FINAL
ALTERNATIVE STORMWATER MANAGEMENT FACILITY REPORT

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Project Development and Environment Study
Pinellas County, Florida

Work Program Item Segment No: 410755 1

Prepared for:

Florida Department of Transportation
District Seven
11201 North McKinley Drive
Tampa, Florida 33612-6456

June 2008

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Prepared for:

Florida Department of Transportation
District Seven
11201 N. Malcolm McKinley Drive
Tampa, Florida 33612

Prepared by:

5300 West Cypress Street
Suite 200
Tampa, Florida 33607

June 2008

EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) conducted a Project Development and Environment (PD&E) Study for roadway and bridge improvement alternatives along S.R. 679 (Pinellas Bayway Structure E) at the Gulf Intracoastal Waterway. This report presented the preliminary analysis of alternative stormwater management facility (SMF) sites recommended for the Pinellas Bayway at Intracoastal Waterway project in Pinellas County, Florida, for each alternative bridge typical. All of the bridge improvement alternatives evaluated for this facility results in a two-lane bridge. The alternatives are: Alternative 1 – Rehabilitation, Alternative 2 – Rehabilitation with Widening, Alternative 3 – Low-Level Bascule Bridge replacement, Alternative 4 – Mid-Level Bascule Bridge replacement, Alternative 5 – High-Level Fixed-Span replacement over the Existing Channel, and Alternative 6 – High-Level Fixed-Span replacement over a Relocated Channel. Alternative 5 is the Recommended Alternative.

SMF site alternatives were chosen for all bridge alternatives except the two rehabilitation alternatives. The two rehabilitation alternatives will not require a SMF site since it is an alteration of an existing roadway without additional capacity. All bridge replacement alternatives will require SMFs since the existing bridge is proposed to be completely replaced and requires changing the geometry of the bridge. These alternatives would be classified as a new project and therefore needs to comply with water quality criteria (treat entire DCIA of project area).

Another alternative studied within this SMF siting report was a four-lane High-Level Fixed-Span replacement over a Relocated Channel. This alternative examined the SMF size required for a four-lane typical section within the project limits of the Recommended Alternative (Alternative 5) and identified a location within the project limits for a potential four-lane SMF site. The four-lane alternative is not viable at this time due to Work Program construction funding constraints. However, it was studied to verify that the two-lane Recommended Alternative can accommodate a potential future improvement to four lanes.

Preferred SMF sites for each bridge alternative are found in Table 1. All SMFs in the Pinellas Bayway have one ultimate outfall: the Boca Ciega Bay, which is a tidally influenced waterway. Attenuation will not be required in areas with unrestricted discharges to these outfalls. Several aspects were explored in analysis of each SMF alternative.

These aspects include environmental impacts, construction costs, right-of-way (ROW) needs, and hydraulics – the ease/difficulty in conveying the stormwater runoff to the SMF. This aspect takes into account Seasonal High Water Table (SHWT) elevations, treatment, and/or attenuation- depths. Construction and ROW costs for the recommended pond alternatives are found in Section 4.4 and 4.5 of this report.

The recommended SMF alternatives are found in Table 1 below:

Table 1
Recommended SMF Locations

BRIDGE ALTERNATIVE	BASIN A	BASIN B
Alternative 1 Rehabilitation	No SMF required	No SMF required
Alternative 2 Rehabilitation with Widening	No SMF required	No SMF required
Alternative 3 – Low-Level Bascule Bridge Replacement	SMF A-1 under proposed bridge	SMF B-1-A linear pond
Alternative 4 – Mid-Level Bascule Bridge Replacement	SMF A-1 under proposed bridge	SMF B-1-A linear pond
Alternative 5 – High-Level Fixed-Span Replacement over Existing Channel	SMF A-1 under proposed bridge	SMF B-1-B under proposed bridge
Alternative 6 – High-Level Fixed-Span Replacement over Relocated Channel	SMF A-1 under proposed bridge	SMF B-1-B under proposed bridge
Four–lane High-Level Fixed-Span over Relocated Channel	SMF A-1 under proposed bridge	SMF B-1-B under proposed bridge

The recommended bridge alternative is Alternative 5, two-lane High-Level Fixed-Span over the Existing Channel. The proposed bridge structure accommodates a SMF under both the north and south end of the bridge to meet treatment requirements for the Recommended Alternative. These proposed pond configurations also accommodate a potential future four-lane bridge for a High-Level Fixed-Span over the Existing Channel without modification to the pond.

TABLE OF CONTENTS

(TABLE OF CONTENTS CONT.)

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF EXHIBITS

Section 1.0
GENERAL PROJECT INFORMATION

1.1 INTRODUCTION

The Florida Department of Transportation (FDOT) conducted a Project Development and Environment (PD&E) Study for roadway and bridge improvement alternatives along S.R. 679 (Pinellas Bayway) at the Gulf Intracoastal Waterway. The project location map (Figure 1.2.1) illustrates the location and limits of the study.

1.2 PURPOSE OF STORMWATER MANAGEMENT FACILITY REPORT

The purpose of this Final Alternative Stormwater Management Facility (SMF) Report was to provide the basis for which SMF alternative was chosen for each basin. This report evaluated two SMF sites in each basin for each bridge alternative. All of the bridge improvement alternatives evaluated for this facility results in a two-lane bridge. The alternatives are: Alternative 1 – Rehabilitation, Alternative 2 – Rehabilitation with Widening, Alternative 3 – Low-Level Bascule Bridge replacement, Alternative 4 – Mid-Level Bascule Bridge replacement, Alternative 5 – High-Level Fixed-Span over Existing Channel replacement, and Alternative 6 – High-Level Fixed-Span replacement over a Relocated Channel.

Another alternative studied within this SMF siting report was a four-lane High-Level Fixed-Span replacement over a Relocated Channel. This alternative examined the SMF size required for a four-lane typical section within the project limits of the Recommended Alternative (Alternative 5) and identified a location within the project limits for a potential four-lane SMF site. The four-lane alternative is not viable at this time due to Work Program construction funding constraints. However, it was studied to verify that the two-lane Recommended Alternative can accommodate a potential future improvement to four lanes.

The recommended SMF sites for each bridge alternative are found in Table 1 on page ii of this report.

1.3 PURPOSE OF PD&E STUDY

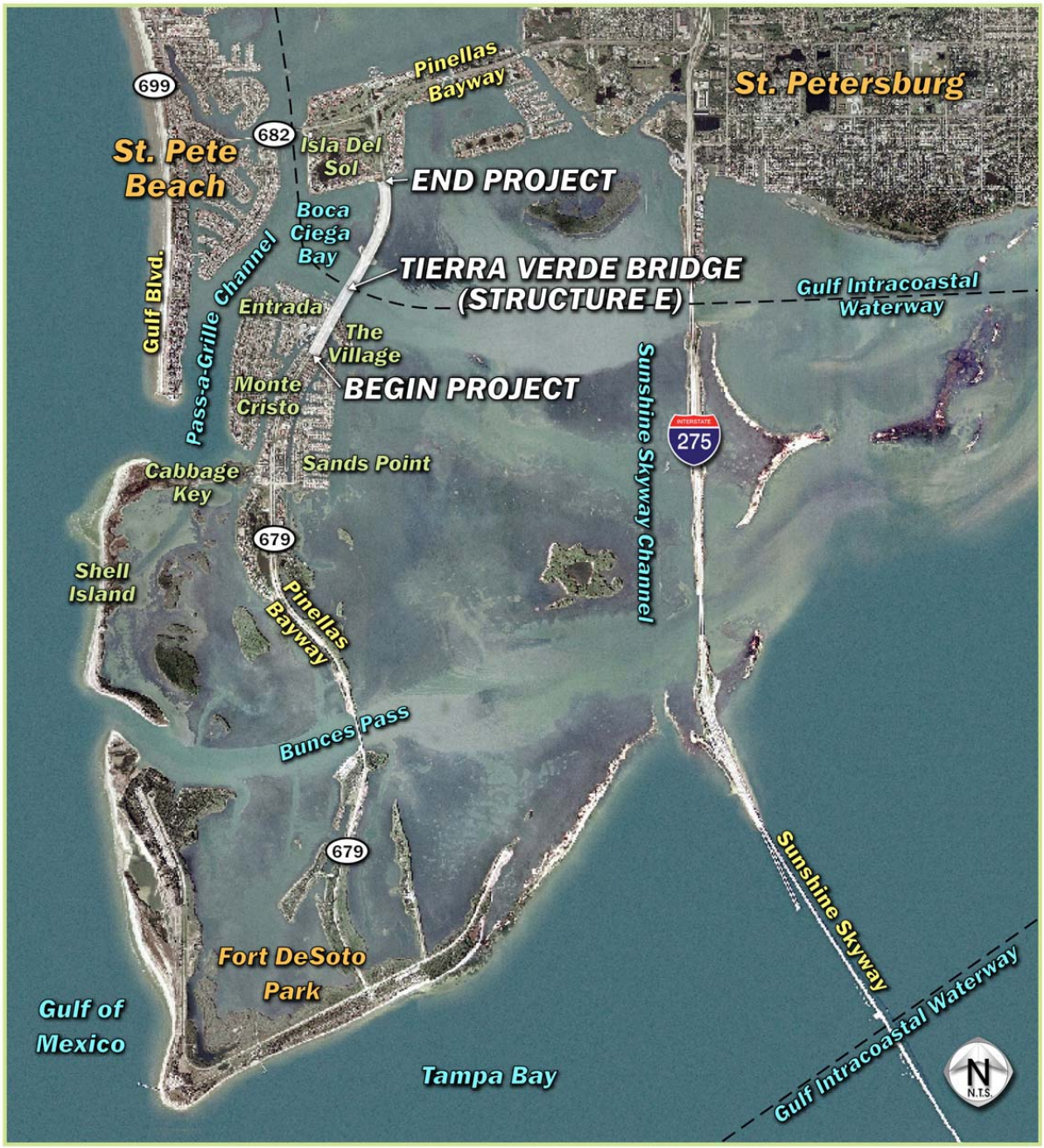
The purpose of the PD&E Study was to provide documented environmental and engineering analyses to assist FDOT and the United States Coast Guard (USCG), the lead federal agency, in reaching a decision as to the type, location, and conceptual design of roadway and bridge improvements to the S.R. 679 (Pinellas Bayway) crossing of the Gulf Intracoastal Waterway. The PD&E Study satisfied the requirements of the National Environmental Policy Act (NEPA) and other federal regulations.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

PROJECT LOCATION MAP

Figure 1.2.1



The PD&E Study documented the need for the improvements and presents the procedures FDOT utilized to develop and evaluate various improvement alternatives including rehabilitation and replacement of the existing double-leaf bascule bridge (Bridge Number 150049, or 'Structure E') known locally as the Tierra Verde Bridge. FDOT collected information relating to the engineering and environmental characteristics essential for alternatives and analytical decisions. FDOT then established design criteria and developed preliminary alternatives. The comparison of alternatives is based on a variety of parameters utilizing a matrix format. This process identified the alternative, which would have the least impact, while providing the necessary improvements. The study also solicited input from the community and users of the facility. The design year for the analysis is 2030.

1.4 SITE LOCATION AND DESCRIPTION

The PD&E Study limits encompass the portion of S.R. 679 (Pinellas Bayway) from south of Madonna Boulevard (milepost 8.366) in Tierra Verde to south of S.R. 682 (milepost 9.454) in Pinellas County, Florida, a distance of 1.088 miles. The project is located within Sections 8, 17, and 20, Township 32 South, Range 16 East, and within the Pass-A-Grille Beach United States Geological Survey (USGS) Quad map (quad Number 3022). Structure E is a low-level bascule structure that spans the Gulf Intracoastal Waterway, a marked federal navigational channel that generally runs between the mainland and the nearly contiguous barrier islands along the Gulf of Mexico. S.R. 679 (Pinellas Bayway) is not part of the National Highway System, the Florida Intrastate Highway System, or the Strategic Intermodal System (SIS); however, the Intracoastal Waterway within the study area is on the SIS. In addition, both S.R. 682 and S.R. 679 (Pinellas Bayway) are designated hurricane evacuation routes.

S.R. 679 (Pinellas Bayway) was originally constructed in 1961 to join the man-made islands of Tierra Verde with Isla Del Sol in St. Petersburg in Pinellas County. S.R. 679 (Pinellas Bayway) is a north-south urban minor arterial that provides the only vehicular access to the islands of Tierra Verde and Mullet Key, where Fort Desoto Park is located. S.R. 679 (Pinellas Bayway) is part of the Pinellas Bayway toll system, which also includes S.R. 682. Three toll plazas are located along the Pinellas Bayway; however, none are located within the study limits.

1.5 SOIL CHARACTERISTICS

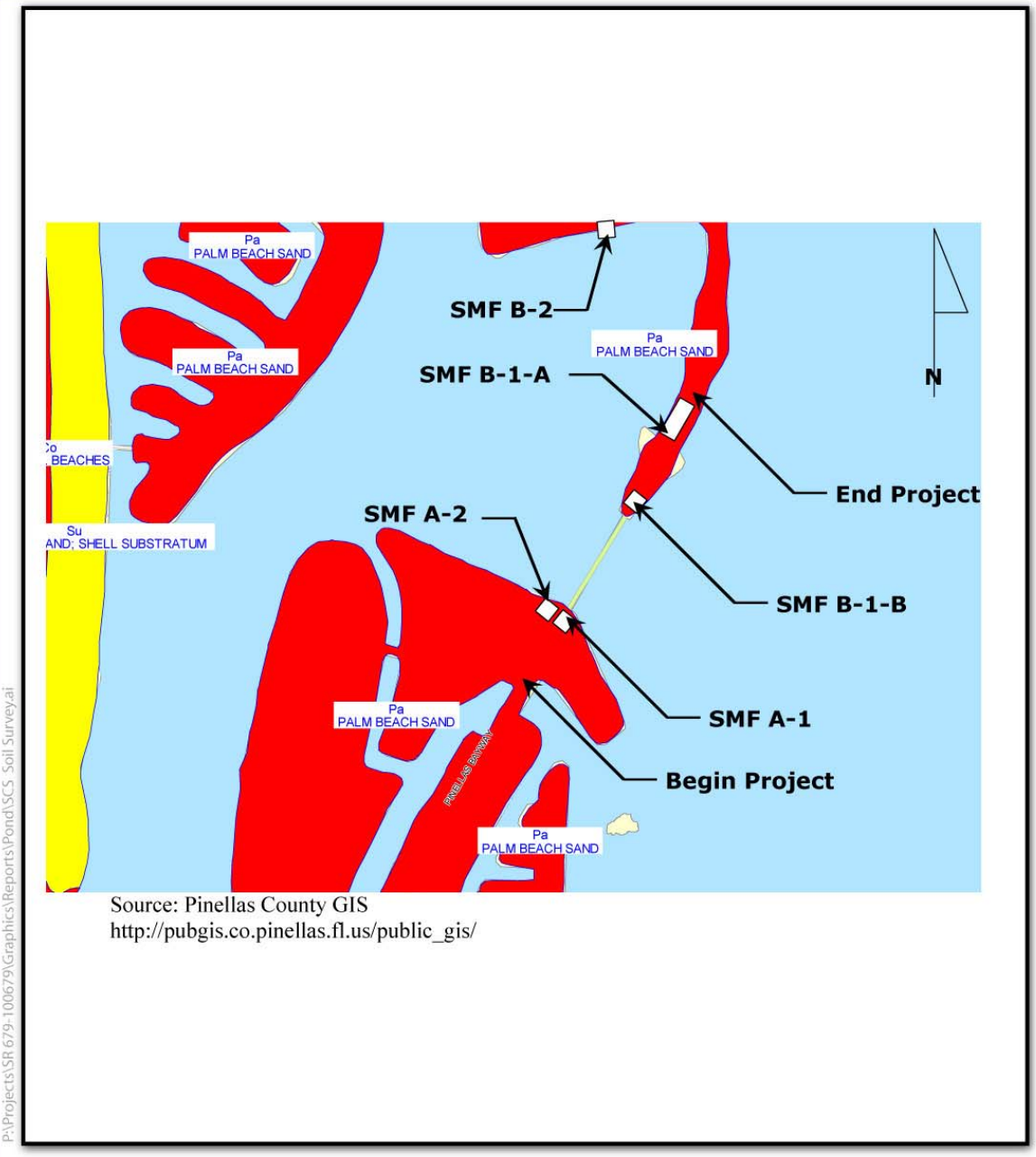
The soil types, as found in the Soil Conservation Service (SCS) Soil Survey for Pinellas County for each SMF alternative are presented in Table 1.5.1 and soil types are shown in Figure 1.5.1**.** The table includes the Hydrologic Soil Group and the approximate depth of the Seasonal High Water Table (SHWT) for the soil type. The existing ground near the SMF alternatives is approximately 5 feet (ft), according to the Southwest Florida Water Management District (SWFWMD) contour maps. The SHWT for all SMF's is 1.7 ft.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

SCS Soil Survey Map

Figure 1.5.1



Source: Pinellas County GIS
http://pubgis.co.pinellas.fl.us/public_gis/

However, the Mean High Water (MHW) of the Boca Ciega Bay will be used as the control elevation for all SMFs, since they are all located near the Bay. The MHW of the Boca Ciega Bay is 1.87 ft.

Table 1.5.1
Soils/SHWT Information for Each SMF

SMF	Soil Type	Soil Name	Hydrologic Soil Group	Depth To SHWT (ft)
A-1 A-2 B-1-A B-1-B B-2	Pa	Palm Beach Sand	A	3.3-5.0

1.6 FLOODPLAIN INFORMATION

This section of the document will serve as the PD&E Location Hydraulic Report requirements that comply with 23 CRF 650 and 23 CFR 771. The flood risk associated with encroachment to floodplain was analyzed and identified as minimal encroachment. The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) panel numbers 12103C0278G and 12103C279G dated September 3, 2003 shows the Pinellas Bayway Structure E location. FEMA firm maps are shown in Figures 1.6.1 and Figure 1.6.2.

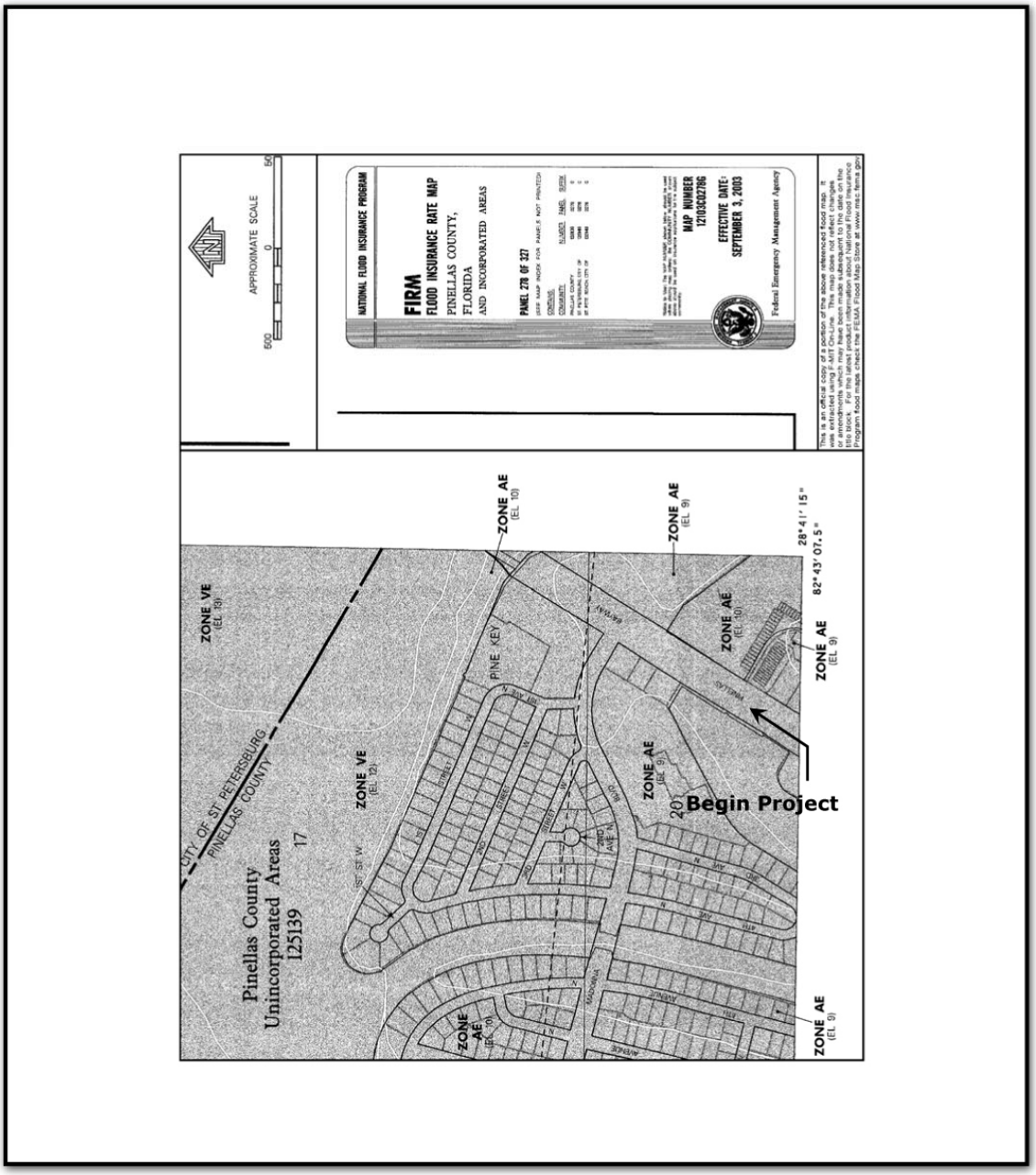
There are shaded areas within Zone AE where a base flood elevation ranges from 9 ft to 12 ft within the project limits. Flood elevations on the maps are referenced to the North American Vertical Datum of 1988 (NAVD 1988). These were determined based on tidal influences. The entire project is located within the 100-year storm surge floodplain; however, since it is tidally influenced, no floodplain mitigation is required. This project will not affect flood heights or floodplain limits. In addition, this project will not have any impacts on human life, transportation facilities, and natural and beneficial floodplains.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

FEMA Map

Figure 1.6.1



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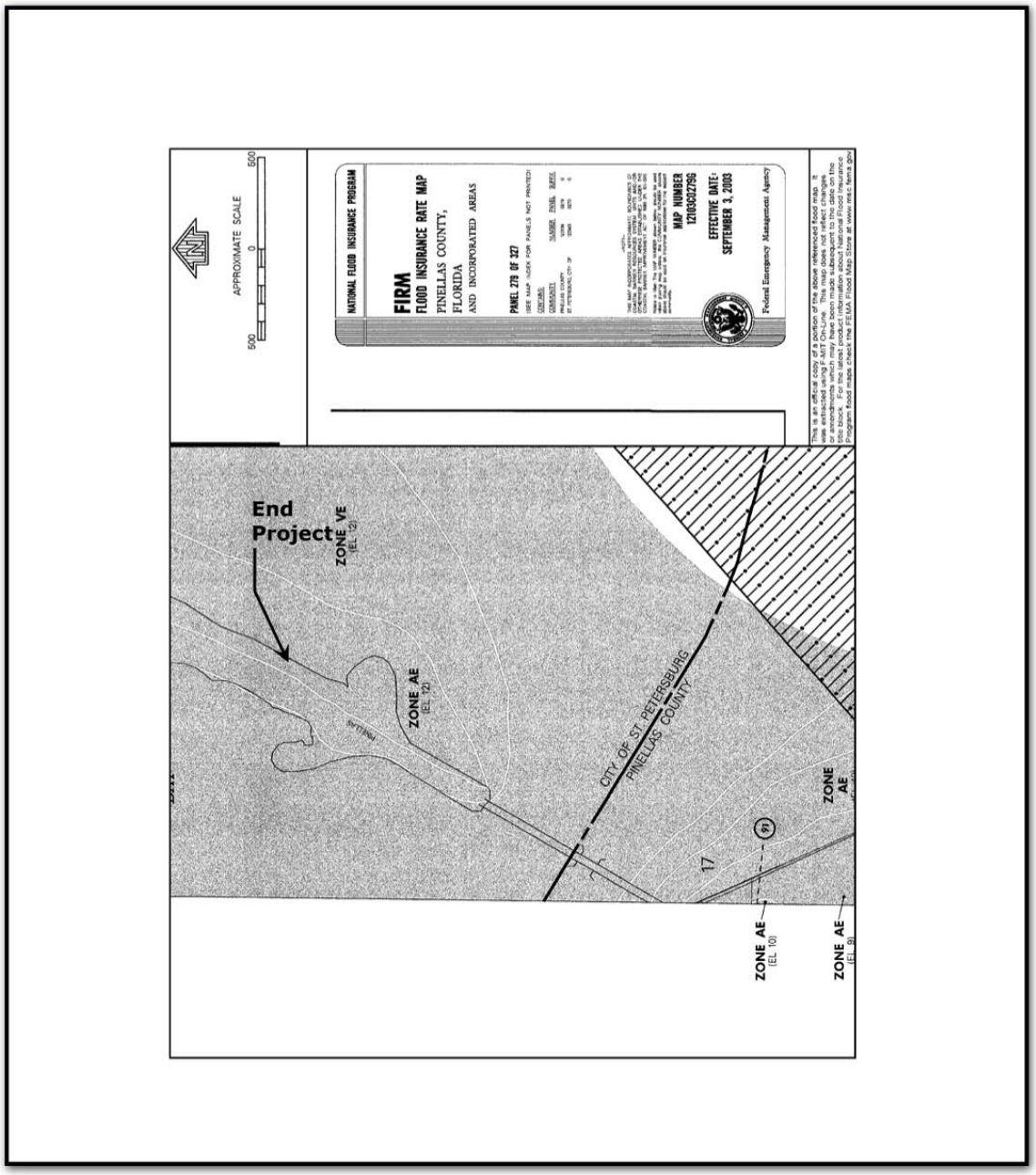
S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

FEMA Map

Figure 1.6.2



Section 2.0
DRAINAGE REFERENCE AND RESOURCE INFORMATION

2.1 MEETINGS

2.1.1 SWFWMD PRE-APPLICATION MEETING

The Southwest Florida Water Management District (SWFWMD) Environmental Resource Permit (ERP) pre-application meeting took place on April 26, 2006. The meeting minutes are located in Appendix B.

- Boca Ciega Bay is an Outstanding Florida Water (OFW) and an aquatic preserve and requires an additional 50 percent treatment volume.

- SWFWMD discussed thoroughly Alternative 6 which requires relocating the existing channel 400 ft north of the existing channel and will require dredging of a new channel. SWFWMD suggested discussing the dredging operation with the Florida Department of Environmental Protection (FDEP), since they are the agency normally designated to regulate channel relocation and dredging. FDEP has more experience and knowledge of the regulation governing those activities.

- Attenuation is not required since the outfall is tidally influenced.

2.1.2 METHODOLODY MEETING WITH FDOT

This meeting was held to coordinate initial findings of the Pond Siting Report for the roadway and bridge rehabilitation and replacement alternatives. Stormwater Management Facilities (SMF) to accommodate a two-lane bridge can be located within the existing right-of-way (ROW) under both the north and south bridge approaches. However, the initial preliminary SMF configuration on the south approach would conflict with a potential future four-lane configuration. The FDOT District Seven design engineer suggested the bridge allow the needed SMF area under the bridge, thereby accommodating a potential four-lane condition without the need to reconfigure the SMF. The meeting minutes are located in Appendix A.

2.2 CURVE NUMBERS

Since attenuation is not required, the curve numbers are not necessary for pre/post calculations. However, the Preliminary SMF Sizing Calculations (Appendix C) show the curve numbers for informational purposes.

2.3 RAINFALL INTENSITY DATA

Since attenuation is not required, the rainfall intensity data is not necessary.

2.4 RESOURCES FOR ANALYSIS

The resources used for this report included:

- SWFWMD ERP Information Manual
- FDOT Stormwater Management Handbook
- FDOT Hydrology Handbook
- Urban Hydrology for Small Watersheds (TR-55)
- Soil Conservation Service (SCS) Soils Survey for Pinellas County
- FDOT Drainage Manual
- Pinellas County GIS – http://pubgis.co.pinellas.fl.us/public_gis/

For project specific information, existing plans for the area were available for use, including:

- FDOT project for S.R. 679 (Pinellas Bayway) from North of Structure E to south of S.R. 682 (FPID 257097-1-52-01). These existing roadway plans were used for information regarding the existing elevations of the roadway and groundwater elevations adjacent to the roadway.

Section 3.0
EXISTING DRAINAGE CHARACTERISTICS

3.1 EXISTING DRAINAGE PATTERNS

Runoff along S.R. 679 (Pinellas Bayway) on Tierra Verde is captured through median or curb inlets and discharged into Boca Ciega Bay. Drainage on the bridges is discharged through scuppers directly into Boca Ciega Bay, an Outstanding Florida Water (OFW) and State Aquatic Preserve. Runoff from the roadway on the causeway is discharged to the bay as sheet flow.

3.2 SEASONAL HIGH WATER TABLE ELEVATIONS

The Seasonal High Water Table (SHWT) elevation for each Stormwater Management Facilities (SMF) site is dependent on the Mean High Water (1.87 ft) of Boca Ciega Bay since all SMF sites studied in this report are located within a close proximity to the Bay.

3.3 EXISTING STORMWATER MANAGEMENT FACILITIES

The existing roadway drains directly to the Boca Ciega Bay without any water quality treatment. There are no major drainage structures or retention/detention SMFs within the project limits.

