Location Hydraulics Report

Florida Department of Transportation

District 5

LPGA Boulevard PD&E Study

Limits of Project: From US 92 (SR 600) to Williamson Boulevard

Volusia County, Florida

Financial Management Number: 448456-1

ETDM Number: 14332

Date: June 2023

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.

LPGA BOULEVARD FROM US 92 (SR 600) TO WILLIAMSON BOULEVARD PD&E STUDY

FPID: 448456-1-22-01

LOCATION HYDRAULIC REPORT

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

February 2023

FDOT

CONTENTS

EXECUTIVE SUMMARY 1
1 INTRODUCTION 2
1.1 PURPOSE AND NEED 2
2 PROJECT DESCRIPTION 4
2.1 EXISTING ROADWAY CONDITIONS 4
2.2 ALTERNATIVES 4
3 EXISTING SITE CONDITIONS 4
3.1 TOPOGRAPHY & HYDROLOGIC FEATURES 4
3.2 SOILS DATA & GEOTECHNICAL INVESTIGATIONS 4
3.3 ENVIRONMENTAL CHARACTERISTICS 7
3.3.1 LAND USE DATA 7
3.3.2 WETLANDS AND OTHER SURFACE WATERS 7
3.4 EXISTING DRAINAGE CONDITIONS 9
3.4.1 CROSS DRAINAGE 9
3.4.2 BRIDGE STRUCTURE 10
3.4.3 FLOODPLAIN/FLOODWAY 10
3.4.4 HISTORY OF FLOODING 12
4 PROPOSED DRAINAGE CONDITIONS 12
4.1 CROSS DRAINS 12
4.2 BRIDGE STRUCTURES 12
4.3 FLOODPLAINS AND FLOODWAYS IMPACTS 12
4.3.1 LONGITUDINAL OR TRANSVERSE ENCROACHMENTS 12
4.3.2 AVOIDANCE ALTERNATIVES 12
4.3.3 EMERGENCY SERVICE AND EVALUATION 13
4.3.4 BASE FLOOD IMPACTS 13
4.3.5 REGULATORY FLOODWAY 14
4.3.6 NATURAL AND BENEFICIAL FLOODPLAIN VALUES 14
4.3.6 FLOODPLAN CONSISTENCY AND DEVELOPMENT 14
4.4 RISK EVALUATION 14

TABLES

Table 1 – NRCS Hydrological Soil Group Summary 5
Table 2 – Existing Cross Drain & Bridges 9
Table 3 – BFE along the project corridor 11
Table 4 –Floodplain Limit, BFE Elevation, and Impact Area 13

FIGURES

Figure 1 Project Location Map 3
Figure 2 NRCS Soil Map 6
Figure 3 Wetlands 8
Figure 4 Floodplain at Tomoka River 11

APPENDICES

Appendix A – Cross Drains within the Project Area
Appendix B – Typical Section of the Selected Alternatives of LPGA Boulevard
Appendix C – Flood Insurance Study, Volusia County, FL
Appendix D - Tomoka River Watershed Management Plan, Volusia County, 1995

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) District 5 is proposing to widen LPGA Boulevard from two to four lanes with shared use paths on both sides from US 92 to N. Williamson Boulevard in Volusia County. The project also includes the replacement of the bridge over the Tomoka River, and the reconfiguration of the I-95 interchange to accommodate future traffic demands.

The project is in the Tomoka River Basin, which is within the Northern Costal Major Basin. The entire project flows west to east through multiple crossdrans and culverts, ultimately to the Tomoka River. The major drainage features include Thayer Canal, US 92 Canal, 11th Street Canal, and the Tomoka River. Floodplains and floodway associated with the canals and river exist within project corridor as shown in FEMA map.

The purpose of this Location Hydraulic Report is to address base floodplain encroachments resulting from the roadway improvements. In accordance with Executive Order 11988 “Floodplain Management”, USDOT Order 5650.2, “Floodplain Management Protection”, and Federal-Aid Policy Guide 23 CFR 650A, Floodplains must be protected. The intent of these regulations is to avoid or minimize highway encroachments within the 100-year (base) floodplains and to avoid supporting land use development incompatible with floodplain values.

The floodway of Tomoka River will not be adversely impacted as to the existing bridge will be replaced with a longer span bridge with larger hydraulic capacity. The base flood elevation of the Zone A floodplains within the project ROW were estimated either from adjacent floodplains with an established flood elevation or available drainage studies. By comparing the contour map and the estimated base flood elevation, it’s found that the floodplains within ROW are mostly shallow and localized depressional areas with limited flood storage. The floodplain encroachments from roadway widening could be compensated by roadside ditches and floodplain compensation ponds. For the proposed improvements, the study is classified as “Minimal Encroachment”.

1 INTRODUCTION

The Florida Department of Transportation is conducting a PD&E Study of LPGA Boulevard from US 92 (International Speedway Boulevard) to North Williamson Boulevard within the City of Daytona Beach in Volusia County (approximately 6.6 miles). The proposed improvements involve widening of LPGA Boulevard from two-lane to four-lane with a closed drainage system, replacement of the bridge over the Tomoka River, and the reconfiguration of the I-95 interchange. A Project Location map is provided in **Figure 1**. Existing LPGA Boulevard is a two-lane roadway from US 92 to Tomoka Farms Road (east of the Tomoka River), a four-lane roadway from Tomoka Farms Road to the I-95 Southbound Ramps, and a six-lane roadway from the I-95 Southbound Ramps over I-95 to Williamson Boulevard.

There are eighteen cross drains on LPGA Boulevard and one cross drain on the northeast ramp of the I-95 interchange. Please refer **Appendix A** for the location of the cross drains. All cross drains eventually discharge into Tomoka River.

1.1 PURPOSE AND NEED

The purpose and need of the PD&E study is provided below:

Purpose

The purpose for the project is to improve congestion and safety for travelers on LPGA Boulevard from US 92 (SR 600) to Williamson Boulevard and on the approaches and ramps to and from the I-95 interchange. The improvements will involve widening of LPGA Boulevard and adding pedestrian and bicycle facilities, replacing, and widening Tomoka River Bridge, and improvements to the I-95 interchange.

Need

This project is needed to address the travel demand and enhance safety along LPGA Boulevard.

Figure 1 Project Location Map

2 PROJECT DESCRIPTION

2.1 EXISTING ROADWAY CONDITIONS

Within the study limits, LPGA Boulevard features two 12-foot travel lanes in each direction with no paved shoulders or sidewalks. I-95 is a six-lane, Strategic Intermodal System (SIS) facility and is a hurricane evacuation route. The I-95 interchange at LPGA Boulevard (Exit 265) is a partial cloverleaf interchange, or parclo interchange, with six (6) on and off ramps.

2.2 ALTERNATIVES

Alternatives for LPGA Boulevard widening and both interchanges were evaluated in an Alternatives Evaluation Technical Memorandum (Alternative Memorandum), dated August 2022. As documented in the Alternatives Memorandum, proposed improvements consist of widening of LPGA Boulevard from existing two lanes to four urban lanes, ditches and 14-foot-wide paved multiuse trails on both side from US-92 to Tymber Creek Road; existing two lanes to six urban travel lanes, ditches and 14-foot-wide paved multiuse trails on both side from Tymber Creek Road to Champions Dr.; existing two to four travel lanes to six urban travel lanes with five to six auxiliary turn lanes, 12 foot-wide paved multiuse trails on both side from Champions Dr. to Technology Blvd; existing four travel lanes to seven urban travel lanes with five auxiliary turn lanes, 12 foot-wide paved multiuse trails on both side from Technology Boulevard to Williamson Boulevard; existing four travel lanes to six urban travel lanes with three auxiliary turn lanes from Williamson Blvd. to Morris Blvd. Please refer **Appendix B** for the typical section of the selected alternatives.

3 EXISTING SITE CONDITIONS

3.1 TOPOGRAPHY & HYDROLOGIC FEATURES

The topography for the project area is relatively uneven with elevations ranging from 28 ft at the intersection of SR 92 and LPGA Boulevard, 19 ft at the LPGA Boulevard over Tomoka River, and 49 ft at the I-95 interchange. Storm runoff from the roadway generally flows to offsite east of the alignment and to a roadside depressional area on the west side of the alignment. There are no stormwater management facilities along the corridor except in the I-95 interchange infields.

3.2 SOILS DATA & GEOTECHNICAL INVESTIGATIONS

Soils are predominantly sandy. The majority of the project area is hydrological soil group A. Based on the Natural Resource Conservation Service (NRCS) soil survey, soils in the are predominantly Pomona fine sand, Pompano-Placid Complex, Farmton fine sand, and Samsula muck. These soils are poorly drained soils with the groundwater approximately 0 to 12 inches below the existing ground surface. **Figure 2** shows the soil map within the project area with soil names shown in **Table 1**.

Table 1 – NRCS Hydrological Soil Group Summary

Map Unit Symbol	Map Unit Name	Hydrological Group
3	Arents	A/D
8	Basinger fine sand, frequently ponded, 0 to 1 percent slopes	A/D
17	Daytona sand, 0 to 5 percent slopes	A
23	Farmton fine sand	B/D
24	Fluvaquents	D
25	Gator muck, 0 to 1 percent slopes, frequently flooded	C/D
29	Immokalee sand	B/D
32	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	A/D
37	Orsino fine sand, 0 to 5 percent slopes	A
42	Paola fine sand, 0 to 8 percent slopes	A
45	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	A/D
49	Pomona fine sand	A/D
50	Pomona fine sand, depressional, 0 to 2 percent slopes	A/D
51	Pomona-St. Johns complex	A/D
53	Pompano-Placid complex	A/D
56	Samsula muck, frequently ponded, 0 to 1 percent slopes	A/D
60	Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes	A/D
54	Troup-Poarch complex, 8 to 12 percent slopes	A
56	Troup-Poarch complex, 5 to 8 percent slopes	A
60	Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes	A/D
63	Tavares fine sand, 0 to 5 percent slopes	A
64	Tequesta muck, frequently ponded, 0 to 1 percent slopes	A/D
65	Terra Ceia muck, frequently ponded, 0 to 1 percent slopes	A/D
75	Wauchula fine sand	A/D

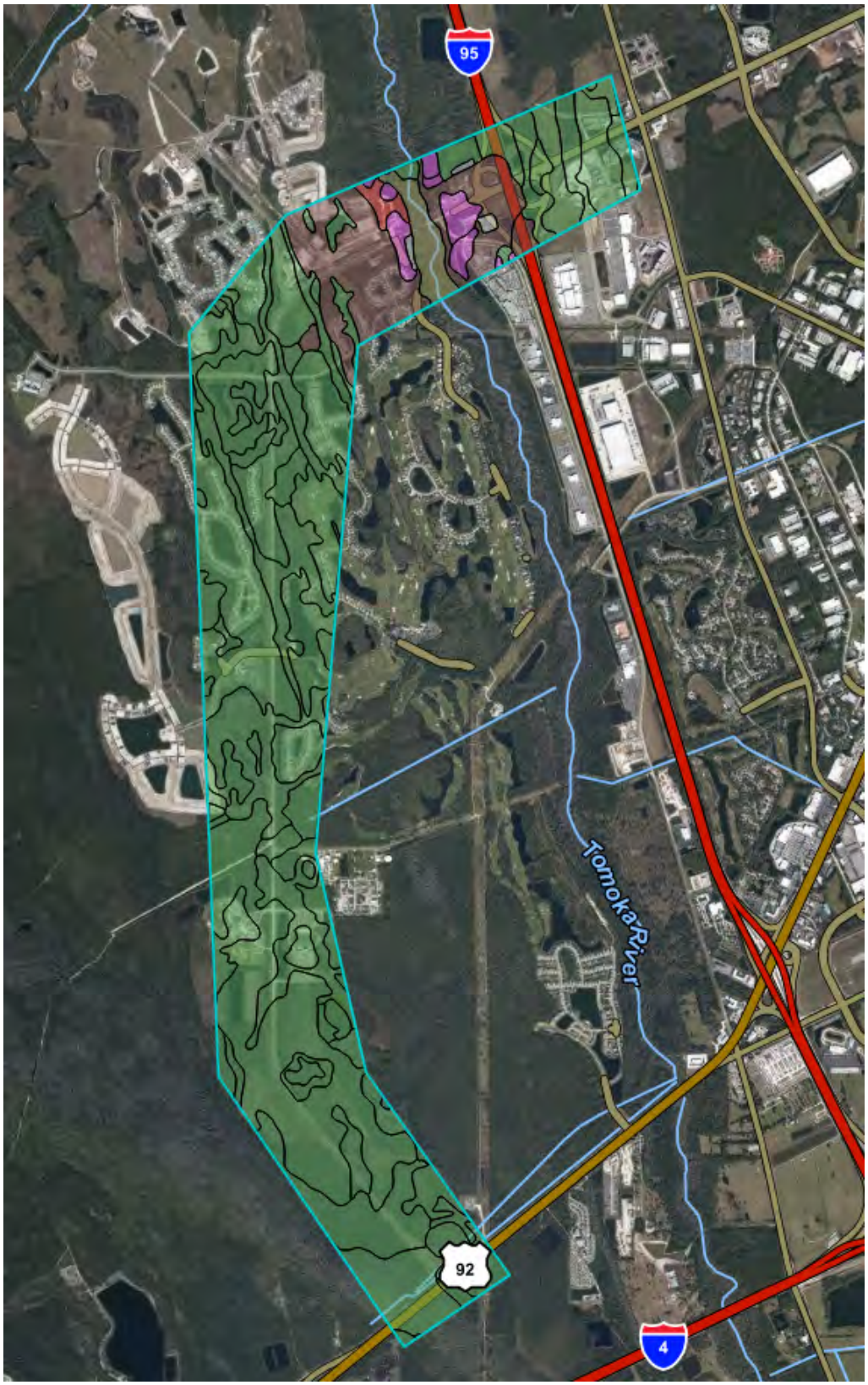


Figure 2 NRCS Soil Map

3.3 ENVIRONMENTAL CHARACTERISTICS

3.3.1 LAND USE DATA

Existing land uses surrounding LPGA Boulevard are mainly public/semipublic & recreation, vacant, and agricultural. The portion of the study area, south of International Tennis Drive/International Golf Drive, is mainly surrounded by agricultural and public/semipublic and recreation land uses. Between International Tennis Drive/International Golf Drive and I-95, LPGA Boulevard transitions to residential with pockets of vacant and public/semipublic and recreation uses. The area surrounding the I-95 interchange and east of I-95 to Williamson Boulevard is mainly commercial institutional, and vacant land. However, some of the vacant lands have been developed since the County adopted its land use map in 2019.

