FINAL REPORT

LPGA Boulevard Extension

Final Pond Siting Report

For the

Project Development and Environment Study

From CR 415 (Tomoka Farms Road) to SR 600 (US 92)

Volusia County, Florida

FIN: 410252-1-22-01
FAP: 777 100 A

Prepared for

Florida Department of Transportation - District 5

January 2006

Prepared by

CH2MHILL

PROFESSIONAL ENGINEER CERTIFICATE

I hereby certify that I am a registered professional engineer in the State of Florida practicing with CH2M HILL, Inc., a corporation, authorized to operate as an engineering business, Certificate of Authorization No. 72, by the State of Florida, Department of Professional Regulation, Board of Professional Engineers, and that I have reviewed or approved the evaluation, findings, opinions, conclusions, or technical advice hereby reported for:

Project:	LPGA Boulevard Extension PD&E Study
FIN:	410252-1-22-01
FAP:	777 100 A
Location:	From CR 415 to US 92 in Volusia County
Client:	FDOT – District 5

This Pond Siting Report includes a summary of data collection efforts and conceptual drainage analyses prepared for conceptual analyses for the LPGA Boulevard Extension PD&E Study. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering and planning as applied through professional judgment and experience. This document is for planning purposes only and is not to replace any effort required for final design.

Name: Karen Acre Snyder, P.E.

Signature:

P.E. Number: 47762

Date:

Address: CH2M HILL

225 E. Robinson Street

Suite 505

Orlando, FL 32801

Table of Contents

Appendices

List of Tables

SECTION 1

Introduction

The Florida Department of Transportation (FDOT) District 5, in conjunction with local government agencies (Volusia County, Volusia County MPO, City of Port Orange, and City of Daytona), proposes to extend the existing LPGA Boulevard in Volusia County. LPGA Boulevard will be extended from its current southern terminus at SR 600 (US 92) south toward CR 415 (Tomoka Farms Road) just north of Shunz Road, a total distance of approximately 3.2 miles as shown in Figure 1. The project is located within the jurisdictions of Volusia County, and the St Johns River Water Management District (SJRWMD). This project is commonly referred to as the LPGA Boulevard Extension Project Development and Environment (PD&E) Study. The PD&E Study includes consideration of social, economic, and environmental impacts and mitigation of those impacts as required by Federal Highway Administration (FHWA) and FDOT's *PD&E Manual*.

The purpose of the project is to enhance the local mobility to serve the existing and proposed land uses along the LPGA Boulevard corridor by connecting two higher-speed regional facilities and providing a regional north-south alternative to I-95. Combined with the existing LPGA Boulevard and CR 415 to the south, the new facility will serve commuter traffic as well as local traffic from existing and proposed development in the immediate region. The new facility will reduce traffic congestion on CR 415 north of I-4 by becoming the major north-south connection over the existing CR 415. It includes the construction of a two-span bridge structure over I-4, and several wildlife crossings.

1.1 Purpose of the Pond Siting Report

This Pond Siting Report (PSR) is provided to present an evaluation of stormwater recommendations and alternatives for the FDOT to reach a decision on the type, estimated size, and location of the proposed stormwater management systems for the LPGA Boulevard Extension PD&E Study in Volusia County, Florida. A three tier process has been performed on this new alignment study for LPGA which consists of:

- 1st Tier: Corridor Analysis,
- 2nd Tier: Alternatives Analysis, and
- 3rd Tier: Preferred Alternative Refinement.

During the 1st Tier Stage, a Corridor Analysis was performed for Corridors A and B. With this analysis Corridor B was shown to be the better corridor as documented in the *Preliminary Engineering Report* (*Kittelson and Associates, January 2006*). The 2nd Tier Stage as part of the Alternative Analysis evaluated preliminary Alignments and potential pond sites for Corridor B, Alignment B-1 and B-2. Alignment B-1 was removed from further consideration during the 2nd Tier due to the larger right-of-way and construction cost estimates; and a higher level of wetland and floodplain impacts. Alignment B-2 has been further refined during the 3rd Tier Stage for Alternative Refinement and has been refined to Alignment B-3. In performing

coordination with the Environmental Advisory Group and local governments an additional Alignment B-4 was developed for consideration to utilize the already disturbed land within the Tomoka Farms Landfill property. However, there are potential contamination concerns which includes buried garbage within an old unlined cell that would have to be removed and relocated to an approved site for Alignment B-4 (*Contamination Screening Report by, Nodarse, August 2005*). Due to this analysis and contamination concerns, this report is based on the Recommended Alignment B-3 as the Preferred Alternative. The impacts for Alignment B-3 have been assessed for the typical section with and without multi-use trail, which is the 3rd Tier Stage. To assess the type, size, location, and cost of the stormwater options the following steps were taken:

- Estimate treatment/attenuation requirements by assessing soils and land use information, defining drainage basins, and computing new pavement areas.
- Identify discharge locations and hydraulic constraints.
- Identify potential pond site locations. One stormwater option was selected for each basin located within Volusia County right-of-way. This alternative is based on the hydraulic and environmental feasibility of potential pond sites. Property impact minimization has been accomplished through extensive ongoing preliminary coordination with potentially impacted public land stakeholders. Two stormwater alternatives were selected for each basin located within private property.
- Assess environmental and social impacts for each option.
- Provide recommendations to satisfy current stormwater management criteria and minimize impacts.
- For proposed stormwater options adjacent to CR 415, Volusia County requested a 100-foot of right-of-way be preserved from the western right-of-way line for future widening of CR 415.

This PSR presents information on the existing and proposed conditions, which includes the development and evaluation of stormwater options as well as engineering details of the proposed improvements. It should be noted that all elevations discussed in this document are in reference to National Geodetic Vertical Datum 1929 (NGVD 29). Information sources used in developing this report include the following:

- FDOT State Job No. 79110-3412 Construction Plans Drainage Map; I-4 Six Laning Design Project from SR 44 to west of I-95 (FPID 408464-1)
- United States Geological Survey (USGS) Quadrangle Maps of Florida: Daytona Beach (1993) Samsula (1970)
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for Volusia County: 12127C0361G (April 15, 2002), 12127C0362G (April 15, 2002), 12127C0363G (April 15, 2002), 12127C0364G (April 15, 2002), 12127C0500G (April 15, 2002) and 12127C0525G (April 15, 2002)

- FEMA Flood Insurance Study for Volusia County, Study Number 12127CV000AFDOT (February 2003)
- United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soils Survey of Volusia County (February 1980)
- SJRWMD Geographic Information Systems (GIS) Database and Permit Information Manual
- Site Investigations, Interviews, Coordination Meetings, Correspondence
- FDOT Drainage Manual (July 2005) and Storm water Management Facility Handbook (January 2004).

SECTION 2

Existing Conditions

Currently the LPGA corridor is undeveloped uplands, wetlands, and floodplain areas. In this section, the soils, existing land use, floodplains, drainage characteristics and environmental characteristics are described for Alignment B-3.

2.1 Soils

The information reviewed for this PSR included the *Soil Survey for Volusia County, Florida* as published by the USDA NRCS. The purpose of the research was to review readily available published literature regarding anticipated geotechnical conditions within the study area. The G*eotechnical Report LPGA Boulevard Extension PD&E Study State Road 415 to State Road 600 (US 92)* prepared by Nodarse contains a full report of soil conditions within the overall corridor. The corridor is characterized by poorly drained to very poorly drained soils, nearly level, with seasonal high groundwater levels ranging from within 10 inches of the existing ground surface to above the ground surface. Field borings as summarized in Table 1 were obtained in order to the increase the understanding of the soil conditions when making stormwater management decisions.

The NRCS data and quadrangle maps were reviewed in conjunction with the geotechnical exploration to relate soils to hydrology and hydraulic conditions. Groundwater information was used to estimate a seasonal high water table (SHWT) in order to evaluate roadway profile and stormwater options for this PD&E Study.

2.2 Land Use

The existing land use within the proposed LPGA Corridor consists of large undeveloped, tracts of land, the majority of which is publicly held. Land uses adjacent to the proposed alignment are primarily classified as industrial, commercial, low-density residential, agricultural, and conservation/wetland areas. The Tomoka River Marsh is located north and east of the corridor. The Tiger Bay Wildlife Management area is located north of I-4 and west of the existing and proposed LPGA Boulevard Alignment. Wetlands are present throughout the study corridor, including portions of the headwaters for the nearby Tomoka River. The neighboring area is habitat to various wildlife species; the *Endangered Species Biological Assessment* report prepared by CH2M HILL for this PD&E Study documents the observed federally and state listed species. There are two existing landfill operations located near the proposed corridor for LPGA. The Tomoka Farms Landfill is located west of the alignment, and the Kirton-Self C&D Landfill is northeast of the alignment.

2.3 Floodplains

Much of the project corridor is located within a Federal Emergency Management Agency (FEMA) designated 100-year floodplain; however, there are no regulated floodways located

within the project limits for the extension of LPGA Boulevard. The Tomoka River is considered a regulated floodway east of the project area and north of I-4. The area south of I-4 has not been studied by FEMA. The floodplain locations were determined using FEMA FIRM panels for Volusia County.

The FEMA FIRM identified two floodplain zones present within the project study area and associated with the Tomoka River. The majority of the project is located within Zone A which is defined as "No base flood elevation determined". The floodplain elevation was estimated overlaying the FEMA floodplain line over the USGS map for the area and making assumptions based on the HW information available for the I-4 cross drains from the original FDOT construction plans. Based on this method, the estimated elevation for the 100-yr floodplain affecting the LPGA Boulevard Extension varies from 25 to 27.5 feet NGVD 29. The northern area of the project between I-4 and US 92 is located within Zone A with base flood elevation. The remainder of the project area is designated Zone X, which is within the 100-year floodplain.

2.4 Drainage Characteristics

Existing drainage characteristics along the LPGA Boulevard Extension corridor were determined by reviewing FDOT construction plans, FDOT drainage and permitting files, USGS Quadrangle Maps, and SJRWMD GIS files. The limits of the study are located within the SJRWMD Halifax River Planning Unit, which is within the Northern Coastal Hydrologic Basin. The existing drainage characteristics associated with this area include nearly level topography that forms interconnected sloughs that drain south via existing I-4 and Landfill Road cross drain systems, and east and ultimately north towards the Tomoka River and its tributaries. The Tomoka River is located to the north and east of the project study area, and flows from south to north toward the Halifax River. This project is also located within the headwaters of the Tomoka River and its associated floodplain. The project area north of I-4 is an Outstanding Florida Water (OFW), and south of I-4 the project area is classified as a Class III water body per state water quality standards, Chapter 62-302.

There are no existing cross drains within the project limits because the proposed project is a new alignment. The existing cross drains located along US 92, I-4, CR 415, and Shunz Road were investigated to use the available information to estimate the size of the structures proposed for the LPGA Boulevard Extension. The existing cross drains serve to maintain drainage patterns in the vicinity of the project area by connecting floodplains and sloughs that drain toward the Tomoka River. Table 1 summarizes the information available for the existing cross drains pertaining to this project. Please refer to Figure 2 for details on the existing flow patterns, cross drain locations, and off-site drainage basins for the proposed Alignment B-3.

Because the proposed facility is a new alignment, few permitted drainage systems are located within the study area. Only the more recently developed parcels along the corridor, including the Tomoka Farms Landfill, Landfill Road, and I-4 have regulated stormwater ponds. The existing landfill operation near the proposed corridor discharges to the Tomoka River basin. The historical drainage patterns within the Tomoka Farms Landfill will be maintained in accordance with their SJRWMD and Florida Department of Environmental Protection (FDEP) National Pollutant Discharge Elimination (NPDES) environmental

permits. The existing drainage systems within the Tomoka Farms Landfill property has been constructed to accommodate SJRWMD and FDEP environmental permits as well as to meet specific National Pollutant Discharge Elimination System (NPDES) discharge standards.

TABLE 1–Existing Cross Drains

LOCATION	CROSS DRAIN ID	SIZE		NO. OF BARRELS	TYPE	FDOT HW INFORMATION	HIGH WATER MARK RECORDED IN FIELD	COMMENTS
		B	D					
US 92	US92-S01	4’	2’	1	CBC	NA	NOT REVIEWED	INFORMATION OBTAINED FROM FDOT PLAN SET
	US92-S02	4’	2’	1	CBC	NA	NOT REVIEWED	INFORMATION OBTAINED FROM FDOT PLAN SET
	US 92 Tomoka Bridge Nos. 790021EB 790097WB			2	Bridge			US 92 STRAIGHT LINE DIAGRAMS
I-4	CD-55	9’	3’	1	CBC	28.41	AVERAGE 1.5’ FROM TOP OF HEADWALL	CD STRUCTURE NUMBERS: PROJECT FIN ID 408464-1-52-01
	CD-57	5’	3’	1	CBC	26.48	AVERAGE 2.0’ FROM TOP OF HEADWALL	
	I-4 Tomoka Bridge Nos. 790103EB 790104WB			2	Bridge			
CR 415	CR415-S01		18”	2	CMP	NA	NOT LOCATED	--
	CR415-S02		24”	2	CMP	NA	1.8’ FROM TOP OF HEADWALL	--
	CR415-S03		24”	2	RCP	NA	1.5’ FROM TOP OF HEADWALL	--
	CR415-S04		36”	1	RCP	NA	2.25’ FROM TOP OF PIPE	--
	CR415-S05	68”	43”	1	ECP	NA	AVERAGE 3.4’ FROM TOP OF HEADWALL	FDOT I-4 79110-3412
	CR415-S06		24”	2	RCP	NA	NA	NOT ACCESSIBLE
	CR415-S07		18”	1	RCP	NA	NOT LOCATED	--
	CR415-S08		24”	1	RCP	NA	NOT LOCATED	--
	CR415-S09		18”	1	RCP	NA	1.3’ FROM TOP OF STRUCTURE	--
	CR415-S10	68”	43”	1	CMP	NA	3’ FROM TOP OF STRUCTURE	I-4 79110-3412
	CR415-S11	6.5’	1.5’	1	CBC	NA		Sldedrain

TABLE 1–Existing Cross Drains (Cont.)

LOCATION	CROSS DRAIN ID	SIZE B	SIZE D	NO. OF BARRELS	TYPE	FDOT HW INFORMATION	HIGH WATER MARK RECORDED IN FIELD	COMMENTS
I-95	I-95 S-01		24"	2	RCP	NA		--
	I-95 S-02		36"	2	RCP	NA		--
	I-95 S-03		24"	1	RCP	NA		--
	I-95 S-04		24"	2	RCP	NA		--
	I-95 S-05	7'	4'	1	CBC	NA		--
	I-95 S-06	6'	4'	2	CBC	NA		--
	I-95 S-07		24"	1	RCP	NA		--
	I-95 S-08		24"	2	RCP	NA		--
	I-95 S09	7'	5'	2	CBC	NA		--
SHUNZ RD.	Shunz-S12	30"	19"	1	ECP	NA	1.42' FROM CROWN OF PIPE	DIMENSIONS CONFIRMED IN FIELD. EQUIVALENT 24" RCP=30"X19".
LANDFILL ROAD	LFR-S14	10'	5'	3	CBC	NA	NA	LANDFILL ROAD 3-LANING PROPOSED CULVERT
LANDFILL AREA	S-8		48	1				
	S-11		24	1				
	S-13		48	1				

Notes:

1- Abbreviations: Not Available = NA

Reinforced Concrete Pipe = RCP
Concrete Box Culvert = CBC
Corrugated Metal Pipe = CMP
Elliptical Concrete Pipe = ECP

2- When available for both sides of the pipe, the High Water was averaged for the downstream and upstream end.

2.5 Environmental Characteristics

This section summarizes environmental characteristics relevant to pond site selection, which are presented in separate documents from this study. Social, natural, and physical environmental constraints exist within the project corridor including the following:

Cultural Resources

A cultural resource assessment survey was conducted as part of this PD&E Study. Background research, including a review of the Florida Master Site File and the National Register of Historic Places (NRHP), indicated that no previously recorded archaeological sites or historic resources are located within or adjacent to the LPGA Boulevard Extension PD&E Study project area of potential effects (APE). A review of relevant site location information for environmentally similar areas within Volusia County and the surrounding region, as well as an examination of historical documents, indicated a generally low probability for the occurrence of precontact and historic period archaeological sites within the project study limits. Sites, if present, would most likely be small lithic and artifact scatters. As a result of field survey, no archaeological sites were discovered and no historic resources were identified within the project APE. Further detailed information on the

cultural resource evaluation can be obtained from the *Cultural Resource Assessment Survey* prepared by Archaeological Consultants, Inc. for this study.

Wetlands

Project biologists characterized and mapped wetlands and surface water features located within the project study area during field investigations conducted in July 2003, October 2004, and January 2005. A major purpose of these assessments was to identify significant and sensitive resources that occur within the project study area. Wetlands are present throughout the study corridor including within portions of the headwaters for the nearby Tomoka River. The field reviews and mapping of wetland habitat types and surface water features combined resulted in the identification of over 30 wetland areas. The approximate wetland locations are represented in the drainage maps. A more detailed discussion on wetlands is provided in the *Wetland Evaluation Report* prepared by CH2M HILL.

Threatened and Endangered Species

A project-specific list of threatened and endangered wildlife and plant species identified as occurring presently or occurring in past years within 500 feet to either side of the proposed right-of-way is provided in the *Endangered Species Biological Assessment* prepared by CH2M HILL for this study.

Contamination

Potential contamination sites identified throughout the corridor were assigned a ranking of low or medium for potential contamination risk. The information was obtained by Nodarse and Associates though observations made during on-site visits, interviews, and review of the database information obtained from Florida Department of Environmental Protection and Volusia County Solid Waste Division. Data pertaining to potential sources of contamination are discussed in the contamination report prepared by Nodarse and Associates for this project. The sites that directly pertain to this project are:

- Kirton-Self C&D Landfill was assigned a ***low risk ranking*** because there are no reported discharges.
- Tomoka Farms Landfill was assigned a ***medium risk ranking*** for Alignment B-3 because of reported contaminated discharges detected within the Landfill monitoring wells. If Alignment B-4 was being considered, the Tomoka Farms Landfill would be assigned a ***high risk ranking*** due to the referenced contaminated discharge readings within existing monitoring wells.

Utilities

Utility companies within the study area were contacted in order to identify the types and locations of existing and planned utilities through the corridor. Utilities contact information and descriptions are discussed in the PER. The following is a list of the utilities found within the study limits:

- Florida Power and Light
- WilTel Communications
- Brighthouse Networks
- FPL Fibernet
- Florida Gas Transmission
- TECO-Peoples Gas

- AT&T
- Bellsouth
- City of Daytona Beach Water & Wastewater
- City of Port Orange Water & Wastewater

SECTION 3

Proposed Conditions

The proposed improvements for the LPGA Boulevard Extension includes constructing the alignment from CR 415 (Tomoka Farms Road) north to the US 92 (SR 600) and tie into the existing LPGA Boulevard. The total distance for this extension is approximately 3.2 miles in length. This project will include a bridge for the extension LPGA over existing Interstate 4. The proposed conditions for the project are discussed in this section including typical section, land use, floodplain impacts, profile grade line, proposed drainage characteristics, and stormwater options.

3.1 Typical Section

The proposed LPGA Boulevard Extension typical section consists of a two-lane, rural typical section, with 12-foot travel lanes and 8-foot shoulders in each direction. It will adhere to FDOT roadway design standards for a 55 mile-per-hour design speed facility.

Two right-of-way widths are being considered, one option would accommodate the proposed roadway and stormwater conveyance ditches, the other add a 12-foot multi-use trail as shown in Figure 3. A full discussion of the alignments that have been considered and refined as part of the Alternative Analysis can found in the Preliminary Engineering Report prepared by Kittelson and Associates.

Regardless of the alignment alternatives, drainage design and environmental permitting will be required for the roadway improvements.

3.2 Land Use

The proposed land use for this corridor is characterized by a mixture of conservation areas, commercial, and industrial land uses. Near the proposed corridor there are several planned developments that are approved and/or under construction as follows:

- The First Baptist Church of Daytona Beach, located north of I-4 and west of CR 415,
- Volusia County proposed Landfill Industrial Park, located south of Landfill Road,
- Consolidated Tomoka Development (also referred to as LPGA DRI in the City of Daytona Beach) large-scale residential community with 18-hole golf course, located north of US 92 and east of the existing LPGA Boulevard, and
- Coquina Cove (formerly Coraci PUD), located east of the CR 415 and proposed LPGA Extension intersection.

