DOCUMENT ADDENDUM
FINAL LOCATION HYDRAULIC REPORT

S.R. 39
FROM I-4 to U.S. 301
HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

Work Program Item Segment Nos: 255099 1 & 256289 1
Federal Aid Project No: F-321-1(4)

This proposed project involves multi-lane improvements to S.R. 39 and the proposed extension of the Alexander Street Bypass from I-4 in Hillsborough County to U.S. 301 in Pasco County, a distance of approximately 21.2 km (13.2 mi)

Prepared for:

Florida Department of Transportation
District Seven
11201 North McKinley Drive
Tampa, Florida 33612

April 2001

The attached Final Location Hydraulic Report (LHR) was completed in October 1999. This addendum provides updated project information that was not available in the previous LHR that was available for public review prior to and at the Public Hearing that was held on April 20, 2000. This addendum improves consistency between the LHR and the Environmental Assessment/Finding of No Significant Impact (EA/FONSI) that was approved by the Federal Highway Administration (FHWA) on November 14, 2000.

INTRODUCTION

Through the Project Development and Environment (PD&E) Study process, the Florida Department of Transportation (FDOT) evaluated the expansion of S.R. 39 to a four-lane facility from the vicinity of Joe McIntosh Road in Hillsborough County to the vicinity of U.S. 301 in Pasco County (Addendum Figure 1). In addition, the FDOT evaluated the extension of Alexander Street Bypass as a four-lane facility from Interstate 4 (I-4) northward to S.R. 39 in the vicinity of Joe McIntosh Road.

The S.R. 39 corridor is functionally classified as a north/south minor arterial facility between I-4 and U.S. 301. S.R. 39 is part of the Federal-Aid Primary and State Highway System and is classified as an emergency evacuation route. The project limits extend from I-4 in Plant City and Hillsborough County to U.S. 301 in Pasco County, a distance of 21.2 kilometers (km) [13.2 miles (mi)].

The existing S.R. 39 within the project limits contains a two-lane undivided typical section with 3.658 meter (m) [12 foot (ft)] wide travel lanes, 1.219 m (4 ft) paved shoulders, and open roadside ditches on both sides of the roadway. The existing right-of-way (ROW) varies from 18.288 m (60 ft) to 45.720 m (150 ft).

S.R. 39 is currently a two-lane undivided roadway with drainage ditches adjacent to the existing roadway. A CSX Transportation railroad line parallels the existing roadway on the east side of S.R. 39 for approximately 17.7 km (11.0 mi) from the existing S.R. 39 and I-4 intersection to a point just north of Crystal Springs in Pasco County.

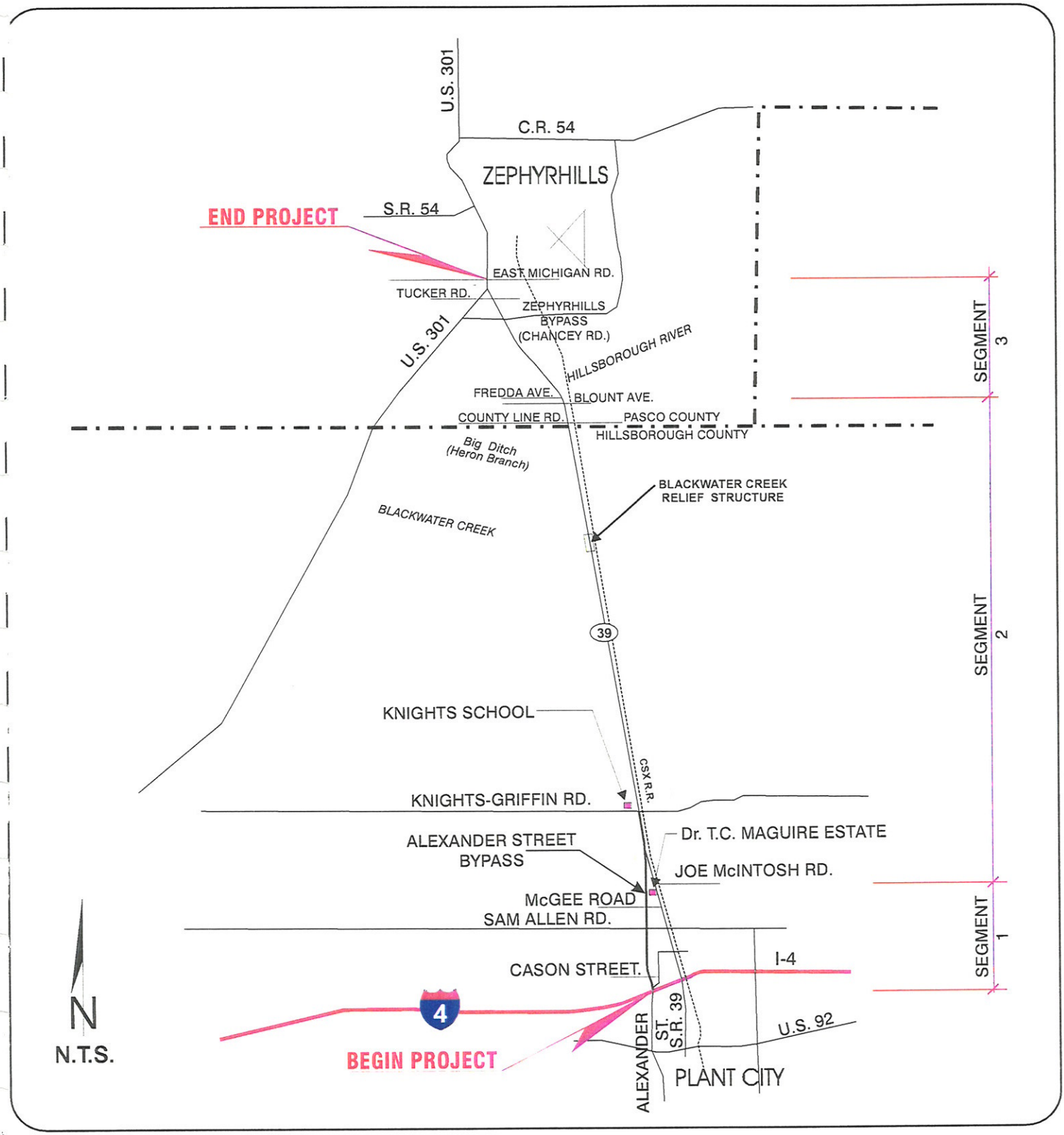
PROPOSED IMPROVEMENTS

The FHWA approved project involves multi-lane improvements to S.R. 39 and the planned extension of the Alexander Street Bypass from I-4 in Hillsborough County to U.S. 301 in Pasco County, a distance of approximately 21.2 km (13.2 mi). The Alexander Street Bypass portion from I-4 to the vicinity of Joe McIntosh Road is approximately 4.02 km (2.5 mi). This new alignment alternative is located to the west of S.R. 39 between I-4 and Joe McIntosh Road due to significant land use constraints on S.R. 39, including the Memorial Park Cemetery in the vicinity of I-4. Overall, improvements will consist of a four-lane divided roadway on new alignment (the Alexander Street Bypass) and improvement to S.R. 39 north of the merge point with the Alexander Street Bypass northward. The existing S.R. 39 north of the merge point will be improved from a two-lane undivided roadway to a four-lane divided facility.

DOCUMENT SPECIFIC UPDATES

This update to the LHR includes the following:

- Project Location Map has been updated (Addendum Figure 1).
- Refer to the Final Preliminary Engineering Report (October 2000) (PER) for project typical sections.
- All current FDOT design standards are to be used.
- Table 3 Proposed Cross Drain Information, missing from the October 1999 LHR has been included as part of this addendum (Addendum Table 3).



FLORIDA DEPARTMENT OF TRANSPORTATION

S.R. 39

From I-4 to U.S. 301
Pasco County, Florida

PROJECT LOCATION MAP

Work Program Item Segment #: 255099 1 & 256289 1
FAP #: F-321-1(4)

FIGURE 1

TABLE 3

PROPOSED CROSS DRAIN INFORMATION
S.R. 39 Location Hydraulics Report

Structure I.D.	Quantity	Type	Size CBC: m x m (ft x ft) RCP: mm (in)	Proposed Length m (ft)	Station (m)	Drainage Area hectares (acres)	Outfall Basin
AB-1	2	CBC	2.44 x 1.22 (8 x 4)	65.5 (215)	26 + 20	126 (312)	Pemberton Creek
AB-2	3	CBC (Bridge Culvert)	2.44 x 0.91 (8 x 3)	57.9 (190)	34 + 20	58 (144)	Pemberton Creek
AB-3	2	RCP	600 (24)	66.5 (218)	48 + 50	8 (20)	Hollomans Branch
AB-4	2	CBC	2.74 x 0.91 (9 x 3)	67.7 (222)	55 + 50	62 (153)	Hollomans Branch
AB-5	2	RCP	900 (36)	65.5 (215)	59 + 50	3 (7)	Hollomans Branch

FINAL
LOCATION HYDRAULICS REPORT

S.R. 39
FROM I-4 TO U.S. 301
HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

Work Program Item Segment Nos: 255099 1 & 256289 1
Federal Aid Project No: F-321-1(4)

This proposed project involves multi-lane improvements to S.R. 39 and the proposed extension at the Alexander Street Bypass from I-4 in Hillsborough County to U.S. 301 in Pasco County, a distance of approximately 21.2 kilometers (13.2 miles).

Prepared by:

URS Corporation Southern
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Tampa, Florida 33607

October 1999

DOCUMENT ADDENDUM
FINAL LOCATION HYDRAULIC REPORT

S.R. 39
FROM I-4 to U.S. 301
HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

Work Program Item Segment Nos: 255099 1 & 256289 1
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This proposed project involves multi-lane improvements to S.R. 39 and the proposed extension of the Alexander Street Bypass from I-4 in Hillsborough County to U.S. 301 in Pasco County, a distance of approximately 21.2 km (13.2 mi)

Prepared for:

Florida Department of Transportation
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April 2001

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EXECUTIVE SUMMARY

The proposed project involves multi-lane improvements to S.R. 39 from I-4 in Hillsborough County to U.S. 301 in Pasco County, a distance of approximately 21.2 kilometers (km) [13.2 miles (mi)]. From I-4 to the vicinity of Joe McIntosh Road, a segment of roadway on new alignment is being proposed, referred to as the Alexander Street Bypass, for a distance of approximately 4.02 km (2.5 mi). This new alignment alternative, located to the west of S.R. 39, is being proposed as an alternative to multi-lane improvements on S.R. 39 within these project limits due to significant land use constraints on S.R. 39, including the Memorial Park Cemetery in the vicinity of I-4. Overall, improvements will consist of a four-lane divided roadway on new alignment, the Alexander Street Bypass, and improvements to S.R. 39 on the existing alignment from the existing two-lane roadway to a four-lane divided facility. S.R. 39 is part of the Federal-Aid Primary and State Highway Systems, however, it is not classified as an emergency evacuation route.

This project involves modifications to existing drainage structures and would result in an insignificant change in their capacity to carry floodwater. This change would cause minimal increases in flood heights and flood limits. These minimal increases would not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant change in flood risks or damage. There would not be a significant change in the potential for interruption or termination of emergency service routes. Therefore, it has been determined that this encroachment would not be significant.

This report addresses the existing and proposed cross drain structures and floodplain impacts for this project. Analyses were performed to determine preliminary sizes of all the proposed cross drain structures and the capacity of the "worst case," or critical existing cross drain for the 50-year storm event and 0.03 in (0.1-ft) of rise in headwater.

Five cross drains are proposed for construction along the new Alexander Street Bypass alignment, and are described in Table 1.

TABLE 1

PROPOSED CROSS DRAINS
S.R. 39 Location Hydraulics Report

Name	Location (m)	Size/Type
AB-1	26 + 20	Double 2.44 m x 1.22 m (8 ft x 4 ft) CBC
AB-2	34 + 20	Triple 2.44 m x 0.91 m (8 ft x 3 ft) CBC (Bridge Culvert)
AB-3	48 + 50	Double 600 mm (24 inches) RCP
AB-4	55+50	Double 2.74 m x 0.91 m (9 ft x 3 ft) CBC
AB-5	59+50	Double 900 mm (36 inches) CBC

The sizes provided in the above table are preliminary and may be revised in the final design stage of this project.

The critical existing cross drain that was analyzed is located at station 84 + 66, labeled D-5, which is immediately south of Lanier Road on the existing S.R. 39 alignment. Presently, D-5 is a double 1.83 m x 0.91 m (6 ft x 3 ft) CBC approximately 25.9 in (85 feet) long. The analysis shows that extending its length would not cause the headwater to rise more than 0.03 m (0.1 ft).

There are two bridges and one bridge culvert along the existing S.R. 39 alignment. The first bridge, proceeding north, traverses Blackwater Creek in Hillsborough County. The bridge crossing at Blackwater Creek is being studied by others and, therefore, is not described in detail in this LHR. A triple (3.05 x 1.22 m) (10- x 4-ft) CBC bridge culvert, crossing Big Ditch (also known as Heron Branch) is located in Hillsborough County. The second bridge is a 96.01 m (315-ft) steel girder bridge supported by timber piles crossing the Hillsborough River in Pasco County. The Hillsborough River is classified as an Outstanding Florida Water (OFW) and immediately downstream (west) of S.R. 39 it is a floodway as designated by the Federal Emergency Management Agency (FEMA). The addition of a bridge parallel to the existing bridge over the Hillsborough River would not cause adverse backwater effects.

Floodplain impacts would be kept to a minimum by using existing alignment and right-of-way to the extent possible. Avoidance of encroachments is not practical due to the high cost of changing the

roadway alignment. The proposed design indicates that there would be no significant impacts to the base flood, likelihood of flood risk, overtopping, or increased backwater.

SECTION 1.0
INTRODUCTION

The Florida Department of Transportation (FDOT) is conducting a Project Development and Environment (PD&E) Study to evaluate multi-lane improvement alternatives for the S.R. 39 study corridor from I-4 to U.S. 301 in Hillsborough and Pasco Counties, Florida

The objective of the PD&E Study is to provide documented environmental and engineering analyses that will help the FDOT and the Federal Highway Administration (FHWA) reach a decision on the type, conceptual design, and location of the necessary improvements along the S.R. 39 corridor to accommodate future transportation needs in a safe and efficient manner.

1.1 PROJECT DESCRIPTION

The proposed project involves multi-lane improvements to S.R. 39 from I-4 in Hillsborough County to U.S. 301 in Pasco County, a distance of approximately 21.2 kilometers (km) [13.2 miles (mi)]. From I-4 to the vicinity of Joe McIntosh Road, a segment of roadway on new alignment is being proposed, referred to as the Alexander Street Bypass, for a distance of approximately 4.02 km (2.5 mi). This new alignment alternative, located to the west of S.R. 39, is being proposed as an alternative to multi-lane improvements on S.R. 39 within these project limits due to significant land use constraints on S.R. 39, including the Memorial Park Cemetery in the vicinity of I-4. Overall, improvements will consist of a four-lane divided roadway on new alignment, the Alexander Street Bypass, and improvements to S.R. 39 on the existing alignment from the existing two-lane undivided roadway to a four-lane divided facility. S.R. 39 is part of the Federal-Aid Primary and State Highway Systems, however, it is not classified as an emergency evacuation route. The S.R. 39 corridor is functionally classified as a north/south minor arterial facility between I-4 and U.S. 301.

The project is located within Sections 5, 6, 8, 17, and 20 of Township 28 South, Range 22 East; Sections 6, 7, 18, 19, 30, and 31 of Township 27 South, Range 22 East; and Section 1 of Township 27 South, Range 21 East in Hillsborough County and Sections 14, 23, 24, 25, and 36 of Township

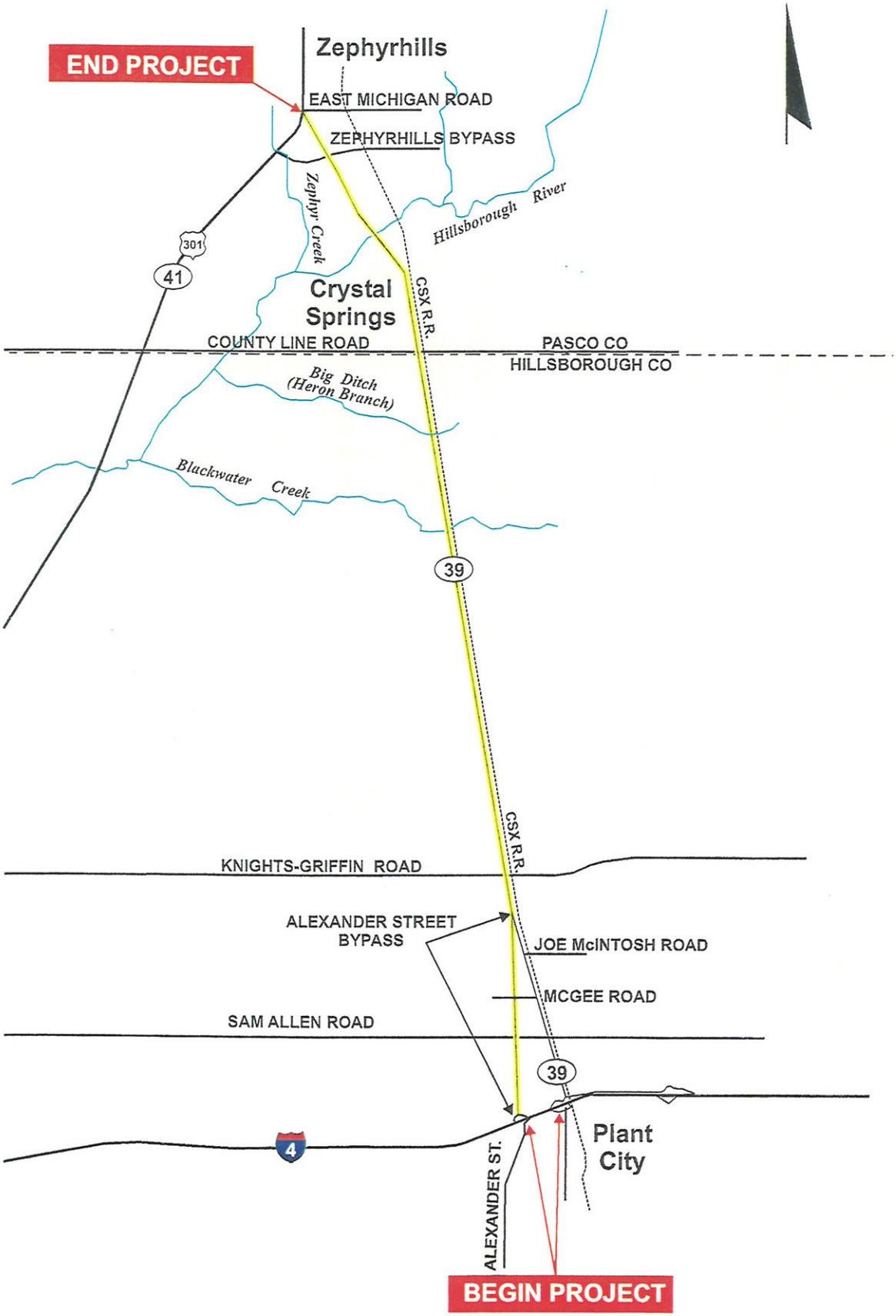
26 South, Range 21 East in Pasco County. The location and limits of the project are shown in Figure 1.

The project includes two bridges and one bridge culvert along the existing S.R. 39 alignment. The bridges include the crossings of the Blackwater Creek in Hillsborough County and the Hillsborough River in Pasco County. The bridge culvert crosses Big Ditch (Heron Branch) in Hillsborough County.

The Alexander bypass, approximately 4.0 km (2.5 mi) in length, will include crossings of upper tributaries of Pemberton Creek. Proposed typical sections will predominantly be rural with an urban typical section at the U.S. 301 intersection. The proposed improvements will provide a median ditch, upgrading two of the three bridge crossings, and extending or replacing the existing cross drains. The bridge crossings at Blackwater Creek are currently being designed (October 1999) for reconstruction/rehabitation and details regarding these structures are contained in the Bridge Development Reports dated May 21, 1999 and August 1999. S.R. 39 in this project corridor is not designated as an evacuation route by the Tampa Bay Regional Planning Council.

S.R. 39 is currently a two-lane undivided roadway with drainage ditches adjacent to the existing roadway. A CSX Transportation railroad line parallels the existing roadway on the east side of SR 39 for approximately 17.7 km (11.0 mi) from the existing S.R. 39 and I-4 intersection to a point just north of Crystal Springs.

The existing land use patterns along the S.R. 39 corridor are both urban and rural in character. At the southern terminus, the Plant City urban district extends northward from I-4 to the vicinity of Sam Allen Road. This area is primarily residential in nature with minor commercial development. The Memorial Park Cemetery is located in the northwest quadrant of I-4 and S.R. 39. Land uses in the central portion of the study area from Sam Allen Road north to the vicinity of Zephyrhills consist of agricultural uses, rural residential development, vacant parcels, and a few commercial/industrial uses. Based on the Hillsborough County and Pasco County Comprehensive Plans, development activity adjacent to, and in the vicinity of, the S.R. 39 corridor is converting from agricultural land use to residential, commercial, and industrial land use. In addition, an ultra-light aircraft airport is



PROJECT LOCATION MAP

S.R. 39 FROM I-4 TO U.S. 301

WPI SEGMENT No. 255099 1 FAP No. F-321-1(4)

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

URS Greiner

Figure 1

located to the east of S.R. 39. At the northern portion of the project in Zephyrhills, the land uses are primarily residential development.

The existing posted speed limit along the S.R. 39 corridor varies between 72 kilometers per hour (km/h) [45 miles per hour (mph)] and 86 km/h (55 mph).

1. 2 GUIDELINES AND SOURCES

This Location Hydraulics Report (LHR) identifies impacts to the 100-year floodplains resulting from the proposed improvements, and is prepared according to the requirements set forth in Executive Order 11988, "Floodplain Management" and Federal Aid Policy Guide. Engineering specifics will be further addressed during the project design phase.

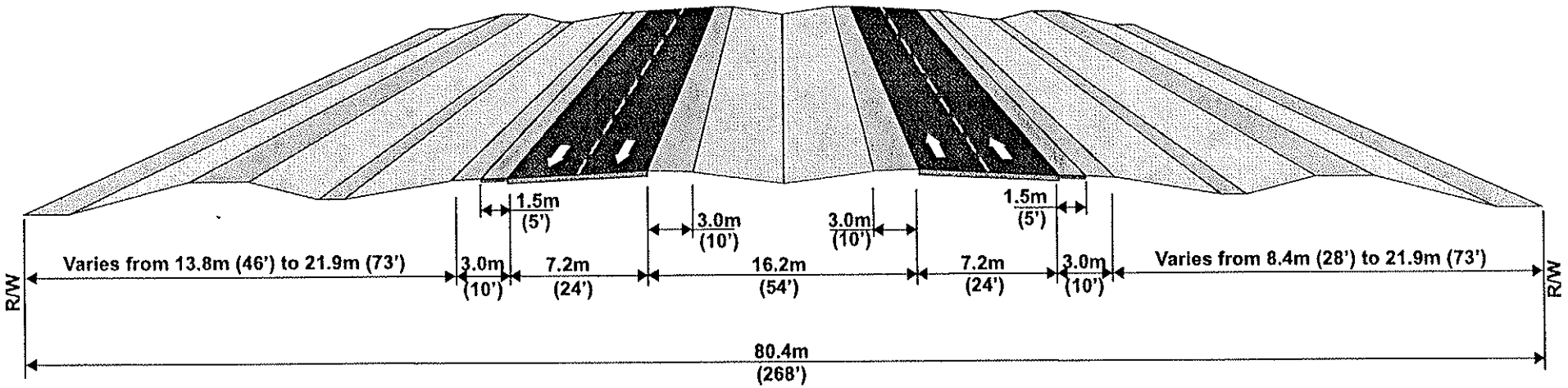
Sources of information for the investigation and development of this report include:

- USGS Quadrangle Maps;
- Southwest Florida Water Management District (SWFWMD) Contour Maps;
- FEMA Flood Insurance Rate Maps for Hillsborough and Pasco Counties;
- FEMA Flood Insurance Studies for Hillsborough and Pasco Counties;
- Soil Surveys of Hillsborough and Pasco Counties;
- Florida Department of Transportation S.R. 39 Widening Plans;
- Recent I-4 Plans and Drainage Calculations;
- City of Plant City, Westside Canal Stormwater Management Master Plan; and
- Floodplain Information on the Blackwater Creek and Hillsborough River Watershed by SWFWMD.

A detailed list of references is provided in Section 10.0 of this document.

The scope of this report covers general planning information. Much of the existing data was taken from FDOT construction plans and previous design information. Detailed calculations will be

required for each structure during the design phases of the project. All cross drains on S.R. 39 from I-4 to US 301 are addressed in this report. In determining the floodplain impacts, this report uses the typical sections shown in Figures 2 and 3.



FROM I-4 TO SHADY OAKS DRIVE

Based on 0.45m (1.5ft.) to
1.8m (6ft.) of Fill to Proposed PGL

TYPICAL SECTION

S.R. 39 FROM I-4 TO U.S. 301

WPI SEGMENT No. 255099 1 FAP No. F-321-1(4)

HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

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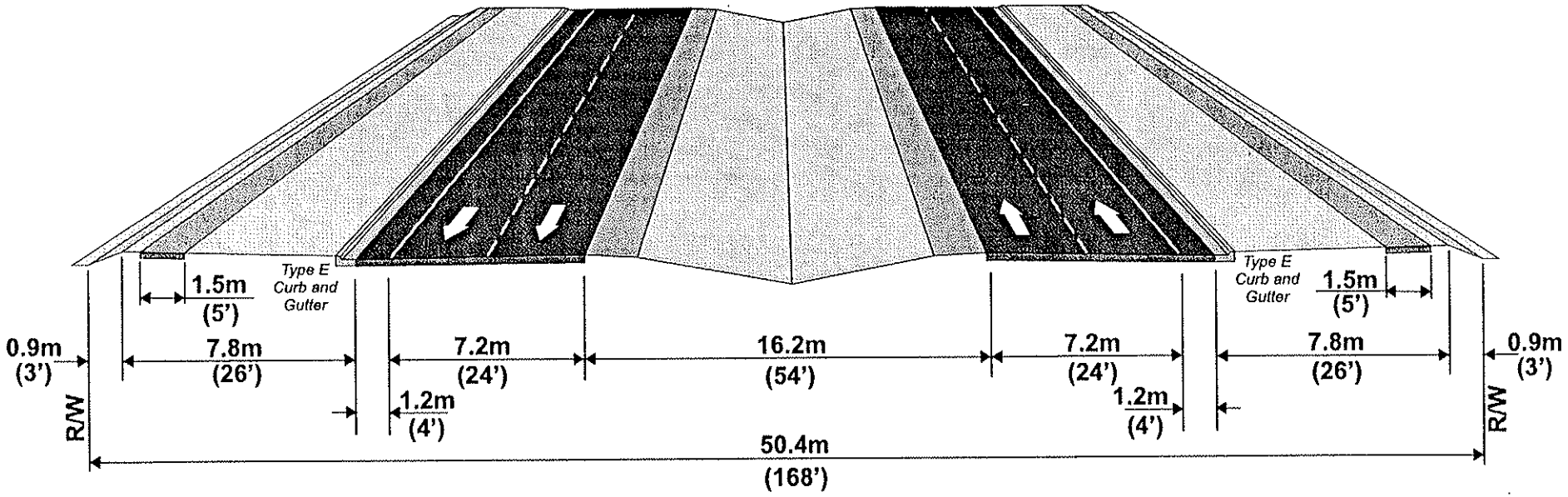
Figure 2



FROM SHADY OAKS DRIVE TO U.S. 301

Based on 0.45m (1.5ft.) of Fill to Proposed PGL

TYPICAL SECTION

S.R. 39 FROM I-4 TO U.S. 301
WPI SEGMENT No. 255099 1 FAP No. F-321-1 (4)
HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

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Figure 3

SECTION 2.0

EXISTING DRAINAGE SYSTEM

Stormwater runoff for the project is currently conveyed through roadside ditches with outfalls to the following basins: Pemberton Creek, Holloman's Branch, East Canal, Itchepackesassa Creek, Two Hole Branch, Blackwater Creek, Big Ditch, Hillsborough River, and Zephyr Creek.

Historically, drainage flows that cross S.R. 39 in the project corridor are primarily from east to west, but in a few cases, the flows travel from west to east. In some fill sections, no ditches exist, and water simply flows from the road to natural ground. Presently, there are no formal or permitted stormwater management or treatment facilities for roadway runoff along the existing subject alignment.

The existing drainage structures along S.R. 39 were identified in the field in February 1999 and by examining existing roadway plans (see Appendix A for the Photograph Log). Twenty-one crossings were located, including 18 culverts, 1 bridge culvert, and 2 bridges, along the existing S.R. 39 alignment between Joe McIntosh Road and U.S. 301. Of the cross drains, nine are concrete box culverts that were originally constructed in 1915. Some existing structures have been extended from earlier widening(s) of S.R. 39. One of the box culverts has been extended with RCPs. Table 2 gives pertinent information about the existing cross drains. The first bridge, proceeding up-station, traverses Blackwater Creek in Hillsborough County and is a 49 m (161 ft) long composite steel bridge with a triple 13.71 m (45 ft) long semi-circular arch flood relief structure. A triple 3.05 x 1.22 m (10- x 4-ft) CBC bridge culvert, crossing Big Ditch (also known as Heron Branch) is located in Hillsborough County. The second bridge is a 96.01 m (315 ft) steel girder bridge supported by timber piles crossing the Hillsborough River in Pasco County. The Hillsborough River is classified as an Outstanding Florida Water (OFW) and immediately downstream of S.R. 39 is a FEMA designated floodway.

All structures are in good condition and are functioning properly with only silt removal of some of the culverts required for optimum performance. No traffic interruption is caused due to local flooding of the existing cross drains. FDOT maintenance staff members have reported that most of

TABLE 2

EXISTING CROSS DRAIN INFORMATION
S.R. 39 Location Hydraulics Report

Structure I.D.	Quantity	Type	Size CBC: m x m (ft x ft) RCP: mm (in) Bridge (Overall Length): m (ft)	Existing Length m (ft)	Milepost km (miles)	Drainage Area hectares (acres)	Outfall Basin
D-5	2	CBC	1.83 x 1.22 (6 x 4)	25.9 (85)	8.087 (5.026)	362.88 (896)	East Canal
D-6	1	CBC	2.13 x 0.91(7 x 3)	25.9 (85)	10.560 (6.559)	99.23 (245)	Blackwater Creek
D-7	1	CBC	1.22 x 1.22 (4 x 4)	25.9 (85)	12.727 (7.905)	74.12 (183)	Blackwater Creek
D-8	1	CBC with 750 mm (30 in) Extension	0.61 x 0.61 (2 x 2)	25.0 (82)	13.862 (8.610)	3.24 (8)	Blackwater Creek
B-1 (Bridges at Backwater Creek)	2 (6 span and 3 span)	Composite steel bridge and triple semi-circular arch relief structure	49 (161) [main channel bridge] 13.71 (45) [relief structure]	7.4 (24.2) (curb-to-curb dimensions)	13.967 - 14.068 (8.675-8.738)	28,512.00 (70,400)	Blackwater Creek
D-9	1	CBC	1.22 x 0.91 (4 x 3)	22.9 (75)	14.786 (9.184)	29.16 (72)	Blackwater Creek
D-10	1	CBC	1.22 x 0.91 (4 x 3)	22.9 (75)	15.351 (9.535)	38.48 (95)	Blackwater Creek
D-11	2	CBC	2.44 x 0.91 (8 x 3)	22.9 (75)	15.614 (9.698)	87.08 (215)	Blackwater Creek
D-12	Does not exist						
B-2 (Bridge culvert at Big Ditch [Heron Branch])	3	Triple CBC bridge culvert	Triple 3.05 x 1.22 (10 x 4)	22.9 (75)	16.364 (10.164)	925.43 (2,285)	Big Ditch
D-13	1	CBC	0.91 x 0.91 (3 x 3)	24.3 (80)	16.659 (10.347)	3.65 (9)	Big Ditch (Heron Branch)
D-14	1	CBC	0.91 x 0.91 (3 x 3)	24.3 (80)	17.341 (10.771)	36.45 (90)	Big Ditch (Heron Branch)
D-15	2	RCP	750 (30)	25.9 (85)	0.138 (0.086)	20.25 (50)	Hillsborough River
D-16	1	RCP	750 (30)	25.6 (84)	0.068 (0.042)	2.43 (6)	Hillsborough River
D-17	2	RCP	900 (36)	23.5 (77)	1.594 (0.990)	2.84 (7)	Hillsborough River
D-18	1	RCP	450 (18)	22.9 (75)	1.835 (1.140)	8.10 (20)	Hillsborough River

TABLE 2 (Continued)

EXISTING CROSS DRAIN INFORMATION
S.R. 39 Location Hydraulics Report

Structure I.D.	Quantity	Type	Size CBC: m x m (ft x ft) RCP: mm (in) Bridge (Overall Length): m (ft)	Existing Length m (ft)	Milepost km (miles)	Drainage Area hectares (acres)	Outfall Basin
D-19	2	RCP	900 (36)	22.3 (73)	2.095 (1.301)	8.10 (20)	Hillsborough River
B-3 (Bridge at Hillsborough River)	(21 spans)	Steel girder bridge at Hillsborough River	96.0 (315)	7.9 (26) (roadway dimensions)	2.552-2.648 (1.585-1.645)	56,505.60 (139,520)	Hillsborough River
D-20	1	RCP	750 (30)	25.9 (85)	3.204 (1.990)	7.29 (18)	Hillsborough River
D-21	3	RCP	900 (36)	25.6 (84)	3.795 (2.357)	Not applicable (equalizer)	Zephyr Creek
D-22	1	RCP	900 (36)	25.6 (84)	4.832 (3.001)	20.25 (50)	Zephyr Creek
D-23	1	RCP	600 (24)	22.3 (73)	5.257 (3.265)	8.10 (20)	Zephyr Creek

the existing drainage system functions properly and adequately. The latest Bridge Inspection Report (BIR) for the bridge culvert at Heron Branch and the Hillsborough River Bridge are provided in Appendix B.

The BIR for the bridge culvert at Heron Branch states the sufficiency rating of the structure is 94.6, status 0, and the bridge culvert is generally in good condition with some siltation occurring. There are no guard rails existing at this structure, and the BIR recommends they be installed.

The BIR for the Hillsborough River Bridge states the sufficiency rating of the structure is 78 and has a status of 1. The bridge was constructed in 1947, and generally, the bridge is in good condition according to the BIR. All of the piles have small cracks appearing, and three of the piles exhibit rotting at their bases. One pile has more severe rotting occurring than the others. The recommended repair for this pile is to determine the depth of rot below grade and install a structural pile jacket.

2.1 EXISTING CROSS DRAINS

Personnel from the FDOT maintenance units were contacted concerning flooding occurrences at the existing cross drains (see Appendix E). The Tampa maintenance unit, which maintains the portion of S.R. 39 in Hillsborough County, identified two of the existing cross drains within the project limits having flooding problems, structures D-5 and D-7 (see maps in Appendix D). The reported flooding problems at the two cross drains do not appear to be due to insufficient culvert capacity but to inadequate outfall situations. The flooding problems at D-5 and D-7 appear to be caused by the downstream cross drains at the CSX railroad. The railroad cross drains were constructed with their inverts higher than those of the adjacent cross drains D-5 and D-7, or the highway culverts were constructed with their inverts lower than the invert of the railroad cross drains. Therefore, the flooding problems at D-5 and D-7 are not due to recent construction activities.

D-5 was deemed the, "worst case," or critical existing cross drain because it has the largest drainage area flowing to it. The existing D-5 cross drain is a double 1.83 m x 0.91 m (6 ft x 3 ft) CBC with a length of 25.9 m (85 feet). Extending D-5's length to 59.7 m (196 feet) will not cause the headwater for the 50-year storm to rise more than 0.03 in (0.1 ft). Therefore extending D-5 will not affect the 50-year floodplain significantly. See Appendix C for the D-5 culvert capacity analysis.

The Dade City maintenance unit was contacted concerning flooding problems occurring along the portion of S.R. 39 in Pasco County. Some flooding problems have occurred at existing side drains near Chancey Road, (C.R. 535) but the flooding does not appear to have been extensive during recent storm events. Larry Boone of this maintenance unit stated that some of side drains near the Crystal Springs Post Office appear to have been installed too high.

SECTION 3.0
PROPOSED DRAINAGE SYSTEM

The proposed drainage system for this project would be designed to carry stormwater runoff away from the roadway in the natural flow directions of that particular basin. In most cases, this would require modifications to existing structures, such as culvert extensions, to correspond to the new roadway sections and clear zone requirements. The existing structures could be extended without significant impacts to headwater elevations or negative effects to emergency services and evacuation. FDOT criteria requires that the proposed headwater at modified structures should not rise more than 0.03 m (0.1 ft) for the 50-year design storm event.

Stormwater management ponds will be required for this project, and potential pond sites will be evaluated and provided in the Pond Siting Report.

3.1 PROPOSED CROSS DRAINS

Five cross drains are proposed for the Alexander Street Bypass. Proceeding up-station from the proposed I-4 interchange, the first proposed cross drain AB-1 (AB, acronym for Alexander Bypass) would occur at Mill Creek, a tributary of Pemberton Creek, at approximately Station 26 + 20. This tributary drains most of the I-4/S.R. 39 (existing) interchange in a westerly direction. Mill Creek crosses below Franklin Street through double 165-mm (42-inch) RCPs, which are approximately 427 m (1,400 ft) upstream of the proposed AB-1 cross drain.

The next cross drain proposed up-station, AB-2, would occur at a second branch of Pemberton Creek. This tributary is not a well-defined channel but more like a broad floodplain crossing. This tributary flows in a southwesterly direction and drains much of the area southwest of the intersection of the existing S.R. 39 and Sam Allen Road. Proposed cross drain AB-2 would be constructed at approximately Station 34 + 20.

A third cross drain, AB-3, would be constructed at approximately Station 48 + 50. It would drain a small area west of the proposed Alexander Street Bypass to the east, similar to the natural drainage pattern.

A fourth proposed cross drain, AB-4, would be located at approximately Station 55 + 50 north of the proposed Alexander Street Bypass and I-4 intersection. An existing ditch occurs at this location and drains a large area from McGee Road up to Joe McIntosh Road west of S.R. 39 and a drainage area east of S.R. 39 and the CSX Railroad line. The portion the drainage area east of S.R. 39 and the CSX Railroad drains to the existing ditch via the existing S.R. 39 cross drain, D-4.

A fifth proposed cross drain, AB-5, would be located at station 59 + 50. It would drain a 7-acre area between the proposed Alexander Street Bypass and the existing S.R. 39 north of Joe McIntosh Road.

Table 3 shows the proposed cross drains, and the calculations are contained in Appendix C.

SECTION 4.0

FLOOD ZONE DESCRIPTIONS

The Federal Emergency Management Agency (FEMA) has developed Flood Insurance Rate Maps (FIRMs) for the unincorporated areas of Hillsborough, Pasco counties and Plant City in the vicinity of the project. Information from the FEMA FIRMs was transferred to USGS Quadrangle maps to show the floodplain limits on the maps provided in Appendix D. Base floodplain, or 100-year floodplain, impacts will occur at a total of 10 locations and all will be transverse in nature. FEMA FIRMs relevant for this project are listed in Section 10.0.

Of the cross drains proposed for the Alexander Street Bypass, two would transversely encroach onto 100-year floodplains. These proposed transverse floodplain crossings would occur at structures AB-1 (station 26 + 20) and AB-2 (station 34 + 20) over tributaries of Pemberton Creek. The proposed alignment will also encroach onto a 100-year floodplain at proposed structure AB-4 (station 55 + 50). There is an existing ditch at this location. The construction of AB-4 will be a transverse crossing and, therefore, it will be a transverse floodplain encroachment.

The proposed improvements to S.R. 39 along the existing alignment would transversely cross FEMA-designated 100-year floodplains at the following existing cross drains:

- D-6 (station 108 + 25),
- D-8 (station 142 + 00),
- B-1 (station 143 + 00),
- B-2 (station 166 + 00),
- D-14 (station 176 + 00), and
- B-3 (station 204 + 50).

The 100-year floodplain is adjacent to the existing alignment south of existing cross drain D-6 (station 104 + 30), near Bruton Road, and the proposed widening would minimally impact the floodplain at that location. The floodplain encroachment at station 104 + 30 is unavoidable in this

area because the existing alignment is adjacent to the floodplain and widening of S.R. 39 will encroach into it. Realignment of S.R. 39 would create greater floodplain encroachment. The realignment of S.R. 39 at the north terminus will create a transverse floodplain impact near U.S. 301 at station 231 + 00.

All floodplain impacts will require 1:1 volume compensation via excavation in the corresponding floodplain.

SECTION 5.0

SOIL CONDITIONS

The National Resource Conservation Service (NRCS, formerly Soil Conservation Service or SCS) soil survey for Hillsborough County shows 19 soil types within the existing and proposed alignments for S.R. 39, which are summarized in Table 4. Almost all of the soils in this section of the project have shallow depths to the Seasonal High Water Table (SHWT). The depths to the SHWT for this project range from 0.61 m (2.0 ft) above grade to greater than 1.83 m (6.0 ft) below grade.

TABLE 4

HILLSBOROUGH COUNTY SOILS
S.R. 39 Location Hydraulics Report

NRCS (SCS) Soil Type	NRCS (SCS) Map Symbol	Hydrologic Soil Group	Depth to Seasonal High Water Table [m (ft)]
Basinger	5	D	+.61 - 0.30 (+2.0 - 1.0)
Candler	7	A	>1.83 (> 6.0)
Chobee	10 / 12	B/D	0.30 (1)
Eaton	13	D	0.30 (1)
Felda	15	B/D	0 - 0.30 (0.0 - 1.0)
Floridana	17	B/D	0 - 0.30 (0.0 - 1.0)
Ft. Meade	18	A	>1.83 (> 6.0)
Gainesville	19	A	>1.83 (> 6.0)
Lake	25	A	1.83 (> 6.0)

TABLE 4 (CONTINUED)

HILLSBOROUGH COUNTY SOILS
S.R. 39 Location Hydraulics Report

NRCS (SCS) Soil Type	NRCS (SCS) Map Symbol	Hydrologic Soil Group	Depth to Seasonal High Water Table [m (ft)]
Malabar	27	B/D	0 - 0.30 (0.0 - 1.0)
Myakka	29	B/D	0 - 0.30 (0.0 - 1.0)
Orlando	35	A	>1.83 (> 6.0)
St. Johns	46	B/D	0 - 0.30 (0.0 - 1.0)
Seffner	47	C	0.46 - 1.07 (1.5 - 3.5)
Smyrna	52	B/D	0 - 0.30 (0.0 - 1.0)
Tavares	53	A	1.07 - 1.83 (3.5 - 6.0)
Wabasso	57	B/D	0 - 0.30 (0.0 - 1.0)
Winder	59	B/D	0 - 0.30 (0.0 - 1.0)
Zolfo	61	C	0.61 - 1.07 (2.0 - 3.5)

The SCS soil survey for Pasco County shows 10 different soil types within the existing and proposed alignments for S.R. 39 and are summarized in Table 5. Almost all of the soils in this section of the project, like the section in Hillsborough County, have shallow depths to the SHWT. The depths to the SHWT for this project range from at grade to 1.83 m (6.0 ft) below grade.

TABLE 5

PASCO COUNTY SOILS
S.R. 39 Location Hydraulics Report

NRCS (SCS) Soil Type	NRCS (SCS) Map Symbol	Hydrologic Soil Group	Depth to Seasonal High Water Table [in (ft)]
Wauchula	1	B/D	0 - 0.30 (0.0 - 1.0)
Pomona	2	B/D	0 - 0.30 (0.0 - 1.0)
Tavares	6	A	1.07 - 1.83 (3.5 - 6.0)
Sparr	7	C	0.46 -1.07 (1.5 - 3.5)
Vero	10	B/D	0 - 0.30 (0.0 - 1.0)
Zephyr	16	D	0.30 (1.0)
Electra Variant	18	C	0.61 - 1.07 (2.0 - 3.5)
Smyrna	21	A/D	0 - 0.30 (0.0 - 1.0)
Chobee	39	B/D	0 - 0.30 (0.0 - 1.0)
Lochloosa	48	C	0.76 - 1.52 (2.5 - 5.0)

SECTION 6.0

HYDROLOGY AND HYDRAULICS

As proposed, this project will widen the existing roadway from two to four lanes, with an ultimate six-lane section. This will require that existing cross drains be extended or replaced with a hydraulically equivalent culvert size. Table 6 summarizes the results of the backwater analyses for the worst-case existing cross drain, D-5, the proposed culverts for the Alexander Street Bypass, and the Hillsborough River Bridge.

