

Location Hydraulics Report

S.R. 50 PD&E Study Reevaluation

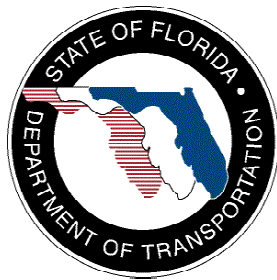
From U.S. 19 (S.R. 55) to the east intersection of S.R. 50/
S.R. 50A [along the Brooksville Bypass]

Hernando County, Florida

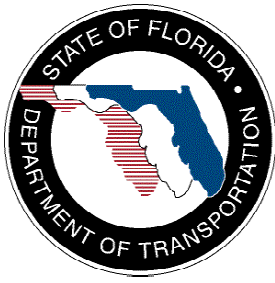
WPI Segment No: 407951 1

FAP No: 300-1(7)

Florida Department of Transportation
District 7



November 2003



LOCATION HYDRAULICS REPORT

Florida Department of Transportation
Project Development and Environment (PD&E) Study Reevaluation

S.R. 50 PD&E Study Reevaluation **From U.S. 19 (S.R. 55) to the east intersection of** **S.R. 50 / S.R. 50A [along the Brooksville Bypass]** Hernando County, Florida

WPI Segment No: 407951 1
FAP No: 300-1(7)

Submitted to:

Florida Department of Transportation - District 7
Tampa, Florida

Submitted by:



in association with:



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S.R. 50 PD&E Reevaluation Study
WPI Segment No. 407951 1
FAP No. 300-1(7)

