

**U.S. 19 PROJECT DEVELOPMENT
AND
ENVIRONMENTAL STUDIES**

PINELLAS AND PASCO COUNTIES, FLORIDA
STATE PROJECT NO. 15150-1565

**LOCATION HYDRAULIC
REPORT**

GANDY BOULEVARD (S.R. 694) TO ALTERNATE U.S. 19 (S.R. 595)

Prepared For
THE FLORIDA DEPARTMENT OF TRANSPORTATION

Prepared By
GREINER ENGINEERING SCIENCES, INC.
Tampa, Florida

RECEIVED
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DRAINAGE DEPT.

JANUARY 1987

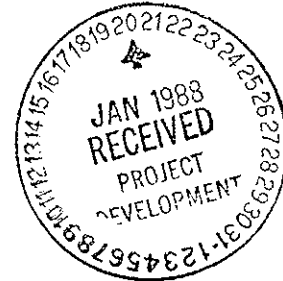
Greiner

P.O. Box 23640
5601 Manner Street
Tampa, Florida 33609 3416
(813) 286-1711
FAX: (813) 287-8591

P8904.00 H10
January 7, 1987

Florida Department of Transportation
801 North Broadway
Bartow, Florida 33830

201-20-88



Attention: Mr. Frank Black

Reference: Location Hydraulic Report U.S. 19 -
Addendum to August 1987 Report

Gentlemen:

It has come to Greiner's attention that the Federal Emergency Management Agency (FEMA) on Flood Boundary and Floodway Map (FLOODWAY), Pinellas County, Florida, Unincorporated Areas Community-Panel Number 125139 0126, effective date: June 1, 1983, shows a regulatory floodway for Alligator Creek. Greiner is adding this information by this letter as an addendum to the Location Hydraulic Report, August 1987. This information has no effect on the other information in the report. This information will be included in the Draft EIS.

If you have any questions, please call me.

Sincerely,

GREINER, INC.

Sharon M. Phillips, AICP
Associate, Project Coordinator

SMP/hd

xc: Kevin Doyle, FDOT Bartow
Elliot Silverson, Greiner, Inc.

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INTRODUCTION

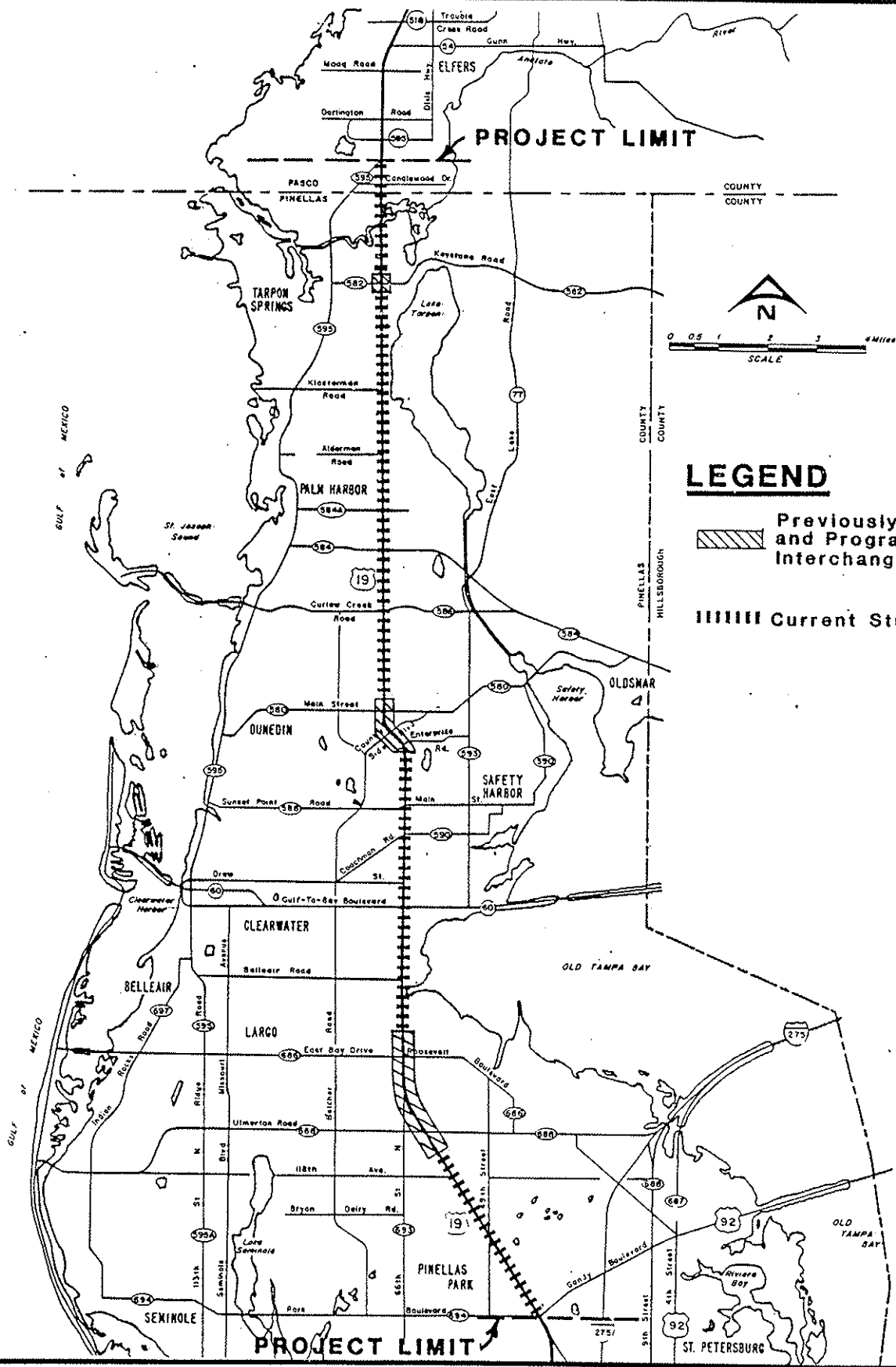
The U.S. Highway 19 corridor is a fast growing highly urbanized main north-south route with 4 to 6 lanes existing with open roadway ditches except at the S.R. 60 Interchange. The project study limits are shown on Exhibit 1.

