USCG VERTICAL CLEARANCE EVALUATION MEMO

Project Development and Environment (PD&E) Study
SR A1A Over Sebastian Inlet – Bridge 880005
Bridge Replacement
Indian River County and Brevard County, Florida

Financial Project ID: 445618-1-22-02
Federal Aid Number: D420 075B
ETDM Number: 14433

PREPARED FOR

Florida Department of Transportation
District Four
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309

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

November 2022

MEMORANDUM

To:	Andy Maris Bridge Management Specialist US Coast Guard Seventh District	**From:**	Binod Basnet, PE Project Manager FDOT District Four
Date:	October 1, 2021		
Project:	Project Development & Environment Study SR A1A Over Sebastian Inlet Bridge 880005 - Bridge Replacement Indian River County and Brevard County		
FPID No.:	445618-1-22-02		
SUBJECT:	**VERTICAL ALTERNATIVES EVALUATION**		

INTRODUCTION

The Florida Department of Transportation (FDOT or Department) District Four is conducting a Project Development & Environment (PD&E) Study to evaluate the replacement of the Sebastian Inlet Bridge (No. 880005) crossing the Sebastian Inlet (Inlet) located at the Indian River County and Brevard County boundary (Figure 1). The purpose of and need for this project is to address the structural and functional deficiencies of the existing Sebastian Inlet Bridge (Bridge) and the gap in system linkage for bicyclists and pedestrians.

A navigation needs analysis memorandum was submitted to the U.S. Coast Guard (USCG) on June 9, 2021. Comments received were responded to and a revised memorandum resubmitted on June 14, 2021. A preliminary clearance determination was received from the USCG on July 12, 2021 (Attachment A) which stated a desired minimum vertical clearance of 65-feet above mean high water (MHW) for a fixed bridge and 125-feet minimum horizontal clearance.

Based on the USCG response, a vertical clearance evaluation has been completed to demonstrate a bridge vertical clearance of less than 65-feet, as preliminarily determined by the USCG, provides for reasonable needs of navigation at the Inlet. Also considered were the Purpose and Need for the project, character of the Inlet, bathymetry, surrounding resources, maintenance of the Inlet and adjacent waterway, and connectivity to the Intracoastal Waterway (ICW).

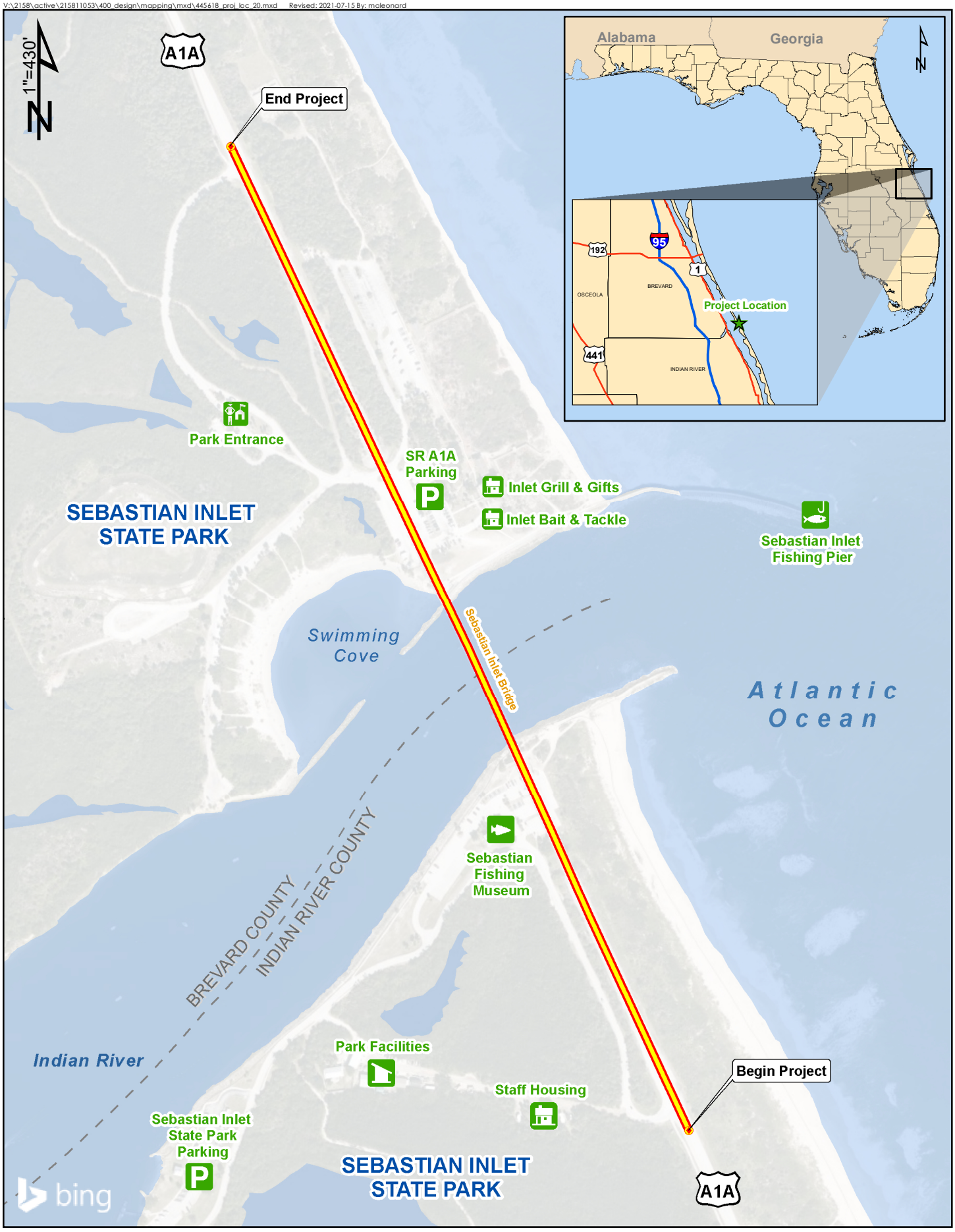
PROJECT LOCATION

The Sebastian Inlet Bridge (Bridge) is a 1,548-foot long concrete structure with two-lanes carrying State Road (SR) A1A over the Sebastian Inlet (Inlet). The Bridge is located within FDOT and Sebastian Inlet District (SID) right-of-way (ROW) and is adjacent to the Sebastian Inlet State Park (Park). Currently the bridge provides access for vessels between the Indian River Lagoon and the Atlantic Ocean through the Inlet. The Inlet is a tidally influenced waterway approximately 525-feet wide at the Bridge. The channel alignment is skewed 70 degrees ENE from the centerline of SR A1A (Figure 1).

SEBASTIAN INLET

The SID currently owns the submerged lands under the Bridge. This area was former uplands that were dredged to create the Inlet. The Inlet is a tidally influenced waterway initially constructed to relieve flooding and improve water quality in the Indian River Lagoon. This led to erosion of downdrift beaches in

V:\2158\active\215811053\400_design\mapping\mxd\445618_proj_loc_20.mxd Revised: 2021-07-15 By: maleonard



PROJECT LOCATION

FIGURE 1

PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY
SR-A1A OVER SEBASTIAN INLET - BRIDGE 880005 - BRIDGE REPLACEMENT
INDIAN RIVER COUNTY AND BREVARD COUNTY, FLORIDA

FINANCIAL PROJECT ID: 242592-4-52-01 | FEDERAL AID NO.: D420 075B | ETDM NO.: 14433

Indian River County and shoaling west of the Bridge in the Indian River Lagoon. The Inlet was eventually stabilized by the construction of the north and south jetties located east of the Bridge and by the creation of the 42-acre sand trap west of the bridge. The sand trap was excavated to reduce shoaling and captures and that is transported via the Inlet into the Indian River Lagoon. In 1988, the SID adopted the first *Sebastian Inlet District Comprehensive Management Plan* (Plan) that outlined maintenance dredging with a commitment to natural resource preservation and environmental protection. In March 2000, the 1988 Plan was reviewed by the Florida Department of Environmental Protection (FDEP) and the current Sebastian Inlet Management Implementation Plan (IMP) was developed (Attachment B). The IMP provides strategies for the maintenance of the inlet and adjacent eroding beaches. The recommended strategies are intended to replicate natural sand drift processes that have been altered by the Inlet which result in downdrift beach erosion. The IMP is consistent with the policies set forth in Section 161.142 Florida Statutes, Beach and Shore Preservation. In 2007, a channel was dredged from the sand trap west to the ICW by the SID (Figure 2).

The Inlet, under the Bridge, is located approximately 2 nautical miles east of the ICW. In August 2007 the SID completed dredging of a navigation channel connecting the Inlet westward to the ICW within an easement granted to the SID from the Florida Division of State Lands which oversees the management of Florida's public lands. The purpose of this 3,120-ft long channel extension was to provide the maritime community with a safe, clearly designated passage to/from the Atlantic Ocean as a matter of public safety and for the future protection of associated aquatic resources Maintenance of these features must continue to prevent shoaling caused by the Inlet velocities, which would otherwise prevent navigability from the Inlet to the ICW through the shallow waters.

The SID entered into a Memorandum of Agreement (MOA) with the FDEP November 5, 2018 (Attachment C) which expires November 5, 2028. This MOA outlines the respective agencies duties and responsibilities regarding the Park and Inlet and their maintenance, management, and safety. The FDEP operates the Park which surrounds the Inlet and includes the north and south jetties. The MOA requires the SID to obtain easements from the Division of State Lands for maintenance, construction, or reconstruction of the following:

- North and south jetties
- Rocks and revetment
    - north shoreline west beyond the tide pool
    - south shoreline
- Truck access easements from SR A1A to Dredged Materials Management Area (DMMA)
- 42-acre sand trap
- Channel from sand trap to ICW

Per the MOA, the SID has obtained a permit from the US Army Corps of Engineers (USACE) for maintenance dredging of the sand trap and channel from the sand trap to the ICW. The SID does not dredge the Inlet under the Bridge, areas east of the Bridge, or west of the Bridge to the sand trap. Due to the velocity of the currents that flow through the Inlet, deposition of sediment under, east, and west of the Bridge does not occur. Benthic surveys of the Inlet and adjacent areas confirm that the Inlet is characterized as scoured, hard bottom with no sediment materials or benthic resources present.