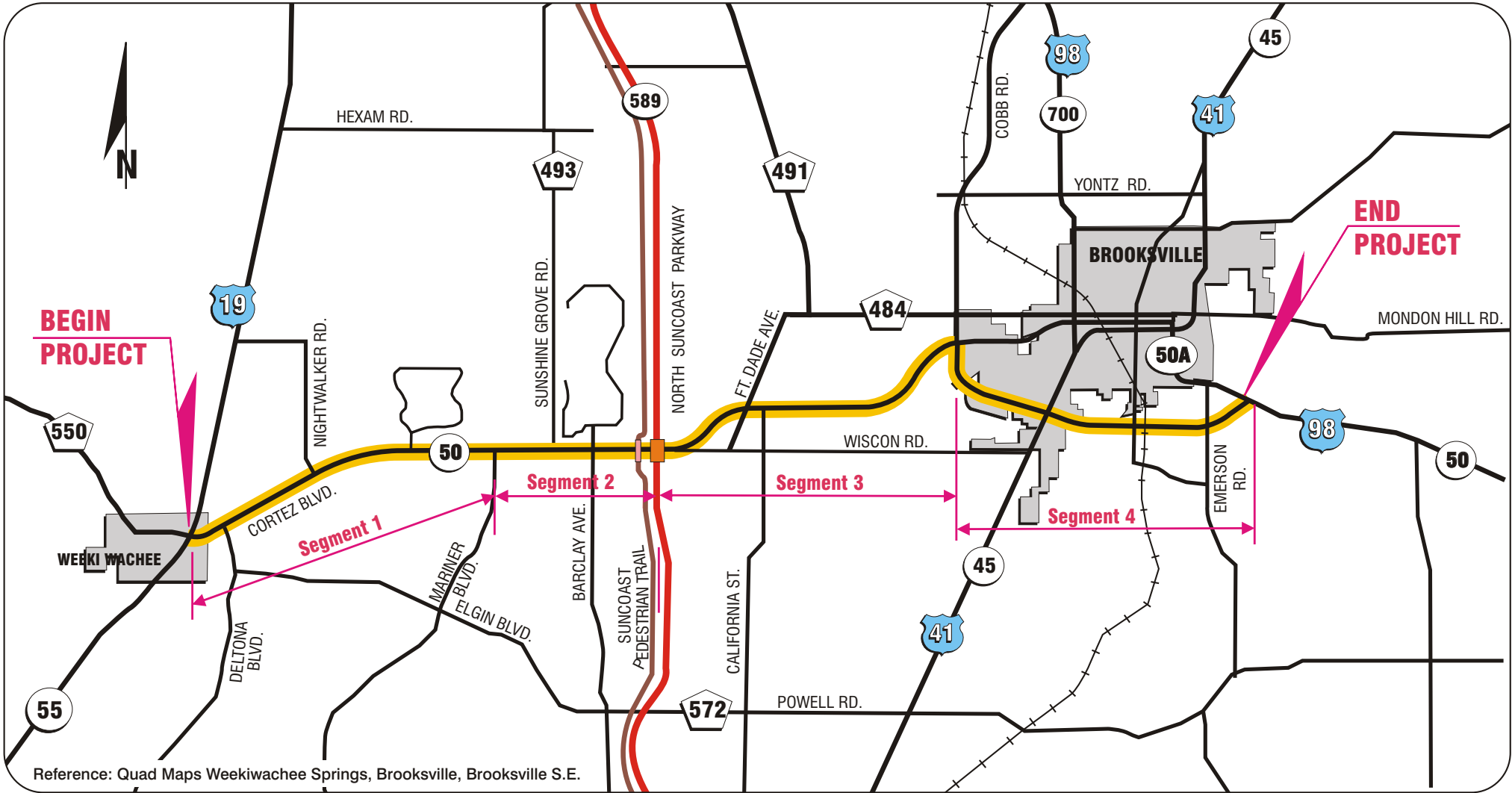
LOCATION HYDRAULIC REPORT

Summary

This project involves the reevaluation of the previous PD&E Study that was performed for the project, which is documentation of any changes that may have occurred since the previous study was completed. The previous PD&E Study being reevaluated is S.R. 50 from U.S. 19 (S.R. 55) to the eastern intersection of S.R. 50/S.R. 50A. This project involves widening S.R. 50 (Cortez Boulevard), from the existing 4-lane typical section to a 6-lane typical section, from U.S. 19 (S.R. 55) to the east intersection of S.R. 50/S.R. 50A [along the Brooksville Bypass]. The length of the project is approximately 13.7 miles. The widening of S.R. 50 from U.S. 19 to the west intersection of S.R. 50/S.R. 50A is proposed to be widened to the outside; whereas the remainder of the project, from the west intersection of S.R. 50/S.R. 50A to the east intersection of S.R. 50/S.R. 50A [along the Brooksville Bypass], is proposed to be widened to the inside. Figure 1, Project Location Map, illustrates the limits of the project area in relation to the local roadway network.

This Location Hydraulic Report has been prepared to determine if any floodplains will be significantly affected due to the recommended improvements. This section of S.R. 50 has seventy-one cross drains and numerous side drains. The project site has been field reviewed on various dates from October 2001 through January 2003. The following ten items have been addressed to document that the floodplain encroachments will be minimal.

1. History of Flooding: Flooding problems have been identified in the vicinity of Cobb Road where clayey soils exist.
2. Longitudinal or Transverse Encroachments: None of the floodplain encroachments will be longitudinal.
3. Avoidance Alternatives: All of the floodplain encroachments will be minimal due to the recommended roadway alignment following the same general alignment as the existing roadway.
4. Emergency Services and Evacuations: S.R. 50 has no history of stormwater overtopping. Therefore, no emergency services or evacuation opportunities will be adversely affected.
5. Base Flood Impacts: The project's drainage design will be consistent with local, Federal Emergency Management Agency (FEMA), FDOT, and Southwest Florida Water Management District's (SWFWMD) design guidelines. Therefore, no significant changes in base flood elevations or limits will occur.
6. Regulatory Floodway: There are no regulatory floodways within the limits of this project.



Reference: Quad Maps Weekiwachee Springs, Brooksville, Brooksville S.E.

