

# **LOCATION HYDRAULICS REPORT**

## **SR 60 GRADE SEPARATION AT CSX RAILROAD PROJECT DEVELOPMENT AND ENVIRONMENT STUDY Polk County, Florida**

**Financial Project ID: 436559-1-22-01**

Prepared for:



**FLORIDA DEPARTMENT OF TRANSPORTATION  
DISTRICT ONE  
801 North Broadway Avenue  
Bartow, Florida 33831  
Tampa, Florida 33612-6403**

**January 2015**

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# ***SECTION 1***

## ***INTRODUCTION***

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The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study to evaluate costs and impacts of constructing a new overpass to carry State Road (SR) 60 over the CSX Railroad (milepost 25.544, crossing #625419N) approximately 11 miles east of Bartow and 4 miles west of Lake Wales in Polk County, Florida.

All elevations are presented in the North American Vertical Datum of 1988 (NAVD 88).

### **1.1 PURPOSE**

The purpose of the project is to replace the SR 60 at-grade railroad crossing with a grade separation. The need for the project is not based on the need for additional capacity. It is based on improving safety; to provide a grade separation of the railroad crossing to separate vehicle traffic from the train traffic. The project will also reduce travel delays by removing the need to stop traffic for trains. The purpose of the PD&E Study is to provide documented environmental and engineering analyses to assist the FDOT in reaching a decision on the location and conceptual design of the new railroad overpass and associated improvements in order to accommodate future traffic demand in a safe and efficient manner. This PD&E study satisfies the FDOT requirements and follows the process outlined in the FDOT *Project Development and Environment Manual, Part 1 Chapter 10: Non-Federal Projects*. The design year for the analysis is 2035.

The purpose of this report is to provide a location hydraulic study for the above project, in accordance with 23 CFR 650 Subpart A, Section 650.111. The report utilized the National Flood Insurance Program maps to determine highway location encroachments. This report evaluates risks associated with the implementation of the project, impacts on natural and beneficial floodplain values, the support of incompatible floodplain development, and measures to minimize floodplain impacts. Local, State, and Federal water resources and floodplain management agencies were consulted to determine if the proposed project is consistent with existing floodplain management programs.

### **1.2 PROJECT DESCRIPTION**

The PD&E Study limits are SR 60 from 3200 feet west of CSX Railroad crossing #625419N to 2500 feet east of CSX Railroad crossing #625419N, a distance of 5700 feet (1.08 mile). The project is located within Section 01, Township 30 South, Range 26 East, and Section 6,

Township 30 South, Range 27 East, within the Eloise United States Geological Survey (USGS) 7.5-minute (1:24,000) quad map and the USGS “Fort Pierce” 1 x 2 degree (1:250,000) topographic map.

SR 60 is an existing four-lane divided rural arterial which is part of the National Highway System and the Strategic Intermodal System (SIS). SR 60 is designated as an evacuation route by the Florida State Emergency Response Team. SR 60 is classified by FDOT as a rural principal arterial – other. Existing land uses in the study area include industrial, agricultural, infrastructure, and residential. The Access Classification is Access Class 3. There are no connecting roads within the project area, but access to SR 60 from adjacent properties is provided by driveway connections. In addition to the proposed bridges over the CSX railroad, new bridges will be provided over the Peace Creek drainage canal (PCDC), west of the railroad. While the purpose and need for this project is not to add capacity, an ultimate six-lane facility will be evaluated in order to accommodate future widening along SR 60.

# ***SECTION 2***

## ***ANALYSIS OF FLOODPLAIN IMPACTS***

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### **2.1 NATIONAL FLOOD INSURANCE PROGRAM COMMUNITIES**

The Federal Emergency Management Agency (FEMA) completed the Flood Insurance Study (FIS) for Polk County that became effective November 19, 2003. No changes to the FIS have been made at this location since 2003 according to the local FEMA office.