Specific detail studies will be required for each location before construction of improvements and can only be discussed in general terms for improvements, detention/retention and permit requirements in this report. Ranges of values are generally shown, depending upon conditions encountered for specific locations along the project.

Sources of data utilized for the project also contain general information and are intended for planning purposes only. Much existing data was taken from FDOT drainage maps and design data for previous improvements along the corridor.

An attempt to obtain elevations for the 1979 flood, from Pinellas County Engineering Department, proved fruitless since maps showing this data could not be located. However, many locations where problems existed in 1979 have been alleviated by accomplished improvements or those noted in the Pinellas County Planned Improvements for the County Master Plan.

Basic information concerning basin areas floodplains, and culvert sizes and locations are shown on the appended 1"=400' scale aerial photos. These appended plans should be referenced for details.



U.S. 19 PROJECT DEVELOPMENT AND ENVIRONMENTAL STUDIES
 Pinellas and Pasco Counties, Florida
 STATE PROJECT NO. 15150-1565

U.S. 19 CORRIDOR STUDY AREA

Florida Department of Transportation
 Exhibit 1

Detention basin data shown on the 1"=400' photos were tabulated for a range of conditions depending on specific variables and are for general information only.

The sources of information used in the preparation of this Location Hydraulic Report include the following:

1. U.S.G.S. Quadrangle Maps
2. Southwest Florida Water Management District Contour Maps
3. Florida Department of Transportation Drainage Maps
4. Pinellas County Planning/Engineering Departments, Summary of Planned Improvements for the Pinellas County Master Drainage Plan
5. F.E.M.A. Flood Insurance Rate Maps and Flood Insurance Study for Pinellas and Pasco Counties
6. Soil Conservation Service, Soil Survey of Pinellas County

All bridges and major crossdrains within the limits of this project are described individually, from Park Boulevard in Pinellas Park, and continuing northward (in the four [4] study segments A, B, C and D) to where U.S. 19 meets U.S. Alt. 19 in Pasco County.

DEFINITIONS

Crossdrains with diameters smaller than 36" and/or having drainage areas less than 30 acres are not usually addressed. Structures not evaluated in this report are listed

below. General information depicting the existing conditions of the areas contiguous to each structure are listed below in order to avoid repetition. They include the variety of soil types found in the project area and the various flood zones (per F.E.M.A. data). The general information definitions and terminology are described here.