TABLE 6

CROSS DRAIN BACKWATER ANALYSIS RESULTS
S.R. 39 Location Hydraulics Report

Cross Drain Number	50-Year Existing Headwater Elevation (m [ft] NGVD)	50-Year Proposed Headwater Elevation (m [ft] NGVD)	100-Year Existing Headwater Elevation (m [ft] NGVD)	100-Year Proposed Headwater Elevation (m [ft] NGVD)
D-5	31.46 (103.2)	31.49 (103.3)	31.65 (103.8)	31.70 (104.0)
AB-1	32.61 (107.1)	32.63 (107.1)	32.74 (107.4)	32.78 (107.5)
AB-2	32.89 (107.9)	32.92 (108.0)	32.92 (108.0)	32.97 (108.1)
AB-3	30.63 (100.5)	30.66 (100.6)	30.63 (100.5)	30.66 (100.6)
AB-4	31.39 (103.0)	31.42 (103.1)	31.39 (103.0)	31.43 (103.1)
AB-5	32.00 (105.0)	32.02 (105.0)	32.00 (105.0)	32.02 (105.1)
B-3 (Hillsborough River)	19.72 (64.7)	19.72 (64.7)	19.93 (65.4)	19.93 (65.4)

The sizes of the proposed culverts, AB-1 through AB-5, which produced the headwaters elevations in the above table are preliminary and may be changed in the final design stage of this project.

SECTION 7.0

STRUCTURE CATEGORIZATION

As set forth in the FDOT PD&E Guidelines, the proposed hydraulic improvements should be categorized based on type of improvement and the approximate floodplain impact. The existing culverts and bridges were evaluated and identified as either Categories 3 or 4 structures.

Category 3: Project Involving Modifications to Existing Drainage Structures.

This applies to structures D5 through D23 and B2. These drainage structures are in fairly good condition throughout the project. Silting is occurring in some areas, but no structure appeared to need replacement because of deterioration. The existing cross drains would be extended to accommodate the proposed additional two lanes including the 11 m (36 ft) clear zone. Using HY-8 software based on techniques provided in FHWA Hydraulic Design Series #5 for the hydraulic calculations, the change in the headwater for a 50-year storm was less than 0.030 m (0.1 ft), which is below the allowable high water. As a result of this computation, the following general statement can be made:

> *"The modifications to drainage structures included in this portion of the project will result in an insignificant change in their capacity to carry floodwater. This change will cause minimal increases to flood heights and flood limits. These minimal increases will not result in any significant adverse impacts on the natural and beneficial floodplain values or any 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."*

Category 4: Projects on Existing Alignment Involving Replacement of Existing Drainage Structures with No Record of Drainage Problems.

The two bridges included in this project were classified as Category 4. The proposed structures should not reduce the hydraulic performance of existing facilities. Also, there is no record of drainage problems and no unresolved drainage complaints from residents in these areas.

7.1 B1- BLACKWATER CREEK

Blackwater Creek downstream of S.R. 39 is a floodplain. Upstream of the bridge is a broad floodplain that is extremely sensitive to changes in backwater elevations. To maintain historical elevations in both directions replacement/rehabilitated structures are currently (October 1999) being designed to perform hydraulically equivalent to the existing structures. The existing S.R. 39 contains two narrow bridges in the Blackwater Creek area. The bridge over Blackwater Creek (Bridge #10036) will be lengthened from 49.33 m (161.8 ft.) to 63 m (206.7 ft.) with a replacement structure to improve hydraulic flow conditions. The Blackwater Creek Relief Structure (Bridge #100037) will be reconstructed/rehabilitated and maintain its current length of 21.4 m (70.2 ft.). Details regarding these structures are contained in the Bridge Development Reports dated May 21, 1999 and August 1999.

7.2 B3 - HILLSBOROUGH RIVER

The Hillsborough River, like Blackwater Creek, is FEMA-regulated from S.R. 39 downstream. Upstream, the bridge design must meet Pasco County criteria requiring no increase in head loss above existing conditions.

It is proposed to replace the existing bridge, in kind, with a parallel bridge of the same length constructed for the two new lanes. Preliminary WSPRO analyses show that the water surface elevations will not vary upstream or downstream from the existing conditions for dual 320-ft bridges. This will also meet the Pasco County requirement of no increase in head loss for new structures.

As a result of the WSPRO analysis, the following general statement can be made for Bridge B3:

> *"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 risks, and 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."

7.3 PROPOSED STRUCTURES

The five proposed cross drains for the Alexander Street Bypass are classified as either Category 1 or 6.

Category 1: Projects which will not involve any work below the 100-year flood elevation.

The 100-year floodplain areas were determined from applicable FEMA FIRM maps. The proposed structures along the Alexander Street Bypass which will be classified as Category 1 are AB-3 and AB-5 the following statement can be made:

Although this involves work within the horizontal limits of the 100-year floodplain, no work is being performed below the 100-year flood elevation and, as a result, this project does not encroach upon the base floodplain."

Category 6: Projects on new alignment, and projects on existing alignment with potentially significant changes in 100-year flood elevations.

The proposed Alexander Street Bypass drainage structures which will be classified as Category 6 are AB-1, AB-2, and AB-4 and the following statement can be made:

"The construction of the drainage structure(s) proposed for this project will cause changes in flood stage and flood limits. These changes will not result in any significant adverse impacts on the natural and beneficial floodplain values or any significant changes in flood risk or damage. These changes have been reviewed by the appropriate regulatory authorities who have concurred with the determination that there will be no significant impacts. There will not be 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."

SECTION 8.0
REGULATORY AUTHORITIES

8.1 LOCAL AGENCIES

Local government agencies with jurisdictions overlapping the project area include the cities of Zephyrhills and Plant City and Pasco County and Hillsborough County.

8.2 STATE AGENCIES

The state agencies involved in the permitting process for the S.R. 39 drainage systems would be the Florida Department of Environmental Protection (FDEP) and the Southwest Florida Water Management District (SWFWMD). Permits would be required for all dredge and fill work within, or areas connected to, Waters of the State (Chapter 17-4.23, FAR), and FDEP has delegated most dredge and fill permitting to SWFWMD.

Stormwater systems would be permitted through SWFWMD pursuant to Chapter 40D-4 FAC. The systems must provide storage for stormwater quantity and quality. The corridor lies adjacent to numerous wetlands areas that must be considered in the design of the stormwater systems. The Hillsborough River is an Outstanding Florida Water (OFW). Projects discharging directly to OFWs shall be required to provide treatment for a volume 50 percent more than required for the selected treatment system. This criteria also applies to existing treatment capacity being displaced by roadway projects.

One-to-one volume compensation would have to be made for storage volume lost due to roadway embankment in the 100-year floodplain.

8.3 FEDERAL AGENCIES

The U.S. Army Corp of Engineers (USACE) would be involved in permitting dredge and fill activities in Pasco and Hillsborough counties. The USACE issues permits for dredge and fill activities in the Waters of the United States.

A National Pollutant Discharge Elimination System (NPDES) permit is administered by the U.S. Environmental Protection Agency (EPA) for stormwater discharges into waters of the United States.

SECTION 9.0
CONCLUSION

The proposed drainage improvements consisting of extending existing culverts and adding or replacing existing bridges to accommodate improvements within the S.R. 39 study corridor should not adversely affect the surrounding area. The existing flood zones fit the surrounding flat lowland terrain and should not change because of the widening. The area surrounding the corridor is urban and rural in nature with numerous wetlands. This improvement to existing facilities should have minimal effect on development in flood zones. The improvement of the roadway should help emergency services. The widening of S.R. 39 adjacent to the existing alignment is the most viable solution because of the numerous wetland areas and the railroad to the east.

At the south end of the corridor, new drainage structures for the Alexander Bypass would have minor impacts, but such impacts are limited to 0.03 m (0.1 ft) of backwater in a 50-year event.

SECTION 10.0

REFERENCES

1. USGS Quad Maps, Plant City West, Fla, 1975 Zephyrhills, Fla. 1975.

2. The following SWFWMD Aerials

   Sections 5, 6, 8, 17, 20; Township 28 E; Range 22S

   Sections 6, 7, 18, 19, 30, 31; Township 27E; Range 22S

   Section 1 Township 27E; Range 21S

   Sections 14, 23, 24, 25, 36; Township 26E; Range 21S

3. FEMA Flood Insurance Rate Maps

Panel No.	Community	Effective Date
120113 0005B	Plant City	April 29, 1983
120112 0270D	Hillsborough County	August 3, 1992
120112 0260C	Hillsborough County	April 17, 1984
120112 0120C	Hillsborough County	April 17, 1984
120230 0470B	Pasco County	November 11, 1981
120230 0460D	Pasco County	September 30, 1992

4. FIS Hillsborough County, August 3, 1992.
   FIS Pasco County, May 18, 1981.

5. NRCS Soils Surveys for Hillsborough County (1989) and Pasco County (June 1982).

6. Design Documentation for I-4 Drainage, (Volumes 1 through 4). Improvements (Segment 4) State Project Number :10190-431, Work Program Number: 7143200, Federal Aid and Project Number: DPI-0043-(1). Proposed for FDOT by Parsons Brinkerhoff, Revised March 1996.

7. City of Plant City, Florida, Westside Canal Stormwater Management Plan, May 1997, by Camp Dresser and McKee.

8. Floodplain Information on the Blackwater Creek Watershed, Blackwater Creek, East Canal and Itchepackesassa. Prepared by the staff of the Southwest Florida Water Management District, Brooksville, Florida, August 1980.

9. Floodplain Information on the Hillsborough River Watershed, Hillsborough River and New River. Prepared by the staff of the Southwest Florida Water Management District, Brooksville, Florida, August 1980.

10. Project Development Environmental Studies, Location Hydraulic Report For State Road 39, Hillsborough and Pasco Counties, WPI No.: 7113335 & 7115925, State Project No.: 10200-1508 and 14110-1503, 1993.

11. Draft Bridge Hydraulic Analysis, SR 39 Over Blackwater Creek, Hillsborough County, Florida," FPID No.: 257163-1-5201, State Project No.: 10200-1515, Work Program No.: 7113773, 1999.

APPENDIX A

PHOTOGRAPH LOG

VIEW OF D-1 LOOKING WEST

VIEW OF D-2 LOOKING WEST

S.R. 39 FROM I-4 TO U.S. 301
WORK PROGRAM ITEM SEGMENT NO. 225099 1
HILLSBOROUGH AND PASCO COUNTIES

VIEW OF D-3 LOOKING NORTH

VIEW OF D-4 LOOKING WEST

S.R. 39 FROM I-4 TO U.S. 301
WORK PROGRAM ITEM SEGMENT NO. 225099 1
HILLSBOROUGH AND PASCO COUNTIES

VIEW OF D-5 LOOKING EAST

VIEW OF D-6 LOOKING EAST

VIEW OF D-7 LOOKING EAST

VIEW OF D-8 LOOKING EAST

VIEW OF D-9 LOOKING WEST

VIEW OF D-10 LOOKING EAST

VIEW OF D-11 LOOKING WEST

VIEW OF D-13 LOOKING WEST

S.R. 39 FROM I-4 TO U.S. 301
WORK PROGRAM ITEM SEGMENT NO. 225099 1
HILLSBOROUGH AND PASCO COUNTIES

VIEW OF D-14 LOOKING WEST

VIEW OF D-15 LOOKING EAST

S.R. 39 FROM I-4 TO U.S. 301
WORK PROGRAM ITEM SEGMENT NO. 225099 1
HILLSBOROUGH AND PASCO COUNTIES

VIEW OF D-16 LOOKING WEST

VIEW OF D-17 LOOKING EAST

VIEW OF D-18 LOOKING EAST

VIEW OF D-19 LOOKING EAST

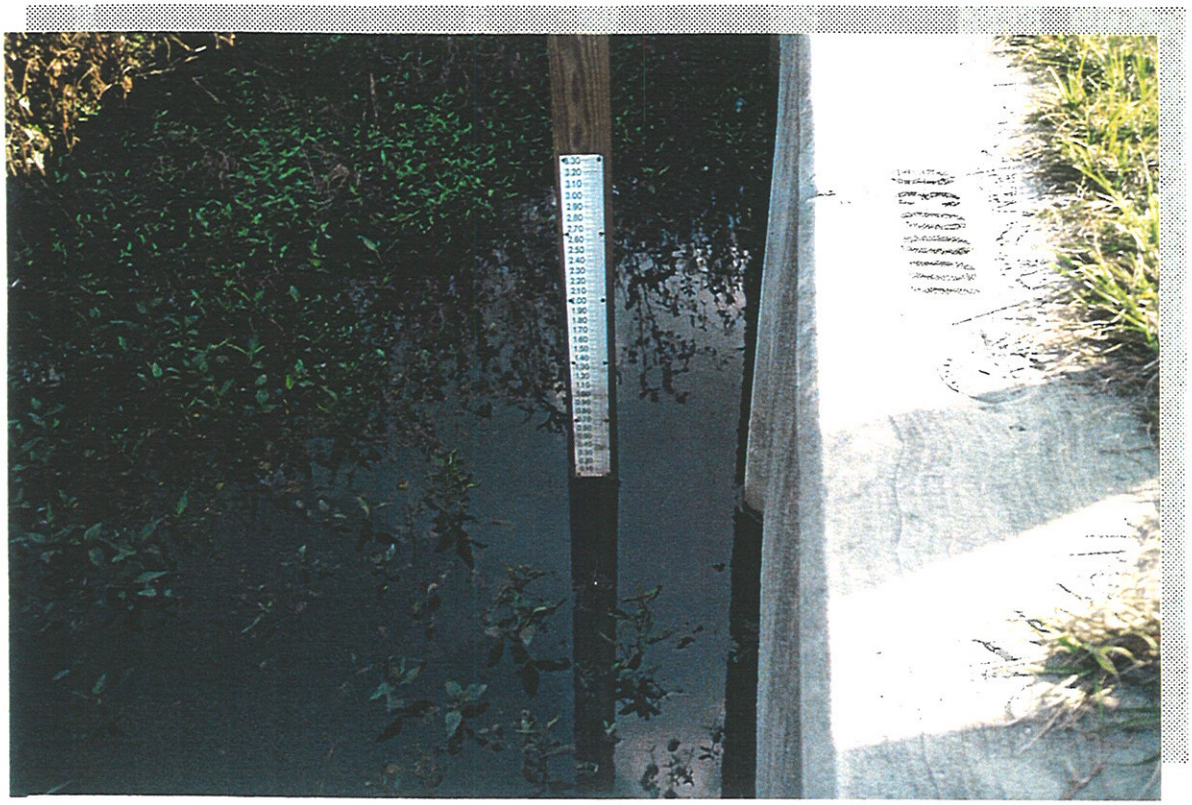
VIEW OF D-20 LOOKING EAST

VIEW OF D-21 LOOKING EAST

VIEW OF D-22 LOOKING WEST

VIEW OF D-23 LOOKING EAST

S.R. 39 FROM I-4 TO U.S. 301
WORK PROGRAM ITEM SEGMENT NO. 225099 1
HILLSBOROUGH AND PASCO COUNTIES



VIEW OF STAFF GAUGE AT BIG DITCH (B-2)

VIEW OF BIG DITCH (B-2) LOOKING WEST

VIEW OF THE HILLSBOROUGH RIVER (B-3)

VIEW OF THE HILLSBOROUGH RIVER (B-3) LOOKING EAST

APPENDIX B

BRIDGE INSPECTION REPORTS

EXISTING BRIDGE CULVERT
OVER BIG DITCH (HERON BRANCH)

BRIDGE INSPECTION REPORT
Prepared by
KISINGER, CAMPO, & ASSOCIATES

CONTENTS OF REPORT

A. Condensed Inspection Report
B. Comprehensive Report of Deficiencies
C. Evaluation of Previous Corrective Action
D. Required Maintenance Repair and Rehabilitation
* E. Methods, Quantities and Costs of Contract Corrective Action
* F. Field Preparation
* G. Fracture Critical Inspections
* H. Scour Evaluation
I. Load Rating Analysis
J. BMIS Report

* This section is not included in this report.

REPORT IDENTIFICATION

Bridge No.: 100038 Bridge Name: SR 39 over Heron Branch

Location: 1.2km South of Pasco County Line

Section No. 10200
US R. N/A
S.R. 39
M.P. 10.164
RD. SYS. 901

NO	YES	
X		This bridge contains fracture critical components?
X		This bridge is scour critical?
X		This report identifies deficiencies which require prompt corrective action?

Type of inspection: [X] Routine [ ] Interim [ ] Special _____

Field Inspection Date: Above Water 01/06/98 Under Water: <1m

Name of Inspector/Diver	Initials	Engineering Registration Number	Certified Bridge Inspection No.
M.H. Betz, CBI (Senior Inspector In Charge)	MHB		00162
R.D. Uptegraff			
(Senior Diving Inspector/Diver)			

Reviewing Bridge Inspection Supervisor

Name: K.C. Reinhold, CBI 00025 Initials: KCR

PE or CBI Number:

Confirming Registered Professional Engineer

Name: P.G. Foley, PE P.E. Number: 40978

Signature PG Foley 2/4/98

STATE OF FLORIDA DEPARTMENT OF TRANSPORTA

CONDENSED INSPECTION REPORT
CULVERT STRUCTURES

FORM 850-010-08-a
REPLACES 571-30
MAINTENANCE
04/91

BRIDGE NUMBER 100038

INSPECTION DATE 01/06/98

APPROACH ROADWAY MAJOR FEATURE

BMIS NO.	ELEMENT TITLE	NCR **
G4.00	Approach Roadway Overall Rating	8
G4.02	Retaining Walls/Approach Slopes/Embankments/Shoulder	8
G4.03	Roadway-Bridge Transition	N
G4.04	Guardrails	*N
G4.05	Roadway Alignment	8

CHANNEL-MAJOR FEATURE

BMIS NO.	ELEMENT TITLE	NCR **
G5.00	Channel and Channel Protection Overall Rating	7
G5.03	Embankments/Slopes	7
G5.04	Degradation/Aggregation	*7
G5.05	Alignment	8
G5.06	Flow	*6

NON-STRUCTURAL FEATURES

BMIS NO.	ELEMENT TITLE	NCR **
G6.01	Lighting Systems	N
G6.02	Signs	N
G6.03	Striping (Roadway Reflective)	4
G6.04	Reflectors	4
G6.05	Utility Attachments	N
G6.08	Traffic Control and Monitoring Systems	N
G6.09	Deck Cleanness	N
G6.12	Fences and Glare Screens	N

CULVERTS

BMIS NO.	ELEMENT TITLE	NCR **
G7.00 (62)	Culvert Overall Rating	7
G7.01	Deck(Top)/Surfacing	N
G7.02	Deck(Underside)	7
G7.03	Side Walls	*7
G7.04	Head Walls	*7
G7.05	Wing Walls	7
G7.06	Floor Slabs	N
G7.07	Handrails/Barriers/ Sidewals	N

NUMERICAL CONDITION RATING DEFINITIONS FOR NON-STRUCTURE FEATURES

CODE	DESCRIPTION
N	NOT APPLICABLE
4	GOOD - Performs intended function with high degree of reliability and/or effectiveness.
3	FAIR - Performs intended function with small reduction in reliability and/or effectiveness.
2	MARGINAL - Performs intended function with significant reduction in reliability and/or effectiveness; repair or replacement may be required.
1	POOR - Does not perform intended function at an acceptable level of reliability and/or effectiveness; repair or replacement is required.

NUMERICAL CONDITION RATING DEFINITIONS FOR CHANNNEL

CODE	DESCRIPTION
N	NOT APPLICABLE - Use when culvert is not over waterway.
9	EXCELLENT CONDITION - No noticable or noteworthy deficiencies which effect the condition of the channel.
8	VERY GOOD CONDITION - Banks are protected or well vegetated. River control devices, such as spur dikes and embankment protection are not required or are in stable condition. Some minor scour has occurred near culvert.
7	GOOD CONDITION - Bank protection is in need of minor repairs. Waterway control devices and embankment protection have minor damage. Banks and/or channnel have minor amounts of drift. Minor local scour developing near culvert.
6	SATISFACTORY CONDITION - Bank is beginning to slump. Waterway control devices and embankment protection have considerable minor damage. There is minor stream bed movement evident. Debris is restricting the waterway slightly. Scour holes deepening.
5	FAIR CONDIITION - Bank protection is being eroded. Waterway control devices and/or embankment have major damage. Trees and brush restrict the channel. Scour holes are becoming more prominent, affecting the stability of the culvert.
4	POOR CONDITION - Bank and embedment protection undermined with corrective action required. Waterway control devices have severe damage. Large deposits of debris in the waterway. The stream bed has changed its location but is causing no problem.
3	SERIOUS CONDITION - Bank protection has failed completely. Scour holes forming in embankment. Waterway control devices have been destroyed. Stream bed aggregation or degradation has changed the waterway to now threaten the culvert and/or approach roadway.
2	CRITICAL CONDITION - Abutment has failed (portion has settled) due to undermining of footing. The waterway has changed and now threatens the culvert and/or embankment. Scour is of sufficient depth so that culvert is near state of collapse.
1	"IMMENINENT"FAILURE CONDTION - Culvert closed corrective action may put structure back into light service.
0	FAILED CONDITION - Culvert closed. Replacement necessary.

* - Deficiencies exist in this element that warrant written and/or sketched descriptions that are provided in section B of this report.

** - NCR is an abbreviation for Numerical Condition Rating, the definitions of which can be found on the back of this pag

621-526

Bridge No.: 100038
County Section No.: 10200
State Road No.: 39
US Road No.: N/A

Location: 1.2km South of Pasco County Line
Inspection Date: 01/06/98
Inspector: M.H. Betz, CBI
Mile Post No.: 10.164

B. COMPREHENSIVE REPORT OF DEFICIENCIES

G4.04 GUARDRAILS

There are no guardrails present at this structure. The recovery zone from the northbound lane line is 8.6m, and from the southbound lane line 7.9m.

G5.04 DEGRADATION/AGGREGATION

The following are groundline measurements referenced to the top of the head wall. These measurements have been provided to compare and monitor scour or build up. All measurements were taken in meters.

	Left Side 07/97	Right Side 07/97
Wall 1	1.5	1.5
Centerline	1.8	1.7
Wall 2	1.8	1.7
Centerline	1.7	1.6
Wall 3	1.8	1.7
Centerline	1.8	1.6
Wall 4	1.5	1.5
Waterline	1.1	1.2

No previous measurements have been taken to date.

G5.06 FLOW

An average of 1m of dirt has accumulated in the center of Barrel 1. Also, on the west side of the structure there is a moderate amount of vegetation growth.

G7.03 SIDE WALLS

There is Class 1 and Class 2 scaling, from the bottom up to less than 1m. Also, the side walls contain Class 1 and Class 2 vertical cracks in the old section of culvert.

G7.04 HEAD WALLS

Both head walls contain Class 1 vertical cracks, and there are Class 2 vertical cracks located at the northeast, southeast, and southwest corners of the structure.

NOTE: For G4.04, see page 5.
Mike Kelly 3/19/98

Bridge No.: 100038 Location: 1.2km South of Pasco Coun y Line
County Section No.: 10200 Inspection Date: 01/06/98
State Road No.: 39 Inspector: M.H. Betz, CBI
US Road No.: N/A Mile Post No.: 10.164

C. Evaluation of Previous Corrective Action

G4.04 GUARDRAILS

Activity: 526 LF Guardrail Repair
Number of Units: 500
Work Force: State

Repair Description:
Install guardrail on both sides of structure.

Evaluation:
No corrective action was taken on the above recommendation.

G5.06 FLOW

Activity: 805 MH Clean-Vegetation or Debris Removal
Number of Units: 10
Work Force: State

Repair Description:
Remove the dirt from barrels, and clear vegetation from channel.

Evaluation:
No corrective action was taken on above recommendation. Heavy rains have reduced the build-up in Barrels 2 and 3. Barrel 1 still contains dirt build-up.

Bridge No.: 100038
County Section No.: 10200
State Road No.: 39
US Road No.: N/A

Location: 1.2km South of Pasco County Line
Inspection Date: 01/06/98
Inspector: M.H. Betz, CBI
Mile Post No.: 10.164

D. Required Maintenance Repair and Rehabilitation

STATE FORCES

TRAFFIC RESTRICTION: This structure currently requires no weight restriction posting as per the results of the most recent load rating analysis dated 09/09/91. Our inspection did not reveal significant deterioration to suggest the need for a new load rating analysis.

WORK ORDERS

G4.04 GUARDRAILS

Activity: 898 MH Miscellaneous Bridge M & R
Number of Units: 40

Repair Description:
Install guardrail on both sides of structure.

FYI Item. E-Mail sent to the Local Maintenance Engineer on 3/19/98. Chuck Kelly

3/31/98

COMMENTS:

National Bridge Inventory
Structure Inventory and Appraisal Report
100038

Last NBI Inspection **1/1/98**

Sufficiency Rating	*	94.6
Status	0	

Identification

State Name: Florida Region: Atlanta
Bridge ID: **100038**
Inventory Route:(On/Under): On Route On Structure
Kind Highway: 3 State Highway
Level of Service: Mainline
Route Number: 00039
Directional Suffix: !
Highway Agency District: D7 - Tampa
County Code: (10)Hillsborou Place Code: No city involved
Features Intersected: **HERON BRANCH**
Facility Name: SR 39
Location: **1.2KM S/O PASCO CO LINE**
Kilometer Point: 10.164 km
Onbasenet: 0
sinvrt: 00102000 SubRt Num: 0
Latitude: 280936
Longitude: 820918
Border Bridge State Code: -2 ! % Share: 0 %
Border Bridge Structure No.:

Structure Type & Material

Main NBI Unit
Material Co
Design Cul

No. of Spans in Main Unit: 3
No. of Approach Spans: 0
Deck StructureType: !
Type of Wearing Surface: !
Type of Membrane: !
Type of Deck Protection: !

Age and Service

Year Built: 1941
Year Reconstruction: 1987
Type Service: On: 1 Under: 5
Avg Daily Traffic: 6500 Year of ADT: 1996
Lanes: 2 Truck Pct: 20 %
Detour Length: 18 km

Classification

NBIS Bridge Length: Y
Highway System: 3 State Highway
Functional Class: 02 Rural Princ. Arterial - Other
Defense Highway: 0
Parallel Structure: N
Directions of Traffic: 2
Temporary Structure: !
Federal Lands Highways: !
Designated National Network: 0
Toll: 3 On Free Road
Maintenance Responsibility:
1 State Highway Agency
Owner: 1 State Highway Agency
Historical Significance: 4
Undeterminable Hist. Significance

Condition

Deck: N
Superstructure: N
Substructure: N
Channel and Channel Protection: 7
Culverts: 7

Status

Structure Open, Posted, or Closed: A

Load Rating and Posting

Design Load: M
Operating Rating Method: 1
Operating Rating: 99.9
Inventory Rating Method: 1
Inventory Rating: 72.5
Bridge Posting: 5

Geometric Data

Length of Maximum Span: 3.3 m
Structure Length: 9.9 m
Curb or Sidewalk: Lt: 0 m Rt: 0 m
Rdway Width Curb to Curb: 0 m
Deck Width Out to Out: 0 m
Appr Rdwy (w/Shoulders): 9.7 m
Bridge Median: 0 # 0
Skew: 0 Structure Flared: No flare
Min Vert Clr/Inv Route: 99.99 m
Invt Rte Total Horiz Clear: 23.8 m
Min Vert Clear over Bridge Rdwy: 99.99 m
Min Vert Underclear: Reference:
! 0 m
Min Horiz Lat UndrClrs: Reference:
! Rt: 0 m
Lt: 0 m

Appraisal

Structural Evaluation: 7
Deck Geometry: !
Undercirs, Vertical Horizontal: N
Waterway Adequacy: 7
Approach Roadway Alignment: 9

Traffic Safety Features

Bridge Guardrails: !
Transitions: !
Approach Guardrails: !
Approach Guardrail Ends: !
Scour Critical Bridge: 8

Proposed Improvements

Type of Work -2 By: !
Length of Structure Improvement: 0
Bridge Improvement Cost $Thousands: 0
Roadway Improvement Cost $Thousands: 0
Total Project Cost $Thousands: 0
Improvement Cost Estimate (Yr.):
Future ADT: 10185
Year of Future ADT: 2018

Navigation Data

Navigation Control: 0
Pier Protection: !
Navigation Vertical Clearance: 0 m
Vert-Lift Bridge Nav Min Vert Clear: 0 m
Navigation Horizontal Clearance: 0 m

Past Inspections

Inspection Date: 01.01.1998 Type: 1
Inspector: BID Pontis User Key: BID
Inspection Notes:

Structural Units

Structural Unit: 0 MAIN SPAN 1 NBI Main Span ☒ NBI Approach Span ☐
Notes:

Bridge Notes

EXISTING S.R. 39 BRIDGE
OVER THE HILLSBOROUGH RIVER

BRIDGE INSPECTION REPORT
PREPARED BY DAVID VOLKERT & ASSOCIATES, INC.

CONTENTS OF REPORT

* This section is not included in this report.

REPORT IDENTIFICATION

Bridge No.: 140007 Bridge Name: SR-39 Over Hillsborough River

Location: 2 Miles south of US-301 Section No. 14110

US R. N/A

S.R. 39

M.P. 1.585

RD. SYS. 901

NO	YES	
[X]	[ ]	This bridge contains fracture critical components?
[X]	[ ]	This bridge is scour critical?
[X]	[ ]	This report identifies deficiencies which require prompt corrective action?

Type of inspection: [X] Routine [ ] Interim [ ] Special _____

Field Inspection Date: Above Water 02-19-97 Under Water: 02-27-97

Name of Inspector/Diver		Initials	Engineering Registration Number	Certified Bridge Inspection No.
K.S. King	(Senior Inspector In Charge)	KSK		00265
R.C. Obi				
V.L. Griswold (Dive Tech)	(Senior Diving Inspector/Diver)			00030
A. Bibelhauser (Dive Tech				

Reviewing Bridge Inspection Supervisor

Name: D.B. Teal 42097 Initials: DBT

PE or CBI Number:

Confirming Registered Professional Engineer

Name: D.B. Teal P.E. Number: 42097

Signature _____ 5/27/97

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION

CONDENSED INSPECTION REPORT
FIXED SPANS

FORM 850-010-09-a
REPLACES 571-30
MAINTENANCE
04/91

BRIDGE NUMBER 140007

INSPECTION DATE 02-19-97

DECK COMPONENT			SUPERSTRUCTURE COMPONENT			SUBSTRUCTURE COMPONENT		
BID NO.	ELEMENT TITLE	NCR **	BID NO.	ELEMENT TITLE	NCR **	BID NO.	ELEMENT TITLE	NCR **
G1.00 (58)	Deck Overall Rating	7	G2.00 (59)	Superstructure Overall Rating	7	G3.00 (60)	Substructure Overall Rating	7
G1.01	Deck(Top)/Surfacing	*7	G2.01	Bearings	7	G3.01	Piling/Shafts	*6
G1.02	Deck(Underside)	7	G2.02	Beams/Stringers/Box& Plate Girders/Flat Slabs/Arches	7	G3.02	Footings/Caissons	N
G1.03	Expansion Joints	7	G2.03	Floor Beams	N	G3.03	Columns/Wall Piers	N
G1.04	Construction Joints	N	G2.04	Main Girders	N	G3.04	Intermediate Caps (Bent & Pier)	7
G1.05	Drainage System	7	G2.05	Diaphragms/Sway Bracing	N	G3.05	Bracing/Struts/Web Walls	7
G1.06	Curbs/Medians/Sidewalks	7	G2.06	Lateral Bracing	N	G3.06	Abutements/End Bents	7
G1.07	Handrails/Barriers/Parapets	7	G2.07	Upper Chords	N	G3.07	Slope Protection/Slope	*7
			G2.08	Lower Chords	N			
			G2.09	Verticals	N			
			G2.10	Diagonals	N	NON-STRUCTURAL FEATURES		
			G2.11	Portals	N	BID NO.	ELEMENT TITLE	NCR **
			G2.12	Fracture Critical Members	N	G6.01	Lighting Systems	N
APPROACH ROADWAY MAJOR FEATURE			CHANNEL- MAJOR FEATURE			G6.02	Signs	N
BID NO.	ELEMENT TITLE	NCR **	BID NO.	ELEMENT TITLE	NCR **	G6.03	Striping (Roadway Reflective)	2
G4.00	Approach Roadway Overall Rating	7	G5.00 (61)	Channel and Channel Protection Overall Rating	8	G6.04	Reflectors	3
G4.01	Approach Slabs	7	G5.01	Fender System	N	G6.05	Utility Attachements	N
G4.02	Retaining Walls/Approach Slopes/Embankments/Shoulder	7	G5.02	Navigation Lights and Aids	N	G6.06	Fishing Walks	N
G4.03	Roadway-Bridge Transition	N	G5.03	Embankments/Slopes/ Pulkheads	7	G6.07	Attenuators	N
G4.04	Guardrails	7	G5.04	Degradation/Aggregation	6	G6.08	Traffic Control and Monitoring Systems	N
G4.05	Roadway Alignment	8	G5.05	Alignment	8	G6.09	Deck Cleanness	3
			G5.06	Flow	8	G6.10	Superstructure Cleanness	4
						G6.11	Substructure Cleanness	4
						G6.12	Fences and Glare Screens	N

* - Deficiencies exist in this element that warrant written and/or sketched descriptions that are provided in section B of this report.

** - NCR is an abbreviation for Numerical Condition Rating, the definitions of which can be found on the back of this page.

621-526

Bridge No.: 140007 Location: 2 Miles south of US-301
County Section No.: 14110 Inspection Date: 02-19-97
State Road No.: 39 Inspector: K.S. King
US Road No.: N/A Mile Post No.: 1.585

B. COMPREHENSIVE REPORT OF DEFICIENCIES

G1.01 DECK (TOP)

The edges of the joints have class 1 to 2 spalls.

G3.01 PILING

All of the piles exhibit weathering splits up to 5mm (1/4") wide. Soft areas up to 5mm (1/4") deep are along the groundline. Pile 3-4 exhibits rot along the base up to 50mm (2") deep. Piles 17-3 and 20-4 have up to 5mm (1/4") deep rot around the piles at the groundline.

G3.07 SLOPE PROTECTION

There are 12 bags of riprap missing from the top of the slope under span 1.

Bridge Number: 140007

Waterway Measurements

Inspection Date: 02-19-97

	LEFT		RIGHT	
	Dist.	Bent No.	Dist.	Bent No.
Distance from top of bridgerail to water at time of inspection:	20.5	12		

Distance from top of bridgerail to mudline

"-" Sign Denotes Degradation "+" Sign Denotes Aggregation

	Left				Right			
Bent No.	Original	Previous	Present	Difference	Original	Previous	Present	Difference
1	1.46	1.46	1.46	0	1.43	1.43	1.44	-0.01
2	3.29	3.35	3.35	0	3.14	3.14	3.14	0
3	5.06	5.06	5.06	0	4.79	4.69	4.69	0
4	5.06	5.03	5.05	-0.02	5.06	5.06	5.05	0.01
5	5.21	5.18	5.20	-0.02	5.36	5.36	5.35	0.01
6	5.36	5.33	5.20	0.13	5.55	5.58	5.60	-0.02
7	5.43	5.39	5.39	0	5.43	5.43	5.45	-0.02
8	5.43	5.39	5.40	-0.01	5.49	5.52	5.50	0.02
9	5.49	5.46	5.49	-0.03	5.61	5.61	5.60	0.01
10	5.61	5.55	5.53	0.02	5.49	5.49	5.50	-0.01
11	5.94	5.94	5.90	0.04	6.25	6.19	6.20	-0.01
12	7.07	7.07	7.08	-0.01	6.98	6.98	6.90	0.08
13	6.98	7.04	7.05	-0.01	7.07	7.01	7.00	0.01
14	6.58	6.49	6.50	-0.01	5.88	5.88	5.90	-0.02
15	5.27	5.27	5.29	-0.02	5.03	5.00	5.00	0
16	5.00	5.00	4.99	0.01	4.88	5.00	5.00	0

Remarks:

These measurements are in metric (meters).

Bridge Number: 140007

Waterway Measurements

Inspection Date: 02-19-97

	LEFT		RIGHT	
	Dist.	Bent No.	Dist.	Bent No.
Distance from water at time of inspection:		to		

Distance from _____ to mudline

"-" Sign Denotes Degradation "+" Sign Denotes Aggregation

	Left				Right			
Bent No.	Original	Previous	Present	Difference	Original	Previous	Present	Difference
17	5.18	5.5	5.19	0.31	5.06	5.06	5.05	0.01
18	5.15	5.09	5.10	-0.01	5.18	5.18	5.20	-0.02
19	5.06	5.00	5.00	0	5.00	5.00	5.00	0
20	4.72	4.72	4.75	-0.03	4.69	4.66	4.70	-0.04
21	3.29	3.23	3.20	0.03	3.20	3.14	3.15	-0.01
22	1.52	1.43	1.44	-0.01	1.52	1.37	1.44	-0.07
				0				0
				0				0
				0				0
				0				0
				0				0
				0				0
				0				0
				0				0
				0				0
				0				0

Remarks:

These measurments are in metric (meters).

Bridge No.: 140007 Location: 2 Miles south of US-301
County Section No.: 14110 Inspection Date: 02-19-97
State Road No.: 39 Inspector: K.S. King
US Road No.: N/A Mile Post No.: 1.585

C. Evaluation of Previous Corrective Action

G3.01 PILING

Activity: 855 LF Substructure-Timber Pile
Number of Units: 80

Repair Description:
Install a timber helper pile adjacent to Piles Nos. 11-5 and 20-2.

Evaluation:
Piles 11-5, 16-5, 19-1 and 20-2 have been jacketed.

G6.09 DECK CLEANNESS

Activity: 805 SF Debris Removal
Number of Units: 200

Repair Description:
Clean sand and debris from the gutters and scuppers.

Evaluation:
The gutterline and scuppers have been adequately cleaned.

Bridge No.: 140007 Location: 2 Miles south of US-301

County Section No.: 14110 Inspection Date: 02-19-97

State Road No.: 39 Inspector: K.S. King

US Road No.: N/A Mile Post No.: 1.585

D. REQUIRED MAINTENANCE REPAIR & REHABILITATION

STATE FORCES

G3.01 PILING

Activity: 850 MH Bridge Substructure M&R
Number of Units: 30

Repair Description:
On pile 3-4, determine the depth below ground of deep rot and install a structural pile jacket.

COMMENTS:

National Bridge Inventory
Structure Inventory and Appraisal Report
140007

Last NBI Inspection 2/1/97

Sufficiency Rating	78
Status	1

Identification

State Name: Florida Region: Atlanta
Bridge ID: **140007**
Inventory Route:(On/Under): On Route On Structure
Kind Highway: 3 State Highway
Level of Service: Mainline
Route Number: 00039
Directional Suffix: !
Highway Agency District: D7 - Tampa
County Code: (14)Pasco Place Code: No city involved
Features Intersected: **HILLSBOROUGH RIVER**
Facility Name: SR 39
Location: **3.2 KM SOUTH OF US 301**
Kilometer Point: 1.585 km
Onbasenet: 1
rsinvrt: 00141100 SubRt Num: 0
atitude: 281148
Longitude: 820948
Border Bridge State Code: -2 ! % Share: 0 %
Border Bridge Structure No.:

Structure Type & Material

Main NBI Unit
Material Co
Design Sla

No. of Spans in Main Unit: 21
No. of Approach Spans: 0
Deck StructureType: 1
Type of Wearing Surface: 1
Type of Membrane: 0
Type of Deck Protection: 0

Age and Service

Year Built: 1947
Year Reconstruction:
Type Service: On: 1 Under: 5
Avg Daily Traffic: 6800 Year of ADT: 1993
Lanes: 2 Truck Pct: 20 %
Detour Length: 5 km

Classification

NBIS Bridge Length: Y
Highway System: 3 State Highway
Functional Class: 02 Rural Princ. Arterial - Other
Defense Highway: 0
Parallel Structure: N
Directions of Traffic: 2
Temporary Structure: !
Federal Lands Highways: !
Designated National Network: 0
Toll: 3 On Free Road
Maintenance Responsibility:
1 State Highway Agency
Owner: 1 State Highway Agency
Historical Significance: 5
Not Eligible for Natl. Reg. Hist. Places

Condition

Deck: 7
Superstructure: 7
Substructure: 7
Channel and Channel Protection: 8
Culverts: N

Status

Structure Open, Posted, or Closed: A

Load Rating and Posting

Design Load: M
Operating Rating Method: 1
Operating Rating: 58
Inventory Rating Method: 1
Inventory Rating: 35.3
Bridge Posting: 5

Geometric Data

Length of Maximum Span: 4.6 m
tructure Length: 96 m
Curb or Sidewalk: Lt: 0.4 m Rt: 0.4 m
Rdway Width Curb to Curb: 7.9 m
Deck Width Out to Out: 9.3 m
Appr Rdwy (w/Shoulders): 9.7 m
Bridge Median: 0 # 0
Skew: 0 Structure Flared: No flare
Min Vert Clr/Inv Route: 99.99 m
Invt Rte Total Horiz Clear: 7.9 m
Min Vert Clear over Bridge Rdwy: 99.99 m
Min Vert Underclear: Reference:
! 0 m
Min Horiz Lat UndrClrs: Reference:
! Rt: 0 m
Lt: 0 m

Appraisal

Structural Evaluation: 7
Deck Geometry: 2
Underclrs, Vertical ,Horizontal: N
Waterway Adequacy: 8
Approach Roadway Alignment: 8

Traffic Safety Features

Bridge Guardrails: 0
Transitions: 1
Approach Guardrails: 1
Approach Guardrail Ends: 0
Scour Critical Bridge: 3

Proposed Improvements

Type of Work 38 By: 1
Length of Structure Improvement: 9.6
Bridge Improvement Cost $Thousands: 74000
Roadway Improvement Cost $Thousands: 7000
Total Project Cost $Thousands: 81000
Improvement Cost Estimate (Yr.): 1997
Future ADT: 7980
Year of Future ADT: 2018

avigation Data

Navigation Control: 0
Pier Protection: !
Navigation Vertical Clearance: 0 m
Vert-Lift Bridge Nav Min Vert Clear: 0 m
Navigation Horizontal Clearance: 0 m

Past Inspections

Inspection Date: 02.01.1997 Type: 1
Inspector: BID Pontis User Key: BID
Inspection Notes:

Structural Units

Structural Unit: 0 MAIN SPAN 1 NBI Main Span ☒ NBI Approach Span ☐
Notes:

Bridge Notes

APPENDIX C

CROSS DRAIN CALCULATIONS

URS Greiner

CROSS DRAIN CALCULATIONS
CONTENTS

I. EXISTING CULVERT D-5

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 2 PROJ. NO. C100003240.19
DESCRIPTION: I.A. DISCHARGE RATES AND TAILWATER ELEVATIONS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

Discharge rates for culvert D-5 were calculated using a USGS Regression Equation. The applicable USGS Regression Equation for natural flow conditions in Florida: Section A (Table 5-12, FDOT Drainage Manual, 1987) was used for computing the peak flow for this basin. See the enclosed calculations for the peak discharge rates and they are as follows:

Event (year)	Discharge Rate (cfs)	Source
50	234	USGS regression equation
100	288	USGS regression equation

The elevation of the crown of the proposed cross drain and the seasonal high water table (SHWT) elevation was compared, and the higher stage was used for the proposed D-5 capacity analyses. In this case the SHWT elevation was used. The nearest field verified SHWT elevation was located at the station 79+25 and the SHWT elevation is 101.99 NGVD (102.00 was used).