LEGEND

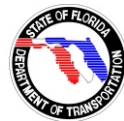
-  Project Study Limits
-  Major Interchange
-  Railroad

FLORIDA DEPARTMENT OF TRANSPORTATION

**S.R. 50 (CORTEZ BLVD.)
PD&E STUDY REEVALUATION**

From U.S. 19 (S.R. 55) to the East Intersection of
S.R. 50 / 50A [along the Brooksville Bypass]
Hernando County, Florida

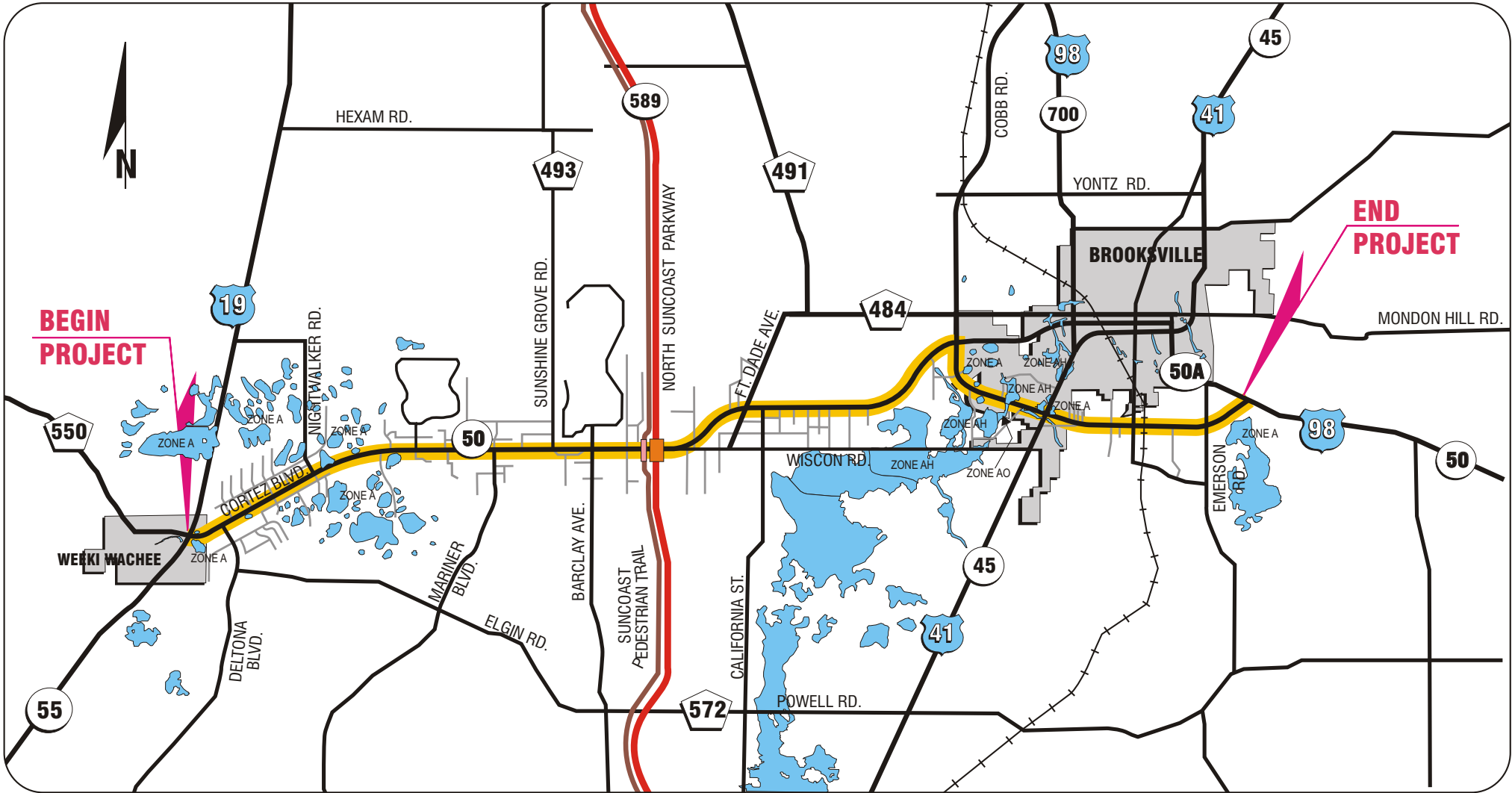
PROJECT LOCATION MAP





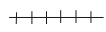

WPI SEG. NO: 407951 1
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FIGURE 1