SEBASTIAN INLET BATHYMETRY

The SID completes a bathymetric survey of the inlet system and adjacent areas of the Indian River Lagoon and beaches twice a year. The most recent bathymetric survey (Figure 3) shows the depth under

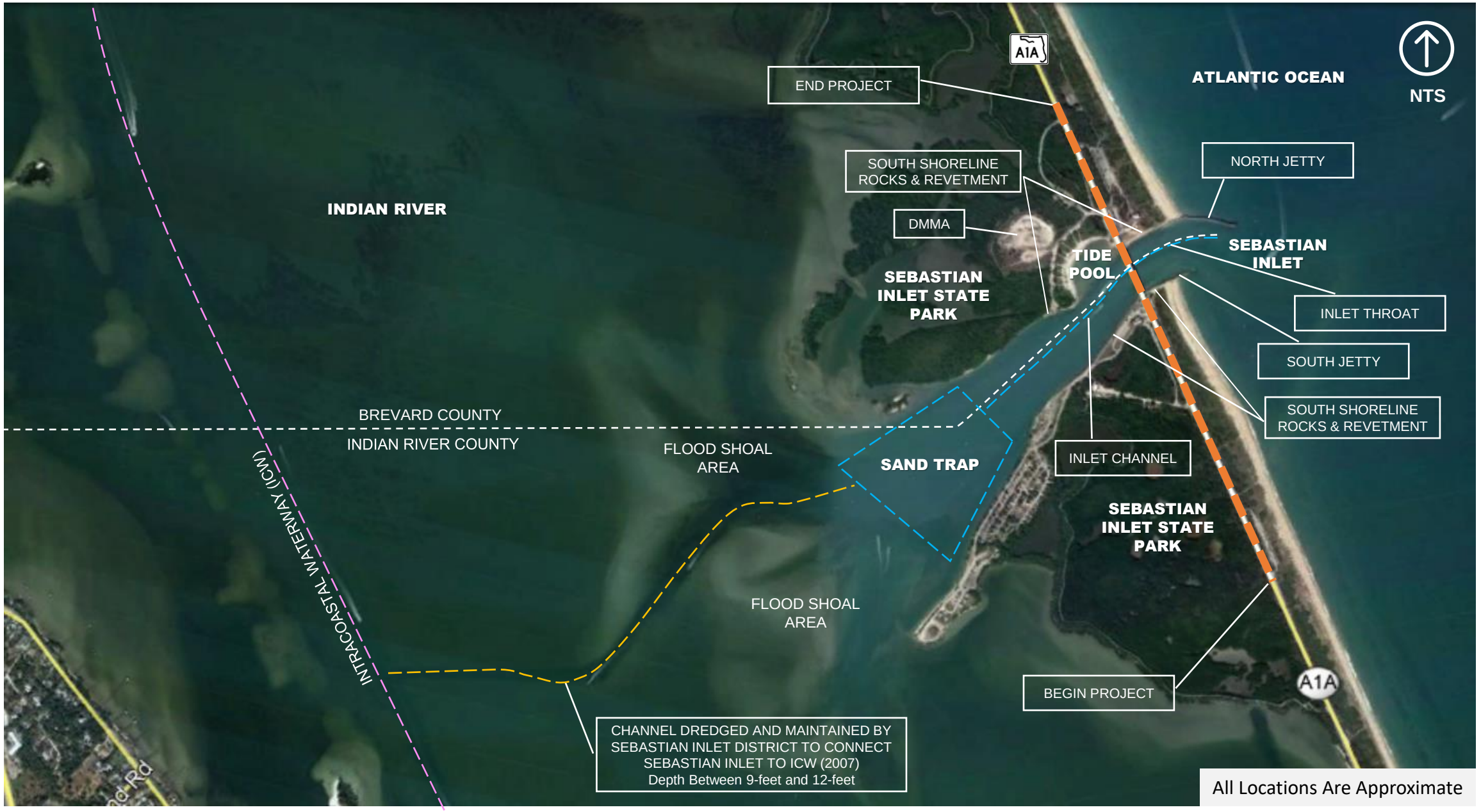
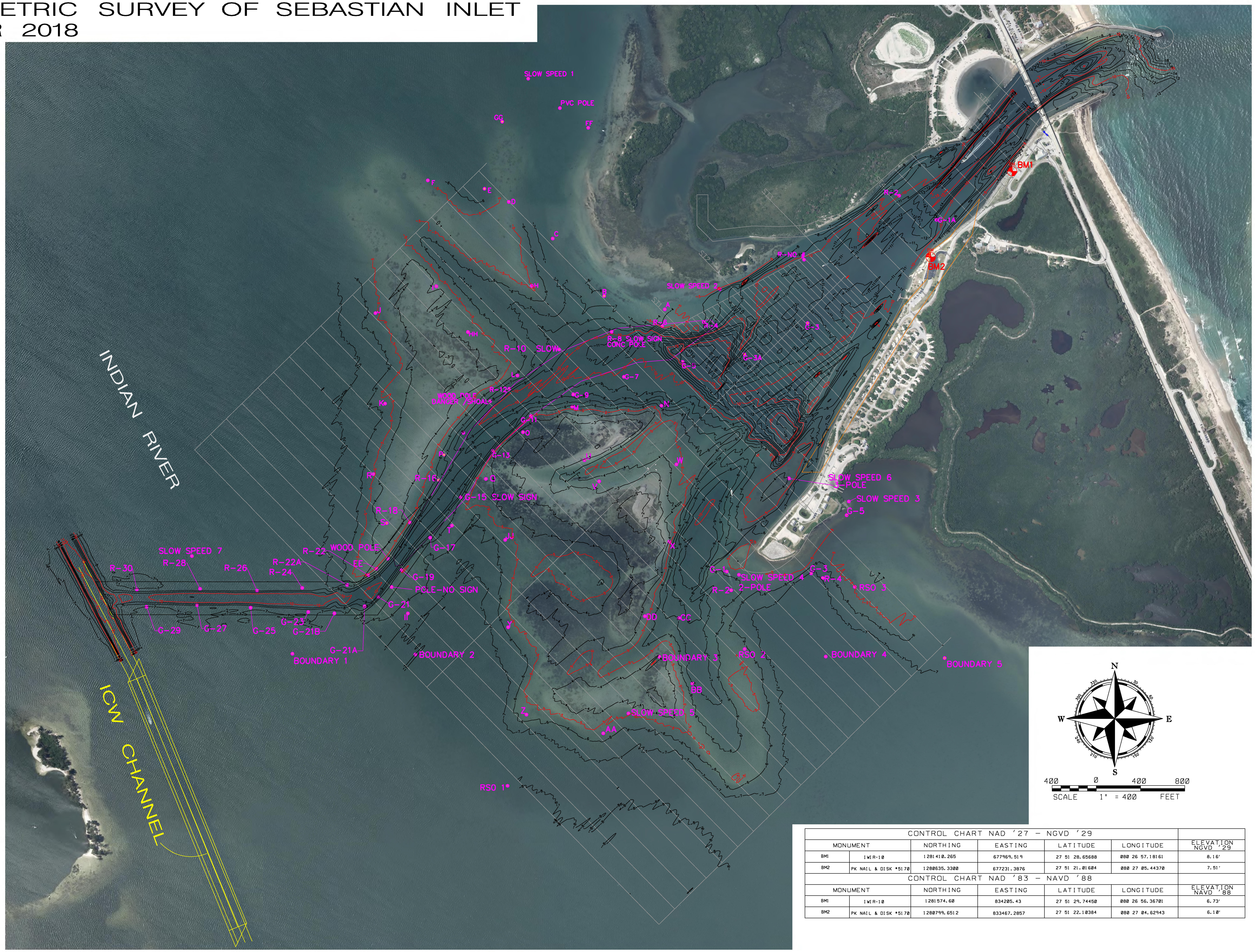


Figure 2.
Sebastian Inlet and Surrounding Waterways Features

PROJECT DEVELOPMENT AND ENVIRONMENT (PD&E) STUDY
SR-A1A SEBASTIAN INLET BRIDGE 880005 - BRIDGE REPLACEMENT
INDIAN RIVER COUNTY AND BREVARD COUNTY, FLORIDA

FDOT

PLAN VIEW
BATHYMETRIC SURVEY OF SEBASTIAN INLET
SUMMER 2018



CONTROL CHART NAD '27 – NGVD '29						
MONUMENT		NORTHING	EASTING	LATITUDE	LONGITUDE	ELEVATION NGVD '29
BM1	IWIR-10	1281410.265	677969.519	27 51 28.65688	080 26 57.18161	8.16'
BM2	PK NAIL & DISK #5170	1280635.3300	677231.3876	27 51 21.01604	080 27 05.44370	7.51'

CONTROL CHART NAD '83 – NAVD '88						
MONUMENT		NORTHING	EASTING	LATITUDE	LONGITUDE	ELEVATION NAVD '88
BM1	IWIR-10	1281574.60	834205.43	27 51 29.74450	080 26 56.36701	6.73'
BM2	PK NAIL & DISK #5170	1280799.6512	833467.2857	27 51 22.10384	080 27 04.62943	6.10'

REVISIONS	BY	DATE

SCALE 1" = 400'
DATE 08-16-18

SURVEY FOR: SEBASTIAN INLET TAX DISTRICT

BATHYMETRIC SURVEY OF SEBASTIAN INLET SUMMER 2018

LAND & SEA SURVEYING CONCEPTS, INC.
LAND BUSINESS #6447
PHONE: 321-454-6310
FAX: 321-454-6998
E-MAIL: TC5170@AOL.COM
1605 CHASE HAMMOCK RD.
MERRITT ISLAND, FL 32953
WWW.LAND-AND-SEA-SURVEYING.COM

SHEET: 2 OF 22
JOB NUMBER: 2018-069
FILE NAME: SEBASTIAN

the Bridge to be -15 (negative fifteen) to -16 feet rising to a depth of -11 feet at the sand trap. The depths across the sand trap vary from -6 feet at the north and south edges and -9 feet to -12 feet across. Holes in the sand trap are located in the north and southwest corners reaching depths of -16 feet. Areas to the west of the sand trap range in depth from -2 feet to -9 feet. The channel leading west from the sand trap to the ICW ranges in depth from -8 feet to -10 feet. This data is supported by information presented in the National Oceanic and Atmospheric Administration's (NOAA) Nautical Chart 11472 (Attachment D).

The depth of the Inlet at the throat east of the Bridge, under the Bridge, and the channel west of the Bridge averages between -15 to -16 feet due to the high velocity of the current that passes through the Inlet. Once west of the bridge, the depth quickly rises to the sand trap and the shallow areas west of the sand trap. Mariners must be certain they can navigate their vessel to the east or west once through the Inlet. This includes consideration of the vessel clearance required above the water surface and draft of the vessel below the water surface. The draft below the surface is more critical to the west of the inlet based on the variance in water depth across the waterbody.

SEBASTIAN INLET HYDRODYNAMIC CONDITIONS

In 2003, a tidal model report for the Sebastian Inlet was completed for FDOT District 4. The *Tidal Model Report – Sebastian Inlet* was part of a series of reports completed that summarize the development of the FDOT District 4 ICW Tidal Model used to assess scour risk of tidally influenced state owned bridges. The Sebastian Inlet model centered on the Sebastian Inlet Bridge and included five additional bridges from US 1 over the Sebastian River (Bridge Nos. 700011 and 700001) south to SR 656 (17th Street) over the Indian River (Bridge No. 880077).