URS Greiner

JOB ERSP/Alex. St. Bypass SHEET 2 OF 2 PROJ. NO. 60003240.19
DESCRIPTION Q50 & Q100 for D-5 COMPUTED BY GJH DATE 2-15-99
CHECKED BY Zinner DATE 2-18-99

Table 5-12 USGS Regression Equations

$$Q_{50} = 496\ DA^{0.690}\ SL^{0.234}\ (LK+3)^{-0.705}$$
$$Q_{100} = 609\ DA^{0.685}\ SL^{0.227}\ (LK+3)^{-0.695}$$

where: DA = Drainage Area (mi^2)
SL = channel slope between points at 10% & 85% of total channel length (ft/mi) (Min. = 0.9)
LK = lake area (% whole number / total)

D-5

DA = 896 ac = 1.4 mi^2 ✓

		Length
SL = 10% - elev =	104	× 650'
85% - elev =	117	× 5525'
Δ =	13'	Δ = 4875' = 0.923 mi

L_T = 6500

SL = 13' / 0.923 mi = 14.08

LK = 2000' × 1300' = 0.093 mi^2 = 6.7%

$$Q_{50} = 496(1.4)^{0.690} * (14.08)^{0.234} * (6.7+3)^{-0.705}$$
$$= 234\ cfs$$ ✓

$$Q_{100} = 609(1.4)^{0.685} * (14.08)^{0.227} * (6.7+3)^{-0.695}$$
$$= 258\ cfs$$ ✓

D-7

DA = 183 ac = 0.286 mi^2 SL = 6 ft / 0.568 mi = 10.56 LK = 2%

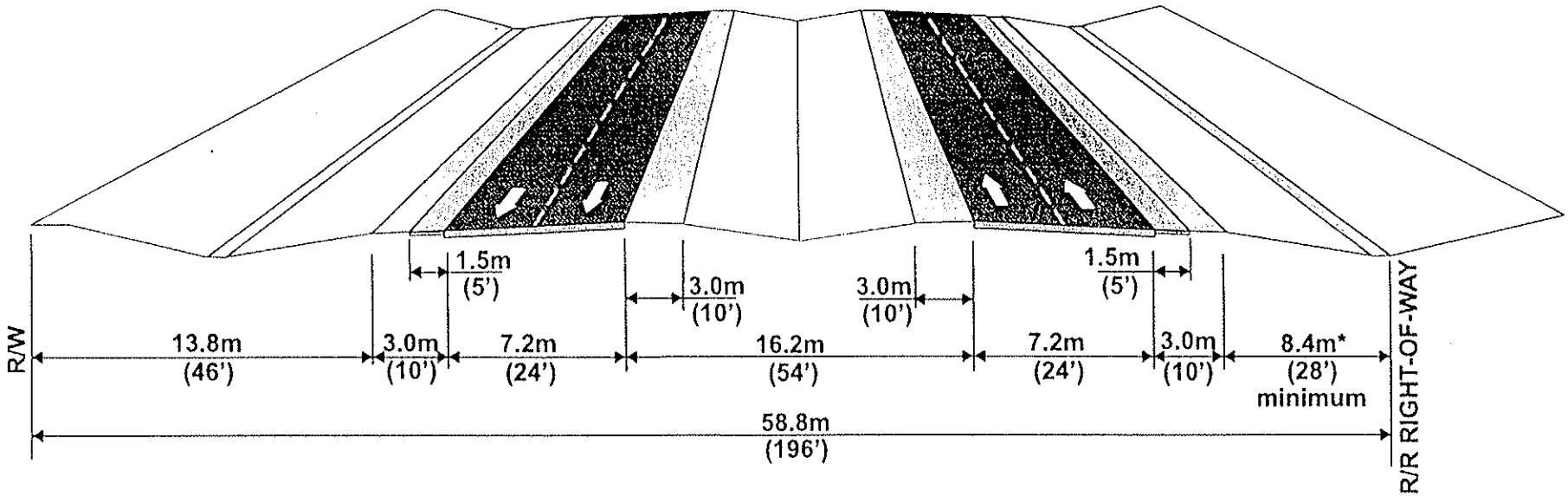
$$Q_{50} = 496(0.286)^{0.690} * (10.56)^{0.234} * (2+3)^{-0.705} = 117\ cfs$$

$$Q_{100} = 609(0.286)^{0.685} * (10.56)^{0.227} * (2+3)^{-0.695} = 144\ cfs$$

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 2 PROJ. NO. C100003240.19
DESCRIPTION: I. B. TYPICAL SECTION COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

See the enclosed typical section proposed for where D-5 will be located.



FROM S.R. 39 TO BLOUNT STREET

Based on 1.5' of Fill to Proposed PGL & Sharing R/R Right-of-Way

* Does Not Meet Border Criteria.
However, it does meet clear zone criteria.

TYPICAL SECTION 8

S.R. 39 FROM I-4 TO U.S. 301
WPI SEGMENT No. 255099 1 FAP No. F-321-1(4)
HILLSBOROUGH AND PASCO COUNTIES, FLORIDA

URS Greiner

Figure 4

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 7 PROJ. NO. C100003240.19
DESCRIPTION: I.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The capacity of the proposed culvert AB-5 was analyzed for the 50- and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

D-5

EXISTING CONDITIONS

CURRENT DATE: 06-03-1999
CURRENT TIME: 22:30:56

FILE DATE: 06-03-1999
FILE NAME: D5X_LC

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	98.66	98.52	85.00	2 RCB	6.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: D5X_LC DATE: 06-03-1999

	ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
50 YR	103.21	234.0	234.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.27	239.4	239.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.33	244.8	244.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.39	250.2	250.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.45	255.6	255.6	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.51	261.0	261.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.57	266.4	266.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.64	271.8	271.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.70	277.2	277.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.77	282.6	282.6	0.0	0.0	0.0	0.0	0.0	0.00	1
100 YR	103.84	288.0	288.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	104.33	323.6	323.6	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: D5X_LC DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
103.21	0.000	234.00	0.00	0.00
103.27	0.000	239.40	0.00	0.00
103.33	0.000	244.80	0.00	0.00
103.39	0.000	250.20	0.00	0.00
103.45	0.000	255.60	0.00	0.00
103.51	0.000	261.00	0.00	0.00
103.57	0.000	266.40	0.00	0.00
103.64	0.000	271.80	0.00	0.00
103.70	0.000	277.20	0.00	0.00
103.77	0.000	282.60	0.00	0.00
103.84	0.000	288.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 06-03-1999
CURRENT TIME: 22:30:56

FILE DATE: 06-03-1999
FILE NAME: D5X_LC

PERFORMANCE CURVE FOR CULVERT 1 - 2(6.00 (ft) BY 3.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
234.00	103.21	4.03	4.55	4-FFt	3.00	2.28	3.00	3.47	6.50	0.00
239.40	103.27	4.11	4.61	4-FFt	3.00	2.32	3.00	3.47	6.65	0.00
244.80	103.33	4.19	4.67	4-FFt	3.00	2.35	3.00	3.47	6.80	0.00
250.20	103.39	4.28	4.73	4-FFt	3.00	2.39	3.00	3.47	6.95	0.00
255.60	103.45	4.36	4.79	4-FFt	3.00	2.42	3.00	3.47	7.10	0.00
261.00	103.51	4.45	4.85	4-FFt	3.00	2.45	3.00	3.47	7.25	0.00
266.40	103.57	4.54	4.91	4-FFt	3.00	2.49	3.00	3.47	7.40	0.00
271.80	103.64	4.63	4.98	4-FFt	3.00	2.52	3.00	3.47	7.55	0.00
277.20	103.70	4.72	5.04	4-FFt	3.00	2.55	3.00	3.47	7.70	0.00
282.60	103.77	4.82	5.11	4-FFt	3.00	2.59	3.00	3.47	7.85	0.00
288.00	103.84	4.91	5.18	4-FFt	3.00	2.62	3.00	3.47	8.00	0.00

El. inlet face invert	98.66 ft	El. outlet invert	98.52 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	98.66 ft
OUTLET STATION	85.00 ft
OUTLET ELEVATION	98.52 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0016
CULVERT LENGTH ALONG SLOPE	85.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	6.00 ft
BARREL RISE	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

CURRENT DATE: 06-03-1999
CURRENT TIME: 22:30:56

FILE DATE: 06-03-1999
FILE NAME: D5X_LC

TAILWATER

CONSTANT WATER SURFACE ELEVATION
101.99

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	32.00 ft
CREST LENGTH	4500.00 ft
OVERTOPPING CREST ELEVATION	104.33 ft

D-5
PROPOSED CONDITIONS

CURRENT DATE: 06-03-1999
CURRENT TIME: 21:22:30

FILE DATE: 06-03-1999
FILE NAME: D5P_LC

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	98.82	98.50	196.00	2 RCB	6.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: D5P_LC DATE: 06-03-1999

	ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
50 YR →	103.32	234.0	234.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.38	239.4	239.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.45	244.8	244.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.51	250.2	250.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.58	255.6	255.6	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.64	261.0	261.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.71	266.4	266.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.78	271.8	271.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.85	277.2	277.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.93	282.6	282.6	0.0	0.0	0.0	0.0	0.0	0.00	1
100 YR →	104.00	288.0	288.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.95	404.2	404.2	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: D5P_LC DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
103.32	0.000	234.00	0.00	0.00
103.38	0.000	239.40	0.00	0.00
103.45	0.000	244.80	0.00	0.00
103.51	0.000	250.20	0.00	0.00
103.58	0.000	255.60	0.00	0.00
103.64	0.000	261.00	0.00	0.00
103.71	0.000	266.40	0.00	0.00
103.78	0.000	271.80	0.00	0.00
103.85	0.000	277.20	0.00	0.00
103.93	0.000	282.60	0.00	0.00
104.00	0.000	288.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

6/7

CURRENT DATE: 06-03-1999
CURRENT TIME: 21:22:30

FILE DATE: 06-03-1999
FILE NAME: D5P_LC

PERFORMANCE CURVE FOR CULVERT 1 - 2(6.00 (ft) BY 3.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
234.00	103.32	3.68	4.50	4-FFt	3.00	2.28	3.00	3.49	6.50	0.00
239.40	103.38	3.75	4.56	4-FFt	3.00	2.32	3.00	3.49	6.65	0.00
244.80	103.45	3.82	4.63	4-FFt	3.00	2.35	3.00	3.49	6.80	0.00
250.20	103.51	3.89	4.69	4-FFt	3.00	2.39	3.00	3.49	6.95	0.00
255.60	103.58	3.96	4.76	4-FFt	3.00	2.42	3.00	3.49	7.10	0.00
261.00	103.64	4.04	4.82	4-FFt	3.00	2.45	3.00	3.49	7.25	0.00
266.40	103.71	4.11	4.89	4-FFt	3.00	2.49	3.00	3.49	7.40	0.00
271.80	103.78	4.19	4.96	4-FFt	3.00	2.52	3.00	3.49	7.55	0.00
277.20	103.85	4.26	5.03	4-FFt	3.00	2.55	3.00	3.49	7.70	0.00
282.60	103.93	4.34	5.11	4-FFt	3.00	2.59	3.00	3.49	7.85	0.00
288.00	104.00	4.42	5.18	4-FFt	3.00	2.62	3.00	3.49	8.00	0.00

El. inlet face invert	98.82 ft	El. outlet invert	98.50 ft
El. inlet throat invert	0.00 ft	El. inlet crest	0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	98.82 ft
OUTLET STATION	196.00 ft
OUTLET ELEVATION	98.50 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0016
CULVERT LENGTH ALONG SLOPE	196.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	6.00 ft
BARREL RISE	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	1:1 BEVEL
INLET DEPRESSION	NONE

CURRENT DATE: 06-03-1999
CURRENT TIME: 21:22:30

FILE DATE: 06-03-1999
FILE NAME: D5P_LC

TAILWATER

CONSTANT WATER SURFACE ELEVATION
101.99

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	182.00 ft
CREST LENGTH	1600.00 ft
OVERTOPPING CREST ELEVATION	105.95 ft

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 1 PROJ. NO. C100003240.19
DESCRIPTION: I.D. RESULTS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The cross drain which satisfies the 0.1' rise for the 50-year storm event is a double 6'x3' CBC.

The results of the HY-8 analyses for the proposed culvert D-5 are shown below:

Event (year)	Existing Headwater/ Tailwater Elevation feet (NGVD)	Proposed Headwater Elevation feet (NGVD)
50	103.21	103.32
100	103.84	104.00

II. PROPOSED CULVERT AB-1

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 10 PROJ. NO. C100003240.19
DESCRIPTION: II. A. DISCHARGE RATES COMPUTED BY: Zinner DATE: 5-27-99
AND TAILWATER ELEVATIONS CHECKED BY: Pratt DATE: 5-28-99

Available discharge rates for proposed culvert AB-1were taken from City of Plant City, Florida, WESTSIDE CANAL, STORMWATER MANAGEMENT MASTER PLAN, MAY 1997" by Camp Dresser & McKee (CDM). See the enclosed title sheet, maps, and HEC-1 outputs (partial) obtained from the aforementioned CDM report. The basin where the proposed cross drain AB-1 will be located is node number 6405 in the CDM model. The storm events provided in the report were the 10, 25, and 100 year frequencies; and all of those events were for a 24 hours duration. The discharge rates for the 25 year and the 100 year were taken from the HEC-1 outputs and the 50 year discharge rate was interpolated from them. See the enclosed interpolation for the 50 year peak discharge rate. The peak discharge rates are as follows:

Event (year)	Discharge Rate (cfs)	Source
50	100	interpolation
100	131	CDM report

The peak stage for the 50-year event was interpolated from the peak stages obtained from Table 4-1 of the CDM report. See the enclosed Table 4-1 from the CDM report. For the proposed cross drain AB-1 capacity analysis, the existing conditions tailwater and headwater was assumed to be the same as the peak stage within node number 6405 because of its central location within the basin/node. See the enclosed interpolation for the 50 year peak stage. The existing peak stages are as follows:

Event (year)	Peak Stage (ft. NGVD)	Source
50	107.0	interpolation
100	107.4	CDM report

CDM Camp Dresser & McKee

2/10

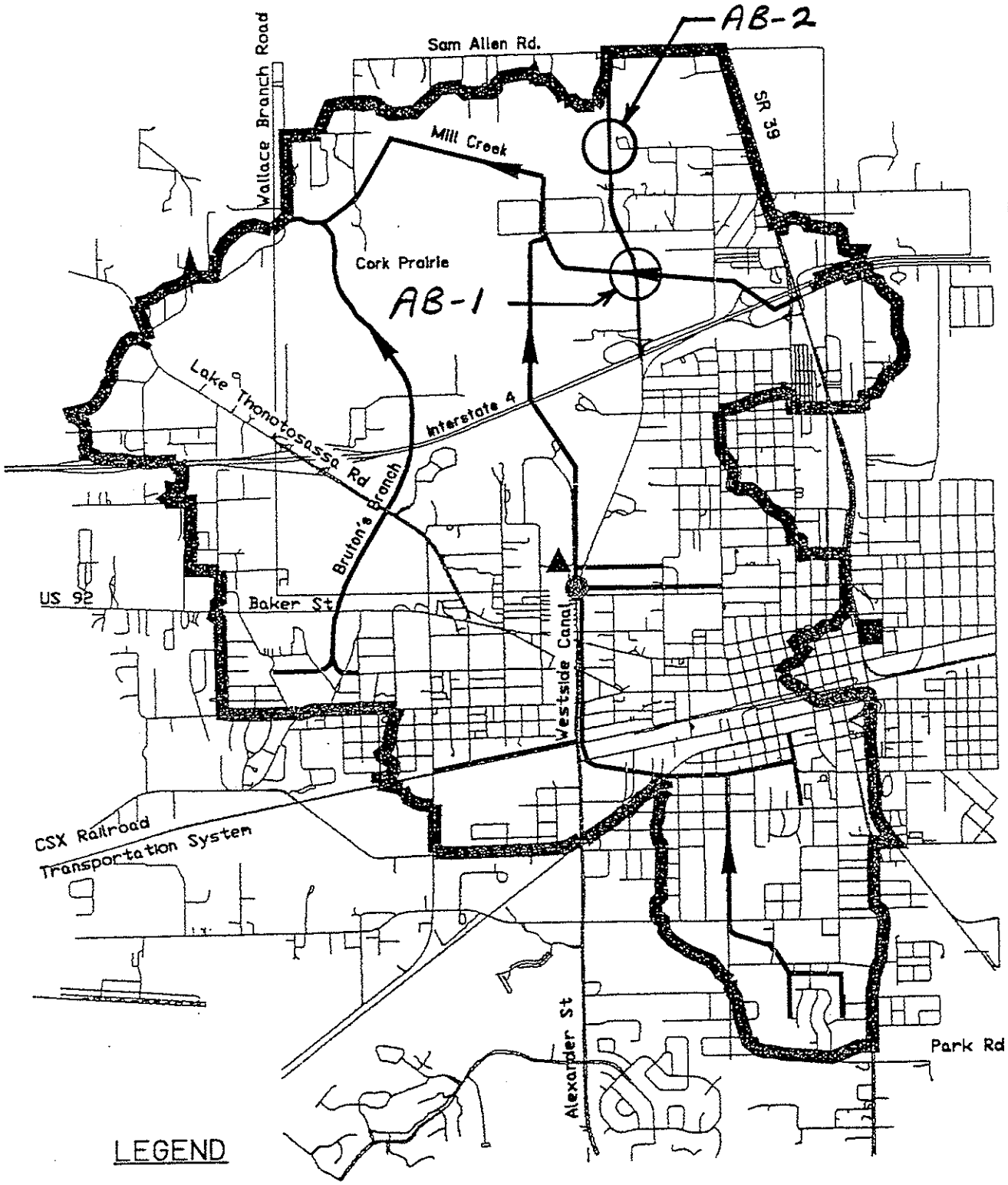
Report

City of Plant City, Florida

WESTSIDE CANAL

STORMWATER MANAGEMENT MASTER PLAN

MAY 1997

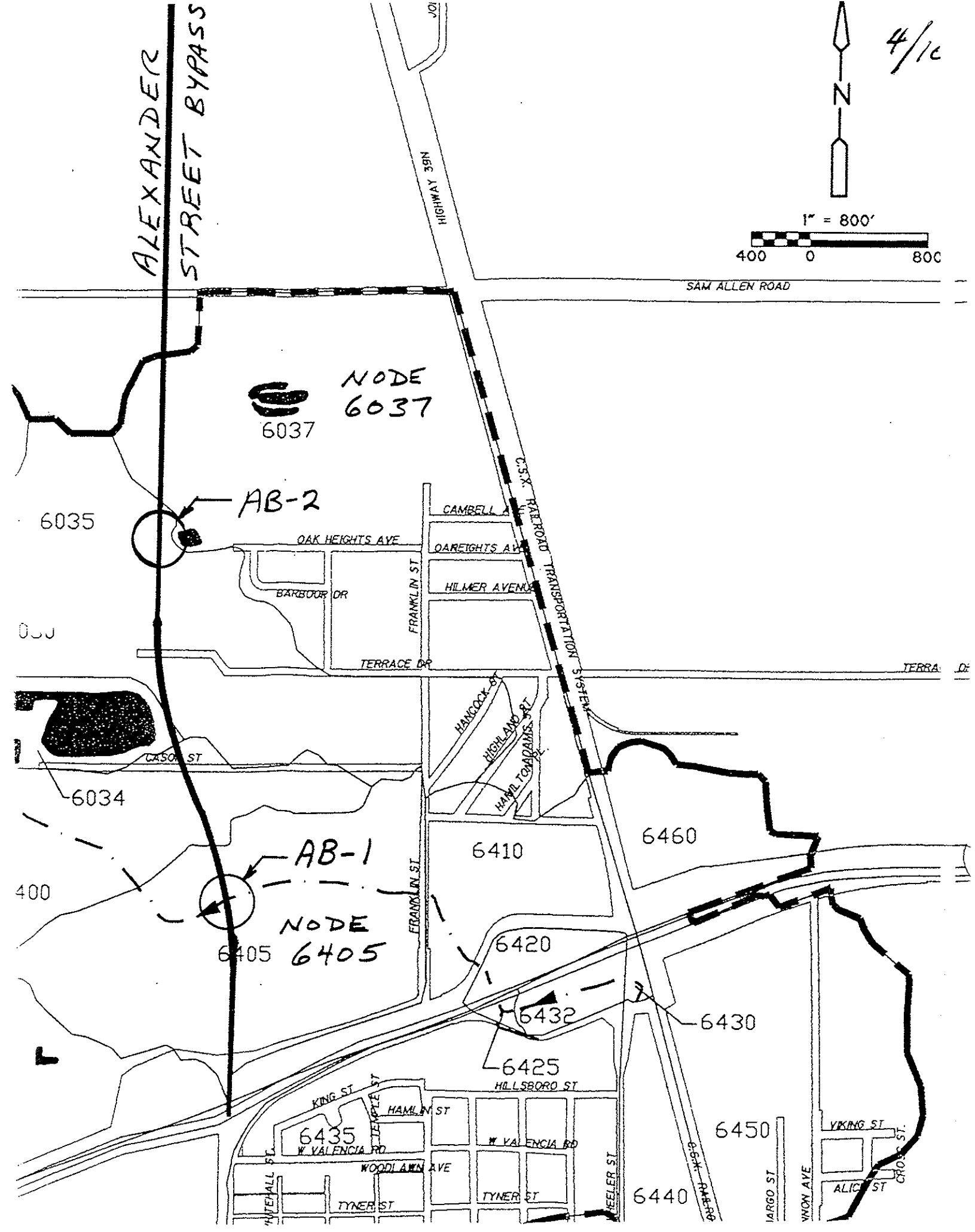


CITY OF PLANT CITY WESTSIDE CANAL STORMWATER MANAGEMENT MASTER PLAN

STAGE/FLOW MONITOR AND RAIN GAUGE LOCATION

CDM
environmental engineers, scientists, planners, & management consultants

Figure No. 2-2


4/1c
N
1" = 800'
400 0 800
ALEXANDER STREET BYPASS
HIGHWAY 39N
SAM ALLEN ROAD
NODE 6037
6037
AB-2
6035
OAK HEIGHTS AVE
BARBOUR DR
FRANKLIN ST
HILMER AVENUE
TERRACE DR
C.S.X. RAILROAD TRANSPORTATION SYSTEM
HANCOCK ST
HIGHLAND ST
HAMILTON ADAMS ST
CASON ST
6034
AB-1
400
NODE 6405
6405
6410
6460
6420
6432
6430
6425
HILLSBORO ST
KING ST
TEMPLE ST
HAMLIN ST
6435
W VALENCIA RD
WOODLAWN AVE
TYNER ST
HUTCHALL ST
6450
6440
WHEELER ST
C.S.X. RAILROAD
LARGO ST
YKING ST
ALICE ST
CROSS ST
YWON AVE

5/10

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1*****************************************
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*   FLOOD HYDROGRAPH PACKAGE  (HEC-1)   *
*          FEBRUARY  1991               *
*           VERSION 4.0.1 (LOCAL)       *
*                                       *
*  RUN DATE  06/15/98  TIME  09:20:36   *
*                                       *
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*                                       *
*    U.S. ARMY CORPS OF ENGINEERS       *
*    HYDROLOGIC ENGINEERING CENTER      *
*          609 SECOND STREET            *
*       DAVIS, CALIFORNIA 95616         *
*          (916) 551-1748               *
*                                       *
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X     X  XXXXXXX   XXXXX          X
X     X  X        X     X        XX
X     X  X        X              X
XXXXXXX  XXXX     X        XXXXX  X
X     X  X        X              X
X     X  X        X     X        X
X     X  XXXXXXX   XXXXX         XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE PORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

1 HEC-1 INPUT PAGE 1

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          LINE  ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
             1  ID
             2  ID
             3  ID
*** FREE ***
                *
             4  IT       3 07JAN98       0     601
             5  IN      15 07JAN98       0
             6  IO       5       0
                *
             7  JR    PREC     7.5
                *
             8  PG    DC24    1.00
                *
             9  PC       0  0.0001  0.0002  0.0003  0.0005  0.0007   0.001  0.0014  0.0018  0.0023
            10  PC  0.0029  0.0036  0.0045  0.0055  0.0065  0.0076  0.0089  0.0115  0.0143  0.0172
            11  PC  0.0203  0.0239  0.0277  0.0316  0.0357   0.042  0.0485   0.055  0.0616  0.0701
            12  PC  0.0787  0.0873   0.096  0.1086  0.1212  0.1339  0.1466  0.1626  0.1786  0.1946
            13  PC  0.2106  0.2315  0.2524  0.2734  0.2945  0.3306  0.3668   0.403  0.4392  0.4918
            14  PC  0.5445  0.5972  0.6499  0.6737  0.6975  0.7213  0.7451  0.7638  0.7825  0.8012
            15  PC    0.82  0.8342  0.8484  0.8626  0.8769  0.8875  0.8981  0.9087  0.9192  0.9273
            16  PC  0.9354  0.9435  0.9516   0.957  0.9625   0.968  0.9734  0.9768    0.98  0.9831
            17  PC  0.9862  0.9882  0.9902  0.9922  0.9941   0.995  0.9958  0.9965  0.9972  0.9977
            18  PC  0.9982  0.9986   0.999  0.9993  0.9996  0.9998       1       1       1       1
            19  PC       1       1       1       1

            20  KK    6005
            21  KM                RUNOFF FROM          6005
            22  KO       0       0       0       0      21
            23  BA 0.01547
            24  PR    DC24
            25  LS       0      57       0       0       0       0    0.05
            26  UD   0.240

            27  KK    6006
            28  KM                RUNOFF FROM          6006
            29  KO       0       0       0       0      21
            30  BA 0.02109
            31  PR    DC24
            32  LS       0      61       0       0       0       0    0.05
            33  UD   0.190

            34  KK    9999
            35  HC       2

            36  KK    6005
            37  KM                RUNOFF FROM          6010
            38  KO       0       0       0       0      21
            39  BA 0.02844
            40  PR    DC24
            41  LS       0      57       0       0       0       0    0.05
            42  UD   0.330
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1 HEC-1 INPUT PAGE 2

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          LINE  ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

            43  KK    9999
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6/10

				TIME	13.20
HYDROGRAPH AT	6335	0.14	1	FLOW	63.
				TIME	13.30
2 COMBINED AT	9999	1.82	1	FLOW	780.
				TIME	13.25
HYDROGRAPH AT	6340	0.10	1	FLOW	41.
				TIME	13.30
2 COMBINED AT	9999	1.93	1	FLOW	821.
				TIME	13.25
HYDROGRAPH AT	6341	0.01	1	FLOW	4.
				TIME	13.15
2 COMBINED AT	9999	1.94	1	FLOW	825.
				TIME	13.25
HYDROGRAPH AT	6342	0.01	1	FLOW	3.
				TIME	13.10
2 COMBINED AT	9999	1.95	1	FLOW	827.
				TIME	13.25
HYDROGRAPH AT	6344	0.04	1	FLOW	16.
				TIME	13.20
2 COMBINED AT	9999	1.99	1	FLOW	843.
				TIME	13.25
HYDROGRAPH AT	6350	0.03	1	FLOW	14.
				TIME	13.15
2 COMBINED AT	9999	2.03	1	FLOW	857.
				TIME	13.20
HYDROGRAPH AT	6360	0.07	1	FLOW	35.
				TIME	13.15
2 COMBINED AT	9999	2.10	1	FLOW	892.
				TIME	13.20
HYDROGRAPH AT	6040	0.07	1	FLOW	34.
				TIME	13.25
2 COMBINED AT	9999	2.17	1	FLOW	926.
				TIME	13.20
HYDROGRAPH AT	6405	0.13	1	FLOW	55.
				TIME	13.35
2 COMBINED AT	9999	2.30	1	FLOW	979.
				TIME	13.25
HYDROGRAPH AT	6410	0.06	1	FLOW	21.
				TIME	13.25
2 COMBINED AT	9999	2.36	1	FLOW	1000.
				TIME	13.25
HYDROGRAPH AT	6420	0.01	1	FLOW	7.
				TIME	13.00
2 COMBINED AT	9999	2.37	1	FLOW	1006.
				TIME	13.20
HYDROGRAPH AT	6425	0.00	1	FLOW	1.
				TIME	13.00
2 COMBINED AT					

$\Sigma = 76$ cfs $= Q_{25}$ Confirmed by Jack Adams at CDM

7/10

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1*************************************
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*   FLOOD HYDROGRAPH PACKAGE (HEC-1)*
*         FEBRUARY 1991             *
*          VERSION 4.0.1 (LOCAL)    *
*                                   *
*  RUN DATE 02/16/98  TIME 14:40:07 *
*                                   *
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*************************************
*                                   *
*   U.S. ARMY CORPS OF ENGINEERS    *
*   HYDROLOGIC ENGINEERING CENTER   *
*        609 SECOND STREET          *
*     DAVIS, CALIFORNIA 95616       *
*         (916) 551-1748            *
*                                   *
*************************************
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X     X  XXXXXXX   XXXXX            X
X     X  X        X     X          XX
X     X  X        X                X
XXXXXXX  XXXX     X          XXXXX  X
X     X  X        X                 X
X     X  X        X     X           X
X     X  XXXXXXX  XXXXX             XXX
```

THIS PROGRAM REPLACES ALL PREVIOUS VERSIONS OF HEC-1 KNOWN AS HEC1 (JAN 73), HEC1GS, HEC1DB, AND HEC1KW.

THE DEFINITIONS OF VARIABLES -RTIMP- AND -RTIOR- HAVE CHANGED FROM THOSE USED WITH THE 1973-STYLE INPUT STRUCTURE.
THE DEFINITION OF -AMSKK- ON RM-CARD WAS CHANGED WITH REVISIONS DATED 28 SEP 81. THIS IS THE FORTRAN77 VERSION
NEW OPTIONS: DAMBREAK OUTFLOW SUBMERGENCE , SINGLE EVENT DAMAGE CALCULATION, DSS:WRITE STAGE FREQUENCY,
DSS:READ TIME SERIES AT DESIRED CALCULATION INTERVAL LOSS RATE:GREEN AND AMPT INFILTRATION
KINEMATIC WAVE: NEW FINITE DIFFERENCE ALGORITHM

HEC-1 INPUT

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1
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10
        1           ID
        2           ID                 CITY OF PLANT CITY WSC SMMP
        3           ID                      100 YEAR STORM EVENT
                                              HEC-1: FLOOD HYDROGRAPH PACKAGE
*** FREE ***
                    *
        4           IT       3 02FEB98       0     601
        5           IN      15 02FEB98       0
        6           IO       5       0
                    *
        7           JR    PREC    10.5
                    *
        8           PG    DC24    1.00
                    *
        9           PC       0  0.0001  0.0002  0.0003  0.0005  0.0007   0.001  0.0014  0.0018  0.0023
       10           PC  0.0029  0.0036  0.0045  0.0055  0.0065  0.0076  0.0089  0.0115  0.0143  0.0172
       11           PC  0.0203  0.0239  0.0277  0.0316  0.0357   0.042  0.0485   0.055  0.0616  0.0701
       12           PC  0.0787  0.0873   0.096  0.1086  0.1212  0.1339  0.1466  0.1626  0.1786  0.1946
       13           PC  0.2106  0.2315  0.2524  0.2734  0.2945  0.3306  0.3668   0.403  0.4392  0.4918
       14           PC  0.5445  0.5972  0.6499  0.6737  0.6975  0.7213  0.7451  0.7638  0.7825  0.8012
       15           PC    0.82  0.8342  0.8484  0.8626  0.8769  0.8675  0.8981  0.9087  0.9192  0.9273
       16           PC  0.9354  0.9435  0.9516   0.957  0.9625   0.968  0.9734  0.9768    0.98  0.9831
       17           PC  0.9862  0.9882  0.9902  0.9922  0.9941   0.995  0.9958  0.9965  0.9972  0.9977
       18           PC  0.9982  0.9986   0.999  0.9993  0.9996  0.9998       1       1       1       1
       19           PC       1       1       1       1

       20           KK    6005
       21           KM                RUNOFF FROM          6005
       22           KO       0       0       0       0      21
       23           BA 0.01547
       24           PR    DC24
       25           LS       0      57       0       0       0       0    0.05
       26           UD   0.230

       27           KK    6006
       28           KM                RUNOFF FROM          6006
       29           KO       0       0       0       0      21
       30           BA 0.02109
       31           PR    DC24
       32           LS       0      61       0       0       0       0    0.05
       33           UD   0.180

       34           KK    9999
       35           HC       2

       36           KK    6005
       37           KM                RUNOFF FROM          6010
       38           KO       0       0       0       0      21
       39           BA 0.02844
       40           PR    DC24
       41           LS       0      57       0       0       0       0    0.05
       42           UD   0.310
```


HEC-1 INPUT

```
1
      LINE          ID.....1.....2.....3.....4.....5.....6.....7.....8.....9.....10

       43           KK    9999
```

8/10

2 COMBINED AT					
+	9999	2.10	1	FLOW	1519.
				TIME	13.20
HYDROGRAPH AT					
+	6040	0.07	1	FLOW	56.
				TIME	13.25
2 COMBINED AT					
+	9999	2.17	1	FLOW	1576.
				TIME	13.20
HYDROGRAPH AT					
+	6405	0.13	1	FLOW	94.
				TIME	13.30
2 COMBINED AT					
+	9999	2.30	1	FLOW	1668.
				TIME	13.20
HYDROGRAPH AT					
+	6410	0.06	1	FLOW	37.
				TIME	13.20
2 COMBINED AT					
+	9999	2.36	1	FLOW	1706.
				TIME	13.20
HYDROGRAPH AT					
+	6420	0.01	1	FLOW	11.
				TIME	13.00
2 COMBINED AT					
+	9999	2.37	1	FLOW	1715.
				TIME	13.20
HYDROGRAPH AT					
+	6425	0.00	1	FLOW	2.
				TIME	13.00
2 COMBINED AT					
+	9999	2.38	1	FLOW	1716.
				TIME	13.20
HYDROGRAPH AT					
+	6430	0.01	1	FLOW	11.
				TIME	13.00
2 COMBINED AT					
+	9999	2.39	1	FLOW	1726.
				TIME	13.20
HYDROGRAPH AT					
+	6432	0.00	1	FLOW	2.
				TIME	13.00
2 COMBINED AT					
+	9999	2.39	1	FLOW	1728.
				TIME	13.20
HYDROGRAPH AT					
+	6435	0.13	1	FLOW	71.
				TIME	13.30
2 COMBINED AT					
+	9999	2.52	1	FLOW	1798.
				TIME	13.20
HYDROGRAPH AT					
+	6440	0.03	1	FLOW	17.
				TIME	13.20
2 COMBINED AT					
+	9999	2.55	1	FLOW	1814.
				TIME	13.20
HYDROGRAPH AT					
+	6450	0.12	1	FLOW	92.
				TIME	13.20
2 COMBINED AT					
+	9999	2.67	1	FLOW	1906.
				TIME	13.20
HYDROGRAPH AT					
+	6460	0.04	1	FLOW	28.
				TIME	13.15
2 COMBINED AT					
+	9999	2.71	1	FLOW	1934.
				TIME	13.20

Σ = 131 cfs = Q100 confirmed by Jack Adams of CDM

TABLE 4-1

City of Plant City
Westside Canal Stormwater Management Master Plan
Summary of Peak Flood Stages for Design Storms and Problem Areas

Model Node	Location	Top of Road (ft-NGVD)	10-yr/24-hr Peak Stage (ft-NGVD)	10-yr/24-hr Depth of Flooding (ft)	25-yr/24-hr Peak Stage (ft-NGVD)	25-yr/24-hr Depth of Flooding (ft)	100-yr/24-hr Peak Stage (ft-NGVD)	100-yr/24-hr Depth of Flooding (ft)	Problem ID Number
6309	Dirt Crossing	106.9	108.1	1.2	108.1	1.2	108.2	1.3	
6310			108.2		108.3		108.5		
6320	I-4	112.5	109.8		110.1		111.0		
6325			111.3		111.4		111.6		
6328			109.8		110.1		111.0		
6330	Thonotossa Road (SR 600)	114.5	110.7		110.9		111.8		
6331			110.7		110.9		111.8		
6332			110.7		110.9		111.8		
6335			109.2		109.3		109.5		
6337			110.7		110.9		111.8		
6340	US 92	112.0	112.1	0.1	112.2	0.2	112.5	0.5	
6341			113.0		113.0		113.2		
6342	Strawberry Festival Service Rd. E.	115.6	114.3		114.5		115.2		
6343			114.4		114.5		115.2		
6344	Ritter Street	120.0	114.4		114.5		115.2		
6349			112.1		112.2		112.5		
6350	Strawberry Festival Service Rd W	113.6	112.2		112.3		112.8		
6355			112.2		112.3		112.8		
6360	Seminole Lake Road	112.8	112.6		112.7		113.0	0.2	
6380			112.1		112.2		112.5		
6390	Bennett Road	107.1	107.5	0.4	107.6	0.5	107.6	0.5	
6405			106.4		106.7		107.4		
6409			106.9		107.0		107.4		
6410	Franklin Street	115.9	111.0		111.3		112.3		
6415			111.1		111.4		112.3		
6420	I-4 Westbound Ramp	117.4	111.4		111.8		113.0		
6425	I-4	118.8	111.6		112.0		113.3		
6430	I-4 Eastbound Entrance Ramp	117.5	111.6		112.0		113.4		
6432	Wheeler Street (SR 39)	116.0	115.2		115.4		116.0	0.0	
6435	I-4 Eastbound Exit Ramp	117.6	112.1		112.7		114.8		
6440	Frontage Road S.	117.8	115.5		115.6		115.7		
6450	CSX Railroad/Frontage Road S.	121.5	115.2		115.5		116.6		
6460			117.3		117.3		117.5		

Peak Stages Utilized

Note: Level of service is 0.5 ft of road flooding for the 25-yr/24-hr storm and 0.75 ft of road flooding for the 100-yr/24-hr storm.

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URS Greiner

JOB: SR 39/ALEXANDER ROAD BYPASS	SHEET 10 of 10	PROJ. NO. C100003240.19
DESCRIPTION: AB-1, 50-yr Q & HW	COMPUTED BY Jim Zinner	DATE 05-25-99
	CHECKED BY RWP	DATE 5-28-99

Input/Output Boxes Explanation

[ ] = manually input values

[ ] = unknown, previously input, or computed output values

Frequency versus Discharge Log-slope Interpolation

when: f 3 > f 1 & f 3 < f 2

	frequency (yrs)		discharge (cfs)
f1 =	25	Q1 =	77
f2 =	100	Q2 =	131
f3 =	50	Q3 =	?

M = log (Q2) - log (Q1) / log (f2) - log (f1) = 2.6088

Q3 = 10 ^ [(log (Q2) - log (Q1) / M + log (f1)] = 100

The peak discharge for the 50 **year event** = 100

Discharge versus Stage Linear Interpolation

	discharge (cfs)		stage (ft)
Q1 =	77	S1 =	106.7
Q2 =	131	S2 =	107.4
Q3 =	100.43	S3 =	?

S3 = S1 + ((S2 - S1) x (Q3 - Q1) / (Q2 - Q1)) = 107.0

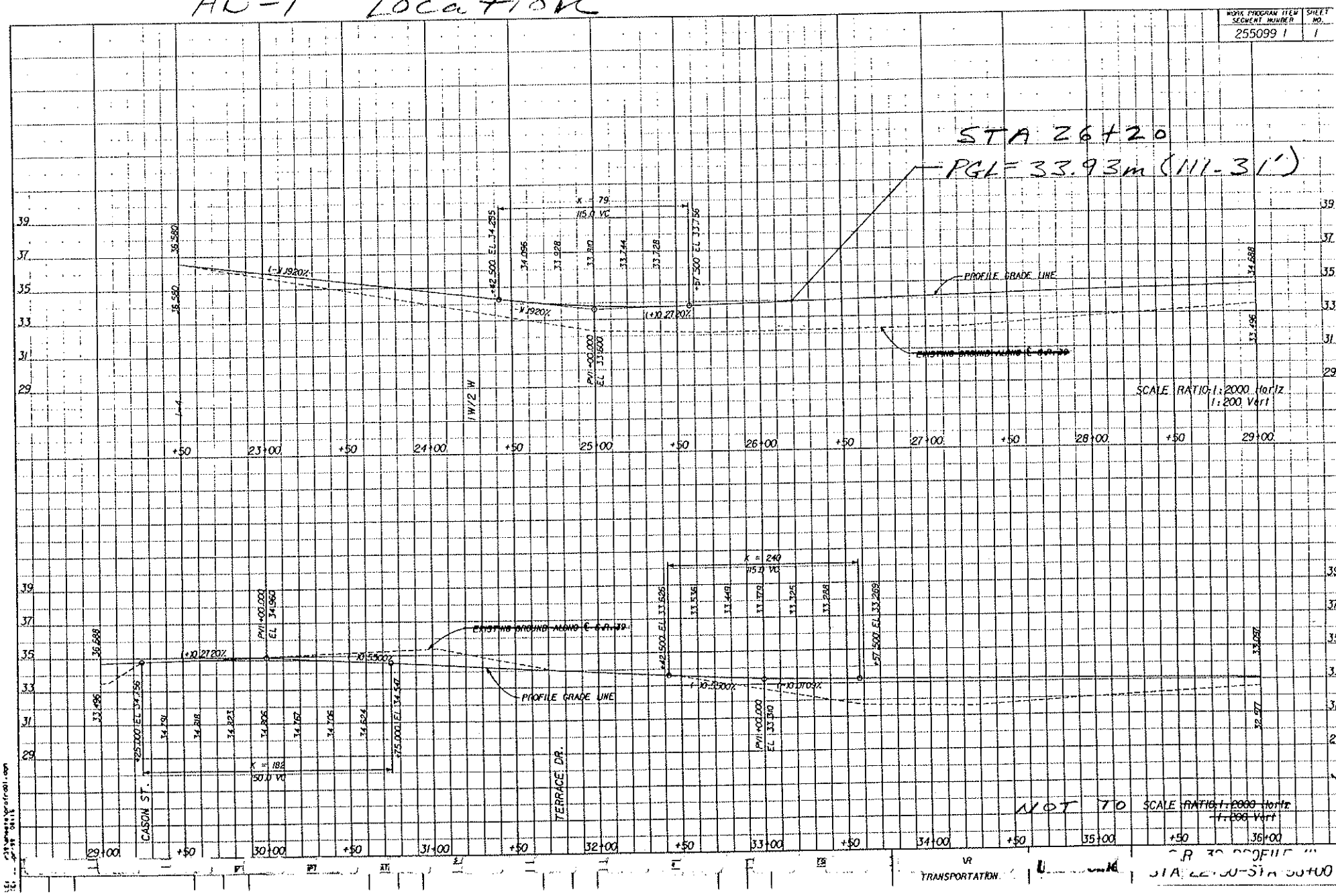
The peak stage for the 50 **year event** = 107.0

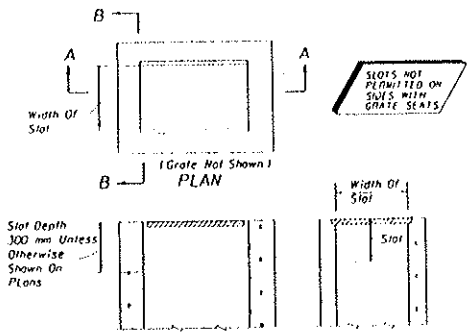
URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 4 PROJ. NO. C100003240.19
DESCRIPTION: II.B. CULVERT LOCATION AND CROSS SECTION COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

A conceptual vertical profile was developed for this PD&E. See the enclosed portion of the vertical profile and where AB-1 will be located. Also enclosed is a sketch of a half cross section of the proposed cross drain AB-1.

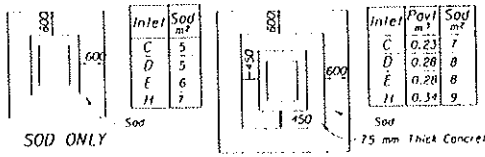
AB-1 Location





NOTE: See Index No. 229 For Application Guidelines

NON-TRAVERSABLE SLOTS

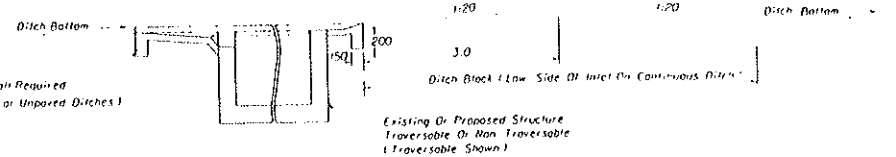


SOD ONLY

PAVT. AND SOD

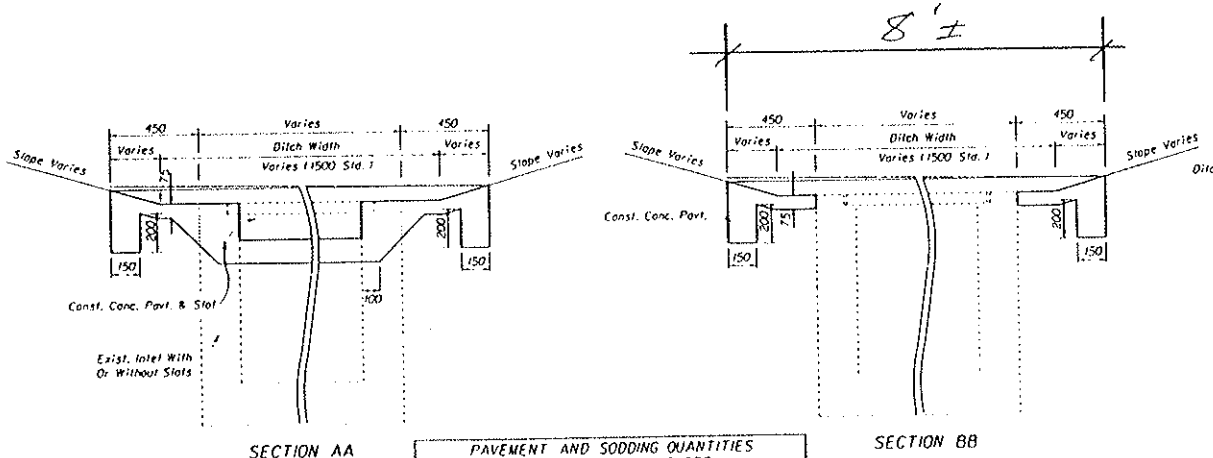
NOTE: See General Notes Nos. 6 and 7

SODDING AND PAVEMENT FOR INLETS WITHOUT SLOTS AND INLETS WITH NON-TRAVERSABLE SLOTS



DITCH BLOCK FOR INLETS WITH OR WITHOUT SLOTS

Anticipated DBI to collect off site runoff.