Structure S-9: one-18" CP. Is not evaluated in this report. This structure is located north of Bellair Road.

Structure S-10: one-36" CP. Is not evaluated in this report. This structure is located south of Nursery Road.

Structure S-11: Proposed two-36" CP. This proposed structure is not evaluated in this report. Structure S-11 is located south of Nursery Road.

Structure S-14: Proposed one-53"x34" CP. Is not evaluated in this report. This structure is located north of Harne Road.

Structure S-20: one-36" CP. This structure is not evaluated in this report. The approximate area draining into S-20 is 17.6 acres. S-20 is located north of N.E. Coachman Road.

Structure S-25 & S-26. These structures are not evaluated in this report. Structure S-25 is located south of Nebraska Avenue, and Structure S-26 is located north of Alderman Road. Drainage areas are 23 and 38 acres respectively for S-25 and S-26.

Structure S-25 & S-26. These structures are not evaluated in this report. Structure S-25 is located south of Nebraska Avenue, and Structure S-26 is located north of Alderman Road. Drainage areas are 23 and 38 acres respectively for S-25 and S-26.

Soil

Astatula Fine Sand - The Astatula series consists of undulating, excessively drained sandy soils that formed in thick deposits of marine sands. Typically, the surface layer is dark-gray fine sand about 5 inches thick. Below this are layers of yellowish-brown and yellow fine sand that extend to a depth of 80 inches. The water table normally is at a depth of more than 60 inches. Astatula soils have very rapid permeability and very low available water capacity.

Immokalee Fine Sand (Im) - This is nearly level, poorly drained soil on broad flats between sloughs. It also occurs in small areas at higher elevations in association with better drained soils. The water table normally is at a depth of 10 to 40 inches. It is within a depth of 10 inches for 1 or 2 months during rainy periods and is below 30 inches during prolonged dry periods.

Made Land (Ma) - Made land consists of mixed sand, clay, hard rock, shells, and shell fragments that have been transported, reworked, and leveled by earth-moving equipment.

Myakka Fine Sand (My) - This is a nearly level, poorly drained soil on broad flats between sloughs and swamps. The water table is normally at a depth of 10 to 30 inches. It rises to the surface for a short time during wet periods and falls below 30 inches in the dry season.

Pinellas Fine Sand - This is a nearly level, somewhat poorly drained soil around sloughs and ponds in the flatwoods. The water table normally is at a depth of 10 to 40 inches for 2 to 6 months in most years. It is within a depth of 10 inches for a short time during wet periods.

Flood Zone Designations

"AH" Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown.

"B" Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot.

"C" Areas of minimal flooding.

DESCRIPTION OF DRAINAGE STRUCTURES

The accompanying 1'-400' scale of this report show the locations of the structures mentioned in this report, as well as additional information for the individual drainage sub-basins for this project.

Structure S-1: Two-6" x 4' CBC. This structure conveys runoff from west of U.S. Highway 19 into Pinellas Park Water Management District (PPWMD) Ditch Number 2, which ultimately discharges into Sawgrass Lake approximately 1.2 miles downstream of the roadway. A drainage area of approximately 141 acres, north of Park Boulevard and west of U.S. 19, drains to Structure S-1. The Pinellas County Master Drainage Plan recommends the following: replace the existing Dbl. 6' x 4' structure with four - 5' x 10' box culverts, replacing culverts under Gandy Boulevard with a bridge, and channel excavation from Sawgrass Lake approximately 0.63 miles up PPWMD Ditch Number 2 and up PPWMD Ditch Number 2-A from Ditch Number 2 to U.S. Highway 19.

The water surface elevation of Sawgrass Lake is manually regulated by a water control structure east of the Lake. The Southwest Florida Water Management District maintains the Lake's stage between the elevations of 3.0' and 5.0' seasonally.

The predominant soils type for the sub-basin of Structures S-1 through S-4 is "Myakka Fine Sand" (My). The presence of a high groundwater table in this sub-basin (from 3" to 10" from the surface) should be considered in the design of drainage systems in this area. The F.E.M.A. Flood Zone for this sub-basin is "Zone C".