The Tidal Model shows the velocity conditions for the study bridges under normal conditions (spring tide). Figure 4 shows velocity magnitude contours and velocity vectors during the time of maximum velocity at the Bridge. Red contours indicate areas of high velocity and the blue areas of lower velocity. The velocity maximums at the Inlet occur at the center of the Bridge.

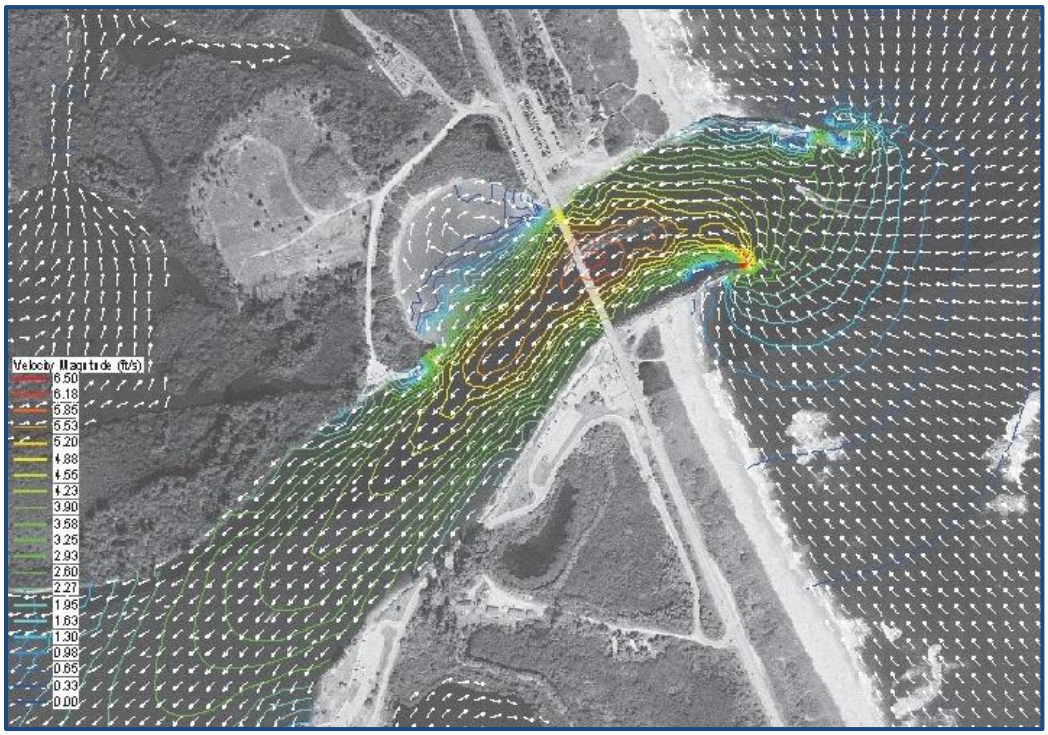


Figure 4. Velocity Magnitude Contours and Velocity Vectors at Bridge No. 880005 at the Time of Maximum Velocity during Spring Tides (*FDOT District Four Tidal Model Report – Sebastian Inlet*, 2003)

The Tidal Model results also demonstrate the velocity conditions for the study bridges under storm surge conditions for the 50-Year, 100-Year, and 500-Year events (Tables 1 – 4). Because the Inlet is relatively small in terms of cross sectional area, spring tide and storm surge is attenuated resulting in maximum velocities. Tables 1 – 4 show that the Inlet velocities are significantly higher at the Bridge than surrounding area bridges under all storm surge events.

These conditions support local knowledge of the adverse conditions at the Inlet and the hazard to navigation for all vessel types. This is also supported by the NOAA chart 11472 (Attachment D) caution for the Inlet stating that "Passage through the inlet is not recommended without local knowledge of all hazardous conditions affecting this area."

Table 1. Maximum Velocity Conditions during Spring Tides (Normal Conditions)

Bridge	Maximum Velocity (ft/s)
Bridges No. 700011 / 700001 US 1 over Sebastian River	0.23
Bridge No. 880005 SR A1A over Sebastian Inlet	**6.5**
Bridge No. 880051 CR 510 over Indian River	0.32
Bridge No. 880053 CR 510 over the ICW	0.51
Bridge No. 880087 SR 60 over Indian River - Merrill Barber Bridge	0.7
Bridge No. 880077 SR 656 over Indian River	0.26

Source: *Tidal Model Report – Sebastian Inlet (November 2003)*

Table 2. Conditions during the 50-year Storm Surge Event

Bridge	Maximum Velocity (ft/s)
Bridges Nos. 700011 / 700001 US 1 over Sebastian River	0.63
Bridge No. 880005 SR A1A over Sebastian Inlet	**15.51**
Bridge No. 880051 CR 510 over Indian River	1.22
Bridge No. 880053 CR 510 over the ICW	1.71
Bridge No. 880087 SR 60 over Indian River - Merrill Barber Bridge	3.09
Bridge No. 880077 SR 656 over Indian River	1.18

Source: *Tidal Model Report – Sebastian Inlet (November 2003)*

Table 3. Conditions during the 100-year Storm Surge Event	
Bridge	**Maximum Velocity (ft/s)**
Bridges Nos. 700011 / 700001 US 1 over Sebastian River	0.63
Bridge No. 880005 SR A1A over Sebastian Inlet	**16.47**
Bridge No. 880051 CR 510 over Indian River	1.31
Bridge No. 880053 CR 510 over the ICW	1.83
Bridge No. 880087 SR 60 over Indian River - Merrill Barber Bridge	3.33
Bridge No. 880077 SR 656 over Indian River	1.26

Source: *Tidal Model Report – Sebastian Inlet (November 2003)*

Table 4. Conditions during the 500-year Storm Surge Event	
Bridge	**Maximum Velocity (ft/s)**
Bridges Nos. 700011 / 700001 US 1 over Sebastian River	0.73
Bridge No. 880005 SR A1A over Sebastian Inlet	**18.28**
Bridge No. 880051 CR 510 over Indian River	1.49
Bridge No. 880053 CR 510 over the ICW	2.05
Bridge No. 880087 SR 60 over Indian River - Merrill Barber Bridge	3.63
Bridge No. 880077 SR 656 over Indian River	1.47

Source: *Tidal Model Report – Sebastian Inlet (November 2003)*

VERTICAL ALTERNATIVES ANALYSIS

In response to the USCG's preliminary determination of the FDOT's PD&E Study, the project team completed a vertical alternatives analysis for the Bridge including the No Build Alternative and fixed-span bridge alternatives at vertical clearances of 39-feet (existing) and 65-feet (preliminary USCG determination). The following key criteria were used to determine a vertical clearance between 39-feet and 65-feet:

- The ability to maintain no fill over the Park public entrances north and south of the Bridge
- The ability to maintain traffic and Park access during construction

Based on the application of the above criteria, a vertical clearance of 51.40-feet was determined. This vertical clearance number was rounded to 51-feet for evaluation purposes.

All bridge vertical clearances were evaluated at the recommended design speed of 50 miles per hour (mph). The target speed is determined in accordance with FDOT's Roadway Design Bulletin 21- 08, FDM table 201.5.1 Design Speed. Per the bulletin, an allowable range of design speeds is determined based on roadway context classification. Additional factors considered include posted speed, land use, vehicular

traffic, transit, bicycle and pedestrian usage, safety, roadway access management, future development, and local input.

Specific parameters used to develop the vertical clearance alternatives included the following:

Vertical Clearance

- Posted Speed
  - 45 mph
- Design Speed
  - 50 mph
- Vertical Clearance (at 50 mph design speed)
  - 39-feet
  - 51-feet
  - 65-feet
- Superstructure Height
- Maximum Grade
- Depth of Fill
  - South Park Entrance
  - SID Access Road
  - North Park Entrance

Horizontal Alignment

- Context Classification
  - C1 Natural/C2 Rural
- Horizontal Alignment
  - Center (existing)
    - 39-feet vertical clearance
    - 150-feet horizontal clearance
  - East
  - West
- Vertical Clearance
  - 39-feet
  - 51-feet
  - 65-feet
- Physical, Cultural, Natural Resource Impacts

The bridge profiles for the vertical clearance evaluation are presented in Figures 5 – 7 and the results of the evaluation are summarized in Table 5. Bridge horizontal alignments evaluated include center (existing), east, and west. At any vertical clearance, the center alignment requires a temporary bridge structure.

The vertical alternatives evaluation completed was qualitative in nature. Additional quantitative evaluations will be completed as part of the PD&E's alternatives development process.

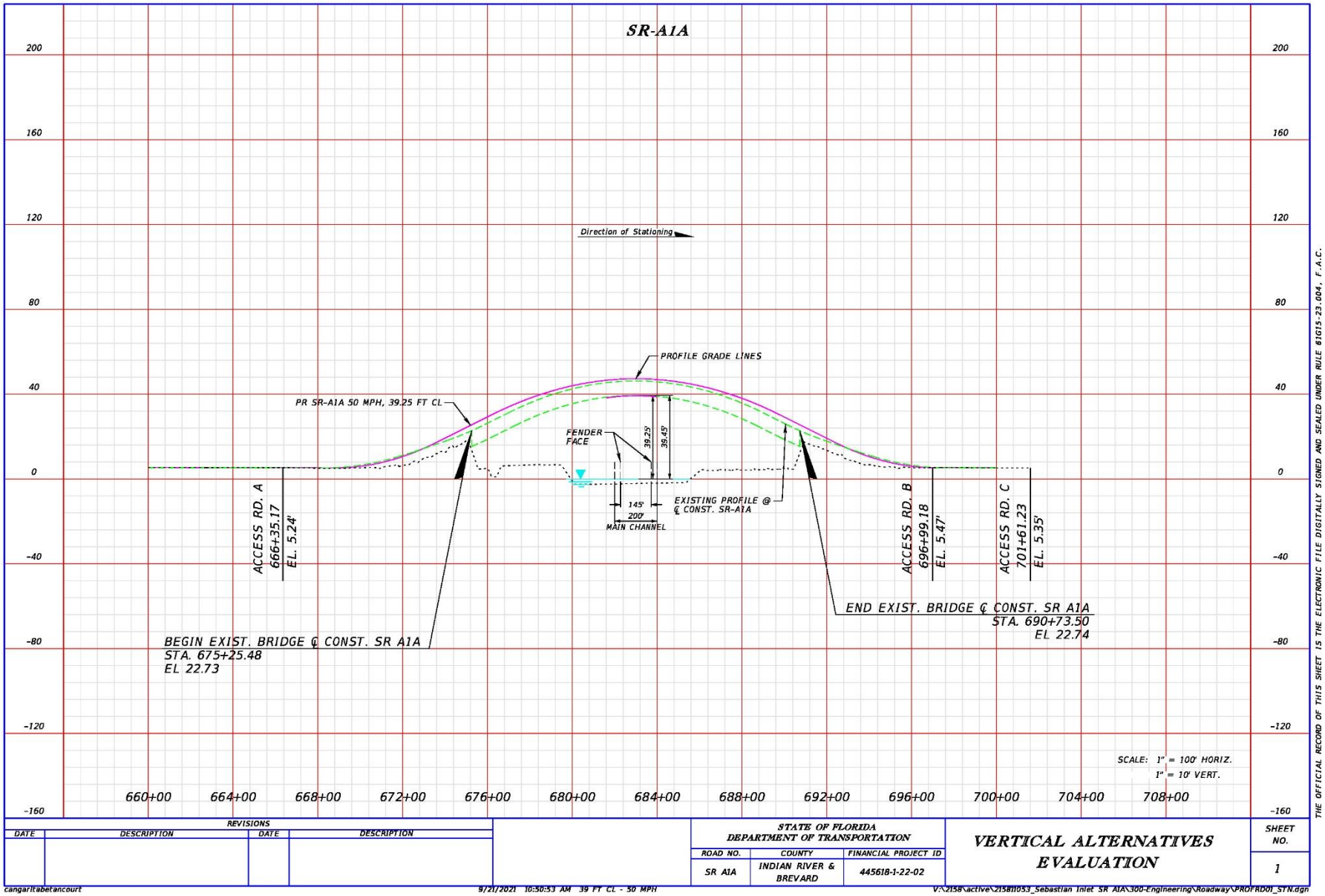


Figure 5. Bridge Profile at 39-Feet Vertical Clearance and 50 MPH Design Speed

Access Rd. A - South Park Entrance
Access Rd. B - SID Access Road
Access Rd. C - North Park Entrance