3.3.2 WETLANDS AND OTHER SURFACE WATERS

There are approximately 24 acres of palustrine wetlands, including cypress, hydric pine flatwoods, mixed forested wetland, mixed hardwood wetland and mixed scrub-shrub wetlands adjacent to the project area. The wetland map is shown in **Figure 3**.

The project corridor traverses the Tomoka River, which is listed as an Outstanding Florida Water. The entire project corridor falls within the Tomoka River Mitigation Basin (as defined by the St. Johns River Water Management District, Chapter 40C-41 F.A.C.), within which, wetlands and uplands abutting the Tomoka River are designated Riparian Habitat Protection Zone (RHPZ) and any construction activity must follow the St. John's River Water Management District (SJRWMD) Riparian Wildlife Habitat Standard. The Tomoka River is also listed as part of the Nationwide Rivers Inventory (NRI) in Florida.

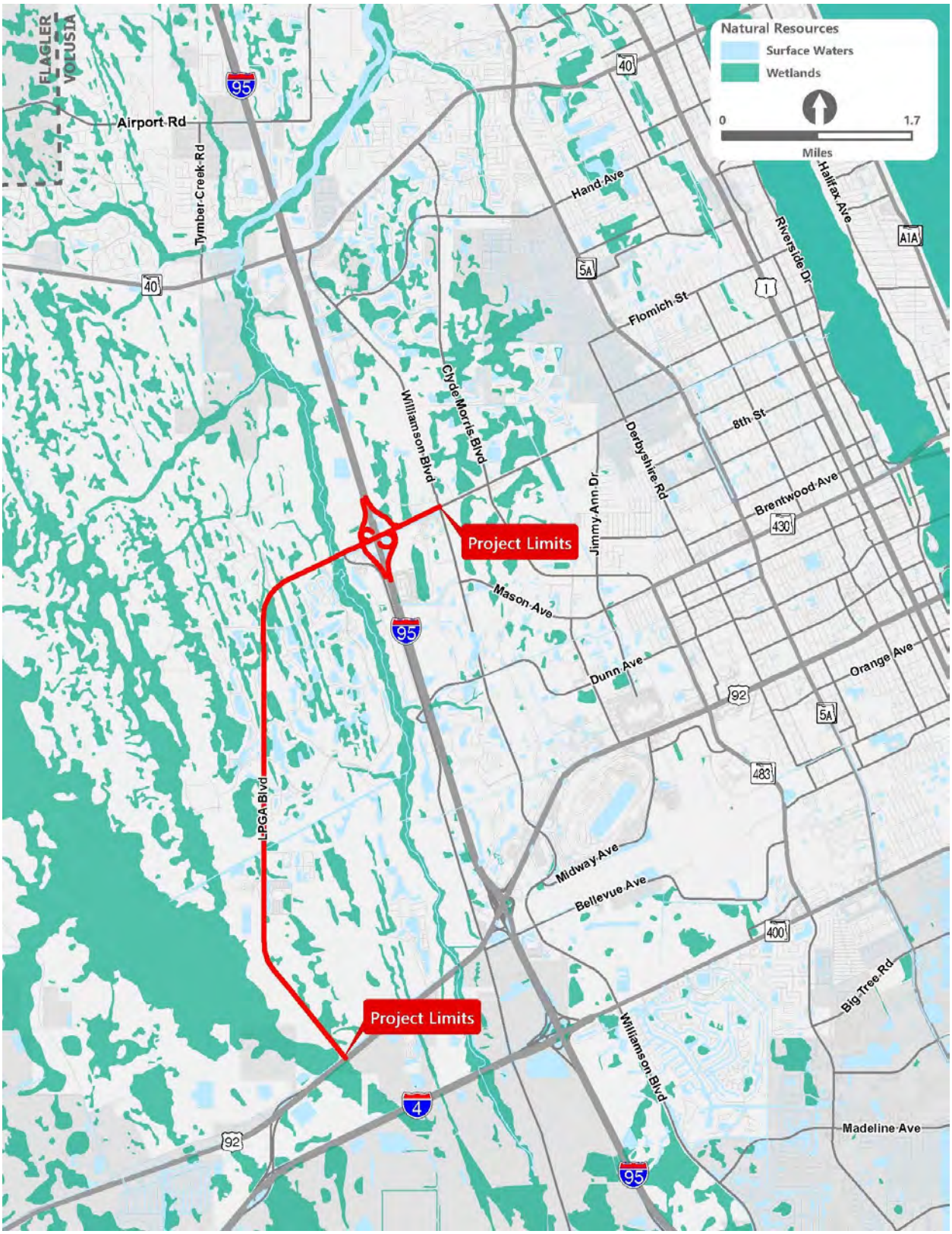


Figure 3 Wetlands

3.4 EXISTING DRAINAGE CONDITIONS

3.4.1 CROSS DRAINAGE

There are 19 cross drain and one bridge identified within the project limits. The cross drain are summarized in **Table 3**.

Table 2 – Existing Cross Drain & Bridges

No.	Station	Size and Type	Length (ft)	Flow Direction
CD-01	301+14.00	2-7'X5' BC	92'	Northeast
CD-02	318+97.00	2-30" RCP	86'	Northeast
CD-03	329+97.00	2-30" RCP	86'	Northeast
CD-04	343+97.00	2-24" RCP	86'	Northeast
CD-05	357+00.00	2-24" RCP	86'	Northeast
CD-06	377+07.00	2-30" RCP	93'	East
CD-07	384+08.00	2-30" RCP	102'	East
CD-08	400+08.00	2-30" RCP	106'	East
CD-09	412+00.00	2-6'X7' BC	110'	Northeast
CD-10	422+10.00	2-36" RCP	86'	East
CD-11	442+10.00	2-30" RCP	86'	East
CD-12	456+10.00	2-24" RCP	100'	East
CD-13	473+10.00	2-36" RCP	85'	East
CD-14	489+10.00	2-24" RCP	85'	East
CD-15	500+10.00	1-24" RCP	89'	East
CD-16	540+35.00	2-36" RCP	110'	South
CD-17	560+84.00	2-48" RCP	96'	South
CD-18	Exist. Ramp B	1-6'x5' RCP	90'	South
CD-19	608+20.00	2-48" RCP	176'	Northeast

3.4.2 BRIDGE STRUCTURE

The existing bridge over Tomoka River (#794038) is located in Volusia County approximately 0.4 miles west of I-95 (approximately Latitude 30.2167 North, Longitude 81.1089 West). This two-lane bridge was constructed in the late 1960s. The bridge is 250 ft long with a total of 5 spans. The superstructure is flat slab construction with two 12' lanes and 2.0' shoulders yielding a deck width of 33' with the barrier walls. The four intermediate bents are supported by 18" square concrete piles. The longitudinal grade elevation of the deck is flat. The low member elevation of the bridge is 15.31 ft.

3.4.3 FLOODPLAIN/FLOODWAY

Floodplains and floodway are found along the project corridor as shown in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel nos. 12127C0351H, 12127C0353H, 12127C0361H, 12127C0363H effective on Feb. 19, 2014 (**Appendix C**). Roadway widening will occur in the floodplains and floodway.

The Tomoka River Floodplain is a 'conveyance' floodplain and has been designated as a FEMA Floodway and the second floodplain is a "storage" floodplain associated with the US-92 Canal, Thayer Canal, and the existing wetland.

The floodplain and floodway at Tomoka River are designated as Zone AE with an established flood elevation (**Figure 4** and **Appendix C**). The floodplains located along the west side of the roadway are designated as Zone A without an established base flood elevation. The existing roadway is out of the floodplain.

In order to evaluate the floodplain impacts from the roadway improvements, the base flooding elevations (BFE) of the floodplains need to be established. The BFEs of Zone A along the corridor were estimated from (1) the elevation of the adjacent hydraulically connected floodplains, (2) the available drainage study.

Water flows from the west side of the LPGA to the East. Both sides of LPGA are hydraulically connected through the US-92 Canal, Thayer Canal, Tomoka River, and multiple cross drains. The BFE of the west side of LPGA Boulevard is controlled by the east side of LPGA Boulevard; therefore, it is reasonable to assume that the BFE of both sides are nearly the same due to the hydraulic connectivity of each side of the LPGA Boulevard through different canals and culvert systems. The floodplains on the east and south side of LPGA Boulevard are mostly located on FEMA Flood Zone AH with a BFE ranges between 17 to 27 feet NAVD.

A detailed hydraulic and hydrologic analysis for Tomoka River watershed was conducted with Stormwater Management Model (SWMM) software by Camp Dresser & McKee (CDM) in 1995. The results were presented in the report of Volusia County Tomoka River Watershed Management Plan (**Appendix D**). The flood elevations from the report were also used as a basis for setting the BFE's along the project corridor. The project corridor BFE's are presented in **Table 3**.

Table 3 – BFE along the project corridor

Floodplains	Receiving Waterbody and BFE	Estimated BFE in Floodplains (ft)
From US 92 to Thayer Canal	US 92 Canal, Pond in County Water Treatment Facility, Thayer Canal / 27	27
From N. Thayer Canal Road to International Tennis Road	East Floodplain / 26	26
From International Tennis Road to Tournament Dr.	East Floodplain / 25	25
From Tournament Drive to Champions Dr.	Tymber Creek/ 23	23
From Champions Dr. to N Tomoka Farms Rd	Tomoka River / 15	15

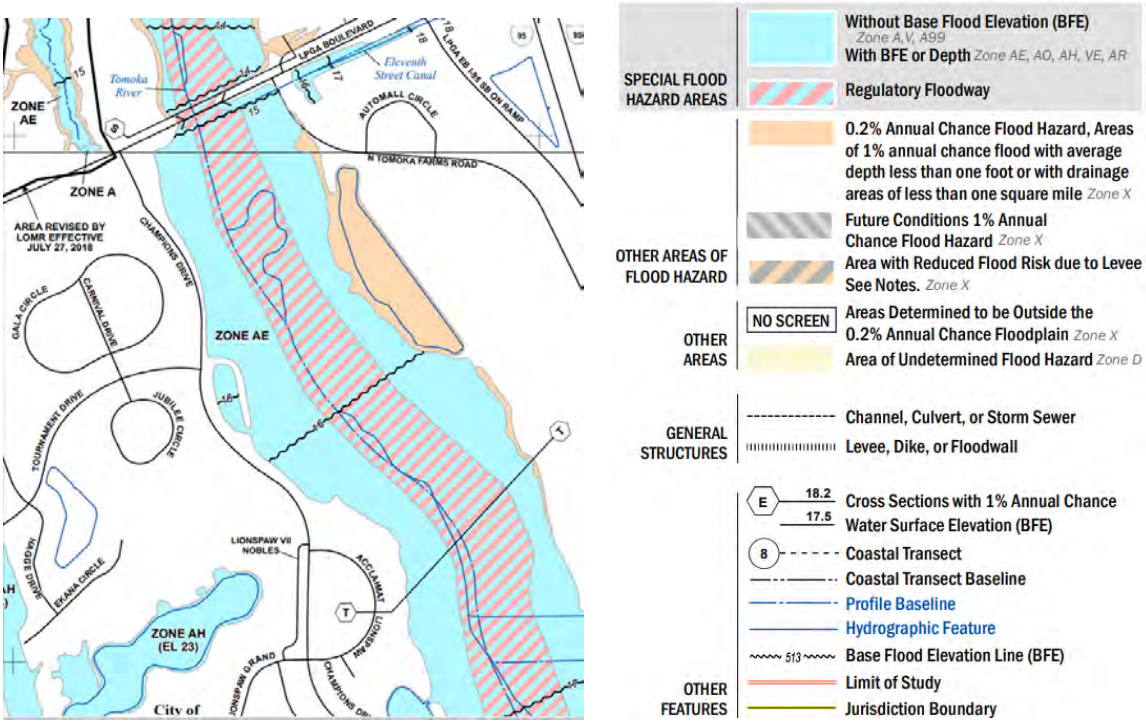


Figure 4 Floodplain at Tomoka River

3.4.4 HISTORY OF FLOODING

No flooding issues were reported along the project corridor. However, during Hurricane Ian in September 2022, the westbound of US 92 and a short section of LPGA Boulevard connecting to US 92 were flooded according to the discussion with FDOT staff. Tomoka River bridge was not overtopped during the hurricane according to the records of USGS gage 2247510 immediately downstream the bridge.

