

LOCATION HYDRAULICS TECHNICAL MEMORANDUM

Florida Department of Transportation

District Seven

Branch Forbes Road Project Development and Environment (PD&E) Study

Limits of Project: From South of US 92 to North of I-4

Hillsborough County, Florida

Work Program Item Segment Number: 447159-1

ETDM Number: 14470

Date: September 2024

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

Draft

LOCATION HYDRAULICS TECHNICAL MEMORANDUM

Branch Forbes Road

Project Development and Environment Study

The Florida Department of Transportation (FDOT) District 7, in coordination with Hillsborough County, is conducting a Project Development and Environment (PD&E) study along Branch Forbes Road from south of US 92 to north of Interstate 4 (I-4), in Hillsborough County. The study focuses on widening the existing two-lane undivided facility to a four-lane divided facility roadway and includes pedestrian and bicycle accommodations. A project location map is shown in **Figure 1**. The objective of the PD&E study is to assist the Florida Department of Transportation's (FDOT) Office of Environmental Management (OEM) in reaching a decision on the type, location, and conceptual design of the proposed improvements for the widening of Branch Forbes Road, including stormwater management facility (SMF) and floodplain compensation (FPC) sites. This study documents the need for the improvements as well as the procedures utilized to develop and evaluate various improvements, including elements such as proposed typical sections, preliminary horizontal alignments, and intersection enhancements. The proposed typical sections are shown in **Figure 2** and **Figure 3**, respectively.

The PD&E study satisfies all applicable requirements, including the National Environmental Policy Act (NEPA), to qualify for federal-aid funding of subsequent development phases (design, right of way acquisition, and construction). This project was screened through the FDOT's Efficient Transportation Decision Making (ETDM) process as ETDM Project No. 14470. The ETDM Programming Screen Summary Report was published on September 23, 2021, containing comments from the Environmental Technical Advisory Team (ETAT) on the project's effects on various natural, physical, and social resources. A Type 2 Categorical Exclusion is the class of action for this PD&E study.

This *Location Hydraulics Technical Memorandum (LHM)* has been prepared to determine if any floodplains will be significantly affected due to the proposed improvements. As stated in the *Pond Siting Report (PSR)* included in the project file, there are three cross drains within the project limits that will be extended or replaced as needed to accommodate the proposed roadway width. The first cross drain (CD-01) is a 30" RCP located on US-92 approximately 150-feet west of Branch Forbes Road. The second cross drain (CD-02) is an 18" RCP located on Branch Forbes Road approximately 100-feet south of Cindy Kay Road. Finally, the third cross drain (CD-03) is a 24" RCP located on Branch Forbes Road approximately 200-feet south of Harvey Tew Road. There are two bridges within the study area. Bridge No. 100111 is a triple span concrete box culvert located approximately 400-ft south of I-4 that conveys Spartman Branch under Branch Forbes Road. This bridge culvert will require extension or replacement to accommodate the proposed roadway width. Bridge No. 100621 is a triple span concrete box culvert located approximately 1000-ft west of Branch Forbes Road that conveys Spartman Branch north across I-4. The project site has been reviewed by project staff. The following 10 items have been addressed to document that floodplain encroachments will be minimal.

