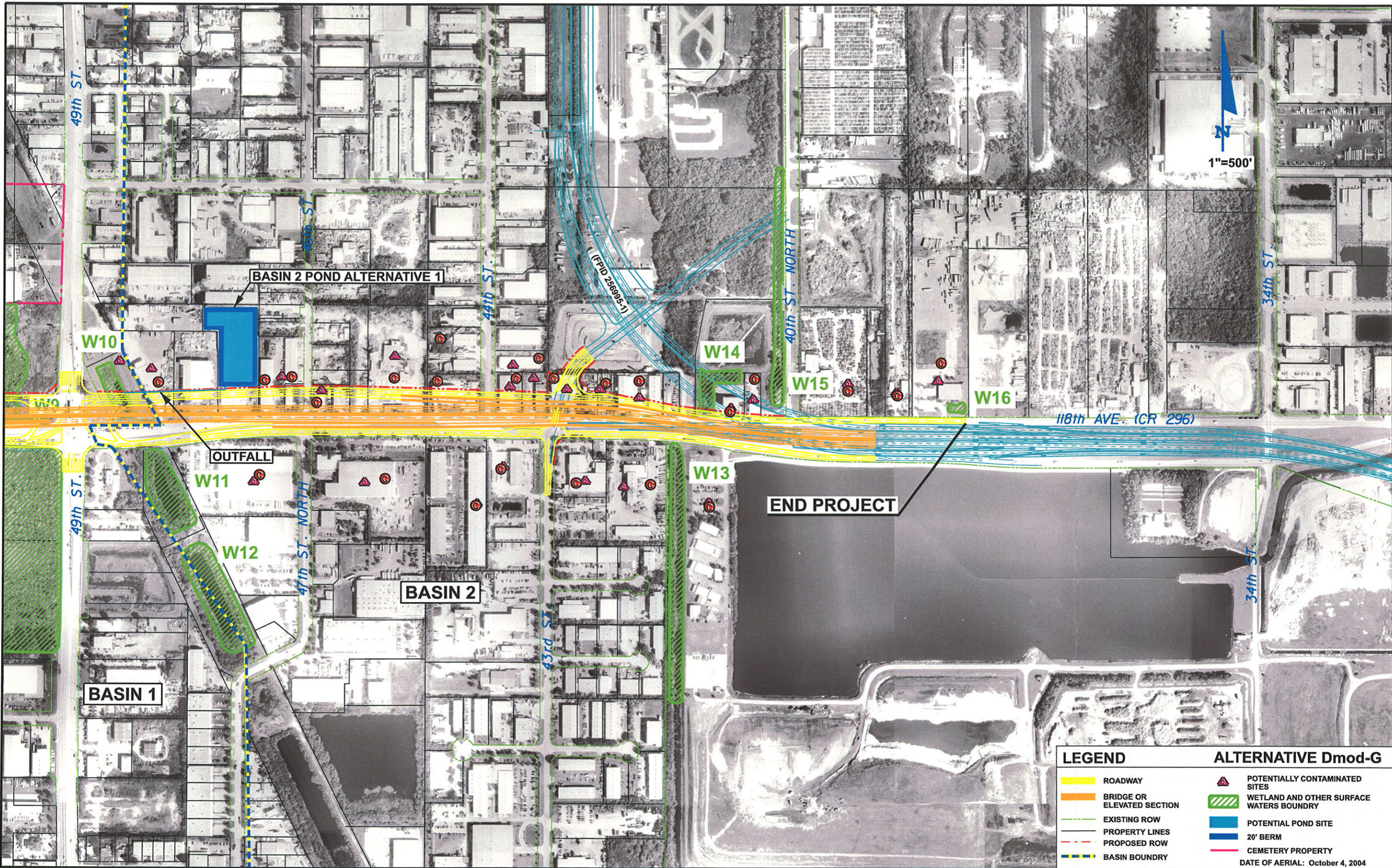
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**118TH AVENUE (CR 296)
 ALTERNATIVE POND SITES**

FIGURE
C4



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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