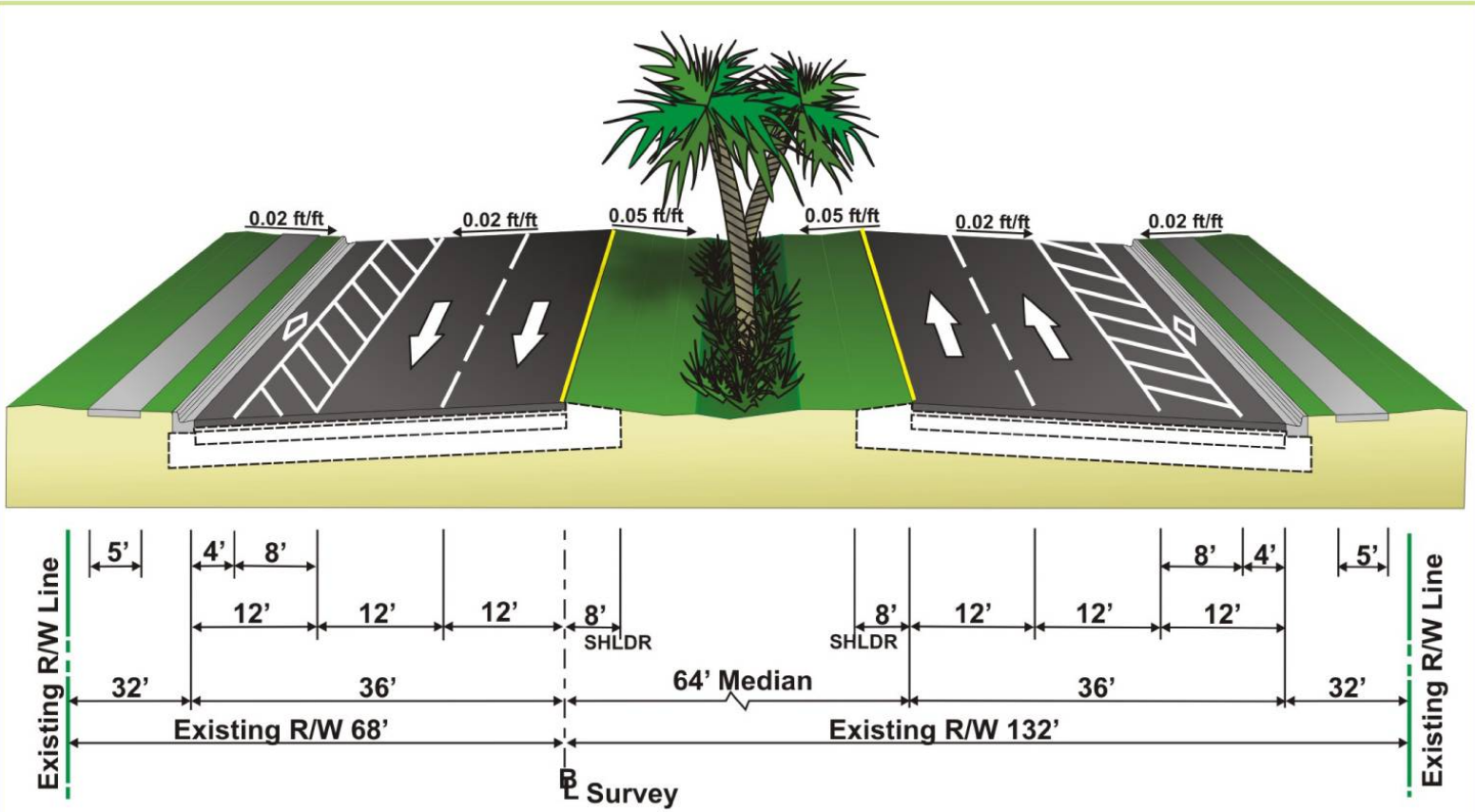
3.4 EXISTING TYPICAL SECTION AND LAND USE

The existing typical section south of Structure E is a four-lane urban roadway with 12-ft lanes and 4-ft bike lanes, with Type F curb and gutter on the outside of the roadway. The existing land use within this typical section is mixed residential and commercial sites. Existing typical section north of the Pinellas Bayway Bridge is a rural roadway with two 12-ft travel lanes and 5-ft paved shoulders which drain to roadside swales that sheet flow into Boca Ciega Bay. Existing land use within this typical section is mixed open space and residential sites. See Figure 3.4.1, 3.4.2, and 3.4.3 for existing roadway and bridge typical sections.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Existing Roadway Typical Section
South of Structure E

WPI Segment No: 410755-1

Figure 3.4.1

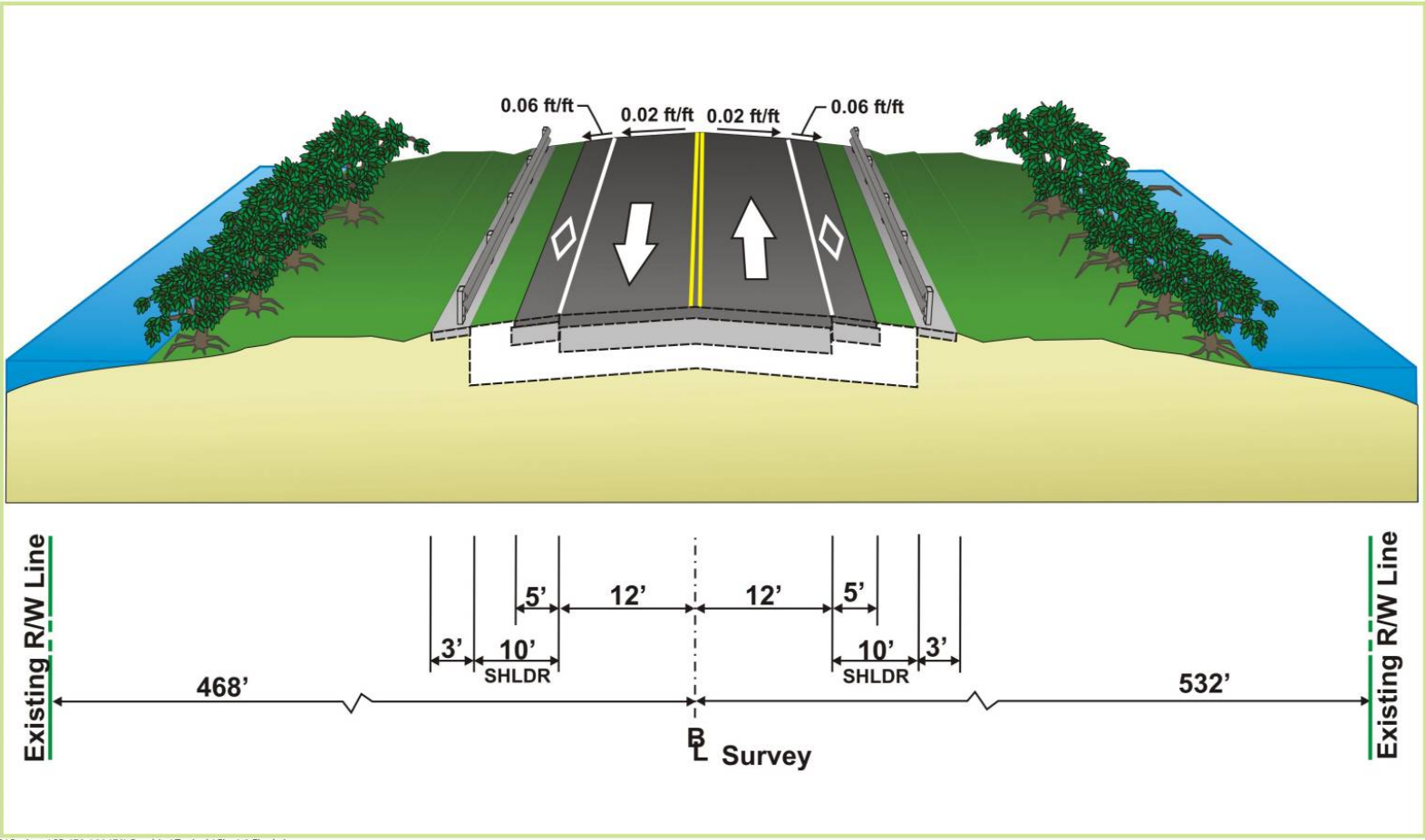


S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Existing Roadway Typical Section

WPI Segment No: 410755-1

North of Structure E

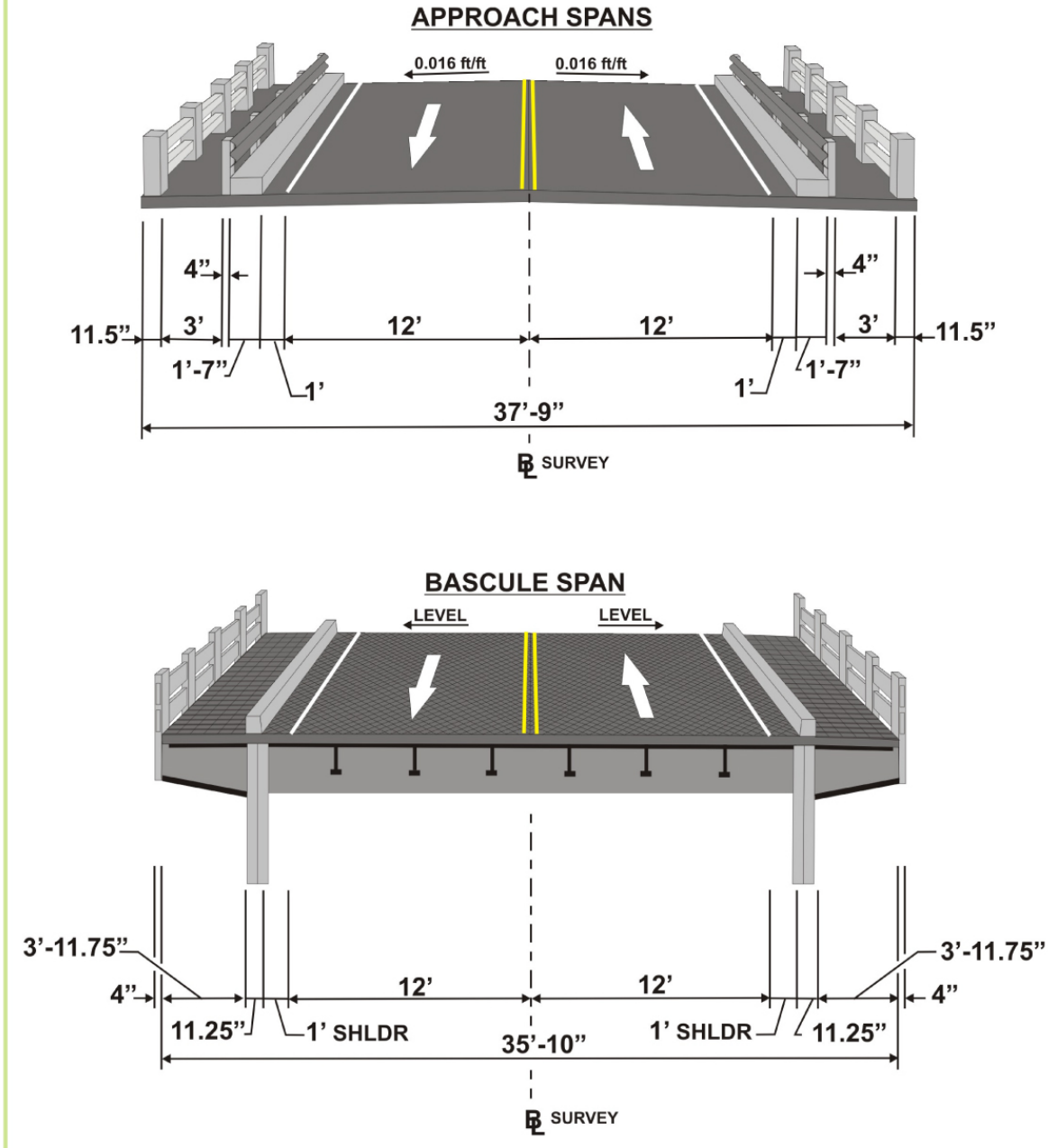
Figure 3.4.2



S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Existing Bridge Typical Sections

WPI Segment No : 410755-1

Figure 3.4.3



Section 4.0
PROPOSED DRAINAGE DESIGN

4.1 DESIGN CRITERIA

The Southwest Florida Water Management District (SWFWMD Environmental Resource Permit (ERP) Informational Manual was the major guide for the preparation of this report. Wet detention is the design approach for the Stormwater Management Facility (SMF) calculations in this report. However, during the design phase of this project when more geotechnical data is obtained at the SMF sites, a dry pond design may be considered.

A wet detention design approach requires that the first one inch of runoff be treated in a SMF. In addition to this criterion, an additional 50 percent of treatment will also be required since the ultimate outfall for this project is Boca Ciega Bay, an Outstanding Florida Waters (OFW). Quantity attenuation is not required because of a direct discharge into the Boca Ciega Bay, a tidal water body.

To maximize the size of the SMFs located under the bridge the berm width is 15 ft, and an inside berm radius of 17 ft is utilized. The treatment depth is 18 inches (in), and 1 ft of freeboard is assumed. See Appendix C for preliminary SMF calculations. Also, the other SMFs not located on existing right-of-way (ROW) have the same maintenance berm width and inside berm radius.

SMF alternatives are based on several factors, including hydraulics, hazardous materials contamination, wetland impacts and impacts to threatened and endangered species, potential archaeological sites, historical significance, construction costs, and ROW impacts.

4.2 STORMWATER MANAGEMENT DESIGN APPROACH

Conveyance to and from the SMF will primarily be via storm drain and/or roadside ditches in the rural typical section. The design approach considers several options:

- Linear treatment within the ROW or under proposed bridges
- ROW acquisition
- Treat currently untreated areas located within the watershed in a facility away from the project limits

4.3 BRIDGE ALTERNATIVE EVALUATIONS

The project was divided into two sub-basins and the following subsections describe the methodology used in each basin. Basin A is defined from the begin project (Sta. 265+60) to the high point of the profile of the bridge over the Intracoastal Waterway for each bridge alternative. Basin B is defined from the high point of the profile of the bridge to the end project. The end project station varies within each bridge alternative. All of the bridge improvement alternatives evaluated for this facility results in a two-lane bridge. The bridge alternatives that were studied during this Project Development and Environment (PD&E) Study include:

- Alternative 1: Rehabilitation
- Alternative 2: Rehabilitation with Widening
- Alternative 3: Low-Level Bascule Bridge over the Existing Channel
- Alternative 4: Mid-Level Bascule Bridge over the Existing Channel
- Alternative 5: High-Level Fixed-Span over the Existing Channel
- Alternative 6: High-Level Fixed-Span over the Relocated Channel

The conceptual roadway plan and profile drawings for Alternatives 1 through 6 are provided in Appendix F and SMF calculations for each basin and each bridge alternative are located in Appendix C of this report. Refer to the Preliminary Engineering Report prepared for this study for more information.

Another alternative studied within this SMF siting report is a four-lane High-Level Fixed-Span replacement over the Relocated Channel. This alternative will examine the SMF size required for a four-lane typical section within the project limits of Alternative 6, and identify a location within the project limits for a potential four-lane SMF site. The four-lane alternative is not viable at this time due to Work Program construction funding constraints. However, it was studied to ensure that the two-lane Recommended Alternative can accommodate a potential future improvement to four lanes.

4.3.1 ALTERNATIVE 1: REHABILITATION

Alternative 1 is the repair and rehabilitation of the existing bridge in its existing design configuration to keep the bridge operating in a safe condition, while maintaining the existing typical section. This alternative will not require a SMF site since this is a rehabilitation alternative and would not require treatment since it is an alteration of an existing roadway without additional capacity. The other alternatives which are reconstruction options would be classified as a new project since the old structure is removed and therefore needs to comply with water quality criteria (treat entire DCIA of project area).The proposed typical section is shown in Figure 4.3.1.

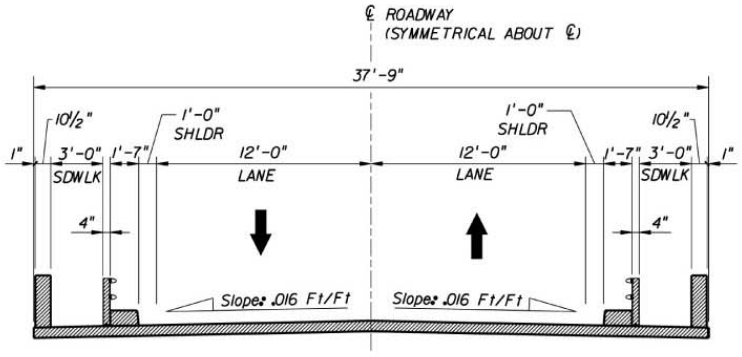
S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

Proposed Bridge Typical Section

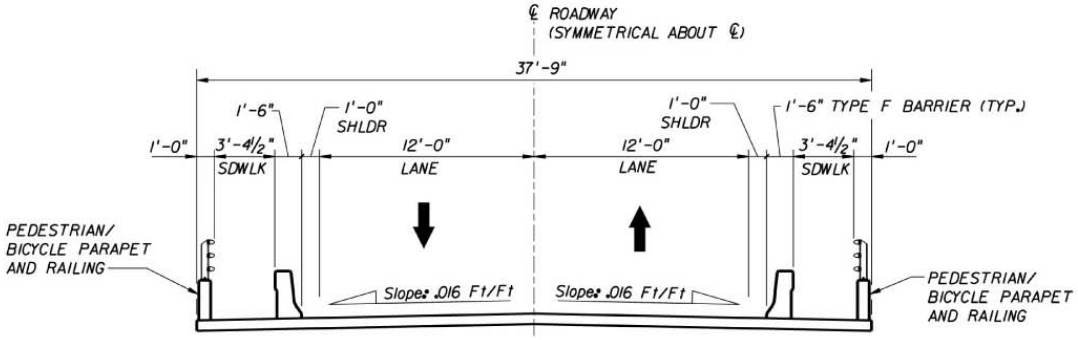
Alternative 1 - Minor Rehabilitation

WPI Segment No : 410755-1

Figure 4.3.1



EXISTING (REMOVAL CROSS-HATCHED)



NEW CONSTRUCTION

NOTES:

1. APPROACH SPAN SUPERSTRUCTURE VARIES (SUPERSTRUCTURE NOT SHOWN).
2. BASCULE SPAN SECTION REMAINS THE SAME, EXCEPT OPEN STEEL AND CONCRETE FILLED GRID DECKS ARE REPLACED (SEE FIGURE 3).

4.3.2 ALTERNATIVE 2: REHABILITATION WITH WIDENING

Alternative 2 includes repair, rehabilitation, and widening of the existing bridge to the east to accommodate current FDOT geometric design requirements and standards. The widened structure features two 12-ft lanes separated by a 4-ft striped median with two 10-ft shoulders, and two 5-ft (minimum) sidewalks separated from the shoulder by a barrier wall, as shown in Figure 4.3.2. In essence, the widening consists of construction of a separate new bascule bridge, with its own separate mechanical and electrical systems, immediately adjacent to the existing bridge. This alternative will not require a SMF site since this is a rehabilitation alternative with widening and would not require treatment since it is an alteration of an existing roadway without additional capacity. The other alternatives which are reconstruction options would be classified as a new project since the old structure is removed and therefore needs to comply with water quality criteria (treat entire DCIA of project area).

4.3.3 ALTERNATIVE 3 – LOW-LEVEL BASCULE OVER THE EXISTING CHANNEL

Alternative 3 proposes to replace the existing Structure E with a low-level bascule structure similar to the existing structure. The proposed typical sections for the bascule bridge and fixed approaches to the replacement bascule bridge include one 12-ft lane and a 10-ft shoulder in each direction which can accommodate bicyclists and disabled vehicles. The fixed span typical section applies to the fixed approaches to the bascule span. A 5-ft sidewalk is included on the west side, separated from the shoulder by a concrete barrier wall. An 11-ft sidewalk is provided on the east side to accommodate a planned multi-use path. The overall width of the fixed-span is 65 ft, while the bascule bridge width is 63 ft-8-in, as shown in Figure 4.3.3. Approach roadway typical section for Alternatives 3 to 6 are shown in Figures 4.3.5 and 4.3.6. Alternative 3 SMF alternatives are discussed in Section 4.4.

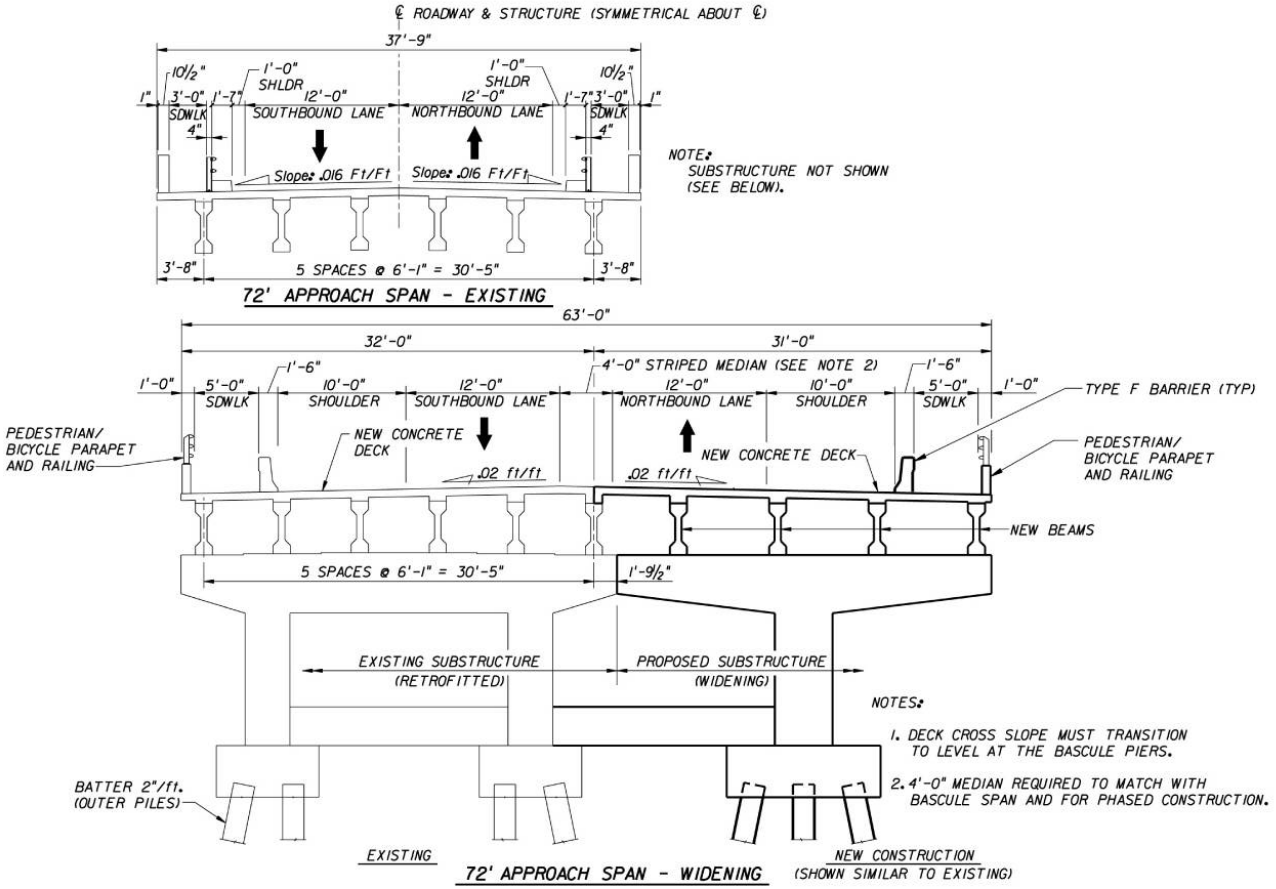
4.3.4 ALTERNATIVE 4 – MID-LEVEL BASCULE OVER THE EXISTING CHANNEL

Alternative 4 proposes to replace the existing Structure E with a new mid-level bascule structure similar to the existing structure, but providing more vertical clearance over the Intracoastal Waterway. The proposed bridge replacement typical sections for Alternative 4 for fixed-span and bascule bridge alternatives include one 12-ft lane and a 10-ft shoulder in each direction, which can accommodate bicyclists and disabled vehicles. As with Alternative 3, the sidewalks are separated from the shoulder by a concrete barrier wall. The overall width of the fixed-span is 61 ft, while the bascule bridge width is 59 ft-8 in, see Figure 4.3.4. Alternative 4 SMF alternatives are discussed in Section 4.4.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Proposed Approach Span Typical Section
Alternative 2 - Major Rehabilitation with Widening

WPI Segment No: 410755-1

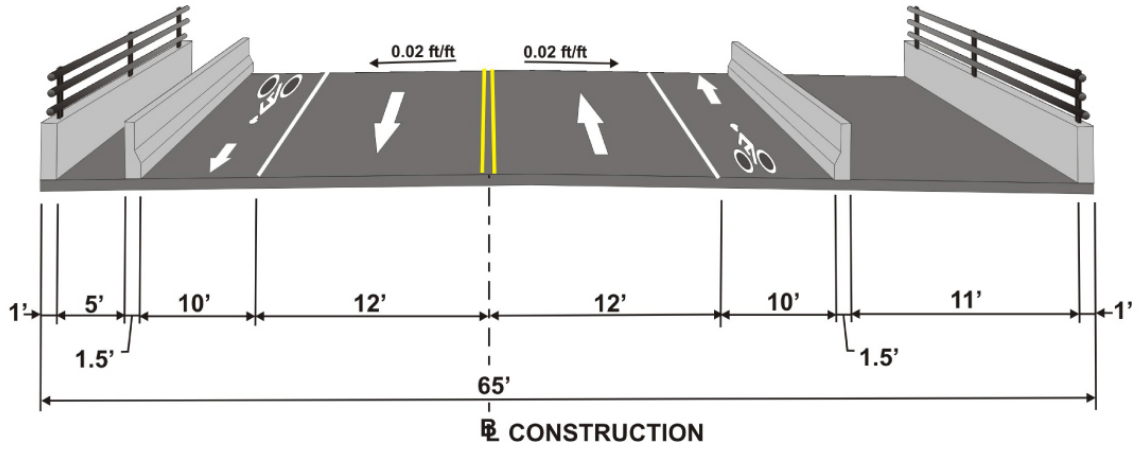
Figure 4.3.2



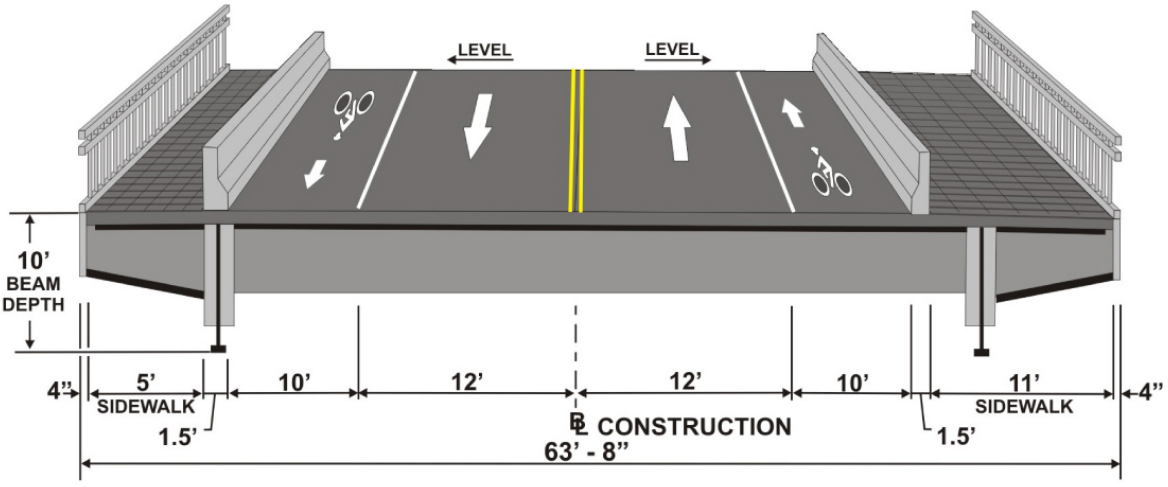
S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

Proposed Bridge Typical Sections

WPI Segment No : 410755-1 | Alternative 3 - Low Level Bascule | Figure 4.3.3



Fixed Spans



Bascule Span

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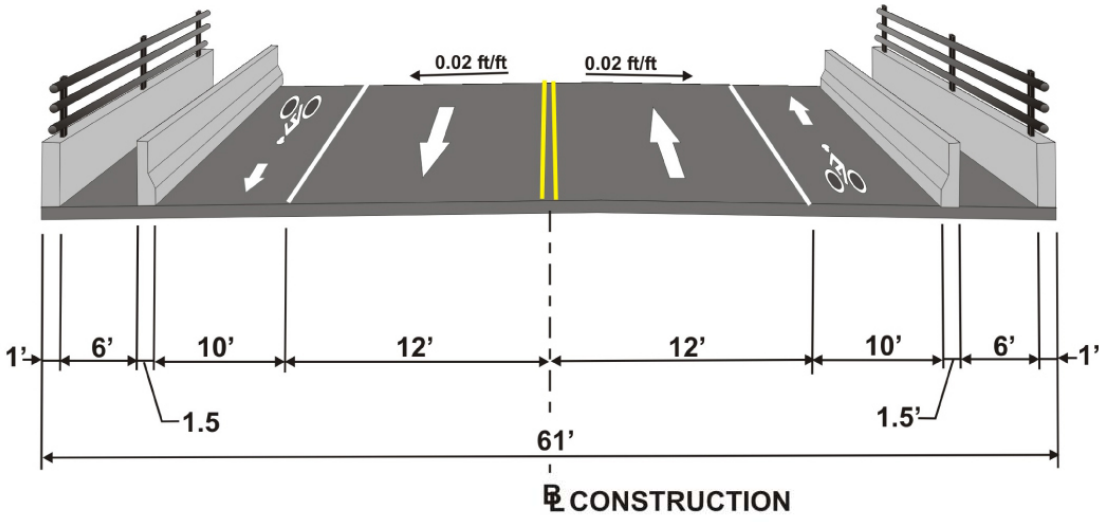
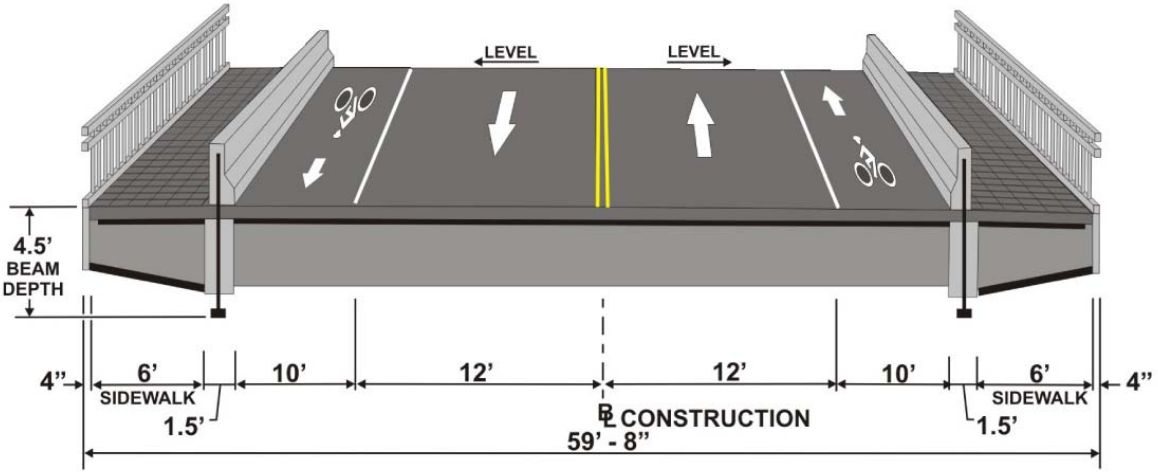
S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

Proposed Bridge Typical Sections

WPI Segment No : 410755-1 — Alternative 4 - Mid-Level Bascule Bridge — Figure 4.3.4



Fixed Spans



Bascule Span (Through-Girder)

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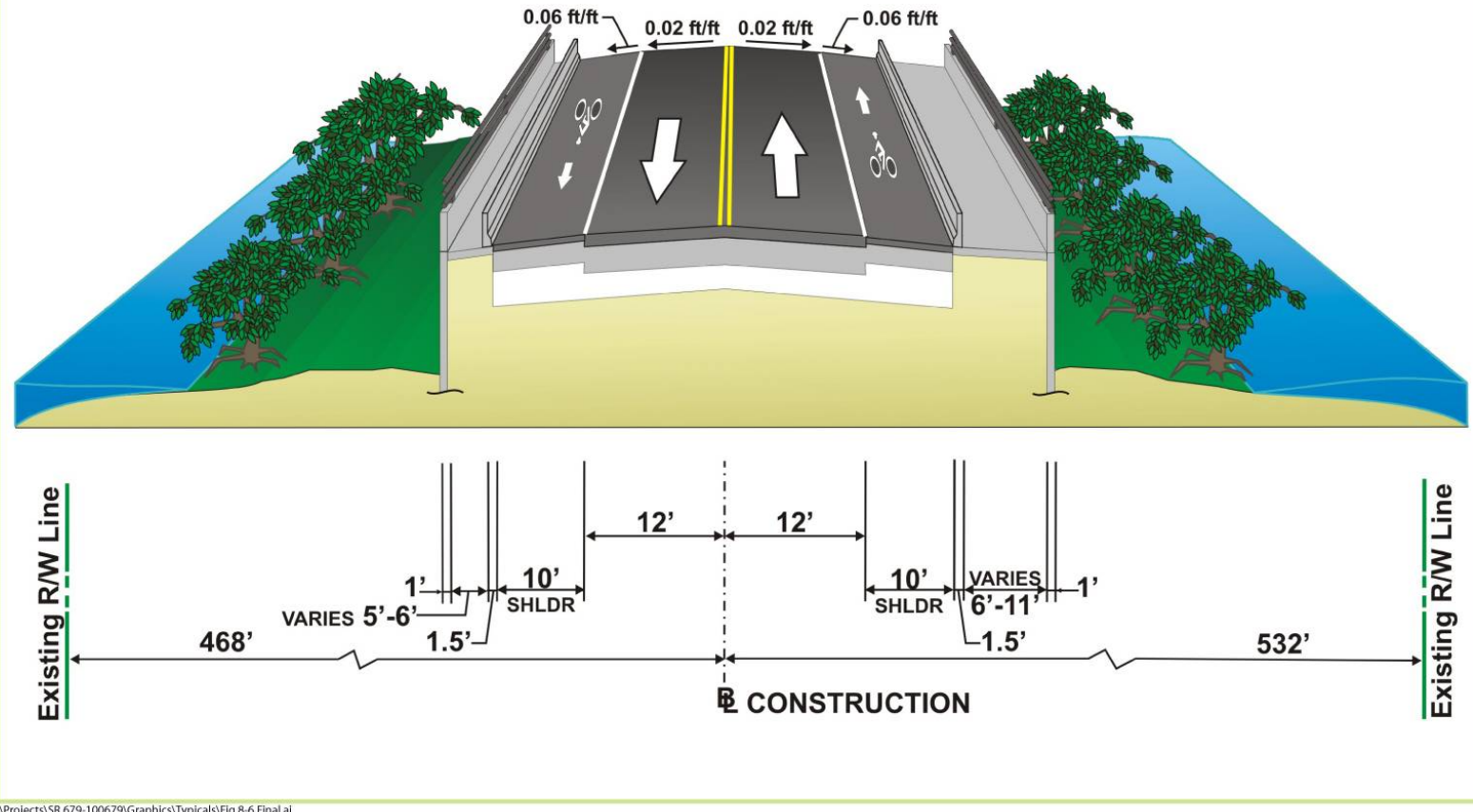
S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Proposed Roadway Typical Section (1)

WPI Segment No: 410755-1

Alternatives 3, 4, 5, & 6 - Northern Approach to Structure E

Figure 4.3.5



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4.3.5 ALTERNATIVE 5 – HIGH-LEVEL FIXED-SPAN OVER THE EXISTING CHANNEL

Alternative 5 proposes to replace the existing Structure E with a new high-level fixed structure. The proposed profile accommodates a minimum 65-ft vertical navigational clearance over the existing channel. The proposed bridge replacement typical section for Alternative 5 includes one 12-ft lane and a 10-ft shoulder in each direction, which can accommodate bicyclists and disabled vehicles. A 5-ft sidewalk is included on the west side, separated from the shoulder by a concrete barrier wall. An 11-ft sidewalk is provided on the east side to accommodate Pinellas County's planned multi-use path. The overall width of the fixed-span is 65 ft, see Figure 4.3.7. Alternative 5 SMF alternatives are discussed in Section 4.4.