3.3 Floodplain Impacts and New Cross Drains

Much of the project is located within the Tomoka River floodplain with impacts associated with the roadway and stormwater management ponds. The proposed stormwater pond

locations have been chosen to minimize impacts to the floodplain by selecting areas with uplands whenever possible. The existing floodplain hydraulic connections will be maintained throughout the corridor with the use of cross drains. A more detailed discussion on floodplain impacts and new cross drains is provided in the Final Location Hydraulics Report (LHR) prepared by CH2M HILL dated January 2006.

USGS maps and FDOT original I-4 construction plans were used to estimate off-site drainage basin areas, determine flow patterns, establish areas of flow confluence, and estimate the size and location of the proposed cross drains. The LHR includes recommendations for proposed cross drain locations and approximate sizes to maintain existing drainage patterns along the new alignment as summarized in Table 2. The cross drain designations were defined in increasing numeric order, starting at Shunz Road and ending at US 92. The cross drains were given numeric designations starting with S-100, the wildlife crossings were given designations starting with S-200. It is anticipated that side drains maybe required for the existing I-4 ditches where LPGA is proposed to bridge over the interstate. This is recommended to be further evaluated during final design when the bridge design details are completed.

TABLE 2
Proposed Cross Drains

Structure type	Structure ID	Station	No. of Barrels	Size	Comments
Cross Drains	S-100	823+00	2	24”	Same size as the culverts downstream under Tomoka Landfill berm, and existing Shunz-S12 equivalent RCP
	S-101	882+00	1	24”	Provides conveyance from east to west.
	S-101A	878+70	1	38”x60”	Maintains conveyance for landfill east outfall ditch
	S-102	910+00	1	5’ X 3’	Skew ± 23° maintains flow from CD-57
	S-103	923+50	1	5’ x 3’	Maintains flow from CD-57
Wildlife Crossing	S-200	812+50	1	36”	Small animal underpass aligned parallel to CR 415 between road and Pond A within a dryer forested area.
	S-201	835+00	1	36”	Small animal underpass near intersection at Shunz Rd. extension, aligned between forested wetland and a dryer area.
	S-202	851+00	1	36”	Small animal underpass near intersection at Landfill Rd., aligned between forested wetland and a pond.
	S-203	865+00	1	36”	Small animal underpass within a dryer area.
	S-204	947+00	1	36”	Small animal underpass within a dryer area; half-way between I-4 bridge underpass and FP&L easement underpass.
	S-205	963+50	1	36”	Small animal underpass aligned along the ecotone of forested wetland and cleared area of FP&L easement, and between ponds.

Compensation for loss of floodplain storage is recommended within dedicated floodplain compensation ponds. The compensation ponds are areas re-graded to provide the required storage volume and to meet the SJRWMD no rise criteria for the Tomoka River Basin. The

proposed floodplain compensation ponds have been identified to remain outside of the 100-year floodplain, but maintain a hydraulic connection into the Tomoka River floodplain and minimize wetland impacts.

Proposed drainage patterns, location of the proposed cross drains, and floodplain compensation areas are depicted on Figure 5, Proposed Drainage Characteristics.

3.4 Profile Grade Line

Because the proposed LPGA Boulevard Extension is a new alignment, the approximate location of the low points for the profile grade line (PGL) were determined based on the following procedure:

- The existing ground elevation was estimated using the USGS map.
- The USDA NRCS Soil Survey of Volusia County was used to estimate the SHWT elevation for each of the basins based on expected depth of SHWT to existing ground.
- The minimum ditch bottom elevation was set one (1) foot above the estimated SHWT elevation.
- The profile grade elevation was calculated using the slopes and horizontal distances corresponding to the roadway typical section depicted in Figure 3.
- The following current FDOT standards were utilized and should be refined during final design efforts:
  - Freeboard: FDOT requires that one (1) foot of freeboard be provided from the top of treatment volume to the lowest point of the maintenance berm, which is equivalent to the shoulder point for ponds adjacent to the roadway.
  - Base Clearance: To protect the roadway base, the FDOT requires two (2) feet of clearance between the bottom of the road base for a rural two-lane typical section roadway and the level where water stands for more than 24 hours, which is referred to as the design high water (DHW). It is recommended during final design that black base is considered for the pavement design of LPGA due to existing high water table conditions throughout the project area and especially when tying into existing CR 415 and US 92.

High points were assumed at the center line of I-4 and at the existing roads or landfill berms where the proposed corridor will tie at or above existing grade.

3.5 Proposed Drainage Characteristics

Based on the PGL evaluation, the onsite drainage areas were defined as the proposed right-of-way width for the roadway and ponds with basins divides were located at the profile high points and low points as summarized in Table 3 below and depicted on Figure 5, Proposed Drainage Characteristics. Stormwater runoff will be conveyed to the stormwater management facilities via roadside ditches with stormdrain below the ditches within the low end of super elevated roadway sections. Additional detail is found on the Drainage Map provided in Appendix E.

Table 3
Basin Limits and PGL Low Points

Basin					PGL Low Point	
Designation	**Begin Sta**	**Description**	**End Sta**	**Description**	**Sta**	**Elevation (ft)**
A	811+00 Elev. 28.00	CR 415	835+00 (elev. 35.00)	West of Shunz Rd	811+00	28.0
B	835+00 (elev. 35.00)	West of Shunz Rd	852+50 (elev. 32.00)	Landfill Rd	852+50	32.0
C	852+50 (elev. 32.00)	Landfill Rd	879+30 (elev. 35.00)	Tomoka Landfill EW Access Berm	862+50	32.0
D	879+30 (elev. 35.00)	Tomoka Landfill EW Access Berm	912+30 (elev. 33.77)	Tomoka Landfill NS Access Berm	900+00	30.5
E	912+30 (elev. 33.77)	Tomoka Landfill NS Access Berm	935+50 (elev. 62.52)	I-4 Bridge High Point	920+00	32.0
F	935+50 (elev. 62.52)	I-4 Bridge High Point	975+86 (elev. 29.40)	US 92	970+00	29.4

3.6 Stormwater Options

Stormwater options, corridor wetlands, and the drainage schematic are shown on the Drainage Map (Appendix E) as well as Figure 5, Proposed Drainage Characteristics. Stormwater options were developed using the best available information in combination with field reviews and coordination with landowners and agencies. The proposed multi-use trail was included for the stormwater options calculations from a worse case scenario because it is being considered as part of the proposed improvements for the LPGA Extension. To develop the stormwater options, the following procedure was used:

- Establish onsite drainage basins between alignment high points.
- Based on SJRWMD, FDOT, and local jurisdiction's stormwater criteria, the requirements to meet water quality (treatment) and water quantity (attenuation) criteria were determined. The project limits fall within the Tomoka River Basin, which has OFW water quality criterion for the portion of the project north of I-4. The proposed project limits are not within the Tiger Bay Wildlife Management Area or the Tomoka River Riparian Habitat Zone.
- The Drainage Methodology for the proposed LPGA Boulevard Extension is included in Appendix B. In meetings with SJRWMD, it was determined that Basin E is not within the Tomoka River Basin OFW boundaries and will not be required to meet OFW criteria. This is due to the stormwater management system does not directly discharge to the I-4 conveyance ditches and allows the necessary mixing and dilution required to discharge upstream of an OFW. The proposed pond for Basin E discharges south to the adjacent

wetlands via proposed cross drain No. S-102 towards Landfill Road. Then onsite runoff will follow existing drainage patterns and drain initially east just south of Landfill Road and then ultimately north to the Tomoka River which will allow the necessary mixing and dilution.

- Based on available GIS data and field observations, vacant, undeveloped parcels were identified outside of the proposed right-of-way. The parcels were then evaluated to avoid and minimize wetland, and floodplain impacts. Pond sites were evaluated to determine physical (relocations, utility impacts, potential contamination), environmental (wetland/habitat, public lands), and hydrologic impacts in order to determine preferred alternatives, and to modify sites to minimize impacts. The evaluation was carried out through field visits and survey information.
- The USDA NRCS Soil Survey of Volusia County was used to estimate the SHWT elevation for each of the proposed pond sites. Upon receipt of geotechnical information from Nodarse and Associates the SHWT elevation has been confirmed to be consistent with our initial assumptions.
- Stormwater volumes required were calculated based on the proposed typical cross section and applicable basin limits. All stormwater management systems were sized using wet detention volumes to use the most conservative approach; therefore, refinement will be required during design. It should be noted for side street tie-ins it may not be feasible to fully collect and treat runoff due to profile grade line constraints; however, the full basin limits were used to determine the treatment requirements for this study. This can be further evaluated during final design when more detailed survey information is available. Stormwater calculations are included in Appendix D.
- The proposed stormwater requirements for Basin A include the portion from Station 800+00 to 811+00 that is proposed to be constructed by Volusia County as part of the Madeline Avenue Extension project. This section has been included in requirements for Basin A to remain conservative and due to being part of the original project limits for this PD&E Study.
- There has been no Total Maximum Daily Load (TMDL) criteria established for any impaired water bodies within the project area at the present time. However, during final design there may be TMDL requirements established for impaired water bodies within this area of Volusia County. It is recommended that a review of the updated TMDL requirements be performed during final design.

Evaluation Matrices Tables 4 through 9 summarize the on-site basins information, including jurisdictional agency, drainage patterns, attenuation and treatment volumes required, impacts, and stormwater options considered. Alternative pond site options were considered only for ponds located within privately owned lands.

TABLE 4
Basin A Evaluation Matrix: STA 811+50 to STA 835+00

Jurisdiction:	SJRWMD	
Basin Type and Outfall Location:	Open basin mapped as part of the Tomoka River Basin. It has positive discharge to the Tomoka River via adjacent wetlands.	
Attenuation Required:	2.20 ac-ft for 25-year, 24-hour (SJRWMD); 2.13 ac-ft for 100-year, 8-hour (FDOT Critical Duration Estimate)	
Treatment Required:	2.22 ac-ft Wet detention. No OFW Criteria required since south of I-4.	
Option 1: Pond A-1. Located on the SW quadrant of the CR 415/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site is not mapped within a FEMA floodplain. Buried fiber optic cable and overhead electric adjacent to CR 415 may be impacted. **Option 2: Pond A-2**. Located on the NW quadrant of the CR 415/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site is partially mapped within a FEMA floodplain. The maintenance berm is the only floodplain potential impact. Buried fiber optic cable and overhead electric adjacent to CR 415 may be impacted. Because the pond alternatives for this basin are located within private property, two options were considered.		
Item	**Option 1: Pond A-1 Recommended**	**Option 2: Pond A-2**
Volume Provided	3.23 ac-ft Wet Detention.	2.22 ac-ft Wet Detention.
Structural Impacts (Residential, Commercial, and/or Billboards)	None.	None.
Site Impacts:		
Jurisdictional Lands (Wetlands, Open Waters, and/or Ditches/Canals)	None.	None.
Habitat	None.	None.
Floodplain	None.	Pond berm, 0.08 ac-ft.
Contamination	None.	None.
Historical or Archaeological	None.	None.
Utilities	Buried fiber optic cable and overhead electric adjacent to the road.	Buried Fiber Optic Cable and overhead electric adjacent to the road.
Right-of-way Acquisition Estimates	ROW: 6.94 ac Cost: $ 492,093.88	ROW: 4.92 ac Cost: $ 403,873.47
Easement Required?	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.
Basin A Recommended Stormwater Alternative is Pond A-1. Volusia County has reserved 3 acres of R/W for the Madeline Extension at the location of Pond A-2.		

TABLE 5
Basin B Evaluation Matrix: STA 835+00 to STA 852+50

Jurisdiction:	SJRWMD
Basin Type and Outfall Location:	Open basin mapped as part of the Tomoka River Basin. It has positive discharge to the Tomoka River via adjacent wetlands.
Attenuation Required:	1.07 ac-ft for 25-year, 24-hour (SJRWMD); 1.04 ac-ft for 100-year, 8-hour (FDOT Critical Duration Estimate)
Treatment Required:	1.43 ac-ft Wet detention. No OFW Criteria required since south of I-4.
Option1: Pond B. Located on the SE quadrant of the Landfill Road/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site is mapped within the FEMA floodplain. The maintenance berm is the only floodplain potential impact. No utility impacts expected. Only one option is considered for this basin because it is within Volusia County publicly owned lands and extensive coordination has taken place to select the site that best suits the stakeholders.	
Item	**Option 1: Pond B**
Volume Provided	1.45 ac-ft Wet Detention
Structural Impacts (Residential, Commercial, and/or Billboards)	None.
Site Impacts:	
Jurisdictional Lands (Wetlands, Open Waters, and/or Ditches/Canals)	3.6 ac. - $318,344.24 Senate Bill Mitigation Estimate
Habitat	None.
Floodplain	Pond berm, 0.2 ac-ft
Contamination	Medium. Located within the Tomoka Landfill property.
Historical or Archaeological	None.
Utilities	None.
Right-of-way Acquisition Estimates	ROW: 3.61 ac Cost: $ 409,000
Easement Required?	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.
Basin B Recommended Stormwater Alternative is Pond B. Coordination has been performed with Tomoka Farms Landfill on finalizing this pond site.	

TABLE 6
Basin C Evaluation Matrix: STA 852+50 to STA 869+30

Jurisdiction:	SJRWMD	
Basin Type and Outfall Location:	Open basin mapped as part of the Tomoka River Basin. It has positive discharge to the Tomoka River via adjacent wetlands.	
Attenuation Required:	0.92 ac-ft for 25-year, 24-hour (SJRWMD); 0.90 ac-ft for 100-year, 8-hour (FDOT Critical Duration Estimate)	
Treatment Required:	1.25 ac-ft Wet detention. No OFW Criteria required since south of I-4.	
Option1: Pond C-1. Located on the NE quadrant of the Landfill Road/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site is mapped within the FEMA floodplain. The maintenance berm is the only floodplain potential impact. No utility impacts expected. **Option2: Pond C-2**. Located on the NE quadrant of the Landfill Road/LPGA Boulevard Extension intersection but is perpendicular to LPGA. Considered a wet detention pond. The site is mapped within the FEMA floodplain. The maintenance berm is the only floodplain potential impact. No utility impacts expected. Two options have been considered to further minimize wetland impacts even though they are located within Volusia County publicly owned lands. Extensive coordination has taken place to select the site that best suits the stakeholders.		
Item	**Option 1: Pond C-1 Recommended**	**Option 2: Pond C-2**
Volume Provided	1.34 ac-ft Wet Detention	1.33 ac-ft Wet Detention
Structural Impacts (Residential, Commercial, and/or Billboards)	None.	None.
Site Impacts:		
Jurisdictional Lands (Wetlands, Open Waters, and/or Ditches/Canals)	2.17 ac - $191,359.28 Senate Bill Mitigation Estimate	1.04 ac - $91,711.36 Senate Bill Mitigation Estimate
Habitat	None.	None.
Floodplain	Pond berm, 0.59 ac-ft	Pond berm, 0.58 ac-ft
Contamination	Medium. Located within the Tomoka Landfill property.	Medium. Located within the Tomoka Landfill property.
Historical or Archaeological	None.	None.
Utilities	None.	None.
Right-of-way Acquisition Estimates	ROW: 3.53 ac Cost: $ 308,472.40	ROW: 3.69 ac Cost: $ 307,596.54
Easement Required?	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.
Basin C Recommended Stormwater Alternative is Pond C-1. The location of Pond C-1 is more advantageous from a hydraulic conveyance standpoint than Pond C-2. Pond C-2 is being impacted by the widening of Landfill Road that is currently under construction. Coordination has been performed with Tomoka Farms Landfill on finalizing this pond site selection.		

TABLE 7
Basin D Evaluation Matrix: STA 869+30 to STA 912+30

Jurisdiction:	SJRWMD	
Basin Type and Outfall Location:	Open basin mapped as part of the Tomoka River Basin. It has positive discharge to the Tomoka River via adjacent wetlands.	
Attenuation Required:	1.3 ac-ft for 25-year, 24-hour (SJRWMD); 1.25 ac-ft for 100-year, 8-hour (FDOT Critical Duration Estimate)	
Treatment Required:	1.65 ac-ft Wet detention. No OFW Criteria required since south of I-4.	
Option 1 : Pond D-1. Located on the Kirton property east of the Tomoka Landfill. Considered a wet detention pond. The site is mapped within a FEMA floodplain. Because the pond alternatives for this basin are located within private property, two options were considered. **Option 2: Pond D-2.** Located on the Kirton property east of the Tomoka Landfill. Considered a wet detention pond. The site is not mapped within a FEMA floodplain. Because the pond alternatives for this basin are located within private property, two options were considered.		
Item	**Option 1: Pond D-1**	**Option 2: Pond D-2 Recommended**
Volume Provided	2.2 ac-ft Wet Detention.	2.2ac-ft Wet Detention.
Structural Impacts (Residential, Commercial, and/or Billboards)	None.	None.
Site Impacts:		
Jurisdictional Lands (Wetlands, Open Waters, and/or Ditches/Canals)	5.1 ac. - $451,502.00 Senate Bill Mitigation Estimate	4.8 ac. - $423,283.20 Senate Bill Mitigation Estimate
Habitat	None.	None.
Floodplain	0.25 ac.	None.
Contamination	Low.	Low.
Historical or Archaeological	None.	None.
Utilities	None.	None.
Right-of-way Acquisition Estimates	ROW: 5.1ac Cost: $ 378,466.65	ROW: 5.8 ac Cost: $ 400,708.31
Easement Required?	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.
Basin D Recommended Stormwater Alternative is Pond D-2. Coordination has been performed with Tomoka Farms Landfill on finalizing this pond site selection which has no floodplain impacts.		

TABLE 8
Basin E Evaluation Matrix: STA 912+30 to STA 935+66

Jurisdiction:	SJRWMD	
Basin Type and Outfall Location:	Open basin mapped as part of the Tomoka River Basin. It has positive discharge to the Tomoka River via adjacent wetlands.	
Attenuation Required:	0.76 ac-ft for 25-year, 24-hour (SJRWMD); 0.74 ac-ft for 100-year, 8-hour (FDOT Critical Duration Estimate)	
Treatment Required:	1.11 ac-ft Wet detention. No OFW Criteria required since south of I-4 and sufficient draining and dilution via existing wetlands/floodplains.	
Option1: Pond E-1. Located on the NW quadrant of the Landfill Road/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site is mapped within the FEMA floodplain. The maintenance berm is the only floodplain potential impact. No utility impacts expected. **Option2: Pond E-2**. Located on the NE quadrant of the Landfill Road/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site is mapped within the FEMA floodplain. The maintenance berm is the only floodplain potential impact. No utility impacts expected. Only one option is considered for this basin because it is within publicly owned lands and extensive coordination has taken place to select the site that best suits the stakeholders.		
Item	**Option 1: Pond E-1 Recommended**	**Option 2: Pond E-2**
Volume Provided	1.99 ac-ft Wet Detention	1.15 ac-ft Wet Detention
Structural Impacts (Residential, Commercial, and/or Billboards)	None.	None.
Site Impacts:		
Jurisdictional Lands (Wetlands, Open Waters, and/or Ditches/Canals)	4.24 ac. - $373,900.00 Senate Bill Mitigation Estimate	3.28 ac. - $289,243.52 Senate Bill Mitigation Estimate
Habitat	None.	None.
Floodplain	Pond berm, 0.26 ac-ft	Pond berm, 0.21 ac-ft
Contamination	Medium. Located within the Tomoka Landfill property.	Medium. Located within the Tomoka Landfill property.
Historical or Archaeological	None.	None.
Utilities	None.	None.
Right-of-way Acquisition Estimates	ROW: 5.02 ac Cost: $ 377,054.53	ROW: 3.28 ac. Cost: $ 301,127.26
Easement Required?	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.
Basin E Recommended Stormwater Alternative is Pond E-1. Coordination has been performed with Tomoka Farms Landfill on finalizing this pond site and they requested all LPGA ponds to be on the east side of the roadway to allow them full use of their land to the west. The I-4 Six Laning Pond shown is based on the 90% plans submittal.		