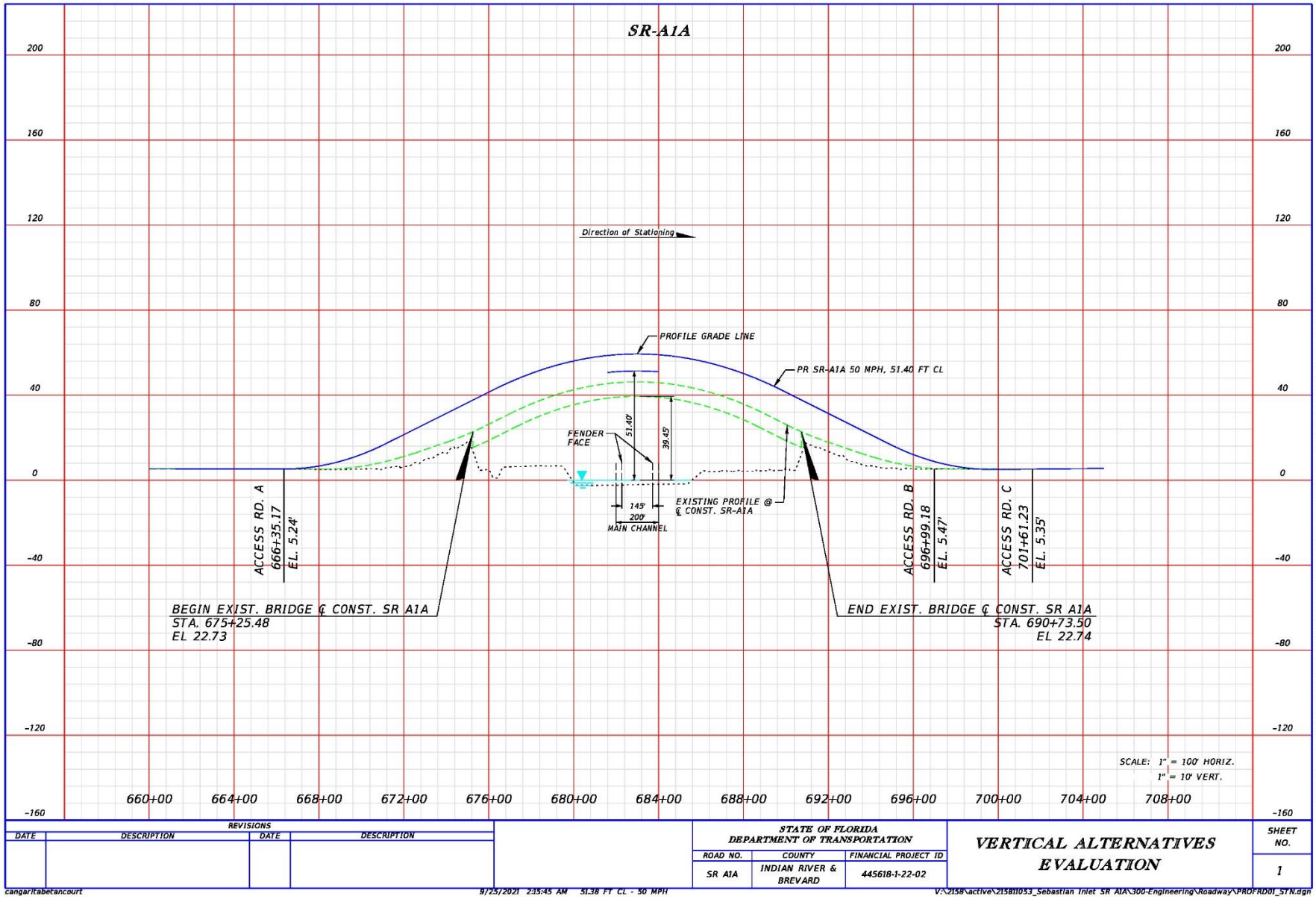


Figure 6. Bridge Profile at 51-Feet Vertical Clearance and 50 MPH Design Speed

Access Rd. A - South Park Entrance
Access Rd. B - SID Access Road
Access Rd. C - North Park Entrance

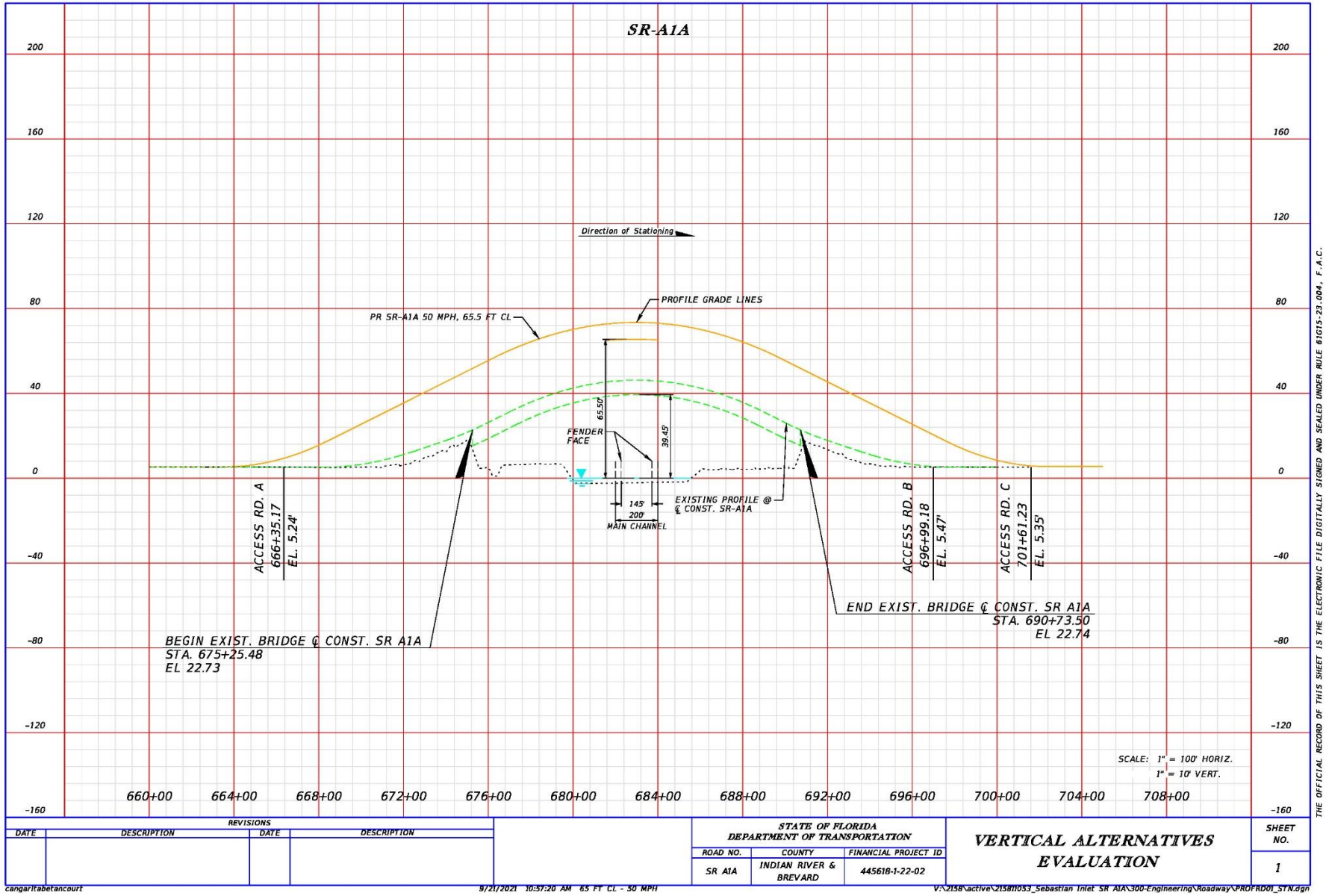


Figure 7. Bridge Profile at 65-Feet Vertical Clearance and 50 MPH Design Speed

Access Rd. A - South Park Entrance
Access Rd. B - SID Access Road
Access Rd. C - North Park Entrance

Table 5. Bridge Vertical Clearance Evaluation Results

Road	Superstructure Height (Feet)	Vertical Clearance (Feet)	Design Speed (mph)	Maximum Grade (%)	FILL AT 'ACCESS ROAD' / STATION (STA.)				South Landing STA.	North Landing STA.
					'A' STA. 666+99.18 (Feet)	'B' STA. 696+99.18 (Feet)	'B-2' STA. 697+42.05 (Feet)	'C' STA. 701+61.23 (Feet)		
SR A1A	6.80	39 Existing Bridge	45	5.00	N/A	N/A	N/A	N/A	668+25.00	697+76.46
SR A1A	8.00	39 Proposed	50	5.00	N/A	N/A	N/A	N/A	668+77.32	697+21.00
SR A1A	8.00	51 Proposed	50	5.00	0.00	3.30	2.25	0.00	665+58.40	700+39.82
SR A1A	8.00	65 Proposed	50	5.00	4.13	15.05	12.95	0.56	663+56.59	702+40.58

Access Road A - South Park Entrance
Access Road B - SID Access Road
Access Road C - North Park Entrance
Access Road B-2 represents the realigned SID access road at SR A1A

Criteria used to evaluate the ability of the vertical clearance alternatives to meet the project Purpose and Need included bridge and roadway design criteria, context criteria, and social, cultural, natural, and physical resource criteria as identified and described in Tables 6 - 7.