4.3.6 ALTERNATIVE 6 – HIGH-LEVEL FIXED-SPAN OVER RELOCATED CHANNEL

Alternative 6 proposes to replace the existing Structure E with a new high-level fixed structure providing 65-ft vertical navigational clearance over a relocated channel. The proximity of the Madonna Boulevard immediately at the bottom of a 6 percent grade is not a desirable situation, especially in an area with a high number of recreational vehicles in the traffic mix. In an effort to reduce or flatten the grade, the relocation of the channel 400 ft to the north was evaluated, allowing maximum grades of 5 percent joined by a 1,650 ft cresting vertical curve. In this alternative, the profile crest can be located above the relocated channel. Appendix G contains a memo prepared by the PBS&J Coastal Engineering Division to summarize potential issues related to hydrodynamics and sediment transport when relocating the channel and removing a portion of the causeway at the northern approach to the proposed bridge.

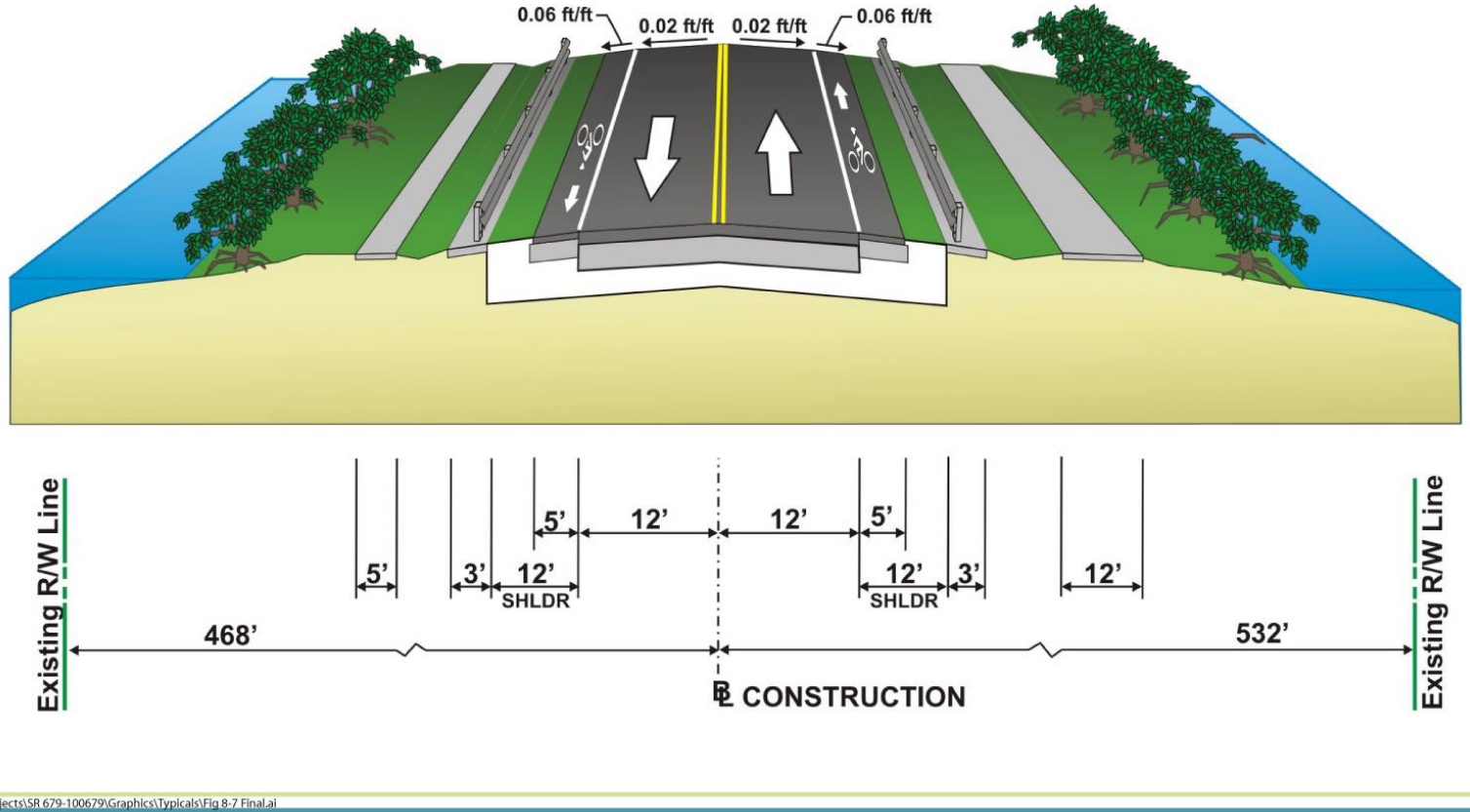
The proposed bridge replacement typical section for Alternative 6 includes one 12-ft lane and a 10-ft shoulder in each direction, which can accommodate bicyclists and disabled vehicles. A 5-ft sidewalk is included on the west side, separated from the shoulder by a concrete barrier wall. An 11-ft sidewalk is provided on the east side to accommodate Pinellas County's planned multi-use path. The overall width of the fixed-span is 65 ft, see Figure 4.3.7. Alternative 6 SMF alternatives are discussed in Section 4.4.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Proposed Roadway Typical Section (2)

WPI Segment No: 410755-1

Alternatives 3, 4, 5, & 6 - North of Structure E

Figure 4.3.6



4.3.7 FOUR-LANE ALTERNATIVE

Another alternative evaluated in the SMF sizing analysis is a four-lane high-level fixed bridge over the relocated channel project limits. This alternative is evaluated to determine the SMF size and location required for each subbasin. The previous six alternatives only considered a two-lane roadway typical section. The four-lane section is not a viable alternative in the PD&E Study due to Work Program construction funding constraints, therefore the following information was assumed for this analysis: four 12-ft travel lanes, four 10-ft shoulders, four 1.5-ft barrier walls, one 11-ft multi-use path, one 5-ft sidewalk, and two 1-ft outside barrier wall for a total impervious width of 112 ft for the bridge and roadway typical section.

The project limits would need to be extended to the S.R. 682 intersection to accommodate the four-lane geometry (well beyond the two-lane project limits), which adds approximately 4000 ft of additional roadway beyond Basin B. Due to the length of the drainage system necessary to convey runoff for this section of roadway, it was assumed that it would not be hydraulically feasible to drain to a SMF located under the bridge in Basin B, and another SMF would be required for this additional basin (which is not part of this study). SMF treatment volume and size required for the four-lane roadway within the project limits for Alternative 6 are discussed in Section 4.4.

4.3.8 RECOMMENDED ALTERNATIVE

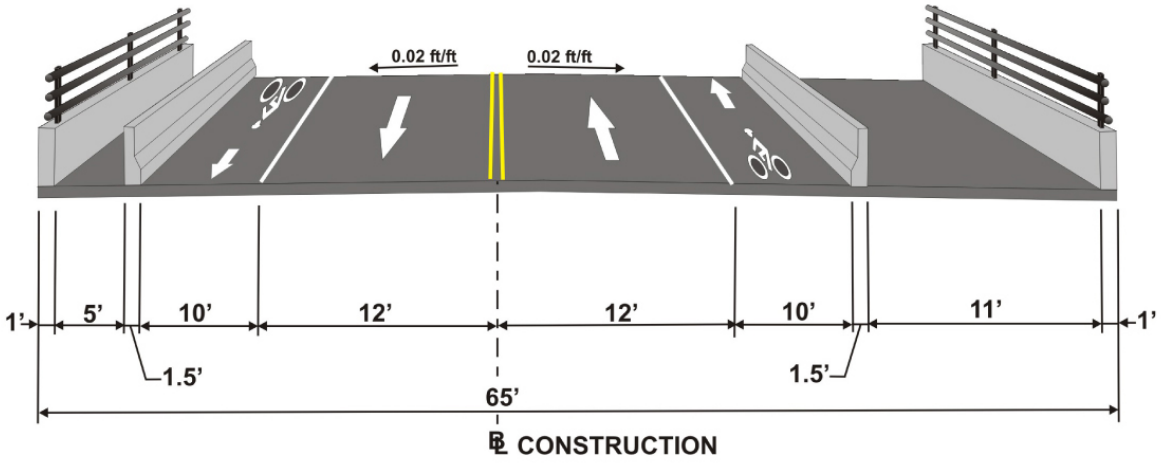
The Recommended Alternative is Alternative 5, the High-Level Fixed-Span over the Existing Channel.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida
Proposed Bridge Typical Sections

Alternative 5 - High-Level Fixed Bridge Over Existing Channel
and Alternative 6 - High-Level Fixed Bridge Over Relocated Channel

WPI Segment No : 410755-1

Figure 4.3.7



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4.4 BASIN A SMF ALTERNATIVES AND RECOMMENDATIONS

Basin A is defined from the begin project (Sta. 265+60) to the high point of the profile of each bridge alternative. The flow from Basin A will be conveyed to a SMF for treatment requirements and then ultimately discharge to the Boca Ciega Bay. The two SMF alternatives are SMF A-1 and SMF A-2 and are shown in Figure 4.4.1.

SMF A-1:

Site Description – This SMF alternative is located on S.R. 679 (Pinellas Bayway) located within the existing ROW near the Tierra Verde Marina shopping plaza. With the proposed roadway configuration there is open space within the existing ROW for a SMF site under the south end of the proposed bridge. The site is located approximate from Sta. 276+00 to 278+50.

Water Quality – Alternative 1 and Alternative 2 do not require a SMF in either basin since the existing bridge will remain or only widening of the existing bridge is proposed with no additional lanes proposed. Alternatives 3 through 6 require a SMF since the existing bridge would be replaced, changing the geometry. SMF A-1 will provide the required treatment volume for bridge alternatives that require a SMF and is sized to accommodate the treatment volume requirements for both the two-lane alternative. It should be noted that a future four-lane section was not studied for the Bascule or Mid-Level bridge alternatives as part of the PSR. The treatment volume provided by SMF A-1 is 0.88 ac-ft. Treatment required for all alternatives are shown below in Table 4.4.1.

Table 4.4.1
SMF A-1 Treatment Volume Comparison

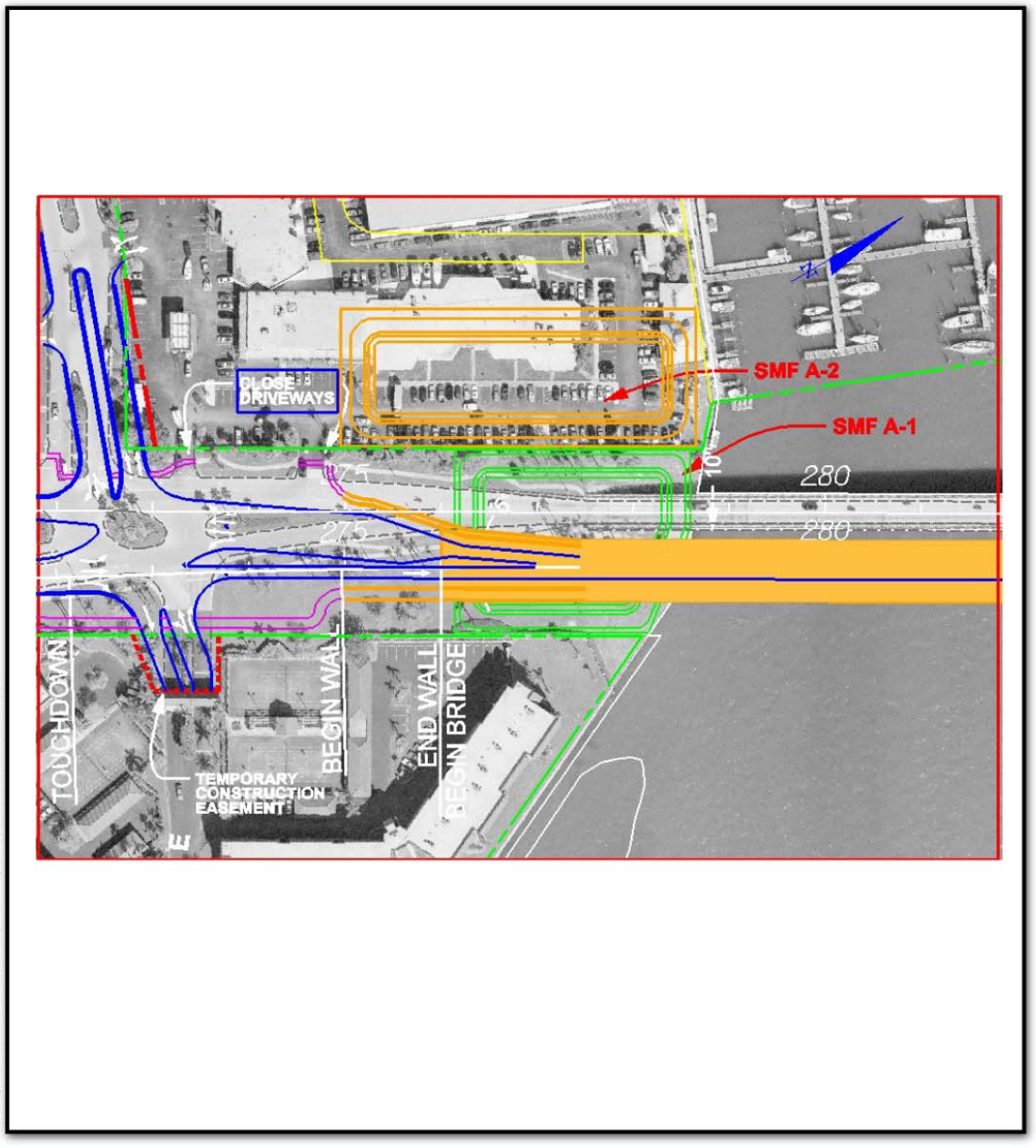
ALTERNATIVE	TREATMENT VOLUME REQUIRED	REMARKS
Alternative 1	N/A	No bridge reconstruction, therefore no SMF required
Alternative 2	N/A	No bridge reconstruction, therefore no SMF required
Alternative 3	0.45 ac-ft	SMF A-1 able to accommodate
Alternative 4	0.42 ac-ft	SMF A-1 able to accommodate
Alternative 5	0.58 ac-ft	SMF A-1 able to accommodate
Alternative 6	0.56 ac-ft	SMF A-1 able to accommodate
Four-lane Alternative 6	0.87 ac-ft	SMF A-1 able to accommodate

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

Basin A SMF Alternatives

Figure 4.4.1



Water Quantity – SMF A-1 will not provide attenuation, because the SMF outfall discharges directly into the bay.

Conveyance – Conveyance to this SMF will be via storm drain system.

Outfall – The SMF outfall ultimately discharges into Boca Ciega Bay.

Wetland Impacts – The SMF does not impact wetlands.

Other Consideration – The proposed bridge structure will accommodate a SMF under the south end of the bridge to meet treatment requirements for the Recommended Alternative (Alternative 5). These proposed pond configurations will accommodate a potential future four-lane bridge for Alternative 6 without modification. The bridge depth will be reduced by utilizing a short span and a shallow beam type for the first two spans starting at the beginning of the bridge. This provides maintenance access clearance of approximately 5 ft for the berm of the SMF to the low member of the bridge at the abutment and provides approximately 13 ft of clearance at the northern berm.

An option to reduce the overall bridge length and reduce the needed SMF area would be to use a Continuous Deflective Separation (CDS) unit near the begin bridge station to treat the roadway runoff and discharge to the waterway. This option should be considered during the design phase.

It should be noted that the four lanes for Alternative 3 or Alternative 4 was not studied with this Pond Siting Report.

SMF A-2:

Site Description – This SMF alternative is located on the west side of S.R. 679 (Pinellas Bayway) located in the Tierra Verde Marina Shopping Plaza. This parcel is located adjacent to the Pinellas Bayway, and would require ROW acquisition.

Water Quality – This site will provide the required treatment volume for bridge alternatives that require a SMF. SMF A-2 is sized to treat the four-lane roadway typical within Alternative 6 project limits. The treatment provided by SMF A-2 is 0.87 ac-ft. Treatment required for all alternatives are shown in Table 4.4.2.

Table 4.4.2
SMF A-2 Treatment Volume Comparison

ALTERNATIVE	TREATMENT VOLUME REQUIRED	REMARKS
Alternative 1	N/A	No bridge reconstruction, therefore no SMF required
Alternative 2	N/A	No bridge reconstruction, therefore no SMF required
Alternative 3	0.45 ac-ft	SMF A-2 able to accommodate
Alternative 4	0.42 ac-ft	SMF A-2 able to accommodate
Alternative 5	0.58 ac-ft	SMF A-2 able to accommodate
Alternative 6	0.56 ac-ft	SMF A-2 able to accommodate
Four-lane Alternative 6	0.87 ac-ft	SMF A-2 able to accommodate

Water Quantity – SMF A-2 will not provide attenuation, because the SMF outfall discharges directly into the bay.

Conveyance – Conveyance to this SMF will be via storm drain system.

Outfall – The SMF outfall ultimately discharges into Boca Ciega Bay.

Wetland Impacts – The SMF does not impact wetlands.

Other Consideration – None

Table 4.4.3 lists the SMF area size requirements for each alternative. The SMF shown in the Recommended Alternative Concept Plans in Appendix F is 1.11 ac, which will accommodate a potential future four-lane bridge for Alternative 6. Estimated costs for SMF's in Basin A are shown in Table 4.4.4.

Table 4.4.3
SMF Size Required for Basin A Improvements

ALTERNATIVE	SMF SIZE REQUIRED
Alternative 1	N/A
Alternative 2	N/A
Alternative 3	0.70 ac
Alternative 4	0.67 ac
Alternative 5	0.84 ac
Alternative 6	0.82 ac
Four-lane typical with Alternative 6	1.11 ac

Table 4.4.4
Preferred SMF Sites for Basin A

	Recommended SMF
	SMF A-1
Location (Station)	276+00 to 278+50
Side (Lt., Rt.)	LT / RT
SMF Area (Max size Ac)	1.11
Mean High Water El. (ft)	1.9
Treatment System	Wet detention
Soils Name	Palm Beach Sand
Hydrological Soil Group	A
Land Use	Under prop. Bridge
Recorded Archaeological Sites	N/A
Archaeological Potential	Low
Recorded Historical Structures/Resources	N/A
Tentative Hazard Ranking	Low
Protected Species Probability	Low
Wetland Impacts (Ac)	0
Wetland Mitigation Cost	N/A
Proximity To Outfall (ft)	56
Outfall Pipe Cost Estimate (Assume 42" pipe at $170 / LF)	$9,520
Other Costs (Excavation, Control Structure, Fencing, etc)	$444,080
SMF Easement Required	0
Number Of Parcels	0
Partial (P) Or Whole Take (WT)	N/A
ROW Cost Estimate	$0
TOTAL ESTIMATED COSTS	$453,600

BASIN A RECOMMENDED SMF ALTERNATIVE

SMF A-1 is the preferred SMF alternative for Basin A since this SMF is located within the existing ROW, and no ROW costs are anticipated. Based on discussions with the District Design Engineer, the proposed SMF will accommodate a potential future four-lane Alternative 6. See meeting minutes dated June 27, 2006, in Appendix A.

SMF A-1 is located within the existing ROW and SMF A-2 is an alternate SMF site located outside the ROW in the Tierra Verde Marina Shopping Plaza. Both sites are sized to provide the required treatment volume for two-lane bridge alternatives that require a SMF as well as a potential four-lane future improvement for Alternative 6.

4.5 BASIN B SMF ALTERNATIVES AND RECOMMENDATIONS

The SMF for Basin B will treat the runoff from the high point of the profile of each bridge alternative to the end project station. Each bridge alternative may have a different end project station due to the profile of the bridge. See proposed concept plans and profiles in Appendix F. The flow from Basin B will be conveyed to a SMF for treatment requirements and then ultimately discharged to Boca Ciega Bay. Layout of the two preferred Basin B SMFs are shown in Figure 4.5.1 and Figure 4.5.2. The four-lane SMF design will not impact the bridge length for the north end of the bridge structure since there is adequate open space beneath the bridge.

SMF B-1-A:

Site Description – SMF B-1-A is a linear pond located within the existing ROW for Alternative 3 and Alternative 4 from approximately Sta. 295+00 to Sta. 305+00 since the proposed bridge length for these bridge alternatives is not adequate to accommodate a SMF under the bridge.

Water Quality – This site will provide enough volume for the required treatment. The treatment volume provided by the linear pond SMF B-1-A for Alternative 3 and Alternative 4 is 0.57 ac-ft. The preferred pond site for Alternative 5, Alternative 6, and the four-lane alternative is SMF B-1-B. Treatment required for alternatives for Basin B are shown in Table 4.5.1.

Table 4.5.1
SMF B-1-A Treatment Volume Comparison

ALTERNATIVE	TREATMENT VOLUME REQUIRED	REMARKS
Alternative 1	N/A	No bridge reconstruction, therefore no SMF required
Alternative 2	N/A	No bridge reconstruction, therefore no SMF required
Alternative 3	0.39 ac-ft	SMF B-1-A able to accommodate
Alternative 4	0.40 ac-ft	SMF B-1-A able to accommodate
Alternative 5	0.41 ac-ft	See SMF B-1-B under proposed bridge
Alternative 6	0.36 ac-ft	See SMF B-1-B under proposed bridge
Four-lane Alternative 6	0.63 ac-ft	See SMF B-1-B under proposed bridge

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

Basin B SMF Alternatives (1)

Figure 4.5.1

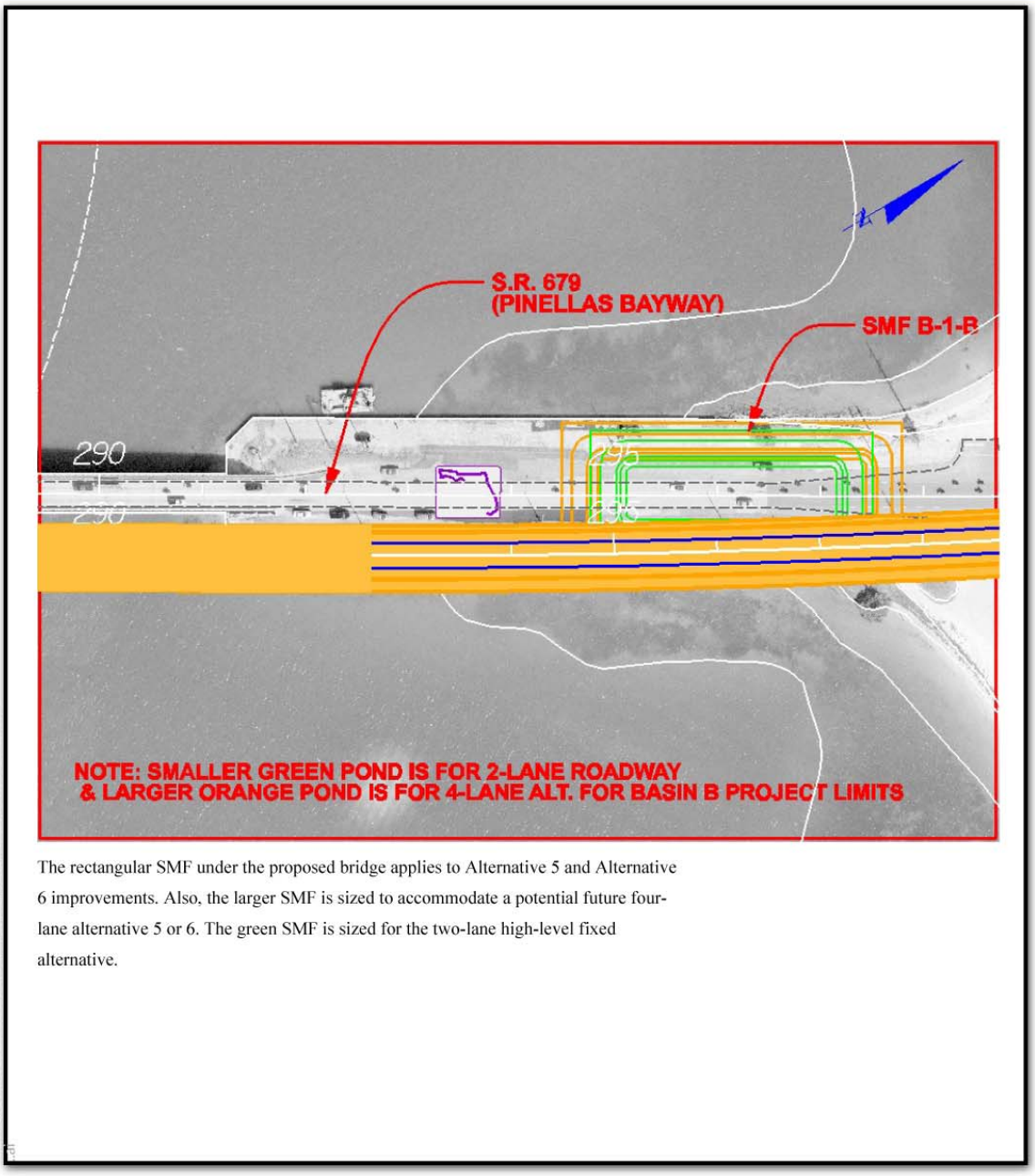
The linear pond SMF B-1-A applies to Alternative 3 and Alternative 4 improvements.

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

Basin B SMF Alternatives (2)

Figure 4.5.2



The rectangular SMF under the proposed bridge applies to Alternative 5 and Alternative 6 improvements. Also, the larger SMF is sized to accommodate a potential future four-lane alternative 5 or 6. The green SMF is sized for the two-lane high-level fixed alternative.

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Water Quantity – SMF B-1-A will not provide attenuation, because the SMF outfall discharges directly into the bay.

Conveyance – Conveyance to this SMF will be via storm drain system.

Outfall – The SMF outfall ultimately discharges into Boca Ciega Bay.

Wetland Impacts – The SMF does not impact wetlands.

Other Considerations – This SMF is located within the existing ROW and would be impacted in the future should the capacity of roadway require a four-lane section with Alternative 3 and Alternative 4. If a four-lane section with Alternative 5 or Alternative 6 bridge alternatives, then SMF B-1-B is the preferred SMF site.

SMF B-1-B:

Site Description – Alternative 5 and Alternative 6 has a high-level fixed bridge and the bridge length is adequate for a SMF under the bridge, therefore a rectangular SMF is proposed for these two bridge alternatives and is referred to as SMF B-1-B. This rectangular SMF is located from Sta. 294+50 to Sta. 297+80 within the existing ROW.

Water Quality – This site will provide the required treatment volume for bridge alternatives that require a SMF and is sized to meet the treatment volume requirements for the four-lane alternative. The treatment volume provided within SMF B-1-B is 0.66 ac-ft. Treatment required for Basin B for all alternatives are shown in Table 4.5.2.

Table 4.5.2
SMF B-1-B Treatment Volume Comparison

ALTERNATIVE	TREATMENT VOLUME REQUIRED	REMARKS
Alternative 1	N/A	No bridge reconstruction, therefore no SMF required
Alternative 2	N/A	No bridge reconstruction, therefore no SMF required
Alternative 3	0.39 ac-ft	See SMF B-1-A
Alternative 4	0.40 ac-ft	See SMF B-1-A
Alternative 5	0.41 ac-ft	SMF B-1-B able to accommodate
Alternative 6	0.36 ac-ft	SMF B-1-B able to accommodate
Four-lane Alternative 6	0.63 ac-ft	SMF B-1-B able to accommodate

Water Quantity – SMF B-1-B will not provide attenuation, because the SMF outfall discharges directly into the bay.

Conveyance – Conveyance to this SMF will be via storm drain system.

Outfall – The SMF outfall ultimately discharges into Boca Ciega Bay.

Wetland Impacts – The SMF does not impact wetlands.

Other Considerations – None

SMF B-2:

Site Description – SMF B-2 is located on the west side of S.R. 679 (Pinellas Bayway) located near Bahia Del Mar Boulevard. This parcel is located adjacent to the Pinellas Bayway, and would require ROW acquisition. SMF B-2 is shown in Figure 4.5.3 and is located from Sta. 330+50 to Sta. 332+30. The SMF is sized to treat the four-lane requirements and will require a larger SMF in comparison to a two-lane typical. See Table 4.5.4 for SMF size requirements for Basin B improvements. Estimated costs for SMF's in Basin B are shown in Table 4.5.5.