TABLE 9
Basin F Evaluation Matrix: STA 935+66 to STA 975+30

Jurisdiction:	SJRWMD	
Basin Type and Outfall Location:	Open basin mapped as part of the Tomoka River Basin. It has positive discharge to the Tomoka River via adjacent wetlands.	
Attenuation Required:	4.43 ac-ft for 25-year, 24-hour (SJRWMD); 4.35 ac-ft for 100-year, 8-hour (FDOT Critical Duration Estimate)	
Treatment Required:	6.52 ac-ft Wet detention. OFW Criteria for Tomoka River Basin is required.	
Option 1: Pond F-1 and F-2. Located on the SW quadrant of the LPGA Boulevard Extension/US92 intersection. Considered a wet detention pond. The site is mapped within a FEMA floodplain. Overhead electric adjacent divides the pond into two cells. **Option 2: Pond F-3**. Located on the SE quadrant of the CR 415/LPGA Boulevard Extension intersection. Considered a wet detention pond. The site mapped within a FEMA floodplain. Because the pond alternatives for this basin are located within private property, two options were considered.		
Item	**Option 1: Pond F-1 & F-2**	**Option 2: Pond F-3 Recommended**
Volume Provided	6.78 ac-ft (2.56/F-1 + 4.22/F-2) Wet Detention.	6.91 ac-ft Wet Detention.
Structural Impacts (Residential, Commercial, and/or Billboards)	None.	None.
Site Impacts:		
Jurisdictional Lands (Wetlands, Open Waters, and/or Ditches/Canals)	F-1 8.9 ac. - $784,837.60 F-2 12.63 ac - $1,113.763.90	18.96 ac. - $1,671,968.64
Habitat	None.	None.
Floodplain	2.1 ac.	1.4 ac.
Contamination	None.	None.
Historical or Archaeological	None.	None.
Utilities	Overhead electric divides the pond into two cells.	Potential fiber optic impacts
Right-of-way Acquisition Estimates	ROW: 8.9 ac/F-1, 12.63 ac/F-2 Cost: $ 2,789,999.97/$3,428,792.94	ROW: 18.96 ac Cost: $ 4,543,152.75
Easement Required?	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.	No, accessed from the proposed right-of-way. Discharging to adjacent wetlands.
Basin F Recommended Stormwater Alternative is Pond F-3. The Recommended Pond F-3 has less wetland impacts than Option 1. It is recommended in design when more detail survey information is available to investigate a pond alternative in the mixed upland/wet prairie areas southeast of Pond F-2.		

SECTION 4

Recommendations and Conclusions

This report has been developed to provide pond site recommendations for the purposes of planning and environmental clearances. The recommended pond sites have been identified to:

- Avoid relocations and public facilities,
- Adhere to avoidance and minimization of wetland and habitat,
- Avoid or minimize floodplain impacts, and
- Avoid or minimize utility relocations.

Opportunities that should be investigated for design include:

- Joint use ponds with adjacent projects such as the roadway improvements for CR 415 and Madeline Road Extension.
- Refine pond sites using up to date survey and geotechnical information to reduce pond sizes as well as wetland and floodplain impacts.
- The use of black base for pavement design should be considered where applicable due to high water table conditions within the project area. Table 10 provides a summary of the stormwater recommendations and comments on the selection considerations.

TABLE 10
Recommended Stormwater Management Systems

Basin Name	Recommendation		Comment
	Pond Name	Pond Type	
A	Pond A-1	Wet	Volusia County requested the pond be on the south side of LPGA since they have reserved 3 acres in the NW quad of LPGA/CR 415 for the Madeline Avenue extension. However, Pond A-2 is the low side of super elevated highway and would facilitate conveyance.
B	Pond B	Wet	Only pond option since located within Volusia County R/W.
C	Pond C-1	Wet	Pond C-1 is better hydraulically connected than Pond C-2. Pond C-2 is in conflict with stormwater pond site for the Landfill Road widening being done by Volusia County.
D	Pond D-2	Wet	No floodplain impacts in comparison to Pond D-1.
E	Pond E-1	Wet	Tomoka Farms Landfill requested the pond be located on the east side of LPGA.
F	Pond F-3	Wet	Wetland impacts are less than for the other option. There is opportunity during design to reduce further this type of impact by using upland/wetland mix area.

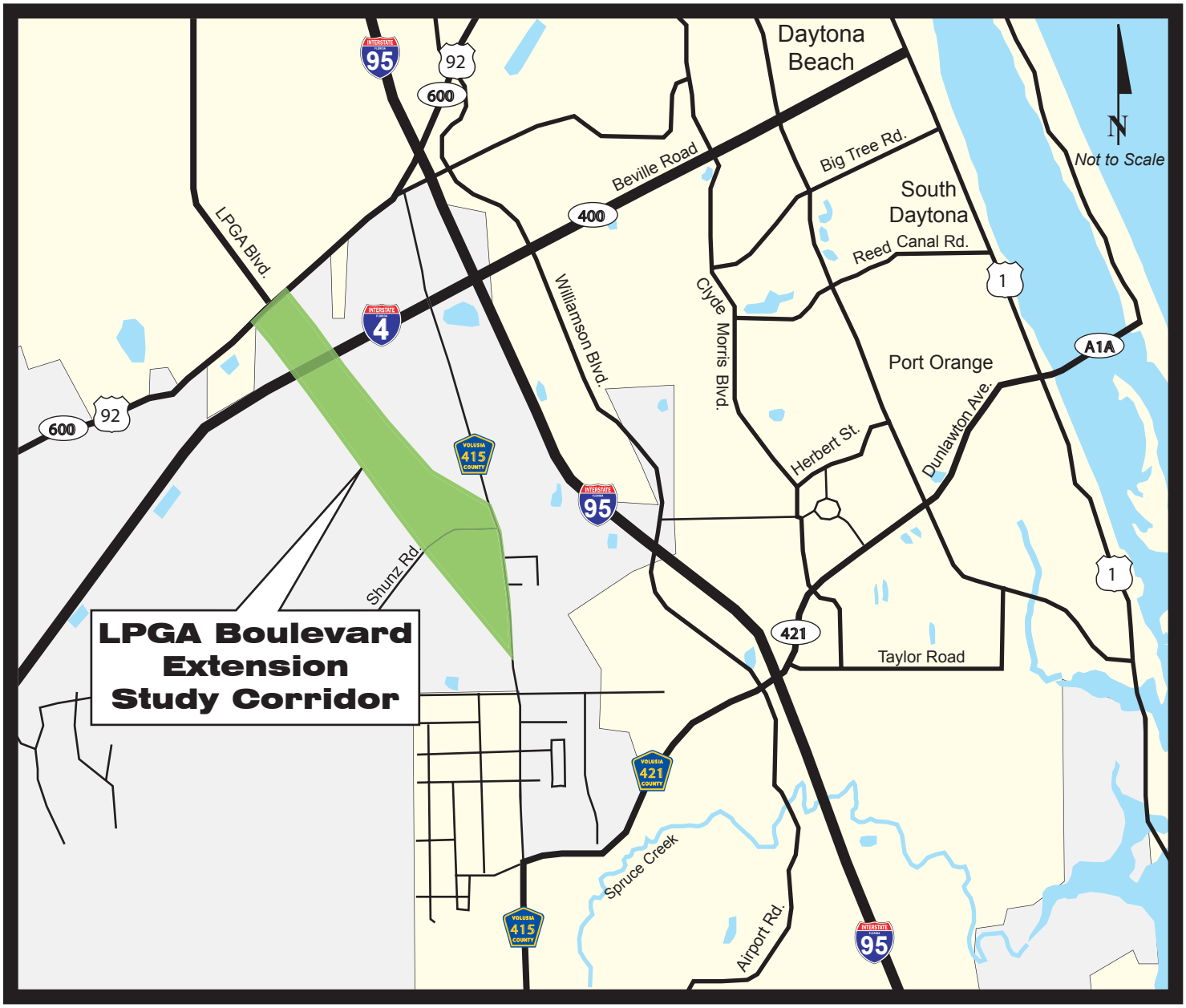
APPENDIX A

Figures

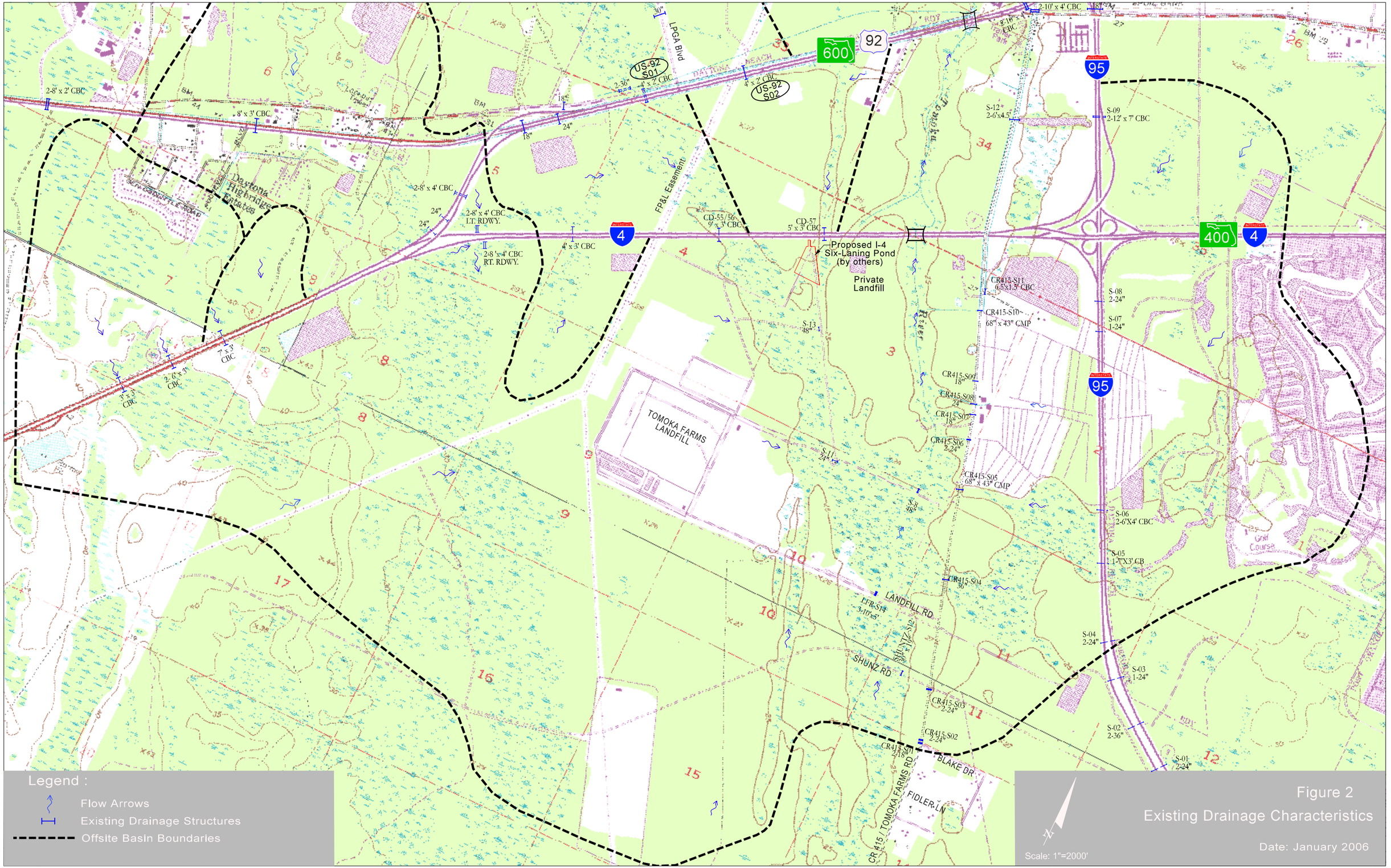
- Figure 1 Location Map
- Figure 2 Existing Drainage Characteristics
- Figure 3 Typical Section
- Figure 4 Proposed Land Use
- Figure 5 Proposed Drainage Characteristics

LPGA Boulevard Extension PD&E Study

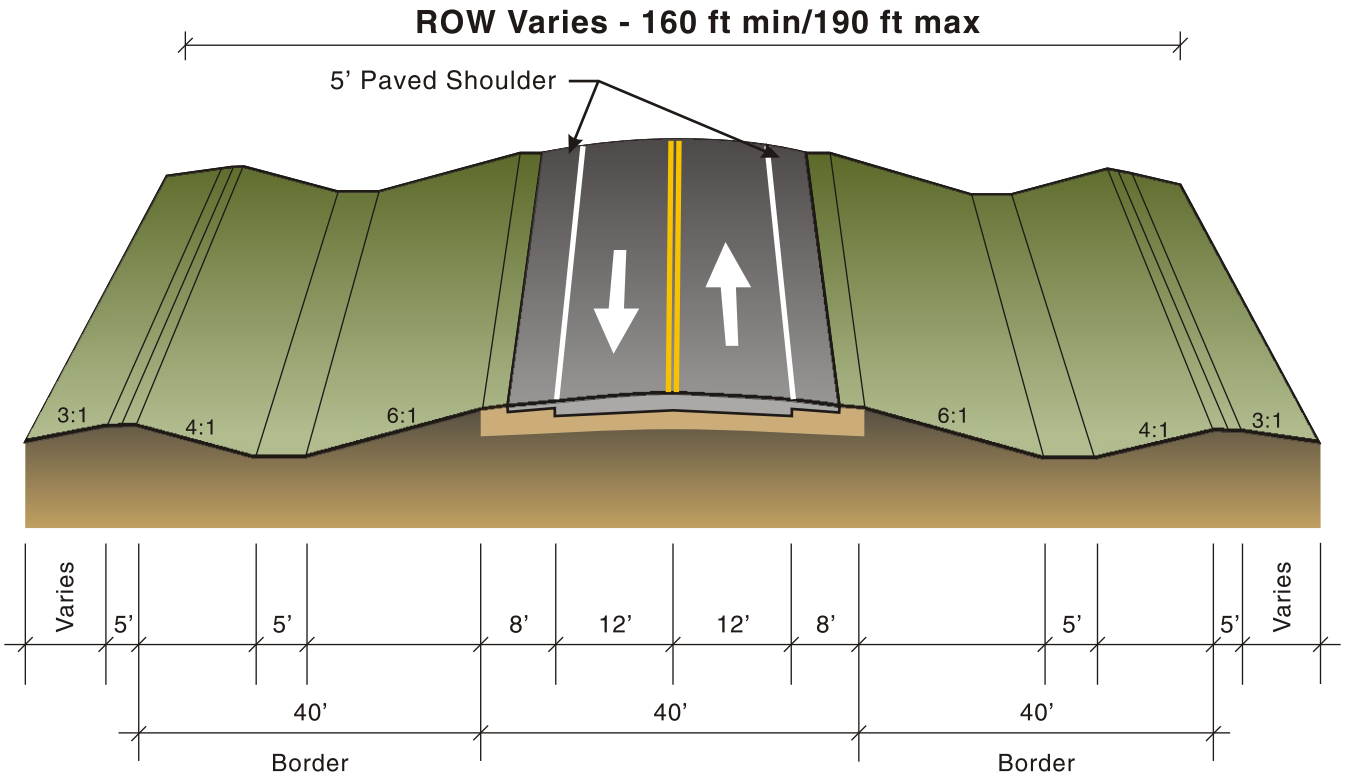
Figure 1
Project Location Map



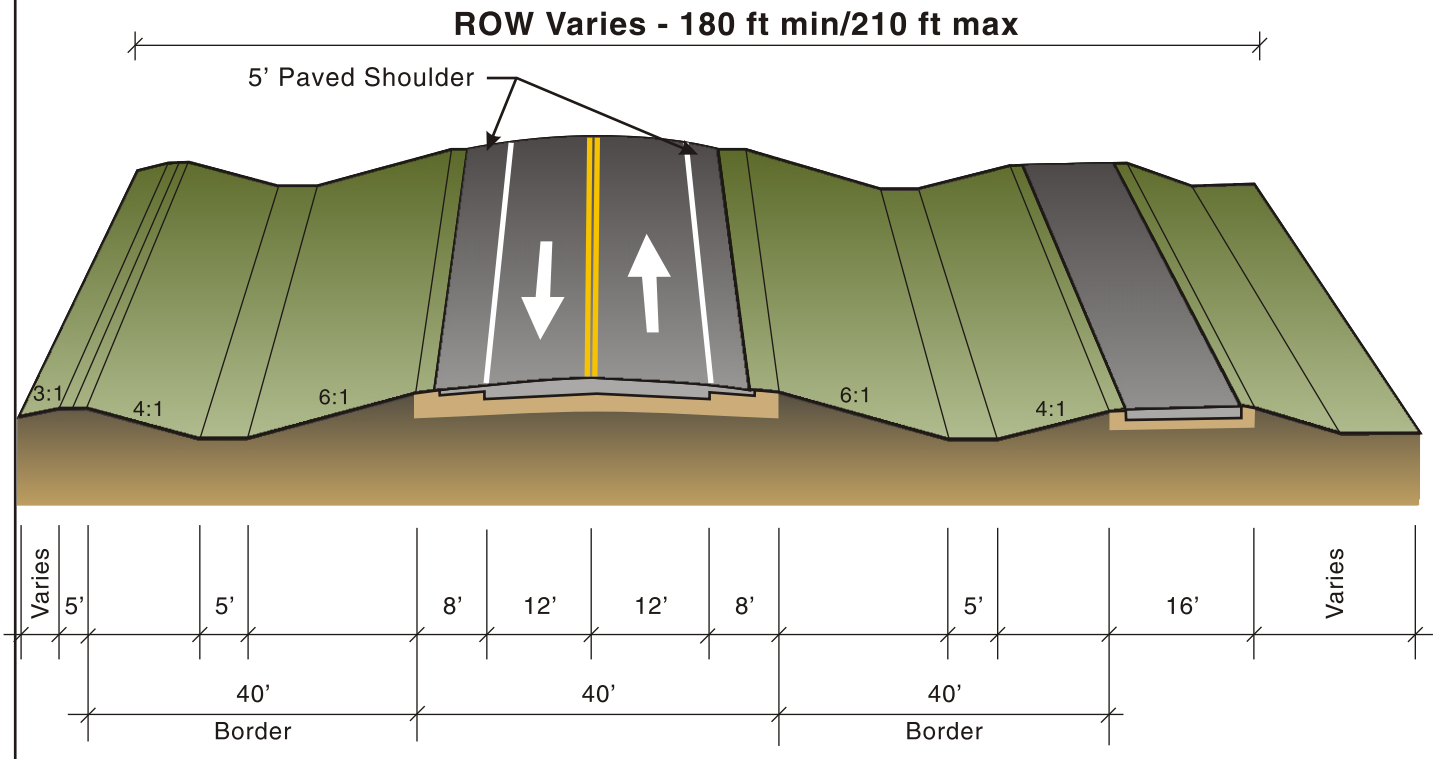
From CR 415 to SR 600 (US 92), Volusia County
FAP No: 7777 100 A Financial ID No: 410252-1-22-01


2-8' x 2' CBC
8' x 3' CBC
Daytona Highbridge Estates
SEVEN SEAS ROAD
2-8' x 4' CBC
24"
24"
2-8' x 4' CBC LT. RDWY.
2-8' x 4' CBC RT. RDWY.
4' x 3' CBC
18"
18"
24"
30"
LPGA Blvd
US-92 S01
2-36"
4' x 2' CBC
4' x 2' CBC
US-92 S02
600
92
FP&L Easement
CD-55/56 9' x 3' CBC
CD-57 5' x 3' CBC
Proposed I-4 Six-Laning Pond (by others)
Private Landfill
4
95
400
2-10' x 4' CBC
2-10' x 4' CBC
S-12 2-6'x4.5'
S-09 2-12' x 7' CBC
CR415-S11 6.5'x1.5' CBC
CR415-S10 68" x 43" CMP
S-08 2-24"
S-07 1-24"
S-13 48"
CR415-S09 18"
CR415-S08 24"
CR415-S07 18"
CR415-S06 2-24"
CR415-S05 68" x 43" CMP
S-11 24"
S-8 48"
S-06 2-6'X4' CBC
S-05 1-7'X3' CB
CR415-S04 36"
LANDFILL RD
DFR-S14 3-10'x5'
CR415-S12 6'x1.5'
SHUNZ RD
S-04 2-24"
S-03 1-24"
CR415-S03 2-24"
CR415-S02 2-24"
S-02 2-36"
CR415-S01 2-18"
BLAKE DR
FIDLER LN
CR 415 / TOMOKA FARMS RD
S-01 2-24"
TOMOKA FARMS LANDFILL
Golf Course
7' x 3' CBC
2-6' x 3' CBC
3' x 3' CBC
Legend :
Flow Arrows
Existing Drainage Structures
Offsite Basin Boundaries
N
Scale: 1"=2000'
Figure 2
Existing Drainage Characteristics
Date: January 2006