1. History of Flooding: The FDOT contacted Hillsborough County for historical work requests regarding any flooding along Branch Forbes Road. According to the county records, there are no flood related work orders or complaints along Branch Forbes Road within the project limits.
2. Longitudinal or Transverse Encroachments: No net encroachment into the floodplain, up to that encompassed by the 100-year event, which will adversely affect conveyance, storage, water quality or adjacent lands, will occur. Any required compensating storage shall be equivalently provided between the lowest level of encroachment and the 100-year flood level to allow storage function during all lesser flood events. The Southwest Florida Water Management District (SWFWMD) preference is a cup for cup approach with compensatory storage provided adjacent to or near as possible to the impacts. Most of the possible encroachments into the floodplain are expected to be longitudinal, occurring alongside the roadway. Additionally, there is a potential for transverse encroachment at the cross drains CD-01 and CD-02 as well as Bridge No. 100621 and Bridge No. 100111.
3. Avoidance Alternatives: The project area lies predominantly outside of the special flood hazard areas, and the proposed widening will follow the same alignment as the existing highway. There are no build alternatives available which would completely avoid any new floodplain encroachment. The build alternative has been selected to minimize encroachment by utilizing the existing alignment and minimizing vertical changes without compromising safety.
4. Emergency Services and Evacuations: There are no emergency services within a mile of the project area. I-4 and US-92 are both designated as a Hurricane Evacuation Route. The preferred build alternative is anticipated to enhance emergency response along the corridor by increasing roadway capacity and improving the ramps to and from I-4, thereby decreasing congestion and increasing emergency vehicle mobility.
5. Base Flood Impacts: The project's drainage design will be consistent with FEMA, Hillsborough County, FDOT, and SWFWMD design guidelines. Therefore, no significant changes in base flood elevations or limits will occur.
6. Regulatory Floodway: The project area lies within the Pemberton Creek - Baker Canal watershed. There is one identified regulatory floodway within the study limits. The improvements to US 92 and Branch Forbes will cross the Spartman Branch floodway at two separate locations. Therefore, a No-Rise Analysis will be performed during the design phase of this project to ensure that there are no floodway impacts associated with the proposed improvements. The Hillsborough County SWMM model was utilized to evaluate floodway conditions as seen in **Figure 5**.

7. Natural and Beneficial Floodplain Values: The entire project will match the existing profile, with widening to the outside of the existing roadway. Therefore, no natural and beneficial floodplain values will be significantly affected.
8. Floodplain Consistency and Development: The project is consistent with the Comprehensive Plan for Hillsborough County. The proposed project will not encourage floodplain development due to local (FEMA) floodplain and SWFWMD regulations.
9. Floodplain/FIRM: The project is located within FEMA FIRM Panels 12057C0264H and 12057C0268H dated August 28, 2008. The FEMA flood zones are shown in **Figure 4**. Hillsborough County also maintains a watershed model of the Spartman Branch River and Pemberton Creek, with the most recent revision dated August 9, 2021. This model is anticipated to be adopted by FEMA, and therefore should be considered in the determination of potential floodplain encroachment. A map of the Hillsborough County watershed model base flood inundation boundaries within the project area is attached as **Figure 5**. As stated in the *PSR*, the project is located primarily within Flood Zones X and AE. Segments of Branch Forbes Road are within Flood Zone AE with base flood elevations ranging from 88-ft to 95-ft. The I-4 interchange infields lie within Flood Zone AE with base flood elevations ranging from 90-ft to 93-ft. Bridge No. 100111 crosses a FEMA designated floodway associated with Spartman Branch.
10. Risk Assessment: Based on the evaluation of anticipated improvements, the applicable floodplain statement according to the *FDOT PD&E Manual Part 2 Chapter 13* is Statement 4- PROJECTS ON EXISTING ALIGNMENT INVOLVING REPLACEMENT OF EXISTING DRAINAGE STRUCTURES WITH NO RECORD OF DRAINAGE PROBLEMS:

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

Figure 1 | Project Location Map

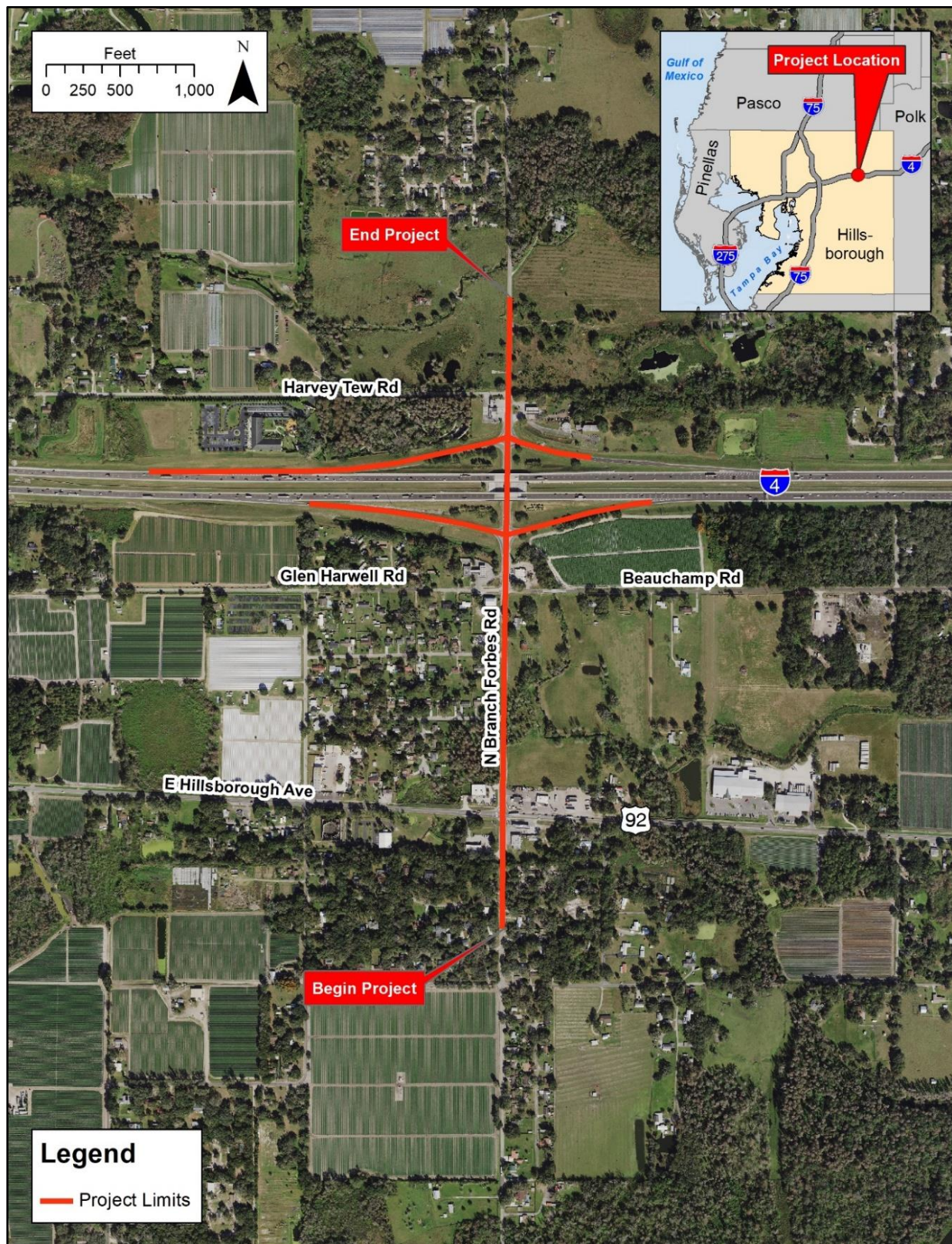