Table 6. Vertical Evaluation Criteria

Criteria	Description
Benefit to Marine Traffic	Factors influencing this rating include the change in number or type of vessel that could pass under the bridge based on vertical clearance and reasonably navigate east or west of the bridge.
Benefit to Vehicular Traffic	Existing vertical clearance has no direct effect to vehicular traffic. Benefit to vehicular traffic results from the addition of shoulders to the bridge and approaches.
Impact to Sebastian Inlet State Park North Entrance	The vertical geometry for the 65-foot clearance will impact the north Park entrance requiring realignment and/or resulting in fill required ranging from 0 to 21-feet over the entrance (Figure 7). Environmental impacts are anticipated.
Impact to Sebastian Inlet State Park South Entrance	The vertical geometry for the 65-foot clearance will impact the south Park entrance requiring realignment and/or resulting in fill required ranging from 0 to 4-feet over the entrance (Figure 7). Environmental impacts are anticipated.
Impact to Sebastian Inlet District (SID) North Access Road	The vertical geometry for the alternatives at 39-feet, 51-feet and 65-feet will impact the SID access road requiring realignment of the access road at SR A1A. The alternatives result in fill required ranging from 0 to 19-feet over the entrance (Figure 7). Environmental impacts are anticipated.
Bicycle and Pedestrian Facilities	Vertical clearance has no direct effect to bicycle and pedestrian traffic. Benefit results from providing bicycle and pedestrian facilities on the Bridge which may be potentially located on both sides. These facilities eliminate the gap in system linkage.
Community Support	Community support is indicated for new bridge. In particular provision of bicycle and pedestrian facilities. Vertical clearance matters to a small number.
Evacuation/Emergency Response	Vertical clearance does not affect evacuation/emergency response.
Traffic Operations	Depending on vertical clearance, a range of impacts may result to intersecting Sebastian Inlet State Park entrances and the SID access road.
Bridge Length (Feet)	An increase in bridge length from the existing 1,548-feet will have a range of impacts including impacts to intersecting Park entrances and the SID access road due to fill requirements and environmental impacts.
Constructability	Fixed-span bridges utilizing conventional construction methods and no temporary bridge are rated higher.
Bridge Construction Cost	This rating reflects the cost difference between a fixed-span bridge at vertical clearances of 39-feet, 51-feet, and 65-feet and an alternative that requires a temporary bridge. The cost for the three vertical clearances does not vary significantly. The higher vertical clearance will result comparatively in a greater cost.

Table 7. Horizontal Alignment Evaluation Criteria	
Criteria	**Description**
Benefit to Marine Traffic	Horizontal alignment has no direct effect to marine traffic.
Benefit to Vehicular Traffic	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.
Requires Additional Right-of-Way (ROW)	The need for additional ROW is directly related to additional impacts to resources.
Impact to North Approach	Independent of vertical clearance, a horizontal alignment to the east or west will impact Park improvements (parking, entrances), natural resources, and potentially require additional ROW. A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts associated with a new bridge.
Impact to South Approach	Independent of vertical clearance, a horizontal alignment to the east or west will impact Park improvements (parking, entrances), natural resources, and potentially require additional ROW. A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Impact to Sebastian Inlet State Park North Entrance	Independent of vertical clearance, a horizontal alignment to the east or west will impact the Park north entrance, natural resources, and potentially require additional ROW. A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Impact to Sebastian Inlet State Park South Entrance	Independent of vertical clearance, a horizontal alignment to the east or west will impact the Park north entrance, natural resources, and potentially require additional ROW. A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Impact to Sebastian Inlet State Park North Parking Area Under Bridge	Independent of vertical clearance, a horizontal alignment to the east or west will impact the Park north parking area under the bridge. A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Impact to Sebastian Inlet State Park South Parking Area Under Bridge	Independent of vertical clearance, a horizontal alignment to the east or west will impact the Park south parking area under the bridge. A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Impact to Sebastian Inlet District (SID) Access Road	Independent of vertical clearance, a horizontal alignment to the east or west will impact the SID access road entrance, natural resources, and potentially require additional ROW. A center

Table 7. Horizontal Alignment Evaluation Criteria	
Criteria	**Description**
	(existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Impacts to Wetlands	Minor to significant wetland impacts are anticipated due to park entrance improvements, turn lanes, shared use path, the SID access road realignment park entrance realignment/reconfiguration and ROW requirements.
Impacts to Wildlife	Minor to moderate impacts are anticipated based on horizontal alignment and vertical clearance associated with reconstruction of the park entrances, impacts to the dune community along the east side of SR A1A south of the bridge, and wetlands north and south of the Bridge.
Impacts to Section 4(f) Resources	Minor to significant impacts to Section 4(f) lands are anticipated based on horizontal alignment and vertical clearance. Additional right of way is required from for turn lane improvements near the park entrances, shared use path on the west side of SR A1A north and south of the Bridge.
Impacts to Archaeological Resources	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should impact project design
Bicycle and Pedestrian Facilities	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing bicycle and pedestrian facilities on the Bridge which may be potentially located on both sides. These facilities eliminate the gap in system linkage.
Community Support	Community support is indicated for a new bridge. In particular provision for bicycle and pedestrian facilities.
Evacuation/Emergency Response	With the addition of inside/outside shoulders, evacuation/emergency response is improved.
Traffic Operations	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, park entrances, and bicycle/pedestrian facilities.
Maintenance of Traffic	East and west horizontal alignment utilize the existing bridge to maintain traffic during construction. Temporary improvements/walls would be utilized at the approaches to allow construction of approach roadways. A temporary bridge is required for a center alignment. The temporary bridge must be built first and then the existing bridge removed before construction of the new bridge can begin.
Temporary Bridge Required	A center (existing) alignment requires a temporary bridge to maintain traffic creating temporary impacts in addition to permanent impacts.
Constructability	Fixed-span bridges utilizing conventional construction methods and procedures and no temporary bridge are rated higher. A temporary bridge adds to the construction cost, increases

Table 7. Horizontal Alignment Evaluation Criteria	
Criteria	**Description**
	impacts, and increases the time for construction since the temporary bridge must be built before demolition of the existing bridge can begin.
Bridge Construction Cost	This rating reflects the cost difference between a fixed-span bridge at vertical clearances of 39-feet, 51-feet, and 65-feet, and horizontal alignments at center (existing), east, and west along with one alternative that requires a temporary bridge. Generally, the alignment requiring a temporary bridge will result in a greater cost.

EVALUATION MATRIX RESULTS

Ratings of the evaluation criteria used include 0 if the alternative has no effect or provides some benefit to the evaluation criteria/category; + if the alternative meets or has a positive response to the evaluation criteria/category; and - if the alternative has a poor or negative response to the evaluation criteria/category. The addition of a + or - sign denotes a greater impact positively or negatively. Alternatives are compared to one another relative to their ability to meet study Purpose and Need. The evaluation matrices were separated into vertical clearance alternatives and horizontal alignment alternatives. The positive and negative results were then tabulated and are presented in Tables 8 - 9 and the complete matrices are included in Attachments E - F.

In summary, the vertical evaluation results indicate, at a project design speed of 50 mph, the following evaluation scores based on vertical clearance:

Vertical Clearance	Score
39-feet	-2
51-feet	-5
65-feet	-11

These results indicate, at a project design speed of 50 mph, a bridge vertical clearance of 39-feet is the best alternative. With a total vertical clearance score of -2 this bridge clearance provides reasonable means of navigation based on the characteristics of the Inlet and adjacent waterways and results in the least impacts to the natural, physical, cultural, and social environments. This bridge vertical clearance also provides the least impacts based on bridge and roadway design criteria.

These results are supported by the data collected during the April 2021 Navigation Survey where the tallest vessel reported passing under the Bridge is 34-feet. Less than 6 percent of respondents stated that they do not use the Inlet due to vertical clearance requirements above 39 feet. Inlet and adjacent channel depths and hazardous Inlet conditions were factors mariners also reported.

Secondly, a vessel survey completed during FDOT's Planning Phase for the project showed several different types of power boats were observed within the Inlet and adjacent area including jet skis, cabin cruisers, catamarans, center consoles, pilothouse, cigarette, jon boats, bowriders and pontoon boats. The majority of boats observed during the field surveys included recreational vessels and commercial fishing charter boats 30 feet or less in length and 15 feet or less in height. Most vessels remained within the Inlet, although some traveled east into the Atlantic Ocean.

Table 8. Vertical Alternatives Evaluation Matrix - Vertical Clearance Summary				
Evaluation Criteria / Category	**No Build Alternative**	**Vertical Clearance at 50 MPH Design Speed**		
		39-Feet Fixed Bridge (Existing)	**51-Feet Fixed Bridge**	**65-Feet Fixed Bridge**
Positive Points	0	+ 2	+ 3	+ 3
Negative Points	- 4	- 4	- 8	- 14
TOTAL POINTS VERTICAL ELEVATION / DESIGN SPEED	**- 4**	**- 2**	**- 5**	**- 11**

Table 9. Vertical Alternative Evaluation Matrix - Horizontal Alignment Summary										
Criteria / Category	**No Build Alternative**	**39-Feet Fixed Bridge** Existing Bridge Vertical Clearance			**51-Feet Fixed Bridge**			**65-Feet Fixed Bridge**		
		Alignment			**Alignment**			**Alignment**		
		Center	**East**	**West**	**Center**	**East**	**West**	**Center**	**East**	**West**
Positive Points	0	+ 4	+ 4	+ 4	+ 5	+ 5	+ 5	+ 5	+ 5	+ 5
Negative Points	- 3	- 17	- 15	- 17	- 15	- 21	- 23	- 18	- 26	- 29
TOTAL POINTS HORIZONTAL ALIGNMENT	**- 3**	**- 13**	**- 11**	**- 13**	**- 10**	**- 16**	**- 18**	**- 13**	**- 21**	**- 24**

Symbol Description
+ The alternative meets or has a positive response to the evaluation criteria/category
0 The alternative has no effect or provides some benefit to the evaluation criteria/category
- The alternative has a poor or negative response to the evaluation criteria/category
NOTE: +++ or - - - denote greater impact positively or negatively

CONCLUSION

Taking into consideration the Purpose and Need for the project, character of the Inlet, Inlet and surrounding bathymetry, surrounding resources, maintenance of the Inlet and adjacent waterway, and connectivity to the Intracoastal Waterway (ICW), the results of the vertical alternatives evaluation show:

- A vertical clearance greater than 39-feet offers no significant benefit to marine traffic based on the following:
  - The channel alignment is skewed 70 degrees ENE from the centerline of SR A1A.
  - The Inlet is stabilized by the north and south jetties located east of the Bridge and by the 42-acre sand trap west of the bridge.
  - Because the Inlet is relatively small in terms of cross sectional area, normal and storm surge conditions are attenuated resulting in maximum velocities through the Inlet. Inlet velocities are significantly higher at the Bridge than surrounding area bridges under normal and all storm surge events. These conditions support local knowledge of the adverse conditions at the Inlet and the hazard to navigation for all vessel types.
  - The depth of the Inlet at the throat (east), under the Bridge, and the channel west of the Bridge average between -15 (negative fifteen) to -16 feet due to the high velocity of the current that passes through the Inlet. Once west of the bridge, the depth quickly rises to the sand trap with depths varying from -6 feet to -12 feet across. Areas to the west of the sand trap range in depth from -2 feet to -9 feet. The Inlet, under the Bridge, is located approximately 2 nautical miles east of the ICW. The channel leading west from the sand trap to the ICW ranges in depth from -8 feet to -10 feet.
  - The SID maintains the sand trap and channel connecting the sand trap to the ICW under an MOA with the FDEP through a lease from the Division of State Lands. Maintenance of these features must continue to prevent shoaling caused by the Inlet velocities, which would otherwise prevent navigability from the Inlet to the ICW through the shallow waters.
  - Mariners must be certain that they can navigate their vessel to the east or west once through the Inlet. This includes consideration of the vessel clearance required above the water surface and draft of the vessel below the water surface.