Water Quality – This site will provide the required treatment volume for bridge alternatives that require a SMF and is sized to meet the treatment volume requirements for the future four-lane alternative. The treatment provided by SMF B-2 is 0.65 ac-ft. Treatment required for all alternatives are shown in Table 4.5.3.

Table 4.5.3
SMF B-2 Treatment Volume Comparison

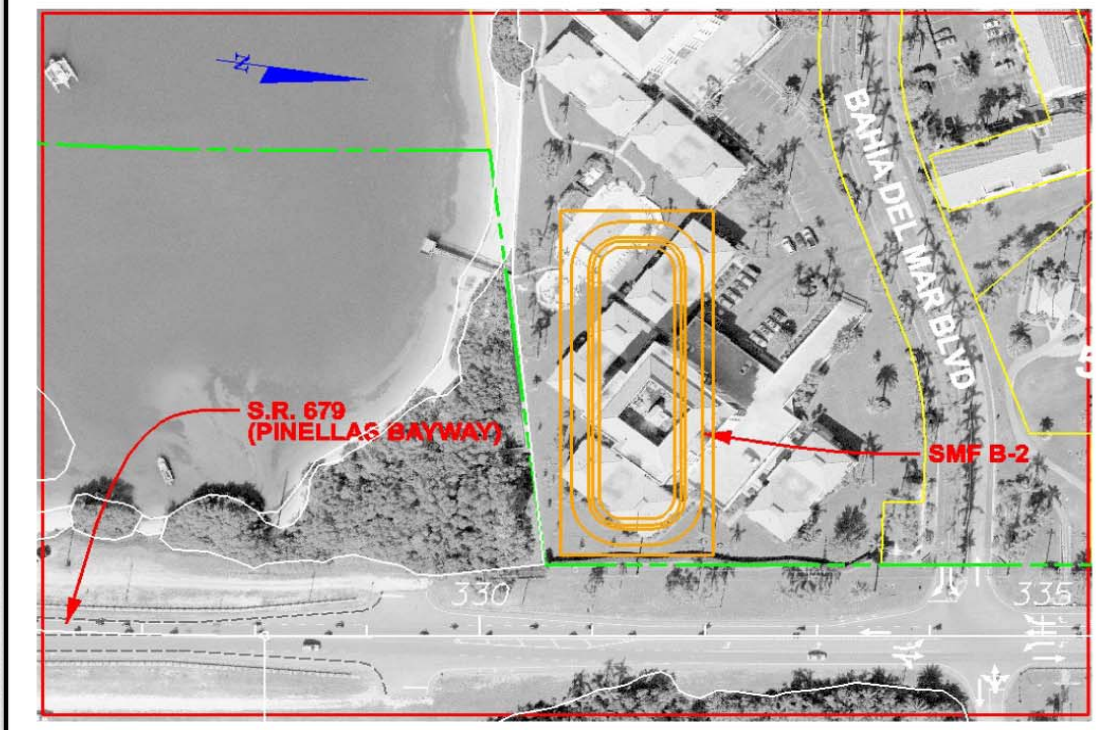
ALTERNATIVE	TREATMENT VOLUME REQUIRED	REMARKS
Alternative 1	N/A	No bridge reconstruction, therefore no SMF required
Alternative 2	N/A	No bridge reconstruction, therefore no SMF required
Alternative 3	0.39 ac-ft	SMF B-2 able to accommodate
Alternative 4	0.40 ac-ft	SMF B-2 able to accommodate
Alternative 5	0.41 ac-ft	SMF B-2 able to accommodate
Alternative 6	0.36 ac-ft	SMF B-2 able to accommodate
Four-lane Alternative	0.63 ac-ft	SMF B-2 able to accommodate

S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Bridge No: 150049
Pinellas County, Florida

WPI Segment No : 410755-1

Basin B SMF Alternatives (3)

Figure 4.5.3



SMF B-2 is a rectangular SMF outside the existing ROW located near the Bahia Del Mar Boulevard. This SMF is sized for the 4-lane high-level fixed alternative, and can be reduced to meet the treatment requirements for Alternatives 3 through 6.

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Water Quantity – SMF B-2 will not provide attenuation, because the SMF outfall discharges directly into the bay.

Conveyance – Conveyance to this SMF will be via storm drain system.

Outfall – The SMF outfall ultimately discharges into Boca Ciega Bay.

Wetland Impacts – The SMF does not impact wetlands.

Other Consideration – None

Table 4.5.4
SMF Size Required for Basin B Improvements

ALTERNATIVE	SMF SIZE REQUIRED
Alternative 1	N/A
Alternative 2	N/A
Alternative 3	0.89 ac
Alternative 4	0.90 ac
Alternative 5	0.71 ac
Alternative 6	0.64 ac
Four-lane with Alternative 6	1.07 ac

Table 4.5.5
Preferred SMF Sites for Basin B

	Recommended SMFs	
	SMF B-1-A	**SMF B-1-B**
Location (Station)	295+00 to 305+00	294+50 to 297+80
Side (Lt., Rt.)	LT	LT / RT
SMF Area (Max size Ac)	0.90	1.07
Mean High Water El. (ft)	1.9	1.9
Treatment System	Wet detention	Wet detention
Soils Name	Palm Beach Sand	Palm Beach Sand
Hydrological Soil Group	A	A
Land Use	Linear pond adjacent to roadway	Under prop. Bridge
Recorded Archaeological Sites	N/A	N/A
Archaeological Potential	Low	Low
Recorded Historical Structures/Resources	N/A	N/A
Tentative Hazard Ranking	Low	Low
Protected Species Probability	Low	Low
Wetland Impacts (Ac)	0	0
Wetland Mitigation Cost	N/A	N/A
Proximity To Outfall (ft)	50	100
Outfall Pipe Cost Estimate (Assume 42" pipe at $170 / LF)	$8,500	$9,500
Other Costs (Excavation, Control Structure, Fencing, etc)	* $283,300	$363,000
SMF Easement Required	0	0
Number Of Parcels	0	0
Partial (P) Or Whole Take (WT)	N/A	N/A
ROW Cost Estimate	$0	$0
TOTAL ESTIMATED COSTS	$291,800	$372,500

* Cost of fencing and gate removed for linear pond

BASIN B RECOMMENDED SMF ALTERNATIVE

SMF B-1-B is the preferred SMF alternative for Basin B for typical section Alternative 5 or 6. **SMF B-1-A** is a more appropriate pond site for Alternative 3 or Alternative 4. Since Alternative 5 was selected as the Recommended Alternative, SMF B-1-B is the preferred pond site. Both preferred SMF alternatives are located within the existing ROW, and no ROW costs are anticipated. SMF B-1-B is also sized for the four-lane roadway typical within the project limits of Alternative 6. If the four-lane typical section were to be extended to the S.R. 682 intersection, then another SMF site would be required to meet the treatment requirements for the additional impervious area between the end project of Alternative 6 and the S.R. 682 intersection. This length or roadway is approximately 4000 ft

APPENDIX A
PROJECT CORRESPONDENCE AND DOCUMENTATION

MEETING MINUTES

Date/Time: **June 27, 2006, 1:15 pm**

Location: **Dwayne Kile's Office**

Subject: **SR 679 (Pinellas Bayway) at Intracoastal Waterway**
PD&E Study
WPI Segment No: 410755 1
Pinellas County, Florida
Pond Siting Report

Attendees: **PBS&J: Doug Reed, Mark Micikas, Hiren Patel**
FDOT: Dwayne Kile

Written By: **Doug Reed**

Copies To: **Attendees, Sharon Phillips, File 100679 (8I)**

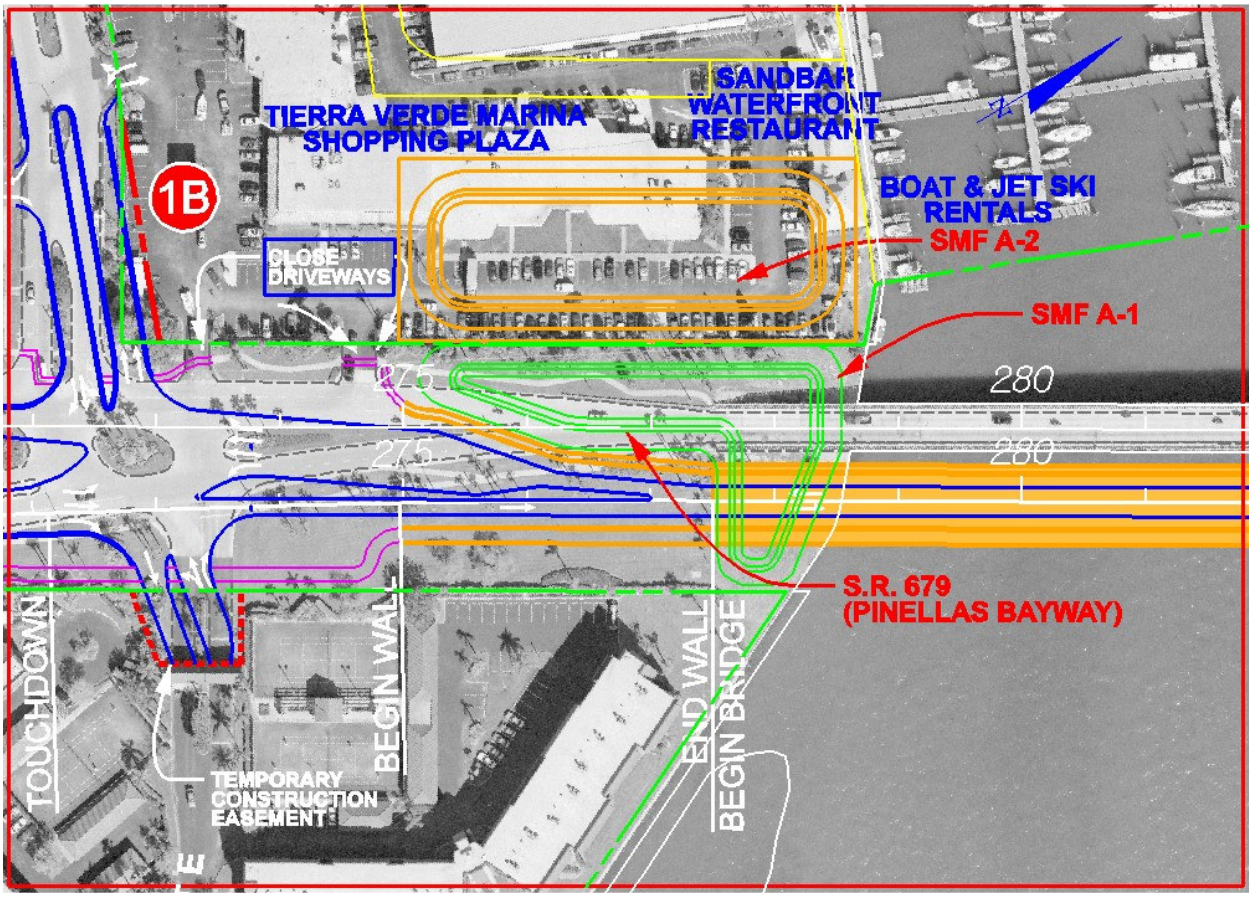
This meeting was held to coordinate initial findings of the Draft Pond Siting Report for the roadway and bridge rehabilitation and replacement alternatives.

Mr. Reed gave a brief overview of the methodology for the drainage evaluation. Mr. Kile, at the December 29, 2005 typical section meeting, indicated that the ultimate four-lane bridge should be considered when evaluating drainage requirements. Today's meeting was requested to report initial findings, and seek further direction.

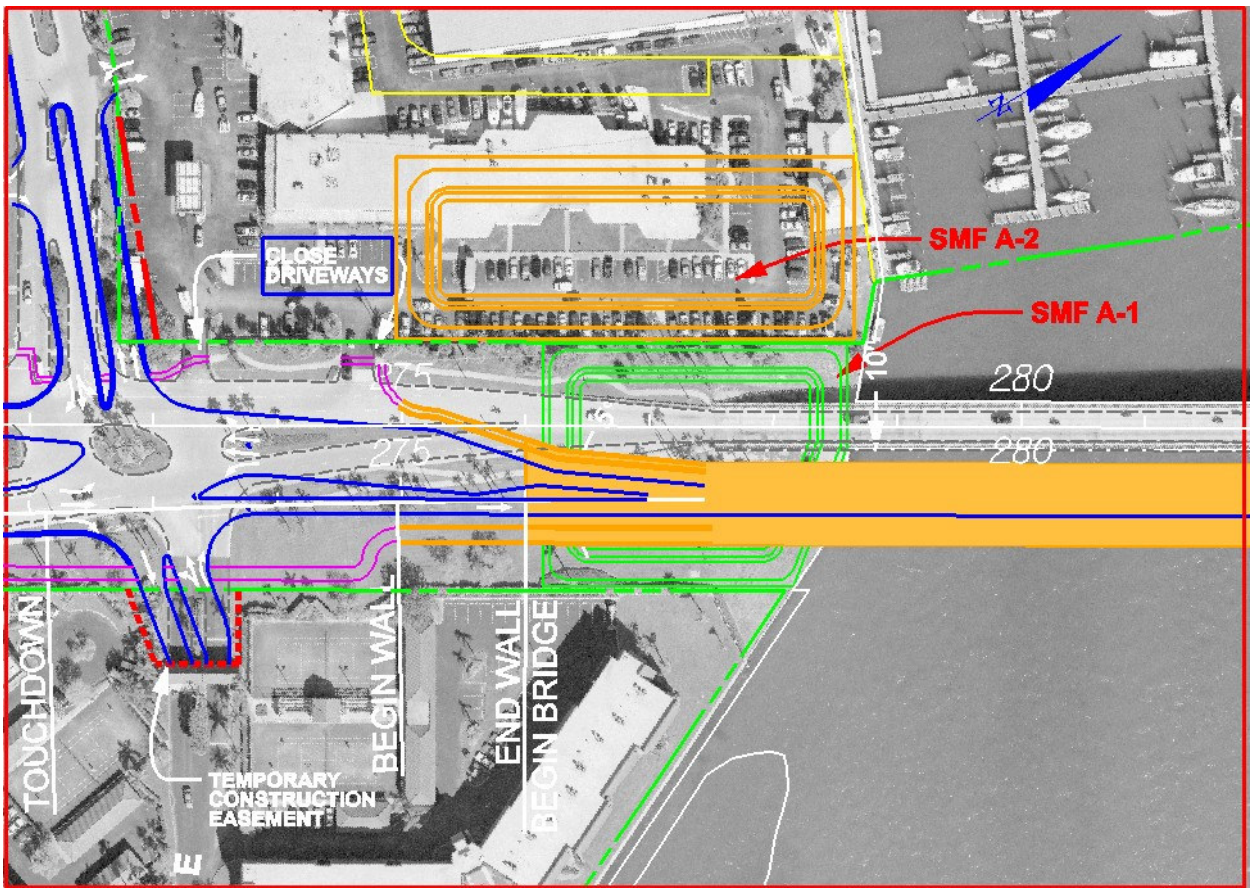
- Pond requirements were evaluated for both two-lane and four-lane bridge alternatives.
- The Recommended Alternative is Alternative 6 (two-lane fixed bridge over a relocated channel).
- Ponds to accommodate a two-lane bridge can be constructed within the existing right-of-way (ROW) on both the north and south bridge approaches (basins). However, the initial preliminary pond configuration (attached) on the south approach would conflict with a potential future four-lane configuration. Mr. Kile suggested the bridge be lengthened to allow more pond area under the bridge, thereby accommodating the ultimate condition without the need to reconfigure the pond (reconfigured pond attached). Since the south pond is located under the bridge structure, an important parameter to consider is the clearance between the low member of the bridge and the maintenance berm. The bridge depth will be reduced by utilizing a shallow bridge type for the first two spans starting at the beginning of the bridge. This provides maintenance access clearance of approximately 5 ft for maintenance personnel.
- A pond sized large enough to accommodate a four-lane bridge can be accommodated within the existing ROW, on the north approach, under the proposed Alternative 6 bridge.

Please notify the author no later than Thursday, July 13, 2006 of any necessary revisions to these minutes. Otherwise, the foregoing shall be deemed an accurate account of the subject meeting. Thank you.

(djr)



Original layout of SMF A-1



Revised layout of SMF A-1.

APPENDIX B
SWFWMD COORDINATION

PBS&J

MEETING MINUTES

DATE: April 26, 2006

PLACE: SWFWMD (Tampa), 10:00 am

SUBJECT: S.R. 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
Pinellas County, FL
Sec/Twp/Range: S 17,20 / T 32S / R 16E
FDOT FPID 410755-1-22-01
Pre-Application Meeting

ATTENDEES: Richard Alt – SWFWMD
Rick Perry – SWFWMD
Doug Reed – PBS&J
Mark Micikas – PBS&J
Hiren Patel – PBS&J
Melanie Calvo – PBS&J/FDOT GEC
Kirk Bogen – FDOT

Doug Reed provided background information on the project and discussed the different bridge alternatives that are being analyzed with this PD&E study. He explained that there have been small group meetings and a public workshop to gather public opinion on the project. A public hearing is to take place in early 2007 to determine which bridge alternative will be preferred. Alternative 6 is a high level fixed bridge that includes relocating the existing channel 400 feet to the north. The relocation of the channel is necessary to maintain the minimal vertical bridge clearance of 65 feet required by the US Coast Guard (USCG) while reducing impacts to properties and maintaining a reasonable profile for the bridge. The other 5 alternatives, including replacing the existing bascule bridge and other fixed bridge alternatives, utilize the existing Pinellas Bayway channel configuration. Alternative 6 is the least costly but presents some environmental and procedural issues due to the channel relocation so most of the meeting focused on this alternative. Because the channel is a federal channel, additional coordination is also required with the US Army Corps of Engineers (CORPS) for this alternative. A letter has already been sent to the CORPS to obtain information on the procedures required for the relocation of a federal channel. The Recommended Alternative has not yet been selected.

Water Quality

The outfall for this project is Boca Ciega Bay, which is an Outstanding Florida Waters (OFW) and an Aquatic Preserve. Full treatment is required for all roadway pavement within a stormwater management facility, not just new additional pavement, since this is a bridge reconstruction project. If a pond site is not feasible within the project limits, then equivalent (compensatory) treatment

would be allowed to treat an untreated existing roadway facility that drains to Boca Ciega Bay. Several bridge configuration alternatives may improve water quality by removing a portion of the seawall and fill at the approach to the existing bridge, resulting in increased flushing action. SWFWMD staff suggested coordinating efforts with the SWIM department at SWFWMD for current bathymetry of channels to see if they have this data. Contact Paul Miselis at the SWIM Department.

Environmental Sensitivity

Alternate 6 involves relocation of existing channel 400 feet to the north to improve the roadway profile tie down at the Madonna Boulevard intersection. The relocated channel length would be around 3,000-4,000 feet. However, the length of the channel requiring dredging is anticipated to be less as existing depths may be adequate for much of the realignment. Preliminary coordination with the CORPS and the US Coast Guard indicate that the depth requirement for the relocated channel is approximately 12 feet,. Since Boca Ciega Bay is an OFW and an Aquatic Preserve, Rick Perry (SWFWMD) made it clear that the any sediment disturbed during construction of the relocated channel needs to be contained and not allowed to travel upstream or downstream. He also indicated that testing would be required to determine the contaminants present in the sediment. If contaminants are present, specific methods for their containment and disposal should be presented in the application. There needs to be a way to contain the disturbed sediment from flowing away from the construction limits to other parts of the Bay by other means than floating turbidity barrier. Newer technology is available to prevent disturbed sediment from discharging into other parts of the Bay. The FDOT should also review mixing zone regulations for OFWs. Mr. Perry also stressed that the application should clearly demonstrate that the Public Interest tests are met for the project.

If Alternative 6 is chosen, Richard Alt (SWFWMD) suggested talking with the Florida Department of Environmental Protection (FDEP), since they are the agency normally designated to regulate channel relocations and dredging, and would have more experience and knowledge of the regulations governing those activities. One option is request that FDEP take jurisdiction over issuance of the permit if desired by the FDOT. The person to contact at FDEP is Ted Murray, Environmental Manager. Mr. Perry stated that the location of sea grass is very important and every step should be taken to avoid impact to existing sea grass. Kirk Bogen (FDOT) conveyed that Todd Mecklenborg (FDOT) has surveyed the area for seagrasses and did not find any seagrass in the footprint of the channel relocation. Aerial reviews also indicated no seagrasses. However, more detailed surveys may be necessary to confirm these initial findings.

It was also noted that the area is Sovereign Submerged Lands and that an easement would be required as well as the ERP.

Other Discussion

Dredging of the channel may temporarily impact the water quality of the Boca Ciega Bay, an Aquatic Preserve and an OFW. Demonstrating that the Public Interest tests have been met is important, particularly as there was public dispute of an adjacent bridge, Pinellas Bayway Structure “C”; which required an Administrative Hearing. To avoid an Administrative Hearing on this project, it is important to convey to the public that bridge reconstruction would serve in everyone’s interest since

this is a hurricane evacuation route, and replacing the bridge would be beneficial for safety reasons. SWFWMD staff suggested scheduling another pre-application meeting once the bridge alternative is decided, and Clark Hull would attend this meeting. Mr. Hull is the Regulation Program Director, and would provide more information regarding the water quality and environmental requirements.

cc: Attendees, Katasha Cornwell (FDOT)

APPENDIX C
PRELIMINARY SMF SIZING CALCULATIONS

SR 679 (Pinellas Bayway) at Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin A (SR 679 from South of Madonna Blvd. to High Point of Bridge over Pinellas Bayway)
Alt. 3 - 2-Lane Low Level Bascule Bridge

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 Begin Project SR 679 to Begin Wall	265+60	275+20	960	78	76	73920
	SR 679 Begin Wall to End Wall / Begin Bridge	275+20	277+50	230	76	65	16215
	SR 679 Begin Bridge to High Point of Bridge over Pinellas Bayway	277+50	284+70	720	65	65	46800
	Madonna Blvd			300	60	60	18000
						TOTAL (sf):	154935
						TOTAL (ac):	**3.56**

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

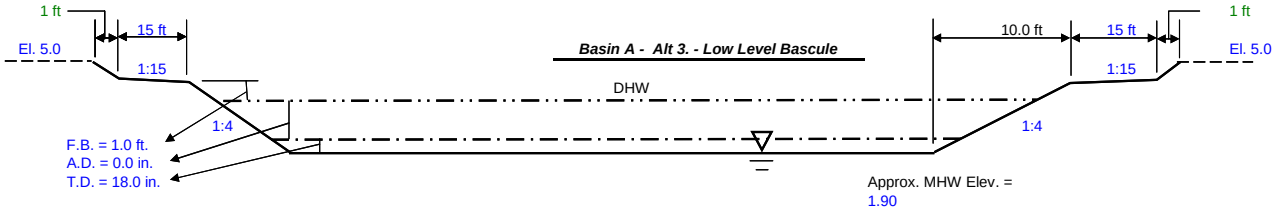
Treat 1 in. of rainfall over DCIA
Area to be treated — 3.56 ac (See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements
Treatment volume required — **0.45 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? — N
Rainfall Depth Zone 6 - 100yr/24hr (P) — 11.0 in.

Attenuation volume required (Post-Pre) — **0.00 ac-ft** **-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle
What is Length/Width Ratio (Rr)? — 4

Resulting Rr: — 4

Treatment area provided by treatment depth (T.D.)	0.30 ac
Square dimension at bottom of T.D.	114.3 ft
Long Rectangular dimension at bottom of T.D. (R1)	228.6 ft
Short Rectangular dimension at bottom of T.D. (R2)	57.2 ft
R1 at top of T.D.	240.6 ft
R2 at top of T.D.	69.2 ft
R1 at top of A.D.	240.6 ft
R2 at top of A.D.	69.2 ft
Attenuation volume provided by attenuation depth (A.D.)	0.00 ac-ft
R1 at top of F.B.	248.6 ft
R2 at top of F.B.	77.2 ft
Outside R1 dimension (including maint. berm & tie-down)	280.2 ft
Outside R2 dimension (including maint. berm & tie-down)	108.8 ft

Treatment Volume Required
0.45 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.70 ac**

PBS&J

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin B (SR 679 from High Point of Bridge over Pinellas Bayway to South of Bahia Del Mar Blvd.)
Alt. 3 - 2-Lane Low Level Bascule Bridge

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 High Point of Bridge over Pinellas Bayway to End Bridge	284+70	291+80	710	65	65	46150
	SR 679 End Bridge/Begin Wall to End Wall	291+80	294+20	240	65	66	15720
	SR 679 End Wall to Beach Access	294+20	298+50	430	66	57	26445
	SR 679 Beach Access to End Project	298+50	306+80	830	57	57	47310
						TOTAL (sf):	135625
						TOTAL (ac):	**3.11**

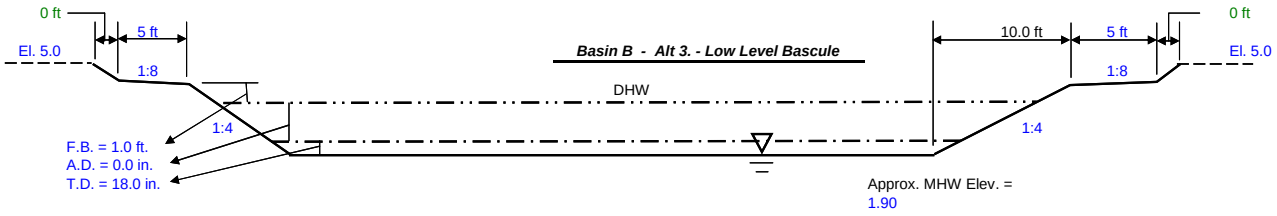
*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

Treat 1 in. of rainfall over DCIA		
Area to be treated	3.11 ac	(See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements		
Treatment volume required	**0.39 ac-ft**	

ATTENUATION CALCULATIONS

Will attenuation be necessary?	N	
Rainfall Depth Zone 6 - 100yr/24hr (P)	11.0 in.	
Attenuation volume required (Post-Pre)	**0.00 ac-ft**	**-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Linear	
What is Approximate Length of Linear SMF (in ft)?	900
Approx. length available for treatment:	869.9
Minimum width allowed:	13.0 ft
Treatment area provided by treatment depth (T.D.)	0.26 ac
Square dimension at bottom of T.D.	106.4 ft
Long Rectangular dimension at bottom of T.D. (R1)	869.9 ft
Short Rectangular dimension at bottom of T.D. (R2)	13.0 ft
R1 at top of T.D.	881.9 ft
R2 at top of T.D.	25.0 ft
R1 at top of A.D.	881.9 ft
R2 at top of A.D.	25.0 ft
Attenuation volume provided by attenuation depth (A.D.)	0.00 ac-ft
R1 at top of F.B.	889.9 ft
R2 at top of F.B.	33.0 ft
Outside R1 dimension (including maint. berm & tie-down)	900.0 ft
Outside R2 dimension (including maint. berm & tie-down)	43.1 ft

Treatment Volume Required
0.39 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.89 ac**

PBS&J

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin A (SR 679 from South of Madonna Blvd. to High Point of Bridge over Pinellas Bayway)
Alt. 4 - 2-Lane Mid Level Bascule Bridge

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 Begin Project SR 679 to Begin Wall	265+60	273+20	760	78	72	57000
	SR 679 Begin Wall to End Wall / Begin Bridge	273+20	277+20	400	72	61	26600
	SR 679 Begin Bridge to High Point of Bridge over Pinellas Bayway	277+20	284+70	750	61	61	45750
	Madonna Blvd			300	60	60	18000
	*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.					TOTAL (sf):	147350
						TOTAL (ac):	**3.38**

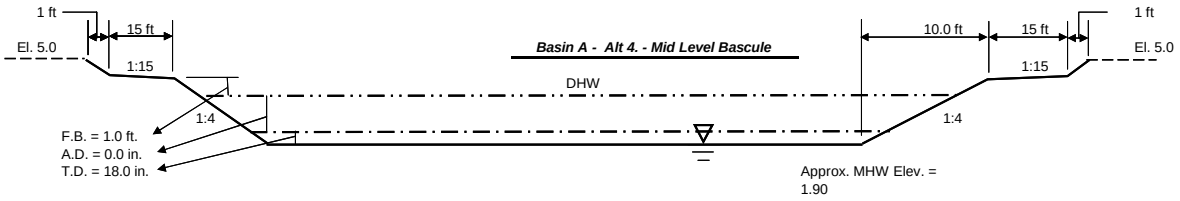
Treat 1 in. of rainfall over DCIA
Area to be treated — 3.38 ac (See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements
Treatment volume required — **0.42 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? — N
Rainfall Depth Zone 6 - 100yr/24hr (P) — 11.0 in.

Attenuation volume required (Post-Pre) — **0.00 ac-ft** **-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle
What is Length/Width Ratio (Rr)? — 4

Resulting Rr: — 4

Treatment area provided by treatment depth (T.D.)	0.28 ac
Square dimension at bottom of T.D.	110.4 ft
Long Rectangular dimension at bottom of T.D. (R1)	220.8 ft
Short Rectangular dimension at bottom of T.D. (R2)	55.2 ft
R1 at top of T.D.	232.8 ft
R2 at top of T.D.	67.2 ft
R1 at top of A.D.	232.8 ft
R2 at top of A.D.	67.2 ft
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**
R1 at top of F.B.	240.8 ft
R2 at top of F.B.	75.2 ft
Outside R1 dimension (including maint. berm & tie-down)	272.4 ft
Outside R2 dimension (including maint. berm & tie-down)	106.8 ft

Treatment Volume Required
0.42 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.67 ac**

PBS&J

SR 679 (Pinellas Bayway) at Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin B (SR 679 from High Point of Bridge over Pinellas Bayway to South of Bahia Del Mar Blvd.)
Alt. 4 - 2-Lane Mid Level Bascule Bridge

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 High Point of Bridge over Pinellas Bayway to End Bridge	284+70	291+80	710	61	61	43310
	SR 679 End Bridge/Begin Wall to End Wall	291+80	296+20	440	61	61	26840
	SR 679 End Wall to Beach Access	296+20	298+50	230	61	71	15180
	SR 679 Beach Access to End Project	298+50	306+80	830	71	57	53120
						TOTAL (sf):	138450
						TOTAL (ac):	**3.18**

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

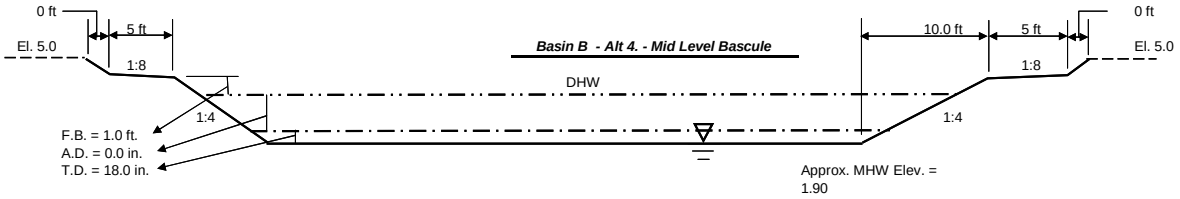
Treat 1 in. of rainfall over DCIA
Area to be treated — 3.18 ac (See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements
Treatment volume required — **0.40 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? — N
Rainfall Depth Zone 6 - 100yr/24hr (P) — 11.0 in.