Two-Lane Typical Section



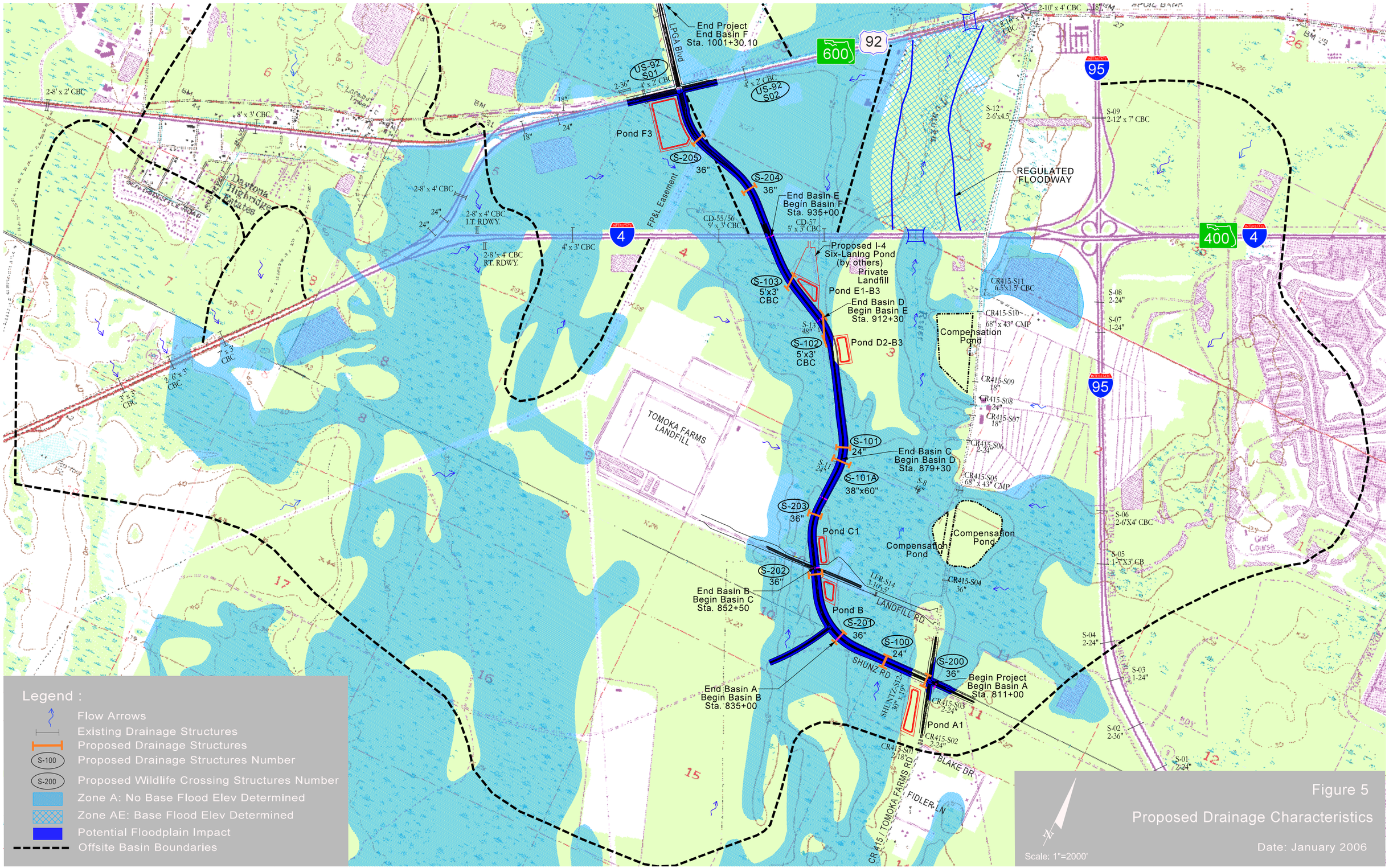
Two-Lane Typical Section (with Multi-Use Trail)



H:\projfile\6639\gn\CDR\6639_LPGA.cdr

Figure 3
Proposed Typical Sections

Figure 4
Proposed Developments within the Project Study Area


End Project
End Basin F
Sta. 1001+30.10
LPGA Blvd
US-92
S01
US-92
S02
2-36"
4' x 2' CBC
4' x 2' CBC
600
92
2-10' x 4' CBC
2-8' x 2' CBC
8' x 3' CBC
18"
24"
Pond F3
S-205
36"
S-204
36"
End Basin E
Begin Basin F
Sta. 935+00
FP&L Easement
2-8' x 4' CBC
24"
24"
2-8' x 4' CBC
LT. RDWY.
2-8' x 4' CBC
RT. RDWY.
4' x 3' CBC
CD-55/56
9' x 3' CBC
CD-57
5' x 3' CBC
Proposed I-4
Six-Laning Pond
(by others)
Private
Landfill
Pond E1-B3
S-103
5'x3'
CBC
End Basin D
Begin Basin E
Sta. 912+30
S-13
48"
S-102
5'x3'
CBC
Pond D2-B3
Compensation
Pond
REGULATED
FLOODWAY
S-12
2-6'x4.5'
S-09
2-12' x 7' CBC
95
400
4
CR415-S11
6.5'x1.5' CBC
S-08
2-24"
S-07
1-24"
CR415-S10
68" x 43" CMP
CR415-S09
18"
CR415-S08
24"
CR415-S07
18"
CR415-S06
2-24"
CR415-S05
68" x 43" CMP
S-06
2-6'X4' CBC
S-05
1-7'X3' CB
S-04
2-24"
S-03
1-24"
S-02
2-36"
S-01
2-24"
TOMOKA FARMS
LANDFILL
S-101
24"
End Basin C
Begin Basin D
Sta. 879+30
S-11
24"
S-8
48"
S-101A
38"x60"
S-203
36"
Pond C1
Compensation
Pond
Compensation
Pond
S-202
36"
End Basin B
Begin Basin C
Sta. 852+50
LFR-S14
3-10'x3'
LANDFILL RD
CR415-S04
36"
Pond B
S-201
36"
S-100
24"
S-200
36"
SHUNTZ RD
SHUNTZ-S12
30" x 19"
End Basin A
Begin Basin B
Sta. 835+00
Begin Project
Begin Basin A
Sta. 811+00
CR415-S03
2-24"
Pond A1
CR415-S02
2-24"
CR415-S01
2-18"
BLAKE DR
FIDLER LN
CR 415 / TOMOKA FARMS RD
Daytona
Highbridge
Estates
Legend :
Flow Arrows
Existing Drainage Structures
Proposed Drainage Structures
S-100
Proposed Drainage Structures Number
S-200
Proposed Wildlife Crossing Structures Number
Zone A: No Base Flood Elev Determined
Zone AE: Base Flood Elev Determined
Potential Floodplain Impact
Offsite Basin Boundaries
Figure 5
Proposed Drainage Characteristics
Scale: 1"=2000'
Date: January 2006

APPENDIX B

Drainage Methodology

LPGA Boulevard Extension PD&E Study
From CR 415 to SR 600 (US 92)

(FPID: 410252-1-22-01)

DRAFT DRAINAGE CRITERIA

The Florida Department of Transportation (FDOT) proposes to extend LPGA Boulevard by 3.8 miles. The project is in the St. Johns River Water Management District in the Tomoka River Hydrologic Basin. The limits of the Outstanding Florida Waters (OFW) for the Tomoka River begin at I-4 and include the project area north of I-4. Therefore, per recent discussions with SJRWMD the OFW requirements will be applied to the study area north of I-4 and not the southern section south of I-4 to C.R. 415.

The following criteria were collected from applicable portions of:

1. SJRWMD Management and Storage of Surface Waters Permit Information Manual (11/03)
2. FDOT Drainage Manual (7/05)
   Drainage Manual Volumes 2A, 2B and 3 (1987) – Reference
   Stormwater Management Facility Handbook (1/04) – Reference
   Storm Drain Handbook (1/2004) – Reference

The following hydrologic/hydraulic computer software will be used for this project:

- Excel Spreadsheets

I. I. STORMWATER MANAGEMENT CRITERIA

A. Runoff

1. SCS Method

Frequency	Duration		
Years	Hours	P (in)	Comments
10	24	7.9	FDOT : TW-HGL Computation
50	24	10.0	FDOT : TW-HGL Computation
25	96	12.0	SJRWMD closed basin criteria
25	24	8.64	SJRWMD open basin criteria

2. FDOT Critical Duration Storms Matrix

Rainfall Volumes (inches)

Duration	2 yr	5 yr	10 yr	25 yr	50 yr	100 yr
1 hr	2.4	2.9	3.3	3.7	4.1	4.5
2 hr	2.8	3.5	3.9	4.5	5.0	5.5
4 hr	3.2	4.1	4.6	5.4	6.0	6.6
8 hr	3.8	4.9	5.6	6.4	7.2	8.0
1 day	5.0	6.5	7.9	8.64	10.0	11.0
3 day	6.0	7.7	9.2	11.1	12.8	13.8
7 day	7.5	9.6	11.0	13.0	14.9	16.9
10 day	8.5	10.8	12.6	15.0	16.7	18.8

Peak discharge computations shall consider: duration, frequency, intensity of rainfall, antecedent moisture conditions, upper soil zone and surface storage, time of concentration, tail-water condition, changes in land use, and changes in topographic and hydraulic characteristics.

- Time of Concentration

  Overland Flow: Kinematic Wave Equation
  Sheet Flow: Kinematic Wave Equation (Max. 300 ft)
  Channel Flow: Manning's Equation

- Assume Antecedent Moisture Condition II

- Surface storage shall be considered as depression storage, analyzed for its effects on peak discharge and time of concentration, and can be considered in post-development storage routing using stage-storage relationships. If depression storage is considered, pre-development and post-development routing must be considered.

B. Water Quantity

1. Closed Basins:

a) SJRWMD: The post-development volume of direct runoff must not exceed the pre-development (*historic*) volume of direct runoff for the 25 year / 96 hour storm. Rainfall values are listed in Section A.1 above. This project is not mapped within the areas considered by the SJRWMD to have Closed Basin Criteria.

b) FDOT: For closed basins the FDOT requires the design of a retention/detention system that is of sufficient size to ensure that the post-development discharge volume does not exceed the pre-development discharge volume for the critical duration storm. The retention/detention

volume shall recover at a rate such that half the volume is available in 7 days, and the total volume available in 30 days. Rainfall values are listed in the Critical Duration Storms Matrix shown in Section A.2 above. This project is not mapped within the areas considered by the SJRMWD to have Closed Basin Criteria.

2. Open Basins:

a) SJRWMD: The pre-development peak discharge must not exceed the post-development peak discharge for the 25-yr frequency, 24-hr duration event.

b) FDOT: The FDOT requires the design of a retention/detention system that is of sufficient size to ensure that the post-development discharge volume does not exceed the pre-development discharge volume for the critical duration storm. The critical duration storm is defined as the storm event that creates the highest rate of net stormwater runoff (post-development runoff less pre-development runoff). Rainfall values are listed in the Critical Duration Storms Matrix shown in Section A.2 above. The Critical Storm Analysis will be performed during final design when the flood routing is performed for the proposed stormwater management facilities.

C. Water Quality:

1. Discharge to Class I, II, and III Waters:

a) Wet detention

- For wet detention systems the design treatment volume is the greater of the following:
  i. One inch of runoff over the drainage area
  ii. 2.5 inches times the impervious area (excluding water bodies)
- The outfall structure should be designed to drawdown one-half the required treatment volume between 24 and 30 hours;
- The drawdown structure should be set at or above the normal on-site ground water table elevation (control elevation) determined by calculating the average of the seasonal high and seasonal low ground water elevations, and the design tailwater elevation;
- Drawdown devices smaller than 3 inches in width shall include a device to prevent clogging;
- The permanent pool should be sized to provide at least a 14-day residence time during the wet season;
- Littoral Zone:
  i. Shall have a slope of 1V:6H or flatter

ii. The treatment volume should not cause the pond level to rise more than 18 inches above the control elevation unless it can be demonstrated that the littoral zone vegetation can survive at greater depths.

iii. As an option to establishing and maintaining vegetative littoral zones the applicant can provide either:

- an additional 50% of the appropriate permanent pool required, or

- pre-treatment of the stormwater prior to the stormwater entering the wet detention pond.

- The rule requires a maximum pond depth of 12 feet and a mean depth (pond volume divided by the pond area at the control elevation) between 2 and 8 feet;

- The average length to width ratio of the pond must be at least 2:1;

- The average pond side slope measured between the control elevation and 2 feet below the control elevation is shall not be steeper than 3H:1V, and;

- The SJRWMD requires that retention volume should recover at a rate of 14 days for the design storm. Where detention basins are designed for reducing the post-development peak discharge, the outlet and regulation schedule should be designed to provide necessary design detention and retention storage within 14 days following any storm event.

b) Dry retention

- The first flush of runoff should be routed to the retention pond and percolated into the ground. For systems discharging to Class III receiving water bodies, the rule specifies one of the following:

i. Off-line retention of the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater;

ii. On-line retention of an additional one-half inch of runoff from the drainage area over the volume specified above;

iii. On-line retention that provides the percolation of the runoff from the three-year, one-hour storm, and;

iv. On-line retention of the runoff from one inch of rainfall or 1.25 inches of runoff from the impervious area, whichever is greater, for areas with less than 40% impervious and SCS type A hydrologic soils.

- The retention system must provide the capacity for the appropriate treatment volume of stormwater specified above within 72 hours following a storm event assuming average antecedent moisture conditions, and;
- The retention system should be stabilized with pervious material or permanent vegetative cover. Permanent vegetative cover must be used when SCS type A hydrologic soils underlie the retention basin, except for pervious pavement systems.

2. Discharge to Outstanding Florida Water (OFW):

   a) Wet detention

   - Wet detention systems which discharge to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting, must provide either:

     i. An additional fifty percent of both the required treatment and permanent pool volumes.

     ii. Pre-treatment of the stormwater prior to the stormwater entering the wet detention pond. The level of pretreatment must be at least that required for retention, underdrain, exfiltration, or swale systems.

   b) Dry retention

   - For direct discharge to Class I, Class II, OFWs, or Class III waters which are approved, conditionally approved, restricted, or conditionally restricted for shellfish harvesting the applicant should provide retention for one of the following:

     i. At least an additional fifty percent of the applicable treatment volume specified for off-line dry retention. Off-line dry retention must be provided for at least the first one-half inch of runoff or 1.25 inches of runoff from the impervious area, whichever is greater, of the total amount of runoff required to be treated.

     ii. On-line retention of an additional fifty percent of the treatment volume specified for on-line dry retention. On-line dry retention requires an additional one-half inch of runoff from the drainage area over the volume required for off-line dry retention.

     iii. On-line retention of runoff from the three-year, one-hour storm.

     iv. On-line retention that provides at least an additional 50 percent of the runoff volume specified for areas with less than 40% impervious and only U.S. Department of Agriculture Natural Resource Conservation Services (SCS) hydrologic group "A" soils. For systems which serve an area with less than 40 percent

impervious surface and that contains only SCS type A hydrologic soils, requires on-line dry retention of the runoff from one inch of rainfall or 1.25 inches of runoff from the impervious area, whichever is greater.

v. The recovery and stabilization requirements as defined in 1. (b) above must be met.

D. Protection From Flooding.

1. Systems discharging to land-locked lakes adjacent to properties of more than one ownership shall not cause an increase in total pre-development flood storage.

2. A system may not cause a net reduction in flood storage within a 10-yr floodplain, except for structures elevated on pilings or traversing works. Traversing work, works or other structures shall cause no more than one foot increase in the 100-yr flood elevation immediately upstream and no more than 0.10 foot increase in the 100-yr flood elevation 500 feet upstream.

E. Erosion Control Plan

Sediment control practices are to be applied as a perimeter defense against any transport of silt and/or turbid water off site.

F. Construction and Maintenance Considerations

1. Ponds shall be designed to provide a minimum 20 feet of horizontal clearance between the top edge of the normal pool elevation and the right-of-way line and a 15-ft wide maintenance berm at a slope of 1V:8H or flatter.

2. The inside corners of the maintenance berm shall have a minimum radius of 35-ft to provide acceptable turning radius for maintenance vehicles.

3. One foot freeboard above the maximum design stage is required to compensate for grading irregularities.

4. Ponds having side slopes greater than 1V:4H shall be fenced.

5. Ponds shall be accessible from the right of way or have an access easement.

II. TOMOKA RIVER HYDROLOGIC BASIN SPECIAL CRITERIA

A. Recharge standard

1. Projects within the Most Effective Recharge Areas must retain three (3) inches of runoff from the directly connected impervious area within the Most Effective Recharge Area of the project area.

2. As an alternative, applicants may demonstrate that the post-developed recharge capacity will be equal to or greater than the pre-development recharge capacity.

B. Floodplain Storage Criteria

Systems constructed in the 100-year floodplain have the potential to increase flood stages on adjacent property. A system must not cause a net reduction in flood storage within the 100-year floodplain of the Tomoka River or Spruce Creak or any of their tributaries except for structures elevated on pilings or traversing works that comply with conveyance requirements in subsection 10.5.2, Applicant's Handbook: Management and Storage of Surface Waters (MSSW).

C. Stormwater Management Standard

Construction of new stormwater management systems must be in accordance with the design and performance standards of Chapter 40C-42 F.A.C. However, systems which serve drainage areas in excess of 10 acres cannot use detention with filtration treatment as the sole stormwater treatment methodology. Additionally, when retention systems are not feasible due to limited percolation capacity, wet detention treatment or other treatment demonstrated to be equivalent to retention or wet detention, in accordance with Chapter 40-42, F.A.C., must be used.

D. Riparian Wildlife Habitat Standard

1. The applicant must provide reasonable assurance that the construction, alteration, operation, maintenance, removal or abandonment of a system within the designated Riparian Habitat Protection Zone (RHPZ) will not adversely affect the abundance, diversity, food sources or habitat (including its use to satisfy nesting, breeding and resting needs) of aquatic or wetland dependent species.

   This may be met by demonstrating that the overall merits of the proposed plan of development, including mitigation as described in section 12.3, MSSW provide a degree of resource protection to these types of fish and wildlife which offsets adverse effects of the proposed system on the uplands and wetlands within the RHPZ. Some reasonable use of the land within the RHPZ can be allowed under subsection 11.5.4, MSSW.

2. Any of the following activities within the Riparian Habitat Protection Zone are presumed to adversely affect the abundance, food sources, or habitat or aquatic or wetland dependent species provided by the Zone: construction of buildings, golf courses, impoundments, roads, canals, ditches, swales, and any land clearing which results in the creation of any system (activities not listed above do no receive a presumption of no adverse effect).

3. The presumption in the above paragraph shall not apply to any activity that results in a more endemic state, where the land in the Zone has been changed by man. An example of such an activity would be construction undertaken to return lands to return lands managed for agriculture or silviculture to a vegetative community that is more compatible with endemic land cover.

4. Roads or other traversing works which cross the RHPZ have the potential to fragment the RHPZ and adversely affect the habitat value of the RHPZ to aquatic and wetland dependent species. To minimize adverse effects to the RHPZ, applicants for permits to construct traversing works in the RHPZ must first demonstrate the need for the traversing works to provide for regional transportation, regional utility services, or reasonable property access, in addition to meeting the requirement of subsection 11.5.4(a), MSSW.

III. METHODOLOGY TO MEET WATER QUANTITY (ATTENUATION) AND WATER QUALITY (TREATMENT) CRITERIA

To address the design level criteria shown above the following methodology will be used for this PD&E Study to estimate stormwater requirements:

A. Stormwater Ponds:

1. Basin boundaries will be defined from right-of–way to right-of–way to calculate attenuation and treatment quantities. The amount of existing, new, and reconstructed pavement will be determined to calculate the impervious and pervious areas within the basin.