7. Natural and Beneficial Floodplain Values: The recommended roadway alignment will follow the same general alignment as the existing roadway. Therefore, no natural and beneficial floodplain values will be significantly affected.
8. Floodplain Consistency and Development: This project is consistent with Hernando County's Comprehensive Plan. This project will not encourage floodplain development due to local (FEMA) floodplain and SWFWMD regulations.
9. Floodplain/FIRM: The FEMA FIRM panels showing the project corridor are shown in Figure 2.
10. Risk Assessment: Floodplain encroachments are not significantly increased by this project's build alternative, as discussed further within this report.



LEGEND

-  Project Study Limits
-  Major Interchange
-  Railroad
-  100yr. Floodplains

Reference: FEMA Maps Panel Numbers 1201110 0140 B, 120413, 1201110 0150 B, 1201110 0175 B, 120333 0001 C and 1201110 0190 B



FLORIDA DEPARTMENT OF TRANSPORTATION

**S.R. 50 (CORTEZ BLVD.)
PD&E STUDY REEVALUATION**

From U.S. 19 (S.R. 55) to the East Intersection of
S.R. 50 / 50A [along the Brooksville Bypass]
Hernando County, Florida

FLOODPLAINS MAP

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FIGURE 2

Introduction

Executive Order 11988, "Floodplain Management", USDOT Order 5650.2, "Floodplain Management and Protection", and Federal-Aid Policy Guide 23 CFR 650A, Subchapter G, Part 650, Subpart A, Section 650.111, December 9, 1991, require the protection of floodplains and floodways. This Location Hydraulic Report memorandum was prepared in accordance with the requirements set forth in the FDOT PD&E Manual, Part 2, Chapter 24, revised April 22, 1998, and it supports the S.R. 50 (Cortez Boulevard) PD&E Reevaluation Study. The intention of this memorandum is to determine the effects of the encroachment within the 100-year base floodplain of the recommended alternative and, where practicable, avoid supporting land use development that is incompatible with floodplain values as the result of the recommended improvements.

Project Description and Recommended Improvements

The Florida Department of Transportation (FDOT) is proposing capacity improvements along S.R. 50 (Cortez Boulevard) from U.S. 19 (S.R. 55) to the east intersection of S.R. 50 / S.R. 50A [along the Brooksville Bypass], which is approximately 13.7 miles in length. The majority of the project is located within an unincorporated area of Hernando County; however, portions extend through the City of Weeki Wachee and the City of Brooksville. The proposed project consists of widening S.R. 50 from the existing 4-lane typical section to a 6-lane typical section to accommodate present and future traffic demands.

The project corridor has been delineated into thirteen basins, identified as A through M in the project's separate *Pond Siting Report*, which are based on the existing FDOT construction plans, United States Geological Survey (USGS) quadrangle and Southwest Florida Water Management District (SWFWMD) maps. The basins contain numerous sub-basins that were utilized for the hydrologic evaluation. Within the immediate vicinity of S.R. 50, wetlands are very sparse and predominantly consist of isolated depressions. The overland flow eventually is conveyed to these depressions. Most of the stormwater runoff travels from north to south through commercial, residential, woods and open land. Drainage along the project corridor is accomplished with a combination of roadside ditches, cross drains, and side drain pipes that are located under driveways and roadways. These basins along the corridor are considered to be closed basins and some are located within the Peck Sink Watershed near S.R. 50 and Cobb Road. The project area will require investigation to avoid these sink areas and chimneys.

Flooding History

The FDOT straight-line diagrams, USGS Quadrangle maps, SWFWMD topographic maps, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs) and conversations with FDOT Maintenance, City of Brooksville and Hernando County personnel were used to identify flood-prone areas within the S.R. 50 corridor. Field inspections were conducted to identify obvious drainage problems.

FDOT Maintenance staff stated that the flooding associated with this corridor is located around Cobb Road, California Street and Dunn Street around milepost 7.2 to 7.4 where clayey soils exist. There is also some new development in low areas that are having some flooding problems. There are no identified flooding problems west of Cobb Road to U.S. 19 where sandy soils are predominant, and no other flooding problems associated with FDOT drainage structures have been identified for the length of this project.