4 PROPOSED DRAINAGE CONDITIONS

4.1 CROSS DRAINS

The majority of the existing culverts have exceeded the 50-year service life. All the existing culverts are recommended to be replaced in the proposed condition. The culverts at US 92 Canal and Thayer Canal are also recommended to be replaced with larger hydraulic opening. The larger opening will be designed to convey the 50-year storm event while reducing existing head water stages. The detail design of the bridge culvert replacement will be conducted in the design phase.

4.2 BRIDGE STRUCTURES

The existing LPGA bridge over Tomoka River will be replaced with a longer span and higher elevation bridge. The new bridge will reduce the floodplain and floodway elevation of the river slightly. Therefore, the new bridge will meet no-rise requirements for the floodway. Please refer Bridge Hydraulics Report (BHR) for the detail recommendation of bridge structure.

4.3 FLOODPLAINS AND FLOODWAYS IMPACTS

4.3.1 LONGITUDINAL OR TRANSVERSE ENCROACHMENTS

LPGA Boulevard crosses Thayer Canal and Tomoka River resulting in transverse floodplain encroachments. There will be a minimal transverse encroachment in the Tomoka River Floodplain associated with replacing the bridge. At the Thayer Canal, although there is no profile change of LPGA Boulevard, slight traverse encroachment will result from the widening of LPGA Boulevard. Limited longitudinal encroachments to the canal and river are anticipated.

4.3.2 AVOIDANCE ALTERNATIVES

The existing LPGA Boulevard, especially the unpaved shoulder on both sides of the roadway, are wide and elevated from the 100-year flood elevation. Therefore, all floodplain encroachments resulting from the proposed widening will be minimal as the proposed improvements follow the same alignment as the existing roadway. There is no feasible alternative alignment that better avoids floodplain encroachments.

4.3.3 EMERGENCY SERVICE AND EVALUATION

LPGA Boulevard is a designated evacuation route. The proposed roadway improvements will not reduce the current level of service for emergency or evacuation purposed.

4.3.4 BASE FLOOD IMPACTS

The floodplain acreages within the project corridor were estimated from Volusia County 2022 GIS contour map and the estimated BFE. By comparison of the contour map and BFE, it's found that most of the ROW is above the BFE. The floodplains within ROW are mostly localized depressional areas, less than 1 foot deep. The total floodplain acreages within each floodplain area are listed in **Table 4**, below. As demonstrated, the majority of the floodplain impacts occur in areas 1 and 3. The floodplain impacts in other areas are minimal.

The roadway improvements will encroach upon most of the floodplains within ROW. However, the impacts will be compensated in two ways: (1) using floodplain compensation ponds; (2) utilizing roadside ditches. As the existing floodplain depth is very shallow with limited storage, a roadside ditch with a bottom elevation below the existing ground surface will provide an effective method for floodplain compensation storage. Therefore, the project will have insignificant impacts to the floodplains.

Table 4 –Floodplain Limit, BFE Elevation, and Impact Area

Area No.	From Station	To Station	From (Road or Canal)	To (Road or Canal)	100 Year Elevation (NAVD)	Impact Area (AC)
1	300+00.00	412+00.00	US 92 Canal	Thayer Canal	27	2.41
2	412+00.00	455+00.00	Thyer Canal	International Tennis Dr.	26	0.18
3	455+00.00	517+00.00	International Tennis Dr.	Tournament Dr.	25	2.07
4	517+00.00	562+66.00	Tournament Dr.	Champions Dr.	23	0.73
5	562+66.00	574+00.00	Champions Dr.	N. Tomoka Farms Road	15	0.00
6	574+00.00	586+00.00	Eastbound LPGA at the east of N. Tomoka Farms Road		17	0.31
						5.70

4.3.5 REGULATORY FLOODWAY

As stated previously, the floodway associated with the Tomoka River at the LPGA bridge location will not be impacted by the improvements as a longer span bridge is proposed to replace the existing bridge.

4.3.6 NATURAL AND BENEFICIAL FLOODPLAIN VALUES

The proposed widening follows the same alignment of the existing roadway. Minimal encroachment will result from the widening of LPGA Boulevard and compensatory storage will be provided equivalent to any proposed encroachments. Therefore, no natural and beneficial floodplain values will be significantly affected.

4.3.6 FLOODPLAN CONSISTENCY AND DEVELOPMENT

The proposed improvements will not directly or indirectly support floodplain development in a manner inconsistent with the National Flood Insurance Program, which regulates development within the base floodplain.

4.4 RISK EVALUATION

PROJECTS ON EXISTING ALIGNMENT INVOLVING REPLACEMENT OF EXISTING DRAINAGE STRUCTURES AND MINIMUM ENCROCHMENTS. 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 the floodplain encroachments associated with the LPGA improvements are not significant.

Florida Department of Transportation District 5

Environmental Management Office

719 S. Woodland Blvd.

DeLand, FL 32720

Appendix A

Cross Drains within the Project Area


N Williamson Blvd
CD-18
600
CD-19
Tomoker River
Champions Dr
7th Street Canal
N Tomoka Farms Rd
Priest Brg
Tymber Creek Rd
550
LPGA Blvd
CD-17
CD-16
0 1000 5000
Feet
N
Tournament Dr
I-95
CD-15
500
CD-14
CD-13
CD-12
International Tennis Dr
450
CD-11
CD-10
Thayer Canal
CD-09
Ralph Brennan Water Treatment Plant
CD-08
400
CD-07
CD-06
CD-05
CD-04
350
CD-03
CD-02
US 92 Canal
US 92
Tomoker River
CD-01

Appendix B

Typical Section of the Selected Alternative of LPGA Boulevard

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(_)	C1 : NATURAL	(_)	C3C : SUBURBAN COMM.
(_)	C2 : RURAL	(_)	C4 : URBAN GENERAL
(_)	C2T : RURAL TOWN	(_)	C5 : URBAN CENTER
(X)	C3R : SUBURBAN RES.	(_)	C6 : URBAN CORE
(_)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(_)	INTERSTATE	(_)	MAJOR COLLECTOR
(_)	FREEWAY/EXPWY.	(_)	MINOR COLLECTOR
(_)	PRINCIPAL ARTERIAL	(_)	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

- (_) NATIONAL HIGHWAY SYSTEM
- (_) STRATEGIC INTERMODAL SYSTEM
- (_) STATE HIGHWAY SYSTEM
- (X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- (_) 1 - FREEWAY
- (_) 2 - RESTRICTIVE w/Service Roads
- (_) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (_) 4 - NON-RESTRICTIVE w/2640 ft. SIgnal Spaclng
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- (_) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (_) 7 - BOTH MEDIAN TYPES

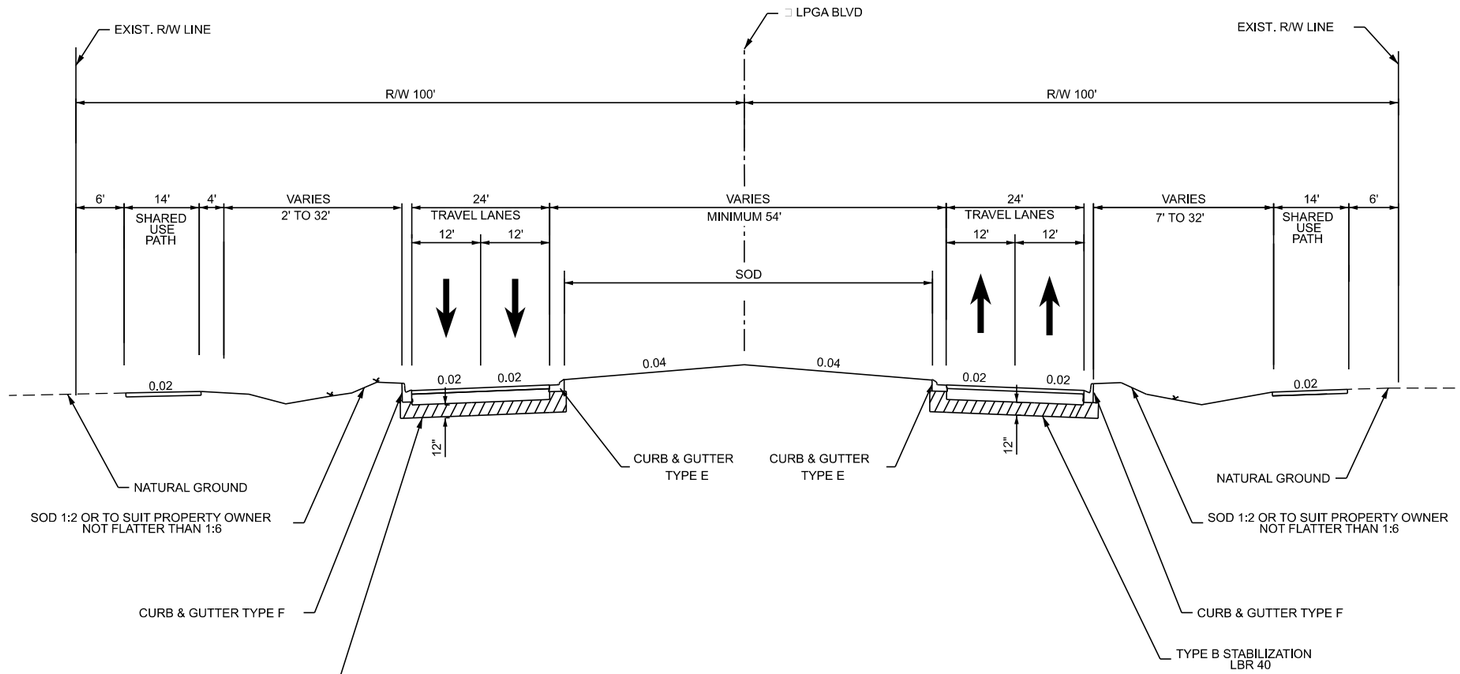
CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- (_) RESURFACING (LA FACILITIES)
- (_) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 1

NOT TO SCALE



PROPOSED TYPICAL SECTION
LPGA BLVD
US-92 TO TYMBER CREEK RD

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 12,000
ESTIMATED OPENING YEAR = 2030 AADT = 19,500
ESTIMATED DESIGN YEAR = 2050 AADT = 36,000
K = % D = % T = % (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
448456-1-22-01	2

$DATE$ $TIME$

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(_)	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
(_)	C2 : RURAL	(_)	C4 : URBAN GENERAL
(_)	C2T : RURAL TOWN	(_)	C5 : URBAN CENTER
(_)	C3R : SUBURBAN RES.	(_)	C6 : URBAN CORE
(_)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(_)	INTERSTATE	(_)	MAJOR COLLECTOR
(_)	FREEWAY/EXPWY.	(_)	MINOR COLLECTOR
(_)	PRINCIPAL ARTERIAL	(_)	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

- (_) NATIONAL HIGHWAY SYSTEM
- (_) STRATEGIC INTERMODAL SYSTEM
- (_) STATE HIGHWAY SYSTEM
- (X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- (_) 1 - FREEWAY
- (_) 2 - RESTRICTIVE w/Service Roads
- (_) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (_) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- (_) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (_) 7 - BOTH MEDIAN TYPES