2. The amount of runoff considered for treatment will then be calculated for the criteria discussed above.

3. This value will be used as the estimated pond storage required to meet treatment criteria.

4. The Soil Conservation Service Soil Survey for Volusia County will be used to determine the soil types that determined the applicable Curve Numbers.

5. The FDOT Zone 7 Intensity-Duration-Frequency curve will be used to determine the precipitation for each of the design storms considered. The SCS Technical Release 55 Method (SCS TR-55) will be used to determine the pre-development and post-development runoff as follows:

   Q = (P – 0.2 S) ^ 2 / (P + 0.8 P), where S = 1000/CN – 10

6. The runoff excess will be calculated by subtracting the pre-development runoff from the post-development runoff for the SJRWMD and FDOT storms.

7. The runoff excess values will be used as the estimated pond storage required to meet attenuation criteria. The 25-yr event will be the only one considered for the Upper St. Johns Basin calculations because it is the greatest volume.

8. Using the treatment and attenuation estimates, stormwater sites will be identified as follows:

   a) Select locations within existing right-of-way whenever possible.

   b) Select vacant, undeveloped parcels based on field and aerial evaluations.

c) Avoid wetland impacts unless the alternative means a residential or business impact, or when only wetlands are available. Wetland ditches, surface waters, and permitted stormwater ponds shown are based on field review.

d) Identify floodplains and utilities, avoid and minimize impacts if feasible.

e) Verify pond site is suitable with a field review.

9. Pond layout will incorporate the following construction and maintenance considerations:

a) Ponds shall be designed to provide a minimum 20 feet of horizontal clearance between the top edge of the normal pool elevation and the right-of-way line and a 15-ft wide maintenance berm at a slope of 1V:8H or flatter.

b) The inside corners of the maintenance berm shall have a minimum radius of 35-ft to provide acceptable turning radius for maintenance vehicles.

c) One foot freeboard above the maximum design stage is required to compensate for grading irregularities.

d) Ponds shall be accessible from the right of way or have an access easement.

10. Estimate seasonal high groundwater table (SHWT) to determine if a wet detention or dry retention pond can be used. Unless compelling evidence to support a dry pond, wet detention will be assumed.

11. Stage storage calculations will be used to determine the storage volume available to assure the volume estimates are met and a reasonable safety margin is used.

B. Protection from Flooding

1. Protection from Flooding:

Floodplain impact volumes will be determined to assess significance. If impact to the 100-year floodplain occurs within the Tomoka River Basin or 10-year floodplain elsewhere, compensation ponds will be reviewed, if needed. Backwater and/or scour analyses are final design efforts; therefore, are not part of this PD&E Study.

2. Cross drains

As this is a new alignment, cross drains will be estimated to maintain the offsite drainage patterns. Available information will be used to size culverts for cost purposes and maintain existing historical drainage patterns. LPGA will be considered a “high use or essential roadway”; therefore, the headwater elevation shall not exceed the edge of shoulder for the 50-yr storm event.

C. Road Profile Issues:

1. To assess minimum profile requirements, the following information is relevant:

a) Longitudinal Slope - For open conveyance systems, a 0% profile is acceptable but a minimum of 0.05% ditch grade will need to be provided. The low point elevations will be defined by the parameters of the receiving pond.

b) Base Clearance to the Design High Water (DHW) will reviewed based on the following base clearance requirements from the FDOT Plans Preparation Manual Vol. 1, Design Criteria and Process Manual (January 2003- Updated January 2004):

Rural Two Lane (ADT >1500 vpd), and ramps	2 ft

DHW is generally defined as the standing water elevation for a period of 24 hours or more. In most cases, the DHW will be the higher of the seasonal high groundwater elevation. This will be estimated from the geotechnical information gathered for this PD&E Study. In typical section discussions between the Department and Kittelson it has been determined that a 2 foot base clearance will be acceptable for this PD&E Study.

APPENDIX C

Communications

- Meeting Minutes
  - 1st EAG Meeting, December 2, 2004
  - Landfill Coordination Meeting, January 5, 2005
  - 2nd EAG Meeting, February 16, 2005
  - SJRWMD Permit Coordination Meeting, July 6, 2005
  - 3rd EAG Meeting, August 2, 2005
  - Project Design Team Meeting, August 24, 2005

- Electronic Mail
  - From: Kim Dixon
    Sent: August 8, 2005
    To: Karen Snyder
    Subject: Pond Siting and Floodplain Compensation

LPGA Environmental Advisory Group

December 2, 2004 Meeting

LPGA Boulevard Extension PD&E Study

FN: 4010252-1-22-01

From Tomoka Farms Road (CR 415) to US 92

Volusia County

ATTENDEES:	Bill Walsh, FDOT	John Marshall, DOF
	Steve Tonjes, FDOT	Cathy Lowenstein, DOF
	Jack Freeman, KAI PM	Mike Neidhart, VCMPO
	Joan Budzynski, SJRWMD	Brian Scheick, FFWCC
	Donna Steinbach, Port Orange	Ginger Martin, Volusia Co.
	Mike Disher, Port Orange	Rosanne Prager, CH2M HILL
	Belinda Collins, Daytona Bch.	Karen Snyder, CH2M HILL
COPIES:	Attendees	
	Richard Fowler, FDOT	Carol Barker, CH2M HILL
	David Dangel, Inwood	
FROM:	Karen A. Snyder and Rosanne Prager	
DATE:	January 31, 2005	

A Kickoff Meeting for the Environmental Advisory Group for the referenced LPGA Boulevard Extension was held on December 2, 2004. Listed below is a summary of the key items that were discussed in the meeting.

- Mr. Jack Freeman provided an overview of the proposed project for the new extension of LPGA Boulevard from Tomoka Farms Road (CR 415) to US 92. The majority of the study area is located within Volusia County and City of Port Orange right-of-way. The proposed LPGA section between Landfill Road and I-4 is within the Volusia County landfill property.
- It was presented in the meeting the importance for this EAG as part of the overall public involvement process in accordance with the NEPA process and the FDOT PD&E guidelines. The goal for this meeting was to introduce the EAG to this project and the PD&E process. Another EAG Meeting will be scheduled during the Alternative Analysis phase of the project to obtain feedback on the alternative

alignments that are being considered, and allow input on which is the preferred alternative for the extension of LPGA.

- The proposed alignments B-1 and B-2 that are being considered were presented in the meeting. The existing conditions that have been identified for the project from an environmental and drainage standpoint (wetlands, wildlife, and floodplain) were presented in the meeting. Potential impacts that may occur with the proposed project were discussed. However, these potential impacts will not be quantified or estimated till the alternative analysis phase and further refinement of the alignments have occurred. Ms. Lowenstein and Ms. Belinda Collins were interested in the estimated wetland impacts for both Alignments B-1 and B-2.

- The closest Bald Eagle nest occurs approximately 1,500 feet of the northern end of the proposed roadway. This location is at the intersection of the existing LPGA Boulevard and US 92. The nest was last active in 2000. Confirmation of this nest tree, or any new nests in the area, has not been obtained yet for the post-2004 hurricane season. The area just north of US 92 did sustain extensive tree damage encountered with the September 2004 storms.

  Although no evidence of black bear was found in the field, and no reports of bear sightings have been made by the landfill operators, bears are suspected to move through the area. This information is based on available records of several road kills in the area along I-4, US 92, and LPGA Boulevard. Mr. Brian Scheick with FFWCC discussed in the meeting that larger animal underpasses were not recommended due to the potential road-crossing hazard posed to the black bears if routed east toward the intersection of I-95/US 92/CR 415. Additionally, due to the dense human population east of I-95, routing bears in an east/west direction and closer to that area would increase the nuisance reports of black bears in the area.

  Mr. Scheick stated that the black bear movement in this area is more likely coming from a north/south direction and not an east/west direction. Another project for widening I-4 west of our project includes constructing three new large wildlife crossings to allow this north/south movement to continue for the black bears in the Tiger Bay conservation area, which is located two to five miles west of our project study area. For this LPGA Boulevard Extension project, smaller wildlife underpasses with exclusionary chain link and funnel fencing is being considered at this time.

- Mr. John Marshall asked about the realignment of the Tomoka Farm's weigh station. He inquired if Landfill Road could be closed east of the proposed LPGA to CR 415 and utilize Shunz Road or proposed Alignment B-2 in connecting to CR 415. There was discussion that this option would only work and dependent on the Madeline Avenue project being constructed that is being currently studied. It was concluded in the meeting that this would need to be further discussed with the Volusia County Engineering and Solid Waste Staff.

- Mr. Brian Scheick asked about CR 415 and if there is any plans with Volusia County to widen. Mr. Freeman did reply that Volusia County is currently studying that corridor for 415 from US 92 South and east of our study area.

- Mr. Freeman briefed the EAG on the nearby developments that are either already currently under construction; permitted and planned for construction; or on the county's approved master plan for this area.
- Ms. Cathy Lowenstein asked about the future 4 lanes of LPGA being considered under this study. It was discussed in the meeting that only 2 lanes for the new extension of LPGA is being considered for this PD&E Study since only 2 lanes are warranted from a traffic standpoint. However, the future 4 lanes of LPGA is still be taken into account when estimating the horizontal alignment and vertical profile grade for this new extension. Therefore, the full 4 lane typical section width is being considered when estimating the vertical and horizontal profile of the project. The existing and proposed utilities for City of Port Orange at Shunz Road were discussed since that section is being proposed for Alignment B-2. This will have to be further considered and evaluated during the Alternative Analysis phase due to the potential impacts.
- Mr. Freeman presented in the meeting that the alignments were proposed specifically to minimize and avoid wetlands and floodplains to the greatest extent possible. Alignment B-1 was proposed to avoid some of the Tomoka River Floodplain areas in the southern portion just west of CR 415.
- In discussions with Ms. Joan Budzynski/SJRWMD it has been determined that the portion of the project north of I-4, only, is considered to be within the designated Outstanding Florida Water (OFW) for the Tomoka River. Therefore, 50 percent additional water quality treatment will be required for the northern section of LPGA Extension from I-4 to US 92. The First Baptist Church will be constructing this northern section of the proposed LPGA Boulevard Extension from US 92 to their proposed entrance road, that is located just north of I-4. The proposed church development will be responsible for providing the required treatment, attenuation, and floodplain compensation for the northern section of the LPGA Boulevard Extension from US 92 to the centerline of the new bridge crossing over I-4.
- It was demonstrated in the meeting that the LPGA Extension study area is located much further east of the Tiger Bay State Forest. This was determined in coordinating with the State Division of Forestry which confirmed that Clark Bay Tract within the Tiger Bay Forest is located further west of the northern section of the LPGA Extension between I-4 and US 92. The proposed project is located southeast of the Rima Ridge Tract within the Tiger Bay State Forest, which is located north of US 92.

LPGA Boulevard PD&E Study

From US 92 to Tomoka Farms Road (CR 415)

FIN: 4010252-1-22-01

Volusia County

ATTENDEES:	Jack Freeman, KAI PM	Martin Bey, Volusia Co.
	Patrick McCormack, Volusia Co.	Karen Snyder, CH2M HILL
	Joe Grusauskas, Volusia Co.	Rosanne Prager, CH2M HILL
	Susan Gaze, Solid Waste	Libertad Acosta-Anderson,
	Gene Palmatier, Solid Waste	CH2M HILL
COPIES:	Bill Walsh, FDOT PM	David Dangel, Inwood
	Steve Tonjes, FDOT	Carol Barker, CH2M HILL
	Richard Fowler, FDOT	Attendees
FROM:	Jack Freeman and Karen A. Snyder	
DATE:	January 7, 2005	

A coordination meeting was held with the Tomoka Farms Landfill in Volusia County on January 5, 2005 at 10 a.m. on the referenced LPGA Boulevard PD&E Study. Listed below is a summary of the key items that were discussed in the meeting.

- Mr. Jack Freeman provided an overview of the proposed project for the new extension of LPGA Boulevard from US 92 south to Tomoka Farms Road.
- Mr. Joe Grusauskas with the Volusia County provided our study team with a copy of their proposed widening of Landfill Road to three lanes from CR 415 to new entrance to Industrial Park. This permit from SJRWMD has recently been approved this past December 2004. The project is planned to be let for construction sometime this Spring 2005.
- It was discussed in the meeting that the proposed realignment of the intersection of the new LPGA and Landfill Road will impact the proposed stormwater pond for the three laning of Landfill Road that has been recently permitted and designed. Mr. Grusauskas recommended that new alignment for LPGA be realigned to the west to avoid impacting their proposed pond. The Kittelson project team agreed to consider an alignment shift to minimize impacts on the proposed retention pond.
- It was stated in the meeting that trucks destined to the landfill back up onto CR 415 during large storm events such as the recent hurricanes. They recommend that a deceleration be implemented on LPGA north of Landfill Road.

- There were discussions in the meeting whether Volusia County would be in agreement for eliminating Landfill Road east from LPGA Boulevard Extension to CR 415. Mr. Grusauskas stated that Volusia County is in the initial stages of building an Industrial Park just southwest of the proposed intersection of LPGA and Landfill Road. They want to maintain a direct route to I-95 from the proposed Industrial Park with the existing Landfill Road. This will be a factor in the consideration of vacating this roadway. It was recommended in the meeting to contact either Randy Sleister or Doug Weaver with Volusia County Growth Management regarding potential abandonment of this roadway. .

- Ms. Susan Gaze provided the LPGA Study Team with existing documentation for their current permits for the Tomoka Farms Landfill with FDEP, ACOE, and NDPES. The existing NPDES Permits with FDEP have specific requirements for how the stormwater within landfill site is permitted to discharge offsite to the adjacent Tomoka River floodplain. The landfill is not permitted to discharge from an east/west flow except at specific outfalls where existing cross drains exist. There is only one outfall located on the west side of their landfill site that allows a north/south flow to the headwaters of the Tomoka River. This will need to be maintained for their site to stay in compliance with their NPDES Permits.

- The main outfall for the landfill site that provides northerly discharge on the east side of their property would be impacted by the proposed LPGA Alignments B-1/B-2. This existing landfill outfall is located between Landfill Road and I-4. There were discussions in the meeting to potentially realign LPGA either east or west to avoid impacting this existing canal. The roadway would remain within existing Volusia County property if widened to the west within the landfill site and on private property to the east. The existing wetland systems are better quality to the west of the proposed alignment, and there are some upland pockets existing to the east. The existing stormwater conveyance system for the landfill site will not be affected if the proposed alignment for LPGA is realigned to the east. The private property to the east does not currently drain to the landfill site since there is a bermed access road located at the Volusia County property line. The Kittelson Team agreed to consider an alignment shift to minimize impacts to the outfall canal.

- There is one large existing wetland conservation area on their landfill site in the northwest quadrant. It is a wetland mitigation site that has been enhanced with cypress tree plantings. The proposed alignment for LPGA will be impacting this existing mitigation site. The LPGA Study Team stated that they will review the landfills existing permits and will need to compensate for these impacts if occurred with the proposed alignment. We will also consider the potential of shifting the alignment eastward to avoid the mitigation site. This will have some impacts to the First Baptist Church site plan and that will need to be considered.

- The Study Team was provided a copy of the landfill's long term wetland jurisdictional line that was approved by the U.S. Army Corp of Engineers dated 1987 as part of the landfill's long term permit. There was discussions in the meeting whether this wetland line would still be valid for our LPGA Alignment that is within the landfill property. **NOTE :** In recent discussions following the meeting with Mr.

Andy Phillips at the U.S. Army Corps of Engineers (ACOE) it was stated that a new wetland delineation would be needed for this project if it has been more than 5 years since that delineation was completed. He said the same would be true for the FDEP/WMD line. He pointed out that a new ACOE line could be an advantage today, if there were a lot of isolated wetlands. The ACOE does not currently have jurisdiction over isolated wetlands. However, there are not isolated wetlands within our project area and are all considered to be contiguous to the floodplain of the Tomoka River.

- It was noted in the meeting that the northern landfill cell discharges to this referenced wetland conservation area via an existing pump system per their existing permits. This is part of their overall stormwater system that generally flows easterly and then southerly and eventually just south of Landfill Road. The system then discharges north to the headwaters of the Tomoka River on the east side of their landfill site through initial sheetflow and ultimately outfalls through existing canal systems that flow north. This existing flow patterns need to be maintained for the landfill site in accordance with their existing NPDES permits.
- The Tomoka Farms Landfill is interested in obtaining borrow material for the landfill. They are interested in the borrow from the proposed construction of our Pond just south of I-4, Pond E. They have not been contacted by the FDOT Design Consultant for the widening of I-4 in this area, Carter Burgess. Mr. Freeman provided in the meeting that this I-4 project is currently undergoing a supplemental agreement process to eliminate swale treatment and incorporate stormwater ponds. The study team will contact this I-4 design team to determine if a joint pond will be proposed for both projects at the LPGA crossing of I-4.
- The existing tree ordinance for this landfill site was provided to the study team in electronic format and included the existing Volusia County regulations for their standard tree ordinances.
- There was discussion of the existing hunting clubs that are located southwest of the new LPGA Alignment and Landfill Road. It was stated in the meeting that there is a large amount of deer on the landfill site during hunting season to avoid the hunters.
- It was stated in the meeting that the City of Daytona Beach has an existing utility easement along Landfill Road and the City of Port Orange has an easement further south. The City of Daytona Beach is currently providing the utilities for the landfill site. The City of Daytona Beach is planning to construct 22 inch water main along the existing utility easement paralleling the south side of Landfill Road. .

Environmental Advisory Group Meeting No. 2

LPGA Boulevard Extension PD&E Study
From CR 415 (Tomoka Farms Road) to SR 600 (US 92)
Volusia County, Florida
FIN: 410252-1-22-01

MEETING DATE: February 16, 2005

MEETING LOCATION: Port Orange Regional Library
10:00 AM – 12:00 PM

ATTENDEES:
Bill Walsh, FDOT
Steve Tonjes, FDOT
Jack Freeman, KAI
Joan Budzynski, SJRWMD
Rick Ottesen, SJRWMD
Donna Steinbach, Port Orange
Lauren Kornel, Volusia County
Susan Gaze, Tomoka F. Landfill
Joe Grusauskas, Tomoka Landfill
Walt Thompson, N. Conservancy
Robert Boggs, Daytona Beach
Cathy Lowenstein, DOF
Alexa Ross, Sierra Club
Rosanne Prager, CH2M HILL
Karen Snyder, CH2M HILL

COPIES:
Attendees
Richard Fowler, FDOT
David Dangel, Inwood
Carol Barker, CH2M HILL

FROM: Karen A. Snyder, CH2M HILL

DATE: March 25, 2005

A second Environmental Advisory Group Meeting for the referenced LPGA Boulevard Extension was held on February 16, 2005. Listed below is a summary of the key items that were discussed at the meeting.

- Mr. Jack Freeman provided a brief powerpoint presentation overview of the proposed project for the new extension of LPGA Boulevard from Tomoka Farms Road (CR 415) to US 92. The road would be maintained by Volusia County as a local road and has been identified as the #3priority by the Volusia MPO. Two alternative alignments have been considered under the study's alternative analysis phase, Alignment B-1 and B-2. Both alignments were described in detail. Alignment B-1 is longer than Alignment B-2. Alignment B-2 ties into the Madeline Avenue Extension in the vicinity of the existing Shunz Road and CR 415 intersection. The Madeline Avenue Extension is a Volusia County roadway that is being extended from Williamson Road westward to CR 415. Right-of-way for this project between I-95 and CR 415 is being donated by the Corraci family as part of a large development located east of CR 415 and west of I-95. Mr. Walt

Thompson inquired about whether traditional mitigation would be utilized for this project. He mentioned that mitigation for wetland impacts might be redirected to include some net gain for upland impacts. He would prefer to see mitigation in the form of preservation along the corridor to be more meaningful.

- Mr. Thompson asked if the additional fill from the excavation of stormwater and floodplain compensation ponds during construction being considered for wetland mitigation? It was discussed that this type of detail has not been evaluated during the study phase but could be implemented during design and development of the construction specifications.