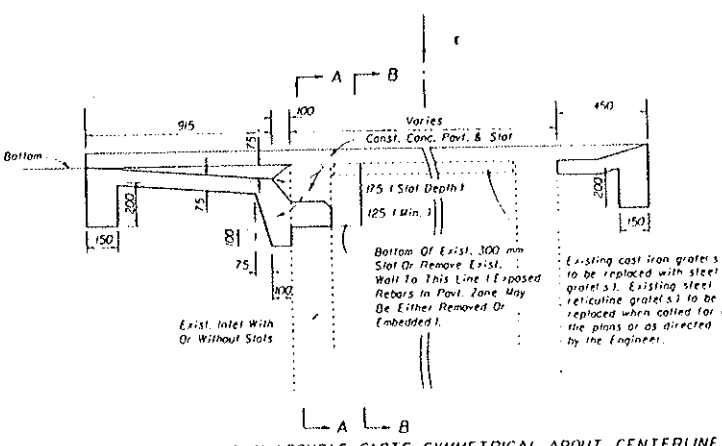


SECTION AA

SECTION BB

PAVEMENT AND SODDING QUANTITIES FOR TRAVERSABLE SLOTS						
Inlet	Pavement				Sod	
	Single Slot		Double Slot		Single Slot	Double Slot
	m²	m³	m²	m³	m²	m²
C	4.01	0.59	5	0.71	10	14
D	5.01	0.70	6	0.84	12	16
E	4.92	0.70	6	0.83	12	15

NOTE: For plan view and additional details see sheet 2 of 4. For payment see General Notes Nos. 6 and 7.



SINGLE SLOT SHOWN (DOUBLE SLOTS SYMMETRICAL ABOUT CENTERLINE)

SECTION CC (CASE 1)

TRAVERSABLE SLOTS FOR EXISTING INLETS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
ROAD DESIGN

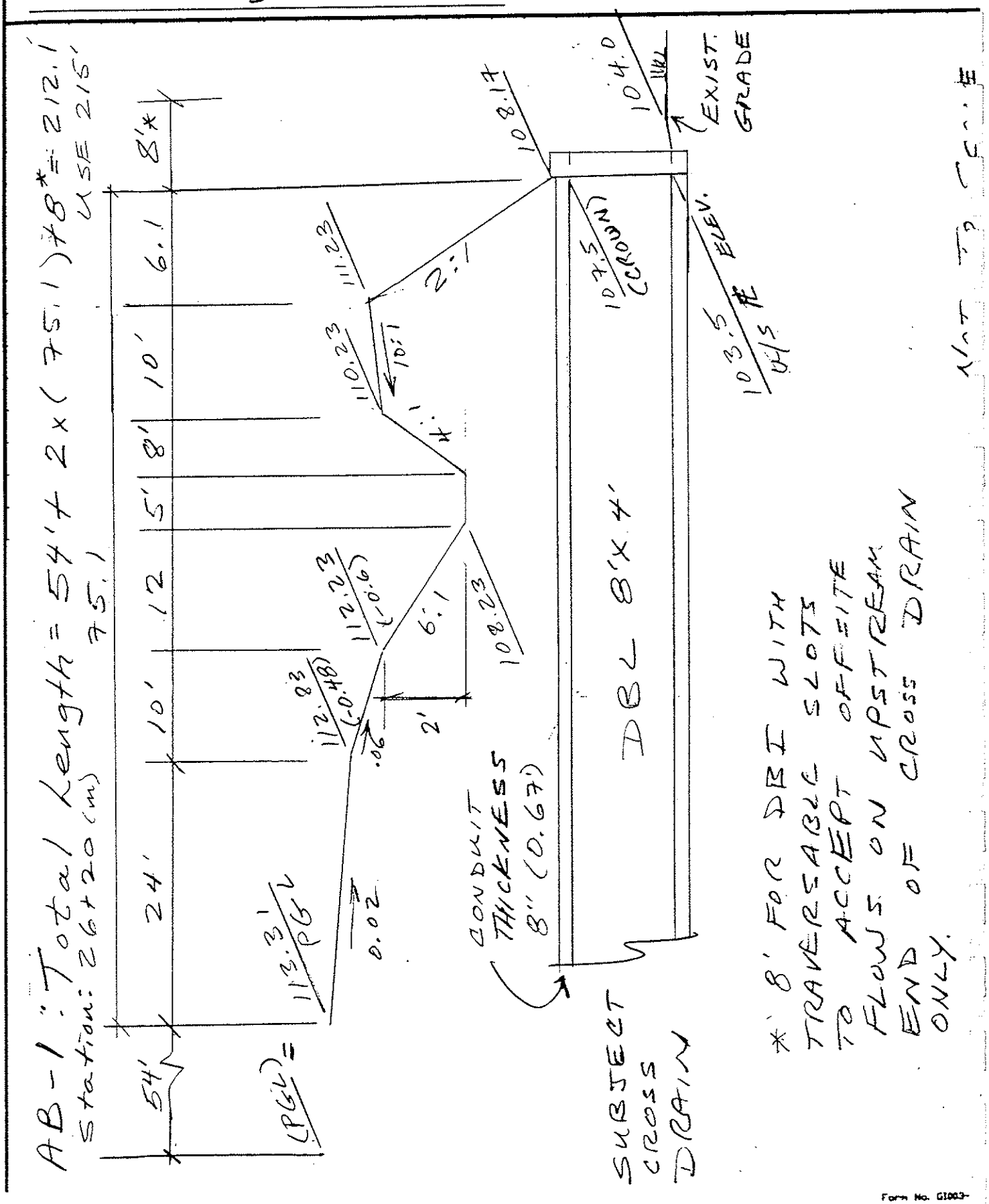
DITCH BOTTOM INLETS TYPES C,D,E & H

DESIGNED BY	CGA	DATE 07/98
DRAWN BY	DRF	07/98
CHECKED BY	ARROYO	07/98
F.H.W.A. APPROVED: 06/29/98		

STANDARD NO. 304 | SHEET NO. 1 of 4 | FILE NO. 232

URS Greiner

JOB Alex St. Bypass & SR39 SHEET 4 OF 4 PROJ. NO. C100003240.17
DESCRIPTION AB-1 Length calc. COMPUTED BY [illegible] DATE 6-4-99
CHECKED BY _____ DATE _____



Form No. G1003-

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 7 PROJ. NO. C100003240.19
DESCRIPTION: II.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The capacity of the proposed culvert AB-1 was analyzed for the 50- and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 7 PROJ. NO. C100003240.19
DESCRIPTION: II.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 6-9-99
CHECKED BY: _____ DATE: _____

The capacity of the proposed culvert AB-1 was analyzed for the 50- and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

2/7

CURRENT DATE: 06-03-1999
CURRENT TIME: 14:49:59

FILE DATE: 06-03-1999
FILE NAME: AB1_50

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	103.50	102.50	215.00	2 RCB	8.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB1_50 DATE: 06-03-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
50 YR — 107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.07	101.0	101.0	0.0	0.0	0.0	0.0	0.0	0.00	1
111.31	691.3	691.3	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB1_50 DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00
107.07	0.000	101.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

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CURRENT DATE: 06-03-1999
CURRENT TIME: 14:49:59

FILE DATE: 06-03-1999
FILE NAME: AB1_50

PERFORMANCE CURVE FOR CULVERT 1 - 2(8.00 (ft) BY 4.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00
101.00	107.07	1.84	3.57	1-S1f	0.90	1.08	4.00	4.50	1.58	0.00

El. inlet face invert 103.50 ft   El. outlet invert 102.50 ft
El. inlet throat invert 0.00 ft   El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **************

UPSTREAM STATION	0.00 ft
UPSTREAM ELEVATION	103.50 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.00
DOWNSTREAM STATION	215.00 ft
DOWNSTREAM ELEVATION	102.50 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.00

***** CULVERT DATA SUMMARY ************************

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	4.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

4/7

CURRENT DATE: 06-03-1999
CURRENT TIME: 14:49:59

FILE DATE: 06-03-1999
FILE NAME: AB1_50

TAILWATER

CONSTANT WATER SURFACE ELEVATION
107.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	192.00 ft
CREST LENGTH	1600.00 ft
OVERTOPPING CREST ELEVATION	111.31 ft

CURRENT DATE: 06-03-1999
CURRENT TIME: 15:14:26

FILE DATE: 06-03-1999
FILE NAME: AB1_100

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	103.50	102.50	215.00	2 RCB	8.00	4.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB1_100 DATE: 06-03-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
100 YR —107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
107.53	131.0	131.0	0.0	0.0	0.0	0.0	0.0	0.00	1
111.31	691.3	691.3	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB1_100 DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00
107.53	0.000	131.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

6/7

CURRENT DATE: 06-03-1999
CURRENT TIME: 15:14:26

FILE DATE: 06-03-1999
FILE NAME: AB1_100

PERFORMANCE CURVE FOR CULVERT 1 - 2(8.00 (ft) BY 4.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00
131.00	107.53	2.18	4.03	4-FFt	1.07	1.28	4.00	4.90	2.05	0.00

El. inlet face invert 103.50 ft   El. outlet invert 102.50 ft
El. inlet throat invert 0.00 ft   El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE ***************

UPSTREAM STATION	0.00 ft
UPSTREAM ELEVATION	103.50 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.00
DOWNSTREAM STATION	215.00 ft
DOWNSTREAM ELEVATION	102.50 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.00

***** CULVERT DATA SUMMARY ************************

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	4.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

CURRENT DATE: 06-03-1999
CURRENT TIME: 15:14:26

FILE DATE: 06-03-1999
FILE NAME: AB1_100

TAILWATER

CONSTANT WATER SURFACE ELEVATION
107.40

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	192.00 ft
CREST LENGTH	660.00 ft
OVERTOPPING CREST ELEVATION	111.31 ft

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 1 PROJ. NO. C100003240.19
DESCRIPTION: II.D. RESULTS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The cross drain which satisfies the 0.1' rise for the 50-year storm event is a double 8'x4 reinforced concrete box culvert (RCB).

The results of the HY-8 analyses for the proposed culvert AB-1 are shown below:

Event (year)	Existing Headwater/ Tailwater Elevation feet (NGVD)	Proposed Headwater Elevation feet (NGVD)
50	107.00	107.07
100	107.40	107.53

III. PROPOSED CULVERT AB-2

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 5 PROJ. NO. C100003240.19
DESCRIPTION: III. A. DISCHARGE RATES AND TAILWATER ELEVATIONS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

Available discharge rates for culvert AB-2 were taken from the CDM report mentioned in the previous AB-1 analysis. The basin where the proposed cross drain AB-2 will be located is in node number 6037 of the CDM model. See the maps from the CDM report in the previous analysis. The discharge rates for the 25 year and the 100 year were taken from the following HEC-1 outputs (partials) and the 50 year discharge rate was interpolated from them. The peak discharge rates are as follows:

Event (year)	Discharge Rate (cfs)	Source
50	120	interpolation
100	157	CDM report

The peak stage for the 50-year event was interpolated from the stages obtained from peak stages in Table 4-1 from the CDM report (see attached). For the proposed cross drain AB-2 capacity analysis, the existing conditions tailwater and headwater was assumed to be the same as the peak stage within node number 6037. See the enclosed interpolations for the 50 year peak stage. The existing peak stages are as follows:

Event (year)	Peak Stage (ft. NGVD)	Source
50	107.9	interpolation
100	108.0	CDM report

2/5

2 COMBINED AT	9999	0.06	1	FLOW	34.
+				TIME	13.10
HYDROGRAPH AT	6020	0.18	1	FLOW	78.
+				TIME	13.35
2 COMBINED AT	9999	0.24	1	FLOW	109.
+				TIME	13.20
HYDROGRAPH AT	6025	0.11	1	FLOW	48.
+				TIME	13.40
2 COMBINED AT	9999	0.35	1	FLOW	156.
+				TIME	13.25
HYDROGRAPH AT	6030	0.00	1	FLOW	2.
+				TIME	13.00
2 COMBINED AT	9999	0.36	1	FLOW	157.
+				TIME	13.25
HYDROGRAPH AT	6032	0.01	1	FLOW	10.
+				TIME	13.00
2 COMBINED AT	9999	0.37	1	FLOW	165.
+				TIME	13.20
HYDROGRAPH AT	6034	0.03	1	FLOW	18.
+				TIME	13.00
2 COMBINED AT	9999	0.40	1	FLOW	181.
+				TIME	13.15
HYDROGRAPH AT	6030	0.15	1	FLOW	51.
+				TIME	13.40
2 COMBINED AT	9999	0.55	1	FLOW	230.
+				TIME	13.20
HYDROGRAPH AT	6036	0.01	1	FLOW	6.
+				TIME	13.00
2 COMBINED AT	9999	0.56	1	FLOW	235.
+				TIME	13.15
HYDROGRAPH AT	6037	0.23	1	FLOW	92.
+				TIME	13.35
2 COMBINED AT	9999	0.79	1	FLOW	325.
+				TIME	13.25
HYDROGRAPH AT	6040	0.03	1	FLOW	14.
+				TIME	13.35
2 COMBINED AT	9999	0.82	1	FLOW	339.
+				TIME	13.25
HYDROGRAPH AT	6050	0.16	1	FLOW	46.
+				TIME	13.60
2 COMBINED AT	9999	0.98	1	FLOW	382.
+				TIME	13.30
HYDROGRAPH AT	6060	0.11	1	FLOW	32.
+				TIME	13.50
2 COMBINED AT	9999	1.09	1	FLOW	414.
+				TIME	13.35
HYDROGRAPH AT	6061	0.05	1	FLOW	33.
+				TIME	13.00

flow from 6035

92. = Q25

3/5

IPNCH	0	PUNCH COMPUTED HYDROGRAPH
IOUT	21	SAVE HYDROGRAPH ON THIS UNIT
ISAV1	1	FIRST ORDINATE PUNCHED OR SAVED
ISAV2	601	LAST ORDINATE PUNCHED OR SAVED
TIMINT	0.050	TIME INTERVAL IN HOURS

1

PEAK FLOW AND STAGE (END-OF-PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND, AREA IN SQUARE MILES
TIME TO PEAK IN HOURS

OPERATION	STATION	AREA	PLAN		RATIOS APPLIED TO PRECIPITATION RATIO 1 10.50
HYDROGRAPH AT +	6005	0.02	1	FLOW	14.
				TIME	13.05
HYDROGRAPH AT +	6006	0.02	1	FLOW	21.
				TIME	13.05
2 COMBINED AT +	9999	0.04	1	FLOW	34.
				TIME	13.05
HYDROGRAPH AT +	6005	0.03	1	FLOW	23.
				TIME	13.15
2 COMBINED AT +	9999	0.06	1	FLOW	57.
				TIME	13.05
HYDROGRAPH AT +	6020	0.18	1	FLOW	131.
				TIME	13.35
2 COMBINED AT +	9999	0.24	1	FLOW	184.
				TIME	13.15
HYDROGRAPH AT +	6025	0.11	1	FLOW	82.
				TIME	13.35
2 COMBINED AT +	9999	0.35	1	FLOW	264.
				TIME	13.20
HYDROGRAPH AT +	6030	0.00	1	FLOW	3.
				TIME	13.00
2 COMBINED AT +	9999	0.36	1	FLOW	267.
				TIME	13.20
HYDROGRAPH AT +	6032	0.01	1	FLOW	15.
				TIME	13.00
2 COMBINED AT +	9999	0.37	1	FLOW	281.
				TIME	13.15
HYDROGRAPH AT +	6034	0.03	1	FLOW	29.
				TIME	13.00
2 COMBINED AT +	9999	0.40	1	FLOW	308.
				TIME	13.10
HYDROGRAPH AT +	6030	0.15	1	FLOW	91.
				TIME	13.35
2 COMBINED AT +	9999	0.55	1	FLOW	395.
				TIME	13.15
HYDROGRAPH AT +	6036	0.01	1	FLOW	10.
				TIME	13.00
2 COMBINED AT +	9999	0.56	1	FLOW	404.
				TIME	13.15
HYDROGRAPH AT +	6037	0.23	1	FLOW	157.

flow from 6035

6037

$= Q_{100}$

TABLE 4-1

City of Plant City
Westside Canal Stormwater Management Master Plan
Summary of Peak Flood Stages for Design Storms and Problem Areas

Model Node	Location	Top of Road (ft-NGVD)	10-yr/24-hr Peak Stage (ft-NGVD)	10-yr/24-hr Depth of Flooding (ft)	25-yr/24-hr Peak Stage (ft-NGVD)	25-yr/24-hr Depth of Flooding (ft)	100-yr/24-hr Peak Stage (ft-NGVD)	100-yr/24-hr Depth of Flooding (ft)	Problem ID Number
6176	Wheeler Street (SR 39)	123.5	122.4		123.1		123.9	0.4	
6178	SR 39 storm sewer (Collins St.)	138.5	129.7		130.2		137.8		
6180	Ball Street	121.0	121.3	0.3	121.3	0.3	121.8	0.8	P-7
6182			121.3		121.4		121.8		
6190			121.4		121.4		121.8		
6196			123.3		123.3		123.6		
6198	Grant Street	128.6	128.9	0.3	129.0	0.4	129.2	0.6	
6200			129.1		129.2		129.5		
6201	Dirt Path	132.6	128.4		128.6		129.0		
6202			128.5		128.6		129.1		
6203	Strawberry Lane	133.9	128.8		128.9		129.5		
6204			128.9		129.0		129.5		
6205	W. Prosser Drive	133.7	130.2		130.5		131.9		
6210			130.3		130.6		131.9		
6220	Essex Drive	132.5	131.0		131.5		132.8	0.3	
6230			131.1		131.5		132.8		
6250	Warren Street storm sewer	121.0	121.4	0.3	121.6	0.6	122.1	1.1	P-5
6251			121.4		121.6		122.1		
6252			121.4		121.6		122.1		
6253			121.4		121.6		122.1		
6254	N. side of Evers St. Kash-N-Karry	122.6	121.4		121.6		122.5		
6255			121.4		121.6		122.5		
6260			121.4		121.6		122.1		
6261		121.4	121.4	0.0	121.6	0.2	122.1	0.7	
6262	CSX Railroad	127.5	121.4		121.6		122.2		
6270			122.4		122.5		123.3		
6271	Ball Street storm sewer	126.9	123.6		124.1		125.8		
6275	Alsobrook Street storm sewer	121.5	121.1		121.2		121.7	0.2	
6280	Hunter Street storm sewer	119.9	121.1	1.2	121.3	1.4	121.7	1.8	P-7
6282	Hunter Street storm sewer	120.3	121.2	0.9	121.3	1.0	121.8	1.5	P-7
6290	Alexander Street storm sewer	120.0	117.0		117.5		118.0		
6291	Alexander Street	120.0	117.1		117.5		118.0		
6292			117.1		117.6		118.0		
6303			105.0		105.1		105.7		
6304			103.6		103.9		105.2		
6305			105.0		105.1		105.7		
6306			107.0		107.1		107.4		
6307			107.9		107.9		108.0		
6308			107.6		107.6		107.7		

Note: Level of service is 0.5 ft of road flooding for the 25-yr/24-hr storm and 0.75 ft of road flooding for the 100-yr/24-hr storm.

HW stage utilized

URS Greiner

JOB: SR 39 ALEXANDER ROAD BYPASS	SHEET 5 of 5	PROJ. NO. C100003240.19
DESCRIPTION: AB-2 50-yr Q, HW, & TW	COMPUTED BY Jim Zinner	DATE 05-25-99
	CHECKED BY DWP	DATE 5-28-99

Input/Output Boxes Explanation

[ ] = manually input values

[ ] = unknown, previously input, or computed output values

Frequency versus Discharge Log-slope Interpolation

when: f 3 > f 1 & f 3 < f 2

	frequency (yrs)		discharge (cfs)
f1 =	25	Q1 =	92
f2 =	100	Q2 =	157
f3 =	50	Q3 =	?

M = log (Q2) - log (Q1) / log (f2) - log (f1) = 2.5938

Q3 = 10 ^ [(log (Q2) - log (Q1) / M + log (f1)] = 120

The peak discharge for the 50 **year event** = **120**

Discharge versus Stage Linear Interpolation

	discharge (cfs)		stage (ft)
Q1 =	92	S1 =	107.9
Q2 =	157	S2 =	108
Q3 =	120.18	S3 =	?

S3 = S1 + ((S2 - S1) x (Q3 - Q1) / (Q2 - Q1)) = 107.9

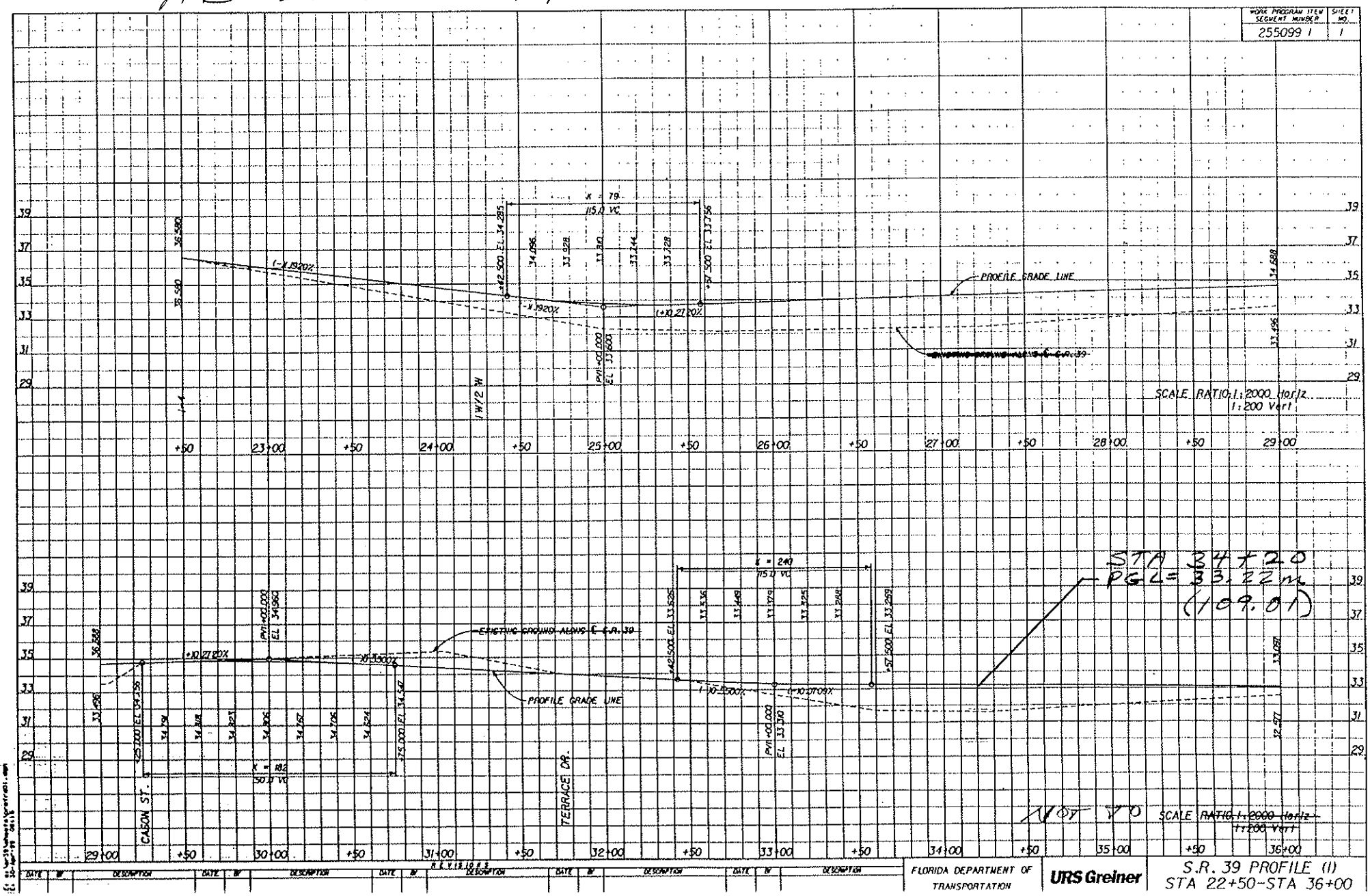
The peak stage for the 50 **year event** = **107.9**

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: III.B. CULVERT LOCATION COMPUTED BY: Zinner DATE: 5-27-99
AND CROSS SECTION CHECKED BY: Pratt DATE: 5-28-99

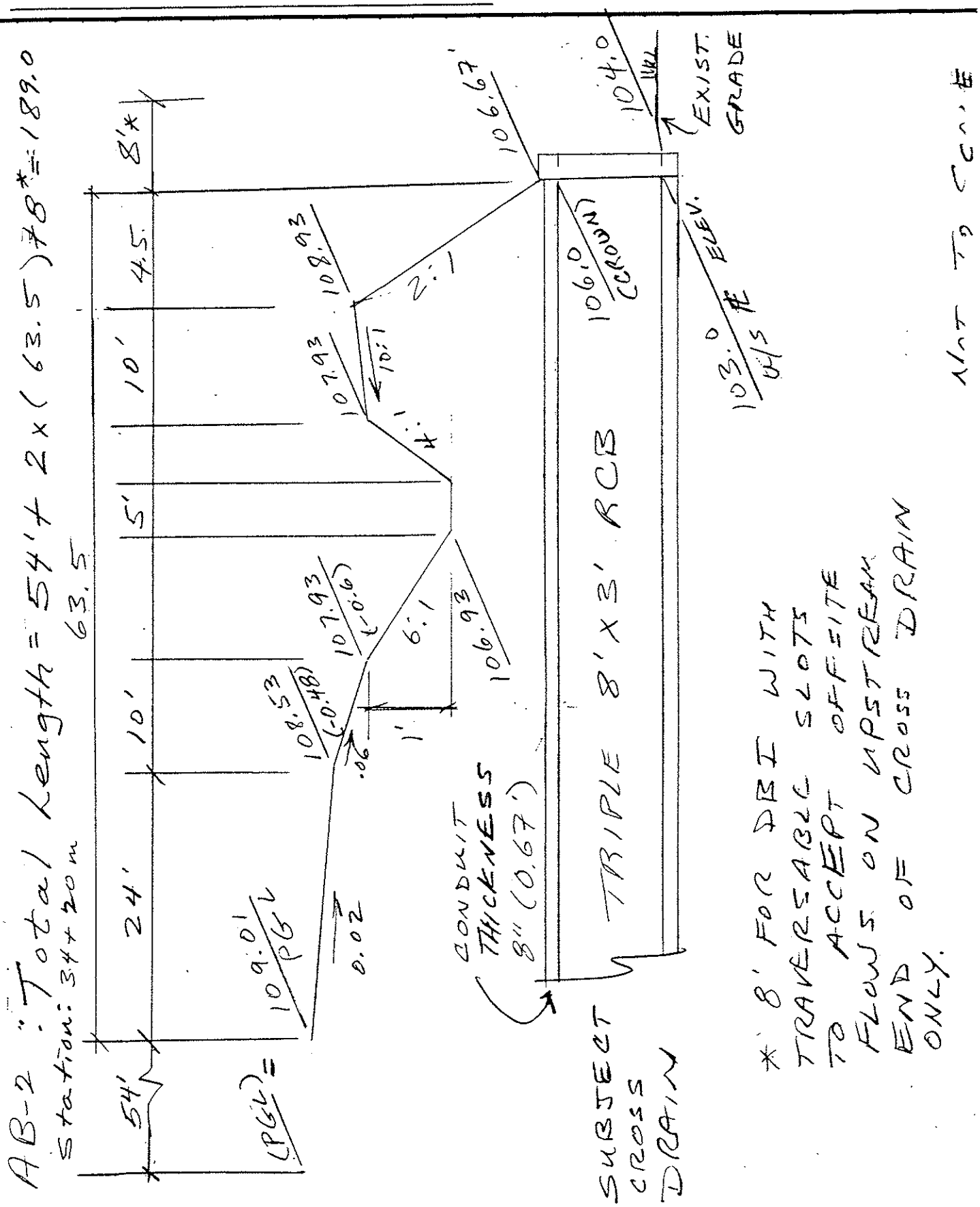
A conceptual vertical profile was developed for this PD&E. See the enclosed portion of the vertical profile and where AB-2 will be located. Also enclosed is a sketch of a half cross section of the proposed cross drain AB-2.

AB-2 Location



URS Greiner

JOB Alex. St. Bypass / SR 39 SHEET 3 OF 3 PROJ. NO. C100003240.91
DESCRIPTION AB-1 Length Calc. COMPUTED BY Zinner DATE 6-4-99
CHECKED BY _____ DATE _____



* 8' FOR DRI WITH TRAVERSABLE SLOTS TO ACCEPT OFF-SITE FLOWS ON UPSTREAM END OF CROSS DRAIN ONLY.

Form No. G1003-1

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 7 PROJ. NO. C100003240.19
DESCRIPTION: III.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The capacity of the proposed culvert AB-2 was analyzed for the 50- and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

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CURRENT DATE: 06-08-1999
CURRENT TIME: 09:28:14

FILE DATE: 06-08-1999
FILE NAME: AB2_50

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

C U L V NO.	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	103.00	102.00	190.00	3 RCB	8.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB2_50 DATE: 06-08-1999

50 — 4R

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
107.99	120.2	120.2	0.0	0.0	0.0	0.0	0.0	0.00	1
109.01	410.8	410.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB2_50 DATE: 06-08-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00
107.99	0.000	120.20	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

3/7

CURRENT DATE: 06-08-1999 FILE DATE: 06-08-1999
CURRENT TIME: 09:28:14 FILE NAME: AB2_50

PERFORMANCE CURVE FOR CULVERT 1 - 3(8.00 (ft) BY 3.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00
120.20	107.99	1.57	4.99	4-FFt	0.74	0.92	3.00	5.90	1.67	0.00

El. inlet face invert 103.00 ft El. outlet invert 102.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE ***************

UPSTREAM STATION	0.00 ft
UPSTREAM ELEVATION	103.00 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.00
DOWNSTREAM STATION	190.00 ft
DOWNSTREAM ELEVATION	102.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.00

***** CULVERT DATA SUMMARY ************************

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

CURRENT DATE: 06-08-1999
CURRENT TIME: 09:28:14

FILE DATE: 06-08-1999
FILE NAME: AB2_50

TAILWATER

CONSTANT WATER SURFACE ELEVATION
107.90

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	172.00 ft
CREST LENGTH	2300.00 ft
OVERTOPPING CREST ELEVATION	109.01 ft

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CURRENT DATE: 06-03-1999
CURRENT TIME: 15:13:56

FILE DATE: 06-03-1999
FILE NAME: AB2_100

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

C U L V NO.	SITE DATA			CULVERT SHAPE, MATERIAL, INLET				
	INLET ELEV. (ft)	OUTLET ELEV. (ft)	CULVERT LENGTH (ft)	BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	103.00	102.00	190.00	3 RCB	8.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB2_100 DATE: 06-03-1999

ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
100 YR — 108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
108.16	157.0	157.0	0.0	0.0	0.0	0.0	0.0	0.00	1
109.01	392.1	392.1	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB2_100 DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00
108.16	0.000	157.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

6/7

CURRENT DATE: 06-03-1999
CURRENT TIME: 15:13:56

FILE DATE: 06-03-1999
FILE NAME: AB2_100

PERFORMANCE CURVE FOR CULVERT 1 - 3(8.00 (ft) BY 3.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00
157.00	108.16	1.87	5.16	4-FFt	0.89	1.10	3.00	6.00	2.18	0.00

El. inlet face invert 103.00 ft El. outlet invert 102.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **************

UPSTREAM STATION	0.00 ft
UPSTREAM ELEVATION	103.00 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.00
DOWNSTREAM STATION	190.00 ft
DOWNSTREAM ELEVATION	102.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.00

***** CULVERT DATA SUMMARY ************************

BARREL SHAPE	BOX
BARREL SPAN	8.00 ft
BARREL RISE	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

7/7

CURRENT DATE: 06-03-1999
CURRENT TIME: 15:13:56

FILE DATE: 06-03-1999
FILE NAME: AB2_100

TAILWATER

CONSTANT WATER SURFACE ELEVATION
108.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	172.00 ft
CREST LENGTH	2300.00 ft
OVERTOPPING CREST ELEVATION	109.01 ft

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 1 PROJ. NO. C100003240.19
DESCRIPTION: III.D. RESULTS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The cross drain which satisfies the 0.1' rise for the 50-year storm event is a triple 8'x3' reinforced concrete box culvert (RCB).

The results of the HY-8 analyses for the proposed culvert AB-2 are shown below:

Event (year)	Existing Headwater Elevation feet (NGVD)	Proposed Headwater Elevation feet (NGVD)
50	107.90	107.99
100	108.00	108.16

IV. PROPOSED CULVERT AB-3

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: IV.A. DISCHARGE RATES AND TAILWATER ELEVATIONS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

Discharge rates for culvert AB-3 were calculated using the Rational method. See the enclosed calculations for the peak discharge rates and they are as follows:

Event (year)	Discharge Rate (cfs)	Source
50	8	Rational method
100	9	Rational method

The elevation of the crown of the proposed cross drain and the seasonal high water table (SHWT) elevation was compared and the higher stage was used for the proposed AB-3 capacity analyses. In this case the SHWT elevation was used. The nearest field verified SHWT elevation was located at the station 48+00 and the SHWT elevation is 100.50 NGVD.

URS Greiner

JOB: SR 39 ALEXANDER ROAD BYPASS	SHEET 2 of 3	PROJ. NO. C100003240.19
DESCRIPTION: Rational C & Q calc.s	COMPUTED BY Jim Zinner	DATE 05-26-99
Drainage Area AB-3	CHECKED BY	DATE

Input/Output Boxes Explanation: [ ] = manually input values; [ ] = unknown, previously input, or computed output values

Drainage Area = [19.6] ac

Land Use	Area (ac)	C	C x A (ac)
Pavement	0.85	0.95	0.8
Industrial / Commercial	0	0.95	0.0
Pasture, grass, farmlands	18.75	0.2	3.8
Woodlands	0	0.25	0.0
Total =	19.6		4.56

C coefficients assumed for sandy soils and flat (0-2%) slopes

composite C = (C x A) / Area = 4.56 / 19.6 = [0.23]

TOC = [48] mins = [0.80] hours (see following worksheet)

Intensities from FDOT Zone [6] IDF Curve

frequency = [50] year

Intensity [1.8] in / hour

Q = CIA = [0.23] * [1.8] * [19.6] = [8] cfs

frequency = [100] year

Intensity [2.00] in / hour

Q = CIA = [0.23] * [2] * [19.6] = [9] cfs

Project: S.R. 39 Alexander Street Bypass

Subject: Time of Concentration Calculations Proposed Conditions

Project No.: C100003240.19

Sheet of

Computed By: JYZ Date: 04-07-99

Checked By: RWP Date: 5-28-99

Basin #	Sheet Flow: Surface Type	Mannings Coeff. n	Flow Length <=300 ft. L (ft)	2yr-24hr Rainfall P2 (in)	Land Slope s (ft/ft)	Time T1 (min)	Shallow Concentrated Flow: Surface Type	Flow Length L (ft)	Water Course Slope s (ft/ft)	Avg. Vel. V (ft/s)	Time T2 (min)	Channel Flow: Cross Sectional Flow Area a (ft^2)	Wetted Perimeter Pw (ft)	Hydraulic Radius r = a/Pw r (ft)	Channel Slope s (ft/ft)	Mannings Roughness Coeff. n	Vel. V (ft/s)	Flow Length L (ft)	Time T3 (min)	Total Time Tc (min)	Total Time Tc (hr)
	T1 = (0.007*(n*L)^0.8) / (P2^0.5)*(s^0.4) *60min/hr						T2 = (L/V) / 60 sec/min.					T3 = (L/V) / 60 sec/min.									
AB3	Cultivat. >20%	0.17	300	4.0	0.006	37.8	unpavd	900	0.014	1.4	10.7										
	cover	Total				37.8	Total				10.7	Total							0	48	0.81
AB4	Cultivat. >20%	0.17	300	4.0	0.028	20.4	unpavd	1000	0.008	1.4	11.9	18.000	21.300	0.845	0.0004	0.1	0.266	2700	169		
												310.000	320.100	0.968	0.0046	0.1	0.989	650	11		
	cover	Total				20.4	Total				11.9	Total							180	212	3.54
AB5	Pasture, grass,	0.17	300	4.0	0.004	44.4	unpavd	700	0.004	1.4	8.3										
	farmland	Total				44.4	Total				8.3	Total							0	53	0.88

NOTES: (1) Sheet Flow Mannings Roughness Coefficient obtained from Table 3-1 Roughness Coefficients for Sheet Flow, Urban Hydrology for Small Watersheds, TR55 Manual

(2) Maximum hydraulic length for sheet Flow is 300 ft. (TR 55 Manual)

(3) Maximum hydraulic length for shallow concentrated flow is 1000 ft.

(4) 2yr-24hr rainfall amount (P2) was obtained from SWFWMD 2yr-24hr return period rainfall map

(5) Average Velocity for Paved Surface = 20.3282(s)^0.5 (See Appendix F TR55 Manual)

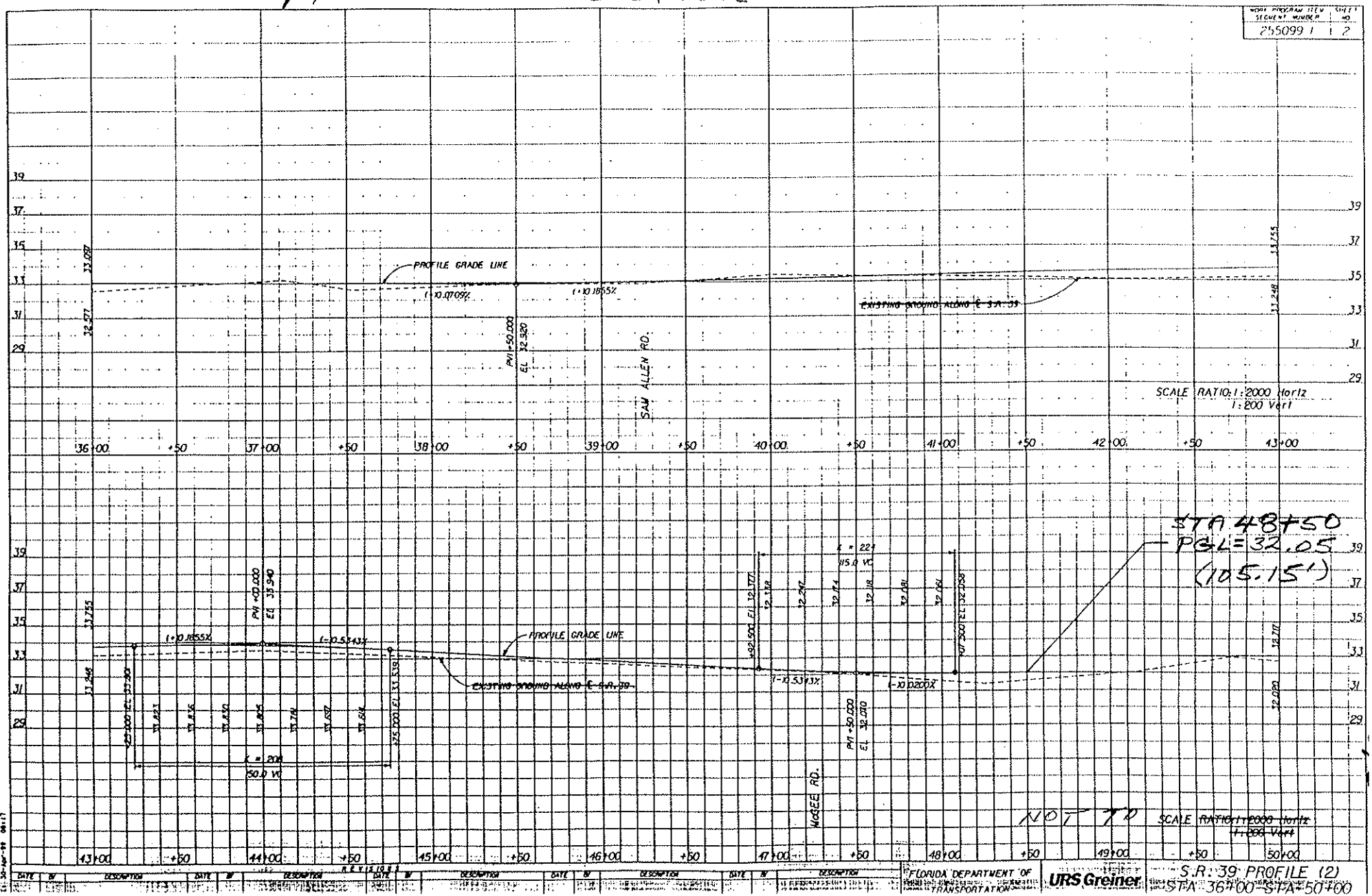
(6) Average Velocity for Unpaved Surface = 16.1345(s)^0.5 (See Appendix F TR55 Manual)

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: IV.B. CULVERT LOCATION COMPUTED BY: Zinner DATE: 5-27-99
AND CROSS SECTION CHECKED BY: Pratt DATE: 5-28-99

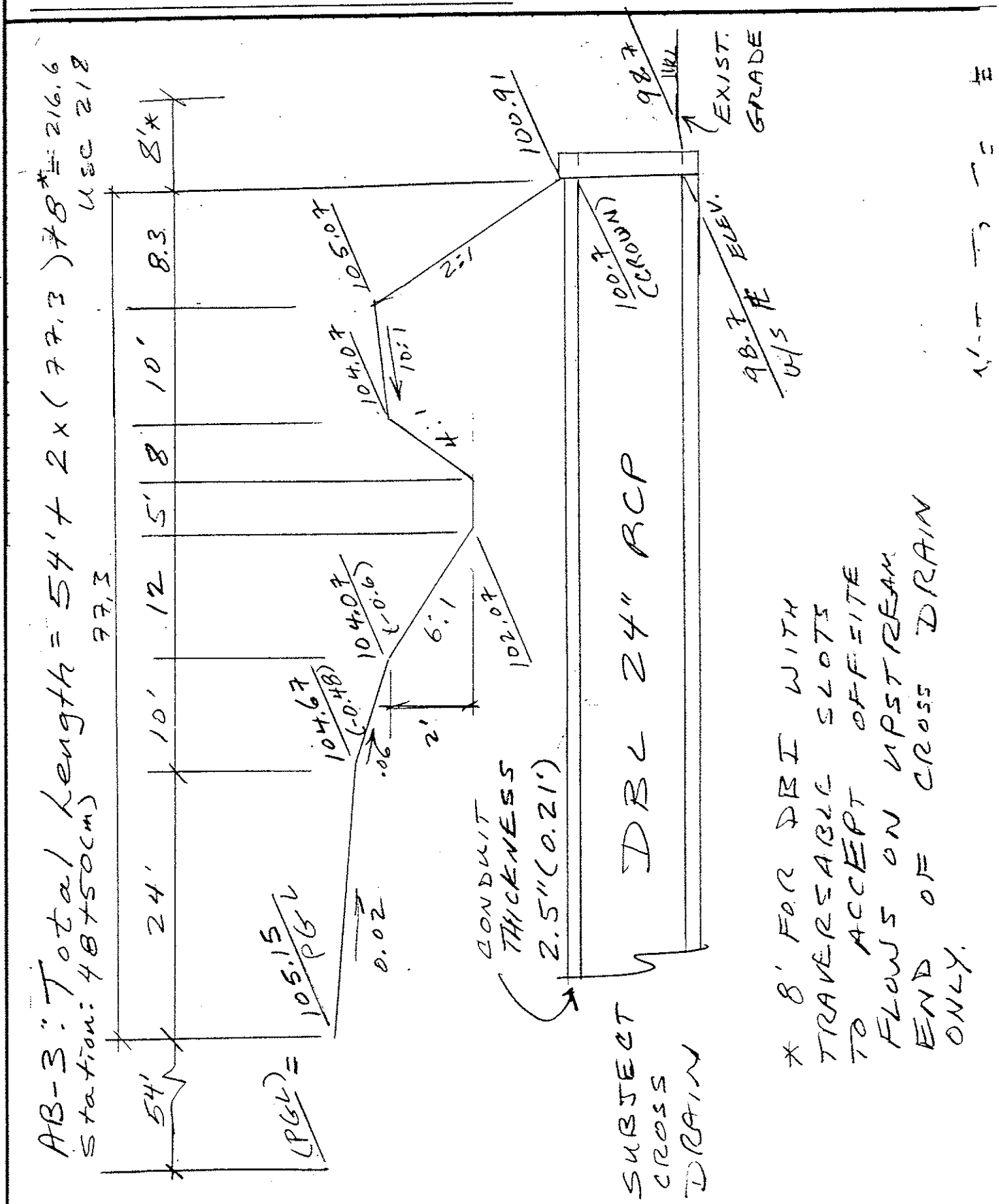
A conceptual vertical profile was developed for this PD&E. See the enclosed portion of the vertical profile and where AB-3 will be located. Also enclosed is a sketch of a half cross section of the proposed cross drain AB-3.