Figure 2 | Branch Forbes Road – Proposed Typical Section

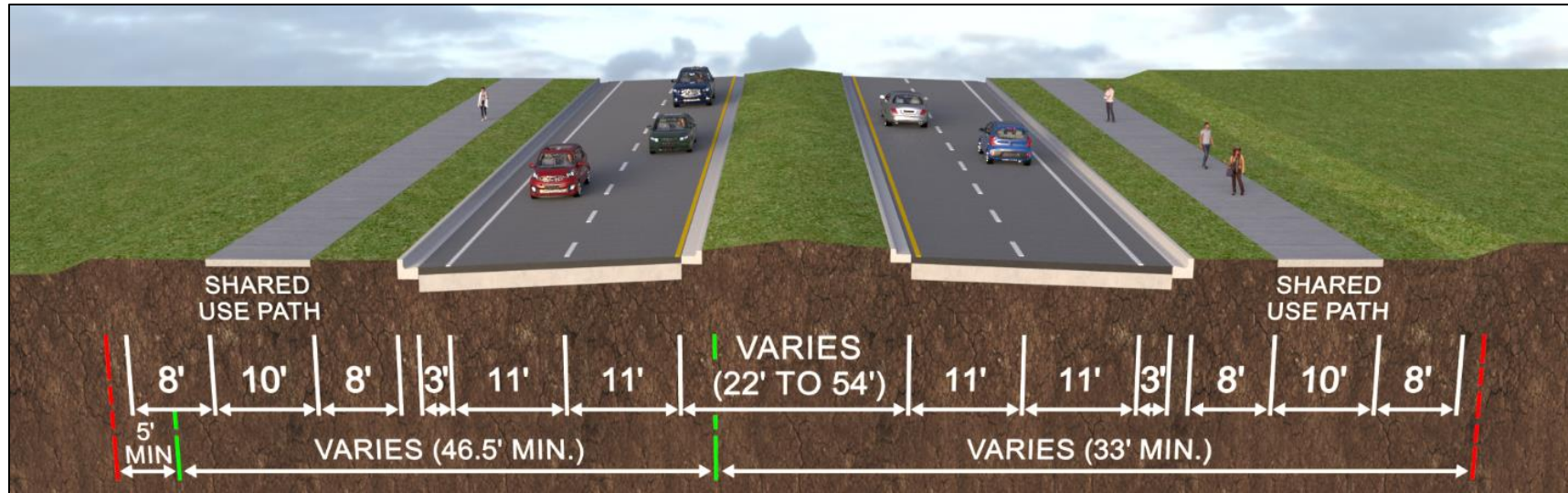
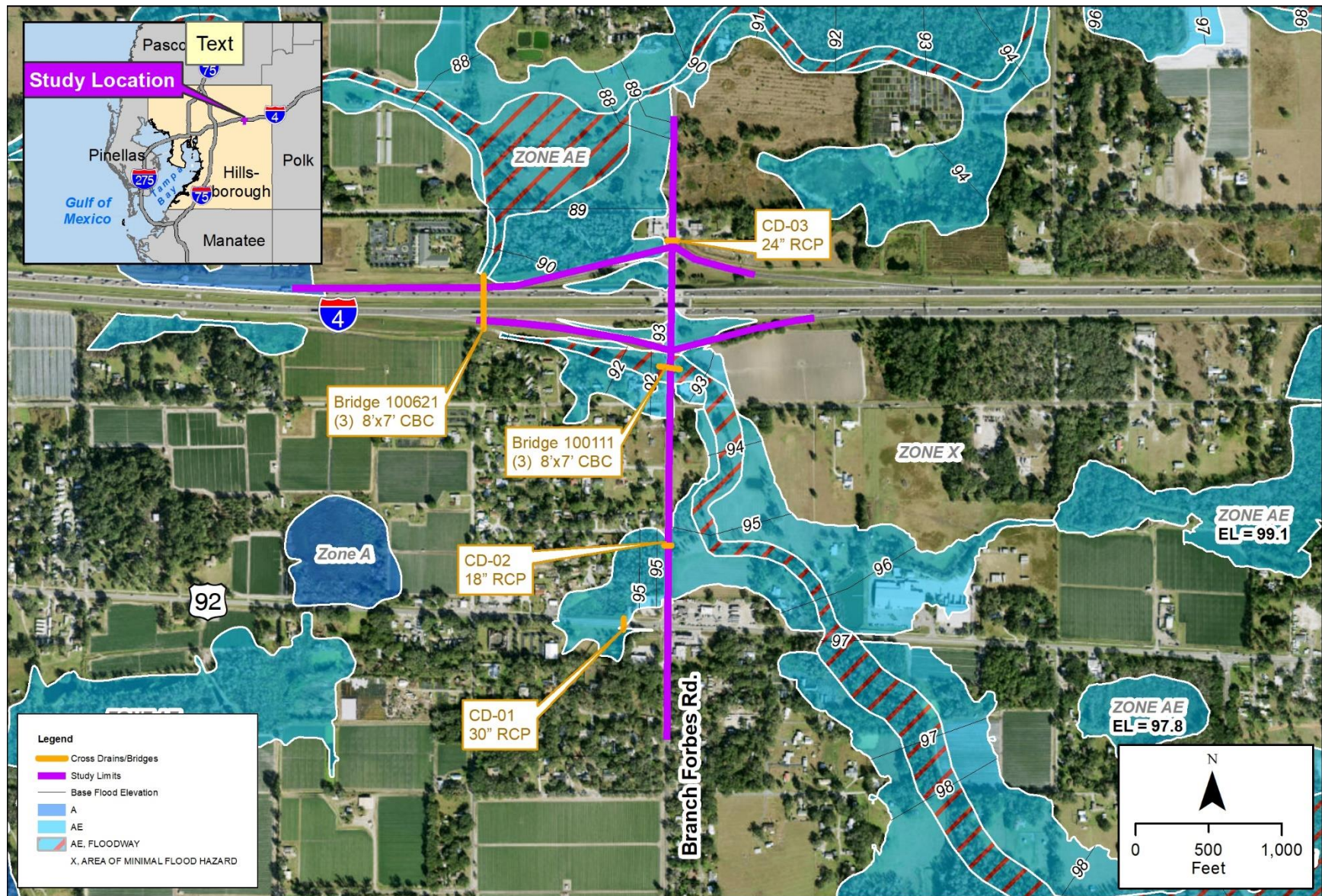