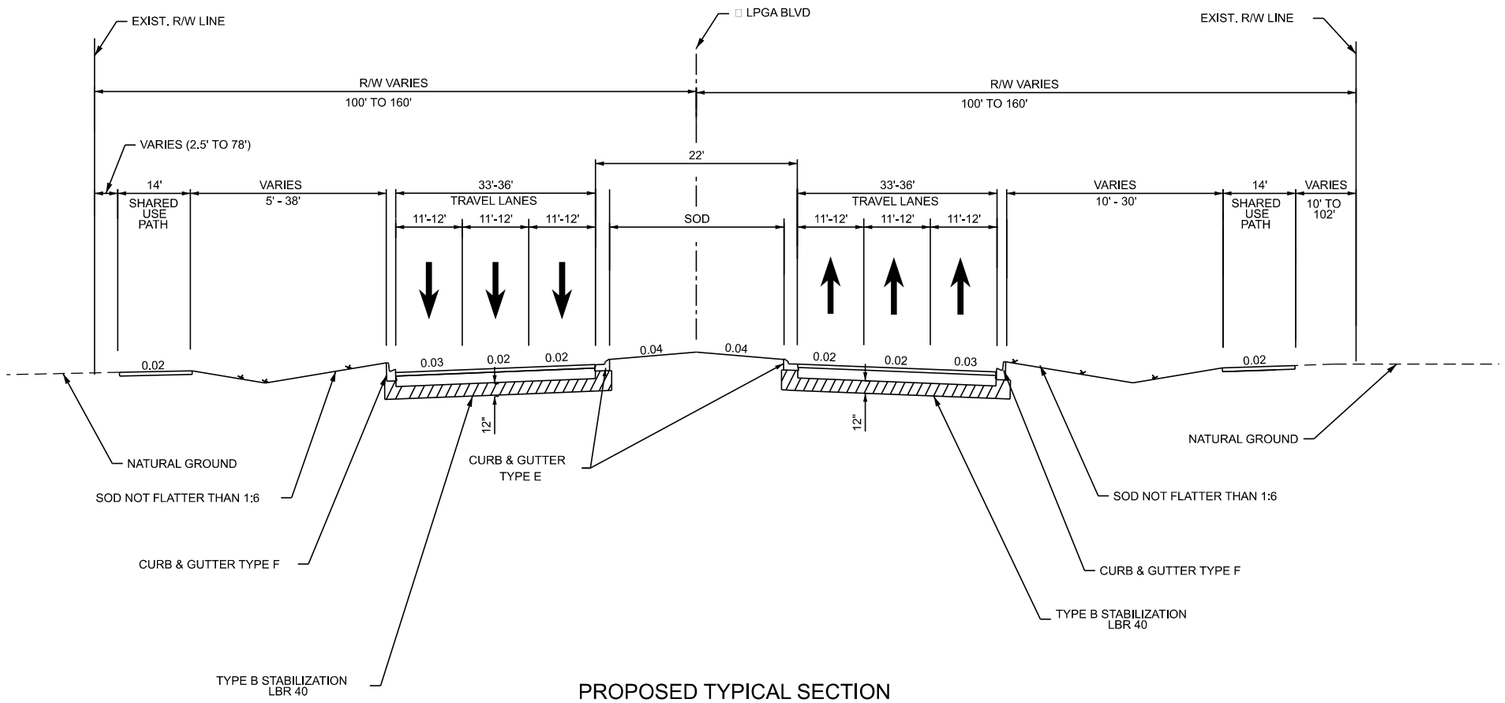
CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- (_) RESURFACING (LA FACILITIES)
- (_) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 2

NOT TO SCALE



PROPOSED TYPICAL SECTION
LPGA BLVD
TYMBER CREEK RD TO CHAMPIONS DR

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 19,000
ESTIMATED OPENING YEAR = 2030 AADT = 29,000
ESTIMATED DESIGN YEAR = 2050 AADT = 50,000
K = % D = % T = % (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

FINANCIAL PROJECT ID	SHEET NO.
448456-1-22-01	3

$DATE$ $TIME$

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(_)	C1 : NATURAL	X	C3C : SUBURBAN COMM.
(_)	C2 : RURAL	(_)	C4 : URBAN GENERAL
(_)	C2T : RURAL TOWN	(_)	C5 : URBAN CENTER
(_)	C3R : SUBURBAN RES.	(_)	C6 : URBAN CORE
(_)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(_)	INTERSTATE	(_)	MAJOR COLLECTOR
(_)	FREEWAY/EXPWY.	(_)	MINOR COLLECTOR
(_)	PRINCIPAL ARTERIAL	(_)	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

- (_) NATIONAL HIGHWAY SYSTEM
- (_) STRATEGIC INTERMODAL SYSTEM
- (_) STATE HIGHWAY SYSTEM
- (X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- (_) 1 - FREEWAY
- (_) 2 - RESTRICTIVE w/Service Roads
- (_) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (_) 4 - NON-RESTRICTIVE w/2640 ft. SIgnal Spaclng
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- (_) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (_) 7 - BOTH MEDIAN TYPES

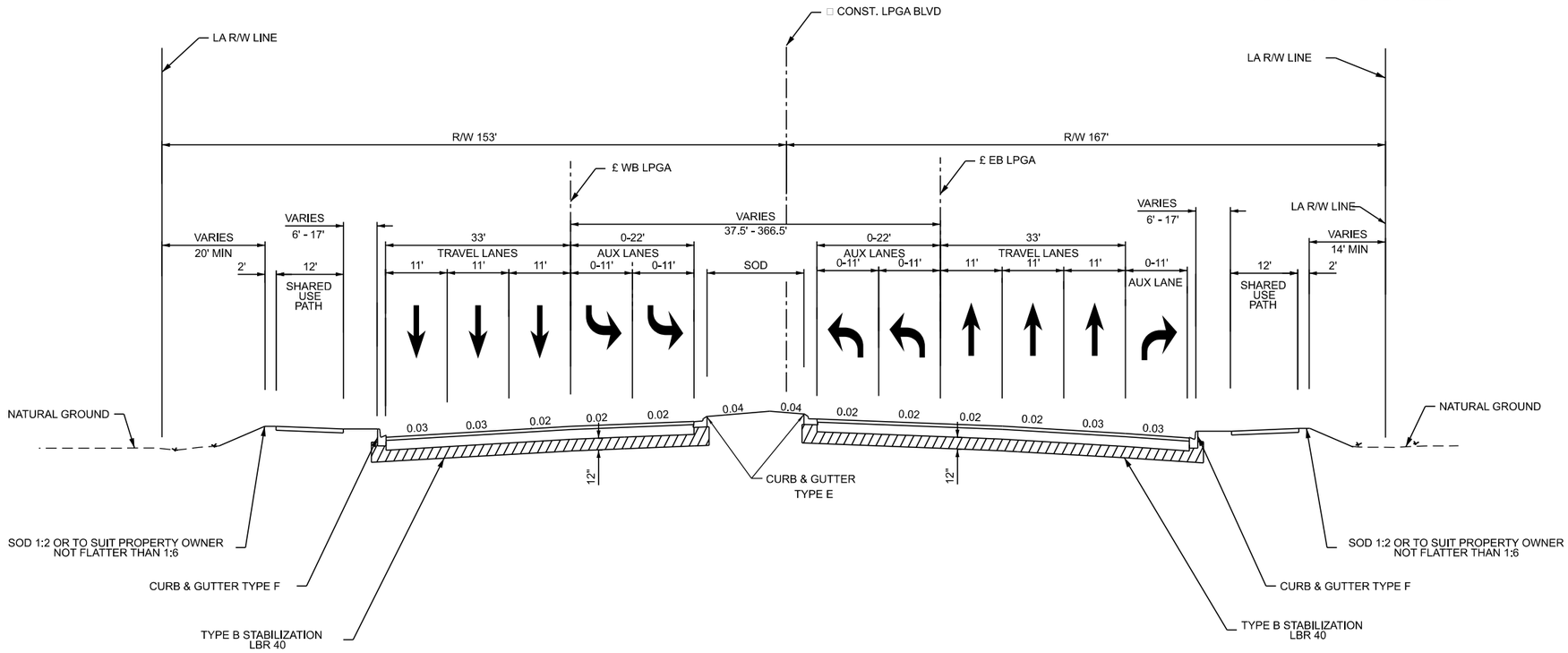
CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- (_) RESURFACING (LA FACILITIES)
- (_) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 3

NOT TO SCALE



PROPOSED TYPICAL SECTION
LPGA BLVD
CHAMPIONS DR TO I-95 SOUTHBOUND RAMPS

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 27,000
ESTIMATED OPENING YEAR = 2030 AADT = 36,000
ESTIMATED DESIGN YEAR = 2050 AADT = 56,000
K = % D = % T = % (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

FINANCIAL PROJECT ID	SHEET NO.
448456-1-22-01	4

$DATE$ $TIME$

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(_)	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
(_)	C2 : RURAL	(_)	C4 : URBAN GENERAL
(_)	C2T : RURAL TOWN	(_)	C5 : URBAN CENTER
(_)	C3R : SUBURBAN RES.	(_)	C6 : URBAN CORE
(_)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(_)	INTERSTATE	(_)	MAJOR COLLECTOR
(_)	FREEWAY/EXPWY.	(_)	MINOR COLLECTOR
(_)	PRINCIPAL ARTERIAL	(_)	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

(_) NATIONAL HIGHWAY SYSTEM
(_) STRATEGIC INTERMODAL SYSTEM
(_) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

(_) 1 - FREEWAY
(_) 2 - RESTRICTIVE w/Service Roads
(_) 3 - RESTRICTIVE w/660 ft. Connection Spacing
(_) 4 - NON-RESTRICTIVE w/2640 ft. SIgnal Spaclng
(X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
(_) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
(_) 7 - BOTH MEDIAN TYPES

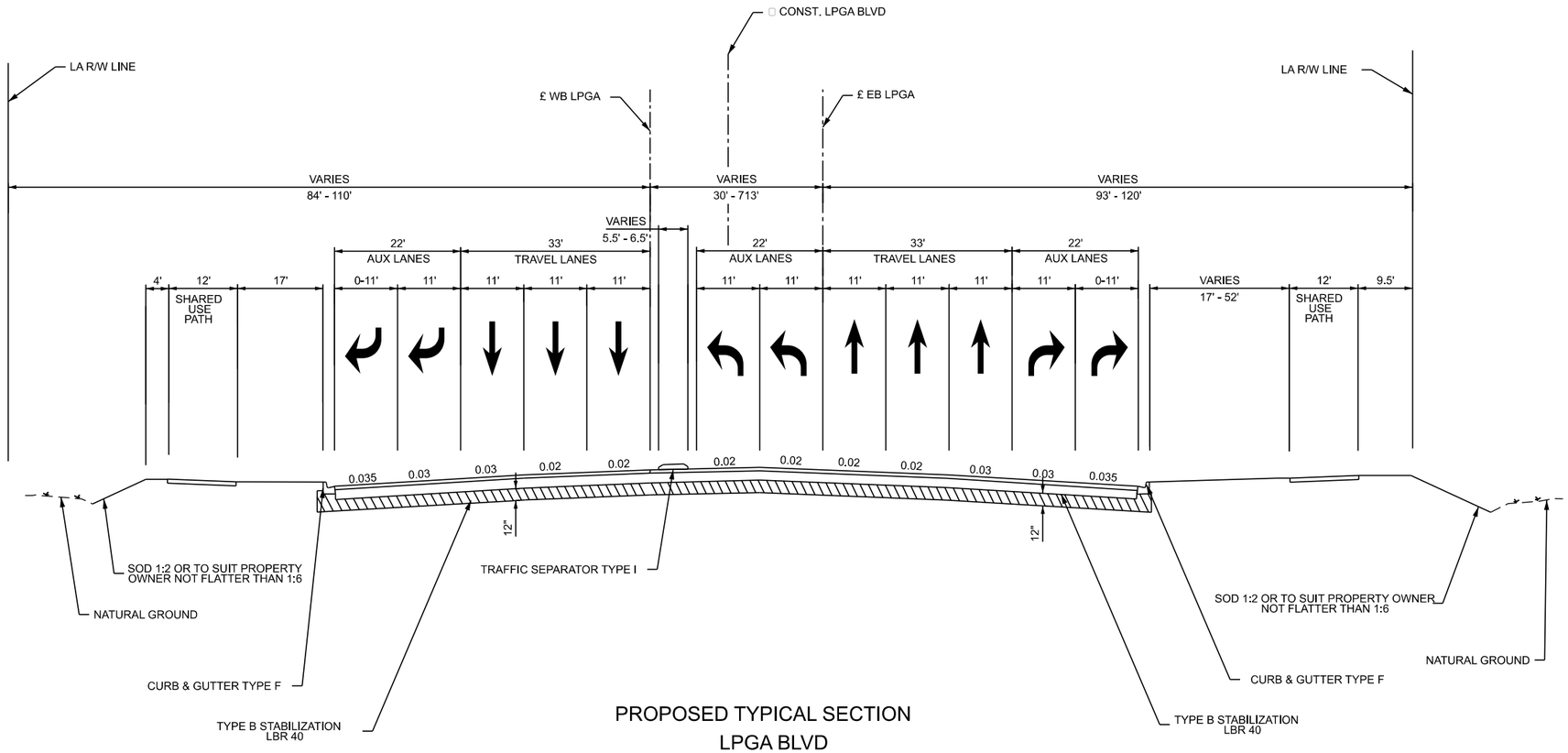
CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
(_) RESURFACING (LA FACILITIES)
(_) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 4

NOT TO SCALE



PROPOSED TYPICAL SECTION
LPGA BLVD
INTERCHANGE TO TECHNOLOGY BLVD

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 44,000
ESTIMATED OPENING YEAR = 2030 AADT = 54,500
ESTIMATED DESIGN YEAR = 2050 AADT = 78,000
K = % D = % T = % (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