The vertical clearance and horizontal alignment evaluation completed indicates, at a project design speed of 50 mph, a bridge vertical clearance of 39-feet is the best alternative providing reasonable means of navigation. The evaluation results show a total vertical clearance score of -2 for this bridge clearance, which provides reasonable means of navigation based on the characteristics of the Inlet and adjacent waterways and results in the least impacts to the natural, physical, cultural, and social environments. This bridge vertical clearance also provides the least impacts based on bridge and roadway design criteria.

The results of the vertical alternatives evaluation are supported by the data collected during the April 2021 Navigation Survey and the February 2020 Vessel Survey.

ATTACHMENT A

US Coast Guard Correspondence

Preliminary Clearance Determination

U.S. Department of Homeland Security
United States Coast Guard

Commander
United States Coast Guard
Seventh District

909 S. E. 1st Avenue (Rm 432)
Miami, FL 33131
Staff Symbol: (dpb)
Phone: (305) 415-6743
Fax: (305) 415-6763
Email: Andi.Maris@uscg.mil

16591/3099
July 12, 2021

Binod Basnet, P.E.
Project Manager
Florida Department of Transportation – District Four
3400 West Commercial Boulevard
Fort Lauderdale, Florida 33309
Via email: Binod.Basnet@dot.state.fl.us

Dear Mr. Basnet:

The Coast Guard has completed its review of the Navigation Impact Report (NIR), dated June 15. The project proposes a replacement of the Sebastian Inlet Bridge (SR A1A), which crosses the Sebastian Inlet and is located at the Indian River County and Brevard County boundary. The navigational impact report technical memorandum for the Sebastian Inlet Bridge project was prepared by the Florida Department of Transportation (FDOT) District Four.

Thank you for presenting a comprehensive and professional study. Based on the review of the NIR and information presently available, we have made a preliminary clearance determination for the bridge structure associated with the proposed project. We have determined that navigational clearances, which are congruent with the AICW in this area, will meet the reasonable needs of navigation for a bridge crossing Sebastian Inlet (replacement bridge); to wit, a minimum vertical clearance of 65 feet above mean high water (MHW) for a fixed or vertical lift bridge or 21 feet (closed) above MHW for a swing or bascule bridge, as well as a minimum horizontal clearance of. The guide clearance for the AICW in this location is available online at Bridge Guide Clearances (uscg.mil) by selecting 'Guide Clearances' on the left side of the webpage.

A note regarding guide clearances from the U.S. Coast Guard Office of Bridge Programs' webpage: *Guide Clearances are defined as the navigational clearances established by the Coast Guard for a particular navigable water of the United States which will ordinarily receive favorable consideration under the bridge permitting process (33 CFR Chapter 1, Subchapter J - Bridges) as providing for the reasonable needs of navigation. They are not intended to be regulatory in nature or to form a legal basis for approving or denying a bridge permit application. Under the circumstances of a particular case, greater or lesser clearances for a proposed bridge may be required or approved as meeting the reasonable needs of navigation for that particular location. For example, the particular character of the waterway and topography at the proposed location may justify a departure from the clearances specified for the waterway in the list of Guide Clearances.*

Please note that this preliminary determination does not constitute an approval or final agency action. In accordance with regulation, the Coast Guard can only make a final determination after processing a complete bridge permit application.

To complete the Bridge Permit Application, please refer to the Coast Guard Bridge Permit Application Guide located at https://go.usa.gov/xRFk2 (case sensitive). If you should have any questions, please email Andi.Maris@uscg.mil. We look forward to continuing to work with you and the FDOT to move this project forward.

Sincerely,

RANDALL D. OVERTON, MPA
Director, District Bridge Program
U.S. Coast Guard
By Direction

eCopy: USCG Sector Miami Waterway Management: : Omar.Beceiro@uscg.mil; Erik.J.Watson@uscg.mil

ATTACHMENT B

Sebastian Inlet Management Plan

SEBASTIAN INLET MANAGEMENT STUDY
IMPLEMENTATION PLAN

CERTIFICATE OF ADOPTION

WHEREAS, the Department of Environmental Protection ("Department"), in conjunction with the Sebastian Inlet Tax District Commission, Brevard County and Indian River County, established a Technical Review Committee ("TRC") to review information and make recommendations as to the adequacy of supporting studies and reports, under the provisions of Section 161.161, Florida Statutes, for the purposes of evaluating the erosive impact of Sebastian Inlet on adjacent beaches, and

WHEREAS the Department has developed an implementation plan to meet the Requirements of Chapter 161, Florida Statutes, and

WHEREAS the implementation plan is consistent with the Department's program objectives under Chapter 161, Florida Statutes,

The Department does hereby adopt the following implementation actions:

1) **Continue to bypass suitable sediment to the downdrift beaches.** Periodic maintenance dredging activities, including dredging of the channel and sand trap, will be conducted with placement of all beach compatible material on the downdrift beaches. Supplemental material from alternative sources will be used to meet, or exceed, an average annual placement objective of 70,000 cubic yards ("cy"). As a first priority, material should be placed on the beach in areas of greatest need based upon a plan approved by the Department. Areas of placement may be further refined based upon results from long term monitoring of the inlet and adjacent beaches. The bypassing objective of 70,000 cy is adopted as an interim measure and will be formally validated or redefined in subsequent revisions of the plan, based on a comprehensive monitoring plan, within 5 years of adoption of the Inlet Management Plan.

2) Restore the downdrift beaches designated by the Department as experiencing critical erosion. Downdrift beach restoration will be pursued in conjunction with implementation of shore protection activities under the Indian River County Beach Preservation Plan (IRCBPP) and be considered an integral part of both plans. The restoration of these beaches as stated in the IRCBPP, will be considered to meet state objectives for restoration of any possible adverse effects of the inlet. The activities under both plans will jointly maintain the restored shorelines.

3) **Evaluate possible alternatives to facilitate sediment bypassing.** Specific alternatives to be investigated include modifications to the

trapping capacity of the sand trap, structural changes to the south jetty to minimize backpassing of material into the inlet, and identification and use of possible sources of trapped littoral sediments (i.e. floodshoal and north shore) for bypassing to the downdrift beaches.

4) **Implement a comprehensive beach and offshore monitoring program.** Monitor inlet shoals and shoreline change, identify beach placement locations for future bypassing efforts and revalidate the sediment budget The program will be coordinated with monitoring activities associated with the Indian River County shore protection projects.

This plan is based on the findings and recommendations of the Sebastian Inlet Technical Review Committee and comments provided by public agencies and the citizenry of Brevard and Indian River counties. Each implementation action contained in this plan is subject to further evaluation, and subsequent authorization, as part of the Department's environmental permitting and authorization process.

It is the intent of the Department to assist in the implementation of the plan through the provision of funds granted under the Florida Beach Erosion Control Program. The Department's financial obligations shall be contingent upon sufficient legislative appropriations. The level of state funding shall be determined based upon the activity being conducted and Department policy. The Department may choose not to participate financially if the proposed method for implementation is not cost effective or fails to meet the intent of Section 161.142, Florida Statutes.

Nothing in this plan precludes the evaluation and potential adoption of other alternatives or strategies for management at Sebastian Inlet.

APPROVED FOR ADOPTION

Kirby B. Green, Deputy Secretary
Department of Environmental Protection

10 Mar 00
Date

SEBASTIAN INLET MANAGEMENT STUDY
SUMMARY OF FINDINGS REPORT
and
RECOMMENDED IMPLEMENTATION PLAN

Introduction

The Department of Environmental Protection, in conjunction with the Sebastian Inlet Tax District Commission, Brevard County and Indian River County, established a Technical Review Committee ("TRC") to review information and make recommendations as to the adequacy of supporting studies and reports for adoption of an Inlet Management Plan pursuant to Section 161.161, Florida Statutes. The TRC reviewed the 1988 Sebastian Inlet District Comprehensive Management Plan, as amended, and the 1997 Survey-Based Sediment Budget Analysis for Sebastian Inlet.

The findings and recommendations of the TRC have been evaluated by the staff of the Office of Beaches and Coastal as they relate to the Office's statutory responsibilities and program objectives. As a result of that evaluation, the Office has developed a recommended implementation plan to meet those responsibilities and objectives. Adoption of the plan will enable governmental entities to seek financial assistance from the Department for the conduct of management activities authorized in the plan.