Portions of the study area for the proposed improvement of SR 60 are located within the floodplain limits shown on the Flood Insurance Rate Map (FIRM) Community Panels 12105C0545 G, as compiled by FEMA. The roadway is located in Zone X, areas within the 500-year floodplain. Portions of the roadside ditches and the FDOT parcels for the proposed stormwater management facilities (SMF) are in Zone AE, areas within the 100-year floodplain, with a base flood elevation (BFE) of 112.081 (NAVD 88 conversion).

### **2.2 FLOODPLAINS**

The Southwest Florida Water Management District (SWFWMD) Interconnected Pond Routing (ICPR) watershed model is currently being reviewed by FEMA and may be incorporated into the updated FIRM. The model is based off the 100-year 5 day event where the existing FIRM is based off the 100-year 24-hour event. The amount of floodplain within the project is minimal and will be compensated for in the reconstruction of the outfall ditch. The construction of this project will not affect the 100 year flood stage, therefore has no adverse effect on the floodplain. The PCDC watershed model will be updated in the design phase to ensure that there is no significant rise to the 100-year flood stage.

### **2.3 FLOODWAYS**

PCDC is classified as a FEMA floodway in the Flood Insurance Study (FIS) for Polk County effective September 28, 2012 (FEMA FIS Polk County, Florida, Table 7, Page 62 and 63).

There are two existing bridges within the project limits over the PCDC. The westbound bridge is considered functionally obsolete and will be removed during construction. The eastbound bridge is still within its design life and will be repurposed as the frontage road with the northern alignment shift. A new bridge will be constructed to carry the mainline traffic over the PCDC. A

FEMA no-rise certification and a bridge hydraulics report (BHR) will be conducted in the design phase.

## **2.4 STORMWATER MANAGEMENT FACILITIES**

The project has been delineated into two basins, Basin 1 and Basin 3. Basin 1 is from the beginning of the project to the high point over the CSX railroad. Basin 3 is from the high point over the CSX railroad to the east end of the project. Both basins discharge to the Peace Creek Drainage Canal (PCDC). Each basin will require a SMF to treat and attenuate stormwater.

## **2.5 DRAINAGE PATTERNS**

### **2.5.1 BASIN 1**

Currently the westbound lanes of SR 60 sheet flow north where the water is intercepted by a drainage ditch running along the FDOT barrow pit parcel and directed to the PCDC. Stormwater from the eastbound lanes drains to a roadside ditch that flows directly to the PCDC.

In this PD&E study, the most easterly inlet in Basin 1 is assumed to be west of the PCDC Bridge. There are several factors such as super elevation transition and profile changes that may require an inlet be placed east of the PCDC Bridge. This would require stormwater to be piped across the PCDC or treatment provided within this subbasin of Basin 1.

In the proposed condition stormwater will be collected and routed through the SMF.

### **2.5.2 BASIN 3**

There is a 30-inch existing cross drain just east of the CSX railroad crossing. Today stormwater within the eastbound lanes east of the CSX railroad crossing flows to a roadside ditch with a profile that brings the stormwater west to the cross drain. The westbound lanes also sheet flow into a roadside ditch and flow to the downstream end of the cross drain.

Historic 1952 aerials depict a drainage ditch running north discharging to the PCDC. However recent aerials, LiDAR, and field reconnaissance shows that the ditch has been partially filled north of the power easement. This ditch will be redesigned and regraded in the design phase of the project.

In the proposed condition a portion of the basin that utilizes the cross drain will be removed and routed through the SMF. A full cross drain analysis will be conducted during the design phase.

## ***SECTION 3***

# ***FLOODPLAIN COORDINATION***

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### ***3.1 FLORIDA DEPARTMENT OF TRANSPORTATION DISTRICT I***

The FDOT District I Bartow Operations Center was contacted concerning any existing flooding problems in the vicinity. A phone conversation with Donald Witmer on December 24, 2014 is documented in the attached communications record. Mr. Witmer did not have any knowledge of flooding within the project limits.