Figure 3 | Branch Forbes Road – Proposed Typical Section Under I-4



Figure 4 | FEMA Flood Zone Map



FEMA Flood Insurance Rate Maps

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Coastal Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Coastal Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this map.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was Florida State Plane west zone (FIPSZONE 0902). The **horizontal datum** was NAD 83, GRS80 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at <http://www.ngs.noaa.gov> or contact the National Geodetic Survey at the following address:

NGS Information Services
NOAA, NINGS12
National Geodetic Survey
SSM-C-3, #9202
1315 East-West Highway
Silver Spring, Maryland 20910-3282
(301) 713-3242

To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov. Information on elevation reference marks is readily available through a variety of sources: the NGS website, www.ngs.noaa.gov/cgi-bin/datasheet.pl, the Land Boundary Information System (LABINS) maintained by the Florida Department of Environmental Protection www.flabins.org, and the Hillsborough County Survey Division www.hillsboroughcounty.org/realstate/surveying/.

Base map information shown on this FIRM was derived from multiple sources. Road centerlines were provided by the City of Tampa Geographic Information System (GIS) group. These data were aligned to aerial imagery at 6-inch pixel resolution dated 2004. Surface water features were provided by the Hillsborough County Information Technology & Services GIS Section. These data were digitized from aerial imagery at 1-foot and 6-inch pixel resolution dated February 2000 and April 2004. Political boundaries were provided by the Hillsborough County Real Estate Department, Survey Division, GIS Section. These data were compiled in 2003. Public Land Survey System (range, township, and sections) were provided by the Florida Geographic Data Library. These data were produced at a scale of 1:24,000.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

Contact the **FEMA Map Service Center** at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood Insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its website at <http://msc.fema.gov/>.