Attenuation volume required (Post-Pre) — **0.00 ac-ft** **-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Linear
What is Approximate Length of Linear SMF (in ft)? — 900

Approx. length available for treatment:	869.9
Minimum width allowed:	13.5 ft
Treatment area provided by treatment depth (T.D.)	0.27 ac
Square dimension at bottom of T.D.	108.4 ft
Long Rectangular dimension at bottom of T.D. (R1)	869.9 ft
Short Rectangular dimension at bottom of T.D. (R2)	13.5 ft
R1 at top of T.D.	881.9 ft
R2 at top of T.D.	25.5 ft
R1 at top of A.D.	881.9 ft
R2 at top of A.D.	25.5 ft
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**
R1 at top of F.B.	889.9 ft
R2 at top of F.B.	33.5 ft
Outside R1 dimension (including maint. berm & tie-down)	900.0 ft
Outside R2 dimension (including maint. berm & tie-down)	43.6 ft

Treatment Volume Required
0.40 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.90 ac**

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin A (SR 679 from South of Madonna Blvd. to High Point of Bridge over Pinellas Bayway)
Alt. 5 - 2-Lane High Level Fixed Bridge over Existing Channel

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 Begin Project SR 679 to Begin Wall	265+60	274+60	900	78	72	67500
	SR 679 Begin Wall to End Wall / Begin Bridge	274+60	277+50	290	72	65	19865
	SR 679 Begin Bridge to High Point of Bridge over Pinellas Bayway	277+50	292+50	1500	65	65	97500
	Madonna Blvd			300	60	60	18000

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

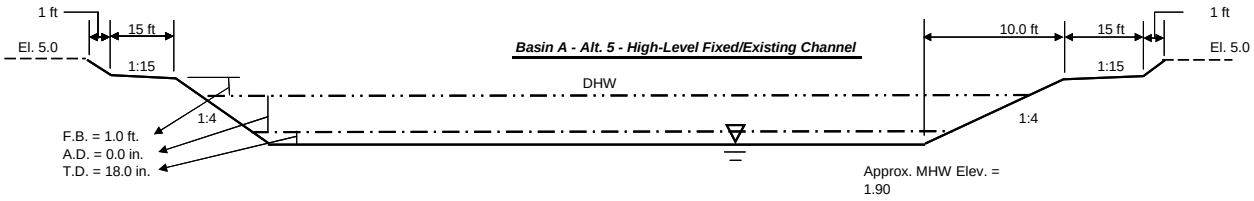
TOTAL (sf): 202865
TOTAL (ac): 4.66

Treat 1 in. of rainfall over DCIA		
Area to be treated	4.66 ac	(See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements		
Treatment volume required	**0.58 ac-ft**	

ATTENUATION CALCULATIONS

Will attenuation be necessary?	N	
Rainfall Depth Zone 6 - 100yr/24hr (P)	11.0 in.	
Attenuation volume required (Post-Pre)	**0.00 ac-ft**	**-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle		
What is Length/Width Ratio (Rr)?	4	
Resulting Rr:	4	
Treatment area provided by treatment depth (T.D.)	0.39 ac	
Square dimension at bottom of T.D.	130.3 ft	
Long Rectangular dimension at bottom of T.D. (R1)	260.6 ft	
Short Rectangular dimension at bottom of T.D. (R2)	65.2 ft	
R1 at top of T.D.	272.6 ft	
R2 at top of T.D.	77.2 ft	
R1 at top of A.D.	272.6 ft	
R2 at top of A.D.	77.2 ft	
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**	
R1 at top of F.B.	280.6 ft	
R2 at top of F.B.	85.2 ft	
Outside R1 dimension (including maint. berm & tie-down)	312.2 ft	
Outside R2 dimension (including maint. berm & tie-down)	116.8 ft	

Treatment Volume Required
0.58 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.84 ac**

PBS&J

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin B (SR 679 from High Point of Bridge over Pinellas Bayway to South of Bahia Del Mar Blvd.)
Alt. 5 - 2-Lane High Level Fixed Bridge over Existing Channel

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 High Point of Bridge over Pinellas Bayway to End Bridge	292+50	306+00	1350	65	65	87750
	SR 679 after End Bridge/Begin Wall to End Wall	306+00	311+30	530	65	80	38425
	SR 679 after End Wall to End Project	311+30	314+50	320	80	30	17600

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

TOTAL (sf): 143775
TOTAL (ac): 3.30

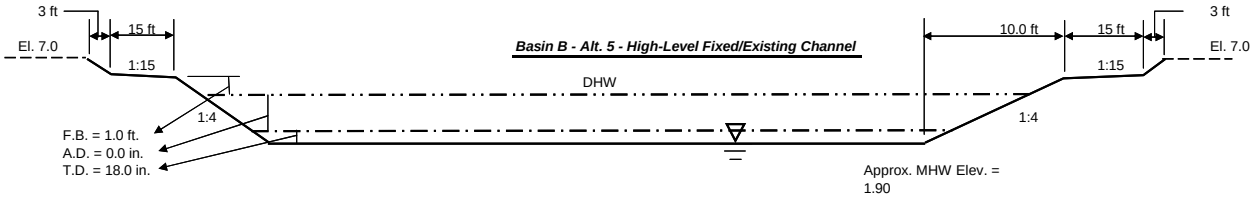
Treat 1 in. of rainfall over DCIA
Area to be treated — 3.30 ac (See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements
Treatment volume required — **0.41 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? N
Rainfall Depth Zone 6 - 100yr/24hr (P) 11.0 in.

Attenuation volume required (Post-Pre) — **0.00 ac-ft** **-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle
What is Length/Width Ratio (Rr)? 4

Resulting Rr: 4

Treatment area provided by treatment depth (T.D.)	0.28 ac
Square dimension at bottom of T.D.	110.4 ft
Long Rectangular dimension at bottom of T.D. (R1)	220.8 ft
Short Rectangular dimension at bottom of T.D. (R2)	55.2 ft
R1 at top of T.D.	232.8 ft
R2 at top of T.D.	67.2 ft
R1 at top of A.D.	232.8 ft
R2 at top of A.D.	67.2 ft
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**
R1 at top of F.B.	240.8 ft
R2 at top of F.B.	75.2 ft
Outside R1 dimension (including maint. berm & tie-down)	277.2 ft
Outside R2 dimension (including maint. berm & tie-down)	111.6 ft

Treatment Volume Required
0.41 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.71 ac**

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin A (SR 679 from South of Madonna Blvd. to High Point of Bridge over Pinellas Bayway)
Alt. 6 - 2-Lane High Level Fixed Bridge over Relocated Channel

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 Begin Project SR 679 to Begin Wall	265+60	274+95	935	78	72	70125
	SR 679 Begin Wall to End Wall / Begin Bridge	274+95	277+50	255	72	65	17468
	SR 679 Begin Bridge to High Point of Bridge over Pinellas Bayway	277+50	291+47	1397	65	65	90824
	Madonna Blvd			300	60	60	18000

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

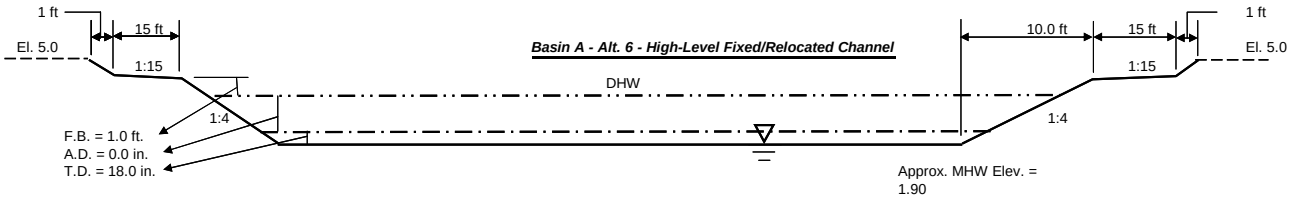
TOTAL (sf): 196417
TOTAL (ac): 4.51

Treat 1 in. of rainfall over DCIA		
Area to be treated	4.51 ac	(See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements		
Treatment volume required	**0.56 ac-ft**	

ATTENUATION CALCULATIONS

Will attenuation be necessary?	N	
Rainfall Depth Zone 6 - 100yr/24hr (P)	11.0 in.	
Attenuation volume required (Post-Pre)	**0.00 ac-ft**	**-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle		
What is Length/Width Ratio (Rr)?	4	
Resulting Rr:	4	
Treatment area provided by treatment depth (T.D.)	0.38 ac	
Square dimension at bottom of T.D.	128.7 ft	
Long Rectangular dimension at bottom of T.D. (R1)	257.4 ft	
Short Rectangular dimension at bottom of T.D. (R2)	64.4 ft	
R1 at top of T.D.	269.4 ft	
R2 at top of T.D.	76.4 ft	
R1 at top of A.D.	269.4 ft	
R2 at top of A.D.	76.4 ft	
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**	
R1 at top of F.B.	277.4 ft	
R2 at top of F.B.	84.4 ft	
Outside R1 dimension (including maint. berm & tie-down)	309.0 ft	
Outside R2 dimension (including maint. berm & tie-down)	116.0 ft	

Treatment Volume Required
0.56 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.82 ac**

PBS&J

SR 679 (Pinellas Bayway) at Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin B (SR 679 from High Point of Bridge over Pinellas Bayway to South of Bahia Del Mar Blvd.)
Alt. 6 - 2-Lane High Level Fixed Bridge over Relocated Channel

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 High Point of Bridge over Pinellas Bayway to End Bridge	291+47	302+00	1053	65	65	68426
	SR 679 End Bridge to End Wall	302+00	307+95	595	65	66	38973
	SR 679 End Wall to End Project	307+95	311+10	315	66	38	16380

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

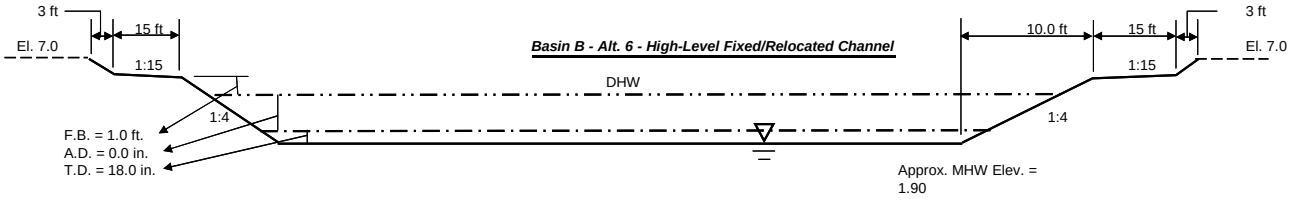
TOTAL (sf): 123779
TOTAL (ac): 2.84

Treat 1 in. of rainfall over DCIA		
Area to be treated	2.84 ac	(See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements		
Treatment volume required	**0.36 ac-ft**	

ATTENUATION CALCULATIONS

Will attenuation be necessary?	N	
Rainfall Depth Zone 6 - 100yr/24hr (P)	11.0 in.	
Attenuation volume required (Post-Pre)	**0.00 ac-ft**	**-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle		
What is Length/Width Ratio (Rr)?	4	
Resulting Rr:	4	
Treatment area provided by treatment depth (T.D.)	0.24 ac	
Square dimension at bottom of T.D.	102.2 ft	
Long Rectangular dimension at bottom of T.D. (R1)	204.4 ft	
Short Rectangular dimension at bottom of T.D. (R2)	51.1 ft	
R1 at top of T.D.	216.4 ft	
R2 at top of T.D.	63.1 ft	
R1 at top of A.D.	216.4 ft	
R2 at top of A.D.	63.1 ft	
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**	
R1 at top of F.B.	224.4 ft	
R2 at top of F.B.	71.1 ft	
Outside R1 dimension (including maint. berm & tie-down)	260.8 ft	
Outside R2 dimension (including maint. berm & tie-down)	107.5 ft	

Treatment Volume Required
0.36 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **0.64 ac**

PBS&J

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin A (SR 679 from South of Madonna Blvd. to High Point of Bridge over Pinellas Bayway)
Alt. 6 - 4-Lane High Level Fixed Bridge over Relocated Channel

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 Begin Project SR 679 to Begin Wall	265+60	274+95	935	100	112	99110
	SR 679 Begin Wall to End Wall / Begin Bridge	274+95	277+50	255	112	112	28560
	SR 679 Begin Bridge to High Point of Bridge over Pinellas Bayway	277+50	291+47	1397	112	112	156496
	Madonna Blvd			300	60	60	18000

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

TOTAL (sf): 302166
TOTAL (ac): 6.94

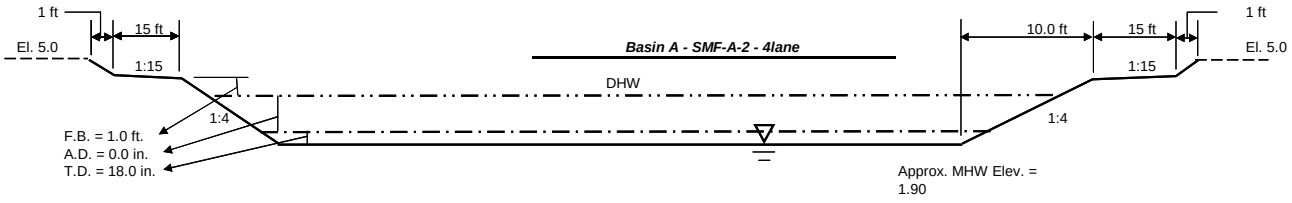
Treat 1 in. of rainfall over DCIA
Area to be treated — 6.94 ac (See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements
Treatment volume required — **0.87 ac-ft**

ATTENUATION CALCULATIONS

Will attenuation be necessary? N
Rainfall Depth Zone 6 - 100yr/24hr (P) 11.0 in.

Attenuation volume required (Post-Pre) — **0.00 ac-ft** **-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle
What is Length/Width Ratio (Rr)? 4

Resulting Rr: 4

Treatment area provided by treatment depth (T.D.)	0.58 ac
Square dimension at bottom of T.D.	158.9 ft
Long Rectangular dimension at bottom of T.D. (R1)	317.8 ft
Short Rectangular dimension at bottom of T.D. (R2)	79.5 ft
R1 at top of T.D.	329.8 ft
R2 at top of T.D.	91.5 ft
R1 at top of A.D.	329.8 ft
R2 at top of A.D.	91.5 ft
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**
R1 at top of F.B.	337.8 ft
R2 at top of F.B.	99.5 ft
Outside R1 dimension (including maint. berm & tie-down)	369.4 ft
Outside R2 dimension (including maint. berm & tie-down)	131.1 ft

Treatment Volume Required
0.87 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **1.11 ac**

PBS&J

SR 679 (Pinellas Bayway) at
Intracoastal Waterway
FPID 410755-1-22-01

Designed By: HMP
Date: 2/27/2006
Checked By: GMG
Date: 3/30/2006

Basin B (SR 679 from High Point of Bridge over Pinellas Bayway to South of Bahia Del Mar Blvd.)
Alt. 6 - 4-Lane High Level Fixed Bridge over Relocated Channel

TREATMENT CALCULATIONS

Area Calculations:

*	*Area to be Treated*						
x	***Description***	***Begin Sta.***	***End Sta.***	***Length***	***Begin Width***	***End Width***	***Area***
	SR 679 High Point of Bridge over Pinellas Bayway to End Bridge	291+47	302+00	1053	112	112	117904
	SR 679 End Bridge to End Wall	302+00	307+95	595	112	112	66640
	SR 679 End Wall to End Project	307+95	311+10	315	112	100	33390

*Areas marked with an "x" are within the basin limits, but will ***not*** be included in the area calculations.

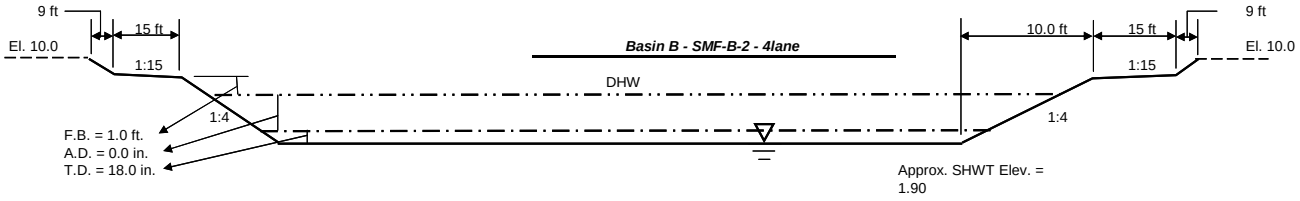
TOTAL (sf): 217934
TOTAL (ac): 5.00

Treat 1 in. of rainfall over DCIA		
Area to be treated	5.00 ac	(See Sheet Calcs-2 for Treatment Area Calculations)
Additional 50% treatment due to OFW requirements		
Treatment volume required	**0.63 ac-ft**	

ATTENUATION CALCULATIONS

Will attenuation be necessary?	N	
Rainfall Depth Zone 6 - 100yr/24hr (P)	11.0 in.	
Attenuation volume required (Post-Pre)	**0.00 ac-ft**	**-->No Attenuation Required**

POND SIZE ESTIMATE



The General shape of the SMF is Rectangle		
What is Length/Width Ratio (Rr)?	4	
Resulting Rr:	4	
Treatment area provided by treatment depth (T.D.)	0.42 ac	
Square dimension at bottom of T.D.	135.3 ft	
Long Rectangular dimension at bottom of T.D. (R1)	270.6 ft	
Short Rectangular dimension at bottom of T.D. (R2)	67.7 ft	
R1 at top of T.D.	282.6 ft	
R2 at top of T.D.	79.7 ft	
R1 at top of A.D.	282.6 ft	
R2 at top of A.D.	79.7 ft	
Attenuation volume provided by attenuation depth (A.D.)	**0.00 ac-ft**	
R1 at top of F.B.	290.6 ft	
R2 at top of F.B.	87.7 ft	
Outside R1 dimension (including maint. berm & tie-down)	339.0 ft	
Outside R2 dimension (including maint. berm & tie-down)	136.1 ft	

Treatment Volume Required
0.63 ac-ft
Attenuation Volume Required
0.00 ac-ft

Minimum Total Area Required: **1.06 ac**

APPENDIX D
ESTIMATED SMF COSTS

	Recommended SMFs
	SMF A-1
Location (Station)	276+00 to 278+50
Side (Lt., Rt.)	LT / RT
SMF Area (Max size Ac)	1.11
Mean High Water El. (ft)	1.9
Treatment System	Wet detention
Soils Name	Palm Beach Sand
Hydrological Soil Group	A
Land Use	Under prop. Bridge
Recorded Archaeological Sites	N/A
Archaeological Potential	Low
Recorded Historical Structures/Resources	N/A
Tentative Hazard Ranking	Low
Protected Species Probability	Low
Wetland Impacts (Ac)	0
Wetland Mitigation Cost	N/A
Proximity To Outfall (ft)	56
Outfall Pipe Cost Estimate (Assume 42" pipe at $170 / LF)	$9,520
Other Costs (Excavation, Control Structure, Fencing, etc)	$444,080
SMF Easement Required	0
Number Of Parcels	0
Partial (P) Or Whole Take (WT)	N/A
ROW Cost Estimate	$0
TOTAL ESTIMATED COSTS	$453,600

	Recommended SMFs	
	SMF B-1-A	**SMF B-1-B**
Location (Station)	295+00 to 305+00	294+50 to 297+80
Side (Lt., Rt.)	LT	LT / RT
SMF Area (Max size Ac)	0.90	1.07
Mean High Water El. (ft)	1.9	1.9
Treatment System	Wet detention	Wet detention
Soils Name	Palm Beach Sand	Palm Beach Sand
Hydrological Soil Group	A	A
Land Use	Linear pond adjacent to roadway	Under prop. Bridge
Recorded Archaeological Sites	N/A	N/A
Archaeological Potential	Low	Low
Recorded Historical Structures/Resources	N/A	N/A
Tentative Hazard Ranking	Low	Low
Protected Species Probability	Low	Low
Wetland Impacts (Ac)	0	0
Wetland Mitigation Cost	N/A	N/A
Proximity To Outfall (ft)	50	100
Outfall Pipe Cost Estimate (Assume 42" pipe at $170 / LF)	$8,500	$9,500
Other Costs (Excavation, Control Structure, Fencing, etc)	* $283,300	$363,000
SMF Easement Required	0	0
Number Of Parcels	0	0
Partial (P) Or Whole Take (WT)	N/A	N/A
ROW Cost Estimate	$0	$0
TOTAL ESTIMATED COSTS	$291,800	$372,500

* Cost of fencing and gate removed for linear pond

APPENDIX E
REVIEW COMMENTS AND RESPONSES

July 28, 2006

PD&E – Draft Alternative Stormwater Management Facility Report
SR 679 (Pinellas Bayway Structure E)
County: Pinellas
Prepared By: PBS&J
FDOT Project Manager: Gabor Farkasfalvy

"DRAINAGE" Comments by Richard E. Griffin, FDOT Drainage

Comment. NO.	CODE	COMMENTS
		In general the report provided reasonable assurance that the proposed stormwater management facilities can be constructed within the limits of existing R/W. Normally the cost data for the alternative sites would be requested before an in depth review of the report, but in this case it is not significant. The issues below do not affect the selection of pond sites and are only suggestions which may make the report read better.
1	EDX	Section 2 2.3 – DOT very seldom sees the 100 yr 24 hour event as the critical duration storm event for attenuation (it is often the 4 or 8 hour event). Although attenuation is not required, there will be design required to set TOB elevations and design outfall structures and pipes. Generally this design is based on a SWFWMD 25 year 24 hour duration and the DOT 100 year critical duration events. **RESPONSE:** For purposes of pond size estimating for pond siting reports, the 100yr-24 hour event is utilized for a Pre vs. Post volume comparison as outlined in Section 5.2.1 of the SMF handbook. If a simple pond model method was utilized, the 100yr-4hr or 8hr and the SWFWMD 25yr-24hr duration would be used.
2	EDX	Section 3 3.2 – Clarify this paragraph, maybe you are trying to say too much in relation to the existing conditions. In general I believe you are trying to relay that the soils information shows the SHW to be in the range of 3.3 to 5 feet below existing ground for Palm Beach Sand, but for preliminary design purposes a wet pond design will be specified and the mean high water elevation of the bay will be used as control. In the third sentence you state that if the pond is located away from the bay then table 1.5.1 will be used, this is confusing since this is never the case for any of the alternate pond sites. Somewhere in the report, but probably not in this section, you may clarify this by noting that a dry pond

		design may be possible based on the SCS soils information, but this would need to be determined using geotechnical data provided during design. Based on the footnote under table 1.5.1 is the SHGW in the pond sites at elevation 3.3 to 5.0 or the depth to the SHGW at 3.3 to 5.0. Maybe that note should be removed as the existing ground does not seem to be associated with this table. **RESPONSE:** Will revise this paragraph to only state the MHW is used as the SHWT control due to the proximity of the bay. Will remove footnote from Table 1.5.1.
3	EDX	Section 4 4.1 – There is no problems with the preliminary design using the wet pond criteria to estimate required volumes, but it is not likely as stated that a high SHW table in this area would require that wet detention be used. **RESPONSE:** Will add to discussion the possibility of using a dry pond during the design phase of this project, but the PSR pond alternatives utilized a wet pond criteria for pond sizing to be conservative.

"ENVIRONMENTAL" Comments by Katasha Cornwell, FDOT Environmental Permit

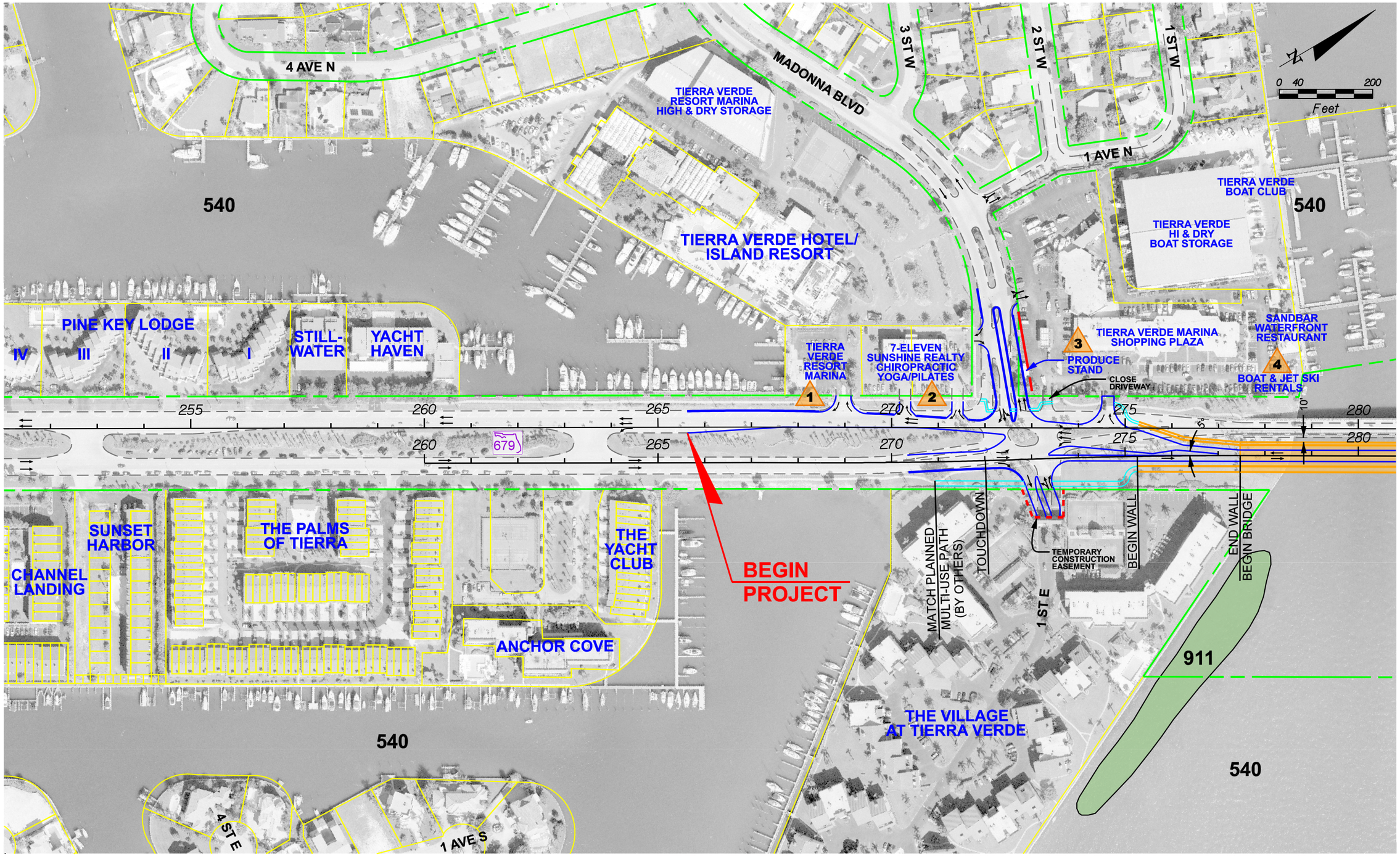
1 EDX No mention of potential wetland impacts for any of the alternative pond site. It appears that the pond alternatives do not impact the wetlands but it might be worth stating in the report.

RESPONSE: Agree, will add this to report.