AE-3 Location



URS Greiner

JOB Alex. St. Bypass / SR39 SHEET 3 OF 3 PROJ. NO. 0000032240.14
DESCRIPTION AB-3 Length Calc. COMPUTED BY Zinner DATE 6-4-99
CHECKED BY _____ DATE _____



Form No. G1003

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 4 PROJ. NO. C100003240.19
DESCRIPTION: IV.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The capacity of the proposed culvert the proposed culvert AB-3 was analyzed for the 50-year and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

CURRENT DATE: 06-03-1999
CURRENT TIME: 17:45:14

FILE DATE: 06-03-1999
FILE NAME: AB3_LC

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	98.70	96.70	218.01	2 RCP	24.00	24.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB3_LC DATE: 06-03-1999

	ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
50 YR	100.60	8.0	8.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.1	8.1	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.2	8.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.3	8.3	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.4	8.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.5	8.5	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.6	8.6	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.7	8.7	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.8	8.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	100.60	8.9	8.9	0.0	0.0	0.0	0.0	0.0	0.00	1
100 YR	100.60	9.0	9.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.15	120.8	120.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB3_LC DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
100.60	0.000	8.00	0.00	0.00
100.60	0.000	8.10	0.00	0.00
100.60	0.000	8.20	0.00	0.00
100.60	0.000	8.30	0.00	0.00
100.60	0.000	8.40	0.00	0.00
100.60	0.000	8.50	0.00	0.00
100.60	0.000	8.60	0.00	0.00
100.60	0.000	8.70	0.00	0.00
100.60	0.000	8.80	0.00	0.00
100.60	0.000	8.90	0.00	0.00
100.60	0.000	9.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 06-03-1999
CURRENT TIME: 17:45:14

FILE DATE: 06-03-1999
FILE NAME: AB3_LC

PERFORMANCE CURVE FOR CULVERT 1 - 2(24.00 (ft) BY 24.00 (ft)) RCP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
8.00	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.08	0.00
8.10	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.20	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.30	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.40	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.50	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.60	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.70	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.80	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
8.90	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00
9.00	100.60	1.44	1.90	3-M1t	0.03	0.06	3.80	3.80	0.09	0.00

El. inlet face invert 98.70 ft El. outlet invert 96.70 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	98.70 ft
OUTLET STATION	218.00 ft
OUTLET ELEVATION	96.70 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0092
CULVERT LENGTH ALONG SLOPE	218.01 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	24.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	BEVELED EDGE (1:1)
INLET DEPRESSION	NONE

4/4

CURRENT DATE: 06-03-1999
CURRENT TIME: 17:45:14

FILE DATE: 06-03-1999
FILE NAME: AB3_LC

TAILWATER

CONSTANT WATER SURFACE ELEVATION
100.50

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	192.00 ft
CREST LENGTH	1600.00 ft
OVERTOPPING CREST ELEVATION	105.15 ft

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 1 PROJ. NO. C100003240.19
DESCRIPTION: IV.D. RESULTS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The cross drain which satisfies the 0.1' rise for the 50-year storm event is a double 24" reinforced concrete pipe (RCP).

The results of the HY-8 analyses for the proposed culvert AB-3 are shown below:

Event (year)	Existing Headwater Elevation feet (NGVD)	Proposed Headwater Elevation feet (NGVD)
50	100.50	100.60
100	100.50	100.60

V. PROPOSED CULVERT AB-4

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: V.A. DISCHARGE RATES COMPUTED BY: Zinner DATE: 5-27-99
AND TAILWATER ELEVATIONS CHECKED BY: Pratt DATE: 5-28-99

Discharge rates for culvert AB-4 were calculated using the Rational method. See the enclosed calculations for the peak discharge rates and they are as follows:

Event (year)	Discharge Rate (cfs)	Source
50	84	Rational method
100	93	Rational method

The elevation of the crown of the proposed cross drain and the seasonal high water table (SHWT) elevation was compared, and the higher stage was used for the proposed AB-4 capacity analyses. In this case the SHWT elevation was used. The nearest field verified SHWT elevation was located at the station 55+00 and the SHWT elevation is 103.00 NGVD.

URS Greiner

JOB: SR 39 ALEXANDER ROAD BYPASS	SHEET 2 of 3	PROJ. NO. C100003240.19
DESCRIPTION: Rational C & Q calc.s	COMPUTED BY Jim Zinner	DATE 05-26-99
Drainage Area AB-4	CHECKED BY	DATE

Input/Output Boxes Explanation: [ ] = manually input values; [ ] = unknown, previously input, or computed output values

Drainage Area = [153] ac

Land Use	Area (ac)	C	C x A (ac)
Pavement	4.3	0.95	4.1
Industrial / Commercial	16.5	0.95	15.7
Pasture, grass, farmlands	123	0.2	24.6
Woodlands	9.2	0.25	2.3
Total =	153		46.66

C coefficients assumed for sandy soils and flat (0-2%) slopes

composite C = (C x A) / Area = 46.66 / 153 = [0.30]

TOC = [212] mins = [3.54] hours (see following worksheet)

Intensities from FDOT Zone [6] IDF Curve

frequency = [50] year

Intensity [1.8] in / hour

Q = CIA = [0.30] * [1.8] * [153] = [84] cfs

frequency = [100] year

Intensity [2.00] in / hour

Q = CIA = [0.30] * [2] * [153] = [93] cfs

Project: S.R. 39 Alexander Street Bypass
Subject: Time of Concentration Calculations Proposed Conditions
Project No.: C100003240.19

Computed By: JYZ Date: 04-07-99
Checked By: RWP Date: 5-28-99

Basin #	Sheet Flow: Surface Type	Mannings Coeff. n	Flow Length <=300 ft. L (ft)	2yr-24hr Rainfall P2 (in)	Land Slope s (ft/ft)	Time T1 (min)	Shallow Concentrated Flow: Surface Type	Flow Length L (ft)	Water Course Slope s (ft/ft)	Avg. Vel. V (ft/s)	Time T2 (min)	Channel Flow: Cross Sectional Flow Area a (ft^2)	Wetted Perimeter Pw (ft)	Hydraulic Radius r = a/Pw r (ft)	Channel Slope s (ft/ft)	Mannings Roughness Coeff. n	Vel. V (ft/s)	Flow Length L (ft)	Time T3 (min)	Total Time Tc (min)	Total Time Tc (hr)
	T1 = (0.007*(n*L)^0.8) / (P2^0.5)*(s^0.4) *60min/hr						Avg. Vel (V), Figure 3-1 T2 = (L/V) / 60 sec/min.					V = 1.49 * (r^0.67) * (s^0.5) / n T3 = (L/V) / 60 sec/min.									
AB3	Cultivat. >20%	0.17	300	4.0	0.006	37.8	unpavd	900	0.014	1.4	10.7										
	cover	Total				37.8	Total				10.7	Total							0	48	0.81
AB4	Cultivat. >20%	0.17	300	4.0	0.028	20.4	unpavd	1000	0.008	1.4	11.9	18.000	21.300	0.845	0.0004	0.1	0.266	2700	169		
												310.000	320.100	0.968	0.0046	0.1	0.989	650	11		
	cover	Total				20.4	Total				11.9	Total							180	212	3.54
AB5	Pasture, grass,	0.17	300	4.0	0.004	44.4	unpavd	700	0.004	1.4	8.3										
	farmland	Total				44.4	Total				8.3	Total							0	53	0.88

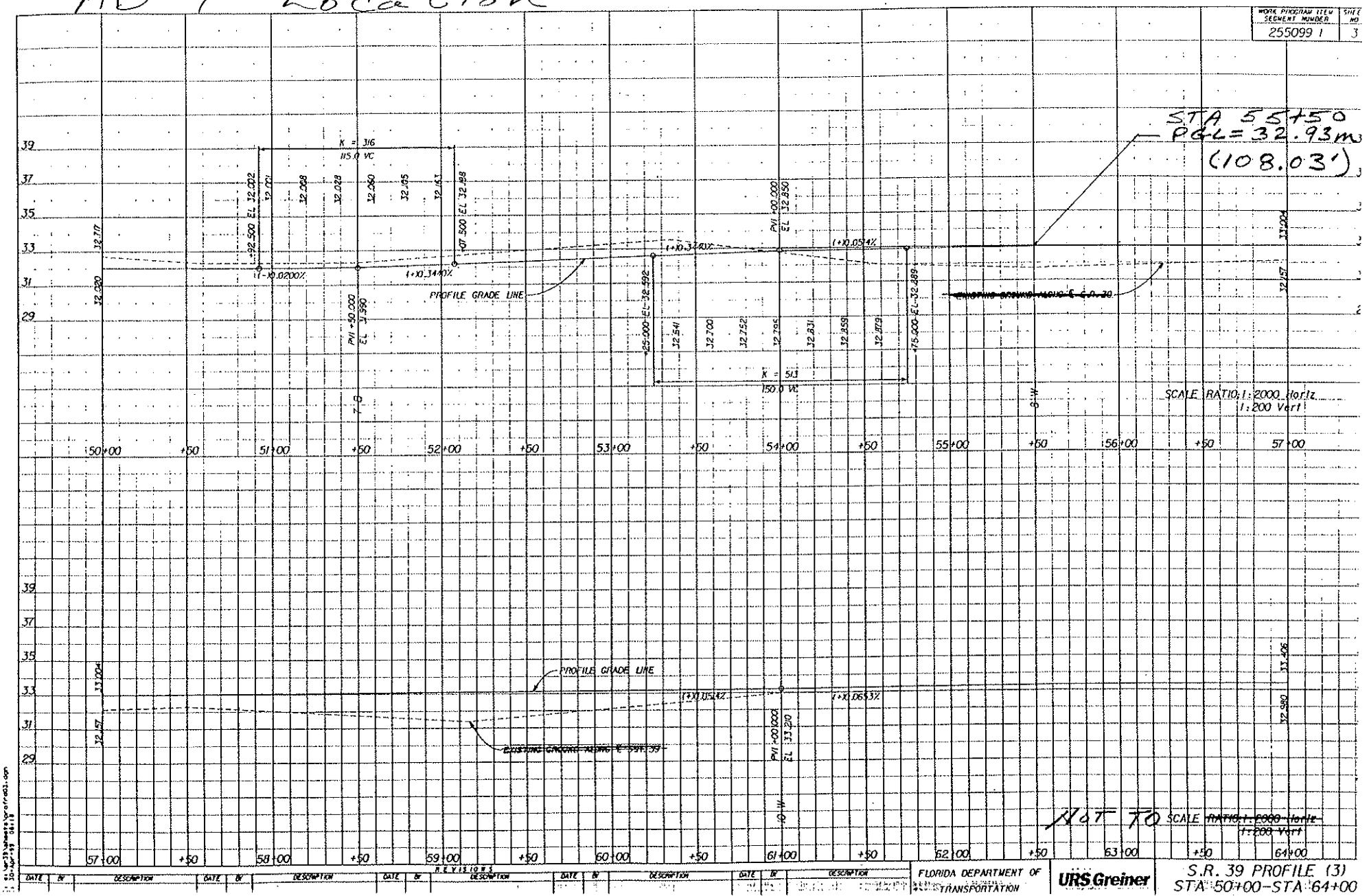
NOTES: (1) Sheet Flow Mannings Roughness Coefficient obtained from Table 3-1 Roughness Coefficients for Sheet Flow, Urban Hydrology for Small Watersheds, TR55 Manual
(2) Maximum hydraulic length for sheet Flow is 300 ft. (TR 55 Manual)
(3) Maximum hydraulic length for shallow concentrated flow is 1000 ft.
(4) 2yr-24hr rainfall amount (P2) was obtained from SWFWMD 2yr-24hr return period rainfall map
(5) Average Velocity for Paved Surface = 20.3282(s)^0.5 (See Appendix F TR55 Manual)
(6) Average Velocity for Unpaved Surface = 16.1345(s)^0.5 (See Appendix F TR55 Manual)

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: V.B. CULVERT LOCATION AND CROSS SECTION COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

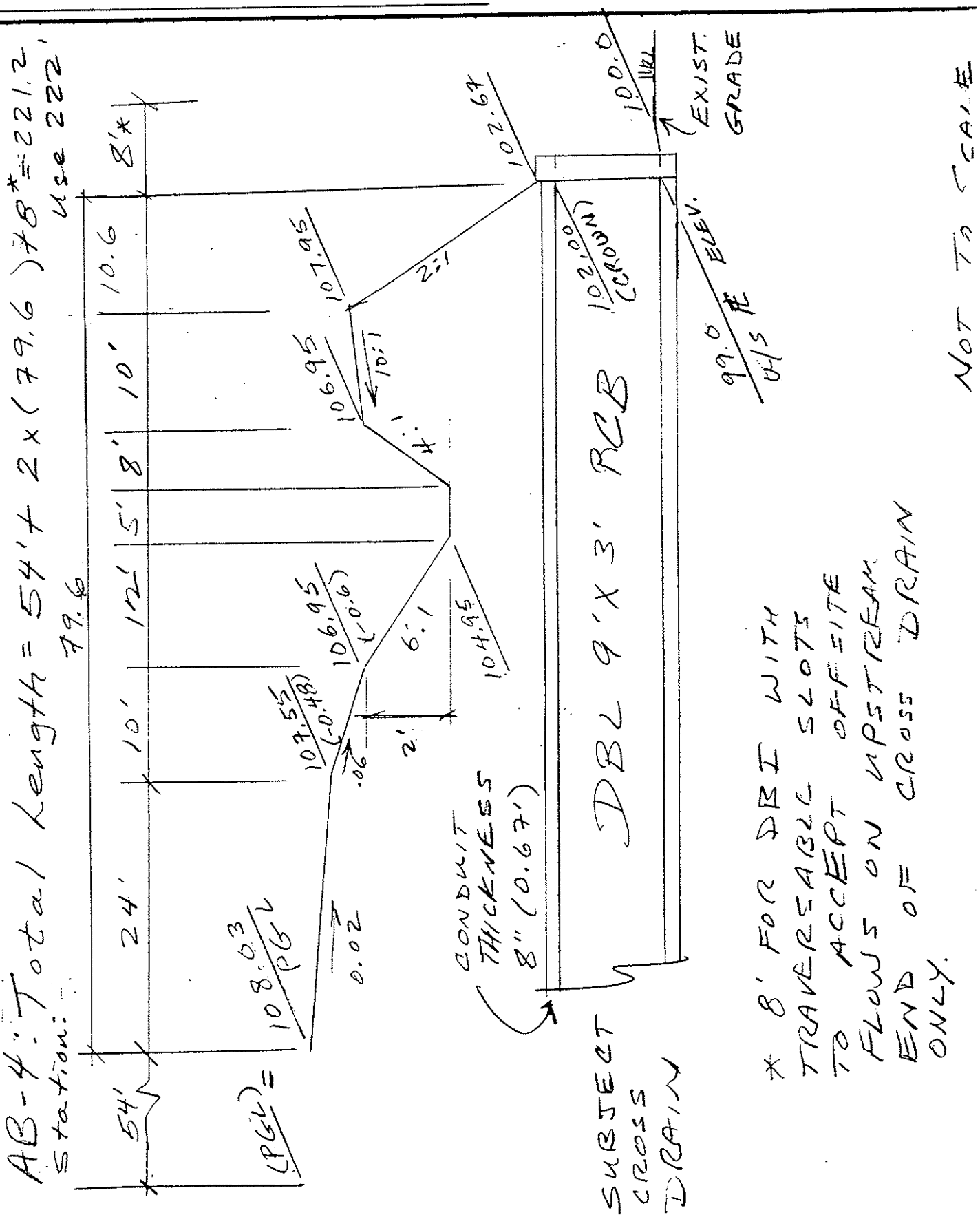
A conceptual vertical profile was developed for this PD&E. See the enclosed portion of the vertical profile and where AB-4 will be located. Also enclosed is a sketch of a half cross section of the proposed cross drain AB-4.

AC-4 Location



URS Greiner

JOB Alex St. Bypass / SR 39 SHEET 3 OF 3 PROJ. NO. C100003240-17
DESCRIPTION AB-4 Length Calc. COMPUTED BY Zinner DATE 6-4-99
CHECKED BY _____ DATE _____



Form No. G1003-P

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 4 PROJ. NO. C100003240.19
DESCRIPTION: V.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The capacity of the proposed culvert AB-4 was analyzed for the 50- and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

CURRENT DATE: 06-03-1999
CURRENT TIME: 16:31:02

FILE DATE: 06-03-1999
FILE NAME: AB4_LC

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	99.00	98.00	222.00	2 RCB	9.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB4_LC DATE: 06-03-1999

	ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
50 YR	103.09	84.0	84.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.09	84.9	84.9	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.09	85.8	85.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.09	86.7	86.7	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.09	87.6	87.6	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.10	88.5	88.5	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.10	89.4	89.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.10	90.3	90.3	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.10	91.2	91.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	103.10	92.1	92.1	0.0	0.0	0.0	0.0	0.0	0.00	1
100 YR	103.11	93.0	93.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	108.03	641.8	641.8	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB4_LC DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
103.09	0.000	84.00	0.00	0.00
103.09	0.000	84.90	0.00	0.00
103.09	0.000	85.80	0.00	0.00
103.09	0.000	86.70	0.00	0.00
103.09	0.000	87.60	0.00	0.00
103.10	0.000	88.50	0.00	0.00
103.10	0.000	89.40	0.00	0.00
103.10	0.000	90.30	0.00	0.00
103.10	0.000	91.20	0.00	0.00
103.10	0.000	92.10	0.00	0.00
103.11	0.000	93.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 06-03-1999
CURRENT TIME: 16:31:02

FILE DATE: 06-03-1999
FILE NAME: AB4_LC

PERFORMANCE CURVE FOR CULVERT 1 - 2(9.00 (ft) BY 3.00 (ft)) RCB

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
84.00	103.09	1.50	4.09	4-FFt	0.74	0.88	3.00	5.00	1.56	0.00
84.90	103.09	1.51	4.09	4-FFt	0.75	0.89	3.00	5.00	1.57	0.00
85.80	103.09	1.52	4.09	4-FFt	0.75	0.89	3.00	5.00	1.59	0.00
86.70	103.09	1.53	4.09	4-FFt	0.76	0.90	3.00	5.00	1.61	0.00
87.60	103.09	1.54	4.09	4-FFt	0.76	0.90	3.00	5.00	1.62	0.00
88.50	103.10	1.55	4.10	4-FFt	0.77	0.91	3.00	5.00	1.64	0.00
89.40	103.10	1.56	4.10	4-FFt	0.77	0.92	3.00	5.00	1.66	0.00
90.30	103.10	1.57	4.10	4-FFt	0.78	0.92	3.00	5.00	1.67	0.00
91.20	103.10	1.58	4.10	4-FFt	0.79	0.93	3.00	5.00	1.69	0.00
92.10	103.10	1.59	4.10	4-FFt	0.79	0.94	3.00	5.00	1.71	0.00
93.00	103.11	1.60	4.11	4-FFt	0.80	0.94	3.00	5.00	1.72	0.00

El. inlet face invert 99.00 ft El. outlet invert 98.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** EMBANKMENT TOE **********

UPSTREAM STATION	0.00 ft
UPSTREAM ELEVATION	99.00 ft
UPSTREAM EMBANKMENT SLOPE (X:1)	0.00
DOWNSTREAM STATION	222.00 ft
DOWNSTREAM ELEVATION	98.00 ft
DOWNSTREAM EMBANKMENT SLOPE (X:1)	0.00

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	BOX
BARREL SPAN	9.00 ft
BARREL RISE	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	SQUARE EDGE (90-45 DEG.)
INLET DEPRESSION	NONE

CURRENT DATE: 06-03-1999
CURRENT TIME: 16:31:02

FILE DATE: 06-03-1999
FILE NAME: AB4_LC

TAILWATER

CONSTANT WATER SURFACE ELEVATION
103.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	212.00 ft
CREST LENGTH	3000.00 ft
OVERTOPPING CREST ELEVATION	108.03 ft

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 1 PROJ. NO. C100003240.19
DESCRIPTION: V.D. RESULTS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The cross drain which satisfies the 0.1' rise for the 50-year storm event is a double 9'x3' reinforced concrete box culvert (RCB).

The results of the HY-8 analyses for the proposed culvert AB-4 are shown below:

Event (year)	Existing Headwater/ Tailwater Elevation feet (NGVD)	Proposed Headwater Elevation feet (NGVD)
50	103.00	103.09
100	103.00	103.11

VI. PROPOSED CULVERT AB-5

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: VI.A. DISCHARGE RATES COMPUTED BY: Zinner DATE: 5-27-99
AND TAILWATER ELEVATIONS CHECKED BY: Pratt DATE: 5-28-99

Discharge rates for culvert AB-5 were calculated using the Rational method. See the enclosed calculations for the peak discharge rates and they are as follows:

Event (year)	Discharge Rate (cfs)	Source
50	16	Rational method
100	18	Rational method

The elevation of the crown of the proposed cross drain and the seasonal high water table (SHWT) elevation was compared, and the higher stage was used for the proposed AB-5 capacity analyses. In this case the SHWT elevation was used. The nearest field verified SHWT elevation was located at the station 61+00 and the SHWT elevation is 104.00 NGVD.

URS Greiner

JOB: SR 39 ALEXANDER ROAD BYPASS	SHEET 2 of 3	PROJ. NO. C100003240.19
DESCRIPTION: Rational C & Q calc.s	COMPUTED BY Jim Zinner	DATE 05-26-99
Drainage Area AB5	CHECKED BY	DATE

Input/Output Boxes Explanation

[ ] = manually input values

[ ] = unknown, previously input, or computed output values

Drainage Area = [7] ac

Land Use	Area (ac)	C	C x A (ac)
Pavement	3.1	0.95	2.9
Pasture, grass, farmlands	3.9	0.2	0.8
Total =	7		3.7

C coefficients assumed for sandy soils and flat (0-2%) slopes

composite C = (C x A) / Area = 3.7 / 7 = [0.53]

TOC = [53] mins = [0.85] hours (see following worksheet)

Intensities from FDOT Zone [6] IDF Curve

frequency = [50] year

Intensity [4.4] in / hour

Q = CIA = [0.53] * [4.4] * [7] = [16] cfs

frequency = [100] year

Intensity [4.80] in / hour

Q = CIA = [0.53] * [4.8] * [7] = [18] cfs

Project: S.R. 39 Alexander Street Bypass
Subject: Time of Concentration Calculations Proposed Conditions
Project No.: C100003240.19

Computed By: JYZ Date: 04-07-99
Checked By: RWP Date: 5-28-99

Basin #	Sheet Flow: Surface Type	Mannings Coeff. n	Flow Length <=300 ft. L (ft)	2yr-24hr Rainfall P2 (in)	Land Slope s (ft/ft)	Time T1 (min)	Shallow Concentrated Flow: Surface Type	Flow Length L (ft)	Water Course Slope s (ft/ft)	Avg. Vel. V (ft/s)	Time T2 (min)	Channel Flow: Cross Sectional Flow Area a (ft^2)	Wetted Perimeter Pw (ft)	Hydraulic Radius r = a/Pw r (ft)	Channel Slope s (ft/ft)	Mannings Roughness Coeff. n	Vel. V (ft/s)	Flow Length L (ft)	Time T3 (min)	Total Time Tc (min)	Total Time Tc (hr)
AB3	Cultivat. >20% cover	0.17	300	4.0	0.006	37.8	unpavd	900	0.014	1.4	10.7										
		Total				37.8	Total				10.7	Total							0	48	0.81
AB4	Cultivat. >20% cover	0.17	300	4.0	0.028	20.4	unpavd	1000	0.008	1.4	11.9	18.000	21.300	0.845	0.0004	0.1	0.266	2700	169		
												310.000	320.100	0.968	0.0046	0.1	0.989	650	11		
		Total				20.4	Total				11.9	Total							180	212	3.54
AB5	Pasture, grass, farmland	0.17	300	4.0	0.004	44.4	unpavd	700	0.004	1.4	8.3										
		Total				44.4	Total				8.3	Total							0	53	0.88

T1 = (0.007*(n*L)^0.8) / (P2^0.5)*(s^0.4) *60min/hr
T2 = (L/V) / 60 sec/min.
T3 = (L/V) / 60 sec/min.

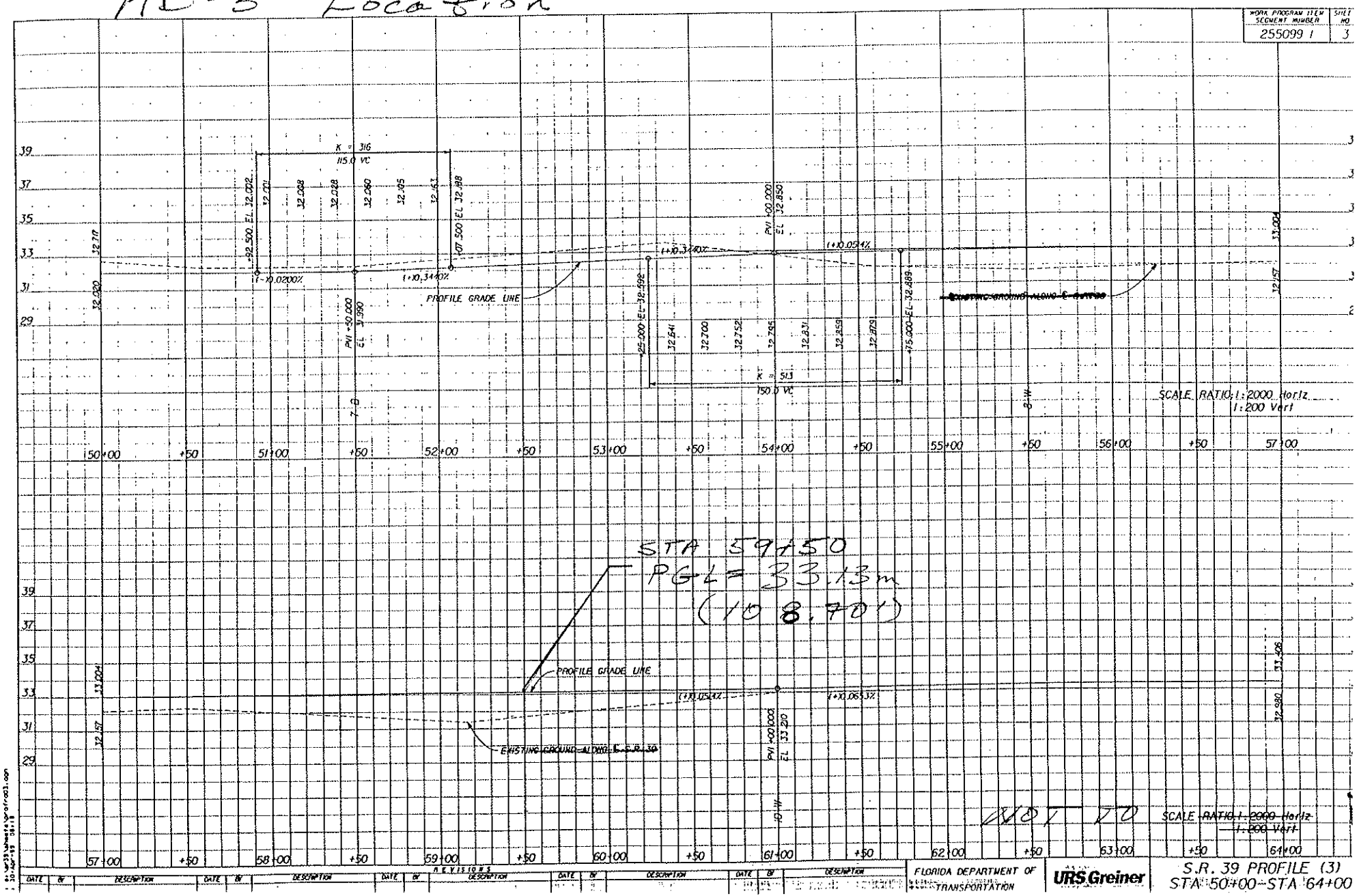
NOTES: (1) Sheet Flow Mannings Roughness Coefficient obtained from Table 3-1 Roughness Coefficients for Sheet Flow, Urban Hydrology for Small Watersheds, TR55 Manual
(2) Maximum hydraulic length for sheet Flow is 300 ft. (TR 55 Manual)
(3) Maximum hydraulic length for shallow concentrated flow is 1000 ft.
(4) 2yr-24hr rainfall amount (P2) was obtained from SWFWMD 2yr-24hr return period rainfall map
(5) Average Velocity for Paved Surface = 20.3282(s)^0.5 (See Appendix F TR55 Manual)
(6) Average Velocity for Unpaved Surface = 16.1345(s)^0.5 (See Appendix F TR55 Manual)

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: VI. B. CULVERT LOCATION AND CROSS SECTION COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

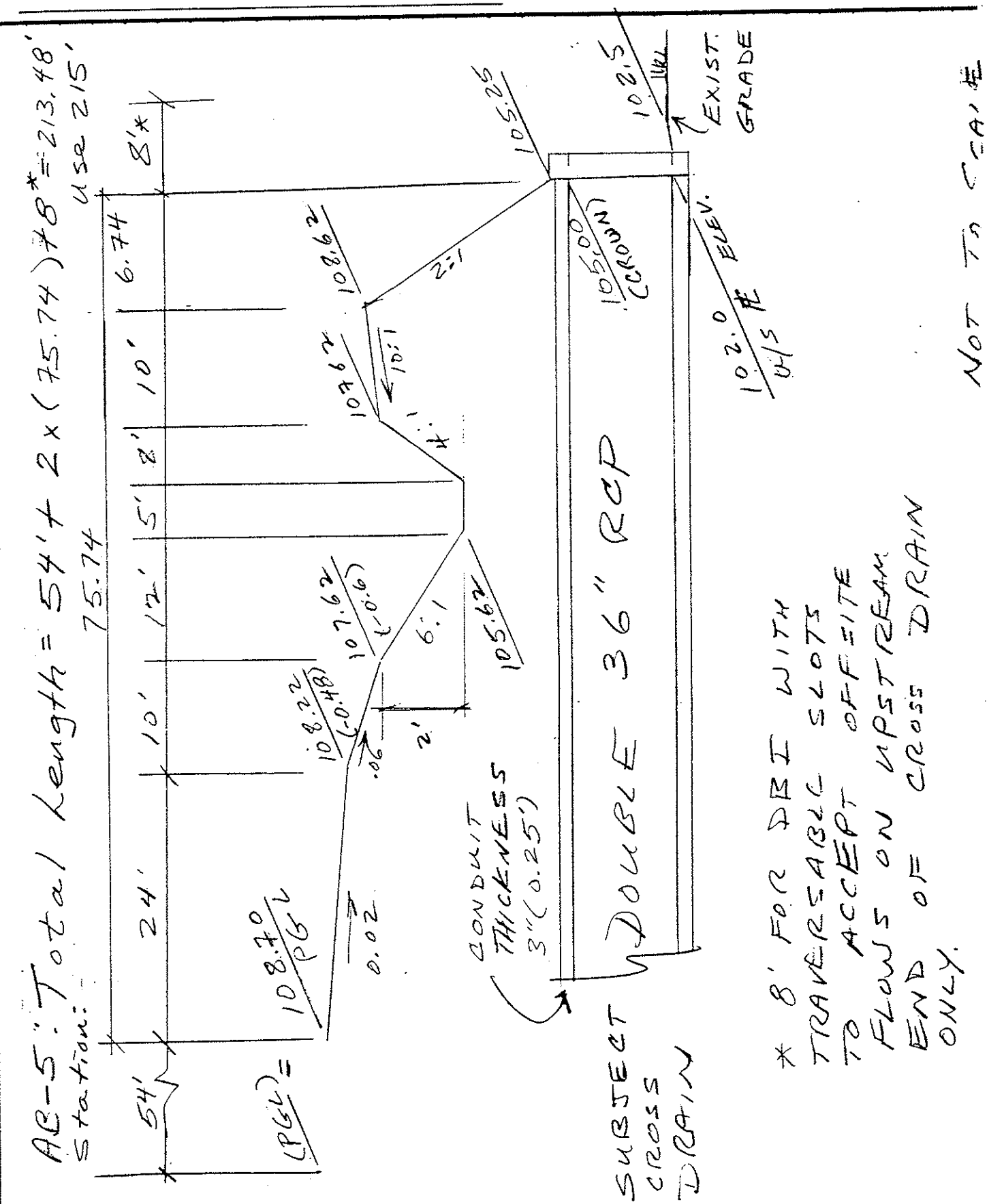
A conceptual vertical profile was developed for this PD&E. See the enclosed portion of the vertical profile and where AB-5 will be located. Also enclosed is a sketch of a half cross section of the proposed cross drain AB-5.

AC-5 Location



URS Greiner

JOB Alex. St. Bypass / SR39 SHEET 3 OF 3 PROJ. NO. C10000324040.19
DESCRIPTION AB-5 Length Calc. COMPUTED BY Zinner DATE 6-4-99
CHECKED BY _____ DATE _____



Form No. G1003-F

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 4 PROJ. NO. C100003240.19
DESCRIPTION: VI.C. 50-YEAR AND 100-YEAR CULVERT CAPACITY ANALYSES COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The capacity of the proposed culvert AB-5 was analyzed for the 50- and 100-year storm events using HY-8, software based on the techniques provided in FHWA Hydraulic Design Series # 5. See the enclosed HY-8 output for the analyses.

CURRENT DATE: 06-03-1999
CURRENT TIME: 18:18:43

FILE DATE: 06-03-1999
FILE NAME: AB5_LC

FHWA CULVERT ANALYSIS
HY-8, VERSION 6.0

CULV NO.	SITE DATA: INLET ELEV. (ft)	SITE DATA: OUTLET ELEV. (ft)	SITE DATA: CULVERT LENGTH (ft)	CULVERT SHAPE, MATERIAL, INLET: BARRELS SHAPE MATERIAL	SPAN (ft)	RISE (ft)	MANNING n	INLET TYPE
1	102.00	101.00	215.00	2 RCP	3.00	3.00	.012	CONVENTIONAL
2								
3								
4								
5								
6								

SUMMARY OF CULVERT FLOWS (cfs) FILE: AB5_LC DATE: 06-03-1999

	ELEV (ft)	TOTAL	1	2	3	4	5	6	ROADWAY	ITR
50-yr	105.04	16.0	16.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.04	16.2	16.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.04	16.4	16.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.04	16.6	16.6	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.04	16.8	16.8	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.05	17.0	17.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.05	17.2	17.2	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.05	17.4	17.4	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.05	17.6	17.6	0.0	0.0	0.0	0.0	0.0	0.00	1
	105.05	17.8	17.8	0.0	0.0	0.0	0.0	0.0	0.00	1
100-yr	105.05	18.0	18.0	0.0	0.0	0.0	0.0	0.0	0.00	1
	108.70	162.9	162.9	0.0	0.0	0.0	0.0	0.0	OVERTOPPING	

SUMMARY OF ITERATIVE SOLUTION ERRORS FILE: AB5_LC DATE: 06-03-1999

HEAD ELEV (ft)	HEAD ERROR (ft)	TOTAL FLOW (cfs)	FLOW ERROR (cfs)	% FLOW ERROR
105.04	0.000	16.00	0.00	0.00
105.04	0.000	16.20	0.00	0.00
105.04	0.000	16.40	0.00	0.00
105.04	0.000	16.60	0.00	0.00
105.04	0.000	16.80	0.00	0.00
105.05	0.000	17.00	0.00	0.00
105.05	0.000	17.20	0.00	0.00
105.05	0.000	17.40	0.00	0.00
105.05	0.000	17.60	0.00	0.00
105.05	0.000	17.80	0.00	0.00
105.05	0.000	18.00	0.00	0.00

<1> TOLERANCE (ft) = 0.010 <2> TOLERANCE (%) = 1.000

CURRENT DATE: 06-03-1999
CURRENT TIME: 18:18:43

FILE DATE: 06-03-1999
FILE NAME: AB5_LC

PERFORMANCE CURVE FOR CULVERT 1 - 2(3.00 (ft) BY 3.00 (ft)) RCP

DIS-CHARGE FLOW (cfs)	HEAD-WATER ELEV. (ft)	INLET CONTROL DEPTH (ft)	OUTLET CONTROL DEPTH (ft)	FLOW TYPE <F4>	NORMAL DEPTH (ft)	CRIT. DEPTH (ft)	OUTLET DEPTH (ft)	TW DEPTH (ft)	OUTLET VEL. (fps)	TW VEL. (fps)
16.00	105.04	1.15	3.04	4-FFt	0.80	0.89	3.00	4.00	1.13	0.00
16.20	105.04	1.16	3.04	4-FFt	0.81	0.90	3.00	4.00	1.15	0.00
16.40	105.04	1.17	3.04	4-FFt	0.82	0.90	3.00	4.00	1.16	0.00
16.60	105.04	1.18	3.04	4-FFt	0.82	0.91	3.00	4.00	1.17	0.00
16.80	105.04	1.19	3.04	4-FFt	0.83	0.91	3.00	4.00	1.19	0.00
17.00	105.05	1.20	3.05	4-FFt	0.83	0.92	3.00	4.00	1.20	0.00
17.20	105.05	1.20	3.05	4-FFt	0.84	0.92	3.00	4.00	1.22	0.00
17.40	105.05	1.21	3.05	4-FFt	0.84	0.93	3.00	4.00	1.23	0.00
17.60	105.05	1.22	3.05	4-FFt	0.85	0.93	3.00	4.00	1.24	0.00
17.80	105.05	1.23	3.05	4-FFt	0.85	0.94	3.00	4.00	1.26	0.00
18.00	105.05	1.24	3.05	4-FFt	0.86	0.94	3.00	4.00	1.27	0.00

El. inlet face invert 102.00 ft El. outlet invert 101.00 ft
El. inlet throat invert 0.00 ft El. inlet crest 0.00 ft

***** SITE DATA ***** CULVERT INVERT **********

INLET STATION	0.00 ft
INLET ELEVATION	102.00 ft
OUTLET STATION	215.00 ft
OUTLET ELEVATION	101.00 ft
NUMBER OF BARRELS	2
SLOPE (V/H)	0.0047
CULVERT LENGTH ALONG SLOPE	215.00 ft

***** CULVERT DATA SUMMARY **********

BARREL SHAPE	CIRCULAR
BARREL DIAMETER	3.00 ft
BARREL MATERIAL	CONCRETE
BARREL MANNING'S n	0.012
INLET TYPE	CONVENTIONAL
INLET EDGE AND WALL	BEVELED EDGE (1:1)
INLET DEPRESSION	NONE

4/4

CURRENT DATE: 06-03-1999
CURRENT TIME: 18:18:43

FILE DATE: 06-03-1999
FILE NAME: AB5_LC

TAILWATER

CONSTANT WATER SURFACE ELEVATION
105.00

ROADWAY OVERTOPPING DATA

ROADWAY SURFACE	PAVED
EMBANKMENT TOP WIDTH	192.00 ft
CREST LENGTH	3000.00 ft
OVERTOPPING CREST ELEVATION	108.70 ft

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET / OF / PROJ. NO. C100003240.19
DESCRIPTION: VI.D. RESULTS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The cross drain which satisfies the 0.1' rise for the 50-year storm event is a double 36" reinforced concrete pipe (RCP).

The results of the HY-8 analyses for the proposed culvert AB-5 are shown below:

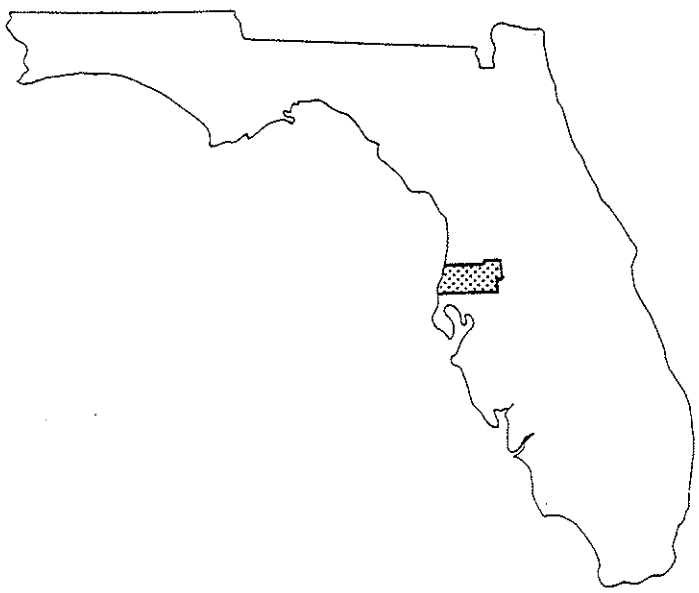
Event (year)	Existing Headwater/ Tailwater Elevation feet (NGVD)	Proposed Headwater Elevation feet (NGVD)
50	105.00	105.04
100	105.00	105.05

VII. HILLSBOROUGH RIVER WSPRO BACKWATER ANALYSIS

FLOOD INSURANCE STUDY

PASCO COUNTY, FLORIDA

UNINCORPORATED AREAS



REVISED:

SEPTEMBER 30, 1992

Federal Emergency Management Agency

COMMUNITY NUMBER -120230

Table 3. Summary of Discharges

Flooding Source and Location	Drainage Area (Square Miles)	Peak Discharges (Cubic Feet per Second) 10-Year	50-Year	100-Year	500-Year
Anclote River At State Highway 54	72.5	2,880	5,220	6,420	9,760
Duck Slough At Mouth	2.8	109	200	268	415
Hillsborough River At Confluence With Blackwater Creek	84	2,600	4,130	4,890	6,800
Pithlachascotee River At the City of New Port Richey	182	1,084	2,060	2,600	4,170
Withlacoochee River At Trilby	570	3,880	7,260	9,080	14,400

VII.A. S.R. 39 BRIDGE OVER THE HILLSBOROUGH RIVER REQUIREMENTS

The Hillsborough River is FEMA regulated from the S.R. 39 downstream. Upstream of the bridge the river must meet the Pasco County criteria requiring no increase in head loss above existing conditions.

The cross sections data at the Hillsborough River were obtained from a report entitled "Project Development and Environmental Studies, Location Hydraulics Report For State Road 39 Hillsborough and Pasco Counties" (see Section 10, References, of this report). A total of 19 cross sections were used in the WSPRO model used to analyze the subject bridge crossing. The hydrologic data from the FEMA Flood Insurance Study (FIS) indicates the discharge of the 50- and 100-year storm events at the downstream model cross section are 4130 and 4890 cfs, respectively. The title page and Table 3 from the FIS which the discharge rates were taken are included after this page.

A WSPRO analysis was conducted to evaluate the head loss due to the existing and proposed bridges.

VII.B. EXISTING CONDITIONS

The existing structure was constructed in 1947 and is located at Mile Post 1.585 of S.R. 39. The structure has 21 spans of 15 ft. resulting in the overall structure length of 315.5 ft. The substructure consists of pile bents. Each pile bent has five timber piles spaced at 6 ft., topped by a 1.83-foot square cap. The superstructure is a 13-inch deep flat slab structure. The bridge width is 26 feet between curbs. The low member elevation is 70 ft. NGVD. The bridge opening data were checked. The net horizontal clearance is 280 ft. The difference between the total bridge length and the horizontal clearance is 35.5 ft.