Structures S-2 and S-3: one-24" CP and two-24" CP. These structures convey runoff from west of U.S. Highway 19, from north and south of 78th Avenue, into a ditch that feeds PPWMD Ditch Number 2, approximately 800 feet downstream of the roadway.

These structures drain a combined area of approximately 56 acres. Both structures have a design high water elevation of 13.6 feet. The F.E.M.A. Flood Zone for this sub-basin is "Zone C".

Structure S-4: one-42" CP. This structure conveys runoff from west of U.S. Highway 19, from north and south of 84th Avenue, into a ditch that feeds PPWMD Ditch Number 2-A, approximately 920 feet downstream of the roadway. A total area of approximately 24 acres drains to this structure. The design high water elevation for this structure is 14.4 feet. The Pinellas County Master Drainage Plan shows most of the drainage area for this structure to be within the 100 year flood plain (100 Year Elevation = 13.7 feet).

Structure S-5: one-60" CP and two-42" CP. This structure conveys runoff from west of U.S. Highway 19, in PPWMD Ditch Number 2-A, which feeds PPWMD Ditch Number 2 and ultimately Sawgrass Lake. The confluence with Ditch 2 is approximately 0.83 miles downstream of the roadway. There is an existing 60 feet drainage easement along Ditch 2-A and the County has proposed to expand the easement to 110 feet on the east side of U.S. 19. A total area of approximately 75 acres drains to this structure. The design high water elevation is 13.4 feet. Roughly half of this sub-basin is within the 100 year flood plain (100 Year elevation = 13.9 feet per Pinellas County Master Drainage Plan).

The predominant soils type for the sub-basin for Structure S-5 is "Pinellas Fine Sand". The wet season groundwater table in this sub-basin will require special attention in the design of drainage systems in this area.

The County Master Drainage Plan proposes to add one 5' x 5' concrete box culvert at Structure S-5 to allow for increased development along PPWMD Ditch Number 2-A. Channel excavation in Ditch 2-A is also proposed.

Structure S-6: one-24" CP. This structure conveys runoff from west of U.S. Highway 19 into PPWMD Ditch Number 2-B, which feeds PPWMD Ditch Number 2-A and ultimately Sawgrass Lake. The confluence with Ditch 2-A is approximately 0.73 miles downstream of the roadway. A total area of approximately 10 acres drains to this structure. The design high water elevation is 14.0 feet. The area draining to Structure S-6 is within the 100 Year Flood Plain (100 Year elevation = 15.0 feet per F.I.R.M. Flood Map - panel No. 120251 0004 D). The F.E.M.A. Zone for this area is "Zone AH".

The predominant soils type in this sub-basin is "Myakka Fine Sand" (My). The wet season water table should be considered during the design of drainage systems in this area.

Structure S-7: two-30" CP. This structure conveys runoff from east of U.S. Highway 19 into a ditch that feeds the Cross Bayou Canal, approximately 0.61 miles downstream of the roadway. The drainage area to Structure S-7 is approximately 46 acres. The design high water elevation is 12.7 feet.

The dominant soils type for the sub-basin of Structures S-7 and S-8 is "Myakka Fine Sand" (My). This poorly drained soil has a water table depth between 3" to 10" and at the surface for a short time during the wet season. This results in little available capacity for runoff detention.

Structure S-8: one-48" CP. This structure conveys runoff from east of U.S. Highway 19, into a ditch that feeds the Cross Bayou Canal, approximately 0.32 miles downstream of the roadway. The drainage area to Structure S-8 is approximately 372 acres. The design high water elevation is at 12.3 feet. The soils and outfall conditions for this structure are identical to the previously mentioned structure S-7.

U.S. Highway 19 Bridge Over Cross Bayou Canal. This structure is a 96 feet-3 span concrete slab bridge. The existing condition 100 year and 25 year flood elevations of the Cross Bayou Canal (at the U.S. 19 Bridge) are 7.5 feet and 5.03 feet respectively. These flood elevations were taken from the Pinellas County Master Drainage Plan without tidal effects. The Cross Bayou Canal is known to be tidally influenced.