FINANCIAL PROJECT ID	SHEET NO.
448456-1-22-01	5

$DATE$ $TIME$

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(_)	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
(_)	C2 : RURAL	(_)	C4 : URBAN GENERAL
(_)	C2T : RURAL TOWN	(_)	C5 : URBAN CENTER
(_)	C3R : SUBURBAN RES.	(_)	C6 : URBAN CORE
(_)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(_)	INTERSTATE	(_)	MAJOR COLLECTOR
(_)	FREEWAY/EXPWY.	(_)	MINOR COLLECTOR
(_)	PRINCIPAL ARTERIAL	(_)	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

- (_) NATIONAL HIGHWAY SYSTEM
- (_) STRATEGIC INTERMODAL SYSTEM
- (_) STATE HIGHWAY SYSTEM
- (X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

- (_) 1 - FREEWAY
- (_) 2 - RESTRICTIVE w/Service Roads
- (_) 3 - RESTRICTIVE w/660 ft. Connection Spacing
- (_) 4 - NON-RESTRICTIVE w/2640 ft. SIgnal Spaclng
- (X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
- (_) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
- (_) 7 - BOTH MEDIAN TYPES

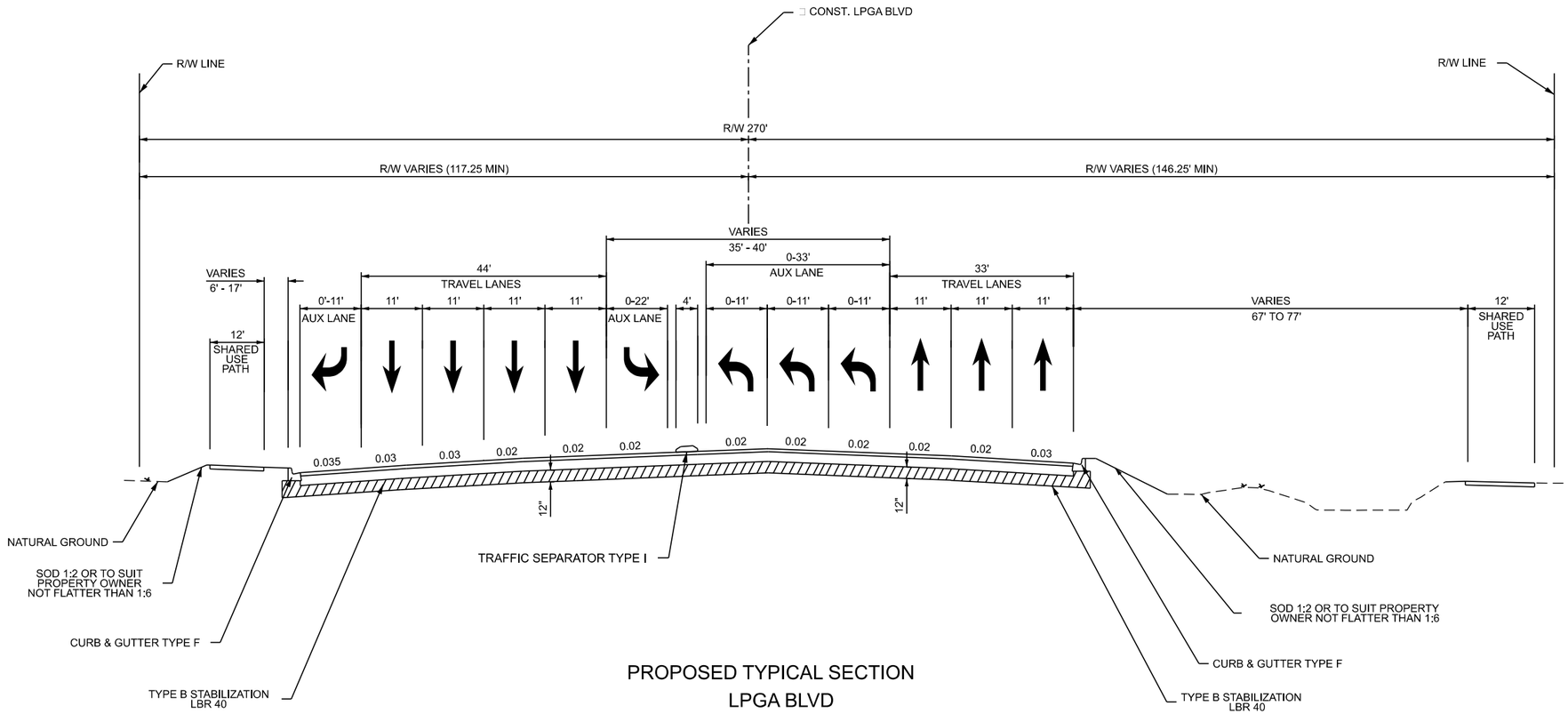
CRITERIA

- (X) NEW CONSTRUCTION / RECONSTRUCTION
- (_) RESURFACING (LA FACILITIES)
- (_) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 5

NOT TO SCALE



PROPOSED TYPICAL SECTION
LPGA BLVD
TECHNOLOGY BLVD TO WILLIAMSON BLVD

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 32,000
ESTIMATED OPENING YEAR = 2030 AADT = 40,000
ESTIMATED DESIGN YEAR = 2050 AADT = 60,000
K = % D = % T = % (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

FINANCIAL PROJECT ID	SHEET NO.
448456-1-22-01	6

$DATE$ $TIME$

PROJECT CONTROLS

CONTEXT CLASSIFICATION

(_)	C1 : NATURAL	(X)	C3C : SUBURBAN COMM.
(_)	C2 : RURAL	(_)	C4 : URBAN GENERAL
(_)	C2T : RURAL TOWN	(_)	C5 : URBAN CENTER
(_)	C3R : SUBURBAN RES.	(_)	C6 : URBAN CORE
(_)	N/A : L.A. FACILITY		

FUNCTIONAL CLASSIFICATION

(_)	INTERSTATE	(_)	MAJOR COLLECTOR
(_)	FREEWAY/EXPWY.	(_)	MINOR COLLECTOR
(_)	PRINCIPAL ARTERIAL	(_)	LOCAL
(X)	MINOR ARTERIAL		

HIGHWAY SYSTEM

(_) NATIONAL HIGHWAY SYSTEM
(_) STRATEGIC INTERMODAL SYSTEM
(_) STATE HIGHWAY SYSTEM
(X) OFF-STATE HIGHWAY SYSTEM

ACCESS CLASSIFICATION

(_) 1 - FREEWAY
(_) 2 - RESTRICTIVE w/Service Roads
(_) 3 - RESTRICTIVE w/660 ft. Connection Spacing
(_) 4 - NON-RESTRICTIVE w/2640 ft. SIgnal Spaclng
(X) 5 - RESTRICTIVE w/440 ft. Connection Spacing
(_) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
(_) 7 - BOTH MEDIAN TYPES

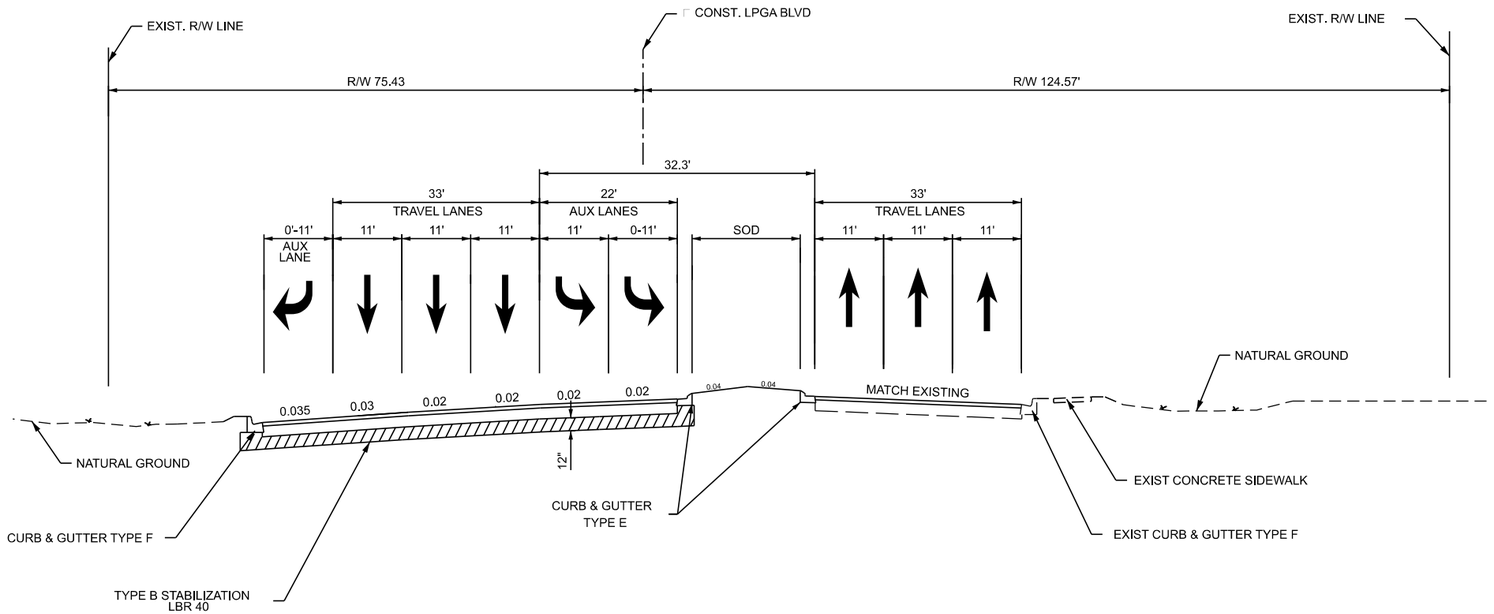
CRITERIA

(X) NEW CONSTRUCTION / RECONSTRUCTION
(_) RESURFACING (LA FACILITIES)
(_) RRR (ARTERIALS & COLLECTORS)

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 6

NOT TO SCALE



PROPOSED TYPICAL SECTION
LPGA BLVD
WILLIAMSON BLVD TO CLYDE MORRIS BLVD

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 34,500
ESTIMATED OPENING YEAR = 2030 AADT = 40,000
ESTIMATED DESIGN YEAR = 2050 AADT = 52,000
K = % D = % T = % (24 HOUR)
DESIGN HOUR T = %
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
448456-1-22-01	7

$DATE$ $TIME$

Appendix C

Flood Insurance Study, Volusia County, FL

February 19, 2014

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. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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 East zone (FIPS zone 0901). The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 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, N/NGS12
National Geodetic Survey
SSMC-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 http://www.ngs.noaa.gov/.

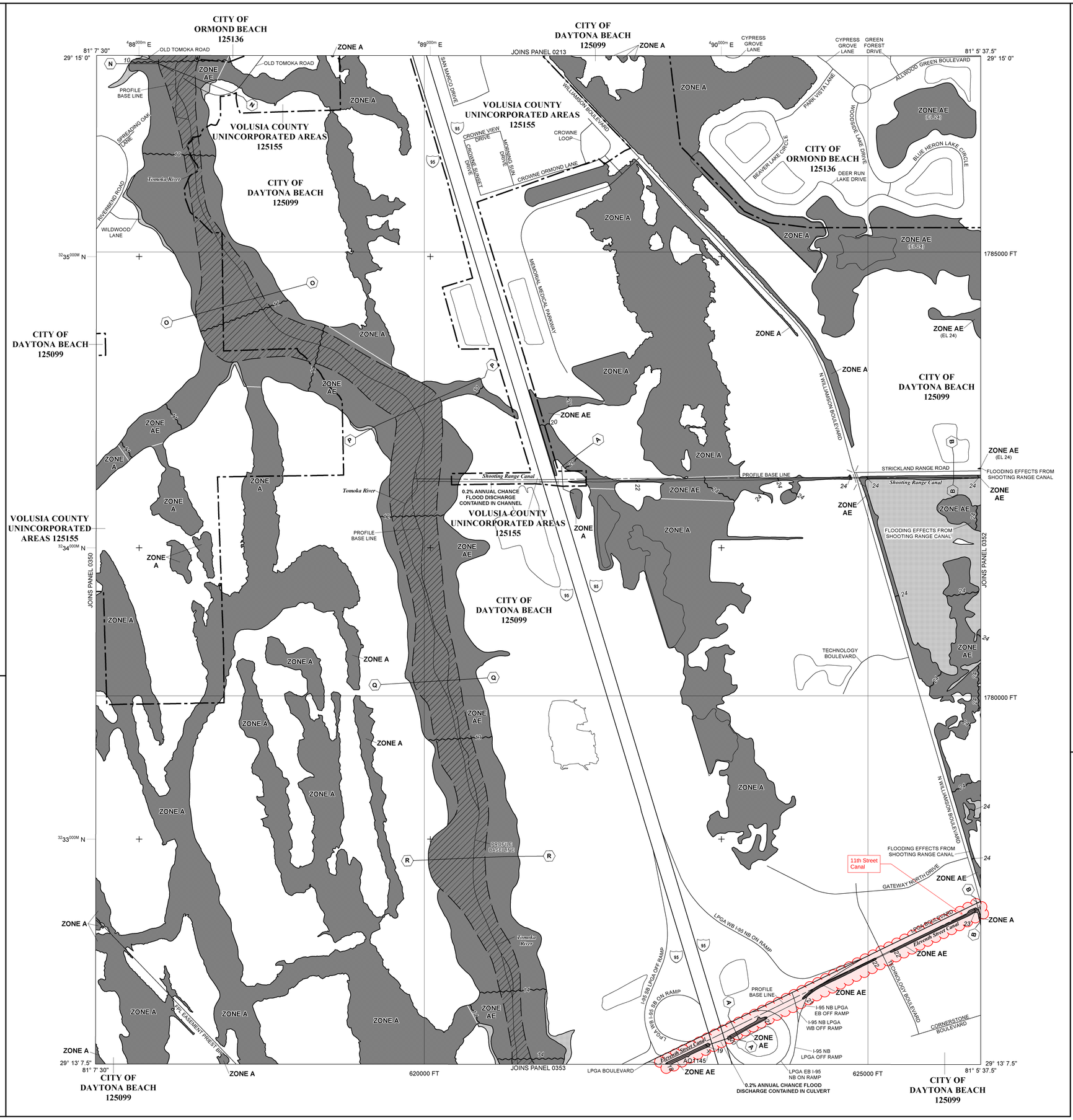
Base Map information shown on this FIRM was provided in digital format by the Volusia County, Florida GIS Department at a scale of 1:12,000 or larger from photography dated 2006 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.