APPENDIX F
PROPOSED CONCEPT PLANS AND PROFILES

PRELIMINARY

FLIGHT DATE: MAY 7, 2005



ALTERNATIVE 3: LOW-LEVEL BASCULE BRIDGE OVER EXISTING CHANNEL

LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 — FLUCFG CODES
- 1 — POTENTIAL CONTAMINATION SITE

PBS&J
5300 West Cypress Street
Suite 200
Tampa, Florida 33607-1768
(813) 282-7275

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 1

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PRELIMINARY

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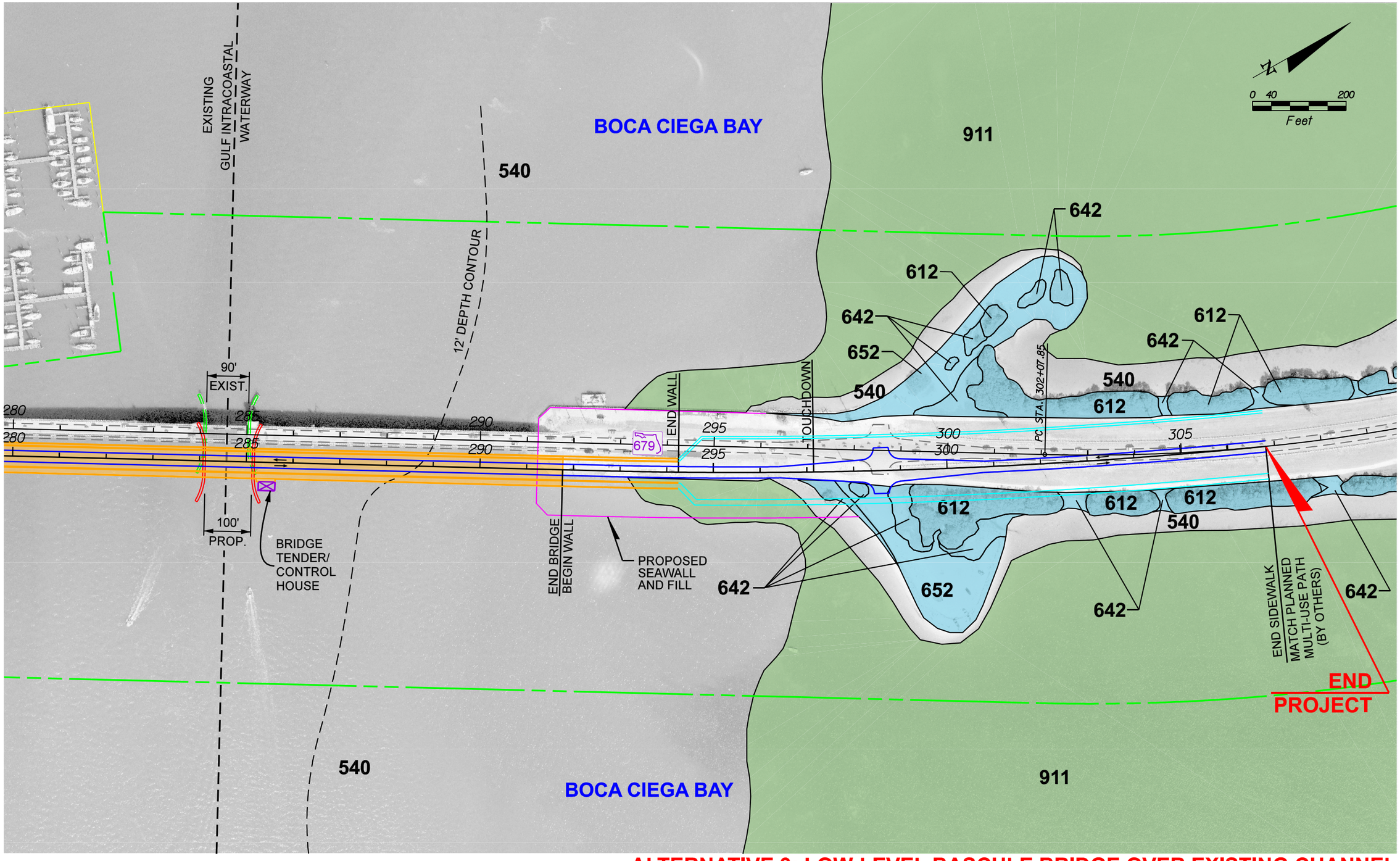

ALTERNATIVE 3: LOW-LEVEL BASCULE BRIDGE OVER EXISTING CHANNEL

LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 — FLUCFC CODES
- POTENTIAL CONTAMINATION SITE

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(813) 282-7275

STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY

CONCEPT PLANS

SHEET NO. 2

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PRELIMINARY

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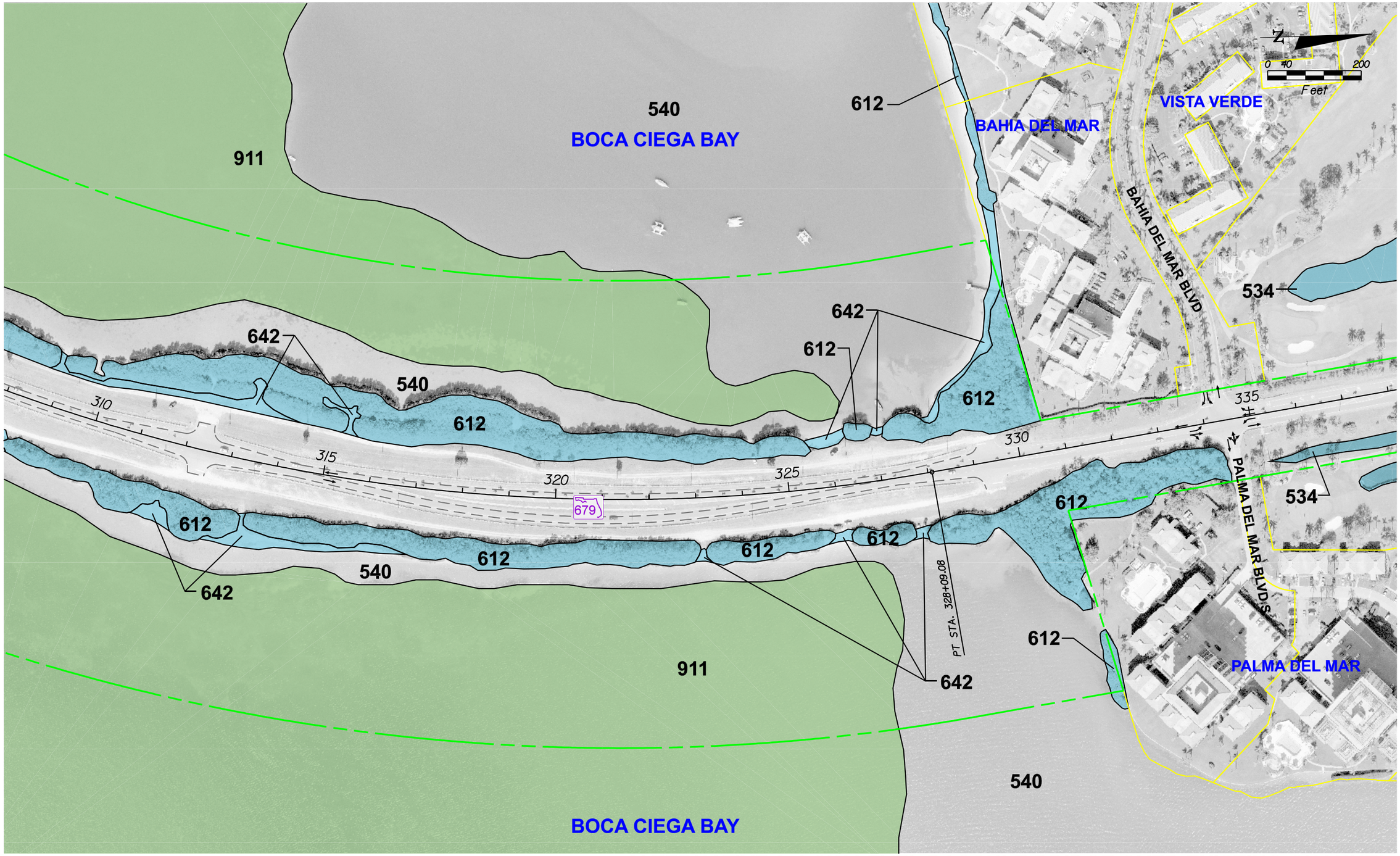

ALTERNATIVE 3: LOW-LEVEL BASCULE BRIDGE OVER EXISTING CHANNEL

LEGEND

- 300 BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 FLUCFC CODES
- 1 POTENTIAL CONTAMINATION SITE

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 3

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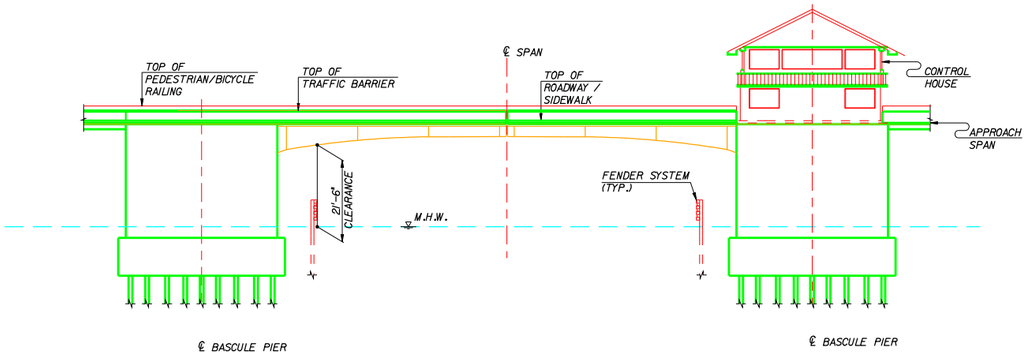
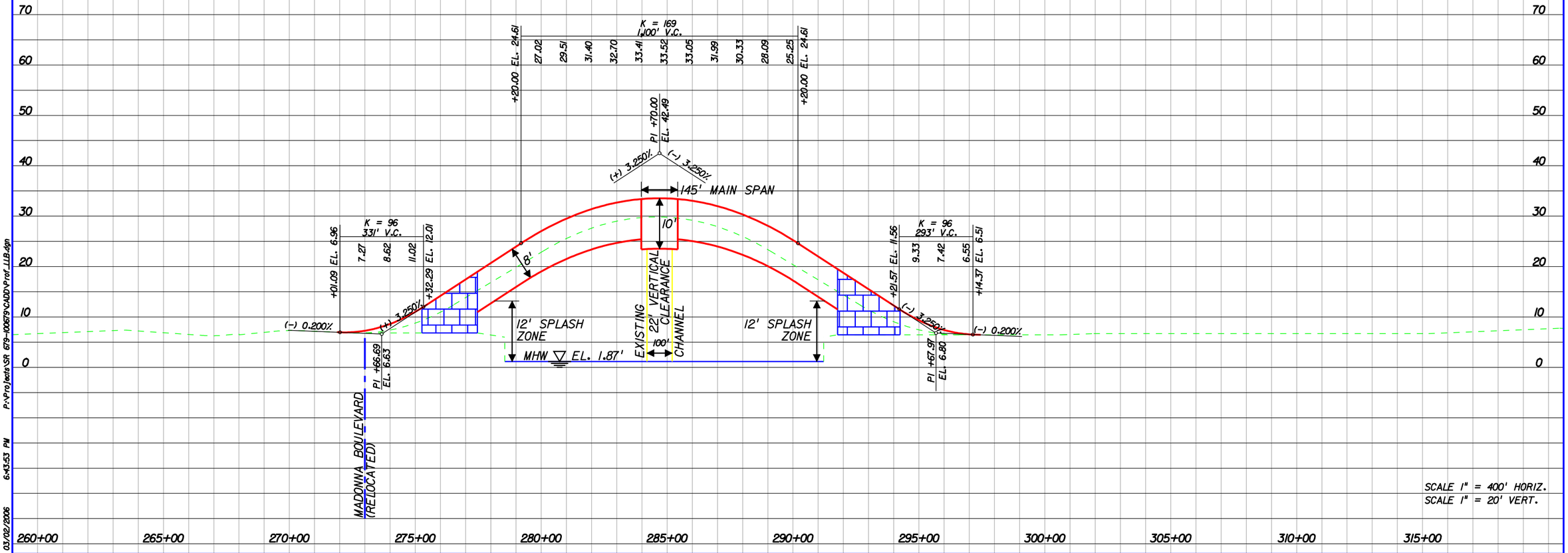


LOW-LEVEL BASCULE SPAN ELEVATION



LEGEND

EXISTING PROFILE

PROPOSED PROFILE

RETAINING WALL

PBSJ
5300 West Cypress Street
Suite 200
Tampa, Florida 33607-1768
(813) 282-7275

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
LOW-LEVEL BASCULE BRIDGE PROFILE
EXISTING CHANNEL 3.25 PERCENT GRADE

SHEET NO. 4

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PRELIMINARY

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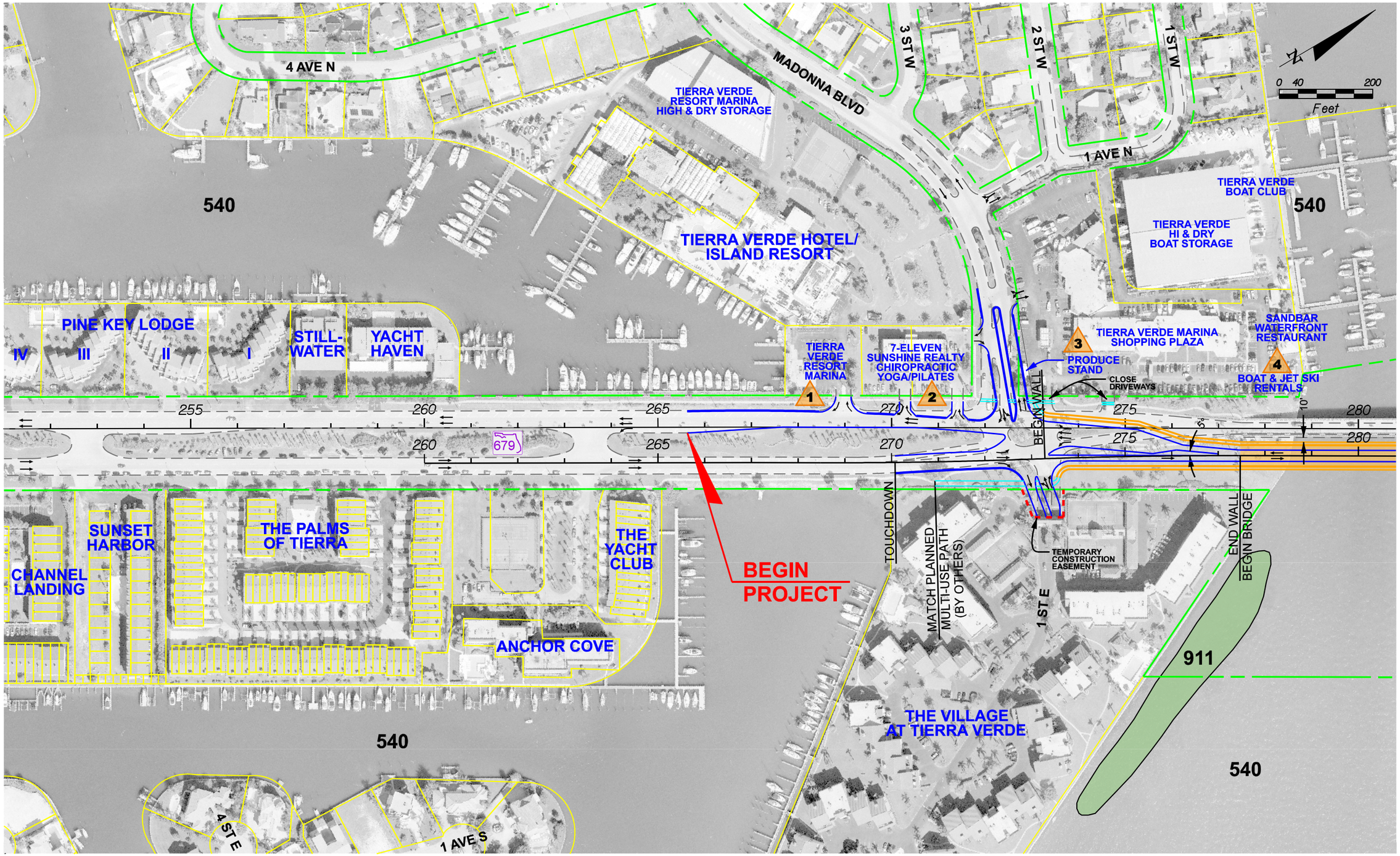

ALTERNATIVE 4: MID-LEVEL BASCULE BRIDGE OVER EXISTING CHANNEL

LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 — FLUCFC CODES
- 1 — POTENTIAL CONTAMINATION SITE

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5300 West Cypress Street
Suite 200
Tampa, Florida 33607-1768
(813) 282-7275

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 1

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PRELIMINARY

FLIGHT DATE: MAY 7, 2005

EXISTING GULF INTRACOASTAL WATERWAY

BOCA CIEGA BAY

911

540

12' DEPTH CONTOUR

END WALL

TOUCHDOWN

PC STA. 302+07.85

642

612

652

90' EXIST.

280

285

290

295

300

305

679

100' PROP.

BRIDGE TENDER/ CONTROL HOUSE

END BRIDGE BEGIN WALL

PROPOSED SEAWALL AND FILL

END SIDEWALK MATCH PLANNED MULTI-USE PATH (BY OTHERS)

END PROJECT

0 40 200 Feet

ALTERNATIVE 4: MID-LEVEL BASCULE BRIDGE OVER EXISTING CHANNEL

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LEGEND

- 300 BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 FLUCFC CODES
- POTENTIAL CONTAMINATION SITE

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Suite 200
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(813) 282-7275

STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

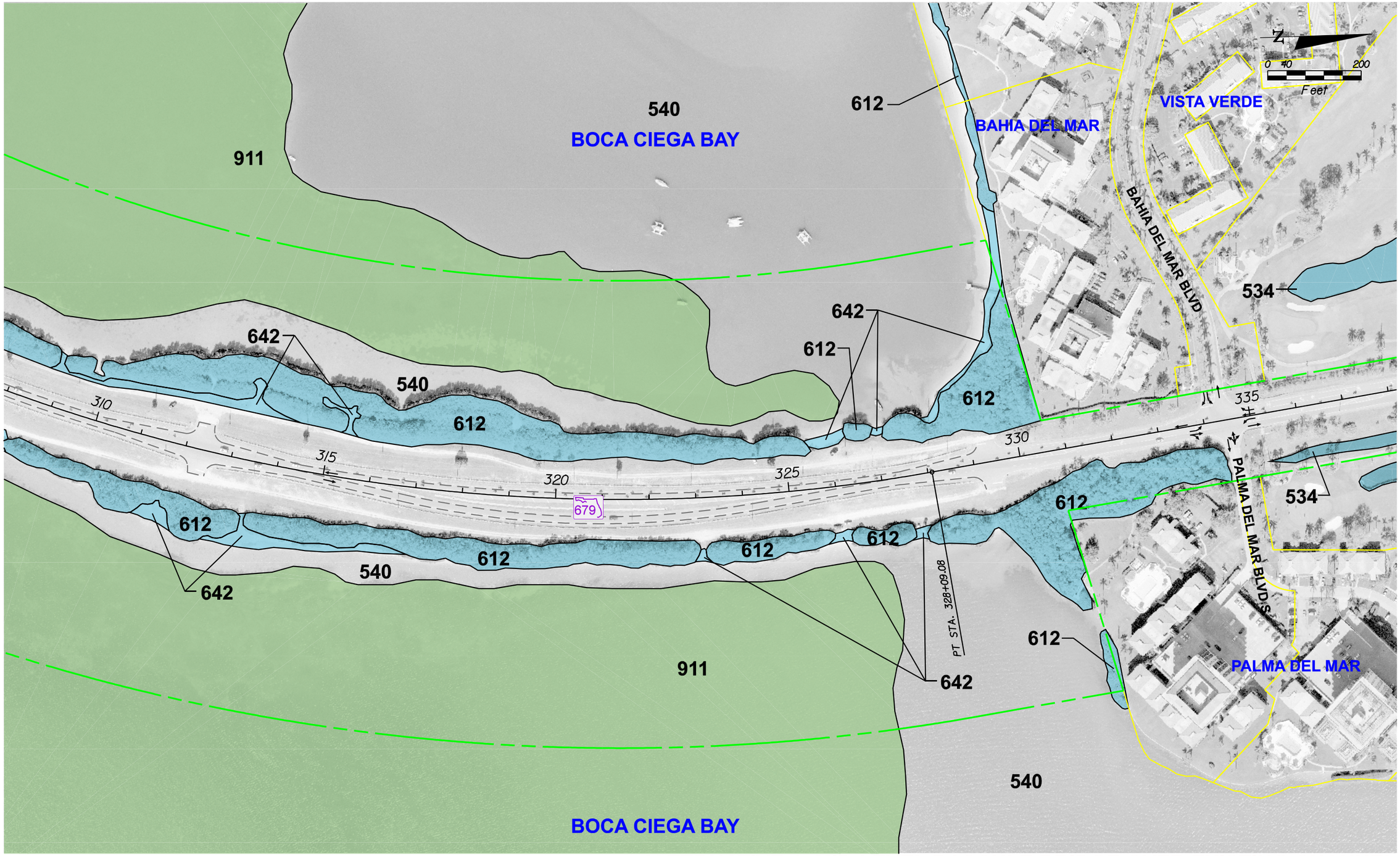
S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY

CONCEPT PLANS

SHEET NO. 2

PRELIMINARY

FLIGHT DATE: MAY 7, 2005



ALTERNATIVE 4: MID-LEVEL BASCULE BRIDGE OVER EXISTING CHANNEL

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LEGEND

- 300 BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 FLUCFC CODES
- 1 POTENTIAL CONTAMINATION SITE

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Suite 200
Tampa, Florida 33607-1768
(813) 282-7275

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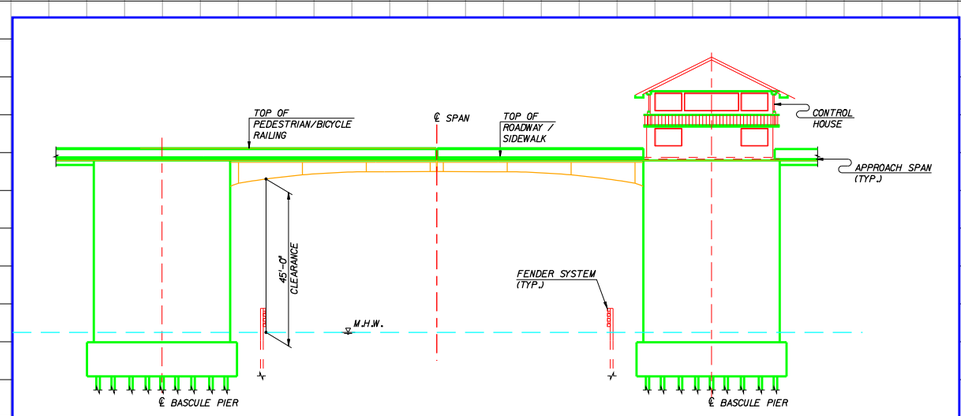
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY

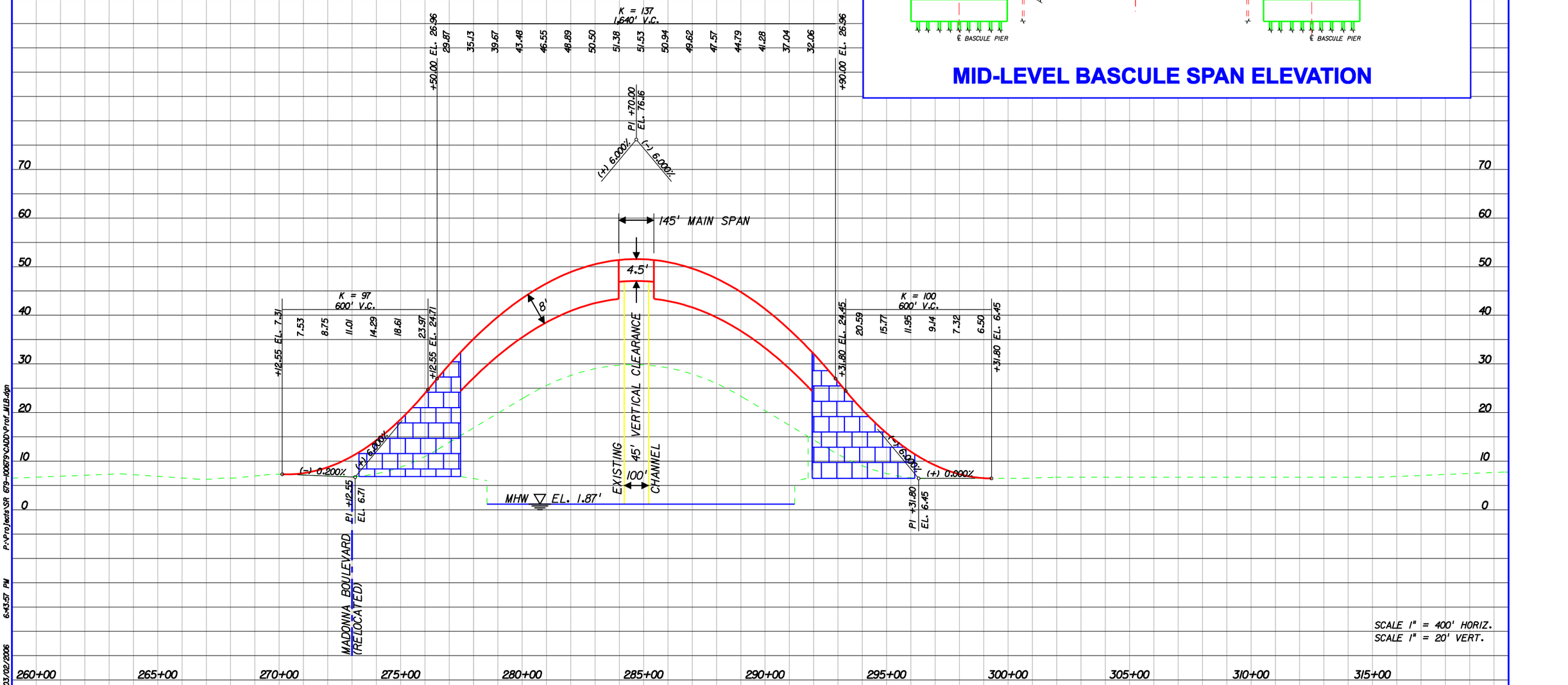
CONCEPT PLANS

SHEET NO. 3

PRELIMINARY



MID-LEVEL BASCULE SPAN ELEVATION



SCALE 1" = 400' HORIZ.
SCALE 1" = 20' VERT.

LEGEND

EXISTING PROFILE

PROPOSED PROFILE

RETAINING WALL

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5300 West Cypress Street
Suite 200
Tampa, Florida 33607-1768
(813) 282-7275

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
MID-LEVEL BASCULE BRIDGE PROFILE
EXISTING CHANNEL 6 PERCENT GRADE

SHEET NO. 4

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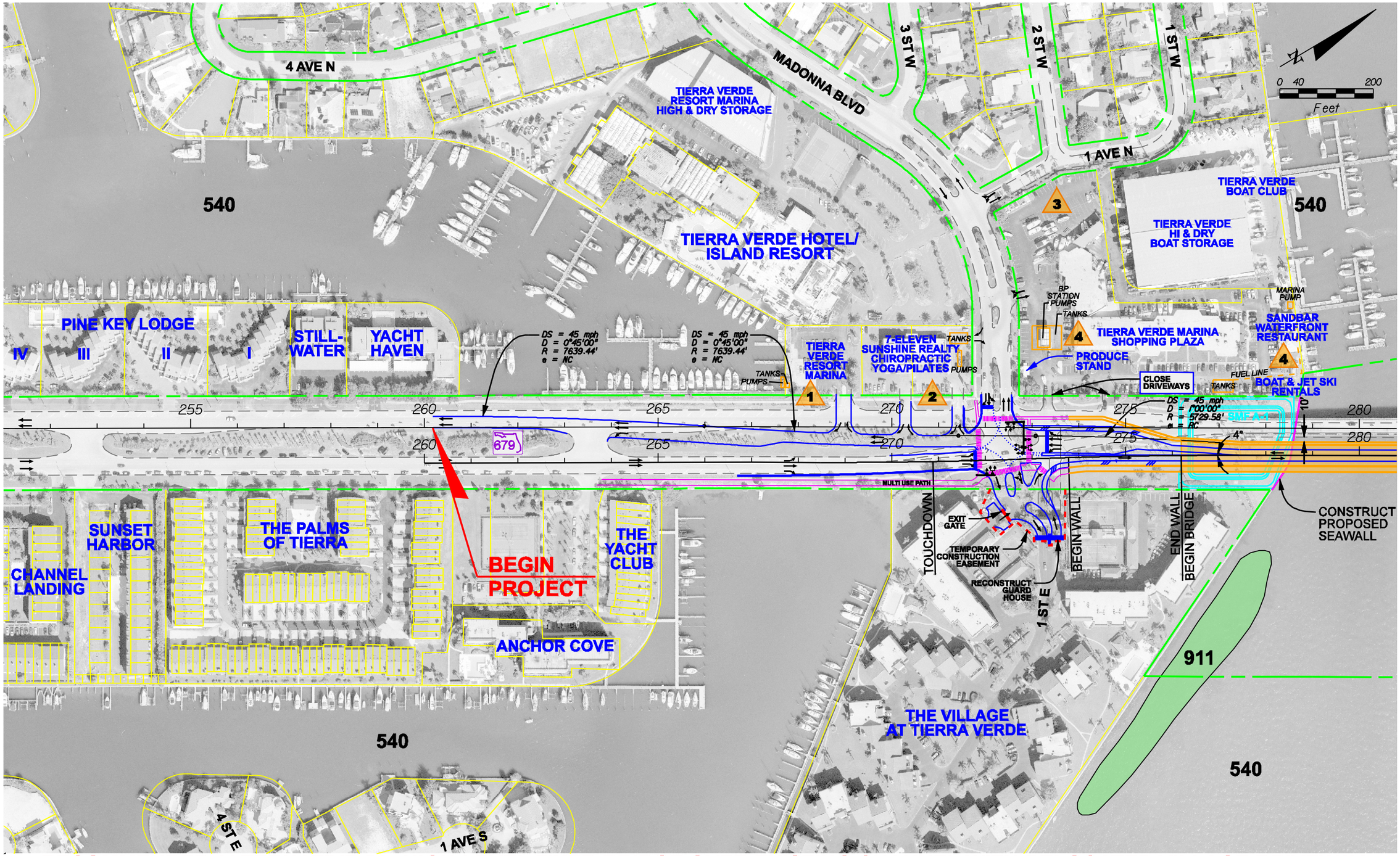
PRELIMINARY

FLIGHT DATE: MAY 7, 2005



RECOMMENDED ALTERNATIVE 5A: HIGH-LEVEL FIXED BRIDGE OVER EXISTING CHANNEL WITH RELOCATED VILLAGE DRIVEWAY

300 BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
PARCEL LINES
EXISTING EDGE OF PAVEMENT
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPOSED EDGE OF PAVEMENT

PROPOSED BRIDGE
PROPOSED BARRIER/RETAINING WALL
PROPOSED SIDEWALK
612 FLUCFC CODES
WETLANDS
SEAGRASS

SMF A-2 RECOMMENDED ALTERNATIVE POND SITES
POTENTIAL CONTAMINATION SITE
PROPOSED TRAFFIC SIGNAL

PBS&J
5300 West Cypress Street
Suite 200
Tampa, Florida 33607-1768
(813) 282-7275

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 1

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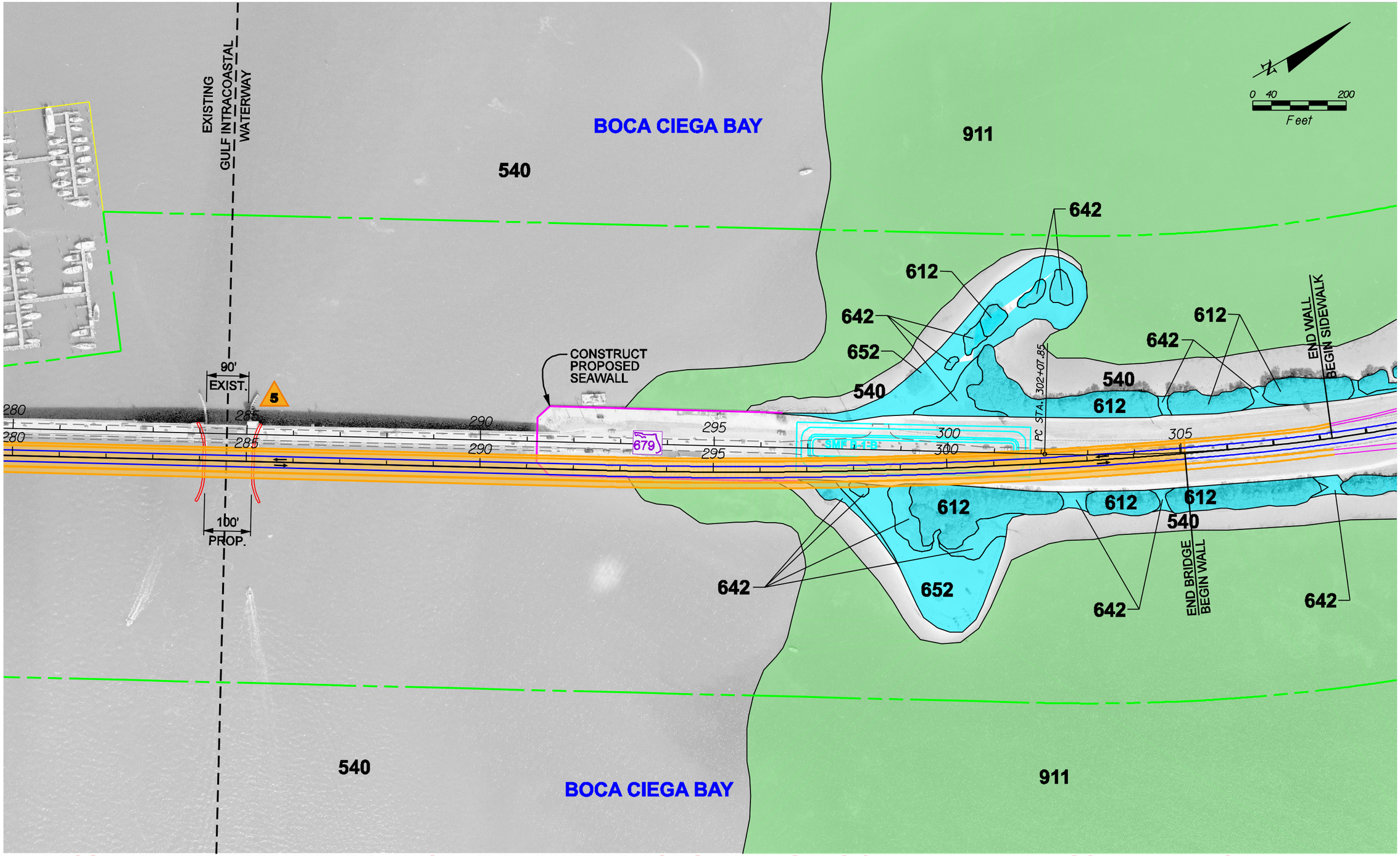
PRELIMINARY

FLIGHT DATE: MAY 7, 2005



RECOMMENDED ALTERNATIVE 5A: HIGH-LEVEL FIXED BRIDGE OVER EXISTING CHANNEL WITH RELOCATED VILLAGE DRIVEWAY

300 BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
PARCEL LINES
EXISTING EDGE OF PAVEMENT
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPOSED EDGE OF PAVEMENT

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WETLANDS
SEAGRASS

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S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 2