FEMA FIRM Panels

FEMA has prepared the following Flood Insurance Rate Maps (FIRMs) for Hernando County, dated April 17, 1984:

- 120110 0140 B
- 120110 0150 B
- 120110 0175 B
- 120110 0190 B

FEMA also prepared the following Flood Insurance Rate Map (FIRM) for the City of Brooksville, dated September 18, 1986:

- 120333 0001 C

There are no FEMA regulatory floodways within the project corridor.

Floodplain Encroachment

The project corridor from U.S. 19 (S.R. 55) to the west intersection of S.R. 50/S.R. 50A encroaches FEMA 100-year base floodplain areas that are designated as Zone A. Zone A is described as areas of 100-year flooding where flood elevations are undetermined.

The project corridor from the west intersection of S.R. 50/S.R. 50A to U.S. 41 [along the Brooksville Bypass] encroaches FEMA 100-year base floodplain areas that are designated as Zones A and AH. These floodplain encroachments have been compensated for in the previous design project for the S.R. 50, Brooksville Bypass (this design was performed by Dames and Moore, Inc. for FDOT).

The recommended improvements encroach into the floodplain at six locations along the project length. It should be noted that those floodplains are as identified by FEMA; however, due to the closed basin conditions of this project the entire length of the corridor was evaluated for 100-year flooding as part of the Reevaluation Study. The preliminary drainage design approach that was used in the project's separate *Pond Siting Report* took this into consideration to avoid impacting 100-year flood elevations, including and beyond those that were identified by FEMA. This design approach designated large shallow ponds, that did not have berms and that were above seasonal high water (SHW), with sufficient volumes to compensate for the additional runoff of the widened roadway plus any reduction in the existing roadside ditch systems.

Risk Assessment and Conclusion

In accordance with the FDOT PD&E Manual guidelines, Part 2, Chapter 24, effective date 4/22/98, this longitudinal floodplain involvement has been categorized by level of significance and project activity. The level of significance is determined to be minimal and the project activity is Category 5. Although the project is not necessarily within "heavily urbanized floodplains", development is occurring at a fast rate in the study area and the flooding conditions are inherent to the area's topography. A preliminary hydraulic evaluation was used as a means of selecting the project activity category for each floodplain encroachment location.

The following Floodplain Statement applies to the base floodplain encroachment for the recommended action in the S.R. 50 project corridor:

Floodplain Evaluation Category 5 – Projects on existing alignment involving replacement of drainage structures in heavily urbanized floodplains.

“Replacement drainage structures for this project are limited to hydraulically equivalent structures. The limitations to the hydraulic equivalency being proposed are basically due to restrictions imposed by the geometrics of design, existing development, cost feasibility, or practicability. An alternative encroachment location is not considered in this category since it defeats the project purpose or is economically unfeasible. Since flooding conditions in the project area are inherent in the topography or are a result of other outside contributing sources, and there is no practical alternative to totally eradicate flood impacts or even reduce them in any significant amount, existing flooding will continue, but not be increased. The proposed structure will be hydraulically equivalent to or greater than the existing structure, and backwater surface elevations are not expected to increase. As a result, the project will not affect existing flood heights or floodplain limits. This project will not result in any new or increased adverse environmental impacts. There will be no 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.”

The recommended capacity improvements along S.R. 50 are consistent with the existing watershed and floodplain management programs for both Hernando County and the City of Brooksville based on their Comprehensive Plans.

Based on consultations with local, state, and federal water resource and floodplain management agencies, it has been determined that there is no regulatory floodway involvement for the proposed project. In addition, the project will not support base floodplain development that is incompatible with existing floodplain management programs.

The recommended improvements include adequate drainage design and compensation for loss of floodplain storage. The floodplain storage compensation will be accomplished within the project’s stormwater management ponds. The floodplain compensation will be designed to have a direct hydraulic connection to the floodplain at or below the 100-year base flood elevation.