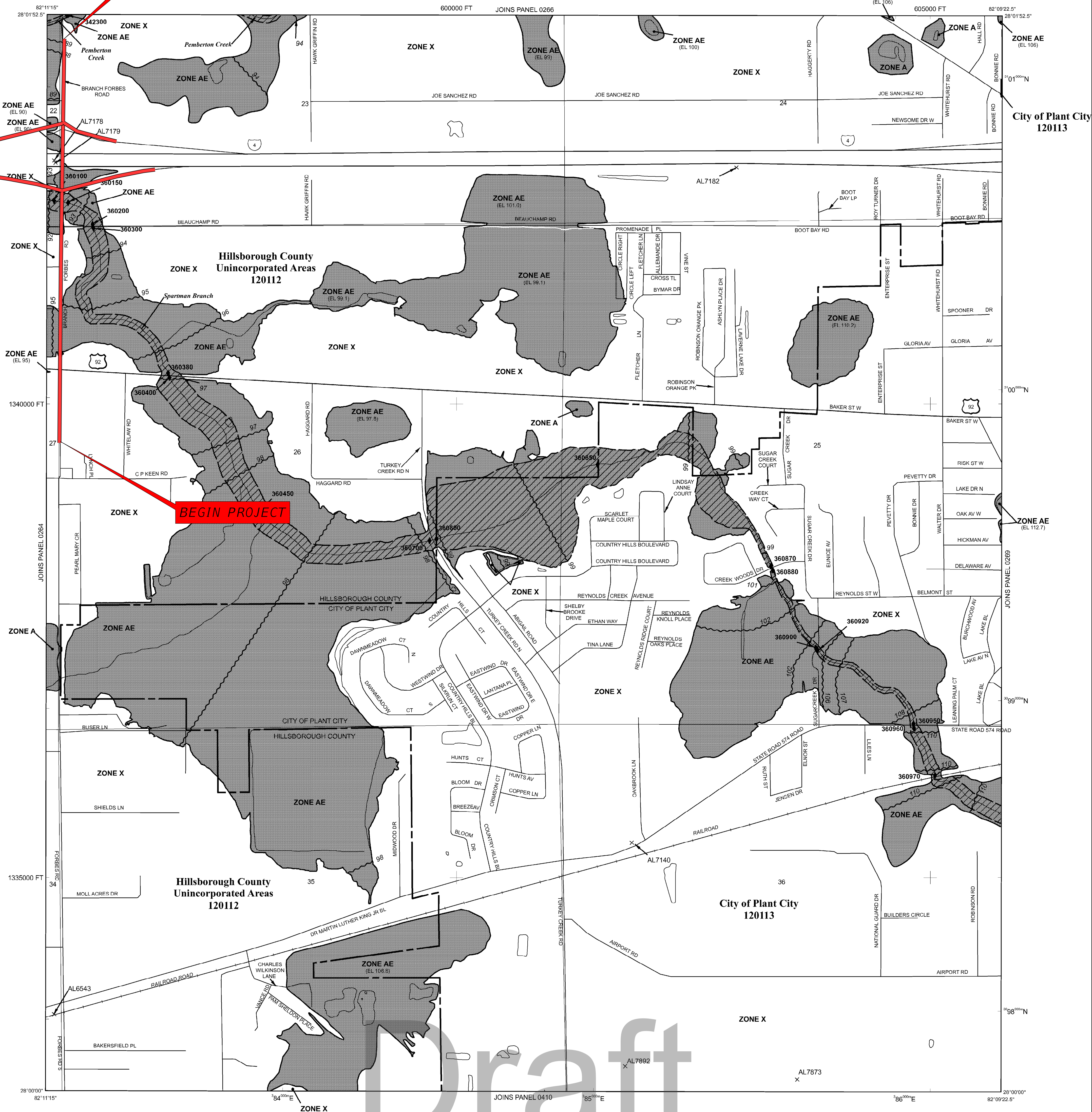
If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA MAP** (1-877-336-2627) or visit the FEMA website at <http://www.fema.gov>.



In cooperation with the Federal Emergency Management Agency (FEMA), Hillsborough County developed this Flood Insurance Rate Map in a digital countywide format to assist communities in their efforts to minimize the loss of property and life through effectively management development in floodprone areas. Hillsborough County has implemented a long term approach to floodplain management to reduce the impacts of flooding. This is demonstrated by the County's commitment to map floodplain areas at the local level. As part of this effort, Hillsborough County is working closely with FEMA as a Cooperating Technical Partner to produce and maintain this digital FIRM.

END PROJECT

BEGIN PROJECT



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.
ZONE AE Base Flood Elevations determined.
ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.

ZONE A99 Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.

ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.

ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain boundary
Floodway boundary
Zone D boundary
CBRS and OPA boundary
Boundary dividing Special Flood Hazard Area zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
Base Flood Elevation line and value; elevation in feet*
Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

Transsect line
87°07'45", 32°22'30"

76°00'N
Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid values, zone NAD 83 UTM Zone 17

5000-foot grid ticks: Florida State Plane coordinate system, West zone (FIPSZONE 0902), Transverse Mercator projection

Bench mark (see explanation in Notes to Users section of this FIRM panel)

● M1.5 River Mile
◆ 410285 Junction

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
August 28, 2008

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

Project Limits

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 500'
250 0 500 1000
150 0 150 300
FEET
METERS

PANEL 0268H

FIRM

FLOOD INSURANCE RATE MAP

HILLSBOROUGH COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 268 OF 801

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
HILLSBOROUGH COUNTY	120112	0268	H
PLANT CITY, CITY OF	120113	0268	H

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
12057C0268H

EFFECTIVE DATE
AUGUST 28, 2008

Federal Emergency Management Agency