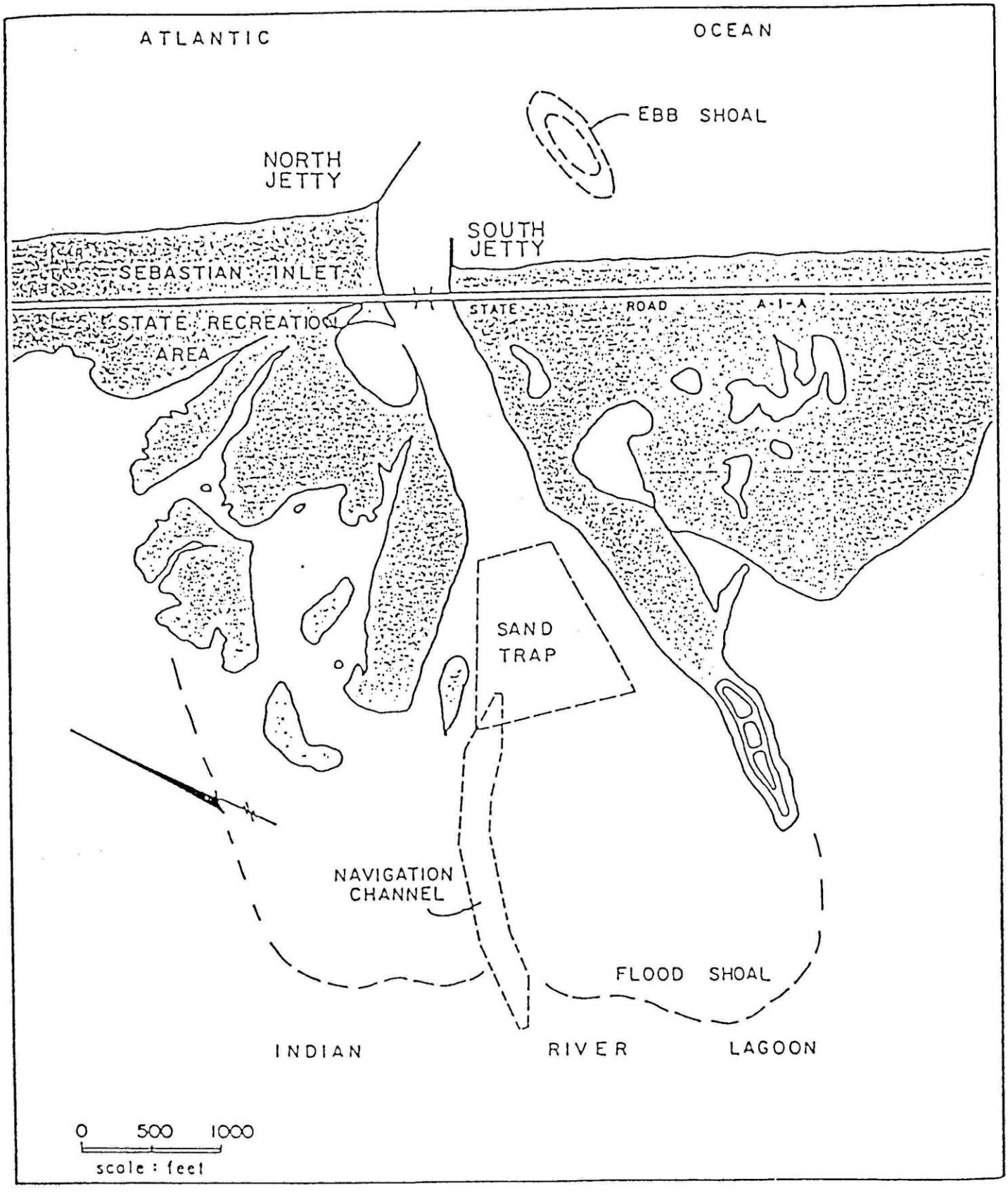
This report contains a brief history of Sebastian Inlet, a summary of the TRC's findings, and recommendations, and the recommended implementation plan.

History of Sebastian Inlet

Sebastian Inlet forms the border between Brevard and Indian Counties. The first attempt to cut a man-made inlet in the Sebastian area was made in 1886, but a hurricane closed the inlet. Since that time, numerous efforts to establish and stabilize the inlet for navigation have occurred over the years resulting in the construction of jetties and a sand trap. The current structural configuration consists of a north jetty approximately 1600 feet in length, and a southern jetty of approximately 1200 feet. The sand trap has a design capacity of 180-190,00 cubic yards (cy).

The inlet channel, sand trap and associated structures are maintained by the Sebastian Inlet Tax District Commission. Maintenance dredging of the channel and sand trap occur periodically, with placement of suitable material on the downdrift beaches located south of the inlet.

Previous studies of the inlet suggest the need to bypass between 70,000 and 75,000 cy of material annually to offset the impacts of the inlet, In an effort to meet the bypassing


ATLANTIC
OCEAN
EBB SHOAL
NORTH JETTY
SOUTH JETTY
SEBASTIAN INLET
STATE RECREATION AREA
STATE ROAD A-1-A
SAND TRAP
NAVIGATION CHANNEL
FLOOD SHOAL
INDIAN RIVER LAGOON
0 500 1000
scale : feet

objective, the District places material from an upland source on the downdrift beaches when sufficient material is not available from the sand trap.

Technical Review Committee Findings and Recommendations

1. Annual Bypassing Volume - Several reference sources reported annual bypassing volumes. There is some variation in the reported bypassing volumes, but most of them consistently report values of 70-75,000 cy/yr. The TRC agreed that a minimum of 70,000 cy/yr should be adopted in the inlet management plan with further refinement to be made following adoption of the Inlet Management Plan (IMP).

2. Flood Shoal - The TRC agreed that further study of long-term effects of the flood shoal on the inlet-related sediment budget should be performed. The position of the TRC was that existing studies do not provide sufficient information to answer questions regarding sand losses to the flood shoal. However, it was agreed that the IMP should move forward for adoption before additional studies are considered.

3. Historic Impacts - The consensus position of the TRC is that identification of the long-term impacts associated with the inlet in terms of impoundment of sand and sediment volume deficit to downdrift areas is incomplete and should be given priority in the implementation phase of the IMP. The TRC acknowledged that there is a high degree of interest from areas downdrift of the inlet with regard to the long-term impact of the inlet. The TRC agreed that there is a lack of sufficient information currently available to establish the long-term inlet impact The TRC agreed that the long-term impact determination would require further study following adoption of the IMP.

4. Area of Inlet Influence - This item is closely linked to item three above. The TRC position is that there is variation in existing numbers and that there is a lack of sufficient analysis and information existing to establish a consensus position on the area of influence. The TRC agreed that this item should be given high priority for determination following adoption of the IMP.

5. Methods of Calculating Sand Budget - The consensus position of the TRC was that continued refinement of the sand budget formulation methodology is desired.

6. Sources of Supplemental Fill - Supplemental sand fill is sand that is placed in addition to the annual sand bypassing needed to maintain the annual sand budget. The supplemental sand would be placed in order to restore eroded beaches downdrift of the inlet. Indian River County is initiating sand search activities for supplemental sand for restoration work with a focus on offshore sand sources. The TRC agreed that cooperative sand search studies should be conducted for the supplemental sand following adoption of the IMP.

7. Sand Bypassing and Placement - Sand bypassing has been performed at Sebastian nlet by either dredging of sand from the Inlet's sand trap and transfer by pipeline or by truck haul to downdrift beaches within the Sebastian Inlet State Recreation Area. The bypassing is per-formed generally on a 2-year cycle rather than on an annual basis, so that larger sand volumes can be transferred in a more economical manner, Currently, the inlet sand trap has a 180-190,000 cy capacity and is dredged when the sand volume reaches 150,000 cy. The TRC agreed that any further consideration of modifications to the inlet sand trap should be a subject of future study. Sand placement utilizing material from the sand trap starts at a distance of 3,000 feet south of the inlet and extends southward. The TRC agreed that sand placement should be in the downdrift area of greatest need within the area of influence of the inlet and be placed in an environmentally sensitive manner.

8. Environmental - The TRC identified and discussed a number of environmental issues relevant to sand management and sand bypassing at Sebastian Inlet. Environmental concerns discussed by the TRC included impacts to nearshore hardbottom areas, nesting marine turtles, dune vegetation, sea grasses, beach mouse habitat, and turbidity impacts. The TRC acknowledged that further environmental studies would likely be required in relation to larger mitigative fill projects or other components of the IMP in the permitting process for those projects, The TRC agreed that no further environmental studies should be required prior to adoption of the IMP.

9. Structural - Technical studies conducted to analyze structural improvements at Sebastian Inlet, particularly studies conducted by the University of Florida for the District, included recommendations to extend the south jetty. A jetty extension would prevent bypassed sand placed on the downdrift beaches from being transported back into the inlet and promote more efficient bypassing. A north jetty extension was also addressed in the studies. The TRC does not support a north jetty extension.

10. Public Resources – The Sebastian Inlet area is heavily used for a number of recreational and public interest activities, including boating, fishing, surfing, etc. The TRC concurred that all public resources associated with the inlet should not be addressed by the TRC or be included in the IMP, but be considered prior to implementation of any IMP components.

Recommended Implementation Plan

The Office of Beaches and Coastal Systems recommends the following implementation plan be adopted to meet the requirements of Chapter 161, Florida Statutes:

1. Continue to bypass suitable sediment to the downdrift beaches. Periodic maintenance dredging activities, including dredging of the channel and sand trap, will be conducted with placement of all beach compatible material on the

Nothing in this plan precludes the evaluation and potential adoption of other alternatives or strategies for management at Sebastian Inlet.

ATTACHMENT C

Florida Department of Environmental Protection – Sebastian Inlet District Memorandum of Agreement

MEMORANDUM OF AGREEMENT

THIS MEMORANDUM OFAGREEMENT is made this 5th day of Nov., 2018, by and between the Board of Commissioners of the Sebastian Inlet District, hereinafter referred to as "District" and the State of Florida Department of Environmental Protection, hereinafter referred to as "Department".

RECITALS

1. WHEREAS, the District, an independent special district, was created and reenacted by Chapter 2003-373; and

2. WHEREAS, the District has the statutory responsibility to construct, improve and maintain the Sebastian Inlet ("Inlet") between the Indian River and the Atlantic Ocean, and is authorized to conduct programs and projects for beach renourishment, erosion control, environmental protection, navigation, boating, recreation, and public safety for the operation and maintenance of the Inlet; and

3. WHEREAS, the District owns the currently submerged lands described in the Warranty Deed at Book 99 and Page 279, which comprise the former uplands that were dredged to form the Inlet, and holds and has held various easements over submerged lands and uplands owned by the Board of Trustees of the Internal Improvement Fund of the State of Florida; and

4. WHEREAS, the District, since 1919, has constructed and maintained navigation structures known as the north and south jetties, which are located primarily on sovereign submerged lands of the State of Florida, as integral infrastructure of the Inlet, and asserts that the primary purpose of the north and south jetties is to allow the District to carry out its function which is to construct, improve, widen or deepen to maintain the Inlet between the Indian River and the Atlantic Ocean for navigational purposes; and

5. WHEREAS, the Department operates Sebastian Inlet State Park ("Park"), a park and public recreational facility immediately adjacent to the Inlet, established following the acquisition of land by the State of Florida in 1971; and

6. WHEREAS, in 2001 the Department, with District assistance, undertook the North Fishing Jetty Improvement project funded under DEP Work Project #60218 with line item appropriations to the Department for schematic review, design development, permitting and construction of jetty infrastructure as well as the fishing deck overlying the north jetty. The Department has operated the multi-use fishing deck and sidewalk, as well as the concrete walkway extending along the south jetty (hereinafter together referred to as the "deck" in this document. See definitions in schedule 3) as part of the Park since that time; and

7. WHEREAS, the Department's predecessor agency, the State of Florida Department of Natural Resources, and the District entered into a Memorandum of Agreement on November 7, 1988, concerning their respective responsibilities and duties regarding the Park and the Inlet addressing public access and the use of the deck over the jetties; and

8. WHEREAS, the Department and the District entered into an Amended and Restated Memorandum of Agreement on December 21, 2000; which restated and readdressed the respective responsibilities and duties of the Department and the District, specifically addressing the Department's management responsibility for maintaining safety and order for Park visitors on the deck; and

9. WHEREAS, the north and south jetties have recently been incorporated into the Park boundary by the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Amendment Number 12 to Lease Number 2457, dated 05-14-2018). This instrument now conforms with previous agreements and understandings between the Department and the District regarding responsibilities for maintaining public access, public order and public safety. The Department shall be responsible for maintaining public order and safety on the deck and jetties; and