U.S. Highway 19 Bridge Over Allens Creek. This structure is a 165 feet-2 span concrete slab bridge. The existing condition 100 year and 25 year flood elevations of Allens Creek (at the U.S. 19 Bridge) are 4.1 feet and 4.8 feet respectively. These elevations were taken from the Pinellas County Master Drainage Plan without tidal effects. Allens Creek is known to be tidally influenced.

Structure S-12: two-36" CP. This structure conveys runoff from west of U.S. Highway 19 into a ditch that eventually discharges into "Old Tampa Bay" approximately 0.33 miles downstream of the roadway. A total of approximately 234 acres drains to structure S-12. The sub basin for S-12 is classified "Zone C" (per F.I.R.M. map panel

No. 125096 0017 B). The soils type for the sub-basins for S-12 through S-16 is "Myakka Fine Sand" (My).

Structure S-13: 42" CP. This structure conveys runoff from West of U.S. Highway 19, into a ditch that outfalls into "Old Tampa Bay", approximately 0.44 miles downstream of the roadway. Approximately 13.5 acres west of U.S. 19 discharge to Structure S-13. The design high water elevation is 28.0 feet. The sub basin for S-13 is classified "Zone C" (per F.I.R.M. map panel No. 125096 0017 B). The soils type for this sub basin is "Myakka Fine Sand" (My).

Structure S-15: one-42" CP. This structure conveys runoff from west of U.S. Highway 19, into a closed pipe system that eventually discharges into "Old Tampa Bay" approximately 0.33 miles downstream of the roadway. Structures S-15, S-16 and S-16A all combine flows at a box culvert on the east side of U.S. 19. A closed pipe system conveys the runoff to a retention pond at the Japanese Gardens Mobile Estates, where the Pond's stage is controlled by a flood gate.

Structure S-16: one-48" CP. This structure conveys runoff from west of U.S. Highway 19, into a closed pipe system that discharges into a retention pond at the Japanese Gardens Mobile Estates. The pond eventually discharges into "Old Tampa Bay", approximately 0.33 miles downstream of the roadway. Approximately 126 acres drains to structure S-16. The design high water elevation for Structure S-16 is 28.0 feet. The sub-basin for Structure S-16 is classified "Zone C" (per F.I.R.M. map panel No. 125096 0017 B).

Structure S-16A: one-48" RCP. This structure conveys runoff from west of U.S. Highway 19, along the south edge of State Road 60, then southward through a closed pipe system to the retention pond at the Japanese Gardens Mobile Estates. This structure is part of the same closed system with Structures S-15 and S-16. Structure S-16A is part of the closed pipe system which drains the U.S. 19/S.R. 60 interchange. Approximately 67.1 acres drains to Structures S-16A. The design high water elevation is 41.8 feet. The areas around the U.S. 19/S.R. 60 interchange are in classified "Zone C". The predominant soils type is "Myakka Fine Sand" (My).

Structure S-17: one-36" CP. This structure is part of the "Alligator Creek" drainage basin. Structure S-17 conveys runoff from west of U.S. Highway 19, into a ditch that confluences with Alligator Creek, approximately 0.58 miles downstream of the roadway. There is an existing 50 foot drainage right-of-way along the ditch. The majority of the remainder of Alligator Creek has an existing 100 feet right-of-way width. Approximately 105 acres drain to S-17.

The "Alligator Creek" Drainage Basin is a "volume sensitive basin". It is designated as a regulated floodway in the FEMA Flood Insurance Study for Pinellas County. A constriction in the floodway in alligator creek, approximately 0.76 miles downstream of the roadway, forces the basin to hold ponded flood waters, potentially causing damage to properties in the basin. The majority of the basin area is within the 100 year floodplain. The base flood elevations for the west and east sides of U.S. 19 are 24.0 feet and 21.0 feet respectively (per FEMA F.I.R.M. map panel No. 125096 0010 B). The predominant soils type in this area is "Made land".

Structure S-18: four-10'x9' CBC. This structure is part of the "Alligator Creek" drainage basin. Structure S-18 conveys runoff from west of U.S. Highway 19, into Alligator Creek, which ultimately outfalls to Alligator Lake, approximately 2.0 miles downstream of the roadway. There is an existing 130 foot drainage right-of-way along Alligator Creek, east of U.S. 19, for approximately 0.36 miles downstream of the roadway. The majority of the remainder of Alligator Creek has an existing 100 foot right-of-way. Approximately 4.16 square miles drain to Structures S-18. The design high water elevation for S-18 is 22.8 feet. A high water elevation of 22.4 feet was recorded in September 1979.