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PRELIMINARY

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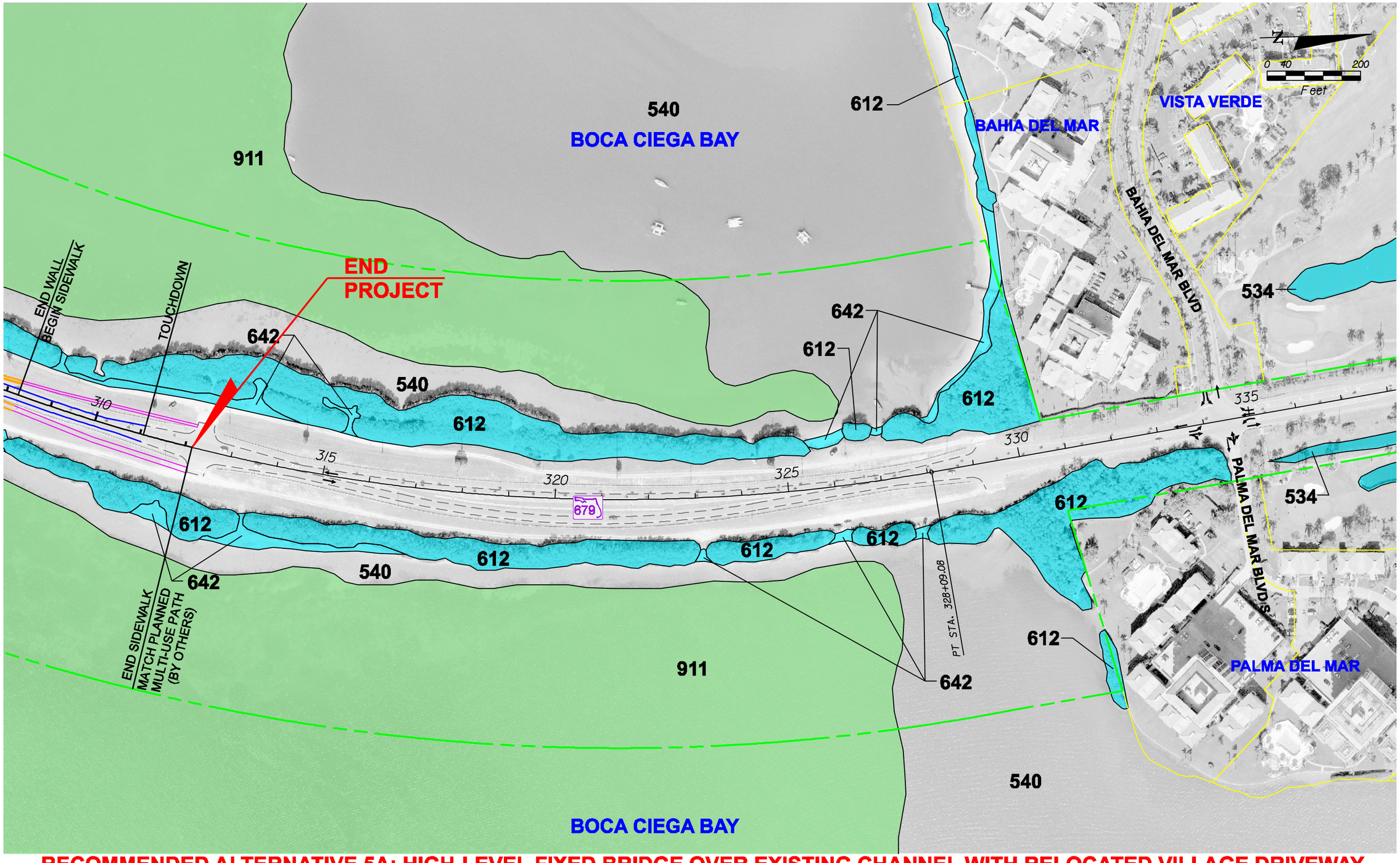

RECOMMENDED ALTERNATIVE 5A: HIGH-LEVEL FIXED BRIDGE OVER EXISTING CHANNEL WITH RELOCATED VILLAGE DRIVEWAY

300 BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
PARCEL LINES
EXISTING EDGE OF PAVEMENT
EXISTING RIGHT-OF-WAY
PROPOSED RIGHT-OF-WAY
PROPOSED EDGE OF PAVEMENT

PROPOSED BRIDGE
PROPOSED BARRIER/RETAINING WALL
PROPOSED SIDEWALK
612 FLUCFC CODES
WETLANDS
SEAGRASS

SMF A-2 RECOMMENDED ALTERNATIVE POND SITES
POTENTIAL CONTAMINATION SITE
PROPOSED TRAFFIC SIGNAL

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E)
AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 3

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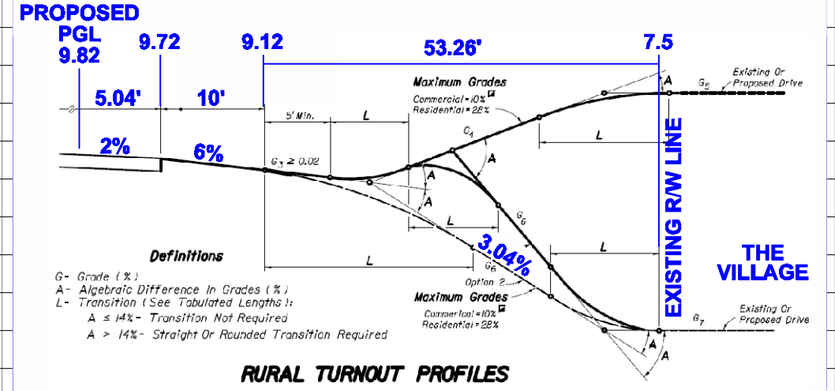
PRELIMINARY

GRADE UP	GRADE DOWN	MAX. ELEV.	BRIDGE LENGTH
6%	5%	90.05'	2889.11'

TURNOUT PROFILE AT STA 272+54.50



RURAL TURNOUT PROFILES
STANDARD INDEX 515

DESIGN SPEED = 45 MPH
K = 98
1,078' V.C.
+14.48 EL. 72.41
PI +53.48 EL. 104.75
+92.48 EL. 77.80
(+) 6.000%
(-) 5.000%

8'
6.25'
19.69'
20.00'
1.75'
65' VERTICAL CLEARANCE
100' EXISTING CHANNEL
MHW EL. 1.87'
(-) 0.202%
(+) 6.000%
(-) 5.000%
(+) 0.000%

BEGIN PROJECT
END PROJECT

DESIGN SPEED = 45 MPH
K = 79
490' V.C.
+88.25 EL. 8.41
+78.19 EL. 22.61
PI +33.22 EL. 7.91

DESIGN SPEED = 45 MPH
K = 79
395' V.C.
+16.86 EL. 16.58
+11.86 EL. 6.71
PI +14.36 EL. 6.71

MADONNA BOULEVARD (EXISTING)
THE VILLAGE (RELOCATED)
RECOMMENDED ALTERNATIVE POND SITE
RECOMMENDED ALTERNATIVE POND SITE
STA 272+54.50

SCALE 1" = 400' HORIZ.
SCALE 1" = 20' VERT.

260+00 265+00 270+00 275+00 280+00 285+00 290+00 295+00 300+00 305+00 310+00 315+00

RECOMMENDED ALTERNATIVE 5A: HIGH-LEVEL FIXED BRIDGE OVER EXISTING CHANNEL WITH RELOCATED VILLAGE DRIVEWAY

LEGEND
EXISTING PROFILE
PROPOSED PROFILE
RETAINING WALL

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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S.R. 679 (PINELLAS BAYWAY STRUCTURE E)
AT INTRACOASTAL WATERWAY
HIGH-LEVEL FIXED BRIDGE PROFILE
EXISTING CHANNEL

SHEET NO. 4

PRELIMINARY

FLIGHT DATE: MAY 7, 2005

4 AVE N
MADONNA BLVD
3 ST W
2 ST W
1 ST W
1 AVE N
0 40 200
Feet
TIERRA VERDE RESORT MARINA HIGH & DRY STORAGE
TIERRA VERDE HOTEL/ ISLAND RESORT
TIERRA VERDE BOAT CLUB
TIERRA VERDE HI & DRY BOAT STORAGE
540
PINE KEY LODGE
IV III II I
STILL-WATER
YACHT HAVEN
TIERRA VERDE RESORT MARINA
7-ELEVEN
SUNSHINE REALTY
CHIROPRACTIC
YOGA/PILATES
1B
3
PRODUCE STAND
CLOSE DRIVEWAYS
TIERRA VERDE MARINA SHOPPING PLAZA
SANDBAR WATERFRONT RESTAURANT
4
BOAT & JET SKI RENTALS
1
2
255 260 265 270 275 280
260 265 270 275 280
679
10'
5%
SUNSET HARBOR
CHANNEL LANDING
THE PALMS OF TIERRA
THE YACHT CLUB
ANCHOR COVE
BEGIN PROJECT
TOUCHDOWN
MATCH PLANNED MULTI-USE PATH (BY OTHERS)
TEMPORARY CONSTRUCTION EASEMENT
BEGIN WALL
END WALL
BEGIN BRIDGE
1 ST E
911
THE VILLAGE AT TIERRA VERDE
540
4 ST E
1 AVE S

ALTERNATIVE 6: HIGH-LEVEL FIXED BRIDGE OVER RELOCATED CHANNEL

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04/03/2006
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LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- 612 — FLUCFC CODES
- WETLANDS
- SEAGRASS
- 1 — POTENTIAL CONTAMINATION SITE
- 3B — NUMBER OF BUSINESS RELOCATIONS

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DEPARTMENT OF TRANSPORTATION

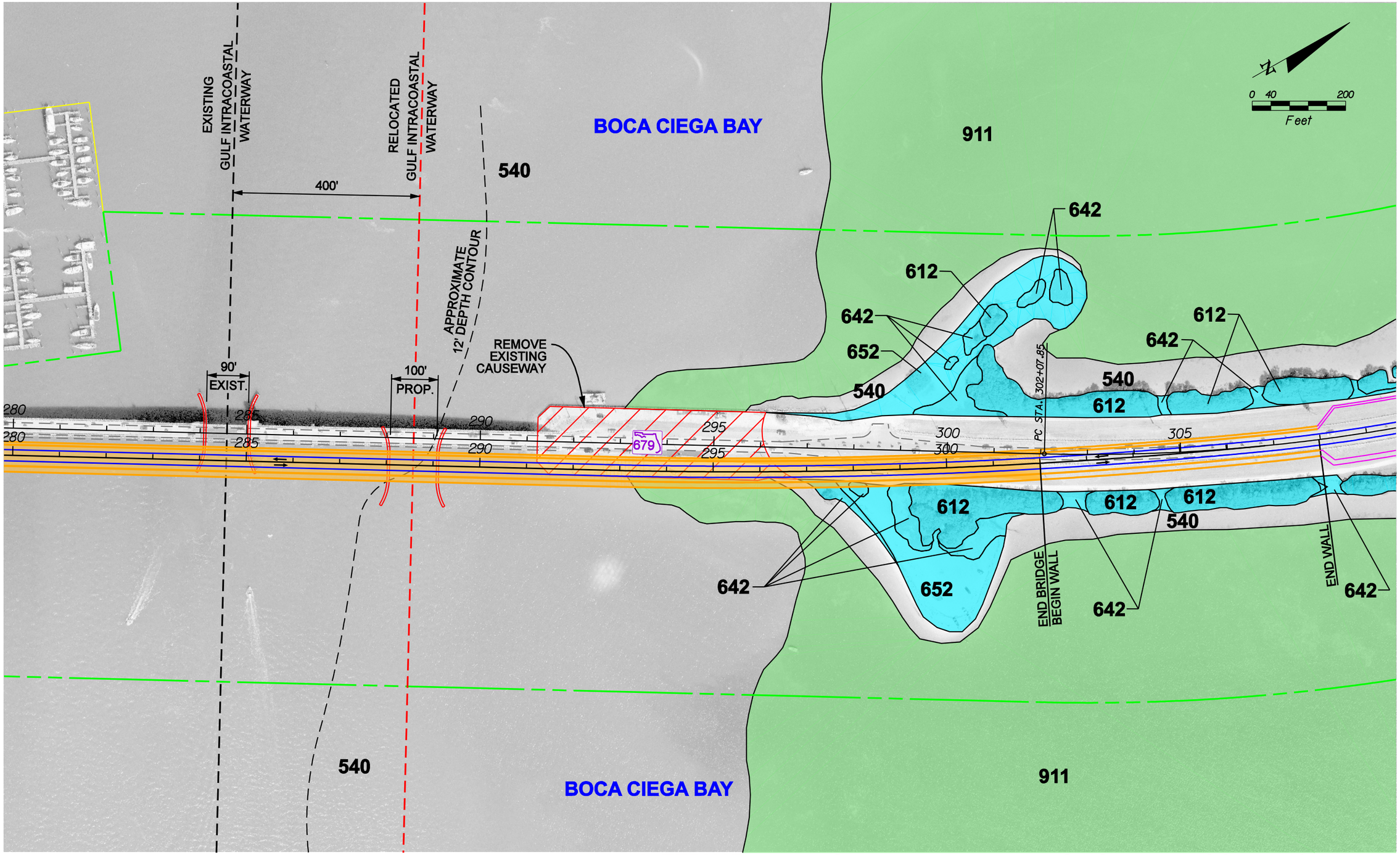
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 1

PRELIMINARY

FLIGHT DATE: MAY 7, 2005



ALTERNATIVE 6: HIGH-LEVEL FIXED BRIDGE OVER RELOCATED CHANNEL

LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
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- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- 612 — FLUCFC CODES
- WETLANDS
- SEAGRASS
- 1 — POTENTIAL CONTAMINATION SITE
- 3B — NUMBER OF BUSINESS RELOCATIONS

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 2

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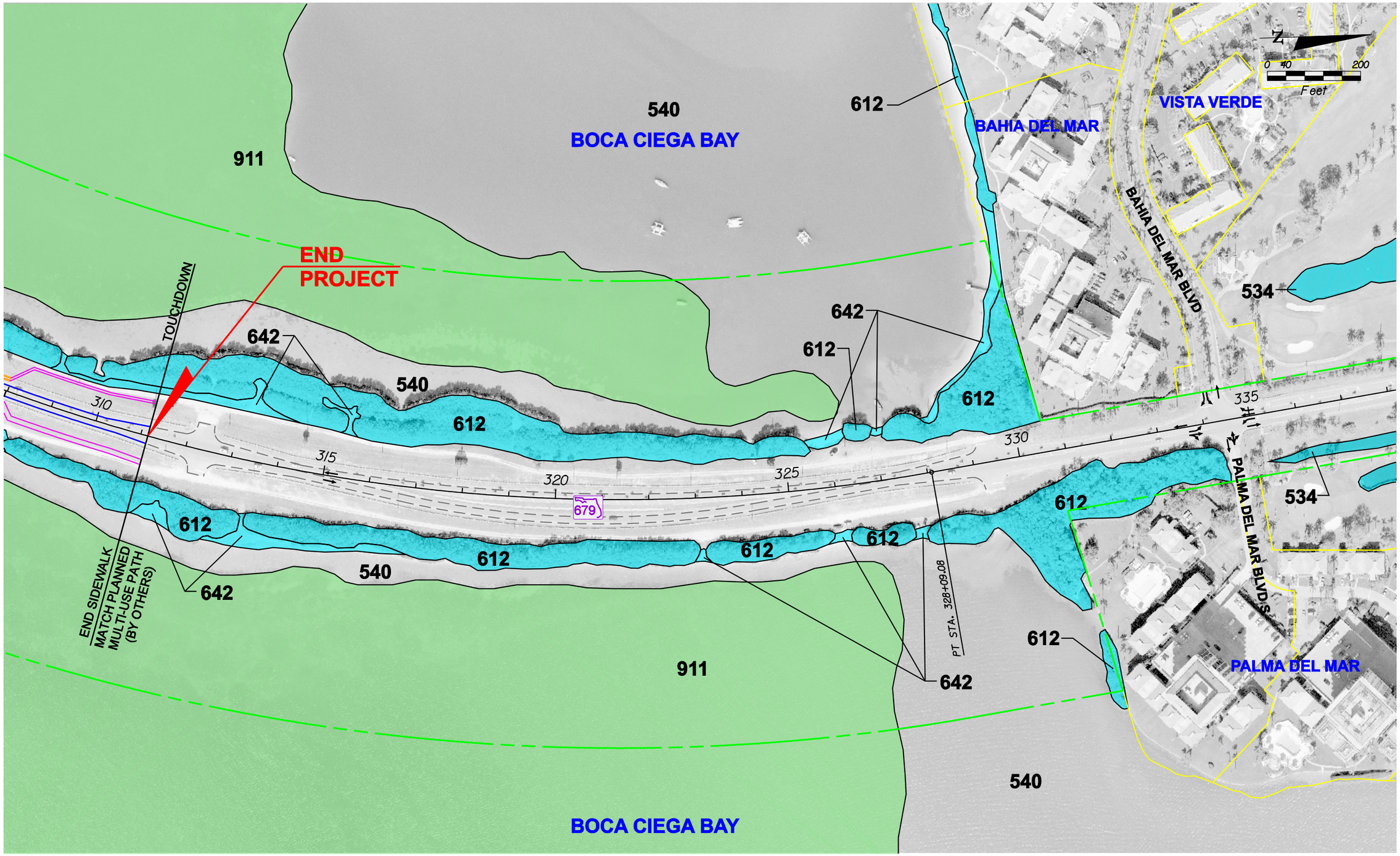
PRELIMINARY

FLIGHT DATE: MAY 7, 2005



ALTERNATIVE 6: HIGH-LEVEL FIXED BRIDGE OVER RELOCATED CHANNEL

LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- 612 — FLUCFC CODES
- WETLANDS
- SEAGRASS
- POTENTIAL CONTAMINATION SITE
- NUMBER OF BUSINESS RELOCATIONS

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

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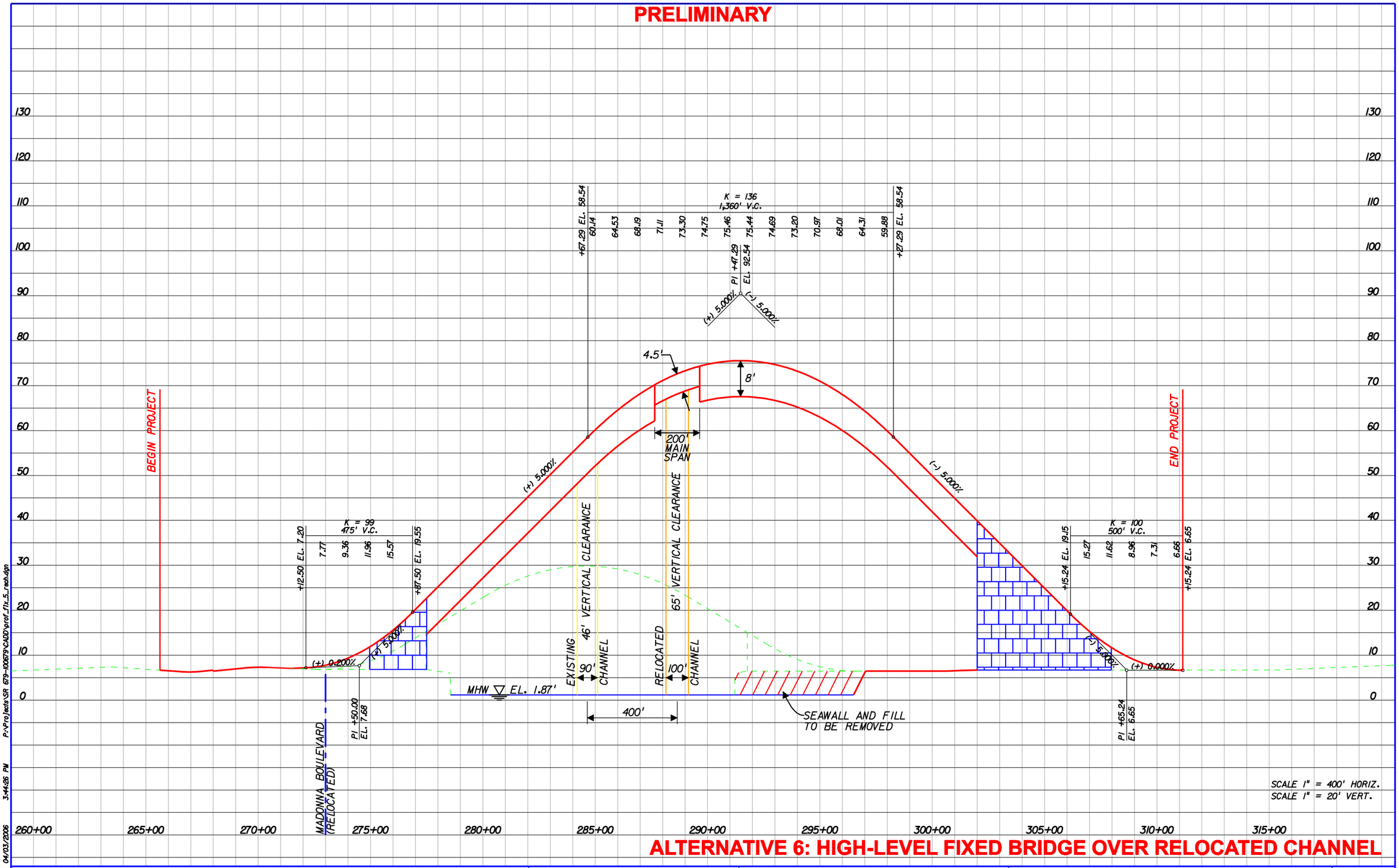
PRELIMINARY



ALTERNATIVE 6: HIGH-LEVEL FIXED BRIDGE OVER RELOCATED CHANNEL

LEGEND

EXISTING PROFILE

PROPOSED PROFILE

RETAINING WALL

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STATE OF FLORIDA
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S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E)
AT INTRACOASTAL WATERWAY
HIGH-LEVEL FIXED BRIDGE PROFILE
RELOCATED CHANNEL 5 PERCENT GRADE

SHEET NO. 4

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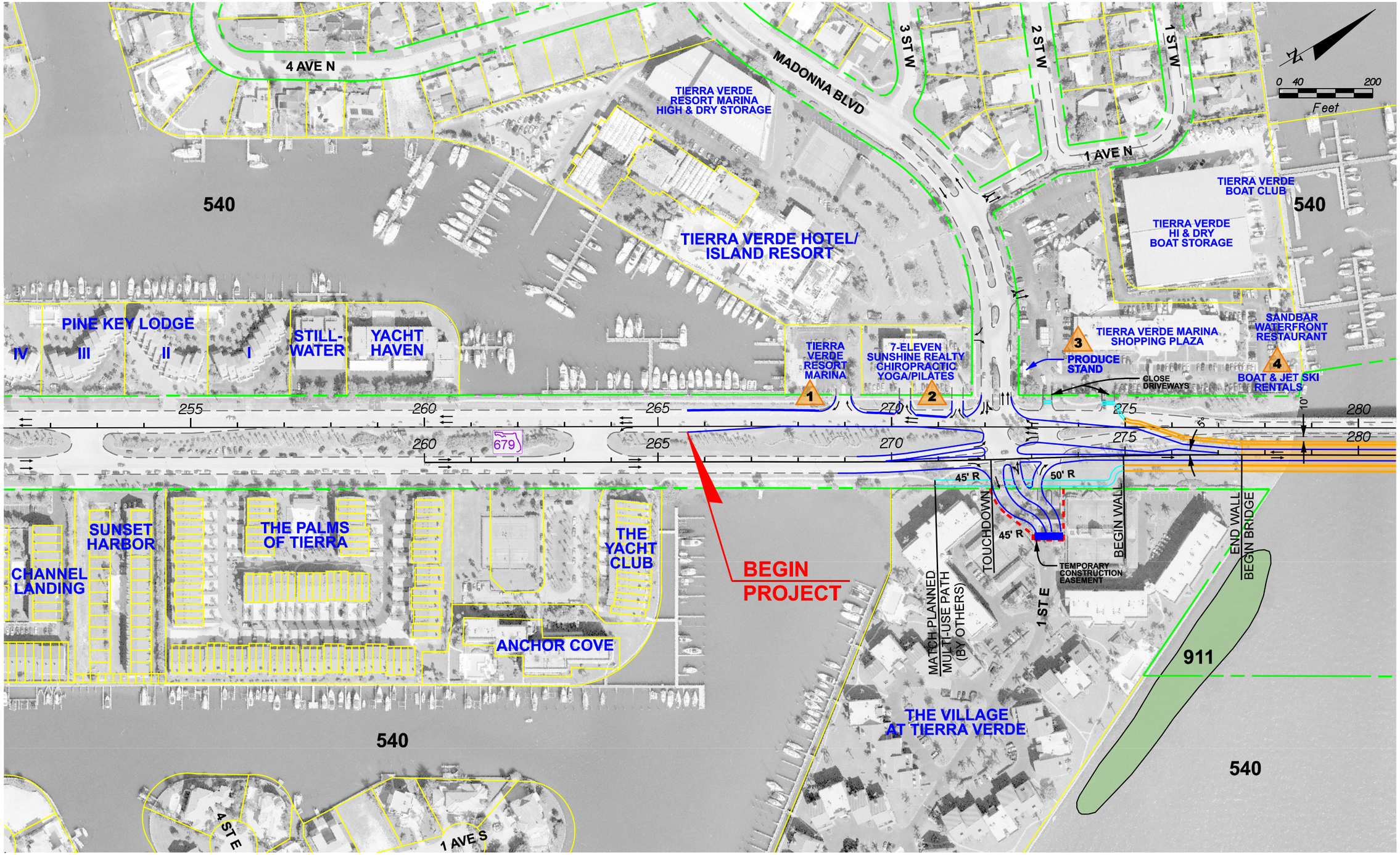
PRELIMINARY

FLIGHT DATE: MAY 7, 2005



INTERSECTION OPTION A - RELOCATED VILLAGE DRIVEWAY

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LEGEND

- 300 — BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
- PROPOSED BARRIER/RETAINING WALL
- PROPOSED EDGE OF PAVEMENT
- PROPOSED SIDEWALK
- WETLANDS
- SEAGRASS
- 612 — FLUCFC CODES
- POTENTIAL CONTAMINATION SITE

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

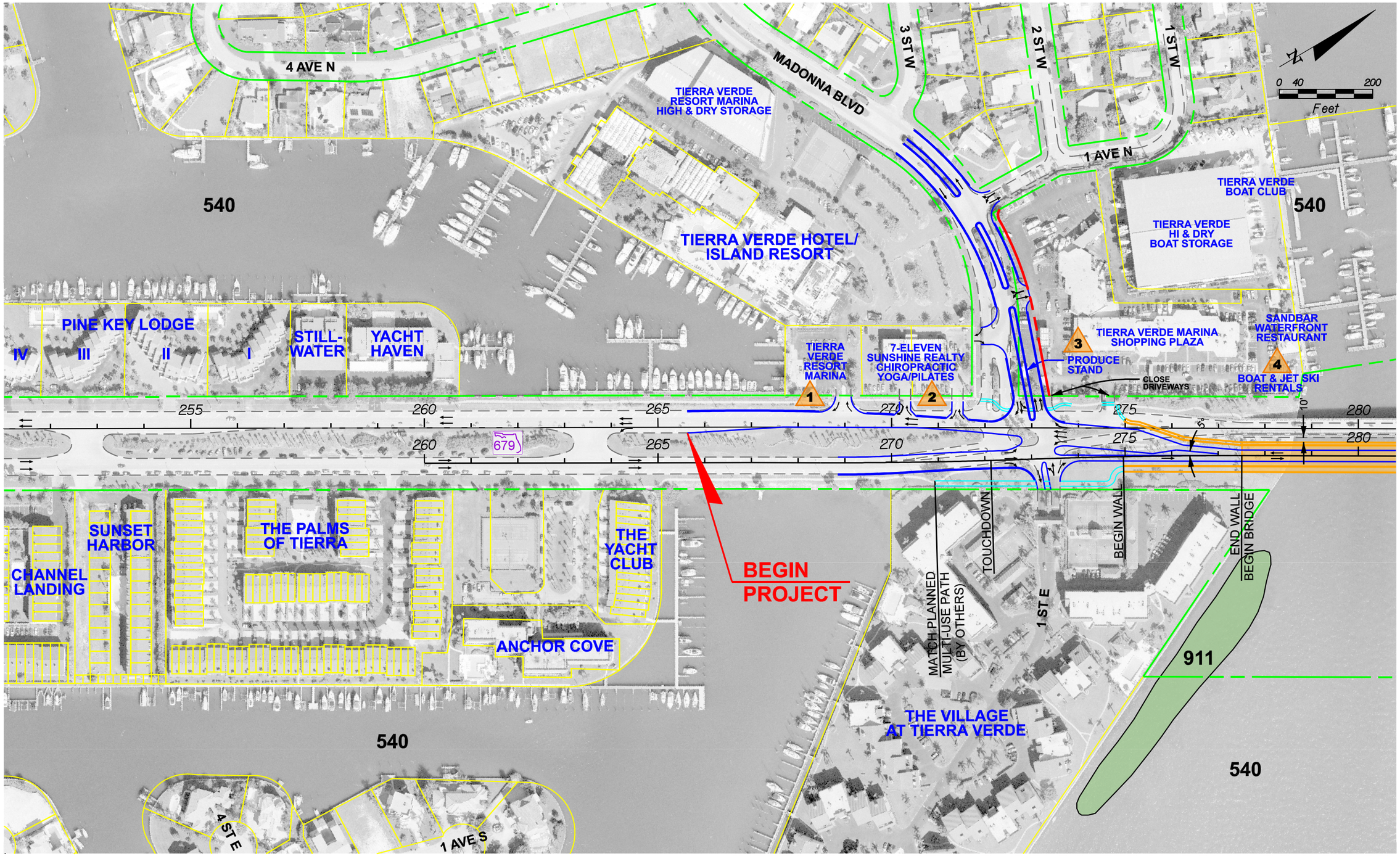
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 1

PRELIMINARY

FLIGHT DATE: MAY 7, 2005



INTERSECTION OPTION B - RELOCATED MADONNA BOULEVARD

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LEGEND

- BASELINE SURVEY/ CENTERLINE OF CONSTRUCTION
- PARCEL LINES
- EXISTING EDGE OF PAVEMENT
- EXISTING RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY
- PROPOSED BRIDGE
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S.R. 679	PINELLAS	410755-1-22-01

S.R. 679 (PINELLAS BAYWAY STRUCTURE E) AT INTRACOASTAL WATERWAY
CONCEPT PLANS

SHEET NO. 1

APPENDIX G
HYDRODYNAMICS AND SEDIMENT TRANSPORT MEMO

PBS&J

Memorandum

Date: **January 25, 2007**

To: **Douglas Reed, P.E.**

From: **Kathryn Ketteridge, P.E., Melanie Calvo**

cc: **Jeffrey Tabar, P.E.**

Subject: **Hydrodynamic and Sediment Transport Issues**
SR 679 (Pinellas Bayway Structure E) at Intracoastal Waterway
PD&E Study
WPI Segment No: 410755 1
Pinellas County, Florida

This memo was prepared to summarize some of the potential hydrodynamic and sediment transport issues which could be expected due to relocation of the Intracoastal Waterway navigational channel.

There are two aspects of Alternative 6, *High-Level Fixed Bridge Over Relocated Channel*, that could potentially effect local hydrodynamics and sediment transport, (1) relocation of the Intracoastal Waterway approximately 400 ft north of its present location and (2) removal of a portion of the causeway on the north side of Boca Ciega Bay.

Figure 1 shows bathymetry for Boca Ciega Bay in the vicinity of the proposed bridge replacement. A profile of the bathymetry is shown in Figure 2 and a cross section is shown in Figure 3 to illustrate the present water depths in the existing and proposed channel location.