- He recommended that landscape linkage could be incorporated to benefit the black bears. This mitigation approach is one where a broader view of the surrounding landscape is taken into consideration to help identify strategic mitigation areas. This may include preservation, or enhancement and preservation of uplands and/or wetlands in areas further away from the project corridor. However, because of their location and type, these approaches will soften wetland upland impacts along the project corridor. This broader view also has a strong temporal component in that, future land uses in (and adjacent to) the project area should be taken into consideration when looking for strategic mitigation areas that will serve as meaningful wildlife movement corridors. The U.S. Army Corps of Engineers are not as favorable of this type of mitigation, because the federal wetland protection rules do not allow wide latitude in giving full credit on wetland impacts by providing upland preservation.

- Mr. Freeman discussed some potential alignment shifts that have been raised recently by the Volusia County Solid Waste and during the Project Design Team meetings. According to several agencies (including theVolusia County Solid Waste, City of Port Orange Utilities, and Volusia County), all are in agreement with making some slight modifications to Alignments B-1 and B-2. The adjustments involve the following:

    1. Consider avoidance of an existing Tomoka Farms Landfill wetland mitigation area, by shifting the Alignment B-1/B-2 to the east approximately ± 700 feet at I-4/LPGA Boulevard.
    2. Reduce impacts to the landfill's drainage canal located on the eastern edge of their property between Landfill Road and I-4. This serves as the drainage outfall for the Landfill's NPDES permit. The original intent for the placement of LPGA was to remain within Volusia County property and maintain a buffer and discourage future development. This shift to the east for Alignment B-1/B-2 would reduce impacts to the canal/outfall, and thereby, reduce overall wetland impacts. However, this shift would require additional right-of-way acquisition from private property.
    3. The Tomoka Farms Landfill is currently in the process of designing the three-laning of Landfill Road. As part of this design and in conjunction with the new industrial park south of Landfill Road, the existing weigh station will be relocated to the west. The previously disturbed area of the weigh station was utilized for the B-1 and B-2 alignment and avoided the relocation of a landfill storage area. Volusia County Solid Waste has indicated that they plan to use the current weigh station area for a stormwater retention area and they would prefer that we relocate the storage area. By shifting the Alignment B-1/B-2 to the west, the pond would be avoided.

4. The original alignment for B-2 was proposed to utilize the existing Shunz Road corridor to tie into the new Madeline Avenue Extension. As Volusia County has continued to develop the Madeline Avenue Extension alignment, it was shifted to the north based on agreements with the Corraci Family. This shift would also avoid impacts to a water main and a reclaimed water line (30-inch and 24-inch pipes respectively) that parallel each side of Shunz Road. A northern shift of the alignment would avoid relocation of these larger utility systems.
5. Revise Alignment B-1 to tie into Tomoka Farms Road (CR 415) with a plus intersection that aligns with the proposed Town West Boulevard. Currently the Corraci Family is proposing a large development at this intersection. This suggestion was previously made by the City of Port Orange at the Project Coordination Meeting.

- Mr. Jack Freeman mentioned that our main focus for this EAG Meeting was to obtain feedback and comments on the proposed Alignments B-1 and B-2 as part of our Alternative Analysis process.

- Ms. Alexa Ross with Sierra Club inquired about the bridge crossing at I-4 and proposed location. Mr. Freeman responded that proposed bridge at I-4 is being located to try to minimize the skew angle and length of the bridge.

- Ms. Cathy Lowenstein with State Division of Forestry expressed concerns about realigning Shunz Road to the north and tying into the Madeline Avenue Extension. She asked whether this would incur more wetland impacts to offset relocating existing utilities. It was discussed in the meeting that additional wetland impacts would occur as a result to this shift. It is necessitated by the aforementioned shift of Madeline Avenue to the north.

- Ms. Alexa Ross asked that since we are looking at disturbing land why don't we consider using the existing gas transmission easement? It was discussed that the gas transmission easement was too far east resulting in the connection to CR 415 being north of Landfill Road. This connection would not meet the project's fundamental purpose of connectivity to other transportation facilities as expressed by local government.

- Mr. Walt Thompson with Nature Conservancy suggested we utilize the already filled land within the Volusia County landfill cells. Mr. Thompson also inquired about designing the roadway/landfill to maximize already disturbed landscape. Mr. Freeman indicated that this can be discussed with landfill manager. Mr. Joe Grusauskas, Volusia County Solid Waste, stated that all filled cells come right up to the edge of wetlands. There is a 3:1 slope up from the edge of a wetland that is filled underneath with old garbage. He also indicated that the active Class III cell has about 15 more years of capacity. There are no old cells abandoned onsite that could be converted to other uses (like a roadway). This active cell is part of the 10-15 year growth plan for Volusia County Solid Waste, and after 15 years the Landfill will be expanded to the west of the current active cells and recycling unit. There is an estimate of a 50-year build out within the Volusia County owned property that extends further west. There may be some potential on the east side of the active cells for placement of LPGA.

- Mr. Rick Ottesen with St. Johns River Water Management District asked that if you shift the alignment further west, what will happen to the existing FP&L easement? This area is part of our Corridor A that was considered during the Corridor Analysis phase of the project. Mr. Grusauskas explained that is part of their 50 year expansion plan for the Volusia County Landfill. The utility is there by easement and the land is currently owned by the county. This might eventually be relocated if needed for long term expansion of the Landfill.

- Mr. Walt Thompson indicated that for the SR 429 Wekiva Parkway Study, a 10 – 15 year growth plan has been established. Has something like this been drafted here? Mr. Joe Grusauskas stated that there may be some potential space on the east side for the LPGA Boulevard Extension; but not on the west because the landfill operation will begin to move west after 15 years, and the plan is for a 50-year landfill capacity.

- Mr. Walt Thompson asked Mr. Joe Grusauskas how much of the landfill footprint would be required for the local roadway. Joe indicated that once the cells west of the power line easement were filled that they would start to fill eastward toward the cells east of the power line easement. Because of the height of the fill and 3 to 1 slopes, most any at-grade road through the power line easement would eliminate the opportunity to use this for landfill cells. The Landfill does not want to lose any existing vacant land that can be used for future expansion.

- Mr. Grusauskas asked how much money will be spent to provide a visual and odor buffer for the road users. Also, would you really want the roadway next to a landfill?

- Ms. Cathy Lowenstein expressed concerns about environmental values and mitigation costs for the proposed B-1/B-2 Alignment located within the Landfill property. Joe added that there would be more costs associated with relocations of any existing landfill facilities and impacts in lieu of the original alignment that need to be considered. Mr. Freeman pointed out that the existing tree ordinance was taken into consideration. There is a recorded tree ordinance that depicts a preliminary alignment for the LPGA Extension. A new tree ordinance will need to be updated.

- Mr. Freeman stated that we are working closely with the First Baptist Church since they will be constructing the first section of the LPGA Boulevard Extension, including stormwater ponds and floodplain compensation. This first section will be constructed ahead of the design and construction of the remainder of the LPGA Boulevard Extension and will be coordinated with Volusia County directly.

- Ms. Cathy Lowenstein responded could the proposed improvements for the section of LPGA being implemented by the First Baptist Church include these potential alignment changes being discussed today? Mr. Freeman indicated that coordination with First Baptist Church has occurred regarding the potential alignment shifts to avoid the existing wetland mitigation area. However, feedback from them has not been received at this time.

- Mr. Steve Tonjes asked if landfill property could be used instead of taking undisturbed land. Mr. Joe Grusauskas responded that the east side of their existing cell and recycling unit might be utilized for the LPGA Boulevard Extension.There was discussion in the meeting to potentially locate an alignment for LPGA Boulevard Extension between the

active Landfill cell and the jurisdictional wetlands. Mr. Grusauskas discussed that it would be very expensive to relocate the recycling unit and could potentially cost $1 Million to relocate and contains $14 Million in equipment.

The meeting was concluded that the potential use of the disturbed landfill property between the active cell and recycling unit and the large wetland systems would be further evaluated. The evaluation will include discussions with Volusia County Public Works and Solid Waste Division to further evaluate this potential use of their facility for the proposed extension of LPGA Boulevard.

SJRWMD Coordination Meeting

LPGA Boulevard Extension PD&E Study
From CR 415 (Tomoka Farms Road) to SR 600 (US 92)
Volusia County, Florida
FIN: 410252-1-22-01

MEETING DATE: July 6, 2005

MEETING LOCATION: SJRWMD Altamonte Springs Service Center – Wekiva Room
2:00 PM– 3:00 PM

ATTENDEES:
Cammie Dewey, SJRWMD
Jessie Wheeler, SJRWMD
Bill Walsh, FDOT
Steve Tonjes, FDOT
Jack Freeman, KAI
Karen Snyder, CH2M HILL
Libertad Acosta-Anderson, CH2M HILL
Rosanne Prager, CH2M HILL

COPIES:
Attendees
Margie Cook, SJRWMD
Pat Muench, FDOT
Mike Hill, FDOT
Carol Barker, CH2M HILL

FROM: Libertad Acosta-Anderson, Karen Snyder, and Rosanne Prager

DATE: July 28, 2005

A meeting for the referenced LPGA Boulevard Extension was held on July 6, 2005 at the SJRWMD Altamonte Springs Service Center. In attendance were representatives for the FDOT, SJRWMD, and the LPGA Study Team. The purpose of the meeting was to discuss with the SJRWMD the revised proposed alignment extension for LPGA from CR 415 to US 92, in order to gain insight about potential permitting issues that would need to be considered during design.

- Ms. Snyder provided a brief overview of the proposed project for the new extension of LPGA Boulevard from Tomoka Farms Road (CR 415) to US 92. The road would be maintained by Volusia County as a local road and would tie into Shunz Road. The project limits cross primarily Volusia County owned lands. The proposed typical consists of a 2-lane rural section with roadside swales. Initially two alternative alignments were developed after the Corridor Analysis phase was completed, B-1 and B-2. Alignment B-2 (now referred to as Alignment B-3) has been modified as part of the Alternative Analysis process, and after coordination with local governments and environmental advisory groups. Alignment B-4 was developed to address the

Environmental Advisory Group concerns in trying to minimize wetland impacts by utilizing already disturbed land within the Landfill property. The new proposed Alignment B-4 has some potential contamination concerns since it crosses one of the original unlined landfill cells that contains buried trash 20 feet deep. The revised Alignment B-3 is predominantly outside of the Landfill property on private property between I-4 and Landfill Road. Alignment B-3 will impact fewer wetlands, and wetlands with lower functional value, in comparison to the original Alignment B-2. The adjustments to the original Alignments B-1 and B-2 involve the following:

1. Avoid the existing Tomoka Farms Landfill Mitigation Area just south of I-4, by shifting the alignment to the east approximately ± 700.5 feet at I-4/LPGA Boulevard.
2. Avoid the drainage canal, which serves as the drainage outfall for the Landfill's NPDES permit. The intent was originally to remain within Volusia County property and maintain a buffer. This shift to the east would avoid the canal/outfall, and thereby, reduce overall wetland impacts to high quality wetlands. This shift will require additional right-of-way acquisition from private property.
3. The Tomoka Farms Landfill is currently in the process of three-laning Landfill Road. The roadway runoff will be diverted to a proposed pond located behind the current landfill offices. The LPGA alignment was shifted to the west to avoid impacts to the Landfill Road pond.
4. The alignment was shifted north of Shunz Road to avoid utility relocations.
5. The development of Alignment B-4 has been requested in the last Environmental Advisory Group meeting to try and minimize the wetland impacts on the Landfill property between I-4 and Landfill Road and utilize the already disturbed land/old landfill cell.

- Mr. Walsh stated that the project is funded for design with the FDOT Work Program in the fiscal year of 2007/2008. The Volusia MPO has this project third on their priority list. He also pointed out that there is regional support for the LPGA Boulevard Extension because:

  1. Volusia County MPO envisions the LPGA Boulevard Extension as a western beltway connection providing improved local access.
  2. LPGA Boulevard Extension would offer an alternative hurricane evacuation route and provide a by-pass to CR 415 at the intersection with Tomoka Farms Road.

- Mr. Freeman provided a brief overview of the proposed future land use that is currently approved and underway that affects the surrounding area north and southeast of the project area; therefore, demonstrating that the proposed LPGA Boulevard Extension would cause minimal secondary and cumulative impacts from a development standpoint. The following developments are already underway and approved regardless if this project is implemented.

  1. The large Consolidated Tomoka DRI has been approved and currently underway northwest of the existing LPGA.
  2. A large Baptist Church development had been approved and permitted by SJRWMD to be constructed east of the LPGA Boulevard Extension between US 92 and I-4.

3. The Coraci PUD (also known as Coquina Cove), located east and south of the intersection of Shunz Road and CR 415, is included in the Volusia County Long-Term plans. The Coraci family and Volusia County have made agreements on the Madeline Road extension to accommodate the development.
4. Construction has begun on the Volusia County large Industrial Park south of the Tomoka Farms Landfill as part of the expansion of their landfill. This will include the reconstruction and three laning of Landfill Road, the relocation of the landfill scales, and an access road to accommodate the new Industrial Park.

- Ms. Wheeler inquired about the type of wetland mitigation proposed for this project. It was indicated that mitigation would take place through Senate Bill program since the design is funded through FDOT Work Program. Ms. Wheeler stated that when the project does go to permitting, a percentage of the wetland impacts proposed for the project would be estimated for secondary and cumulative impacts. Mr. Freeman mentioned that Martin Kirton had expressed interest in having his property used as part of the Florida Forever Conservation Plan, and this may be a good mitigation area to be considered if the Senate Bill is not used for compensation.

- The project limits fall within the Tomoka River Basin and must adhere to special basin criterion that dictates no net reduction in flood storage within the 100-year floodplain. Ms. Snyder explained that the project would have unavoidable floodplain impacts; therefore, compensation is proposed within a pond located adjacent to CR 415 that is outside of the 100-year floodplain and hydraulically connected to the Tomoka River floodplain.

- It was confirmed in the meeting that the proposed project limits are not within the Tiger Bay Widlife Management Area and the Tomoka River Riparian Habitat Zone. It was discussed in the meeting that the project area north of I-4 is considered within the OFW of the Tomoka River Basin. However, Ms. Dewey did point out that the first basin just south of I-4 does appear to directly discharge to the Tomoka River via the I-4 roadside ditch system. This basin will be required to meet the standard OFW criteria if it cannot be demonstrated that this basin does undergo the required mixing and dilution specified in Chapter 40C-42 of the F.A.C. prior to discharging into the Tomoka River. The rest of the basins south of I-4 to CR 415 do discharge directly to the adjacent floodplain and wetland systems that are required to provide adequate mixing and dilution prior to discharging to the river. Therefore, it was recommended that the OFW criteria be applied to the project from US 92 to I-4 and include the first basin just south of I-4 on LPGA.

- Ms. Snyder stated that in performing coordination with the Florida Fish and Wildlife Conservation Commission (FFWCC) on this project that no bear crossings need to be provided for this project, due to bear travel corridors being predominantly in a north/south direction within the Tiger Bay Preserve which is several miles west of our project area. The Tomoka Farms Landfill staff had confirmed that they have not had any bear sightings within the project area in many years. There will be smaller wildlife crossings provided with the new proposed cross drain systems that will accommodate smaller mammals and reptiles within the wildlife habitat in the project area.

- Mr. Tonjes called attention to the FFWCC concern about secondary and cumulative impacts on bear habitat. He asked that the WMD review the correspondence with FFWCC and our documentation of existing development plans for the area in the ESBA and inform us as soon as possible if it seemed likely that additional mitigation would be required for secondary and cumulative impacts on bear habitat.

The meeting was concluded with the following remarks:

1. Avoidance and minimization of wetland impacts should be demonstrated clearly in the project documents.
2. Secondary and cumulative impacts will be considered during design phase, however, documentation at this point (PD&E Study) of any permitted projects or in-progress development in the area, will help define the true secondary and cumulative impacts that may result from this road extension project.
3. Advance Notification has been sent to appropriate environmental agencies and feedback will continue to be actively sought throughout the PD&E Study process.
4. There will be another EAG meeting scheduled for August 2, 2005 at the City of Port Orange Library. It was recommended to add Ms. Wheeler, Ms. Dewey, and Ms. Margie Cook to the EAG mailing list and notification for the next EAG.

LPGA BOULEVARD EXTENSION PD&E STUDY
SJRWMD PERMIT COORDINATION MEETING

July 6, 2005
2:00 PM
SJRWMD Orlando Office
Kittelson & Associates & CH2M HILL

AGENDA

I. Introductions

II. Provide Project Update

A. Present revised Alternatives/Alignments – B-3 & B-4

B. Proposed Land Use within Project Area

C. Summarize Environmental Meetings and Agency Coordination

D. EAG Meeting – August 2, 2005 (*tentative*)

III. Proposed Project – Avoidance & Minimization

A. Wetland & Floodplain Systems

B. Floodplain Systems & Proposed Compensation

C. Wildlife Habitat

D. Proposed Drainage

IV. Open Discussion

Environmental Advisory Group Meeting No. 3

LPGA Boulevard Extension PD&E Study
From CR 415 (Tomoka Farms Road) to SR 600 (US 92)
Volusia County, Florida
FIN: 410252-1-22-01

MEETING DATE: August 2, 2005

MEETING LOCATION: Port Orange Regional Library
10:30 AM – 12:00 PM

ATTENDEES:
Bill Walsh, FDOT
Steve Tonjes, FDOT
Jack Freeman, KAI
Walt Thomson, N. Conservancy
Mike Neidhart, Volusia County MPO
Mike Disher, City of Port Orange
Kimberly Dixon, Volusia County
Cathy Lowenstein, DOF
CalLee Davenport, USFWS
Robert Boggs, Daytona Beach
Karen Snyder, CH2M HILL
Rosanne Prager, CH2M HILL
Libertad Acosta-Anderson, CH2M HILL

COPIES:
Attendees
Mike Hill, FDOT
Joan Budzynski, SJRWMD
Rick Ottesen, SJRWMD
Donna Steinbach, Port Orange
Lauren Kornel, Volusia County
Joe Grusauskas, Tomoka Landfill
Alexa Ross, Sierra Club
Carol Barker, CH2M HILL

FROM: Karen Snyder, Rosanne Prager, and Libertad Acosta-Anderson

DATE: August 4, 2005

A 3rd Environmental Advisory Group Meeting for the referenced LPGA Boulevard Extension was held on August 2, 2005 at the Port Orange Regional Library. The purpose of the meeting was to discuss the revised alignments for LPGA from CR 415 to US 92 in order to gain insight about issues that would need to be addressed during design. Listed below is a summary of the key items that were discussed at the meeting:

- Mr. Jack Freeman, Project Manager with Kittelson and Associates, provided an overview of the proposed project for the new extension of LPGA Boulevard from Tomoka Farms Road (CR 415) to US 92. The road will be maintained by Volusia County as a local road and would tie into Shunz Road. The project limits cross primarily Volusia County owned lands. The proposed typical consists of a 2-lane rural section with roadside swales.

- Mr. Freeman explained that initially two alternative alignments, B-1 and B-2, were developed during the Corridor Analysis phase. As part of the Alternative Analysis process, and after coordination with local governments and environmental advisory groups, Alignment B-2 was modified and is now referred to as Alignment B-3, and Alignment B-1 was eliminated from further consideration. The adjustments to the original Alignment B-2 involve the following:

  1. The alignment was shifted east approximately 700 feet at I-4/LPGA Boulevard to avoid the existing Tomoka Farms Landfill Mitigation Area just south of I-4.
  2. The alignment was shifted east to avoid the landfill drainage canal that serves as the drainage outfall for the Landfill's NPDES. The original intent was to remain within Volusia County property. This shift will require additional right-of-way acquisition from private property; however, it would reduce the overall wetland impact to high quality wetlands.
  3. The Tomoka Farms Landfill is currently in the process of three-laning Landfill Road. The roadway runoff will be diverted to a proposed pond located behind the current landfill administration office. The LPGA alignment was shifted to the west to avoid impacts to the proposed Landfill Road pond. This west shift will impact a landfill storage facility.
  4. The alignment was shifted north of Shunz Road to avoid utility relocations and to match the proposed Madeline Avenue alignment by Volusia County as was discussed during the Project Design Team meetings with Volusia County, City of Port Orange, and City of Daytona Beach.
  5. Alignment B-4 was developed to address the Environmental Advisory Group concerns to minimize wetland impacts by utilizing already disturbed land within the Landfill property. The new proposed Alignment B-4 presents potential contamination concerns because it traverses one of the original unlined landfill cells containing buried trash that is reported to be 20 to 25 feet deep. In addition, Alignment B-4 would require the filling and relocation of an existing retention pond.