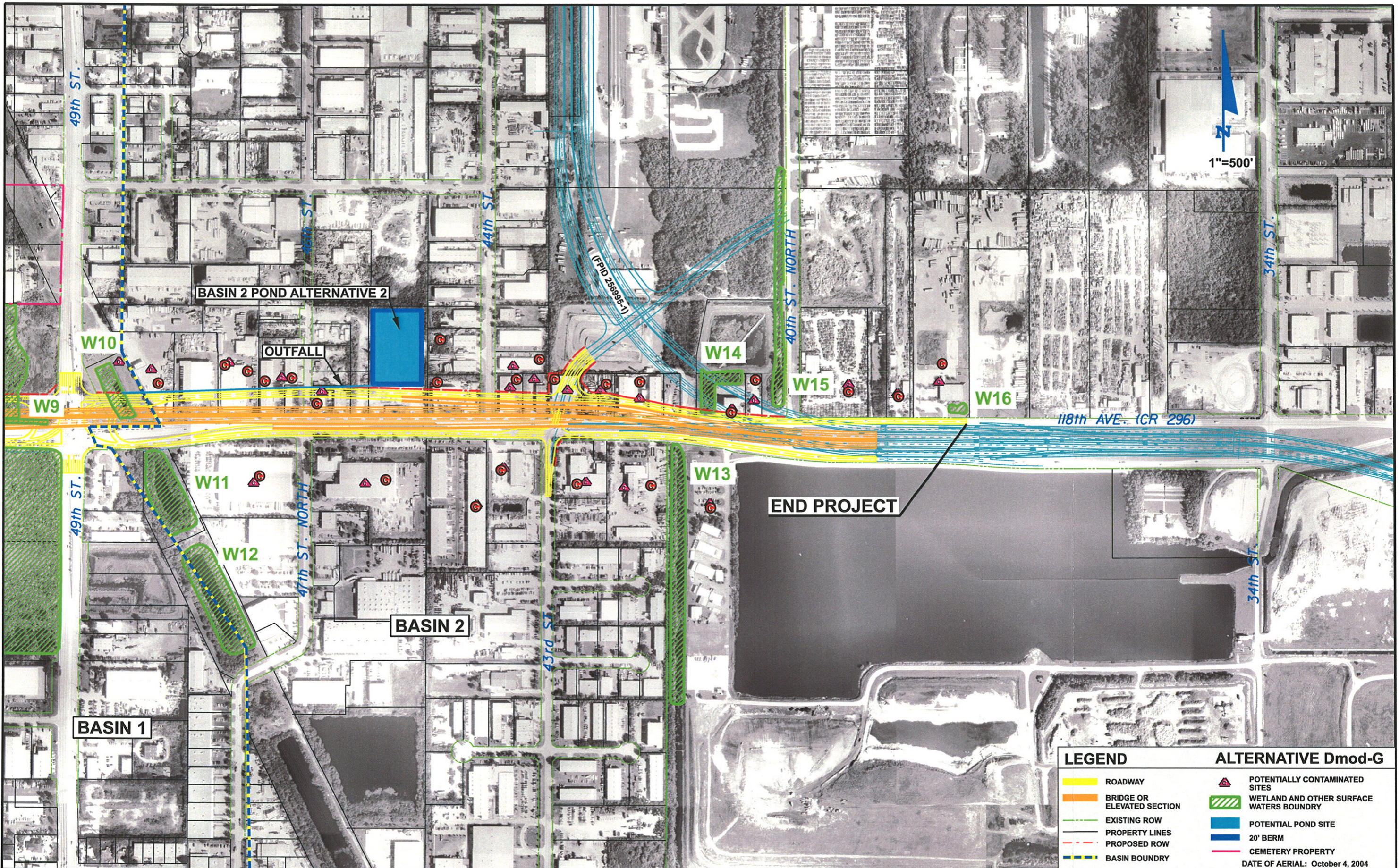
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**118TH AVENUE (CR 296)
ALTERNATIVE POND SITES**

FIGURE
C5

LEGEND		ALTERNATIVE Dmod-G	
	ROADWAY		POTENTIALLY CONTAMINATED SITES
	BRIDGE OR ELEVATED SECTION		WETLAND AND OTHER SURFACE WATERS BOUNDARY
	EXISTING ROW		POTENTIAL POND SITE
	PROPERTY LINES		20' BERM
	PROPOSED ROW		CEMETERY PROPERTY
	BASIN BOUNDARY		DATE OF AERIAL: October 4, 2004



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**118TH AVENUE (CR 296)
 ALTERNATIVE POND SITES**

FIGURE
C6