VII.C. PROPOSED CONDITIONS

It is proposed to replace the existing bridge in kind, with a parallel bridge of the same length constructed for the two new lanes. The substructures are proposed to be the same. Without detailed pier dimension, the pier width of the proposed bridge is assumed to be the same as the existing bridge.

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: VII.D. WSPRO ANALYSIS, EXISTING CONDITIONS COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The WSPRO analyses were conducted considering the case of existing conditions "with the old bridge." This section includes the WSPRO input and output for the analysis of 50- and 100-year storm events for the existing conditions.

EXISTING CONDITIONS 2/31
ANALYSIS
INPUT

```
T1     HILLSBOROUGH RIVER, SR 39
T2     LOCATION HYDRAULICS STUDY
T3     50 AND 100 YR. FLOOD
*      J3 1
Q      4130   4890
WS      50.75  51.74
*
XS    B1 3450
GR      0.0, 60.00     1900, 55.00   3700, 50.00   4200, 45.00   4400, 43.00
GR      5100, 39.00   5180, 37.00   5195, 33.00   5200, 33.00   5220, 38.00
GR      5250, 39.00   5270, 40.00   5570, 43.0    6000, 45.00   7900, 50.0
GR      9500, 55.00   13570, 60.00
SA      5180   5220
N       0.25   0.07   0.25
XS    C  7000
GR      0.0, 60.00    1500, 55.00   2200, 50.00   3300, 45.00   3350, 41.00
GR      3390, 40.00   3405, 35.00   3410, 35.00   3420, 30.00   3540, 43.00
GR      4178, 45.00   4720, 50.00   4920, 52.00   6000, 55.00   9000, 60.00
SA        3390   3420
N      0.25     0.07   0.25
*
XS    D  10200
GR      0.0, 60.00     2300, 55.00   2750, 54.00   2950, 50.00   3380, 45.00
GR      3400, 44.00   3415, 39.00   3420, 39.00   3440, 44.00   3470, 46.00
GR      4020, 48.00   4200, 50.00   5500, 55.0    7550, 60.0
SA      3380   3420
*
XS    E  13200
GR      0.0, 60.00     2000, 55.00   2350, 50.00   2600, 45.00   2620, 44.00
GR      2625, 39.0     2630, 39.00   2640, 44.00   2680, 45.00   3180, 50.00
GR      3930, 55.00   6000, 60.0
SA      2620   2640
*
XS    F  16200
GR      0.0, 60.00     700, 55.00    1000, 50.00   1079, 48.00   1080, 47.00
GR      1095, 42.0     1100, 42.00   1110, 47.00   1170, 48.00   1750, 50.00
GR      2150, 55.00   2900, 60.0
SA      1080   1110
*
XS    G  18500
GR       0.0, 65.00     380, 60.00    900, 55.00    1100, 51.00   1800, 50.00
GR      1810, 49.00   1960, 48.00   1970, 43.00   1975, 43.00   1990, 48.00
GR      2240, 49.00   2260, 50.00   2860, 54.0    3360, 55.00   4060, 65.0
```

```
SA      1960   1990
*
XS   H  20500
GR      0.0, 62.50     300, 60.00     700, 55.0    1270, 50.00   1280, 49.00
GR      1300, 48.00    1305, 43.00    1310, 43.00  1320, 48.00   1350, 49.00
GR      1370, 50.00    2100, 55.00    2950, 60.0   5400, 65.00
SA      1300   1320
*
XS   HA  25100
GR      0.0, 65.00     1400, 60.00    1750, 55.00  2250, 54.00   2700, 51.00
GR      2705, 46.00    2710, 46.00    2720, 51.00  3420, 55.00   3720, 60.00
GR      4100, 63.00
SA      2700   2720
*
XS   LOBR 25900
GR      0.0, 65.00     1400, 60.00    1750, 55.00  2250, 54.00   2700, 51.00
GR      2705, 46.00    2710, 46.00    2720, 51.00  3420, 55.00   3720, 60.00
GR      4100, 63.00
SA      2700   2720
N       0.25   0.07   0.25
*
XS   APPR 26980, 0, 0.3, 0.1
GR      0.0, 65.00     1400, 60.00    1750, 56.00  2250, 53.00   3250, 52.00
GR      3260, 47.00    3265, 47.00    3270, 54.00  3470, 55.00   4220, 60.00
GR      6220, 65.00
SA      3250   3270
N       0.25   0.07   0.25
*
XS   I  31180
GR      0.0, 70.00     3800, 65.00    5200, 60.00  5600, 56.00   5620, 51.00
GR      5640, 51.00    5650, 56.00    6100, 59.00  6800, 60.00   7350, 65.00
GR      8750, 70.00
SA      5600   5650
N       0.25   0.07   0.25
*
XS   FULLV 32188
GR      0.0, 73.00     210, 74.30     360, 73.60   540, 73.00    1060, 72.80
GR      1440, 72.60    1860, 72.50    2080, 73.00  2410, 73.60   2440, 70.40
GR      2463, 60.10    2470, 58.60    2590, 55.90  2605, 51.20   2620, 51.40
GR      2628, 52.40    2650, 57.00    2725, 59.10  2755, 70.40   2890, 73.0
GR      3130, 72.00    3350, 71.0     3980, 70.0   5090, 70.00   5160, 71.0
GR      5320, 72.00    5520, 74.00
SA      2440   2755
```

```
*
BR  SR39 32188,  70.0,  0.0,  0.5,  0.3
GR      2410.0, 73.6  2490, 70.40   2500, 66.40   2518, 56.30   2590, 55.90
GR      2605, 51.20   2620, 51.40   2628, 52.40   2650, 57.00   2664, 57.40
GR      2680, 65.10   2690, 70.00   2441, 70.00   2410, 73.60
SA      2518   2664
N       0.05   0.03   0.05
CD      3, 105, 2,   69.70
PD 1     53.2,1.5, 1   56.4, 3.0, 1    57.8, 4.50, 1
*
XR  ROAD 32238, 105, 1
GR      0.0, 74.30    1860,72.50   2410,73.60   2440, 72.00   2755, 72.00
*
AS  UP39 32470, 0.0, 0.5, 0.1
GR      0.0, 70.0      125, 69.00     240, 66.0    420, 66.00   460, 67.00
GR      640, 67.00   830, 66.00   1040, 66.00   1090, 67.00   1250, 68.00
GR      1285, 69.00   1325, 69.00   1360, 68.0    1410, 68.00   1470, 69.0
GR      1640, 69.00   1710, 68.00   2190, 68.00   2290, 64.00   2580, 62.00
GR      2780, 58.00   2805, 58.00   2830, 59.0    2850, 56.00   2860, 51.4
GR      2875, 51.40    2880, 56.00   2900, 59.0    3690, 63.00   3750, 65.00
GR      3830,  66.00   4290, 74.00
SA     .2830   2900
N       0.25,   0.07,   0.25
*
XS   L  32765
GR      0.0, 68.00      180, 65.00   470, 65.00   640, 63.00   940, 63.00
GR      960, 65.00   1070, 69.00   1100, 69.00   1170, 67.00   1430, 65.00
GR      1820, 65.00   1840, 68.00   1920, 68.0    2494, 58.30   2533, 57.7
GR      2539, 56.40    2545, 57.60   2703, 58.2    2726, 52.70   2751, 53.10
GR      2755, 55.70   2772, 59.10   2780, 55.6    2799, 56.30   2842, 59.2
GR      2862, 55.80    2881, 58.00   2908, 58.6    2932, 54.90   2960, 60.00
GR      3020,  61.00   3835, 65.00    4160, 74.00
SA      2725   2842
XS  UPXS1 33025 * *  * 0.0004
EX
ER
```

EXISTING CONDITIONS ANALYSIS OUTPUT 5/31

```
   ************************* W S P R O ****************************
      Federal Highway Administration  -  U. S. Geological Survey
            Model for Water-Surface Profile Computations.
        Run Date & Time:  3/ 2/99  4:49 pm      Version V050196
         Input File: SR39TX1.INP9   Output File: SR39TX1.LST9
   *-------------------------------------------------------------*
T1         HILLSBOROUGH RIVER, SR 39
T2         LOCATION HYDRAULICS STUDY
T3         50 AND 100 YR. FLOOD
Q          4130    4890

 ***   Processing Flow Data; Placing Information into Sequence  1   ***

WS         50.75  51.74
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record   B1     *
        *-------------------------------------------------*

XS     B1 3450
GR        0.0, 60.00       1900, 55.00    3700, 50.00    4200, 45.00    4400, 43
GR        5100, 39.00    5180, 37.00    5195, 33.00    5200, 33.00    5220, 38.0
GR        5250, 39.00    5270, 40.00    5570, 43.0      6000, 45.00    7900, 50.
GR        9500, 55.00    13570, 60.00
SA        5180    5220
N         0.25   0.07   0.25

 ***   Completed Reading Data Associated With Header Record   B1    ***
 ***  Storing X-Section Data In Temporary File As Record Number  1  ***

 ***              Data Summary For Header Record   B1              ***
 SRD Location:     3450.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:    .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:    .50   Contraction:    .00

                    X,Y-coordinates (17 pairs)
     X          Y          X          Y          X          Y
----------  ---------  ---------  ---------  ---------  ---------
      .000      60.000    1900.000      55.000    3700.000      50.000
  4200.000      45.000    4400.000      43.000    5100.000      39.000
  5180.000      37.000    5195.000      33.000    5200.000      33.000
  5220.000      38.000    5250.000      39.000    5270.000      40.000
  5570.000      43.000    6000.000      45.000    7900.000      50.000
  9500.000      55.000   13570.000      60.000
----------  ---------  ---------  ---------  ---------  ---------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:         .000  ( associated Y-Elevation:    60.000 )
  Maximum X-Station:    13570.000  ( associated Y-Elevation:    60.000 )
  Minimum Y-Elevation:     33.000  ( associated X-Station:    5200.000 )
  Maximum Y-Elevation:     60.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                 SubArea  Coefficient  Breakpoint
                 -------  -----------  ----------
                    1         .250         ---
                              ---        5180.000
                    2         .070         ---
                              ---        5220.000
                    3         .250         ---
                 -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record   B1     *
        *-------------------------------------------------*
```

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```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  C       *
        *-------------------------------------------------*

XS    C   7000
GR        0.0, 60.00     1500, 55.00    2200, 50.00    3300, 45.00    3350, 41.0
GR        3390, 40.00    3405, 35.00    3410, 35.00    3420, 30.00    3540, 43.0
GR        4178, 45.00    4720, 50.00    4920, 52.00    6000, 55.00    9000, 60.0
SA             3390    3420
N         0.25      0.07    0.25

 ***   Completed Reading Data Associated With Header Record  C      ***
 ***  Storing X-Section Data In Temporary File As Record Number  2  ***

 ***              Data Summary For Header Record  C                 ***
 SRD Location:     7000.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:    .00000   Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:    .50   Contraction:    .00

                    X,Y-coordinates (15 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      60.000    1500.000      55.000    2200.000      50.000
  3300.000      45.000    3350.000      41.000    3390.000      40.000
  3405.000      35.000    3410.000      35.000    3420.000      30.000
  3540.000      43.000    4178.000      45.000    4720.000      50.000
  4920.000      52.000    6000.000      55.000    9000.000      60.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:    60.000 )
  Maximum X-Station:    9000.000  ( associated Y-Elevation:    60.000 )
  Minimum Y-Elevation:    30.000  ( associated X-Station:    3420.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                 SubArea  Coefficient Breakpoint
                 -------  ----------- ----------
                    1         .250        ---
                              ---       3390.000
                    2         .070        ---
                              ---       3420.000
                    3         .250        ---
                 -------  ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  C       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
        Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  D       *
        *-------------------------------------------------*

XS    D   10200
GR        0.0, 60.00       2300, 55.00    2750, 54.00    2950, 50.00    3380, 45
GR        3400, 44.00    3415, 39.00    3420, 39.00    3440, 44.00    3470, 46.0
GR        4020, 48.00    4200, 50.00    5500, 55.0      7550, 60.0
SA        3380    3420

 ***   Completed Reading Data Associated With Header Record  D      ***
 ***  Storing X-Section Data In Temporary File As Record Number  3  ***

 ***              Data Summary For Header Record  D                 ***
 SRD Location:    10200.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (14 pairs)
    X          Y          X          Y          X          Y
---------- ---------- ---------- ---------- ---------- ----------
      .000     60.000   2300.000     55.000   2750.000     54.000
  2950.000     50.000   3380.000     45.000   3400.000     44.000
  3415.000     39.000   3420.000     39.000   3440.000     44.000
  3470.000     46.000   4020.000     48.000   4200.000     50.000
  5500.000     55.000   7550.000     60.000
---------- ---------- ---------- ---------- ---------- ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:    7550.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:    39.000  ( associated X-Station:   3420.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                         Roughness   Horizontal
                SubArea  Coefficient  Breakpoint
                -------  -----------  ----------
                   1         .250        ---
                             ---       3380.000
                   2         .070        ---
                             ---       3420.000
                   3         .250        ---
                -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  D       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  E       *
        *-------------------------------------------------*

XS    E   13200
GR        0.0, 60.00       2000, 55.00    2350, 50.00    2600, 45.00    2620, 44
GR        2625, 39.0       2630, 39.00    2640, 44.00    2680, 45.00    3180, 50.
GR        3930, 55.00    6000, 60.0
SA        2620    2640

 ***   Completed Reading Data Associated With Header Record  E      ***
 ***  Storing X-Section Data In Temporary File As Record Number  4  ***

 ***              Data Summary For Header Record  E                 ***
 SRD Location:    13200.    Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000     Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:    .50   Contraction:    .00

                    X,Y-coordinates (12 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      60.000    2000.000      55.000    2350.000      50.000
  2600.000      45.000    2620.000      44.000    2625.000      39.000
  2630.000      39.000    2640.000      44.000    2680.000      45.000
  3180.000      50.000    3930.000      55.000    6000.000      60.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:         .000  ( associated Y-Elevation:    60.000 )
  Maximum X-Station:    6000.000   ( associated Y-Elevation:    60.000 )
  Minimum Y-Elevation:    39.000   ( associated X-Station:    2630.000 )
  Maximum Y-Elevation:    60.000   ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                        Roughness    Horizontal
                SubArea Coefficient  Breakpoint
                -------  ----------  ----------
                   1         .250        ---
                             ---       2620.000
                   2         .070        ---
                             ---       2640.000
                   3         .250        ---
                -------  ----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  E       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-----------------------------------------------*
        *      Starting To Process Header Record  F     *
        *-----------------------------------------------*

XS    F   16200
GR        0.0, 60.00       700, 55.00      1000, 50.00    1079, 48.00    1080, 4
GR        1095, 42.0      1100, 42.00     1110, 47.00    1170, 48.00    1750, 50.
GR        2150, 55.00    2900, 60.0
SA        1080    1110

 ***   Completed Reading Data Associated With Header Record  F      ***
 ***  Storing X-Section Data In Temporary File As Record Number  5  ***

 ***              Data Summary For Header Record  F                 ***
 SRD Location:    16200.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (12 pairs)
    X          Y            X          Y            X          Y
---------- ---------- ---------- ---------- ---------- ----------
      .000     60.000     700.000     55.000    1000.000     50.000
  1079.000     48.000    1080.000      4.000    1095.000     42.000
  1100.000     42.000    1110.000     47.000    1170.000     48.000
  1750.000     50.000    2150.000     55.000    2900.000     60.000
---------- ---------- ---------- ---------- ---------- ----------

            Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:    2900.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:     4.000  ( associated X-Station:   1080.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                        Roughness   Horizontal
                SubArea Coefficient Breakpoint
                ------- ----------- ----------
                   1         .250        ---
                             ---      1080.000
                   2         .070        ---
                             ---      1110.000
                   3         .250        ---
                ------- ----------- ----------

        *-----------------------------------------------*
        *      Finished Processing Header Record  F     *
        *-----------------------------------------------*
```

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```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  G       *
        *-------------------------------------------------*

XS    G   18500
GR          0.0, 65.00       380, 60.00    900, 55.00    1100, 51.00    1800, 50.
GR        1810, 49.00    1960, 48.00    1970, 43.00    1975, 43.00    1990, 48.0
GR        2240, 49.00    2260, 50.00    2860, 54.0      3360, 55.00   4060, 65.0
SA        1960    1990

 ***   Completed Reading Data Associated With Header Record  G      ***
 ***  Storing X-Section Data In Temporary File As Record Number  6  ***

 ***              Data Summary For Header Record  G                  ***
 SRD Location:    18500.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:    .00000   Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (15 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      65.000      380.000      60.000      900.000      55.000
  1100.000      51.000     1800.000      50.000     1810.000      49.000
  1960.000      48.000     1970.000      43.000     1975.000      43.000
  1990.000      48.000     2240.000      49.000     2260.000      50.000
  2860.000      54.000     3360.000      55.000     4060.000      65.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:    65.000 )
  Maximum X-Station:    4060.000  ( associated Y-Elevation:    65.000 )
  Minimum Y-Elevation:    43.000  ( associated X-Station:    1975.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                           Roughness   Horizontal
                  SubArea  Coefficient Breakpoint
                  -------  ----------- ----------
                     1         .250        ---
                               ---       1960.000
                     2         .070        ---
                               ---       1990.000
                     3         .250        ---
                  -------  ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  G       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         .Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  H       *
        *-------------------------------------------------*

XS    H   20500
GR        0.0, 62.50       300, 60.00      700, 55.0     1270, 50.00    1280, 49
GR        1300, 48.00    1305, 43.00    1310, 43.00    1320, 48.00    1350, 49.0
GR        1370, 50.00    2100, 55.00    2950, 60.0      5400, 65.00
SA        1300    1320

 ***   Completed Reading Data Associated With Header Record  H      ***
 ***  Storing X-Section Data In Temporary File As Record Number  7  ***

 ***              Data Summary For Header Record  H                 ***
 SRD Location:    20500.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:    .50   Contraction:    .00

                    X,Y-coordinates (14 pairs)
     X          Y          X          Y          X          Y
---------- ---------- ---------- ---------- ---------- ----------
      .000     62.500    300.000     60.000    700.000     55.000
  1270.000     50.000   1280.000     49.000   1300.000     48.000
  1305.000     43.000   1310.000     43.000   1320.000     48.000
  1350.000     49.000   1370.000     50.000   2100.000     55.000
  2950.000     60.000   5400.000     65.000
---------- ---------- ---------- ---------- ---------- ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   62.500 )
  Maximum X-Station:    5400.000  ( associated Y-Elevation:   65.000 )
  Minimum Y-Elevation:    43.000  ( associated X-Station:   1310.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:   5400.000 )

                  Roughness Data (  3 SubAreas )
                         Roughness   Horizontal
                SubArea  Coefficient  Breakpoint
                -------  -----------  ----------
                   1         .250        ---
                             ---       1300.000
                   2         .070        ---
                             ---       1320.000
                   3         .250        ---
                -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  H       *
        *-------------------------------------------------*
```

```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
        Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record HA       *
        *-------------------------------------------------*

XS   HA   25100
GR        0.0, 65.00      1400, 60.00    1750, 55.00    2250, 54.00    2700, 51
GR        2705, 46.00    2710, 46.00    2720, 51.00    3420, 55.00    3720, 60.0
GR        4100, 63.00
SA        2700    2720

 ***   Completed Reading Data Associated With Header Record HA      ***
 ***  Storing X-Section Data In Temporary File As Record Number  8  ***

 ***              Data Summary For Header Record HA                 ***
 SRD Location:    25100.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (11 pairs)
    X          Y          X          Y          X          Y
---------- ---------- ---------- ---------- ---------- ----------
      .000      65.000    1400.000      60.000    1750.000      55.000
  2250.000      54.000    2700.000      51.000    2705.000      46.000
  2710.000      46.000    2720.000      51.000    3420.000      55.000
  3720.000      60.000    4100.000      63.000
---------- ---------- ---------- ---------- ---------- ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   65.000 )
  Maximum X-Station:    4100.000  ( associated Y-Elevation:   63.000 )
  Minimum Y-Elevation:    46.000  ( associated X-Station:   2710.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                        Roughness   Horizontal
                SubArea Coefficient Breakpoint
                ------- ----------- ----------
                   1         .250        ---
                             ---      2700.000
                   2         .070        ---
                             ---      2720.000
                   3         .250        ---
                ------- ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record HA       *
        *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record LOBR     *
        *-------------------------------------------------*

XS   LOBR 25900
GR        0.0, 65.00       1400, 60.00    1750, 55.00    2250, 54.00    2700, 51
GR        2705, 46.00    2710, 46.00    2720, 51.00    3420, 55.00    3720, 60.0
GR        4100, 63.00
SA        2700    2720
N         0.25   0.07    0.25

 ***   Completed Reading Data Associated With Header Record LOBR    ***
 ***  Storing X-Section Data In Temporary File As Record Number  9  ***

 ***              Data Summary For Header Record LOBR              ***
 SRD Location:    25900.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (11 pairs)
    X          Y            X          Y            X          Y
---------- ---------- ---------- ---------- ---------- ----------
      .000     65.000    1400.000     60.000    1750.000     55.000
  2250.000     54.000    2700.000     51.000    2705.000     46.000
  2710.000     46.000    2720.000     51.000    3420.000     55.000
  3720.000     60.000    4100.000     63.000
---------- ---------- ---------- ---------- ---------- ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   65.000 )
  Maximum X-Station:    4100.000  ( associated Y-Elevation:   63.000 )
  Minimum Y-Elevation:    46.000  ( associated X-Station:    2710.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                  SubArea Coefficient Breakpoint
                  ------- ----------- ----------
                     1         .250        ---
                               ---      2700.000
                     2         .070        ---
                               ---      2720.000
                     3         .250        ---
                  ------- ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record LOBR     *
        *-------------------------------------------------*
```

```
************************** W S P R O ***************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record APPR     *
        *-------------------------------------------------*

XS   APPR 26980, 0, 0.3, 0.1
GR        0.0, 65.00       1400, 60.00    1750, 56.00    2250, 53.00    3250, 52
GR        3260, 47.00    3265, 47.00    3270, 54.00    3470, 55.00    4220, 60.0
GR        6220, 65.00
SA        3250    3270
N           0.25   0.07   0.25

 ***   Completed Reading Data Associated With Header Record APPR    ***
 ***  Storing X-Section Data In Temporary File As Record Number 10  ***

 ***              Data Summary For Header Record APPR               ***
 SRD Location:    26980.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .30   Contraction:   .10

                    X,Y-coordinates (11 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      65.000    1400.000      60.000    1750.000      56.000
  2250.000      53.000    3250.000      52.000    3260.000      47.000
  3265.000      47.000    3270.000      54.000    3470.000      55.000
  4220.000      60.000    6220.000      65.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:         .000  ( associated Y-Elevation:    65.000 )
  Maximum X-Station:    6220.000   ( associated Y-Elevation:    65.000 )
  Minimum Y-Elevation:    47.000   ( associated X-Station:    3265.000 )
  Maximum Y-Elevation:    65.000   ( associated X-Station:        .000 )

                   Roughness Data (  3 SubAreas )
                            Roughness   Horizontal
                  SubArea   Coefficient Breakpoint
                  -------   ----------- ----------
                     1          .250        ---
                                ---       3250.000
                     2          .070        ---
                                ---       3270.000
                     3          .250        ---
                  -------   ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record APPR     *
        *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record I        *
        *-------------------------------------------------*

XS   I    31180
GR        0.0, 70.00       3800, 65.00    5200, 60.00    5600, 56.00    5620, 51
GR        5640, 51.00    5650, 56.00    6100, 59.00    6800, 60.00    7350, 65.0
GR        8750, 70.00
SA        5600    5650
N          0.25   0.07   0.25

 ***   Completed Reading Data Associated With Header Record I       ***
 ***  Storing X-Section Data In Temporary File As Record Number 11  ***

 ***              Data Summary For Header Record I                  ***
 SRD Location:    31180.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (11 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      70.000    3800.000      65.000    5200.000      60.000
  5600.000      56.000    5620.000      51.000    5640.000      51.000
  5650.000      56.000    6100.000      59.000    6800.000      60.000
  7350.000      65.000    8750.000      70.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   70.000 )
  Maximum X-Station:    8750.000  ( associated Y-Elevation:   70.000 )
  Minimum Y-Elevation:    51.000  ( associated X-Station:   5640.000 )
  Maximum Y-Elevation:    70.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                           Roughness   Horizontal
                  SubArea  Coefficient  Breakpoint
                  -------  -----------  ----------
                     1         .250        ---
                               ---       5600.000
                     2         .070        ---
                               ---       5650.000
                     3         .250        ---
                  -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record I        *
        *-------------------------------------------------*
```

```
************************* W S P R O *****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record FULLV    *
        *-------------------------------------------------*

XS   FULLV 32188
GR        0.0, 73.00      210, 74.30    360, 73.60    540, 73.00    1060, 72.80
GR        1440, 72.60    1860, 72.50    2080, 73.00   2410, 73.60    2440, 70.4
GR        2463, 60.10     2470, 58.60   2590, 55.90   2605, 51.20    2620, 51.4
GR        2628, 52.40    2650, 57.00    2725, 59.10   2755, 70.40    2890, 73.0
GR        3130, 72.00      3350, 71.0   3980, 70.0    5090, 70.00    5160, 71.0
GR        5320, 72.00    5520, 74.00
SA        2440    2755

 ***   Completed Reading Data Associated With Header Record FULLV   ***
 ***  Storing X-Section Data In Temporary File As Record Number 12  ***

 ***              Data Summary For Header Record FULLV              ***
 SRD Location:    32188.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                     X,Y-coordinates (27 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      73.000     210.000      74.300     360.000      73.600
   540.000      73.000    1060.000      72.800    1440.000      72.600
  1860.000      72.500    2080.000      73.000    2410.000      73.600
  2440.000      70.400    2463.000      60.100    2470.000      58.600
  2590.000      55.900    2605.000      51.200    2620.000      51.400
  2628.000      52.400    2650.000      57.000    2725.000      59.100
  2755.000      70.400    2890.000      73.000    3130.000      72.000
  3350.000      71.000    3980.000      70.000    5090.000      70.000
  5160.000      71.000    5320.000      72.000    5520.000      74.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:    73.000 )
  Maximum X-Station:    5520.000  ( associated Y-Elevation:    74.000 )
  Minimum Y-Elevation:    51.200  ( associated X-Station:    2605.000 )
  Maximum Y-Elevation:    74.300  ( associated X-Station:     210.000 )

                  Roughness Data (  3 SubAreas )
                           Roughness   Horizontal
                  SubArea  Coefficient Breakpoint
                  -------  ----------- ----------
                     1         .250        ---
                               ---       2440.000
                     2         .070        ---
                               ---       2755.000
                     3         .250        ---
                  -------  ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record FULLV    *
        *-------------------------------------------------*
```

```
********************** W S P R O ***************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record SR39     *
        *-------------------------------------------------*

BR   SR39 32188,  70.0,  0.0,  0.5,  0.3
GR        2410.0, 73.6   2490, 70.40    2500, 66.40    2518, 56.30    2590, 55.9
GR        2605, 51.20    2620, 51.40    2628, 52.40    2650, 57.00    2664, 57.4
GR        2680, 65.10    2690, 70.00    2441, 70.00    2410, 73.60
SA        2518    2664
N         0.05    0.03    0.05
CD        3, 105, 2,   69.70
PD 1      53.2,1.5, 1   56.4, 3.0, 1     57.8, 4.50, 1

 ***   Completed Reading Data Associated With Header Record SR39    ***
 ***   Storing Bridge Data In Temporary File As Record Number 13    ***

 ***              Data Summary For Bridge Record SR39               ***
 SRD Location:    32188.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:  *******    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .30

                    X,Y-coordinates (14 pairs)
    X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
  2410.000      73.600    2490.000      70.400    2500.000      66.400
  2518.000      56.300    2590.000      55.900    2605.000      51.200
  2620.000      51.400    2628.000      52.400    2650.000      57.000
  2664.000      57.400    2680.000      65.100    2690.000      70.000
  2441.000      70.000    2410.000      73.600
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:    2410.000  ( associated Y-Elevation:    73.600 )
  Maximum X-Station:    2690.000  ( associated Y-Elevation:    70.000 )
  Minimum Y-Elevation:    51.200  ( associated X-Station:    2605.000 )
  Maximum Y-Elevation:    73.600  ( associated X-Station:    2410.000 )

                    Roughness Data (  3 SubAreas )
                              Roughness   Horizontal
                    SubArea   Coefficient  Breakpoint
                    -------  -----------  ----------
                       1         .050        ---
                                 ---       2518.000
                       2         .030        ---
                                 ---       2664.000
                       3         .050        ---
                    -------  -----------  ----------

                  Discharge coefficient parameters
                BRType   BRWdth   EMBSS   EMBElv    UserCD
                  3      105.000   2.00    69.700 **********

                     Pressure flow elevations
                        AVBCEL      PFElev
                     *********      70.000

                       Abutment Parameters
```

ABSLPL	ABSLPR	XTOELT	YTOELT	XTOERT	YTOERT
*******	*******	*********	*********	*********	*********

Pier/Pile Data (3 Group(s))
Code Indicates Bridge Uses Piles

Group	Elevation	Gross Width	Number
1	53.200	1.500	1
2	56.400	3.000	1
3	57.800	4.500	1

Finished Processing Header Record SR39

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record ROAD     *
        *-------------------------------------------------*

XR   ROAD 32238, 105, 1
GR        0.0, 74.30     1860,72.50    2410,73.60    2440, 72.00    2755, 72.00

 ***   Completed Reading Data Associated With Header Record ROAD    ***
  ***  Storing Roadway Data In Temporary File As Record Number 14    ***

 ***              Data Summary For Roadway Record ROAD              ***
 SRD Location:    32238.   Cross-Section Skew:     .0   Error Code   0
 Roadway Width:  105.000   User-Specified Weir Coefficient:  ******
 Input Code Indicates Roadway Surface Consists of a Paved Material.

                    X,Y-coordinates ( 5 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      74.300    1860.000      72.500    2410.000      73.600
  2440.000      72.000    2755.000      72.000
----------  ----------  ----------  ----------  ----------  ----------

                  Minimum and Maximum X,Y-coordinates
   Minimum X-Station:        .000  ( associated Y-Elevation:   74.300 )
   Maximum X-Station:    2755.000  ( associated Y-Elevation:   72.000 )
   Minimum Y-Elevation:    72.000  ( associated X-Station:    2755.000 )
   Maximum Y-Elevation:    74.300  ( associated X-Station:       .000 )

Bridge datum projection:  XREFLT = *******

        *-------------------------------------------------*
        *      Finished Processing Header Record ROAD     *
        *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
        Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record UP39     *
        *-------------------------------------------------*

  AS   UP39 32470, 0.0, 0.5, 0.1
+++078 NOTICE:  AS Record Replaced With XS Record (See Users Manual).
  GR        0.0, 70.0       125, 69.00      240, 66.0     420, 66.00    460, 67.00
  GR        640, 67.00    830, 66.00    1040, 66.00    1090, 67.00    1250, 68.00
  GR        1285, 69.00    1325, 69.00    1360, 68.0     1410, 68.00   1470, 69.0
  GR        1640, 69.00    1710, 68.00    2190, 68.00    2290, 64.00    2580, 62.0
  GR        2780, 58.00    2805, 58.00    2830, 59.0     2850, 56.00   2860, 51.4
  GR        2875, 51.40     2880, 56.00   2900, 59.0     3690, 63.00 .  3750, 65.0
  GR        3830,  66:00    4290, 74.00
  SA        2830    2900
  N         0.25,   0.07,   0.25

   ***   Completed Reading Data Associated With Header Record UP39     ***
   ***  Storing X-Section Data In Temporary File As Record Number 15  ***

   ***              Data Summary For Header Record UP39               ***
   SRD Location:    32470.   Cross-Section Skew:    .0   Error Code   0
   Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
   Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .10

                        X,Y-coordinates (32 pairs)
      X          Y           X          Y           X          Y
 ----------  ----------  ----------  ----------  ----------  ----------
       .000      70.000      125.000      69.000      240.000      66.000
    420.000      66.000      460.000      67.000      640.000      67.000
    830.000      66.000     1040.000      66.000     1090.000      67.000
   1250.000      68.000     1285.000      69.000     1325.000      69.000
   1360.000      68.000     1410.000      68.000     1470.000      69.000
   1640.000      69.000     1710.000      68.000     2190.000      68.000
   2290.000      64.000     2580.000      62.000     2780.000      58.000
   2805.000      58.000     2830.000      59.000     2850.000      56.000
   2860.000      51.400     2875.000      51.400     2880.000      56.000
   2900.000      59.000     3690.000      63.000     3750.000      65.000
   3830.000      66.000     4290.000      74.000
 ----------  ----------  ----------  ----------  ----------  ----------

                   Minimum and Maximum X,Y-coordinates
   Minimum X-Station:        .000  ( associated Y-Elevation:   70.000 )
   Maximum X-Station:    4290.000  ( associated Y-Elevation:   74.000 )
   Minimum Y-Elevation:    51.400  ( associated X-Station:   2875.000 )
   Maximum Y-Elevation:    74.000  ( associated X-Station:   4290.000 )

                    Roughness Data (  3 SubAreas )
                                Roughness   Horizontal
                    SubArea   Coefficient   Breakpoint
                    -------   -----------   ----------
                       1          .250          ---
                                  ---        2830.000
                       2          .070          ---
                                  ---        2900.000
                       3          .250          ---
                    -------   -----------   ----------
```

```
Bridge datum projection(s):  XREFLT  XREFRT  FDSTLT  FDSTRT
                            ******* ******* ******* *******

          *-------------------------------------------------*
          *      Finished Processing Header Record UP39     *
          *-------------------------------------------------*
```

```
********************** W S P R O **************************
   Federal Highway Administration - U. S. Geological Survey
         Model for Water-Surface Profile Computations.
        Input Units: English / Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  L       *
        *-------------------------------------------------*

XS    L   32765
GR        0.0, 68.00      180, 65.00    470, 65.00    640, 63.00    940, 63.00
GR        960, 65.00    1070, 69.00    1100, 69.00   1170, 67.00   1430, 65.00
GR        1820, 65.00    1840, 68.00    1920, 68.0    2494, 58.30   2533, 57.7
GR        2539, 56.40     2545, 57.60   2703, 58.2    2726, 52.70    2751, 53.1
GR        2755, 55.70    2772, 59.10    2780, 55.6    2799, 56.30   2842, 59.2
GR        2862, 55.80     2881, 58.00   2908, 58.6    2932, 54.90    2960, 60.0
GR        3020,  61.00    3835, 65.00    4160, 74.00
SA        2725    2842

 ***   Completed Reading Data Associated With Header Record  L      ***
 ***  Storing X-Section Data In Temporary File As Record Number 16  ***

 ***              Data Summary For Header Record  L                 ***
 SRD Location:    32765.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (33 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      68.000     180.000      65.000     470.000      65.000
   640.000      63.000     940.000      63.000     960.000      65.000
  1070.000      69.000    1100.000      69.000    1170.000      67.000
  1430.000      65.000    1820.000      65.000    1840.000      68.000
  1920.000      68.000    2494.000      58.300    2533.000      57.700
  2539.000      56.400    2545.000      57.600    2703.000      58.200
  2726.000      52.700    2751.000      53.100    2755.000      55.700
  2772.000      59.100    2780.000      55.600    2799.000      56.300
  2842.000      59.200    2862.000      55.800    2881.000      58.000
  2908.000      58.600    2932.000      54.900    2960.000      60.000
  3020.000      61.000    3835.000      65.000    4160.000      74.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   68.000 )
  Maximum X-Station:    4160.000  ( associated Y-Elevation:   74.000 )
  Minimum Y-Elevation:    52.700  ( associated X-Station:   2726.000 )
  Maximum Y-Elevation:    74.000  ( associated X-Station:   4160.000 )

                  Roughness Data (  3 SubAreas )
                        Roughness   Horizontal
                SubArea Coefficient Breakpoint
                -------  ----------  ----------
                   1         .250        ---
                             ---       2725.000
                   2         .070        ---
                             ---       2842.000
                   3         .250        ---
                --------  ----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  L       *
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

       *-------------------------------------------------*
       *      Starting To Process Header Record UPXS1    *
       *-------------------------------------------------*

XS   UPXS1 33025 * *  * 0.0004

 ***   Completed Reading Data Associated With Header Record UPXS1   ***
 ***   No Roughness Data Input, Propagating From Previous Section   ***
 ***  Storing X-Section Data In Temporary File As Record Number 17  ***

 ***              Data Summary For Header Record UPXS1              ***
 SRD Location:    33025.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:    .00040   Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (33 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      68.104     180.000      65.104     470.000      65.104
   640.000      63.104     940.000      63.104     960.000      65.104
  1070.000      69.104    1100.000      69.104    1170.000      67.104
  1430.000      65.104    1820.000      65.104    1840.000      68.104
  1920.000      68.104    2494.000      58.404    2533.000      57.804
  2539.000      56.504    2545.000      57.704    2703.000      58.304
  2726.000      52.804    2751.000      53.204    2755.000      55.804
  2772.000      59.204    2780.000      55.704    2799.000      56.404
  2842.000      59.304    2862.000      55.904    2881.000      58.104
  2908.000      58.704    2932.000      55.004    2960.000      60.104
  3020.000      61.104    3835.000      65.104    4160.000      74.104
----------  ----------  ----------  ----------  ----------  ----------

                 Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   68.104 )
  Maximum X-Station:    4160.000  ( associated Y-Elevation:   74.104 )
  Minimum Y-Elevation:    52.804  ( associated X-Station:    2726.000 )
  Maximum Y-Elevation:    74.104  ( associated X-Station:    4160.000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                 SubArea  Coefficient Breakpoint
                 -------  ----------- ----------
                    1         .250        ---
                              ---       2725.000
                    2         .070        ---
                              ---       2842.000
                    3         .250        ---
                 -------  ----------- ----------

       *-------------------------------------------------*
       *      Finished Processing Header Record UPXS1    *
       *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD
EX

      *=================================================*
      *     Summary of Boundary Condition Information    *
      *=================================================*

        Reach       Water Surface   Friction
  #   Discharge       Elevation      Slope          Flow Regime
 --   ---------     -------------   --------   --------------------
  1     4130.00         50.750       ******        Sub-Critical
  2     4890.00         51.740       ******        Sub-Critical
 --   ---------     -------------   --------   --------------------

      *=================================================*
      *         Beginning  2 Profile Calculation(s)     *
      *=================================================*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
        Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

                  WSEL     VHD       Q         AREA      SRDL      LEW
                  EGEL      HF       V          K        FLEN      REW
                  CRWS      HO      FR #        SF       ALPHA     ERR
                ---------- ------ ---------- ---------- --------- ---------
Section:   B1      50.750   .003   4130.000  24086.250 *********  3430.000
Header Type: XS    50.753 ******       .171  499312.80 *********  8140.000
SRD:   3450.000    41.635 ******       .036     ******     7.229   ******

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " C   ".
      KRATIO:   .59

Section:  C        51.162   .011   4130.000  13811.520  3550.000  2037.283
Header Type: XS    51.173   .413       .299  293342.50  3550.000  4836.227
SRD:   7000.000    39.359   .004       .067      .0001     8.017      .003

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " D   ".
      KRATIO:   .47

Section:  D        52.492   .036   4130.000   7595.759  3200.000  2825.383
Header Type: XS    52.528  1.336       .544  139229.00  3200.000  4848.009
SRD:  10200.000    48.394   .012       .138      .0004     7.835      .006

Section:  E        54.696   .023   4130.000   8711.233  3000.000  2021.269
Header Type: XS    54.719  2.178       .474  168761.60  3000.000  3884.423
SRD:  13200.000    48.851   .000       .098      .0007     6.487      .013

Section:  F        56.152   .029   4130.000   8695.945  3000.000   538.711
Header Type: XS    56.181  1.453       .475  208668.30  3000.000  2322.810
SRD:  16200.000    34.634   .003       .108      .0005     8.169      .006

Section:  G        56.896   .007   4130.000  13638.500  2300.000   702.850
Header Type: XS    56.903   .712       .303  263974.60  2300.000  3492.697
SRD:  18500.000    51.417   .000       .053      .0003     4.884      .010

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " H   ".
      KRATIO:   .59

Section:  H        57.730   .023   4130.000   8695.275  2000.000   481.632
Header Type: XS    57.753   .831       .475  155548.80  2000.000  2564.032
SRD:  20500.000    53.248   .008       .106      .0004     6.641      .011

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "HA   ".
      KRATIO:  1.58

Section: HA        59.800   .006   4130.000  12429.960  4600.000  1414.035
Header Type: XS    59.805  2.051       .332  245958.50  4600.000  3707.970
SRD:  25100.000    54.359   .000       .045      .0004     3.258      .001

Section: LOBR      60.019   .005   4130.000  12935.770   800.000  1394.786
Header Type: XS    60.024   .214       .319  259805.70   800.000  3722.358
SRD:  25900.000    54.359   .000       .043      .0003     3.190      .005

Section: APPR      60.270   .003   4130.000  14928.190  1080.000  1324.447
Header Type: XS    60.273   .249       .277  284889.40  1080.000  4327.933
SRD:  26980.000    54.229   .000       .035      .0002     2.546      .000

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "I    ".
```

KRATIO: .44

Section: I	62.243	.056	4130.000	7218.647	4200.000	4572.097
Header Type: XS	62.299	1.997	.572	125931.30	4200.000	7046.676
SRD: 31180.000	58.740	.027	.196	.0005	*****	.002
Section: FULLV	63.290	.083	4130.000	1786.210	1008.000	2455.876
Header Type: FV	63.374	1.055	2.312	129452.90	1008.000	2736.125
SRD: 32188.000	58.427	.013	.161	.0010	1.000	.007

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "UP39 ".
KRATIO: .67

Section: UP39	63.691	.146	4130.000	3931.946	282.000	2334.862
Header Type: AS	63.836	.429	1.050	86511.63	282.000	3710.718
SRD: 32470.000	60.490	.031	.319	.0015	8.497	.002

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

<<< The Following Data Reflect The "Constricted" Profile >>>
<<< Beginning Bridge/Culvert Hydraulic Computations >>>

	WSEL / EGEL / CRWS	VHD / HF / HO	Q / V / FR #	AREA / K / SF	SRDL / FLEN / ALPHA	LEW / REW / ERR
Section: SR39	64.088	.184	4130.000	1425.954	1008.000	2504.121
Header Type: BR	64.271	1.882	2.896	290587.00	1008.000	2677.896
SRD: 32188.000	57.991	.090	.212	******	1.409	-.012

Specific Bridge Information		C	P/A	PFELEV	BLEN	XLAB	XRAB
Bridge Type 3	Flow Type 1						
Pier/Pile Code 1		.8426	.029	70.000	********	********	********

*** Roadway Section Located at SRD 32238.000 ***

Section: ROAD Header Type: XR
<<< Embankment Is Not Overtopped >>>

	WSEL / EGEL / CRWS	VHD / HF / HO	Q / V / FR #	AREA / K / SF	SRDL / FLEN / ALPHA	LEW / REW / ERR
Section: UP39	64.712	.072	4130.000	5397.853	177.000	2272.204
Header Type: AS	64.784	.487	.765	123400.10	257.524	3741.355
SRD: 32470.000	60.490	.024	.198	.0015	7.889	-.020

Approach Section UP39 Flow Contraction Information

M(G)	M(K)	KQ	XLKQ	XRKQ	OTEL
.876	.416	72560.9	2770.493	2944.315	64.516

<<< End of Bridge Hydraulics Computations >>>

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " L ".
KRATIO: 1.43

Section: L	64.986	.036	4130.000	7611.293	295.000	471.156
Header Type: XS	65.023	.232	.543	176129.40	295.000	3832.230
SRD: 32765.000	59.192	.000	.146	.0008	7.967	.008

* EXISTING CONDITIONS BACKWATER ELEVATION FOR THE 50-YEAR STORM EVENT

Section: UPXS1	65.134	.045	4130.000	7727.777	260.000	178.223
Header Type: XS	65.179	.153	.534	164729.30	260.000	3836.070
SRD: 33025.000	59.296	.004	.184	.0006	*****	-.001

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

                  WSEL     VHD       Q         AREA      SRDL      LEW
                  EGEL      HF       V           K        FLEN      REW
                  CRWS      HO      FR #        SF       ALPHA      ERR
                --------- ------ ---------- ---------- --------- ---------
Section:   B1      51.740   .003  4890.000  29082.400 *********  3073.599
Header Type: XS    51.743 ******      .168  609721.80 *********  8456.801
SRD:   3450.000    42.018 ******      .034     ******     6.988     ******

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " C   ".
      KRATIO:    .60

Section:  C        52.119   .010  4890.000  16601.300  3550.000  1903.328
Header Type: XS    52.129   .382      .295  364248.30  3550.000  4962.872
SRD:   7000.000    39.995   .003      .060      .0001     7.314      .000

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " D   ".
      KRATIO:    .49

Section:  D        53.308   .031  4890.000   9348.840  3200.000  2784.596
Header Type: XS    53.340  1.186      .523  177166.00  3200.000  5060.103
SRD:  10200.000    48.643   .011      .124      .0004     7.397      .014

Section:  E        55.423   .025  4890.000  10176.030  3000.000  1830.920
Header Type: XS    55.448  2.121      .481  190869.20  3000.000  4104.998
SRD:  13200.000    49.204   .000      .107      .0007     7.089     -.013

Section:  F        56.966   .028  4890.000  10243.430  3000.000   424.809
Header Type: XS    56.994  1.541      .477  243964.50  3000.000  2444.847
SRD:  16200.000    36.823   .001      .105      .0005     7.936      .004

Section:  G        57.683   .007  4890.000  15888.990  2300.000   620.967
Header Type: XS    57.690   .694      .308  324832.20  2300.000  3547.811
SRD:  18500.000    51.615   .000      .049      .0003     4.420      .002

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " H   ".
      KRATIO:    .59

Section:  H        58.451   .021  4890.000  10262.360  2000.000   423.928
Header Type: XS    58.472   .772      .476  190681.50  2000.000  2686.654
SRD:  20500.000    53.533   .007      .097      .0004     6.018      .003

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "HA   ".
      KRATIO:  1.49

Section: HA        60.507   .006  4890.000  14122.200  4600.000  1257.909
Header Type: XS    60.514  2.028      .346  284473.00  4600.000  3784.280
SRD:  25100.000    54.680   .000      .047      .0004     3.249      .014

Section: LOBR      60.734   .006  4890.000  14706.230   800.000  1194.341
Header Type: XS    60.740   .226      .333  296991.90   800.000  3813.036
SRD:  25900.000    54.680   .000      .045      .0003     3.265      .000

Section: APPR      61.001   .003  4890.000  17306.280  1080.000  1119.698
Header Type: XS    61.004   .263      .283  330533.90  1080.000  4620.432
SRD:  26980.000    54.391   .000      .036      .0002     2.630      .001

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "I    ".
```

KRATIO: .48

Section: I	62.897	.047	4890.000	8921.246	4200.000	4388.893
Header Type: XS	62.944	1.901	.548	159820.10	4200.000	7118.649
SRD: 31180.000	59.003	.022	.170	.0005	*****	.017
Section: FULLV	63.887	.097	4890.000	1954.229	1008.000	2454.544
Header Type: FV	63.984	1.010	2.502	149272.20	1008.000	2737.708
SRD: 32188.000	58.728	.025	.168	.0010	1.000	.005

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

Section: UP39	64.296	.133	4890.000	4791.732	282.000	2282.599
Header Type: AS	64.429	.421	1.021	107231.50	282.000	3728.881
SRD: 32470.000	60.973	.018	.284	.0015	8.227	.006

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

<<< The Following Data Reflect The "Constricted" Profile >>>
<<< Beginning Bridge/Culvert Hydraulic Computations >>>

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
Section: SR39	64.684	.233	4890.000	1530.347	1008.000	2503.057
Header Type: BR	64.917	1.832	3.195	323914.70	1008.000	2679.136
SRD: 32188.000	58.346	.140	.231	******	1.467	-.010

Specific Bridge Information	C	P/A	PFELEV	BLEN	XLAB	XRAB
Bridge Type 3 Flow Type 1						
Pier/Pile Code 1	.8255	.028	70.000	********	********	********

*** Roadway Section Located at SRD 32238.000 ***

Section: ROAD Header Type: XR
<<< Embankment Is Not Overtopped >>>

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
* Section: UP39	65.372	.068	4890.000	6382.466	177.000	2255.712
Header Type: AS	65.440	.495	.766	150715.90	257.965	3779.722
SRD: 32470.000	60.973	.027	.181	.0015	7.480	-.016

Approach Section UP39 Flow Contraction Information

M(G)	M(K)	KQ	XLKQ	XRKQ	OTEL
.880	.456	82307.8	2771.269	2947.385	65.187

<<< End of Bridge Hydraulics Computations >>>

Section: L	65.630	.040	4890.000	9535.148	295.000	142.229
Header Type: XS	65.670	.229	.513	204632.90	295.000	3857.732
SRD: 32765.000	59.403	.000	.162	.0008	9.828	.001
Section: UPXS1	65.780	.039	4890.000	9678.994	260.000	139.459
Header Type: XS	65.819	.146	.505	207921.30	260.000	3859.400
SRD: 33025.000	59.507	.000	.158	.0006	9.800	.003

ER

* EXISTING CONDITIONS BACKWATER ELEVATION FOR 100-YEAR STORM EVENT

```
****************** Normal end of WSPRO execution. ******************
*************** Elapsed Time:   0 Minutes  4 Seconds ***************
```

URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: VII.E. WSPRO ANALYSIS, COMPUTED BY: Zinner DATE: 5-27-99
PROPOSED CONDITIONS CHECKED BY: Pratt DATE: 5-28-99

The WSPRO analyses were conducted considering the case of proposed conditions "with new proposed bridge." This section includes the WSPRO input and output for the analysis of 50- and 100-year storm events for the proposed conditions.