Structure S-19: two-48" CP. This structure is part of the "Alligator Creek" basin. Structure S-19 conveys runoff from west of U.S. Highway 19, into a ditch that crosses the Amtrack Seaboard Coastline Railroad, and confluences with Alligator Creek. There is an existing drainage right-of-way along the ditch. The approximate area draining into Structure S-19 is 66 acres. The dominant soils type in this area is "Made Land".

Structure S-21: four-54" CP. This structure conveys runoff from east of U.S. Highway 19, into a ditch that discharges into "Curlew Creek". A high water elevation of 49.0 feet was recorded on 3/12/48. The majority of the sub-basin is in "Zone C" area. There is a sizable 100 year flood plain around the lower areas on Curlew Creek west of U.S. 19. The dominant soils group in this sub-basin is "Myakka Fine Sand" (My).

Structure S-22: two-48" CP. This structure conveys runoff from east of U.S. Highway 19, in "Curlew Creek", which flows westerly into the Gulf intercoastal area near Dunedin. The design high water elevation for Structure S-22 is 45.7 feet. Curlew Creek runs through the middle of the 100 year flood plain on the west side of U.S. Highway 19. The east side of U.S. 19 is all "Zone C". The dominant soils type in this sub-basin is "Myakka Fine Sand" (My).

Structure S-23: two-54" CP. This structure conveys runoff from east of U.S. Highway 19, into a ditch that discharges into "Curlew Creek". A high water elevation of 50.7 feet was recorded on 3/12/48. The majority of the sub-basin is in "Zone C" areas. There is a sizable 100 year flood plain around the lower areas on Curlew Creek west of U.S. 19.

The dominant soils group in this sub-basin is "Immokalee Fine Sand" (Im).

Structure S-24: one-24" & one-30" CP. This structure conveys runoff from west of U.S. Highway 19, into a ditch that conflues with the "Cow Branch Stream," approximately 0.83 miles downstream of the roadway. The "Cow Branch Stream" continues eastward for approximately 1 mile and runs into Lake Tarpon Canal. Approximately 35 acres west of U.S. 19 drains into Structure S-24. This sub basin is in the area of a low point in the highway profile (elev. 64.3 feet) which was at flooding elevation during a storm in 1948.

Structure S-27: one-6'x4'CBC and one-6'x6'CBC. This structure conveys runoff from east of U.S. Highway 19 into a ditch that feeds the Anclote River, approximately 100 feet downstream of the roadway. A total area of approximately 75 acres drains into

approximately 75 acres drains into Structure S-27. The high water elevation at Structure S-27 is 9.9 feet. The sub basin lies in "Zone C".

U.S. Highway 19 Bridge Over Anclote River. This structure is a 285 feet-2 Span concrete slab bridge. The base flood has a flow of 10,070 cfs and a stage of 12.5 feet (per SWFWMD data). The high water elevation for this bridge is 9.9 feet. Anclote River is designated as a regulated floodway in the FEMA Flood Insurance Study for Pinellas and Pasco Counties.

The existing crossdrains were recently evaluated and many upgraded with the recently completed U.S. 19 reconstruction projects. During the field surveys for this report. Existing structures were functioning properly. However, with the major improvements proposed as a result of the U.S. 19 PD&E Study, including the replacements of parallel ditches and swales with enclosed pipe for roadway stormwater runoff, the entire drainage system will be completely reanalyzed. The proposed roadway project should not contribute to an increase in the flood zone area, since the present flood zone designations are a result of either coastal flooding due to high tidal action, or are inherent in the topography of the surrounding urbanized area. Since the U.S. 19 corridor is currently heavily developed, the proposed roadway improvements should not contribute to development in the flood zone.

While other corridors were considered in previously approved Design Alternatives Report, no other alignment was found to adequately serve the projected U.S. 19 travel demands in the region. Due to the nature of the flood zone, the lack of impact on the cross drainage and the lack of other

viable location alternatives, the use of the existing alignment of U.S. 19 is recommended. There should be no increased risk of flooding associated with this project.