LEGEND

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

The 1% annual chance 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 Areas 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 Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- (A) (A) — Cross section line
- (23) (23) — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4989000 N — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 4989000FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPS Zone 0901), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
APRIL 15, 2002

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 19, 2014 - to update corporate limits, to reflect updated topographic information, to add and change Base Flood Elevations, to add floodways, to add and change Special Flood Hazard Areas, to incorporate previsously issued Letters of Map Revision, and to change zone designations.

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 FEET

150 0 150 300 METERS

MAP REPOSITORY PANEL LAYOUT

PANEL 0351H

FIRM
FLOOD INSURANCE RATE MAP

VOLUSIA COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 351 OF 930
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DAYTONA BEACH, CITY OF	125099	0351	H
ORMOND BEACH, CITY OF	125136	0351	H
VOLUSIA COUNTY	125155	0351	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
12127C0351H
MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

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. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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 East zone (FIPS zone 0901). The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 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, N/NGS12
National Geodetic Survey
SSMC-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 http://www.ngs.noaa.gov/.

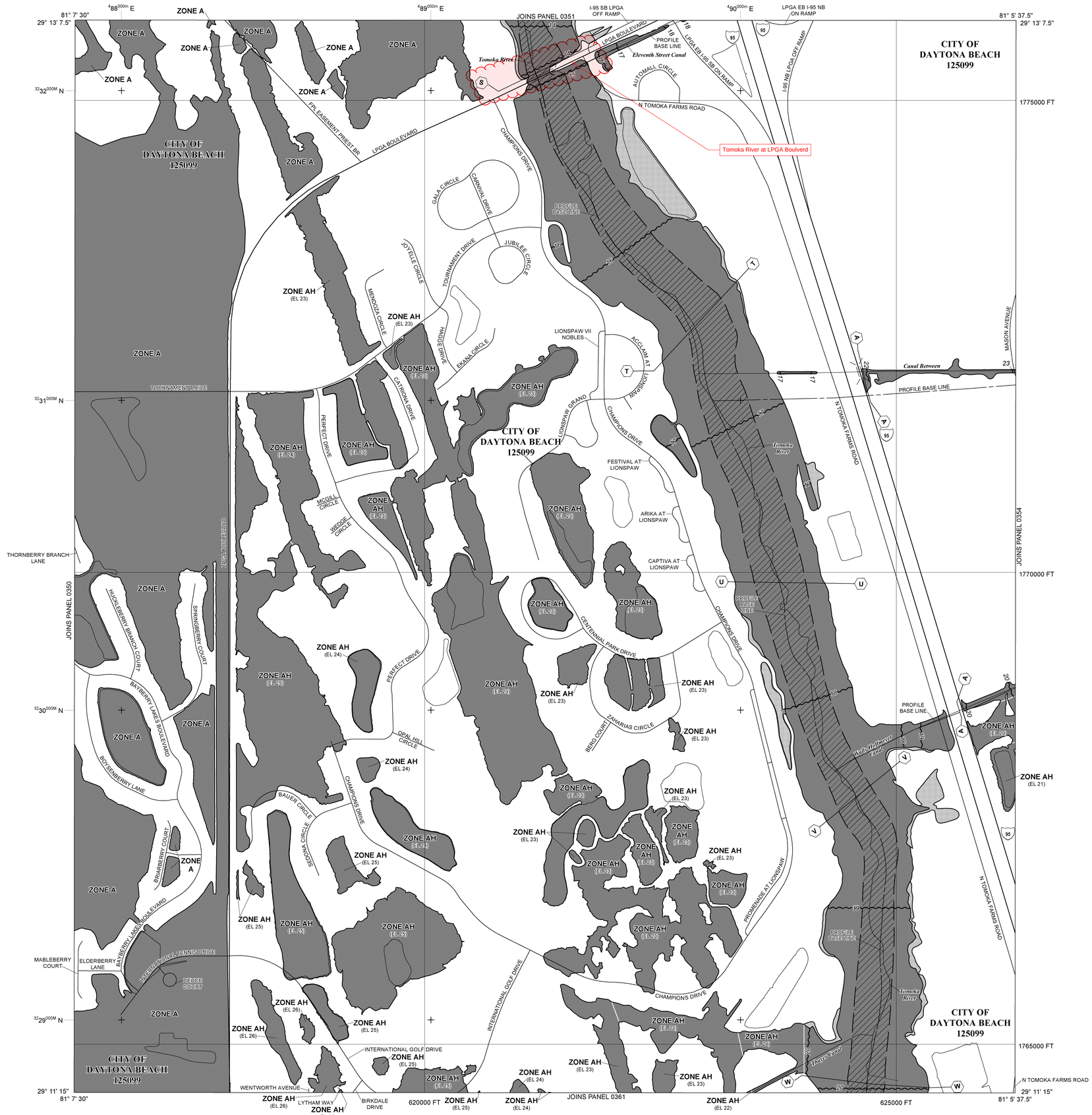
Base Map information shown on this FIRM was provided in digital format by the Volusia County, Florida GIS Department at a scale of 1:12,000 or larger from photography dated 2006 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.



LEGEND

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

The 1% annual chance 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 Areas 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 Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4889000m N — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 4989000FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPS Zone 0901), Lambert Conformal Conic
- DX5510 × — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
APRIL 15, 2002
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 19, 2014 - to update corporate limits, to reflect updated topographic information, to add and change Base Flood Elevations, to add floodways, to add and change Special Flood Hazard Areas, to incorporate previsously issued Letters of Map Revision, and to change zone designations.

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 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0353H

FIRM
FLOOD INSURANCE RATE MAP

VOLUSIA COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 353 OF 930
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DAYTONA BEACH, CITY OF	125099	0353	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
12127C0353H
MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

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. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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 East zone (FIPS zone 0901). The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 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, N/NGS12
National Geodetic Survey
SSMC-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 http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by the Volusia County, Florida GIS Department at a scale of 1:12,000 or larger from photography dated 2006 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

LEGEND

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

The 1% annual chance 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 Areas 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 Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4890000m N — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 4989000FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPS Zone 0901), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
APRIL 15, 2002

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 19, 2014 - to update corporate limits, to reflect updated topographic information, to add and change Base Flood Elevations, to add floodways, to add and change Special Flood Hazard Areas, to incorporate previsously issued Letters of Map Revision, and to change zone designations.

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 FEET
150 0 150 300 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0361H

FIRM
FLOOD INSURANCE RATE MAP

VOLUSIA COUNTY, FLORIDA
AND INCORPORATED AREAS

PANEL 361 OF 930
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DAYTONA BEACH, CITY OF	125099	0361	H
VOLUSIA COUNTY	125155	0361	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
12127C0361H
MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

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. Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

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 East zone (FIPS zone 0901). The **horizontal datum** was the North American Datum of 1983 (NAD 83), GRS1980 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, N/NGS12
National Geodetic Survey
SSMC-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 http://www.ngs.noaa.gov/.

Base Map information shown on this FIRM was provided in digital format by the Volusia County, Florida GIS Department at a scale of 1:12,000 or larger from photography dated 2006 or later.

Based on updated topographic information, this map reflects more detailed and up-to-date **stream channel configurations and floodplain delineations** than those shown on the previous FIRM for this jurisdiction. As a result, the Flood Profiles and Floodway Data tables may reflect stream channel distances that differ from what is shown on the map. Also, the road to floodplain relationships for unrevised streams may differ from what is shown on previous maps.

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.

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at http://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

LEGEND

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

The 1% annual chance 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 Areas 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 Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the North American Vertical Datum of 1988

- A — A — Cross section line
- 23 — 23 — Transect line
- Culvert
- Bridge
- Footbridge
- 45° 02' 08", 93° 02' 12" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83) Western Hemisphere
- 4889000m N — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 4989000FT — 5000-foot grid values: Florida State Plane coordinate system, East zone (FIPS Zone 0901), Lambert Conformal Conic
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
APRIL 15, 2002
EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 19, 2014 - to update corporate limits, to reflect updated topographic information, to add and change Base Flood Elevations, to add floodways, to add and change Special Flood Hazard Areas, to incorporate previsously issued Letters of Map Revision, and to change zone designations.

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 FEET

150 0 150 300 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0363H

FIRM

FLOOD INSURANCE RATE MAP

VOLUSIA COUNTY, FLORIDA AND INCORPORATED AREAS

PANEL 363 OF 930
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
DAYTONA BEACH, CITY OF	125099	0363	H
VOLUSIA COUNTY	125155	0363	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.

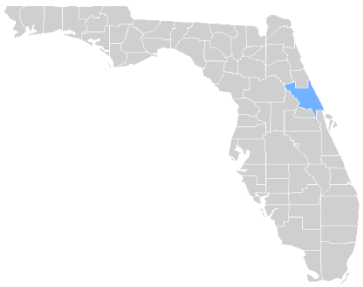
MAP NUMBER
12127C0363H
MAP REVISED
FEBRUARY 19, 2014

Federal Emergency Management Agency

FLOOD INSURANCE STUDY

FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUME 2 OF 5



VOLUSIA COUNTY, FLORIDA

AND INCORPORATED AREAS

COMMUNITY NAME	NUMBER	COMMUNITY NAME	NUMBER
DAYTONA BEACH, CITY OF	125099	NEW SMYRNA BEACH, CITY OF	125132
DAYTONA BEACH SHORES, CITY OF	125100	OAK HILL, CITY OF	120624
DEBARY, CITY OF	120672	ORANGE CITY, CITY OF	120633
DELAND, CITY OF	120307	ORMOND BEACH, CITY OF	125136
DELTONA, CITY OF	120677	PIERSON, TOWN OF	120675
EDGEWATER, CITY OF	120308	PONCE INLET, TOWN OF	120312
FLAGLER BEACH, CITY OF	120087	PORT ORANGE, CITY OF	120313
HOLLY HILL, CITY OF	125112	SOUTH DAYTONA, CITY OF	120314
LAKE HELEN, CITY OF	120674	VOLUSIA COUNTY (UNINCORPORATED AREAS)	125155

Reprinted with corrections on June 27, 2020

REVISED:

September 29, 2017

FLOOD INSURANCE STUDY NUMBER
12127CV002D
Version Number 2.3.3.2

FEMA

LOCATION		FLOODWAY			1% ANNUAL CHANCE FLOOD WATER SURFACE ELEVATION (FEET NAVD88)			
CROSS SECTION	DISTANCE[1]	WIDTH (FEET)	SECTION AREA (SQ. FEET)	MEAN VELOCITY (FEET/SEC)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
A	3345	203	2174	4.1	3.6[2]	1.8[3]	1.8	0.0
B	7,428	272	2,729	3.3	4.0[2]	3.4	3.8	0.4
C	14,219	418	4,165	2.1	4.8[2]	4.6	5.5	0.9
D	20,034	2,445	15,745	0.7	5.5[2]	5.4	6.4	1.0
E	22,925	241	3,677	3.4	5.7	5.7	6.7	1.0
F	23,484	249	3,905	3.2	5.9	5.9	6.9	1.0
G	25,739	659	7,158	1.7	6.3	6.3	7.3	1.0
H	30,663	281	4,786	2.7	7.0	7.0	8.0	1.0
I	35,095	756	8,739	1.5	7.5	7.5	8.5	1.0
J	38,241	309	4,866	2.8	7.8	7.8	8.7	0.9
K	43,152	477	6,335	2.2	8.5	8.5	9.5	1.0
L	45,210	542	6,734	2.1	8.9	8.9	9.9	1.0
M	46,912	311	4,754	1.3	9.2	9.2	10.2	1.0
N	49,810	448	4,298	1.8	9.4	9.4	10.4	1.0
O	52,677	774	8,499	0.9	10.4	10.4	11.4	1.0
P	54,934	536	6,267	1.0	11.3	11.3	12.3	1.0
Q	58,152	522	5,686	1.0	12.6	12.6	13.6	1.0
R	60,216	629	6,323	0.9	13.4	13.4	14.4	1.0
S	63,130	249	2,026	2.8	14.7	14.7	15.7	1.0