PROPOSED CONDITIONS ANALYSIS INPUT

```
T1     HILLSBOROUGH RIVER, SR 39
T2     LOCATION HYDRAULICS STUDY
T3     50 AND 100 YR. FLOOD
*      J3 1
Q      4130   4890
WS     50.75  51.74
*
XS     B1 3450
GR     0.0, 60.00    1900, 55.00   3700, 50.00   4200, 45.00   4400, 43.00
GR     5100, 39.00   5180, 37.00   5195, 33.00   5200, 33.00   5220, 38.00
GR     5250, 39.00   5270, 40.00   5570, 43.0    6000, 45.00   7900, 50.0
GR     9500, 55.00   13570, 60.00
SA     5180   5220
N      0.25   0.07   0.25
XS     C  7000
GR     0.0, 60.00    1500, 55.00   2200, 50.00   3300, 45.00   3350, 41.00
GR     3390, 40.00   3405, 35.00   3410, 35.00   3420, 30.00   3540, 43.00
GR     4178, 45.00   4720, 50.00   4920, 52.00   6000, 55.00   9000, 60.00
SA        3390   3420
N      0.25     0.07   0.25
*
XS     D  10200
GR     0.0, 60.00    2300, 55.00   2750, 54.00   2950, 50.00   3380, 45.00
GR     3400, 44.00   3415, 39.00   3420, 39.00   3440, 44.00   3470, 46.00
GR     4020, 48.00   4200, 50.00   5500, 55.0    7550, 60.0
SA     3380   3420
*
XS     E  13200
GR     0.0, 60.00    2000, 55.00   2350, 50.00   2600, 45.00   2620, 44.00
GR     2625, 39.0    2630, 39.00   2640, 44.00   2680, 45.00   3180, 50.00
GR     3930, 55.00   6000, 60.0
SA     2620   2640
*
XS     F  16200
GR     0.0, 60.00    700, 55.00    1000, 50.00   1079, 48.00   1080, 47.00
GR     1095, 42.0    1100, 42.00   1110, 47.00   1170, 48.00   1750, 50.00
GR     2150, 55.00   2900, 60.0
SA     1080   1110
*
XS     G  18500
GR     0.0, 65.00    380, 60.00    900, 55.00    1100, 51.00   1800, 50.00
GR     1810, 49.00   1960, 48.00   1970, 43.00   1975, 43.00   1990, 48.00
GR     2240, 49.00   2260, 50.00   2860, 54.0    3360, 55.00   4060, 65.0
```

```
SA      1960   1990
*
XS   H  20500
GR      0.0, 62.50     300, 60.00    700, 55.0    1270, 50.00   1280, 49.00
GR      1300, 48.00    1305, 43.00   1310, 43.00  1320, 48.00   1350, 49.00
GR      1370, 50.00    2100, 55.00   2950, 60.0    5400, 65.00
SA      1300   1320
*
XS   HA  25100
GR      0.0, 65.00     1400, 60.00   1750, 55.00  2250, 54.00   2700, 51.00
GR      2705, 46.00    2710, 46.00   2720, 51.00  3420, 55.00   3720, 60.00
GR      4100, 63.00
SA      2700   2720
*
XS   LOBR 25900
GR      0.0, 65.00     1400, 60.00   1750, 55.00  2250, 54.00   2700, 51.00
GR      2705, 46.00    2710, 46.00   2720, 51.00  3420, 55.00   3720, 60.00
GR      4100, 63.00
SA      2700   2720
N      0.25   0.07   0.25
*
XS   APPR 26980, 0, 0.3, 0.1
GR      0.0, 65.00     1400, 60.00   1750, 56.00  2250, 53.00   3250, 52.00
GR      3260, 47.00    3265, 47.00   3270, 54.00  3470, 55.00   4220, 60.00
GR      6220, 65.00
SA      3250   3270
N       0.25   0.07   0.25
*
XS   I   31180
GR      0.0, 70.00     3800, 65.00   5200, 60.00  5600, 56.00   5620, 51.00
GR      5640, 51.00    5650, 56.00   6100, 59.00  6800, 60.00   7350, 65.00
GR      8750, 70.00
SA      5600   5650
N       0.25   0.07   0.25
*
XS   FULLV 32188
GR      0.0, 73.00     210, 74.30    360, 73.60   540, 73.00    1060, 72.80
GR      1440, 72.60    1860, 72.50   2080, 73.00  2410, 73.60   2440, 70.40
GR      2463, 60.10    2470, 58.60   2590, 55.90  2605, 51.20   2620, 51.40
GR      2628, 52.40    2650, 57.00   2725, 59.10  2755, 70.40   2890, 73.0
GR      3130, 72.00    3350, 71.0    3980, 70.0   5090, 70.00   5160, 71.0
GR      5320, 72.00    5520, 74.00
SA      2440   2755
```

```
*
BR  SR39 32188,  70.0,  0.0,  0.5,  0.3
GR      2410.0, 73.6  2490, 70.40   2500, 66.40   2518, 56.30   2590, 55.90
GR      2605, 51.20   2620, 51.40   2628, 52.40   2650, 57.00   2664, 57.40
GR      2680, 65.10   2690, 70.00   2441, 70.00   2410, 73.60
SA      2518   2664
N       0.05   0.03   0.05
CD      3, 117, 2,   69.70
PD 1    53.2,1.5, 1   56.4, 3.0, 1    57.8, 4.50, 1
*
XR  ROAD 32238, 105, 1
GR      0.0, 74.30    1860,72.50   2410,73.60   2440, 72.00   2755, 72.00
*
AS  UP39 32470, 0.0, 0.5, 0.1
GR      0.0, 70.0      125, 69.00     240, 66.0    420, 66.00   460, 67.00
GR      640, 67.00   830, 66.00   1040, 66.00   1090, 67.00   1250, 68.00
GR      1285, 69.00   1325, 69.00   1360, 68.0    1410, 68.00   1470, 69.0
GR      1640, 69.00   1710, 68.00   2190, 68.00   2290, 64.00   2580, 62.00
GR      2780, 58.00   2805, 58.00   2830, 59.0    2850, 56.00   2860, 51.4
GR      2875, 51.40    2880, 56.00   2900, 59.0    3690, 63.00   3750, 65.00
GR      3830,  66.00   4290, 74.00
SA      2830   2900
N       0.25,   0.07,   0.25
*
XS   L  32765
GR      0.0, 68.00      180, 65.00   470, 65.00   640, 63.00   940, 63.00
GR      960, 65.00   1070, 69.00   1100, 69.00   1170, 67.00   1430, 65.00
GR      1820, 65.00   1840, 68.00   1920, 68.0    2494, 58.30   2533, 57.7
GR      2539, 56.40    2545, 57.60   2703, 58.2    2726, 52.70    2751, 53.10
GR      2755, 55.70   2772, 59.10   2780, 55.6    2799, 56.30   2842, 59.2
GR      2862, 55.80    2881, 58.00   2908, 58.6    2932, 54.90    2960, 60.00
GR      3020,  61.00   3835, 65.00    4160, 74.00
SA      2725   2842
XS  UPXS1 33025 * *  * 0.0004
EX
ER
```

PROPOSED CONDITIONS ANALYSIS OUTPUT 5/31

```
   ************************* W S P R O ****************************
      Federal Highway Administration  -  U. S. Geological Survey
            Model for Water-Surface Profile Computations.
         Run Date & Time:  3/ 4/99  3:19 pm      Version V050196
          Input File: sr39tx2.inp9   Output File: sr39tx2.LST9
   *-------------------------------------------------------------*
T1         HILLSBOROUGH RIVER, SR 39
T2         LOCATION HYDRAULICS STUDY
T3         50 AND 100 YR. FLOOD
Q          4130     4890

 ***   Processing Flow Data; Placing Information into Sequence  1   ***

WS         50.75  51.74
```

```
************************** W S P R O ****************************
   Federal Highway Administration - U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record   B1     *
        *-------------------------------------------------*

XS     B1 3450
GR        0.0, 60.00      1900, 55.00    3700, 50.00    4200, 45.00    4400, 43
GR        5100, 39.00     5180, 37.00    5195, 33.00    5200, 33.00    5220, 38.0
GR        5250, 39.00     5270, 40.00    5570, 43.0      6000, 45.00    7900, 50.
GR        9500, 55.00     13570, 60.00
SA        5180    5220
N         0.25   0.07   0.25

 ***   Completed Reading Data Associated With Header Record   B1    ***
 ***  Storing X-Section Data In Temporary File As Record Number  1  ***

 ***              Data Summary For Header Record   B1               ***
 SRD Location:     3450.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (17 pairs)
     X          Y           X          Y           X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      60.000    1900.000      55.000    3700.000      50.000
  4200.000      45.000    4400.000      43.000    5100.000      39.000
  5180.000      37.000    5195.000      33.000    5200.000      33.000
  5220.000      38.000    5250.000      39.000    5270.000      40.000
  5570.000      43.000    6000.000      45.000    7900.000      50.000
  9500.000      55.000   13570.000      60.000
----------  ----------  ----------  ----------  ----------  ----------

                 Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:   13570.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:    33.000  ( associated X-Station:    5200.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:        .000 )

                    Roughness Data (  3 SubAreas )
                                Roughness   Horizontal
                    SubArea   Coefficient   Breakpoint
                    -------   -----------   ----------
                       1          .250          ---
                                  ---         5180.000
                       2          .070          ---
                                  ---         5220.000
                       3          .250          ---
                    -------   -----------   ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record   B1     *
        *-------------------------------------------------*
```

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```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  C       *
        *-------------------------------------------------*

XS    C   7000
GR        0.0, 60.00     1500, 55.00    2200, 50.00    3300, 45.00    3350, 41.0
GR        3390, 40.00    3405, 35.00    3410, 35.00    3420, 30.00    3540, 43.0
GR        4178, 45.00    4720, 50.00    4920, 52.00    6000, 55.00    9000, 60.0
SA             3390    3420
N       0.25      0.07    0.25

 ***   Completed Reading Data Associated With Header Record  C      ***
 ***  Storing X-Section Data In Temporary File As Record Number  2  ***

 ***              Data Summary For Header Record  C                 ***
 SRD Location:     7000.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (15 pairs)
    X          Y          X          Y          X          Y
---------  ---------  ---------  ---------  ---------  ---------
     .000     60.000    1500.000    55.000    2200.000    50.000
 3300.000     45.000    3350.000    41.000    3390.000    40.000
 3405.000     35.000    3410.000    35.000    3420.000    30.000
 3540.000     43.000    4178.000    45.000    4720.000    50.000
 4920.000     52.000    6000.000    55.000    9000.000    60.000
---------  ---------  ---------  ---------  ---------  ---------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:    9000.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:    30.000  ( associated X-Station:   3420.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                SubArea  Coefficient  Breakpoint
                -------  -----------  ----------
                   1         .250        ---
                             ---       3390.000
                   2         .070        ---
                             ---       3420.000
                   3         .250        ---
                -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  C       *
        *-------------------------------------------------*
```

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```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  D       *
        *-------------------------------------------------*

XS    D   10200
GR        0.0, 60.00       2300, 55.00    2750, 54.00    2950, 50.00    3380, 45
GR        3400, 44.00    3415, 39.00    3420, 39.00    3440, 44.00    3470, 46.0
GR        4020, 48.00    4200, 50.00    5500, 55.0      7550, 60.0
SA        3380   3420

 ***   Completed Reading Data Associated With Header Record  D      ***
 ***  Storing X-Section Data In Temporary File As Record Number  3  ***

 ***              Data Summary For Header Record  D                 ***
 SRD Location:    10200.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (14 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      60.000    2300.000      55.000    2750.000      54.000
  2950.000      50.000    3380.000      45.000    3400.000      44.000
  3415.000      39.000    3420.000      39.000    3440.000      44.000
  3470.000      46.000    4020.000      48.000    4200.000      50.000
  5500.000      55.000    7550.000      60.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:    7550.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:    39.000  ( associated X-Station:    3420.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                           Roughness   Horizontal
                SubArea  Coefficient  Breakpoint
                -------  -----------  ----------
                   1         .250        ---
                             ---       3380.000
                   2         .070        ---
                             ---       3420.000
                   3         .250        ---
                -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  D       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  E       *
        *-------------------------------------------------*

XS    E   13200
GR        0.0, 60.00       2000, 55.00    2350, 50.00    2600, 45.00    2620, 44
GR        2625, 39.0      2630, 39.00    2640, 44.00    2680, 45.00    3180, 50.
GR        3930, 55.00    6000, 60.0
SA        2620    2640

 ***   Completed Reading Data Associated With Header Record  E      ***
 ***  Storing X-Section Data In Temporary File As Record Number  4  ***

 ***              Data Summary For Header Record  E                 ***
 SRD Location:    13200.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (12 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      60.000    2000.000      55.000    2350.000      50.000
  2600.000      45.000    2620.000      44.000    2625.000      39.000
  2630.000      39.000    2640.000      44.000    2680.000      45.000
  3180.000      50.000    3930.000      55.000    6000.000      60.000
----------  ----------  ----------  ----------  ----------  ----------

             Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:    6000.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:    39.000  ( associated X-Station:    2630.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                         Roughness   Horizontal
                SubArea  Coefficient  Breakpoint
                -------  -----------  ----------
                   1         .250        ---
                             ---       2620.000
                   2         .070        ---
                             ---       2640.000
                   3         .250        ---
                -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  E       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  F       *
        *-------------------------------------------------*

XS    F   16200
GR        0.0, 60.00       700, 55.00      1000, 50.00    1079, 48.00    1080, 4
GR        1095, 42.0      1100, 42.00     1110, 47.00    1170, 48.00    1750, 50.
GR        2150, 55.00     2900, 60.0
SA        1080    1110

 ***   Completed Reading Data Associated With Header Record  F      ***
 ***  Storing X-Section Data In Temporary File As Record Number  5  ***

 ***              Data Summary For Header Record  F                 ***
 SRD Location:    16200.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (12 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      60.000      700.000      55.000     1000.000      50.000
  1079.000      48.000     1080.000       4.000     1095.000      42.000
  1100.000      42.000     1110.000      47.000     1170.000      48.000
  1750.000      50.000     2150.000      55.000     2900.000      60.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   60.000 )
  Maximum X-Station:    2900.000  ( associated Y-Elevation:   60.000 )
  Minimum Y-Elevation:     4.000  ( associated X-Station:    1080.000 )
  Maximum Y-Elevation:    60.000  ( associated X-Station:        .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                SubArea   Coefficient Breakpoint
                -------   ----------- ----------
                   1          .250        ---
                              ---       1080.000
                   2          .070        ---
                              ---       1110.000
                   3          .250        ---
                -------   ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  F       *
        *-------------------------------------------------*
```

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```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  G       *
        *-------------------------------------------------*

XS    G   18500
GR         0.0, 65.00       380, 60.00    900, 55.00    1100, 51.00    1800, 50.
GR        1810, 49.00    1960, 48.00    1970, 43.00    1975, 43.00    1990, 48.0
GR        2240, 49.00    2260, 50.00    2860, 54.0      3360, 55.00   4060, 65.0
SA        1960    1990

 ***   Completed Reading Data Associated With Header Record  G      ***
 ***  Storing X-Section Data In Temporary File As Record Number  6  ***

 ***              Data Summary For Header Record  G                 ***
 SRD Location:    18500.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (15 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      65.000     380.000      60.000     900.000      55.000
  1100.000      51.000    1800.000      50.000    1810.000      49.000
  1960.000      48.000    1970.000      43.000    1975.000      43.000
  1990.000      48.000    2240.000      49.000    2260.000      50.000
  2860.000      54.000    3360.000      55.000    4060.000      65.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   65.000 )
  Maximum X-Station:    4060.000  ( associated Y-Elevation:   65.000 )
  Minimum Y-Elevation:    43.000  ( associated X-Station:   1975.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                SubArea   Coefficient Breakpoint
                -------   ----------  ----------
                   1         .250        ---
                             ---       1960.000
                   2         .070        ---
                             ---       1990.000
                   3         .250        ---
                -------   ----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  G       *
        *-------------------------------------------------*
```

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```
**************************  W S P R O  **************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record  H       *
        *-------------------------------------------------*

XS    H   20500
GR        0.0, 62.50       300, 60.00      700, 55.0     1270, 50.00    1280, 49
GR        1300, 48.00    1305, 43.00    1310, 43.00    1320, 48.00    1350, 49.0
GR        1370, 50.00    2100, 55.00    2950, 60.0      5400, 65.00
SA        1300    1320

 ***   Completed Reading Data Associated With Header Record  H      ***
 ***  Storing X-Section Data In Temporary File As Record Number  7  ***

 ***              Data Summary For Header Record  H                 ***
 SRD Location:    20500.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (14 pairs)
    X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      62.500     300.000      60.000     700.000      55.000
  1270.000      50.000    1280.000      49.000    1300.000      48.000
  1305.000      43.000    1310.000      43.000    1320.000      48.000
  1350.000      49.000    1370.000      50.000    2100.000      55.000
  2950.000      60.000    5400.000      65.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   62.500 )
  Maximum X-Station:    5400.000  ( associated Y-Elevation:   65.000 )
  Minimum Y-Elevation:    43.000  ( associated X-Station:   1310.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:   5400.000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                 SubArea  Coefficient Breakpoint
                 -------  ----------- ----------
                    1         .250        ---
                              ---       1300.000
                    2         .070        ---
                              ---       1320.000
                    3         .250        ---
                 -------  ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record  H       *
        *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record HA       *
        *-------------------------------------------------*

XS   HA   25100
GR        0.0, 65.00       1400, 60.00    1750, 55.00    2250, 54.00    2700, 51
GR        2705, 46.00    2710, 46.00    2720, 51.00    3420, 55.00    3720, 60.0
GR        4100, 63.00
SA        2700    2720

 ***   Completed Reading Data Associated With Header Record HA      ***
 ***  Storing X-Section Data In Temporary File As Record Number  8  ***

 ***              Data Summary For Header Record HA                 ***
 SRD Location:    25100.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (11 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      65.000    1400.000      60.000    1750.000      55.000
  2250.000      54.000    2700.000      51.000    2705.000      46.000
  2710.000      46.000    2720.000      51.000    3420.000      55.000
  3720.000      60.000    4100.000      63.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   65.000 )
  Maximum X-Station:    4100.000  ( associated Y-Elevation:   63.000 )
  Minimum Y-Elevation:    46.000  ( associated X-Station:   2710.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                 SubArea  Coefficient  Breakpoint
                 -------  -----------  ----------
                    1         .250        ---
                              ---       2700.000
                    2         .070        ---
                              ---       2720.000
                    3         .250        ---
                 -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record HA       *
        *-------------------------------------------------*
```

```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record LOBR     *
        *-------------------------------------------------*

XS   LOBR 25900
GR        0.0, 65.00      1400, 60.00    1750, 55.00    2250, 54.00    2700, 51
GR        2705, 46.00    2710, 46.00    2720, 51.00    3420, 55.00    3720, 60.0
GR        4100, 63.00
SA        2700    2720
N         0.25    0.07    0.25

 ***   Completed Reading Data Associated With Header Record LOBR    ***
 ***  Storing X-Section Data In Temporary File As Record Number  9  ***

 ***              Data Summary For Header Record LOBR               ***
 SRD Location:    25900.    Cross-Section Skew:     .0   Error Code   0
 Valley Slope:    .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                     X,Y-coordinates (11 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      65.000    1400.000      60.000    1750.000      55.000
  2250.000      54.000    2700.000      51.000    2705.000      46.000
  2710.000      46.000    2720.000      51.000    3420.000      55.000
  3720.000      60.000    4100.000      63.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:         .000  ( associated Y-Elevation:    65.000 )
  Maximum X-Station:    4100.000  ( associated Y-Elevation:    63.000 )
  Minimum Y-Elevation:    46.000  ( associated X-Station:    2710.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:        .000 )

                   Roughness Data (  3 SubAreas )
                            Roughness   Horizontal
                  SubArea   Coefficient Breakpoint
                  -------   ----------- ----------
                     1          .250        ---
                                ---       2700.000
                     2          .070        ---
                                ---       2720.000
                     3          .250        ---
                  -------   ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record LOBR     *
        *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record APPR     *
        *-------------------------------------------------*

XS   APPR 26980, 0, 0.3, 0.1
GR        0.0, 65.00       1400, 60.00    1750, 56.00    2250, 53.00    3250, 52
GR        3260, 47.00    3265, 47.00    3270, 54.00    3470, 55.00    4220, 60.0
GR        6220, 65.00
SA        3250    3270
N           0.25   0.07   0.25

 ***   Completed Reading Data Associated With Header Record APPR    ***
 ***  Storing X-Section Data In Temporary File As Record Number 10  ***

 ***              Data Summary For Header Record APPR              ***
 SRD Location:    26980.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .30   Contraction:   .10

                    X,Y-coordinates (11 pairs)
    X          Y           X          Y           X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      65.000     1400.000      60.000     1750.000      56.000
  2250.000      53.000     3250.000      52.000     3260.000      47.000
  3265.000      47.000     3270.000      54.000     3470.000      55.000
  4220.000      60.000     6220.000      65.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   65.000 )
  Maximum X-Station:    6220.000  ( associated Y-Elevation:   65.000 )
  Minimum Y-Elevation:    47.000  ( associated X-Station:   3265.000 )
  Maximum Y-Elevation:    65.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                SubArea   Coefficient Breakpoint
                -------   ----------- ----------
                   1          .250        ---
                              ---       3250.000
                   2          .070        ---
                              ---       3270.000
                   3          .250        ---
                -------   ----------- ----------

        *-------------------------------------------------*
        *     Finished Processing Header Record APPR      *
        *-------------------------------------------------*
```

```
*************************  W S P R O  ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record I        *
        *-------------------------------------------------*

XS   I    31180
GR         0.0, 70.00       3800, 65.00    5200, 60.00    5600, 56.00    5620, 51
GR         5640, 51.00    5650, 56.00    6100, 59.00    6800, 60.00    7350, 65.0
GR         8750, 70.00
SA         5600    5650
N           0.25   0.07   0.25

 ***   Completed Reading Data Associated With Header Record I       ***
 ***  Storing X-Section Data In Temporary File As Record Number 11  ***

 ***              Data Summary For Header Record I                   ***
 SRD Location:    31180.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (11 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      70.000    3800.000      65.000    5200.000      60.000
  5600.000      56.000    5620.000      51.000    5640.000      51.000
  5650.000      56.000    6100.000      59.000    6800.000      60.000
  7350.000      65.000    8750.000      70.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   70.000 )
  Maximum X-Station:    8750.000  ( associated Y-Elevation:   70.000 )
  Minimum Y-Elevation:    51.000  ( associated X-Station:   5640.000 )
  Maximum Y-Elevation:    70.000  ( associated X-Station:       .000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                 SubArea  Coefficient  Breakpoint
                 -------  -----------  ----------
                    1         .250        ---
                              ---       5600.000
                    2         .070        ---
                              ---       5650.000
                    3         .250        ---
                 -------  -----------  ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record I        *
        *-------------------------------------------------*
```

17/31

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

       *-------------------------------------------------*
       *      Starting To Process Header Record FULLV    *
       *-------------------------------------------------*

XS   FULLV 32188
GR        0.0, 73.00       210, 74.30    360, 73.60    540, 73.00    1060, 72.80
GR        1440, 72.60    1860, 72.50    2080, 73.00    2410, 73.60    2440, 70.4
GR        2463, 60.10     2470, 58.60    2590, 55.90    2605, 51.20    2620, 51.4
GR        2628, 52.40    2650, 57.00    2725, 59.10    2755, 70.40    2890, 73.0
GR        3130, 72.00       3350, 71.0   3980, 70.0    5090, 70.00    5160, 71.0
GR        5320, 72.00    5520, 74.00
SA        2440    2755

 ***   Completed Reading Data Associated With Header Record FULLV   ***
 ***  Storing X-Section Data In Temporary File As Record Number 12  ***

 ***              Data Summary For Header Record FULLV              ***
 SRD Location:    32188.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (27 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      73.000      210.000      74.300      360.000      73.600
   540.000      73.000     1060.000      72.800     1440.000      72.600
  1860.000      72.500     2080.000      73.000     2410.000      73.600
  2440.000      70.400     2463.000      60.100     2470.000      58.600
  2590.000      55.900     2605.000      51.200     2620.000      51.400
  2628.000      52.400     2650.000      57.000     2725.000      59.100
  2755.000      70.400     2890.000      73.000     3130.000      72.000
  3350.000      71.000     3980.000      70.000     5090.000      70.000
  5160.000      71.000     5320.000      72.000     5520.000      74.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:    73.000 )
  Maximum X-Station:    5520.000  ( associated Y-Elevation:    74.000 )
  Minimum Y-Elevation:    51.200  ( associated X-Station:    2605.000 )
  Maximum Y-Elevation:    74.300  ( associated X-Station:     210.000 )

                  Roughness Data (  3 SubAreas )
                              Roughness   Horizontal
                  SubArea   Coefficient  Breakpoint
                  -------   -----------  ----------
                     1          .250         ---
                                ---        2440.000
                     2          .070         ---
                                ---        2755.000
                     3          .250         ---
                  -------   -----------  ----------

       *-------------------------------------------------*
       *      Finished Processing Header Record FULLV    *
       *-------------------------------------------------*
```

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```
************************** W S P R O **************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record SR39     *
        *-------------------------------------------------*

BR   SR39 32188,  70.0,  0.0,  0.5,  0.3
GR        2410.0, 73.6   2490, 70.40    2500, 66.40    2518, 56.30    2590, 55.9
GR        2605, 51.20    2620, 51.40    2628, 52.40    2650, 57.00    2664, 57.4
GR        2680, 65.10    2690, 70.00    2441, 70.00    2410, 73.60
SA        2518    2664
N         0.05    0.03    0.05
CD        3, 117, 2,   69.70
PD 1      53.2,1.5, 1   56.4, 3.0, 1     57.8, 4.50, 1

 ***   Completed Reading Data Associated With Header Record SR39     ***
 ***   Storing Bridge Data In Temporary File As Record Number 13     ***

 ***              Data Summary For Bridge Record SR39                ***
 SRD Location:    32188.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:  *******    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .30

                    X,Y-coordinates (14 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
  2410.000      73.600     2490.000      70.400     2500.000      66.400
  2518.000      56.300     2590.000      55.900     2605.000      51.200
  2620.000      51.400     2628.000      52.400     2650.000      57.000
  2664.000      57.400     2680.000      65.100     2690.000      70.000
  2441.000      70.000     2410.000      73.600
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:    2410.000  ( associated Y-Elevation:    73.600 )
  Maximum X-Station:    2690.000  ( associated Y-Elevation:    70.000 )
  Minimum Y-Elevation:    51.200  ( associated X-Station:    2605.000 )
  Maximum Y-Elevation:    73.600  ( associated X-Station:    2410.000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                SubArea   Coefficient Breakpoint
                -------   ----------- ----------
                   1          .050        ---
                              ---        2518.000
                   2          .030        ---
                              ---        2664.000
                   3          .050        ---
                -------   ----------- ----------

                  Discharge coefficient parameters
                BRType   BRWdth    EMBSS    EMBElv     UserCD
                  3      117.000    2.00     69.700 **********

                     Pressure flow elevations
                        AVBCEL      PFElev
                     *********      70.000

                       Abutment Parameters
```

ABSLPL	ABSLPR	XTOELT	YTOELT	XTOERT	YTOERT
*******	*******	*********	*********	*********	*********

Pier/Pile Data (3 Group(s))
Code Indicates Bridge Uses Piles

Group	Elevation	Gross Width	Number
1	53.200	1.500	1
2	56.400	3.000	1
3	57.800	4.500	1

--
* Finished Processing Header Record SR39 *
--

```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record ROAD     *
        *-------------------------------------------------*

XR   ROAD 32238, 105, 1
GR        0.0, 74.30     1860,72.50    2410,73.60    2440, 72.00    2755, 72.00

 ***   Completed Reading Data Associated With Header Record ROAD    ***
  ***   Storing Roadway Data In Temporary File As Record Number 14    ***

 ***              Data Summary For Roadway Record ROAD              ***
 SRD Location:    32238.   Cross-Section Skew:    .0   Error Code   0
 Roadway Width:  105.000   User-Specified Weir Coefficient:  ******
 Input Code Indicates Roadway Surface Consists of a Paved Material.

                    X,Y-coordinates ( 5 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      74.300    1860.000      72.500    2410.000      73.600
  2440.000      72.000    2755.000      72.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   74.300 )
  Maximum X-Station:    2755.000  ( associated Y-Elevation:   72.000 )
  Minimum Y-Elevation:    72.000  ( associated X-Station:    2755.000 )
  Maximum Y-Elevation:    74.300  ( associated X-Station:       .000 )

Bridge datum projection:  XREFLT = *******

        *-------------------------------------------------*
        *      Finished Processing Header Record ROAD     *
        *-------------------------------------------------*
```

```
************************* W S P R O ***************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-----------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record UP39     *
        *-------------------------------------------------*

  AS   UP39 32470, 0.0, 0.5, 0.1
+++078 NOTICE:  AS Record Replaced With XS Record (See Users Manual).
  GR        0.0, 70.0       125, 69.00      240, 66.0     420, 66.00    460, 67.00
  GR        640, 67.00    830, 66.00    1040, 66.00    1090, 67.00    1250, 68.00
  GR        1285, 69.00    1325, 69.00    1360, 68.0     1410, 68.00   1470, 69.0
  GR        1640, 69.00    1710, 68.00    2190, 68.00    2290, 64.00    2580, 62.0
  GR        2780, 58.00    2805, 58.00    2830, 59.0     2850, 56.00   2860, 51.4
  GR        2875, 51.40     2880, 56.00   2900, 59.0     3690, 63.00    3750, 65.0
  GR        3830,  66.00    4290, 74.00
  SA        2830    2900
  N         0.25,   0.07,   0.25

   ***   Completed Reading Data Associated With Header Record UP39     ***
   ***  Storing X-Section Data In Temporary File As Record Number 15  ***

   ***              Data Summary For Header Record UP39               ***
   SRD Location:    32470.   Cross-Section Skew:    .0   Error Code   0
   Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
   Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .10

                        X,Y-coordinates (32 pairs)
      X          Y           X          Y           X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      70.000      125.000      69.000      240.000      66.000
    420.000      66.000      460.000      67.000      640.000      67.000
    830.000      66.000     1040.000      66.000     1090.000      67.000
   1250.000      68.000     1285.000      69.000     1325.000      69.000
   1360.000      68.000     1410.000      68.000     1470.000      69.000
   1640.000      69.000     1710.000      68.000     2190.000      68.000
   2290.000      64.000     2580.000      62.000     2780.000      58.000
   2805.000      58.000     2830.000      59.000     2850.000      56.000
   2860.000      51.400     2875.000      51.400     2880.000      56.000
   2900.000      59.000     3690.000      63.000     3750.000      65.000
   3830.000      66.000     4290.000      74.000
----------  ----------  ----------  ----------  ----------  ----------

                  Minimum and Maximum X,Y-coordinates
   Minimum X-Station:        .000  ( associated Y-Elevation:   70.000 )
   Maximum X-Station:    4290.000  ( associated Y-Elevation:   74.000 )
   Minimum Y-Elevation:    51.400  ( associated X-Station:   2875.000 )
   Maximum Y-Elevation:    74.000  ( associated X-Station:   4290.000 )

                     Roughness Data (  3 SubAreas )
                           Roughness   Horizontal
                     SubArea Coefficient Breakpoint
                     ------- ----------- ----------
                        1        .250        ---
                                 ---       2830.000
                        2        .070        ---
                                 ---       2900.000
                        3        .250        ---
                     ------- ----------- ----------
```

```
Bridge datum projection(s):  XREFLT  XREFRT  FDSTLT  FDSTRT
                            ******* ******* ******* *******

          *-------------------------------------------------*
          *      Finished Processing Header Record UP39     *
          *-------------------------------------------------*
```

```
********************** W S P R O **************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

       *-------------------------------------------------*
       *      Starting To Process Header Record  L       *
       *-------------------------------------------------*

XS    L   32765
GR        0.0, 68.00      180, 65.00    470, 65.00    640, 63.00    940, 63.00
GR        960, 65.00    1070, 69.00    1100, 69.00   1170, 67.00   1430, 65.00
GR        1820, 65.00    1840, 68.00    1920, 68.0     2494, 58.30   2533, 57.7
GR        2539, 56.40     2545, 57.60   2703, 58.2     2726, 52.70    2751, 53.1
GR        2755, 55.70    2772, 59.10    2780, 55.6     2799, 56.30   2842, 59.2
GR        2862, 55.80     2881, 58.00   2908, 58.6     2932, 54.90    2960, 60.0
GR        3020,  61.00    3835, 65.00    4160, 74.00
SA        2725    2842

 ***   Completed Reading Data Associated With Header Record  L      ***
 ***  Storing X-Section Data In Temporary File As Record Number 16  ***

 ***              Data Summary For Header Record  L                 ***
 SRD Location:    32765.   Cross-Section Skew:     .0   Error Code   0
 Valley Slope:   .00000    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (33 pairs)
     X          Y          X          Y          X          Y
----------  ----------  ----------  ----------  ----------  ----------
      .000      68.000     180.000      65.000     470.000      65.000
   640.000      63.000     940.000      63.000     960.000      65.000
  1070.000      69.000    1100.000      69.000    1170.000      67.000
  1430.000      65.000    1820.000      65.000    1840.000      68.000
  1920.000      68.000    2494.000      58.300    2533.000      57.700
  2539.000      56.400    2545.000      57.600    2703.000      58.200
  2726.000      52.700    2751.000      53.100    2755.000      55.700
  2772.000      59.100    2780.000      55.600    2799.000      56.300
  2842.000      59.200    2862.000      55.800    2881.000      58.000
  2908.000      58.600    2932.000      54.900    2960.000      60.000
  3020.000      61.000    3835.000      65.000    4160.000      74.000
----------  ----------  ----------  ----------  ----------  ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:    68.000 )
  Maximum X-Station:    4160.000  ( associated Y-Elevation:    74.000 )
  Minimum Y-Elevation:    52.700  ( associated X-Station:    2726.000 )
  Maximum Y-Elevation:    74.000  ( associated X-Station:    4160.000 )

                  Roughness Data (  3 SubAreas )
                          Roughness   Horizontal
                SubArea  Coefficient  Breakpoint
                -------  -----------  ----------
                   1         .250        ---
                             ---       2725.000
                   2         .070        ---
                             ---       2842.000
                   3         .250        ---
                -------  -----------  ----------

       *-------------------------------------------------*
       *      Finished Processing Header Record  L       *
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

        *-------------------------------------------------*
        *      Starting To Process Header Record UPXS1    *
        *-------------------------------------------------*

XS   UPXS1 33025 * *  * 0.0004

 ***   Completed Reading Data Associated With Header Record UPXS1   ***
 ***   No Roughness Data Input, Propagating From Previous Section   ***
 ***  Storing X-Section Data In Temporary File As Record Number 17  ***

 ***              Data Summary For Header Record UPXS1              ***
 SRD Location:    33025.   Cross-Section Skew:    .0   Error Code   0
 Valley Slope:   .00040    Averaging Conveyance By Geometric Mean.
 Energy Loss Coefficients ->   Expansion:   .50   Contraction:   .00

                    X,Y-coordinates (33 pairs)
    X          Y          X          Y          X          Y
---------- ---------- ---------- ---------- ---------- ----------
      .000     68.104    180.000     65.104    470.000     65.104
   640.000     63.104    940.000     63.104    960.000     65.104
  1070.000     69.104   1100.000     69.104   1170.000     67.104
  1430.000     65.104   1820.000     65.104   1840.000     68.104
  1920.000     68.104   2494.000     58.404   2533.000     57.804
  2539.000     56.504   2545.000     57.704   2703.000     58.304
  2726.000     52.804   2751.000     53.204   2755.000     55.804
  2772.000     59.204   2780.000     55.704   2799.000     56.404
  2842.000     59.304   2862.000     55.904   2881.000     58.104
  2908.000     58.704   2932.000     55.004   2960.000     60.104
  3020.000     61.104   3835.000     65.104   4160.000     74.104
---------- ---------- ---------- ---------- ---------- ----------

                Minimum and Maximum X,Y-coordinates
  Minimum X-Station:        .000  ( associated Y-Elevation:   68.104 )
  Maximum X-Station:    4160.000  ( associated Y-Elevation:   74.104 )
  Minimum Y-Elevation:    52.804  ( associated X-Station:   2726.000 )
  Maximum Y-Elevation:    74.104  ( associated X-Station:   4160.000 )

                  Roughness Data (  3 SubAreas )
                        Roughness   Horizontal
                SubArea Coefficient Breakpoint
                ------- ----------- ----------
                   1         .250       ---
                             ---      2725.000
                   2         .070       ---
                             ---      2842.000
                   3         .250       ---
                ------- ----------- ----------

        *-------------------------------------------------*
        *      Finished Processing Header Record UPXS1    *
        *-------------------------------------------------*
```

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD
EX

      *=================================================*
      *     Summary of Boundary Condition Information    *
      *=================================================*

        Reach       Water Surface   Friction
   #   Discharge      Elevation      Slope          Flow Regime
  --   ---------    -------------   --------   --------------------
   1     4130.00        50.750       ******        Sub-Critical
   2     4890.00        51.740       ******        Sub-Critical
  --   ---------    -------------   --------   --------------------

      *=================================================*
      *         Beginning  2 Profile Calculation(s)     *
      *=================================================*
```