### ***3.2 POLK COUNTY FEMA COORDINATOR***

The Polk County FEMA coordinator was contacted to make sure that the information FEMA has posted is the latest and if there are any proposed significant changes with the flood elevations. A phone conversation with Randall Vogel on December 29, 2014 is documented in the attached communications record. Mr. Vogel did not anticipate any issues going forward.

### ***3.3 SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT***

A meeting took place with SWFWMD on October 1, 2014 to discuss the project, treatment requirements, attenuation, floodplain impacts, and environmental concerns. The PCDC ICPR model was discussed and will be modified and analyzed to show that there will be no increase in flood stages. The meeting minutes are attached.



# ***SECTION 4 CONCLUSIONS***

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## **4.1 RECOMMENDED ALTERNATIVES**

The project's build option is feasible. The proposed project will not encourage floodplain development due to local (FEMA) floodplain and SWFWMD regulations. The projects drainage design will be consistent with local (FEMA), FDOT, and SWFWMD design guidelines. Therefore, no significant changes in the base flood elevation or limits will occur.

## **4.2 PROJECT CATEGORY**

Based on the information collected during this study, the proposed improvement can be categorized as a type 4 project: projects on existing alignment involving replacement of existing drainage structures with no record of drainage problems.

"The proposed structure will perform hydraulically in a manner equal to or greater than the existing structure, and backwater surface elevations are not expected to increase. As a result, there will be no significant adverse impacts on natural and beneficial floodplain values. There will be no significant change in flood risk, and there will not be a significant change in the potential for interruption or termination of emergency service or emergency evacuation routes. Therefore, it has been determined that this encroachment is not significant."

# ***ATTACHMENTS***

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# Communication Record

<b>Person spoken with:</b>	Donald Witmer		
<b>Representing:</b>	FDOT D1 Maintenance Yard		
<b>Subject:</b>	SR 60 PD&E Drainage Issues	<b>Date and time:</b>	Dec 24, 2014 - 10:36
<b>Atkins representative:</b>	Gregory Lee	<b>Phone:</b>	863-519-4314

**Details:**

After brief introductions, we discussed the project limits for the SR60 PD&E. Mr. Witmer has no knowledge of any flooding or drainage issues at the crossing of the Peace Creek Drainage Canal and SR 60 in question. He did advise that there have been flooding issues at the Peace Creek Drainage Canal and SR 60 crossing approximately two miles west.

Mr. Witmer recommends Mr. Mark Barnes (Field Operations Manager, Bartow Operations Center) at 863-519-4306 if any further inquiry is required.

**Action required:**

<b>Distribute to:</b>	SR 60 PD&E LHR	<b>cc:</b>	Tim Polk
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**File ref:**

# Communication record

<b>Person spoken with:</b>	Randall E Vogel, Floodplain Manager		
<b>Representing:</b>	Polk County		
<b>Subject:</b>	SR 60 @ CSX FEMA Coordination	<b>Date and time:</b>	Dec 29, 2014 - 12:46
<b>Atkins representative:</b>	Gregory Lee	<b>Phone:</b>	863-534-6767

## Details:

Mr. Vogel returned my voicemail from the morning of December 24<sup>th</sup>, 2014. I informed him that we were conducting a PD&E study on SR 60 at CSX and the PCDC. He asked for a parcel number in the area to get his bearings.

I asked about the difference in dates between the FIS and the FIRM. He confirmed that we had the latest information. The FIRM was updated in 2003 as an "intermediate map update". In 2012 other panels were updated triggering the date change on the FIS.

I asked about any updates to the area. He informed me that the process is slightly behind. Polk County was expecting maps to review by the end of the year. He anticipates that they will be in early next year. At that point the maps will be under review for 18-24 months. He recommended contacting Dawn Turner (800-423-1476 X4199) at SWFWMD for more detailed information if needed.

Lastly, we discussed the CSX intermodal facility to see if it could have any impact to our project area. He recalls that the facility will contain all stormwater runoff and should not affect the SR 60 @ CSX project.