[1]Feet above Tomoka Basin
[2]Combined coastal and riverine effects from Atlantic Ocean
[3]Elevation computed without consideration of storm surge effects from Tomoka Basin

at LPGA

TABLE 24

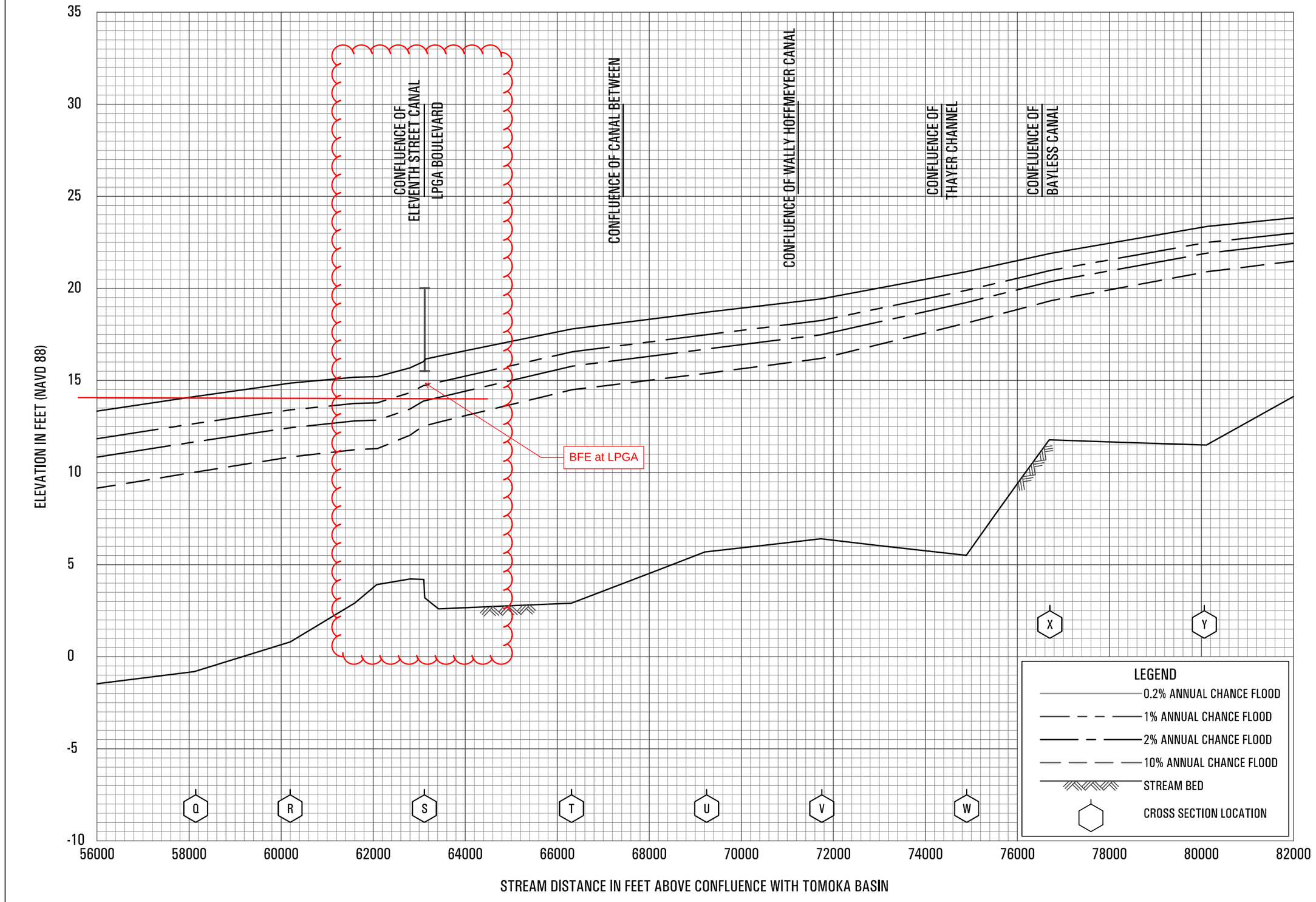
FEDERAL EMERGENCY MANAGEMENT AGENCY

VOLUSIA COUNTY, FLORIDA

AND INCORPORATED AREAS

FLOODWAY DATA

FLOODING SOURCE: TOMOKA RIVER



FLOOD PROFILES

TOMOKA RIVER

FEDERAL EMERGENCY MANAGEMENT AGENCY
VOLUSIA COUNTY, FL
AND INCORPORATED AREAS

Appendix D

Tomoka River Watershed Management Plan, Volusia County, FL

1995

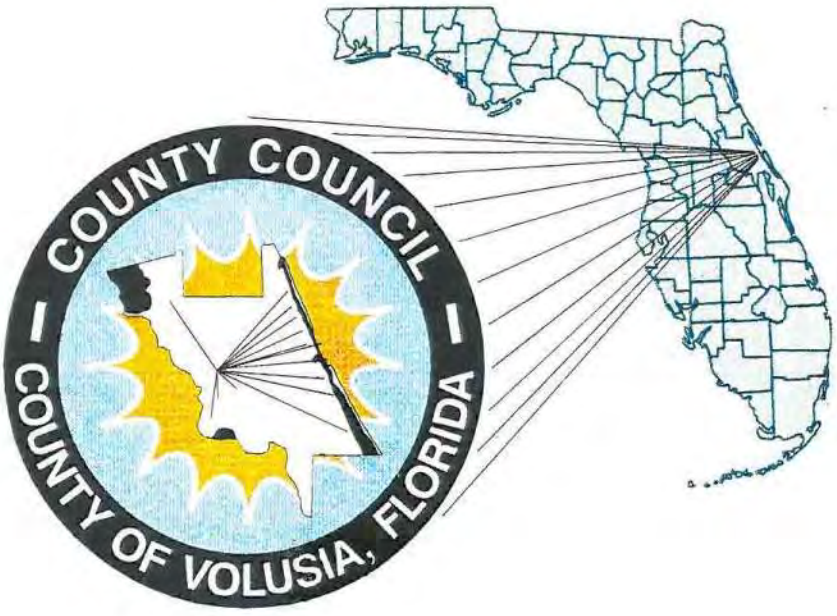
CDM Camp Dresser & McKee

Report

Volusia County Tomoka River Watershed Management Plan

Stormwater Control, Conservation and Aquifer Recharge Program

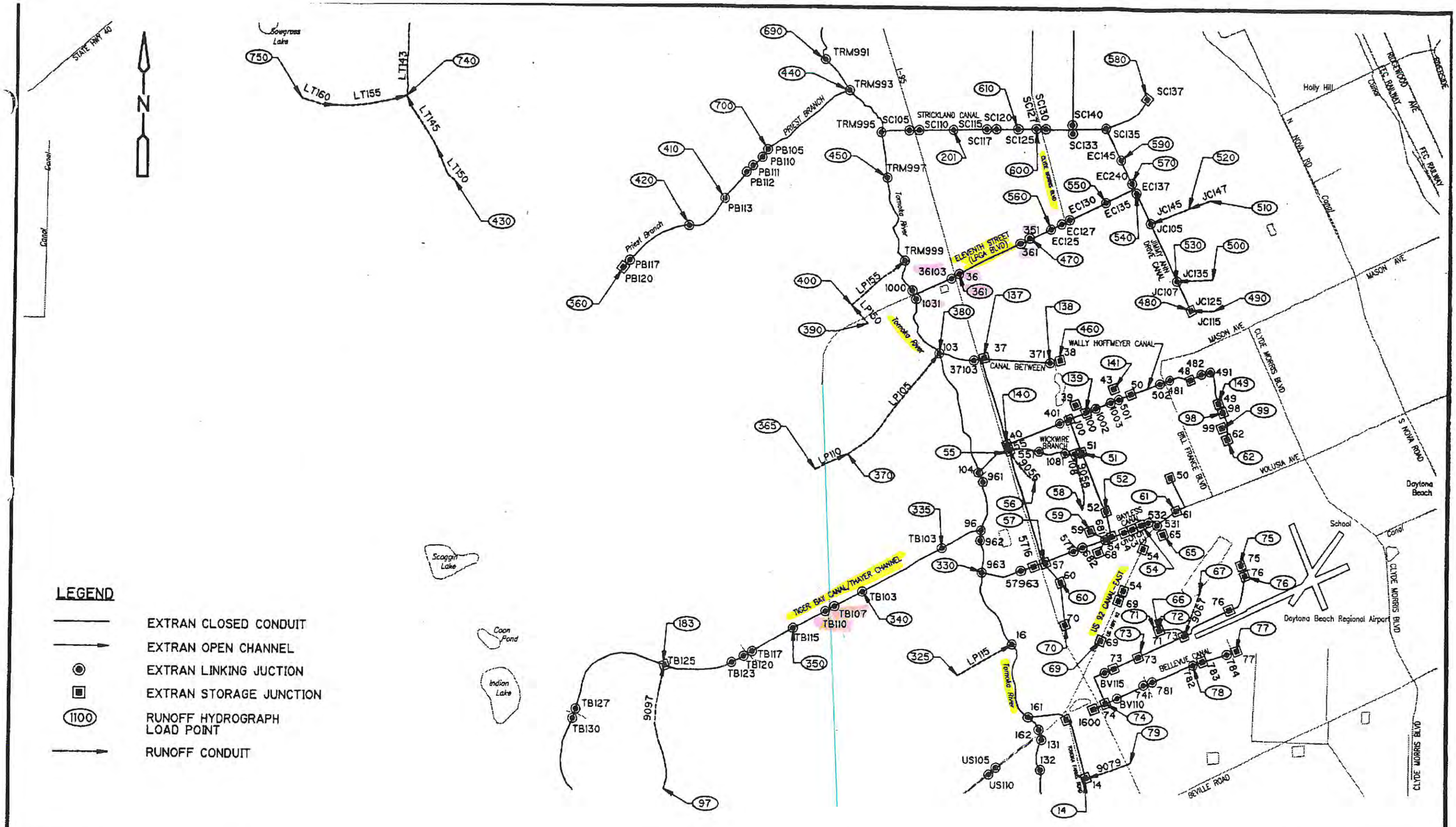
Final Report
April 1995



SUMMARY OF FLOOD STAGES (FUTURE LAND USE)											
TOMOKA RIVER WATERSHED MANAGEMENT PLAN											
WATERBODY	STREET NAME	JUNCTION NUMBER	10-YEAR FLOOD STAGE (FT-NAVD)	100-YEAR FLOOD STAGE (FT-NAVD)	FEMA (FT-NAVD)	AVG. EXIST. GROUND ELEVATION (FT-NAVD)		REMARKS	AVG. PROP. GROUND ELEVATION (FT-NAVD)	
US 92 CANAL WEST		US125	26.77	27.57	N/A (ZONE A)	28	IN AREA OF WIDENING	**NO PROP. ENCROACHMENT**	31	EXIST. ROADWAY ELEVATION
THAYER CHANNEL		TB107	22.07	23.77	N/A (ZONE A)	27	IN AREA OF WIDENING	**NO PROP. ENCROACHMENT**	31	EXIST. ROADWAY ELEVATION
	11TH STREET	TB110	23.47	24.17	N/A (ZONE A)	26	IN AREA OF WIDENING	**NO PROP. ENCROACHMENT**	30	EXIST. ROADWAY ELEVATION
TOMOKA RIVER SOUTH OF 11TH STREET	11TH STREET	1031	12.57	14.87	14.87	15	IN AREA OF WIDENING	**NO PROP. ENCROACHMENT**		
	WILLIAMSON BLVD	351	23.07	24.17	22.87	25	IN AREA OF WIDENING	**NO PROP. ENCROACHMENT**	25	EXIST. ROADWAY ELEVATION
11TH STREET CANAL	I-95	36103	18.77	19.67	14.87	25		**NO PROP. ENCROACHMENT**		
		36	19.37	20.97	20.87	25		**NO PROP. ENCROACHMENT**		
		361	22.57	23.37	20.87	24		**NO PROP. ENCROACHMENT**		

Notes:

1. Existing ground elevations are higher than the 10-year and 100-year floodplan elevations therefore is no proposed encroachment
2. Existing ground elevations (NAVD88) are based on LIDAR data obtained from NOAA.
3. 10-year and 100-year flood stages were obtained from the Tomoka River Watershed Management Plan
4. NAVD88 = NGVD29 - 1.13