```
************************** W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
          Model for Water-Surface Profile Computations.
        Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD
```

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
Section: B1	50.750	.003	4130.000	24086.250	*********	3430.000
Header Type: XS	50.753	******	.171	499312.80	*********	8140.000
SRD: 3450.000	41.635	******	.036	******	7.229	******

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " C ".
KRATIO: .59

Section: C	51.162	.011	4130.000	13811.520	3550.000	2037.283
Header Type: XS	51.173	.413	.299	293342.50	3550.000	4836.227
SRD: 7000.000	39.359	.004	.067	.0001	8.017	.003

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " D ".
KRATIO: .47

Section: D	52.492	.036	4130.000	7595.759	3200.000	2825.383
Header Type: XS	52.528	1.336	.544	139229.00	3200.000	4848.009
SRD: 10200.000	48.394	.012	.138	.0004	7.835	.006
Section: E	54.696	.023	4130.000	8711.233	3000.000	2021.269
Header Type: XS	54.719	2.178	.474	168761.60	3000.000	3884.423
SRD: 13200.000	48.851	.000	.098	.0007	6.487	.013
Section: F	56.152	.029	4130.000	8695.945	3000.000	538.711
Header Type: XS	56.181	1.453	.475	208668.30	3000.000	2322.810
SRD: 16200.000	34.634	.003	.108	.0005	8.169	.006
Section: G	56.896	.007	4130.000	13638.500	2300.000	702.850
Header Type: XS	56.903	.712	.303	263974.60	2300.000	3492.697
SRD: 18500.000	51.417	.000	.053	.0003	4.884	.010

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " H ".
KRATIO: .59

Section: H	57.730	.023	4130.000	8695.275	2000.000	481.632
Header Type: XS	57.753	.831	.475	155548.80	2000.000	2564.032
SRD: 20500.000	53.248	.008	.106	.0004	6.641	.011

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "HA ".
KRATIO: 1.58

Section: HA	59.800	.006	4130.000	12429.960	4600.000	1414.035
Header Type: XS	59.805	2.051	.332	245958.50	4600.000	3707.970
SRD: 25100.000	54.359	.000	.045	.0004	3.258	.001
Section: LOBR	60.019	.005	4130.000	12935.770	800.000	1394.786
Header Type: XS	60.024	.214	.319	259805.70	800.000	3722.358
SRD: 25900.000	54.359	.000	.043	.0003	3.190	.005
Section: APPR	60.270	.003	4130.000	14928.190	1080.000	1324.447
Header Type: XS	60.273	.249	.277	284889.40	1080.000	4327.933
SRD: 26980.000	54.229	.000	.035	.0002	2.546	.000

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "I ".

KRATIO: .44

Section: I	62.243	.056	4130.000	7218.647	4200.000	4572.097
Header Type: XS	62.299	1.997	.572	125931.30	4200.000	7046.676
SRD: 31180.000	58.740	.027	.196	.0005	*****	.002
Section: FULLV	63.290	.083	4130.000	1786.210	1008.000	2455.876
Header Type: FV	63.374	1.055	2.312	129452.90	1008.000	2736.125
SRD: 32188.000	58.427	.013	.161	.0010	1.000	.007

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "UP39 ".
KRATIO: .67

Section: UP39	63.691	.146	4130.000	3931.946	282.000	2334.862
Header Type: AS	63.836	.429	1.050	86511.63	282.000	3710.718
SRD: 32470.000	60.490	.031	.319	.0015	8.497	.002

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

<<< The Following Data Reflect The "Constricted" Profile >>>
<<< Beginning Bridge/Culvert Hydraulic Computations >>>

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
Section: SR39	64.095	.179	4130.000	1427.321	1008.000	2504.107
Header Type: BR	64.274	1.889	2.894	291015.80	1008.000	2677.913
SRD: 32188.000	57.991	.086	.209	******	1.373	-.012

Specific Bridge Information	C	P/A	PFELEV	BLEN	XLAB	XRAB
Bridge Type 3 Flow Type 1	------	-----	--------	--------	--------	--------
Pier/Pile Code 1	.8533	.029	70.000	********	********	********

*** Roadway Section Located at SRD 32238.000 ***

Section: ROAD Header Type: XR
<<< Embankment Is Not Overtopped >>>

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
* Section: UP39	64.693	.073	4130.000	5370.445	165.000	2272.671
Header Type: AS	64.766	.464	.769	122649.80	242.821	3740.795
SRD: 32470.000	60.490	.027	.199	.0015	7.904	-.019

Approach Section UP39	Flow Contraction Information				
M(G)	M(K)	KQ	XLKQ	XRKQ	OTEL
.876	.414	72290.8	2770.479	2944.332	64.508

<<< End of Bridge Hydraulics Computations >>>

* PROPOSED CONDITIONS BACKWATER ELEVATION FOR 50-YEAR STORM EVENT

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " L ".
KRATIO: 1.43

Section: L	64.971	.037	4130.000	7576.733	295.000	472.479
Header Type: XS	65.008	.234	.545	175309.40	295.000	3829.057
SRD: 32765.000	59.192	.000	.147	.0008	7.963	.008

Section: UPXS1	65.119	.045	4130.000	7686.177	260.000	179.079
Header Type: XS	65.165	.154	.537	163843.70	260.000	3835.554
SRD: 33025.000	59.296	.004	.185	.0006	*****	-.002

```
************************* W S P R O ****************************
   Federal Highway Administration  -  U. S. Geological Survey
         Model for Water-Surface Profile Computations.
         Input Units: English  /  Output Units: English
*-------------------------------------------------------------*
                  HILLSBOROUGH RIVER, SR 39
                  LOCATION HYDRAULICS STUDY
                     50 AND 100 YR. FLOOD

                  WSEL     VHD        Q         AREA      SRDL      LEW
                  EGEL      HF        V           K        FLEN      REW
                  CRWS      HO       FR #        SF       ALPHA     ERR
               --------- ------ ---------- ---------- --------- ---------
Section:   B1      51.740   .003   4890.000  29082.400 *********  3073.599
Header Type: XS    51.743 ******       .168  609721.80 *********  8456.801
SRD:   3450.000    42.018 ******       .034     ******     6.988    ******

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " C   ".
      KRATIO:    .60

Section:  C        52.119   .010   4890.000  16601.300  3550.000  1903.328
Header Type: XS    52.129   .382       .295  364248.30  3550.000  4962.872
SRD:   7000.000    39.995   .003       .060      .0001     7.314      .000

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " D   ".
      KRATIO:    .49

Section:  D        53.308   .031   4890.000   9348.840  3200.000  2784.596
Header Type: XS    53.340  1.186       .523  177166.00  3200.000  5060.103
SRD:  10200.000    48.643   .011       .124      .0004     7.397      .014

Section:  E        55.423   .025   4890.000  10176.030  3000.000  1830.920
Header Type: XS    55.448  2.121       .481  190869.20  3000.000  4104.998
SRD:  13200.000    49.204   .000       .107      .0007     7.089     -.013

Section:  F        56.966   .028   4890.000  10243.430  3000.000   424.809
Header Type: XS    56.994  1.541       .477  243964.50  3000.000  2444.847
SRD:  16200.000    36.823   .001       .105      .0005     7.936      .004

Section:  G        57.683   .007   4890.000  15888.990  2300.000   620.967
Header Type: XS    57.690   .694       .308  324832.20  2300.000  3547.811
SRD:  18500.000    51.615   .000       .049      .0003     4.420      .002

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID " H   ".
      KRATIO:    .59

Section:  H        58.451   .021   4890.000  10262.360  2000.000   423.928
Header Type: XS    58.472   .772       .476  190681.50  2000.000  2686.654
SRD:  20500.000    53.533   .007       .097      .0004     6.018      .003

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "HA   ".
      KRATIO:   1.49

Section: HA        60.507   .006   4890.000  14122.200  4600.000  1257.909
Header Type: XS    60.514  2.028       .346  284473.00  4600.000  3784.280
SRD:  25100.000    54.680   .000       .047      .0004     3.249      .014

Section: LOBR      60.734   .006   4890.000  14706.230   800.000  1194.341
Header Type: XS    60.740   .226       .333  296991.90   800.000  3813.036
SRD:  25900.000    54.680   .000       .045      .0003     3.265      .000

Section: APPR      61.001   .003   4890.000  17306.280  1080.000  1119.698
Header Type: XS    61.004   .263       .283  330533.90  1080.000  4620.432
SRD:  26980.000    54.391   .000       .036      .0002     2.630      .001

===135 CONVEYANCE RATIO OUTSIDE OF RECOMMENDED LIMITS AT SECID "I    ".
```

KRATIO: .48

Section: I	62.897	.047	4890.000	8921.246	4200.000	4388.893
Header Type: XS	62.944	1.901	.548	159820.10	4200.000	7118.649
SRD: 31180.000	59.003	.022	.170	.0005	*****	.017
Section: FULLV	63.887	.097	4890.000	1954.229	1008.000	2454.544
Header Type: FV	63.984	1.010	2.502	149272.20	1008.000	2737.708
SRD: 32188.000	58.728	.025	.168	.0010	1.000	.005

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

Section: UP39	64.296	.133	4890.000	4791.732	282.000	2282.599
Header Type: AS	64.429	.421	1.021	107231.50	282.000	3728.881
SRD: 32470.000	60.973	.018	.284	.0015	8.227	.006

<<< The Preceding Data Reflect The "Unconstricted" Profile >>>

<<< The Following Data Reflect The "Constricted" Profile >>>
<<< Beginning Bridge/Culvert Hydraulic Computations >>>

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
Section: SR39	64.692	.227	4890.000	1531.679	1008.000	2503.044
Header Type: BR	64.919	1.839	3.193	324347.40	1008.000	2679.152
SRD: 32188.000	58.346	.135	.228	******	1.430	-.009

Specific Bridge Information	C	P/A	PFELEV	BLEN	XLAB	XRAB
Bridge Type 3 Flow Type 1	------	-----	--------	--------	--------	--------
Pier/Pile Code 1	.8361	.028	70.000	********	********	********

*** Roadway Section Located at SRD 32238.000 ***

Section: ROAD Header Type: XR
<<< Embankment Is Not Overtopped >>>

	WSEL EGEL CRWS	VHD HF HO	Q V FR #	AREA K SF	SRDL FLEN ALPHA	LEW REW ERR
* Section: UP39	65.352	.069	4890.000	6352.616	165.000	2256.202
Header Type: AS	65.421	.472	.770	149879.00	243.666	3778.154
SRD: 32470.000	60.973	.030	.182	.0015	7.489	-.015

Approach Section UP39	Flow Contraction Information				
M(G)	M(K)	KQ	XLKQ	XRKQ	OTEL
.880	.455	82008.8	2771.256	2947.400	65.178

<<< End of Bridge Hydraulics Computations >>>

Section: L	65.613	.041	4890.000	9483.006	295.000	143.236
Header Type: XS	65.653	.231	.516	203444.80	295.000	3857.126
SRD: 32765.000	59.403	.000	.163	.0008	9.838	.001
Section: UPXS1	65.764	.039	4890.000	9631.521	260.000	140.371
Header Type: XS	65.804	.148	.508	206834.30	260.000	3858.851
SRD: 33025.000	59.507	.000	.160	.0006	9.810	.003

ER

* PROPOSED CONDITIONS BACKWATER ELEVATION FOR THE 100-YEAR STORM EVENT.

```
****************** Normal end of WSPRO execution. ******************
*************** Elapsed Time:   0 Minutes  4 Seconds  ***************
```

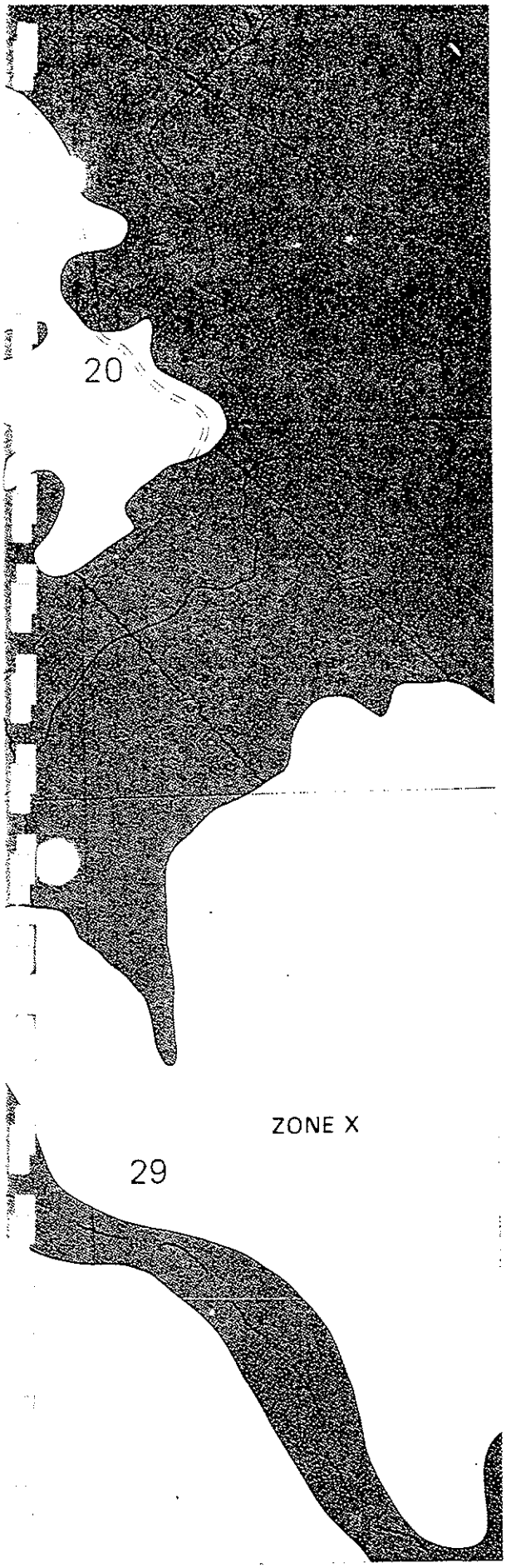
URS Greiner

JOB: SR 39 FROM I-4 TO U.S. 301 SHEET 1 OF 3 PROJ. NO. C100003240.19
DESCRIPTION: VII.F. Results COMPUTED BY: Zinner DATE: 5-27-99
CHECKED BY: Pratt DATE: 5-28-99

The results in the following table indicate the backwater elevations of the proposed conditions are not adversely affected in comparison to the backwater elevations of the existing conditions.

Event	Backwater Elevations (ft, NGVD)	
	Existing Conditions	Proposed Conditions
50-Year	64.7	64.7
100-Year	65.4	65.4

The 100-year stages resulting from WSPRO analysis are approximately equal to those provided on the following FEMA FIRM map.



To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET

1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

PASCO COUNTY, FLORIDA

(UNINCORPORATED AREAS)

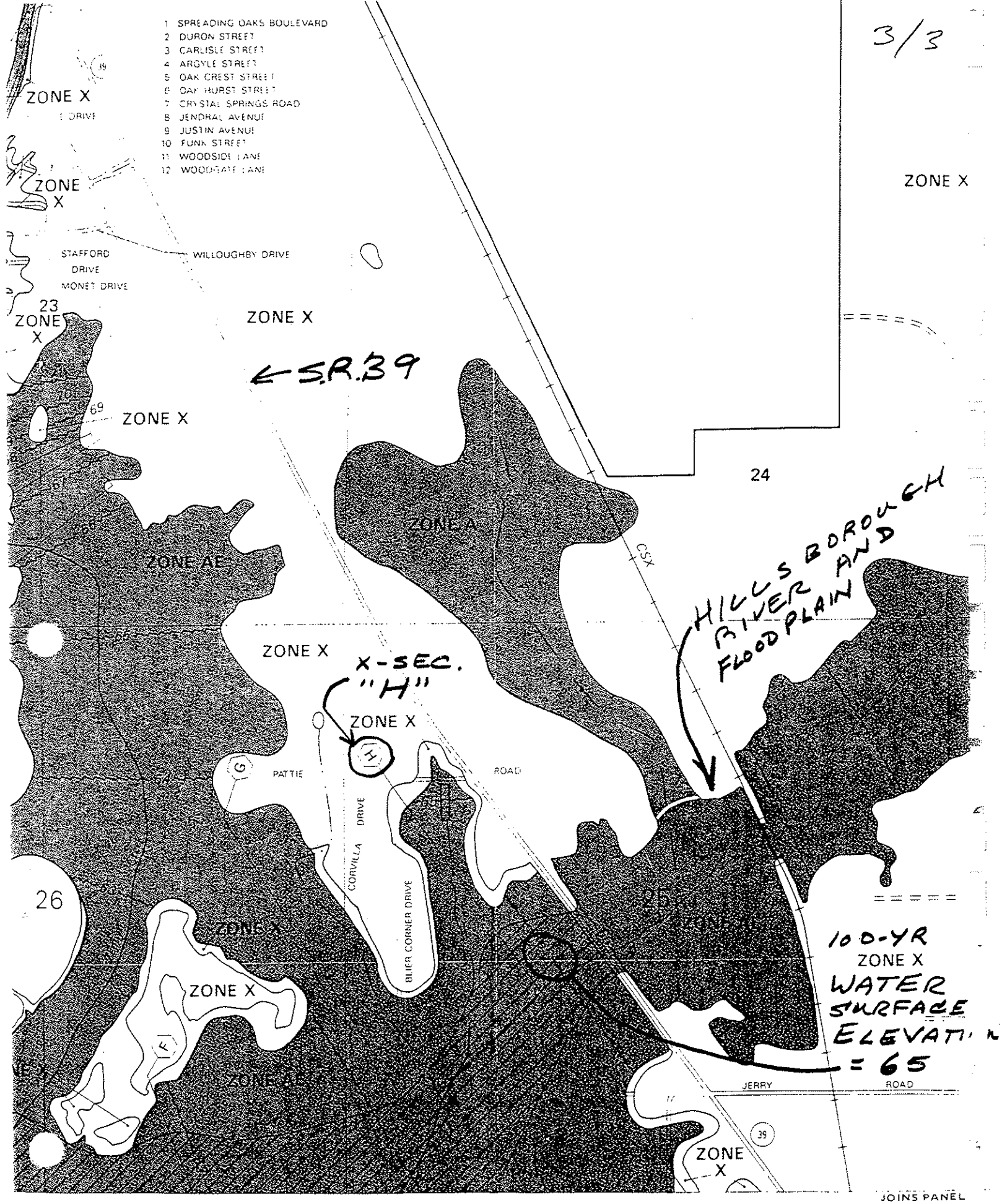
PANEL 460 OF 500

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY—PANEL NUMBER:
120230 0460 D

MAP REVISED:
SEPTEMBER 30, 1992

Federal Emergency Management Agency


1 SPREADING OAKS BOULEVARD
2 DURON STREET
3 CARLISLE STREET
4 ARGYLE STREET
5 OAK CREST STREET
6 OAK HURST STREET
7 CRYSTAL SPRINGS ROAD
8 JENDRAL AVENUE
9 JUSTIN AVENUE
10 FUNK STREET
11 WOODSIDE LANE
12 WOODGATE LANE
ZONE X
ZONE X
ZONE X
STAFFORD DRIVE
MONET DRIVE
WILLOUGHBY DRIVE
23
ZONE X
ZONE X
← S.R. 39
ZONE X
24
ZONE A
ZONE AE
CSX
HILLSBOROUGH RIVER FLOOD PLAIN
ZONE X
X-SEC. "H"
ZONE X
H
G
PATTIE
ROAD
CORVILLA DRIVE
BLUE CORNER DRIVE
26
25
ZONE X
ZONE X
F
ZONE AE
ZONE AE
100-YR ZONE X WATER SURFACE ELEVATION = 65
JERRY
ROAD
39
ZONE X
JOINS PANEL

APPENDIX D

CROSS DRAIN LOCATION
AND
FLOODPLAIN MAPS

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF FLORIDA

ZEPHYRHILLS QUADRANGLE
FLORIDA
7.5 MINUTE SERIES (TOPOGRAPHIC)

CROSS DRAIN LOCATION AND FLOODPLAIN MAP

MORICZVILLE TO ZEPHYRHILLS

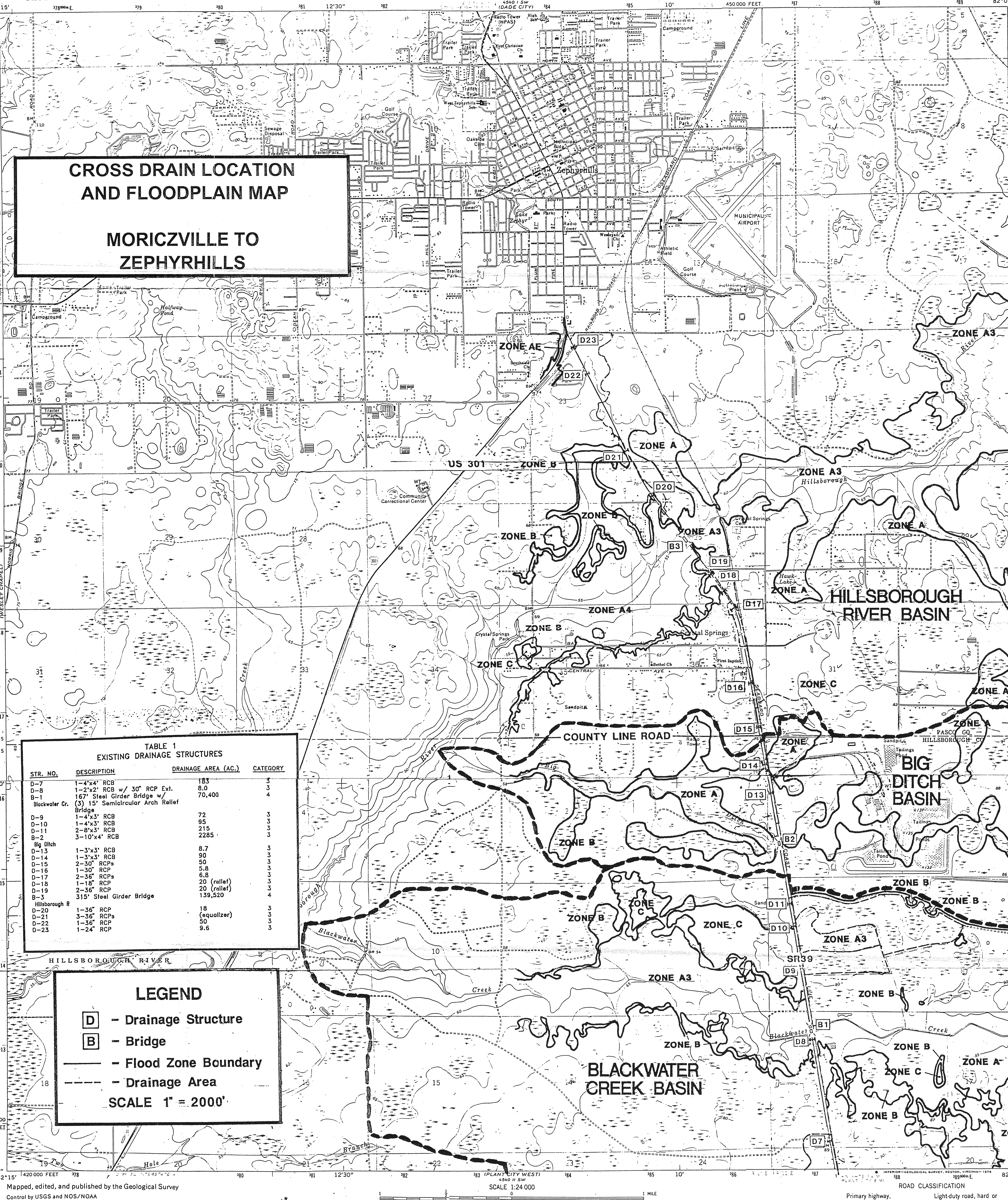


TABLE 1
EXISTING DRAINAGE STRUCTURES

STR. NO.	DESCRIPTION	DRAINAGE AREA (AC.)	CATEGORY
D-7	1-4'x4' RCB	183	3
D-8	1-2'x2' RCB w/ 30" RCP Ext.	8.0	3
B-1 Blackwater Cr.	167' Steel Girder Bridge w/ (3) 15' Semicircular Arch Relief Bridge	70,400	4
D-9	1-4'x3' RCB	72	3
D-10	1-4'x3' RCB	95	3
D-11	2-8'x3' RCB	215	3
B-2 Big Ditch	3-10'x4' RCB	2285	3
D-13	1-3'x3' RCB	8.7	3
D-14	1-3'x3' RCB	90	3
D-15	2-30" RCPs	50	3
D-16	1-30" RCP	5.8	3
D-17	2-36" RCPs	6.8	3
D-18	1-18" RCP	20 (relief)	3
D-19	2-36" RCP	20 (relief)	3
B-3 Hillsborough R	315' Steel Girder Bridge	139,520	4
D-20	1-36" RCP	18	3
D-21	3-36" RCPs	(equalizer)	3
D-22	1-36" RCP	50	3
D-23	1-24" RCP	9.6	3

LEGEND

- D – Drainage Structure
- B – Bridge
- ——— – Flood Zone Boundary
- - - - - – Drainage Area

SCALE 1" = 2000'

Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken December 1971. Field checked 1975
Supersedes Army Map Service map dated 1947
Projection and 10,000-foot grid ticks: Florida coordinate system, west zone (transverse Mercator)
1000-metre Universal Transverse Mercator grid ticks, zone 17, shown in blue. 1927 North American datum
Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked
Red tint indicates area in which only landmark buildings are shown

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Primary highway, hard surface
Light-duty road, hard or improved surface
Secondary highway, hard surface
Unimproved road
Interstate Route
U. S. Route
State Route

ZEPHYRHILLS, FLA.
N2807.5—W8207.5/7.5
1975
AMS 4540 II NW—SERIES V847

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF FLORIDA

PLANT CITY WEST QUADRANGLE
FLORIDA—HILLSBOROUGH CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

CROSS DRAIN LOCATION AND FLOODPLAIN MAP

PLANT CITY TO MORICZVILLE

BLACKWATER CREEK BASIN

TWO HOLE BRANCH BASIN

HOLLOMANS BRANCH BASIN

CAMPBELL BRANCH BASIN

PEMBERTON CREEK BASIN

EAST CANAL BASIN

ZONE A
ZONE B
ZONE C
ZONE A3

PROPOSED AB5
PROPOSED AB4
PROPOSED AB3
PROPOSED AB2
PROPOSED AB1

D1
D2
D3
D4
D5
D6

ALEXANDER STREET BYPASS

KNIGHTS GRIFFIN ROAD

SAM ALLEN ROAD

INTERSTATE 4

PLANT CITY

TABLE 1
EXISTING DRAINAGE STRUCTURES

STR. NO.	DESCRIPTION	DRAINAGE AREA (AC.)	CATEGORY
D-5	2-6'x3' RCB	896	3
D-6	1-7'x3' RCB	245	3

LEGEND

- D – Drainage Structure
- B – Bridge
- —— – Flood Zone Boundary
- – – – – Drainage Area

SCALE 1" = 2000'

Mapped, edited, and published by the Geological Survey

Control by USGS, NOS/NOAA, and Florida Department of Transportation

Topography by photogrammetric methods from aerial photographs taken November, December 1971. Field checked 1975
Supersedes Army Map Service Antioch map dated 1944

Projection and 10,000-foot grid ticks: Florida coordinate system, west zone (transverse Mercator)
1000-metre Universal Transverse Mercator grid ticks, zone 17, shown in blue. 1927 North American datum

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

Red tint indicates areas in which only landmark buildings are shown

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

ROAD CLASSIFICATION

Primary highway, hard surface
Secondary highway, hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U. S. Route
State Route

QUADRANGLE LOCATION

3318
PLANT CITY WEST, FLA.
N2800—W8207.5/7.5

1975

AMS 4540 II SW—SERIES V847

APPENDIX E

COMMUNICATIONS

1/1

URS Greiner Woodward Clyde

RECORD OF CONVERSATION

DATE: 2/15/99

RECORDED BY: Jim Zinner

TALKED WITH: Larry Boone

ROUTE TO:

JOB NO: C100003240.19

OWNER/CLIENT FDOT Dist. 7

OF FDOT Dade City Maintenance

SUBJECT OF CONVERSATION: SR39 in Pasco County

ITEMS DISCUSSED:

Larry said that some side drains on the east side of SR39, just south of Chancey Road, used to flood at some driveways. The flooding problems may have been repaired when Chancey Rd. was constructed, but Larry is not positive this situation has been corrected.

Several sidedrains were constructed when the decel/accel lanes at the Crystal Springs Post Office were constructed during the last resurfacing. The side drains were installed with their flowline elevations at the same elevation as the back slope. It would be desirable if the side drains were lowered and still function properly.

FAX COVER SHEET

cw → F. KIDD / J. GARRISON, HANDLE ONES IN HILLS. CO. 2/5

To:	Chuck Williams
Firm:	FDOT - Tampa Maintenance Dept.
Fax #:	813-744-6057
From:	Jim Zinner
Subject:	S.R. 39 from I-4 to U.S. 301

URS Greiner
7650 W. Courtney Campbell Causeway
P.O. Box 31646 (33631-3416)
Tampa, FL 33607-1462
Telephone: (813) 286-1711, ext. 5355
Fax: (813) 286-6587

Date:	February 5, 1999
Page 1 of	6

Memo:

Mr. Williams:

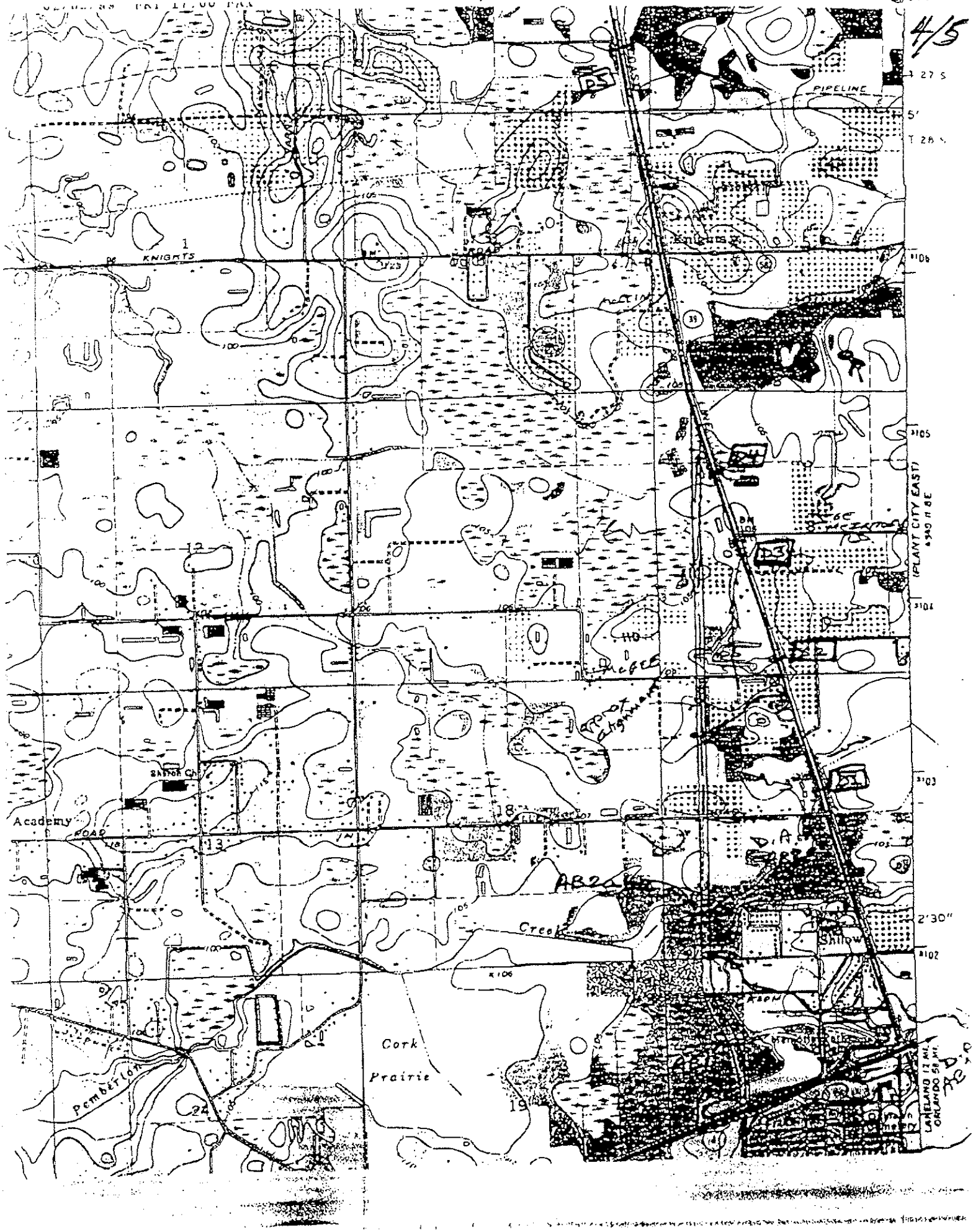
We are under FDOT contract to perform a PD&E study on the S.R. 39 corridor from I-4 to U.S. 301. Please see the attached map of the corridor delineated with the approximate locations of the existing cross drains and description.

Do any of the subject cross drains have a history of flooding and or scouring? We require this information to determine whether to lengthen or replace the cross drains.

Please call me at 813-286-1711.

Thank you,
Jim Zinner

cc:


4/5
PIPELINE
T 27 S
T 28 S
KNIGHTS
Academy
ROAD
Cork
Prairie
Pemberton
Creek
Shiloh
(PLANT CITY EAST)
2'30"
LAKELAND 12 MI.
ORLANDO 58 MI.

1/2

FAX COVER SHEET

To:	Jack Adams
Firm:	Camp Dresser, & McKee
Fax #:	813-288-8787
From:	Jim Zinner
Subject:	Alexander Street Bypass

URS Greiner
7650 W. Courtney Campbell Causeway
P.O. Box 31648 (33631-3416)
Tampa, FL 33607-1462
Telephone: (813) 286-1711, ext. 5355
Fax: (813) 286-8587

Date: February 26,1999

Memo:

Mr. Adams:

URS Greiner is under FDOT contract to perform a PD&E study on the S.R. 39 corridor from I-4 to U.S. 301 which includes the Alexander Street Bypass.

I apologize in that I did not look over the Plant City Westside Canal study more thoroughly before calling you yesterday. Please see the attached copied portion of Figure 2-1, of the above mentioned study, showing the proposed Alexander Street Bypass alignment. We will need information on all of the nodes that the proposed alignment will become associated with. Specifically nodes; 6410, 6405, 6034, 6035, and 6037.

Can we also obtain the Pistol Range Preliminary Alternative Data Collection Results and Conceptual Report and/or the Pistol Range Preliminary Design Report. URS Greiner and the FDOT should be cognizant of what Plant City has planned in the subject area.

We require this information for our Pond Siting Report.

If you have any questions please call me.

Thank you,
Jim Zinner

cc:

URS Greiner

7650 W. Courtney Campbell Causeway
Tampa, Florida 33607-1462
Telephone: (813) 286-1711
Facsimile: (813) 287-8591
Offices in Principal Cities Nationwide

FLORIDA #AA C000901
FLORIDA #LC C000234

1/9

April 14, 1999

Mr. Carlos Lopez, P.E.
District Drainage Engineer
FDOT District Seven
1120 N. McKinley Drive
Tampa, FL 33612

Re: **SR39 and Alexander Street Bypass PD&E Study**
WPI Segment No. 254552, FAP No. F-321-1 (4)
Hillsborough and Pasco Counties, Florida

Dear Mr. Lopez:

This letter presents the conclusions of our meeting held on April 9, 1999 concerning the roadway grade control elevations discussed for the referenced project along with some background information for clarification. We discussed the seasonal high water table (SHWT) and design high water (DHW) elevations for the portion of the referenced project from I-4 to Knights-Griffin Road and an additional pond site.

The SHWT, used for vertical control elevations, was estimated by Mark Brown of FDOT at predetermined locations using wetland and soil boring indicators. The normal pool (NP) and flood elevations were also estimated at most of the wetland locations. Some the control elevations, as well as the NP and flood estimates, were field surveyed at locations where it appeared the grade elevation may not be reflected accurately on the Southwest Florida Water Management (SWFWMD) contoured aerials due to development, vegetative cover, etc. Mark Brown presented his findings in the attached memorandums. An error in the field reduction for the SHWT at site 13B was discovered and confirmed with Mark (see correction in 3-26-99 memorandum).

The nominal DHW elevation was typically assumed to be one-half of the 0.46 m (1.5 ft) maximum treatment depth (SWFWMD criteria) or 0.23 m (0.75 ft) above the SHWT. Although it was not specifically discussed, the profile grade line (PGL) can be generated from the DHW for use by Roadway Design. If the DHW was above natural grade, the minimum PGL was determined at the control elevation locations by adding 1.18m (3.87 ft) to the DHW. This 1.18 m (3.87 ft) distance is the sum of 0.61m (2 ft) base clearance, 0.42 m (1.39 ft) of pavement thickness, and 0.15 m (0.48 ft) for the cross slope. If the calculated minimum PGL elevation occurred below natural grade, the minimum PGL was assumed to be set at natural grade at that station.

3/9

The first basin that the ASB traverses is an upper reach of Pemberton Creek just north of I-4. The SHWT in the area of station 25+00 (meters) was estimated at grade, approximately 32.31 m (106.0 ft) NGVD at location 1W. This portion of Pemberton Creek is a FEMA designated floodplain but has no designated 100-year base flood elevation. This reach was recently modeled by CDM for the Westside Canal Study (for the City of Plant City) and according to their study the 100-year flood stage is 32.74 m (107.4 ft) NGVD. Mr. Lopez suggested we obtain the Pemberton Creek Study recently performed by Hillsborough County to confirm the elevations computed by CDM.

The second basin traversed by the ASB is part of another reach of Pemberton Creek farther north of the aforementioned reach. The SHWT and flood elevations were estimated and surveyed at 31.72 m (104.08 ft) NGVD and 31.98 m (104.92 ft) NGVD, respectively, near station 34+00 (location 3W). The base flood elevation in the area of this control elevation was calculated to be 32.25 m (105.8 ft) NGVD according to the CDM study, approximately 0.3 m (1 ft) above the wetland flood elevation delineated by Mark Brown.

A control elevation south of McGee Road was estimated using a soil boring at an existing high point in the proposed alignment near station 44+00 (location 5B). This control elevation was not field surveyed and therefore SWFWMD topographic information was used for estimating the SHWT at 31.62 m (103.75 ft) NGVD. In this case, the control elevation was estimated lower than the existing grade (approximately 33.53m [110.0 ft]).

McGee Road will be crossed by the ASB at approximately station 47+50. McGee Road does not appear to have flooding problems and its existing grade at 32.16 m (105.5 ft) should be maintained with the proposed vertical profile as much as possible.

The ASB crosses an agriculture irrigation and drainage (man-made) ditch system, associated with adjacent farming activities north of McGee Road, near station 48+00 (location 6W). The break-over elevation downstream of this drainage system is approximately 29.72 m (97.5 ft). It was estimated that the SHWT in this system is 2 to 3 feet above this break-over elevation, thus setting the SHWT at 30.63 m (100.5 ft) NGVD.

A control elevation was estimated using a soil boring between McGee and Joe McIntosh Roads at an existing high point near station 51+50 (location 7B). This control elevation was field surveyed and the SHWT is at 31.63m (103.76 ft) NGVD, which is lower than the existing grade (32.31m [106.01 ft]).

Part of the aforementioned man-made irrigation and drainage system drains to an existing ditch which travels west from the existing SR39 alignment, near Joe McIntosh Road. The ASB crosses this ditch at approximately 55+00 (location 8W). The SHWT at this location is estimated at 31.39 m (103.0 ft) NGVD using an adjacent wetland boundary elevation noted on the SWFWMD aerial.

FDOT Technical Memorandum

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5/9

To: Gabor Farkasfalvy, Carlos Lopez
cc: Dennis Jent, John Kubler
From: Mark Brown
Subject: SR 39/Alexander Street Extension
PD&E Study (FIN 255099-1, SPN 10200-1508)
Date: March 26, 1999

The following table lists the water elevations associated with the sites requested for evaluation. I have attached a copy of my original memorandum with approximate elevations that are within close range of the surveyed elevations. If I receive additional data from the survey crew, I will pass that information along. If you have any questions, please call (ext. 27989) or e-mail (RD744MB). Thanks again for all your help. Mark

State Road 39 - Wetland/Upland Surface & Ground Water Elevations

SITE	Grade Elev.	Normal Pool	Seasonal High	Flood Elev.
3W	103.62 ft.	103.62 ft.	104.08 ft.	104.92 ft.
7B	106.01 ft.	----------	103.76 ft.	----------
11B	110.24 ft.	----------	105.4 ft.	----------
12W	100.2 ft.	100.71 ft.	101.37 ft.	102.19 ft.
13B	105.41 ft.	----------	~~106.8~~ 101.49 ft.	----------
14W	100.7 ft.	101.19 ft.	101.99 ft.	----------
15W	97.42 ft.	97.42 ft.	98.41 ft.	----------
16W	95.65 ft.	----------	95.65 ft.	----------
19W	72.23 ft.	72.8 ft.	73.54 ft.	----------
20W	70.34 ft.	70.74 ft.	71.59 ft.	----------

Note. The sites are designated "W" for wetland elevations using above-grade biological indicators for hydrological estimations. Sites designated as "B" are wetlands and uplands using soil borings for hydrological evaluations. Site 4W/B was not surveyed since it is part of the same wetland associated with Site 3W. A few wetlands have grade elevations that match either normal pool or seasonal high water elevations

Post-it® Fax Note 7671	Date 3/30/99	# of pages ▸ 5
To Kevin Doyle	From Gabor Farkasfalvy	
Co./Dept. URS Greiner	Co. FDOT	
Phone #	Phone # 975-6455	
Fax # 286-6587	Fax #	

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Franklin Street until the road ends. Turn right on a private drive, when the driveway turns back to the east, you will see a series of locator flags leading north to the maple tree on the north side of a fenceline.

Site 4B/W (Sheet 2) - This site is actually a tailwater recovery pond used for the adjacent strawberry fields. It would be good to know how deep the pond is since it will have to be filled for the roadway The table lists the elevation for 35+46 as 104.0 ft. and 37+13 as 109.0 ft. Since the latter elevation is representative of the surrounding strawberry fields, I can't tell if the 104.0 elevation is at the pond toe-of-slope or somewhere else. In any case, I put a stake with pink ribbon at the northeast pond boundary to mark the grade elevation (SHWT) of the pond and surrounding fields. The water levels are controlled for berry production but on the average, the SHWT appears to be at least two feet below grade through the fields. **Location:** Take SR 39 north then west on Sam Allen Road until you see strawberry fields (south) across from the citrus groves (north) (Refer to Sheet 3). There is a dirt road approximately located down the proposed road right-of-way

Site 5B (Sheet 4) - In the soil survey, this area is mapped as Fort Meade which matches the soil characteristics I found in the soil boring. The SHWT is greater than 75 inches below grade The grade elevation at Station 44+45 is listed as 109.0 ft. **Location:** Take SR 39 north then west on McGee Road until you reach the proposed roadway centerline. Take private dirt road south until almost the end of the driveway. There is pink flag on a tree where the boring was conducted

Site 6W (Sheet 4) - This area is a series of canals and ponds dredged within historic wetlands. Water levels within this ponded area substantially vary due to the influence of the surrounding strawberry fields. The closest station (Station 48+72) is listed as 105.0 ft. which may be close to the SHWT/Flood Elev. nailed in a willow tree, followed with a nail at the NP elev. The next station (Station 49+94) is listed as 92.4 ft. which appears to be a real questionable elevation. **Location:** There is a gate along McGee Road north of the proposed R/W. If it is closed, there is another entrance north along Jerry Red Road. There are dirt roads through the strawberry fields that run along the proposed roadway centerline.

Site 7B (Sheet 5) - There is a descrepency between the soil conditions and what is depicted in the NRCS soil survey. Additional borings within the area found the same soil characteristics as a soil mapped just south of the proposed R/W. The soil is Seffner which has a SHWT 20-40 inches below grade. The borings conducted found a SHWT approximately 27 inches below grade The grade elevation is difficult to determine at Station 51+50 (Station 50+70 is 105.0 ft. and Station 54+97 is 110.0 ft.). **Location:** You can either take the crop roads from Site 6W or take the private driveway from SR 39 across from Joe McIntosh Road.

Sites 8W and 9B (Sheet 5) - These sites were included as one since the soil conditions are anticipated to be the same Both sites are mapped on the NRCS soil survey as Myakka which has a SHWT approximately 12 inches below grade A soil boring at 8W found a SHWT at 14 inches below

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Site 17B (Sheet 16) - I conducted a soil boring adjacent to the roadway that indicated the SHWT is approximately 20 inches below. The roadway and adjacent natural grade elevation at that location (Station 135+18) is listed as 85 ft. which would estimate the SHWT at approximately 83.5 ft. There is a large, deep drainage swale along the R/W that probably maintains that lower water level. In addition, approximately 6 inches of fill is located adjacent to the roadway.

Site 18W (Sheet 17) - This is the Blackwater Creek crossing area. I did not set any water level indicators but refer to the specific hydrologic modeling conducted by Megan Arasteh in preparation of the Blackwater Creek Bridge replacement.

Site 19W (Sheet 21) - I set two nails (SHWT, NP) within a cypresss tree along the proposed R/W limits. The nearest grade elevation (Station 168+87) is listed as 73.0 with the road grade elevation at 77.7. The SHWT elevation is 1-1.5 ft. above natural grade.

Site 20W (Sheet 23)- I set two nails (SHWT, NP) within a cypress tree. There is an old road grade berm located along the edge of the proposed R/W through this swamp. That berm acts to impound surface water between the existing SR 39 embankment and the old berm, resulting in some rather high water level indicators. The closest station (Station 185+03) has a road grade elevation of 74.5 ft. and natural grade elevation of 70.0 ft. The wetland SHWT is probably around 72.0 ft

Site 21W (Sheet 29) - This area is listed as both a wetland and within the 100-Year Flood Zone. It is not a wetland area and have real doubts about the accuracy of the FEMA map if it is in a flood zone. The NRCS soil survey depicts the area as a Tavares soil which has a SHWT between 40 to 60 inches below grade. A soil boring within the proposed alignment verified that the soil is Tavares and a SHWT is estimated at 52 inches below grade.

If you should have any questions, please my e-mail is RD744MB and extension is 27989. Thanks-MB