- Mr. Walt Thompson inquired if this old cell on the Tomoka Landfill is a designated Superfund Site. He suggested that FDOT might want to inquire about this possible designation for two reasons, if the site is a superfund site: (1) there might be federal dollars already allocated for the clean up of any contamination, and (2) there might already be monitoring in place that defines the extent of the contamination; thus the new owner (e.g. purchased ROW) would have documentation as to the extent of the contamination plume and the previous owner would retain the responsibility of the remediation. Mr. Steve Tonjes did reply that if the FDOT did acquire the landfill property they would be responsible to clean up the site if considered contaminated.

- Mr. Freeman described the proposed roadway typical section as a two-lane, rural typical section, with 12-foot travel lanes and 8-foot shoulders in each direction. It will adhere to FDOT roadway design standards for a 55 mile-per-hour design speed facility with a 6:1 front slope, a 4:1 back slope, and a 3:1 slope to tie into natural ground. Mr. Steve Tonjes suggested that a 4:1 slope be considered and a variation obtained in order to reduce the right-of-way width required to accommodate the alignment and thereby reduce the wetland impacts.

- Mr. Freeman added that the typical section right-of-way widths from border width to border width consist of 120 ft for a section without multi-use trail and a 146 ft for a section with multi-use trail; however, these widths do not account for the appropriate distance to tie into existing ground. That distance varies considerably throughout the entire project. Therefore, to obtain a true level of impacts for wetlands and floodplains, cross sections have been prepared to define where the toe of the backslope matches natural ground and to set the right-of-way accordingly. There really is not a standard typical right-of-way width for the corridor; however, the footprints depicted for each of the alignments accurately reflect the required right-of-way requirements for each of the alternatives being evaluated. Mr. Freeman indicated that the typical section with trail has local government support.

- Ms. Cathy Lowenstein inquired about the trail connectivity to other local and regional recreational facilities. Mr. Freeman responded that support documentation is being requested at this time from Volusia County. Mr. Mike Neidhart suggested the County Leisure Department be contacted.

- Mr. Freeman stated that the project is funded for design with the FDOT Work Program in the fiscal year of 2007/2008. The Volusia MPO has this project third on their priority list. He also pointed out that there is regional support for the LPGA extension because:

    1. Volusia County MPO envisions the LPGA extension as a western beltway connection providing improved local access. There is no good north/south connectivity within the local road systems for this project area.

    2. LPGA would offer an alternative hurricane evacuation route and relieve the traffic issues at the US 92 and CR 415 intersection.

- Mr. Freeman provided a brief overview of the proposed future land use that is currently approved and underway that affects the surrounding area north and southeast of the project area; therefore, demonstrating that the proposed LPGA extension would cause minimal secondary and cumulative impacts from a development standpoint. The following developments are already underway and approved regardless if this project is implemented.

    1. The large Consolidated Tomoka DRI has been approved and currently underway northwest of the existing LPGA. Based on the LPGA DRI Phase 2 Monitoring and Modeling Methodology (March 14, 2005) 461 residential units, 69,000 sq ft of office, 40,500 sq ft of manufacturing, 6,560 sq ft of convenience market, 153,340 sq ft of new car sales, 93,752 sq ft of medical office, 65,700 sq ft of church, and 36 holes of golf course. The remaining development plan consists of 7,206 residential units, 840,891 sq ft of office, 598,840 sq ft of retail, 450,200 sq ft of manufacturing, 8,522 sq ft of fast-food restaurant, 25,390 sq ft of pharmacy, 20,622 sq ft of bank, 71,904 sq ft of new car sales, 20,000 sq ft of medical office, and 20,000 sq ft of nursing home.

    2. The First Baptist Church development has been approved and permitted by SJRWMD to be constructed east of the LPGA extension between US 92 and I-4.

3. The Coraci PUD (AKA Coquina Cove), located east and south of the intersection of Shunz Road and CR 415, is included in the Volusia County Long-Term plans with DRI approvals in place for development. The Coraci family and Volusia County have made agreements on the Madeline Road extension to accommodate the development. Two phases have been approved. The first, Port Orange Plantation Phase I, is under construction, and includes 90 single-family lots. This phase is almost finished as reported in July 2005. The other, Coquina Cove Phase I, includes 332 single-family and duplex lots, and is just beginning construction (July 2005). The City of Port Orange is also reviewing final plans for Port Orange Plantation Phase II, which would include 104 single-family lots. It is on hold while the City and County work out solutions to the anticipated traffic impacts with the developer. There are several other phases of Port Orange Plantation and Coquina Cove on the drawing board. With Port Orange Plantation, another 210 single-family units and 571 multi-family units are proposed. For Coquina Cove, another 700 units are proposed.
4. Construction has begun by Volusia County on the large Landfill Industrial Park located south of the Tomoka Farms Landfill as part of the expansion of their property. This will include the reconstruction and three laning of Landfill Road, the relocation of the landfill scales, and a new access road to accommodate the new Industrial Park.

- Mr. Freeman presented the alignment alternatives evaluation matrix indicating that the costs had been finalized late the previous evening and had not been carefully checked; therefore, they were being offered only to show the order of magnitude of the costs for the two alignments. He also pointed out that construction costs were higher than for the previous alignments considered because:

  1. Construction costs have increased
  2. Right-of-way footprint is wider than previously considered to allow for tying into natural ground
  3. There are more wetland impacts
  4. There are more floodplain impacts
  5. The initial estimate was based upon First Baptist Church donating right-of-way for the roadway and stormwater retention ponds north of I-4 and constructing parts of the initial roadway south of US 92 plus the stormwater retention and floodplain compensating storage pond.

- Mr. CalLee Davenport inquired if there are plans to construct an interchange at the proposed LPGA Boulevard Extension and I-4. Mr. Jack Freeman indicated that there is one discussed in the current Volusia MPO Long Range Plan but will probably be removed in the updated Long Range Plan, which Mr. Neidhart corroborated.

- Ms. Karen Snyder gave an overview of the wetland lines, threatened and endangered (T&E) species, stormwater ponds, and compensation ponds locations. She pointed out that it was not possible to avoid wetland impacts due to the fact that wetlands are widespread through out the project area. She also reiterated that, although the wetland impacts have increased because the wider right-of-way, the quality of the wetlands being impacted has decreased when compared to the original alignments considered.

- Ms. Snyder showed the location of the compensation ponds adjacent to CR 415. She noted that the floodplain compensation pond sites were selected to ensure that the ponds were outside but adjacent to the floodplain to avoid further impacts to the floodplain and provide connectivity. She also explained that the area west of CR 415 and east of the proposed alignment that is not within the 100-year floodplain was not considered because there is a private landfill operation in that area.

- Ms. Snyder referred to the eagle's nest located south of US 92 and west of the proposed LPGA Extension as the only potential federally-listed T&E species impact. She explained that because of the design restrains to tie the new alignment to US 92 and the existing LPGA Boulevard, 1500 ft buffer from the roadway to the eagle's nest could not be provided. Mr. Davenport pointed out that the eagle is probably well acclimated to roadway movement because of its proximity to US 92 so the distance provided will probably be sufficient. He also added that Mr. John White with the Florida Fish and Wildlife Conservation Commission would be a good contact to get further information on the active status of this nesting pair. Mr. Tonjes interjected that in that case it may be worth it to have the alignment be closer to the eagle if it implies avoiding further wetland impacts.

- Ms. Rosanne Prager explained that the wetland impacts overshadow wildlife issues. Because of the topographical make up of the area there are no uplands for tortoises or scrub jays. Furthermore, no wood stork nesting colonies have been documented within 40 miles of the project; and the only T&E species within the project limits is the aforementioned eagle. Ms. Lowenstein inquired if the nest is active. Ms. Prager indicated that the data reviewed showed it was active in 2000, but she will follow up with FFWCC to inquire of their recent survey results. [Subsequent to this meeting, it has been confirmed by FFWCC that this nest is gone as of the 2004 flyover surveys.]

- Mr. Thompson asked if wildlife corridors were being impacted by the proposed LPGA Extension. Ms. Prager answered that in discussions with local Florida Fish and Wildlife Conservation Commission (FFWCC), it was] concluded that the bear movements are generally from north to south west of this project within the Tiger Bay Wildlife Management Area. The Tomoka Farms Landfill staff has confirmed that they have not had any bear sightings within the project area in many years. Ms. Prager added that large crossings will not be provided because the FFWCC does not want to encourage an eastern movement for the bears to allow them to enter the existing developed areas of Daytona Beach. There will be smaller wildlife crossings provided with the new proposed cross drain systems that will accommodate smaller mammals and reptiles within the wildlife habitat in the project area.

- Ms. Prager stated that vegetation alone can not be used as a good indicator of the jurisdictional wetland limits for this project; but rather because the area is a mosaic of slight topographic changes, all three wetland parameters (wetland vegetation, hydric soil indicators, and clear evidence of surface hydrology) will have to be used extensively to delineate wetlands during the design/permitting phase.

- Mr. Thompson inquired about the mitigation methods being considered for this project. He showed concern that with the PUDs and DRIs proposed for this area, the landscape will be changed drastically and that consideration should be given to offering mitigation locally. Ms. Prager welcomed all of the discussion and suggestions on possible mitigation options; and pointed out that in the meetings with SJRWMD and ACOE, agency representatives stressed minimization and avoidance first, before mitigation can be considered.
- Discussion on different mitigation opportunities ensued with the following suggestions being offered for further research and consideration:
    1. Contacting Mr. Tom Workman? (SJRWMD) to explore possible mitigation opportunities within the Clark Bay Area.
    2. Contacting the City of Port Orange for mitigation opportunities within their wellfield properties.
    3. Looking into land acquisition of a 660 foot strip, adjacent to the Tiger Bay preservation area that is privately owned and could potentially become developed.
    4. Looking into funding studies being conducted or proposed by the Division of Forestry in the Bennett Swamp/Rima Ridge Area.
    5. Contacting Volusia Forever.
- The meeting was concluded with Mr. Freeman indicating that the project is scheduled to be completed by the end of the year and design is scheduled for the 07-08 fiscal year. He added that there is no date set yet for right-of-way acquisition. He also offered a summary of what is to be done before the public hearing scheduled in late October:
    1. Getting the project evaluation matrix completed.
    2. Obtaining feedback from FDOT on the reports submitted.
    3. Meeting with the local governments as part of the Project Design Team on the revised alignments

Action Items

1. Kim Dixon to follow up for Volusia County on information requested on local recreational facilities that would connect to the proposed trail to demonstrate connectivity.
2. Kim Dixon to provide information on who to contact to investigate possible mitigation opportunities with the County.
3. Rosanne Prager to review 2004 data from FFWCC to determine eagle's nest status.
4. KAI to provide Volusia County, City of Port Orange, City of Daytona Beach, and Volusia MPO an electronic copy of the proposed revised alignments for the LPGA Boulevard Extension.

Meeting Minutes

LPGA Boulevard Extension - Phase II PD&E Study
From SR 415 near Landfill Entrance to SR 600 (US 92) at LPGA Boulevard
Financial Project ID: 410252-1-22-01

Project Coordination Meeting

August 24, 2005 at 10:00 AM - Port Orange Regional Library

The following summarizes the LPGA Boulevard Extension PD&E Study Coordination Meeting that was held on Wednesday, August 24, 2005. An agenda packet was provided which included the two alternative typical sections being considered and the alternatives comparative evaluation matrix. The attendance sign-in sheet and the meeting agenda packet are attached to these meeting minutes.

I. Introduction

Following introductions, Jack Freeman, the Consultant Project Manager with Kittelson & Associates, gave an overview of the meeting agenda. Next, he explained that input is being sought at this meeting from the local government representatives regarding the recommendation of the preferred typical section and alignment. The final selection of the preferred concept will not be made until after the public hearing is held on the project. Jack then described the graphics on display which included both alignment options (B-3 and B-4), a map with both alignments shown and an overall future land use graphic.

II. Alternative Alignments

The two remaining viable alternative alignments, B-3 and B-4, were displayed on aerial background graphics. Jack described the alignments which both begin at CR 415 where the Madeline Avenue Extension project will connect to CR 415. They continue along the north side of Shunz Road and curve to the north to landfill road, just east of the Volusia County landfill entrance. Continuing northward, Alternative B-3 diverges from Alternative B-4 around the Landfill Road area and shifts to the east onto the Kirton property. It then shifts back towards the west and re-joins Alternative B-4 just south of I-4. Alternative B-4 runs adjacent to the Volusia County landfill and was the result of input from the Environmental Advisory Group (EAG) for the project to minimize wetland impacts. This alignment (B-4) impacts a historic landfill cell which would need to be excavated and re-filled with suitable fill. It was explained that this cell is unlined and is approximately 20 to 25 feet deep. The filling of the cell involved some burning with the use of diesel fuel. The excavation of this portion of the landfill could involve extensive contamination issues and will be very expensive to deal with. B-4 would also impact a landfill retention pond that would need to be filled and relocated. From a point just south of I-4 to the project terminus at US 92, the alignments of B-3 and B-4 are the same.

Jack then explained that the First Baptist Church is no longer going to be constructing the portion of the LPGA Boulevard Extension between I-4 and US 92. They could not work out right-of-way issues with the property owner immediately south of US 92 and have received their permit to cross the Tomoka River on the east side of their development. This crossing will provide a connection to CR 415 for church access and the connection to US 92 at LPGA Boulevard is not needed at this time.

III. Typical Sections

Next, Jack discussed the two roadway typical sections. The two typical sections are similar however one includes a multi-use trail and one does not. The proposed typical section consists of a two-lane rural roadway with 12-foot travel lanes and five-foot paved shoulders. Drainage swales are provided along both sides of the road. The multi-use trail is a 12-foot paved asphalt trail with two-foot unpaved shoulders along both sides. The proposed typical section without the multi-use trail requires 160 to 190 feet of right-of-way and the typical section with the multi-use trail requires 180 to 210 feet of right-of-way. Jack explained that the typical section right-of-way is approximately 50 feet wider than those shown at the Public Workshop that is because the recently received geotechnical information has allowed Kittelson to set a preliminary profile. As a result of the need to raise the profile of the roadway due to groundwater conditions, the roadway footprint has expanded to accommodate the higher fill slopes.

IV. Alternatives Evaluation Matrix

Following the typical section discussion, Jack went over the revised alternatives Comparative Evaluation Matrix. He pointed out that the overall impacts and costs are higher than what has previously been presented for several reasons. First, the wider typical section involve more wetland and floodplain impacts which must also be compensated for. Secondly, the portion of the road between I-4 and US 92 which was not previously included because it was going to be constructed by the First Baptist Church, is now being included. Finally, the construction unit costs for several elements have increased dramatically over the past year. For example, the old unit cost for embankment was $4.50 per cubic yard and it is now $8.50 per cubic yard. Overall, Alternative B-3 is slightly longer than Alternative B-4, but it is approximately $10 million less expensive than B-4. Also, the cost of the multi-use trail is approximately $5 million for either alignment.

V. PD&E Study Schedule

Jack next explained the upcoming schedule for the completion of the Study and how the timing of document approvals will drive the date of the Public Hearing. The status of the project documents was explained as shown below:

Endangered Species Biological Assessment – submitted to environmental agencies on July 21, 2005
Wetlands Evaluation Report – submitted to federal agencies on August 23, 2005
Cultural Resource Assessment Survey – to be submitted to SHPO this week
Location Hydraulics Report – submitted to FDOT on August 16, 2005
Air & Noise Reports – both documents are finalized
Geotechnical Report – the draft report is being reviewed by FDOT
Contamination Screening Evaluation Report – the draft report is being reviewed by FDOT
Pond Siting Report – the draft report will be submitted to FDOT next week
Preliminary Engineering Report – Chapters 2 through 8 are being reviewed by FDOT
Environmental Assessment (EA) – this document is currently being prepared and is anticipated to be sent to the Federal Highway Administration (FHWA) by the end of September.

Jack also explained that the Public Hearing for the project cannot be held until the EA is signed/approved by FHWA. In order to approve the EA, FHWA will need approval/sign-off letters on several of the project documents from the State Historic Preservation Office (SHPO), the US Fish and Wildlife Service and the US Army Corps of Engineers. The Public Hearing is currently scheduled for early November. If approvals are not received in time, the two weeks following Thanksgiving in early December will be considered. If the necessary approvals have still not been received, the Public Hearing would need to be moved to late January 2006.

VI. Local Government Input

Following the project overview, Jack asked for specific input on which alignment and typical section each government agency preferred. The following comments were made.

- Joe Grusauskas, with the Volusia County landfill, stated that because of the issues with the B-4 impacts to the landfill, he prefers Alternative B-3. Joe also requested that FDOT consider locating the stormwater ponds along the east side of the road in the area adjacent to the landfill. The landfill would like to have the property along the west side of the proposed roadway available for fill excavation to use as landfill cover. Karen Snyder with CH2M Hill indicated that the pond on the west side is preferred due to the lack of availability of a large enough pond site on the east side of the road in this particular basin. Karen did say that she would look further into this request. It was noted in this discussion that the location of the I-4 widening proposed stormwater retention pond should be added to the plans.
- Kim Dixon, with Volusia County's Engineering Division, requested that FDOT consider a pond site south of the LPGA Boulevard Extension connection to CR 415 instead of the pond site shown in the northwest quadrant of this intersection. A pond on the south side would be more compatible with the anticipated drainage needs of the Madeline Avenue extension project. Karen agreed to look at a pond on the south side and both Karen and Kim agreed that a joint use pond should be considered during design.
- Kim Dixon also indicated that the Volusia County Council has approved a 200-foot right-of-way for CR 415 in this area and that the proposed LPGA Boulevard Extension floodplain compensation area north of Landfill Road needs to consider this 200-foot roadway corridor. The additional 100-feet will most likely come from the west side of CR 415, although the recently begun Preliminary Engineering Study for CR 415 will make this determination. Karen indicated that the floodplain compensation area shown is conservative and that the revision to account for the 200-foot corridor to ensure that there is 100-feet from the existing right-of-way line for CR 415 is reserved for CR 415 widening should not be a problem. This will be noted in the final Location Hydraulics Report.
- Jon Cheney, with Volusia County Traffic Engineering, indicated the County's support for Alternative B-3.
- Mike Neidhart, with the Volusia County MPO, indicated that the MPO would support Volusia County's preference. Mike did also mention that the Volusia County MPO supports the inclusion of the multi-use trail with this project.
- Jack Freeman continued the discussion of the multi-use trail and when the County will be adding the trail along the LPGA Boulevard Extension into their adopted trails plan. Kim Dixon will speak with John Harper regarding this issue. Jack indicated that the environmental agencies will not look favorably at the trail if it is not included in the adopted trail plan for Volusia County. Jack also indicated that the addition of the trail into the

adopted plan would need to happen before the EA is submitted to FHWA which is anticipated to occur in about a month.

- Jon Cheney indicated that when Volusia County builds this road, they would include, at a minimum, a five-foot sidewalk along one side which is the County standard. They would not build the typical section that does not have a sidewalk or trail. Jon requested that a five-foot sidewalk be added to the typical section without the multi-use trail and adjust the construction costs accordingly. There was discussion on whether the sidewalk should be eight-feet in width, but there are not anticipated to be school children walking from the landfill area to a school site in the Coraci development east of CR 415. Jon indicated that the trail is being considered at the request of the Volusia County MPO and that the additional trail costs needs to be shared by the local governments.
- Bob Boggs, with the City of Daytona Beach, indicated that he has not received input in order to indicate the City's preference on the alignment or typical section. He did ask if FDOT could show the wider right-of-way typical section without the multi-use trail. Jack explained that there needs to be a documented need for the additional right-of-way and that the additional width could not be justified without the trail.
- Roger Smith, with the City of Port Orange, asked questions regarding who would own the LPGA Boulevard Extension once it was constructed and how the value of the publicly owned land was determined for the right-of-way impact costs. Jon Cheney indicated that the LPGA Boulevard Extension would be built by Volusia County and that it would remain a County road. Roger suggested that if local governments make right-of way donations for the road/trail, this value should be considered as a contribution towards the additional cost of the trail. Jack answered the second question by stating that FDOT's Right-of-Way staff actually did the estimates and that they probably did not discount the publicly owned property. Bill Walsh also indicated that FDOT's Right-of-Way staff would have considered the property's highest and best use for their estimates. Bill will check to make sure that this procedure was followed and will get back to Roger if this is not the case.
- Roger Smith and Rick Skeens then expressed their preference to keep the proposed alignment along Shunz Road along the north half of the 200-foot right-of-way due to utility impact concerns. Jack indicated that the alignment has been shifted to the northern half of the right-of-way to avoid utility impacts. Karen indicated that the pond that she will consider on the south side of Shunz Road will be sited to avoid these Port Orange utility lines.
- Roger Smith asked if the road was expected to remain a two-lane road. Jack indicated that it is for now because that is what the future traffic demand shows the need for. However, the roadway geometry of the alignment has been set-up to accommodate a future four-lane divided roadway. The propose right-of-way shown in the two alternative typical sections is not adequate for the future four-lane widening.
- Bob Boggs again mentioned that he had not received direction on what the City of Daytona Beach prefers. He will try to get back with Jack Freeman on this issue as early as this afternoon (August 24, 2005).
- Roger Smith indicated that the City of Port Orange strongly supports including the multi-use trail in the project.
- Joe Grusauskas commented on the proposed configuration of the Shunz Road/LPGA Boulevard Extension intersection. Roger Smith indicated that access to the Port Orange property down existing Shunz Road is restricted and fencing will need to be provided at the new intersection. The ability for vehicles to turn around at this gate was discussed and Jack indicated that the pavement will be 36-feet in width with shoulders which should be

adequate. The issue of semi-trailers being able to stack on this access road at the gate was also discussed. Joe Grusauskas stated that these details can be worked out during design.