Hydrodynamic issues related to relocating the Intracoastal Waterway include:

1) The channel will move boat traffic approximately 400 ft to the north and subsequently 400 ft closer to existing seagrass beds. It is not anticipated that this will alter the effects of wakes on the seagrass beds.

2) In order to access the depths required to handle current boat traffic under the bridge, a boat traffic study may be required.

3) The current channel is approximately 17-24 ft deep along the centerline and approximately 400 ft wide. There may be pressure from the local boating community to replace the channel in kind, regardless of current ACOE regulations on maintenance depths for the Intracoastal Waterway.

4) The proposed location for the new channel alignment has an average depth of 12 ft with minimum depths of seven ft north-east of the proposed bridge location. The side slopes on the channel required for stability would depend upon the subsurface soil conditions in the area, which is presently unknown. Depending upon the side slopes required and design dredge depth, the proposed channel could be wider than currently shown on the conceptual drawings.

5) Relocation of the channel will affect local hydrodynamics. If the channel is dredged to a depth of nine ft, it is not anticipated that this effect will be substantial. However, the effects could be significant if the proposed channel is dredged to 20 ft, the average depth of the existing channel. In order to determine the magnitude and spatial extent of the effect of the channel relocation on local hydrodynamics and sediment transport, numerical modeling of the channel needs to be performed. A 2-D (depth averaged) finite element model where hydrodynamics and sediment transport are coupled is recommended for this effort.

Hydrodynamic issues related to the removal of the causeway:

1) Removal of the causeway will affect local hydrodynamics. It is anticipated that currents along the northern banks of Boca Ciega Bay will be increased on average once the causeway is removed. This may affect local seagrass beds. In order to determine the magnitude and spatial extent of the effect of the removal of the causeway on local hydrodynamics and sediment transport, numerical modeling of the channel needs to be performed.

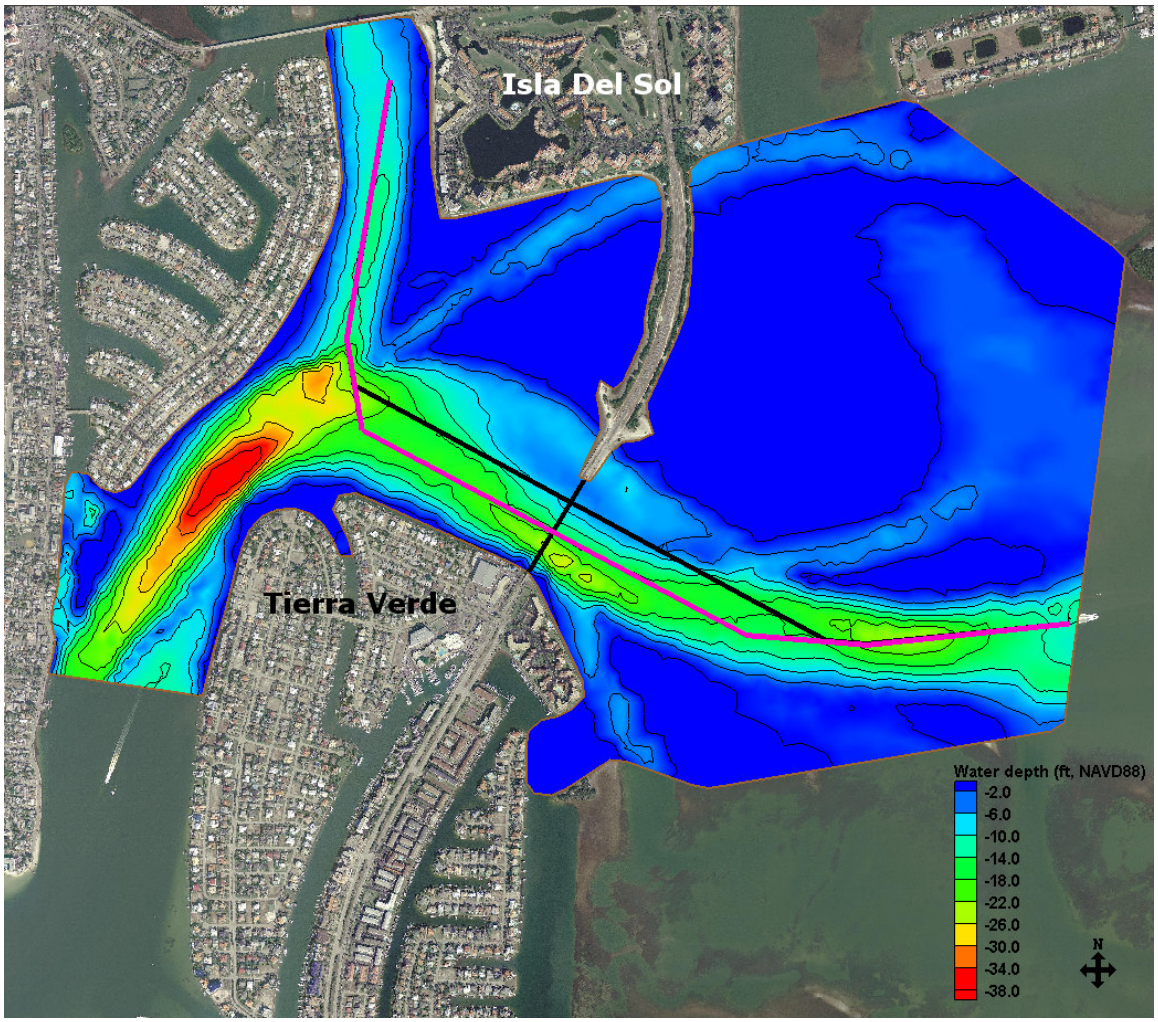

Figure 1: NOAA Bathymetry for Boca Ciega Bay in Vicinity of Pinellas Bayway Structure E

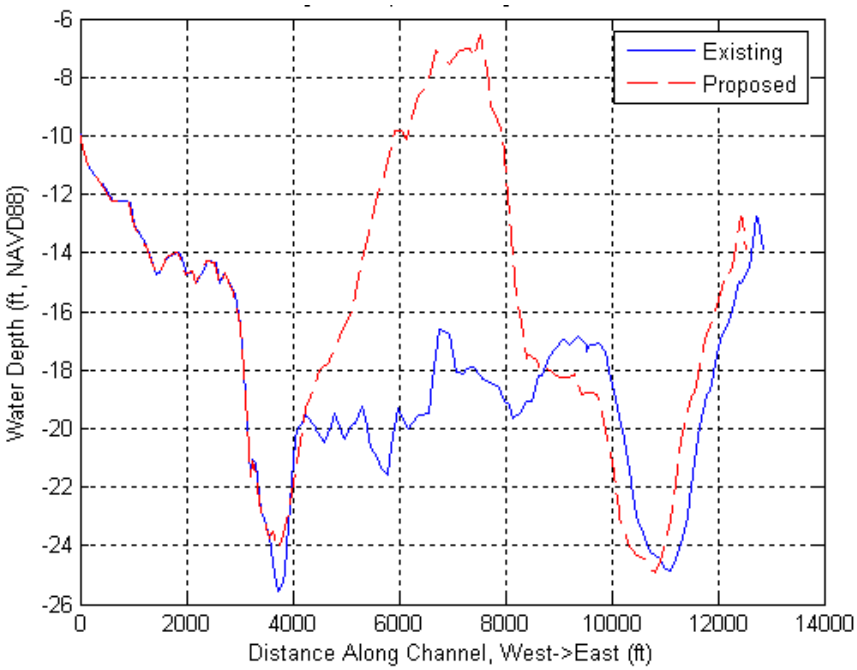

Figure 2: Profile (East-West) of Existing Bathymetry along Existing and Proposed Channels

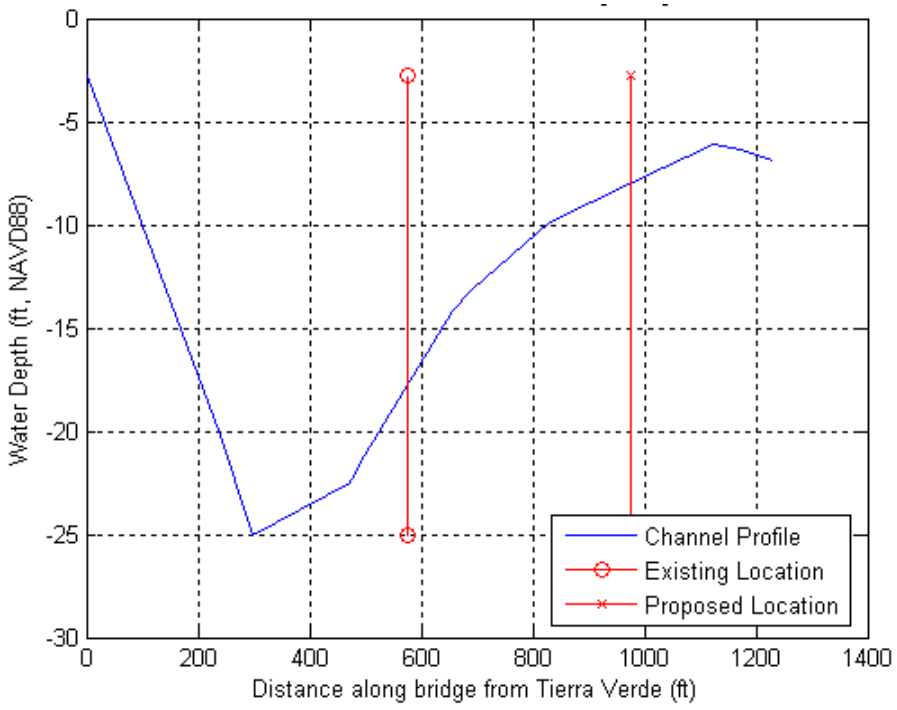

Figure 3: Cross Section (South-North) of Existing Bathymetry along Proposed Bridge Location showing Center Line of Existing and Proposed Channels

WETLAND MITIGATION

Wetland and seagrass impacts are associated with the bridge approaches. The channel relocation is not anticipated to result in direct impacts to wetlands or seagrasses but may affect bottom communities (EFH). Hydrological modeling will indicate if there will be indirect impacts to seagrasses. A full range of mitigation options has been considered in developing this project to avoid long-term and short-term adverse impacts to wetland and surface water resources and to avoid new construction in wetlands wherever there is a practicable alternative. Mitigation policies have been established by the USACE, the FDEP, and the water management districts. Options for mitigating the loss of wetlands include mitigation banking, upland and/or wetland preservation, and wetland restoration, enhancement, and creation.

Mitigation in the form of a transfer of funds per ac of impact to the SWFWMD is also an option available through F.S. Chapter 373.4137. These funds are used to finance mitigation programs managed and implemented by the SWFWMD. This Chapter states in part that "… mitigation for the impact of transportation projects proposed by the Department of Transportation can be more effectively achieved by regional, long-range mitigation planning rather than on a project-by-project basis. It is the intent of the Legislature that mitigation to offset the adverse effects of these transportation projects be funded by the Department of Transportation and be carried out by the Department of Environmental Protection and the water management districts…".

Wetland impacts resulting from the construction of this project are anticipated to be mitigated pursuant to Section 373.4137 F.S. to satisfy all mitigation requirements of Part IV Chapter 373, F.S. and 33 United States Code 1344. Under Section 373.4137 F.S., mitigation of FDOT wetland impacts will be implemented by SWFWMD. The project is currently listed on FDOT's wetland mitigation inventory, which is provided to SWFWMD on an annual basis. It is anticipated that FDOT will provide funding to SWFWMD for implementation of wetland mitigation required for this project.

CONSTRUCTION AND WETLANDS

To further minimize wetland impacts and effects to local water quality, specific measures will be implemented during construction. Short term construction related impacts will be minimized by adherence to FDOT's "***Standard Specifications for Road and Bridge Construction***". These specifications include measures known as Best Management Practices (BMP) which include the use of siltation barriers, dewatering structures, and containment devices that will be implemented for controlling turbid water discharges outside of construction limits. The Recommended Alternative includes the relocation of the channel. During design, specific techniques to contain the turbidity generated by dredging associated with that relocation will be determined and presented to the agencies during the permitting process. Also, the effect of the new channel alignment on the surrounding seagrass beds will need to be evaluated (secondary impacts).

In the event that blasting is required for the demolition of the existing structure, the

Marine Wildlife Safety Plan will be implemented to assure the protection of protected species, particularly marine turtles and manatees, during the blasting events.

REQUIRED PERMITS AND REVIEW AGENCIES

USACE and SWFWMD/FDEP regulate wetlands within the project area. Normally, SWFWMD is the lead State agency on transportation projects. However, the Recommended Alternative requires the relocation of a channel that may result in significant dredging activity. As the FDEP is responsible for permitting dredging projects and the associated water quality issues, FDEP could be requested to be the lead agency. It will be determined at the time of permit application which agency will take the lead on this project. The USFWS, United States Environmental Protection Agency (EPA), National Marine Fisheries Service (NMFS), and the Florida Fish and Wildlife Conservation Commission (FFWCC) review and comment on wetland permit applications. It is currently anticipated that the following permits will be required for this project:

Permit Issuing Agencies

- Environmental Resource Permit (ERP) SWFWMD or FDEP
- Section 404 Dredge and Fill Permit USACE
- U.S. Coast Guard Bridge Permit USCG

The SWFWMD/FDEP requires an ERP when construction of any project results in the creation of a water management system or in impacts to waters of the state. The ERP required for this project may be elevated to an Individual level by SWFWMD because it is located in an Aquatic Preserve and OFW, has seagrass impacts, and may require the relocation of the federal channel.

In conjunction with the ERP application process, the project will also require authorization through the granting of a public easement to utilize state sovereign submerged lands from the FDEP TIITF. Although this is a proprietary issue rather than a regulatory matter, the approval of the easement has been linked to the ERP process and may impact permitting schedules.

Because a USCG Bridge Permit is required for any of the proposed Alternatives, the USCG has agreed to be the lead federal agency and will include Section 404 permit requirements within their review. Compliance with Section 404(b)(1) guidelines includes verification that all wetland impacts have first been avoided to the greatest extent possible, that unavoidable impacts have been minimized to the greatest extent possible, and that unavoidable impacts have been mitigated in the form of wetlands creation, restoration, and/or enhancement. Because the USCG will function as the lead federal agency, the USACE may review the project under Nationwide 15 for “U.S. Coast Guard Approved Bridges”. However, if the Recommended Alternative is chosen to proceed into

design, the relocation of the federal channel will require further USACE approval in addition to the Section 404 guidelines.

ESSENTIAL FISH HABITAT (EFH) ASSESSMENT

MAGNUSON-STEVENS ACT

Under the requirements of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) of 1996, Essential Fish Habitat (EFH) Assessment is required for the proposed project. EFH is defined as the water and substrate necessary for fish spawning, breeding, feeding, and growth to maturity. The Act established standards for fishery conservation and management, and created eight regional Fishery Management Councils (FMC) to apply the national standards in the Fishery Management Plans (FMP).

Another provision of the MSFCMA requires that the FMC identify and protect EFH for every species managed by a FMP (50 CFR 600). The MSFCMA also requires federal agencies to provide consultation on activities that may adversely affect EFH designated in the FMP. The NMFS, a service of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), is responsible for implementing this mandate. Consultation with the NMFS is required as part of this process.

EFH INVOLVEMENT

Any land development activity may have direct (e.g., physical disruption) or indirect (e.g., loss of prey species) effects on EFH and be site-specific or habitat-wide. The potential adverse effect must be evaluated individually and cumulatively. The NMFS provides comments and recommendations to the responsible federal permitting agency. That information is considered by the permitting agency, and may be included in the recommendations as part of the Section 404 permit conditions.

According to NOAA guidelines for EFH (1998), EFH assessments must include:

- A description of the proposed action
- An analysis of the effects, including cumulative effects, of the action on EFH, the managed species, and associated species by life history stage
- The federal agency's reviews regarding the effects of the action on EFH
- Proposed mitigation, if applicable

Seagrass impacts are looked at carefully by the NMFS, and mitigation will have to fully compensate for the loss of the seagrass areas in the project area. During the development of the mitigation plan to be provided through SWFWMD, in accordance with Section 373.4137 (F.S.), the NMFS will be a part of the interagency team that reviews any plans proposed by SWFWMD as mitigation. With appropriate mitigation provided, this project

is not anticipated to adversely affect EFH.

The project is located in Boca Ciega Bay, designated as both an Aquatic Preserve and an Outstanding Florida Water (OFW). To minimize impacts and affects to local water quality, specific measures will be implemented during construction. Short term construction related impacts will be minimized by adherence to Florida Department of Transportation's (FDOT) *Standard Specifications for Road and Bridge Construction.* These specifications include measures known as Best Management Practices (BMPs) which include the use of siltation barriers, dewatering structures, and containment devices that will be implemented for controlling turbid water discharges outside of construction limits. If the channel is relocated, during design, specific techniques to contain the turbidity generated by dredging associated with that relocation will be determined and presented to the agencies during the permitting process.

For approval of impacts to wetlands (including seagrass) or EFH, the project will involve coordination with Southwest Florida Water Management District (SWFWMD), the United Stated Coast Guard (USCG), the Florida Department of Environmental Protection (FDEP), and the United States Army Corps Engineers (USACE). The National Marine Fisheries Service (NMFS) will also be an integral part of the federal permitting process as seagrass impacts and Essential Fish Habitat (EFH) are involved. The federal channel relocation, in addition to requiring regulatory approval, will also require proprietary approval from the USACE, which is anticipated to impact the permitting timeline. Finally, the project is within sovereign submerged lands and will require a public easement from the FDEP. While this is also a proprietary approval, it is linked to the Environmental Resource Permit (ERP) application process, and is also anticipated to affect the permitting timeframe.

PROTECTED SPECIES

The following federally protected species were identified as potentially occurring within the project area.

Gulf sturgeon
smalltooth sawfish
loggerhead turtle
green turtle
leatherback turtle
hawksbill turtle
Kemp's Ridley turtle
piping plover
bald eagle
wood stork
West Indian manatee

In addition to the federally protected species, state-only protected species were also identified. These included state-protected wading birds, such as the roseate spoonbill, little blue heron, reddish egret, snowy egret, tricolored heron, and white ibis. The state protected brown pelican, least tern, American oystercatcher, snowy plover, and black skimmer were also identified as potentially occurring in the project area. In the event that blasting is required for the demolition of the existing structure, the Marine Wildlife Safety Plan will be implemented to assure the protection of protected species, particularly marine turtles and manatees, during the blasting events. Other provisions for the protection of protected species are included in the Wetland Evaluation and Biological Assessment for the project. With the protective provisions in place and mitigation provided for loss of habitat, the project is not anticipated to adversely effect protected species.

EXHIBITS

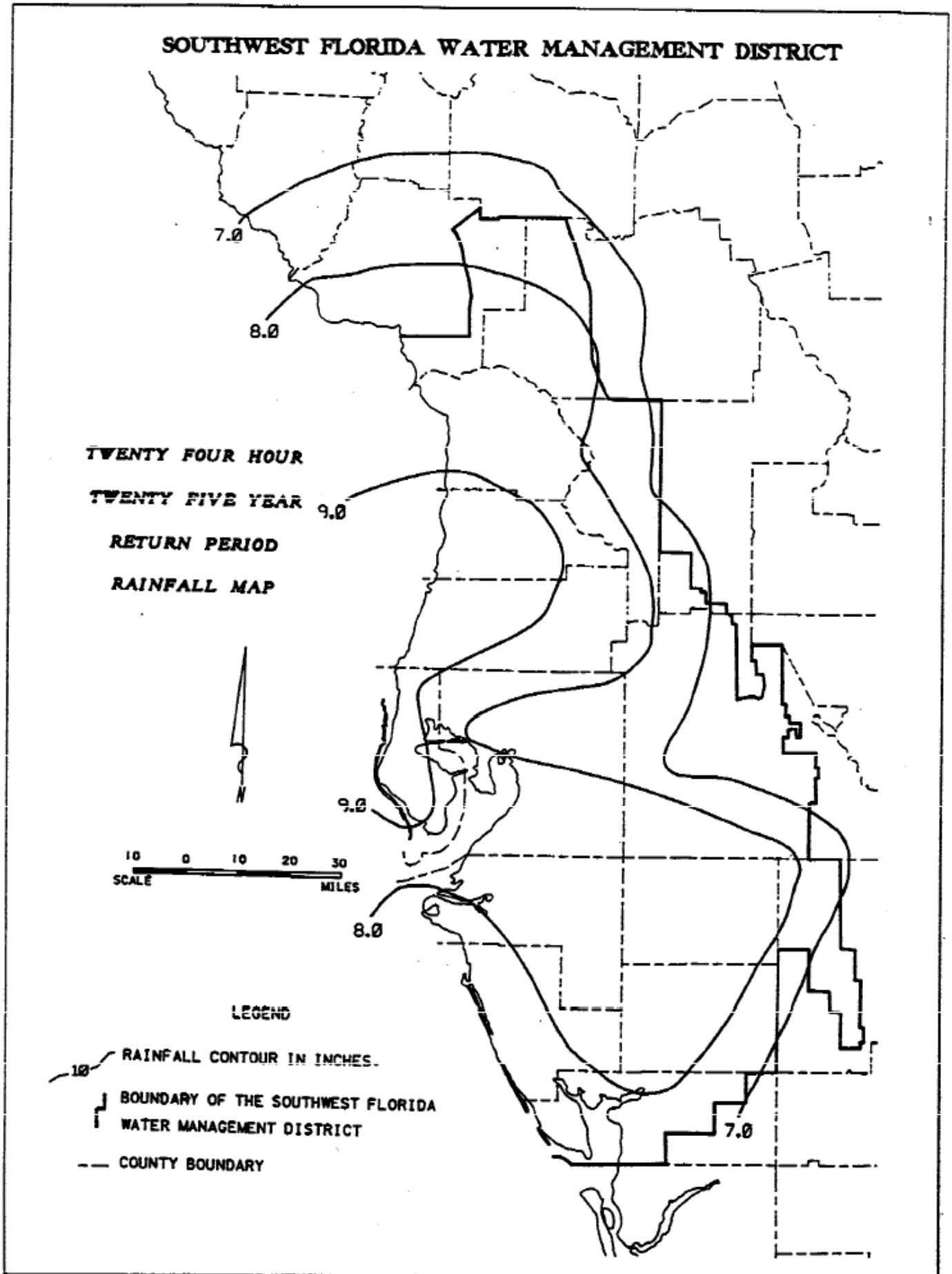
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
7.0
8.0
9.0
9.0
8.0
7.0
TWENTY FOUR HOUR
TWENTY FIVE YEAR
RETURN PERIOD
RAINFALL MAP
N
10 0 10 20 30
SCALE
MILES
LEGEND
10 RAINFALL CONTOUR IN INCHES.
BOUNDARY OF THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
COUNTY BOUNDARY

FIGURE D-5

COMPILED BY PHOTOGRAMMETRIC METHODS
BY
ABRAMS
AERIAL SURVEY CORPORATION OF FLORIDA
ST. PETERSBURG, FLORIDA

LEGEND

HORIZONTAL CONTROL U.S.C.&G.S. △

FLORIDA STATE DEPT OF TRANSPORTATION ○

TRAVERSE STATIONS FFG 6 ⊡

VERTICAL CONTROLS FFG-7 9780 ×

SECTION CORNERS 16 | 15 | 14

CONTOURS

DEPRESSION CONTOURS

SPOT ELEVATIONS

CONTOURS ALONG THE SHORELINES ARE OMITTED BECAUSE OF SEA WALLS AND THE FIRST CONTOUR ABOVE IS LABELED.

KEY MAP

NOTE ACCURACY: IT IS INTENDED THAT THIS MAPPING COMPLY WITH U.S. NATIONAL MAP ACCURACY STANDARDS. HOWEVER, SUCH ACCURACY OR ANY OTHER LEVEL OF ACCURACY IS NOT GUARANTEED BY THE SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT.

THE LAND LINE INFORMATION SHOWN HEREON IS COMPILED FROM THE BEST AVAILABLE DATA AND MAY NOT NECESSARILY REPRESENT TRUE LAND LINE LOCATION.

DASHED CONTOURS AND UNDERLINED ELEVATIONS INDICATE STANDARD VERTICAL ACCURACY REDUCED BY TREE COVER.

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GRID BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, WEST ZONE

ELEVATIONS BASED ON U.S.C. & G.S. DATUM

200 0 200 400 600
SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY MARCH 1979
DATE OF MAPPING JULY 1979

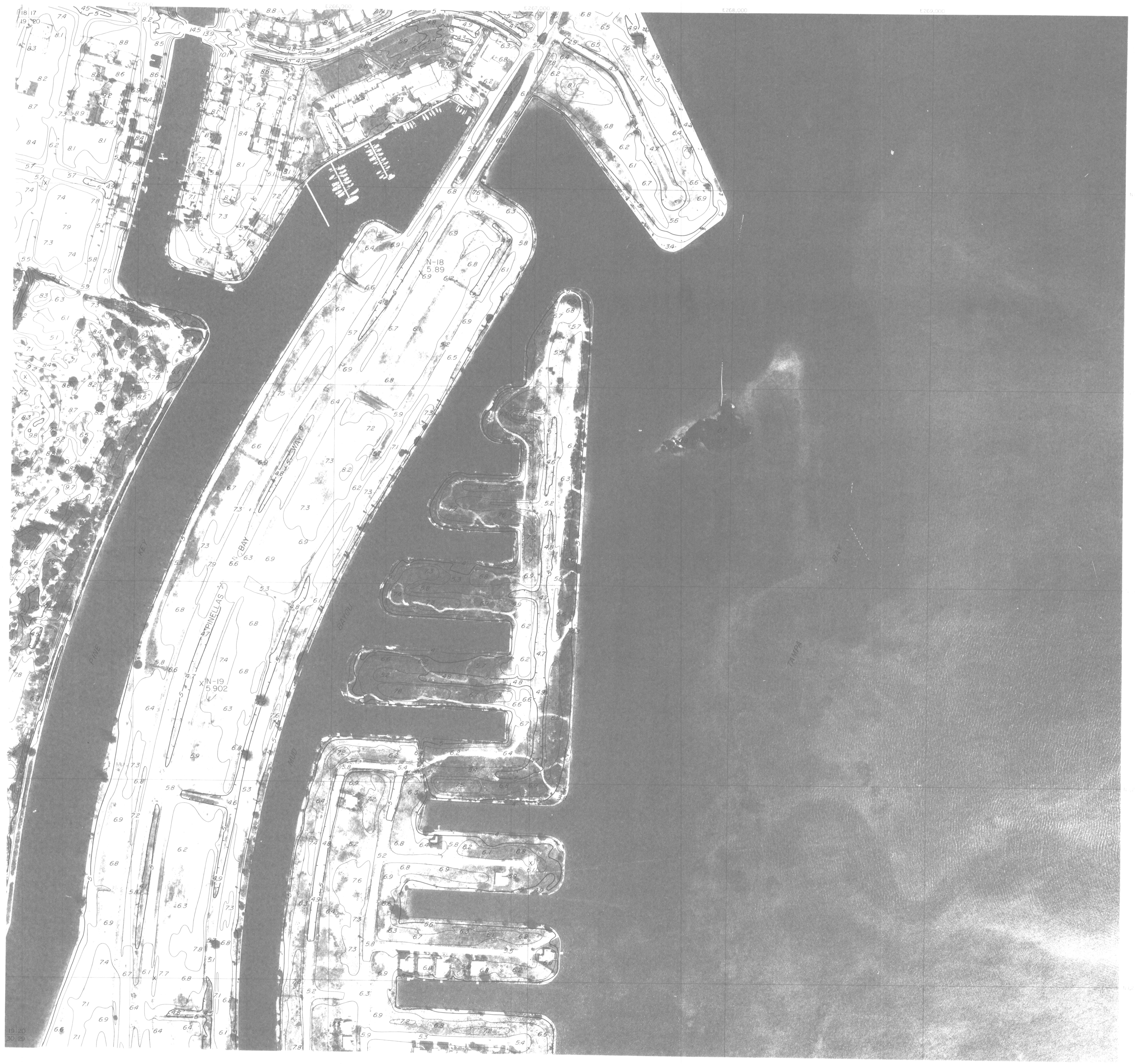
SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

PINELLAS-ANCLOTE RIVER BASIN

P.A. COASTAL ISLANDS

AERIAL PHOTOGRAPHY WITH CONTOURS

SHEET NO. 4



COMPILED BY PHOTOGRAMMETRIC METHODS
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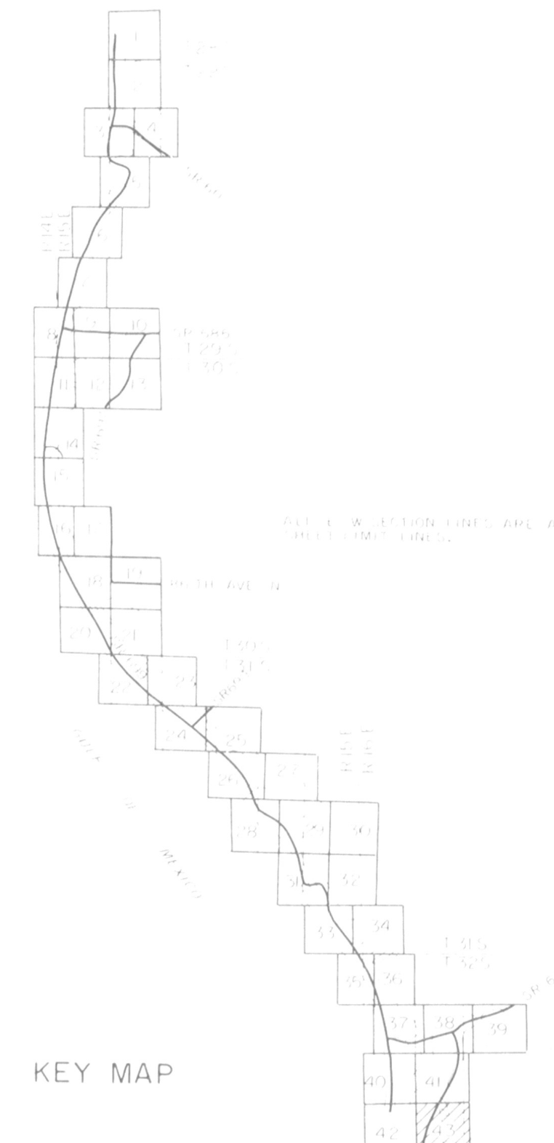
LEGEND

HORIZONTAL CONTROL U.S.C.&G.S.	△
FLORIDA STATE DEPT OF TRANSPORTATION	⬡
TRAVERSE STATIONS	FFQ 6 ⊙
VERTICAL CONTROLS	FFQ-7 97.61 X
SECTION CORNERS	10 11 / 15 14
CONTOURS	45 / 40
DEPRESSION CONTOURS	50
SPOT ELEVATIONS	50.4

CONTOURS ALONG THE SHORELINES ARE OMITTED BECAUSE OF SEA WALLS AND THE FIRST CONTOUR ABOVE IS LABELED.



KEY MAP

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200 0 200 400 600

SCALE 1" = 200' CONTOUR INTERVAL 1'

DATE OF PHOTOGRAPHY: MARCH 1979
DATE OF MAPPING: JULY 1979

SOUTHWEST FLORIDA
WATER MANAGEMENT DISTRICT

PINELLAS–ANCLOTE RIVER BASIN

P.A. COASTAL ISLANDS

AERIAL PHOTOGRAPHY WITH CONTOURS

SHEET NO. 43

A.A.S.C. 16508