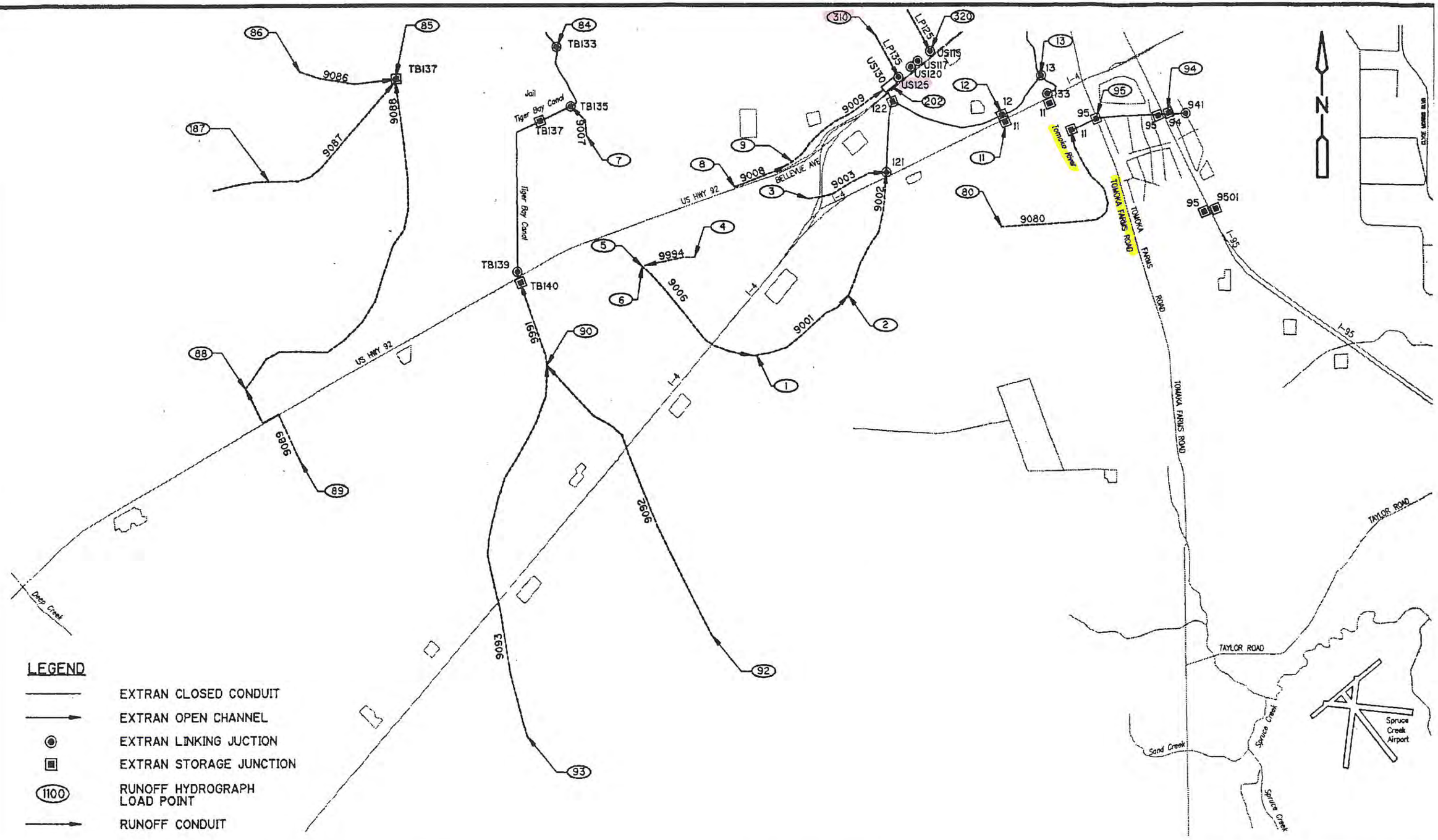


RUNOFF & EXTRAN SCHEMATIC PART B
TOMOKA RIVER WATERSHED MANAGEMENT PLAN
VOLUSIA COUNTY, FLORIDA

Page No. 427

environmental engineers, scientists, planners, & management consultants

CDM



RUNOFF & EXTRAN SCHEMATIC PART C
TOMOKA RIVER WATERSHED MANAGEMENT PLAN
VOLUSIA COUNTY, FLORIDA

Page 428

environmental engineers, scientists, planners, & management consultants CDM

NGVD29-1.13= NAVD88

TABLE 3-43

TOMOKA RIVER SOUTH OF 11th STREET
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

PRESENT LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
1031	11th Street	20.4	16.7	11.7	0.0	13.3	0.0	14.4	0.0	15.7	0.0		P
103				12.9		14.5		15.6		16.9			
104				15.1		16.9		17.9		19.1			
961	FPL Easement	17.7	17	16.3	0.0	18.1	0.4	18.7	1.0	19.4	1.7		
96				16.9		18.7		19.4		20.2			
962	FPL Easement	17.5	14.3	18.3	0.8	19.8	2.3	20.4	2.9	21.0	3.5		
963				18.6		20.3		20.9		21.7			
16				20.2		21.7		22.6		23.4			
161				21.6		23.1		23.9		24.8			
162				21.7		23.2		24.0		24.9			
131	U.S. 92	25.8	24	22.9	0.0	23.7	0.0	24.4	0.0	25.4	0.0		P
132				22.5		23.8		24.6		25.5			
13				23.7		24.4		24.9		25.7			
133				23.7		24.4		24.9		25.7			

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-44

TOMOKA RIVER SOUTH OF 11th STREET
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

FUTURE LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
1031	11th Street	20.4	16.7	12.1	0.0	13.7	0.0	14.7	0.0	16.0	0.0		P
103				13.2		14.9		15.9		17.2			
104				15.4		17.2		18.2		19.4			
961	FPL Easement	17.7	17	16.9	0.0	18.3	0.6	18.9	1.2	19.6	1.9		
96				17.4		18.9		19.6		20.4			
962	FPL Easement	17.5	14.3	18.7	1.2	20.0	2.5	20.5	3.0	21.2	3.7		
963				19.1		20.5		21.1		21.8			
16				20.5		21.9		22.8		23.6			
161				22.0		23.4		24.1		25.0			
162				22.0		23.4		24.2		25.0			
131	U.S. 92	25.8	24	22.7	0.0	23.9	0.0	24.6	0.0	25.5	0.0		P
132				22.9		24.0		24.7		25.6			
13				23.9		24.5		25.0		25.8			
133				23.9		24.5		25.0		25.8			

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-46

11TH STREET CANAL
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

PRESENT LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
36103				18.2		19.6		20.1		20.7			
36	I-95	27.6	21.9	18.4	0.0	20.0	0.0	20.8	0.0	21.7	0.0		P
361				22.4		23.4		23.8		24.3			
351	Williamson Blvd.	28.0	22.7	22.7	0.0	23.8	0.0	24.4	0.0	25.0	0.0		P
EC125				23.0		24.2		24.8		25.3			
EC127				23.1		24.4		25.0		25.5			
EC130	Clyde Morris Blvd.	28.0	20.8	23.4	0.0	24.9	0.0	25.6	0.0	26.4	0.0		
EC135				23.5		25.0		25.8		26.5			
EC137				23.6		25.1		25.9		26.6			
EC140	11th St.	27.6	19.2	23.3	0.0	24.5	0.0	25.3	0.0	26.1	0.0		
EC145				23.3		24.5		25.3		26.1			

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-47

11TH STREET CANAL
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

FUTURE LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
36103				18.9		19.9		20.4		20.8			
36	I-95	27.6	21.9	19.2	0.0	20.5	0.0	21.2	0.0	22.1	0.0		P
361				23.1		23.7		24.0		24.5			
351	Williamson Blvd.	28.0	22.7	23.5	0.0	24.2	0.0	24.7	0.0	25.3	0.0		P
EC125				23.8		24.6		25.0		25.6			
EC127				23.9		24.8		25.2		25.7			
EC130	Clyde Morris Blvd.	28.0	20.8	24.3	0.0	25.4	0.0	26.0	0.0	26.7	0.0		
EC135				24.4		25.6		26.1		26.8			
EC137				24.5		25.7		26.2		26.9			
EC140	11th St.	27.6	19.2	23.7	0.0	24.8	0.0	25.5	0.0	26.2	0.0		
EC145				23.7		24.8		25.5		26.2			

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-61

TIGER BAY CANAL/THAYER CHANNEL
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

PRESENT LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
TB103				19.2		21.0		22.0		22.7			
TB105				20.3		22.5		23.6		24.6			
TB107				21.3		22.8		23.8		24.6			
TB110	11th St.	33.5	24.7	24.1	0.0	24.5	0.0	24.8	0.0	25.2	0.0		P
TB115				24.5		25.2		25.8		26.6			
TB117				26.6		27.0		27.2		27.4			
TB120	Dirt Road	31.3	30.3	26.7	0.0	27.0	0.0	27.2	0.0	27.4	0.0		
TB123				28.2		28.6		28.7		29.0			
TB125				29.8		30.4		30.6		30.9			
TB127				30.2		30.9		31.3		31.8			
TB130	Dirt Road	36.3	32.1	30.2	0.0	31.0	0.0	31.5	0.0	32.2	0.0		
TB133				30.7		31.3		31.7		32.4			
TB135				31.4		31.9		32.3		33.0			
TB137				34.6		35.8		36.7		37.6			
TB139				36.1		37.3		38.0		38.9			
TB140	U.S. 92	40.7	37.6	36.1	0.0	37.3	0.0	38.1	0.0	38.9	0.0		P

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-62

TIGER BAY CANAL/THAYER CHANNEL
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

FUTURE LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
TB100				19.6		21.4		22.2		22.9			
TB105				20.8		22.9		23.9		24.9			
TB107				21.4		23.2		24.0		24.9			
TB110	11th St.	33.5	24.7	24.2	0.0	24.6	0.0	24.9	0.0	25.3	0.0		P
TB115				24.6		25.3		26.0		26.9			
TB117				26.7		27.0		27.2		27.4			
TB120	Dirt Road	31.3	30.3	26.7	0.0	27.1	0.0	27.2	0.0	27.4	0.0		
TB123				28.2		28.6		28.7		29.0			
TB125				29.8		30.4		30.6		30.9			
TB127				30.2		30.9		31.3		31.8			
TB130	Dirt Road	36.3	32.1	30.2	0.0	31.0	0.0	31.5	0.0	32.2	0.0		
TB133				30.8		31.4		31.9		32.4			
TB135				31.4		31.9		32.4		33.0			
TB137				34.6		35.9		36.7		37.6			
TB139				36.1		37.3		38.0		38.9			
TB140	U.S. 92	40.7	37.6	36.1	0.0	37.3	0.0	38.1	0.0	38.9	0.0		P

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-70

U.S. 92 CANAL - WEST
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

PRESENT LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
US105				24.6		25.6		26.4		27.2			
US110	Wooden Bridge	28.5	23.8	24.6	0.0	25.6	0.0	26.4	0.0	27.2	0.0		
US115				25.8		26.9		27.8		28.5			
US117				26.3		27.3		27.9		28.6			
US120	Wooden Bridge	29	25.3	26.5	0.0	27.7	0.0	28.2	0.0	28.7	0.0		
US125				26.7		27.8		28.3		28.7			
US130	11th Street	29.7	26	26.8	0.0	28.0	0.0	28.6	0.0	29.1	0.0		P

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.

TABLE 3-71

U.S. 92 CANAL WEST
SUMMARY OF FLOOD STAGES AND PROBLEM AREAS (1)

FUTURE LAND USE

JUNCTION NUMBER	STREET NAME	TOP OF ROAD ELEV. (FT-NGVD)	LOW CHORD (FT-NGVD)	2-YEAR FLOOD STAGE (FT-NGVD)	2-YEAR ROAD (2) FLOODING (FT)	10-YEAR FLOOD STAGE (FT-NGVD)	10-YEAR ROAD FLOODING (FT)	25-YEAR FLOOD STAGE (FT-NGVD)	25-YEAR ROAD FLOODING (FT)	100-YEAR FLOOD STAGE (FT-NGVD)	100-YEAR ROAD FLOODING (FT)	PROBLEM ID NUMBER(3)	ROADWAY TYPE (4)
US105				24.7		25.6		26.4		27.3			
US110	Wooden Bridge	28.5	23.8	24.7	0.0	25.7	0.0	26.4	0.0	27.3	0.0		
US115				25.9		27.0		27.9		28.6			
US117				26.4		27.3		28.0		28.6			
US120	Wooden Bridge	29	25.3	26.6	0.0	27.7	0.0	28.2	0.0	28.7	0.0		
US125				26.8		27.9		28.3		28.7			
US130	11th Street	29.7	26	26.9	0.0	28.1	0.0	28.7	0.0	29.1	0.0		P

(1) - All stages and elevations are referenced to National Geodetic Vertical Datum of 1929 (FT-NGVD) unless otherwise noted.
(2) - Road flooding stage is referenced to road crown elevation.
(3) - Problem ID number is referenced to the associated Water Quantity Problem Area Figure.
(4) - Road type descriptions are as follows:
P = Primary evacuation route.
S = Secondary evacuation route.