Mr. Vogel welcomed us to reach out to him again if we think of anything else.

## Action required:

<b>Distribute to:</b>	SR 60 PD&E LHR	<b>cc:</b>	Tim Polk
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**File ref:**

# Meeting Minutes

**Project:** FPID 436559-1-22-01 SR 60 Grade Separation over CSX Railroad, Polk County

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**Subject:** SWFWMD Pre-Application Meeting

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**Date & Time:** October 1, 2014 at 2:00 PM

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**Meeting Place:** SWFWMD Tampa Office      **Minutes By:** Atkins

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<b>Present:</b>	Brent Setchell	<b>Representing:</b>	FDOT
	Nicole Monies		FDOT
	David Kramer		SWFWMD
	Albert "Al" Gagne		SWFWMD
	Tim Polk		Atkins
	Gordon Mullen		Atkins

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The project was introduced to the SWFWMD staff and aerial exhibits handed out with the proposed roadway concept. The FDOT proposes a PD&E project to construct an overpass carrying SR 60 over the CSX railroad (RR) between Alturas and Lake Wales in Polk County. The proposed crossing over the CSX RR will also require the bridge replacement over the Peace Creek Drainage Canal (PCDC). Since access must be maintained to the Florida Power electric substation and industrial business on the south side of the road west of the CSX RR, and to businesses and properties on the north side of SR 60, frontage roads will need to be constructed. At this time, the roadway concept will be to elevate the SR 60 mainline using mechanically stabilized earth walls to limit the right-of-way footprint. At this time, the existing four lanes will be maintained, but the PD&E effort is considering bridges for an ultimate six-lane facility.

It was noted that the PCDC is flowing from northeast to southwest at this location on SR 60. The PCDC then joins a tributary that picks up the watershed from the south and then drains northwest under SR 60. The PCDC through this area is part of the SWFWMD PCDC ICPR model, and the PCDC is an Impaired Water Body (WBID) for nutrients (WBID 1539, Historic Chlorophyll-a). The PCDC is a FEMA floodway at the SR 60 crossing, and much of the offsite area is within the 100-year base floodplain.

The FDOT does have existing offsite R/W east and west of the RR crossing that was purchased during the 1940s. Drainage easements may be needed across adjacent private property for stormwater conveyance to these sites.

## Treatment Requirements

It was proposed that since the FDOT does own offsite R/W, and there is a right-of-way (R/W) phase with this project; the project's directly connected impervious area (DCIA) or equivalent pavement shall be treated with this project. In addition, since this is an Impaired Water Body, the pollutant loading from this project needs to be equivalent to or less than the existing condition.

## Water Quantity and Floodplain Requirements

Attenuation will be provided and floodplain compensation will need to be evaluated with the SWFWMD PCDC ICPR model. The existing offsite FDOT R/W to the east of the RR is within Zone X and the R/W to the west of the RR is also west of the PCDC and within Zone AE. The existing PCDC ICPR model will be modified with the proposed floodplain encroachments, and analyzed to show that there is no increase in flood stages in the post condition.

The FIRM map also shows that there is overtopping of SR 60 west of the PCDC. If this is the case, the overtopping will be reduced, which will affect (increase) the PCDC Bridge opening. It is assumed that a No-Rise Certification will be required during the design phase for the crossing, which will show no increase in the base floodplain elevation.

### **Environmental Considerations**

Although not quantified at this time, wetland impacts from this project are expected to be minimal and largely confined to the PCDC channel. However, based on preliminary review of aerial photo signatures, there is a possibility that further field reviews will determine the presence of wetlands within the FDOT off-site R/W (potential pond sites). The project occurs within the service areas of both the Boran Ranch and Peace River mitigation banks, and it is expected that wetland impacts will be offset through the purchase of sufficient credits as determined/coordinated during the Environmental Resource Permit (ERP) process. Reviews for wetland-dependent and other listed species will be conducted within the next few months and further refined during the design and permitting process.

The schedule for the completion and submittal of the ERP application has not yet been determined.