- Kim Dixon asked about what kind of development that the City of Port Orange has planned for this area south of Shunz Road. Roger Smith indicated that it is planned for commercial development and that the City may locate a new 6 million gallon sewer plant in this area.
- Jon Cheney indicated that Volusia County supports the inclusion of pedestrian and bicycle facilities on the road. However, local funding matches will be needed and nobody should assume that Volusia County will pay for the trail in full. He again indicated that the base typical section should include the five-foot sidewalk along one side. Jon also indicated that FDOT usually requires justification for including sidewalks in their projects, but Volusia County includes sidewalks as part of their standard roadway construction. He indicated that the County's policy to provide a sidewalk should overrule FDOT's need for justification. Jack requested that Jon Cheney provide him a copy of the County's policy on sidewalks.
- Roger Smith indicated that the City would support rest areas for trail users adjacent to the proposed roadway stormwater ponds.
- Rick Skeens asked whether the trail would extend all the way to US 92 and beyond. Jack indicated that the trail will be provided on the bridge over I-4 and will extend up to US 92. The County's adopted trail plan includes a future trail along LPGA Blvd. north of US 92.
- Roger Smith asked whether the pond sites were sized for Outstanding Florida Waters (OFW) requirements. Karen answered that the ponds north of I-4, adjacent to the Tomoka River headwaters, were sized according to OFW requirements. The other ponds do not fall under OFW requirements.

VII. Summary

Jack Freeman summarized the meeting by indicating that Volusia County supports Alternative B-3 and including the multi-use trail. The Volusia County MPO supports the inclusion of the multi-use trail and the alignment that is preferred by Volusia County. Port Orange does not prefer one alignment over the other, but they do support the inclusion of the multi-use trail. The City of Daytona Beach did not provide guidance at this meeting but will in the near future.

Jack indicated that a presentation will be made to the Volusia County MPO following the Public Hearing. Mike Neidhart informed the group that the Volusia County MPO no longer meets every month and will not meet in December.

The meeting concluded at approximately 11:45 am.

Note: The above reflects the writer's understanding of the contents of the meeting. If any misinterpretations or inaccuracies are included, please contact David Dangel at (407) 971-8850 or via email at ddangel@inwoodinc.com, as soon as possible for resolution and revisions if necessary.

LPGA Boulevard Extension
Phase 2 (PD&E) Study

From CR 415 to SR 600 (US 92), Volusia County

Financial Project ID: 410252-1-22-01 Federal Aid Project No: 7777 100 A

Coordination Meeting
Wednesday, August 24, 2005

Name	Organization	Address	Phone/Fax	E-mail
DAVID DANGEL	INWOOD CONSULTING ENGINEERS	870 CLARK ST	(407) 971-8850 (407) 971-8955	ddangel@inwood.inc.com
JACK FREEMAN	Kittelson & Associates, Inc	315 E. Robinson St; Suite 465 Orlando, FL 32801	(407) 540-0555 (407) 540-0550	JFreeman@Kittelson.com
Karen Snyder	CH2M Hill	225 E. Robinson St., 505 Orlando, FL 32801	407-427-0030	KSnyder@ch2m.com
Jon Cheney	Volusia County Traffic Engr	123 W Indiana Ave DeLand FL 32720	386/736-5968 740-5242	jcheney@co.volusia.fl.us
Mike Neidhart	Volusia County MPO	1196 Pelican Bay Dr. Daytona Beach	386-322-5160 ext 35	Mneidhart@co.volusia.fl.us
Stephen Tonjes	FDOT			
Bill Walsh	FDOT	719 S. Woodland Ave DeLand, FL 32720	386-943-5411	william.walsh@dot.state.fl.us
Roger Smith	City of Port Orange	1000 City center circle Port Orange, FL 32129	386-506-5750	rsmith@port-orange.org
Rick Skeen	City of Port Orange	"	"	rskeens@port-orange.org

Meeting Location: Port Orange Library, Port Orange, Florida

LPGA Boulevard Extension
Phase 2 (PD&E) Study

From CR 415 to SR 600 (US 92), Volusia County

Financial Project ID: 410252-1-22-01 Federal Aid Project No: 7777 100 A

Coordination Meeting
Wednesday, August 24, 2005

Name	Organization	Address	Phone/Fax	E-mail
STAN LEMLCE	CITY OF DAYTONA BEACH	950 Beleme	386-671-8607	lemlces@cod6.us
Kimberly Dixon	Vo. County	123 Indiana Room 402 Deland	386 736-5967	kdixon@co.volusia.fl.us
Joe Gruszka	Vo. County	" "	386-527-6987	JGruszka@co.Volusia.FL.us.
Jennifer Stirk	Vo. Co.	" "	386 947 2952	jstirk@co.volusia.fl.us
Robert Boggs	CODS	950 Beleme Ave.	(386) 671-8650	boggsr.bart@cod6.us

Meeting Location: Port Orange Library, Port Orange, Florida

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION PLANNING/TRAFFIC ENGINEERING
315 E. ROBINSON STREET, SUITE 465 · ORLANDO, FL 32801 · (407) 540-0555 · FAX (407) 540-0550

MEETING AGENDA

LPGA Boulevard Extension Phase II PD&E Study
From SR 415 near Landfill Entrance to SR 600 (US 92) at LPGA Blvd.
Financial Project ID: 410252-1-21-01

Project Coordination Meeting
August 24, 2005 @ 10:00 AM
City of Port Orange Public Library
1st Floor – Meeting Room

I. Introduction
- Individual introductions of attendees

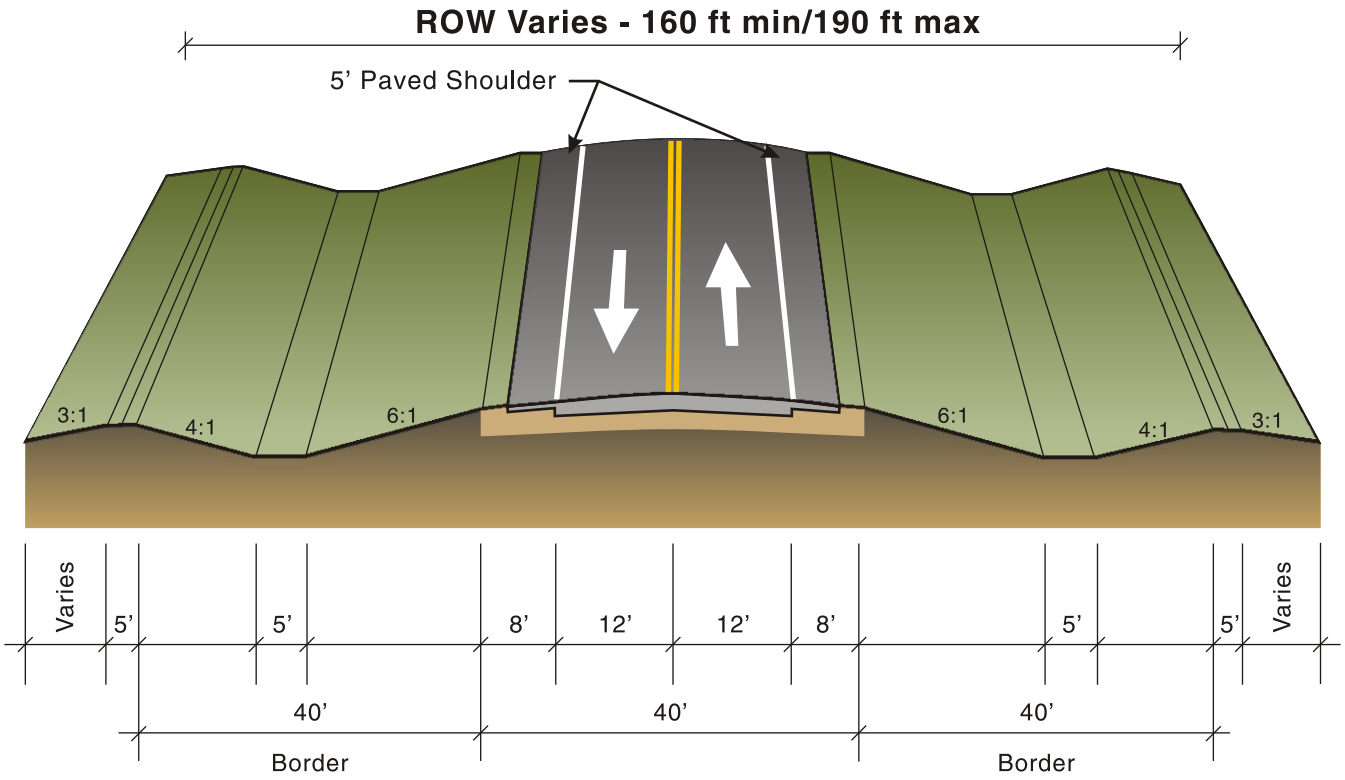
II. Discussion Items
- Alignment alternatives being considered
- Typical sections being considered
- Comparative evaluation matrix
- Update on environmental documentation

III. Feedback on Alignment and Typical Section Preferences
- Receive input from attendees

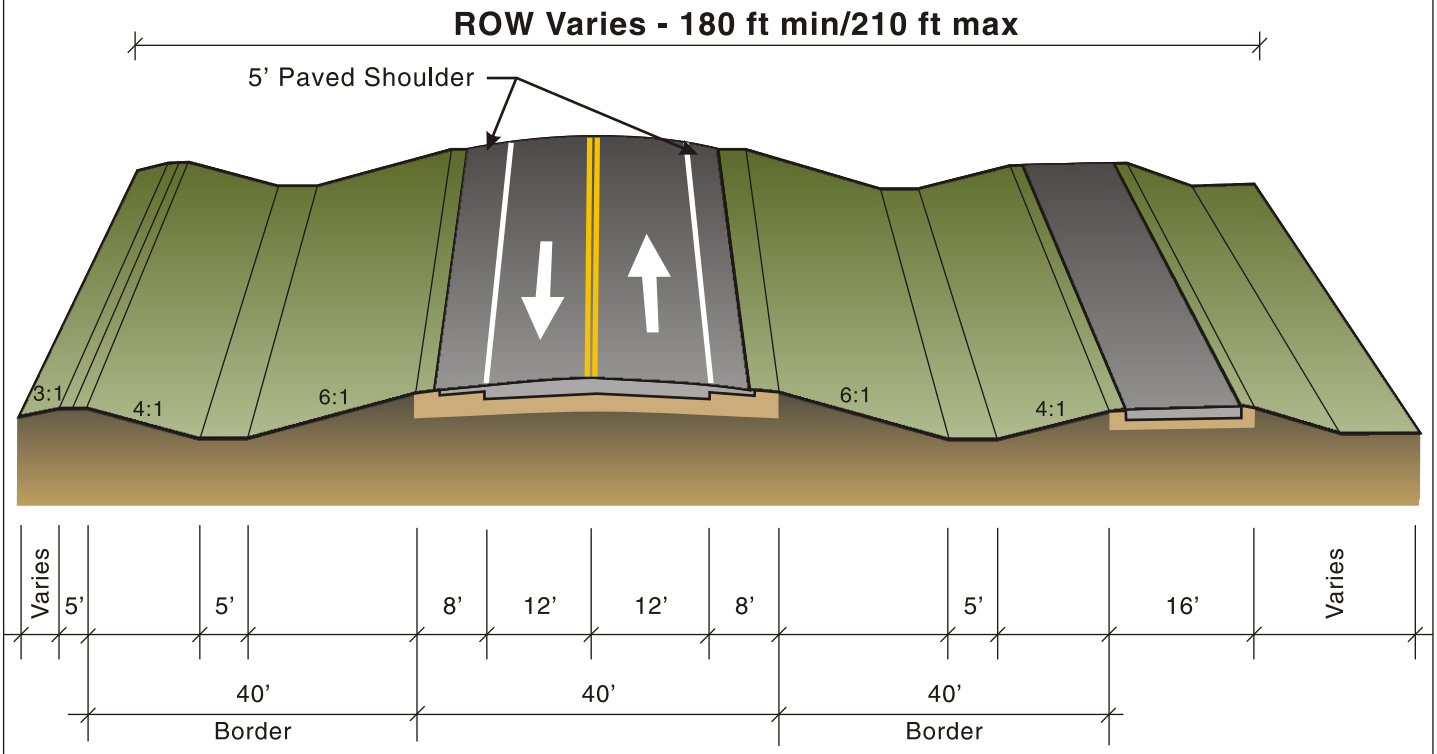
IV. Upcoming activities
- Completion of Preliminary Engineering Report
- Completion and Submittal of Environmental Assessment to FHWA
- Conduct Public Hearing – before Thanksgiving

V. Adjourn

Two-Lane Typical Section

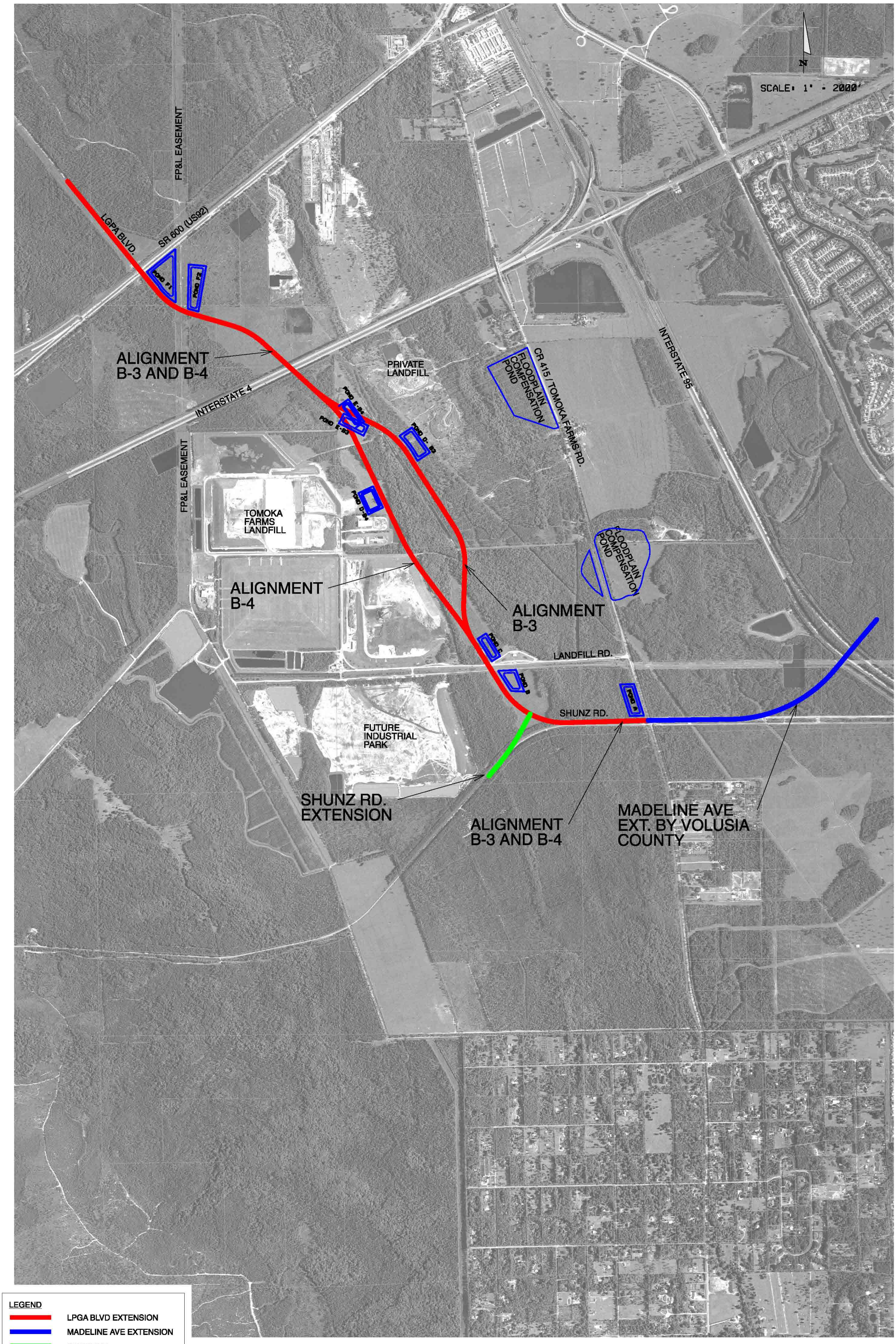


Two-Lane Typical Section (with Multi-Use Trail)



LPGA Boulevard Extension Typical Sections

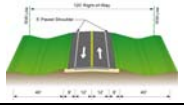
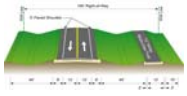
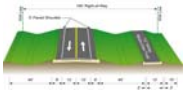
FIGURE 8-1



ALIGNMENTS B3 AND B4
VOLUSIA COUNTY, FLORIDA

FIGURE
8-3

Alternatives Evaluation Matrix
LPGA Boulevard Extension PD&E Study
From CR 415 South of the Volusia County Landfill Entrance to SR 600 (US 92), Volusia County

	No Build	Alt. B-3 without trail	Alt. B-3 with trail	Alt. B-4 without trail	Alt. B-4 with trail
					
Segment Length		3.11 miles	3.11 miles	3.02 miles	3.02 miles
Right-of-Way (R/W) Impacts					
R/W to be acquired for project (acres)	0	170.4	176.9	167.4	173.8
Number of parcels impacted	0	36	36	29	29
Relocations					
Residences	None	None	None	None	None
Businesses	None	None	None	None	None
Natural, Environmental and Physical Impacts					
Species/Habitat	None	Yes	Yes	Yes	Yes
Total Wetland Impact Area (acres)	None	97.22	103.41	86.96	92.31
Floodplain Encroachment (acre-feet)	None	22.34	25.54	23.48	26.05
Social & Neighborhood Impacts	None	None	None	None	None
Estimated Costs					
Engineering Design Costs	$0	$2,200,000	$2,500,000	$2,200,000	$2,500,000
Right-of-Way Costs	$0	$14,200,000	$14,775,000	$23,325,000	$23,525,000
Wetland Mitigation Costs	$0	$8,575,000	$9,125,000	$7,675,000	$8,150,000
Roadway Construction Costs	$0	$26,925,000	$28,675,000	$26,150,000	$28,525,000
Bridge Construction Costs	$0	$1,450,000	$1,850,000	$1,450,000	$1,850,000
Landfill Debris Cleanup	$0	$0	$0	$3,000,000	$3,000,000
CE&I Costs	$0	$4,300,000	$5,450,000	$4,250,000	$5,375,000
Total Cost		$57,650,000	$62,375,000	$68,050,000	$72,925,000

APPENDIX D

Drainage Calculations

- Treatment/Attenuation Calculations
- Geotechnical Data by Nodarse
- R/W Estimates for Proposed Pond Sites

APPENDIX E

Drainage Map

- Proposed Drainage Map
- P roposed Profile Grade