10. WHEREAS, there may be a need from time to time to provide supplemental security utilizing the presence of sworn officers through agreements between the District, the Department and third parties, in accordance with Section 6 of Section 3 of Chapter 2003-373, Laws of Florida. Such provision of supplemental security will in no manner restrict public access onto the decks and will be provided as a security presence and a deterrent to any potential unlawful behavior; any supplemental security personnel will abide by Rules and Conditions set out in Schedule 3 of this agreement; and

11. WHEREAS, the primary purpose of the north and south jetties is to serve as navigation structures and provide integral infrastructure to the Inlet, and the deck built on the north jetty and the concrete walkway of the south jetty provide public access and a secondary function for fishing and other recreational activities; and

12. WHEREAS, the Park is an important resource for public access widely known as a premier fishing destination, attracting 809,565 visitors in the 2016/2017 fiscal year, with users also enjoying public access to the beach, camping, or other activities within the Park. The multi-use fishing deck is a major attraction within the Park, with an estimated head count on the north deck between 6,000 and 7,000 users per month for the calendar year 2016; and

13. WHEREAS, the District and the Department acknowledge that the jetties have a primary function as infrastructure to the Inlet and may need to be reconfigured in the future for navigation management, inlet safety and coastal management and that both

parties recognize and promote the secondary recreational uses over the jetties, both of which attract users in addition to anglers, including sightseers, bird watchers, photographers, surfing observers and nature enthusiasts; and

14. WHEREAS, the District and the Department are sensitive to conflicts between various users of the decks and surrounding water; and

15. WHEREAS, the Department is focused on continuing to ensure public access and public safety over the decks because of the concerns listed above; and

16. WHEREAS, the District has taken steps and incurred expense to maintain public safety, such as posting signs with rules, installing video surveillance cameras, installing a barrier/control gate on the deck over the north jetty, as further described in paragraph 3 below, and requesting more security presence by law enforcement agencies; and

17. WHEREAS, the Department and the District agree that an increased presence of law enforcement officers (including both Florida Fish and Wildlife Conservation Commission officers and local law enforcement) at the north jetty and on the water near the north jetty is an effective management tool; and

18. WHEREAS, the parties desire to facilitate the presence of law enforcement officers at the Park, including the decks, to establish an effective security presence; and

19. WHEREAS, the parties desire to enter into this Memorandum of Agreement to replace the Amended and Restated Memorandum of Agreement dated December 21, 2000, as amended by the Amendment to the Amended and Restated Memorandum of Agreement of the same date, reflecting changes occurring since the Amended and Restated Memorandum of Agreement and its Amendment, and altering and modifying the respective responsibilities and duties of each party.

IT IS, THEREFORE, AGREED as follows:

1. The Recitals above are true and accurate.

2. MAINTENANCE OF THE INLET: The District is responsible for the construction and maintenance of the Sebastian Inlet between the Indian River and Atlantic Ocean. Maintenance of Inlet infrastructure, including rock ribs, revetments, pilings, instrumentation and navigational aids, are the responsibility of the District., The fishing walkways, sidewalks and railings, as well as the fishing deck, grates and railings above the north jetty and concrete walkway along the south jetty are maintained by the Park. For a detailed inventory of Inlet features and the responsibilities of the parties for maintenance, See Schedule 1, as part of this agreement.

3. EASEMENTS AND ACCESS: The District holds fee simple title from third parties within the Inlet itself, landward of the mean high-water line of the Atlantic Ocean. The District requires easements from the Trustees of the Internal Improvement Trust Fund (Board) where the north jetty, south jetty, and revetments have been constructed and a spoil disposal area is maintained. The District requires the use of the aforementioned property identified for the maintenance, construction and reconstruction of the Inlet. Such property includes the areas necessary for the jetties, the shoreline revetment areas adjacent to and in the Inlet, and the Dredged Material Management Area (DMMA), the Sand Trap Area, the Navigation Channel, staging areas and the beach access area at R-8. (See Schedule 2 for a list of easements and conveyances needed by the District for maintenance, construction, and reconstruction of the Inlet.) The District shall secure all necessary authorizations, and State and Federal regulatory permits for any projects it undertakes for the operation and maintenance of the inlet and the waters of the Atlantic Ocean and Indian River Lagoon adjacent thereto. It is understood that the District must comply with the applicable laws and Department and Board rules in obtaining any regulatory permits from the Department and any proprietary authorizations from the Board. Both parties will work together to facilitate the easements and access necessary to maintain the inlet. It is also understood that although the District installed a barrier/gate on the deck over the north jetty, that gate shall not be used to preclude public access to the deck without written agreement of the park manager..

4. ASSIGNMENT OF LAW ENFORCEMENT: The parties to this Agreement agree to request assistance from the Florida Fish and Wildlife Conservation Commission and local law enforcement as necessary and as described below, to assign sworn law enforcement officers to the Sebastian Inlet State Park, including the decks, to establish an effective security presence both during daytime and nighttime Park hours. This assignment of law enforcement shall not limit the coordination required of the parties described throughout this agreement. The District may, by coordinated agreement with the park manager, contract with the Brevard County Sheriff's Office, FWCC or private security firm to provide supplemental security at such times when the presence of sworn officers is perceived necessary for assurance of public safety. The park manager will provide a set of conditions and limits for the use of supplemental security (see Schedule 3) and the District bears all responsibility for ensuring that officers are briefed and agree to conform to the conditions and limits.

5. COORDINATION AND COMMUNICATION: The Department has created a Sebastian Inlet State Park Unit Management Plan and the District has created an Inlet Management Plan, both of which outline procedures and goals of the respective entities. The parties acknowledge that projects will be undertaken within their respective management plans and pursuant to their authorizing statutes and legislation. The parties further acknowledge that they will continue dialog regarding proposed future projects and will consider comments to ensure that activities will result in the least impact on each party's area of responsibility possible. The parties further agree to determine what easements or other submerged land authorizations from the Board may be necessary to allow the District to continue operating and maintaining the Inlet, starting from the list provided as Schedule 2 of this Agreement.

6. NOTIFICATION: Any notices required to be given under this Memorandum of Agreement shall be provided as follows:

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION:
Division of Recreation and Parks
Office of Park Planning

Bureau Chief

Steven A. Cutshaw

3900 Commonwealth Blvd., MS 535

Tallahassee, FL 32399-3000

BOARD OF COMMISSIONERS OF THE SEBASTIAN INLET TAX DISTRICT F/K/A THE SEBASTIAN INLET DISTRICT

Administrator

Marty Smithson

114 Sixth Avenue

Indialantic, FL 32903

7. FISCAL CONSTRAINTS: The parties understand and agree that each party is a unit of government responsible under the law for establishing its own budget and program priorities. Each party operates under fiscal constraints and will unilaterally determine the amount of funds available, if any, to fulfill their duties under this Agreement.

8. INDEMNIFICATION. The Department shall indemnify the District and save the District harmless from any and all claims, injuries, damages, liabilities, losses and causes of action of or to a third party arising out of any negligent act, error or omission of the Department related to the District's performance under this Agreement. The District shall indemnify the Department and save the Department harmless from any and all claims, injuries, damages, liabilities, losses and causes of action of or to a third party arising out of any negligent act, error or omission of the District related to the Department's performance under this Agreement. Nothing in this Agreement shall be construed to waive or affect the parties' enjoyment of sovereign immunity.

9. DISPUTES AND DISAGREEMENTS AND RESOLUTIONS THEREOF: The parties to this Agreement shall, in the event there is a dispute or disagreement with regards to any party's rights or obligations hereunder, notify the other party in writing of the claimed dispute or disagreement. The notified party shall have 30 days to cure the dispute or disagreement and should it not agree with the claim of the complaining party, it shall so notify the complaining party. In such event, the parties agree that they shall meet in person within 30 days of the response to the claiming party to discuss and attempt to resolve the dispute or disagreement. All attempts will be made to avoid the need for mediation.

10. MODIFICATION OR AMENDMENT: Any modification or amendment to this Agreement must be in writing, must be accepted, acknowledged and executed by all parties, and

must comply with the rules and statutes in existence at the time of the execution of the modification or amendment.

11. TERM AND RENEWAL: This Agreement shall be for a term of ten years, commencing on the date of the signature of the last party to execute the agreement. Renewal of this Agreement shall be at the discretion of the parties. Such renewal shall be subject to the terms, conditions and provisions of management standards and applicable laws, rules and regulations in effect at that time.

12. ENTIRETY: This Agreement represents the entire agreement between the parties. This Agreement supersedes the Memorandum of Agreement dated December 21, 2000, as well as the first Amendment to the Memorandum of Agreement of the same date.

IN WITNESS WHEREOF, we have set our hands and seals on the date first written above.

WITNESS

Martin S. Smithson
Administrator

David Kerr

BOARD OF COMMISSIONERS OF THE SEBASTIAN INLET TAX DISTRICT F/K/A THE SEBASTIAN INLET DISTRICT

By: _____
Chairperson

Thia Cay
Pamela Harman

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

By: _____
Deputy Secretary

Approved as to form and legality:

DEP Attorney

SID Attorney

SCHEDULE 1

Inventory of Items of Inlet District - Maintenance Responsibility (Note: Access to structures on state owned lands [both submerged and uplands] that are part of this list is governed by easements and leases to the District from the Board of Trustees. This list is provided for organizational purposes between the District and the Park only and should not be construed to indicate authorization of use by the Board of Trustees of the Internal Improvement Trust Fund of the State of Florida.)

- North Jetty rocks and revetment
- North Jetty weather station and navigation light
- North Jetty web cam with weather instruments and surveillance cameras
- North Jetty splash apron, asphalt veneer and rocks underneath from pier structure to A1A bridge.
- North Jetty web cam wiring and conduit to concession building
- South Jetty – rocks and revetment
- Storage Shed with computer and modem plus cable to offshore Acoustic Doppler Current Profiler (ADCP). North end of park.
- Rocks and revetment (North Shore) to Tide Pool and west.
- Dredged Material Management Area (DMMA) with control structures and fencing.
- DMMA turnaround with dry detention stormwater treatment
- Truck access easements – off A1A into park for DMMA access.
- South shoreline rocks and revetments
- T-Dock for dredge workboat staging
- Expanded 42-acre Sand Trap
- Coconut Point revetment with staging area easement
- Inlet Channel Markers (36), Boat Ramp channel (6), Channel to Sebastian River (6)
- R-8 Beach access area

SCHEDULE 1

Structural Maintenance Responsibilities of the Sebastian Inlet District and State Park In District Easement areas within Sebastian Inlet State Park

FEATURE	DISTRICT	STATE PARK	NOTES
North Jetty	Pilings, rocks, District devices described above including: signage, lights, weather station, and web cam	Pier decking, grates, railings, gates, park signage, safety devices, trash collection system, fish cleaning stations	
Splash Apron	Asphalt and rocks underneath asphalt veneer from the pier structure to the A1A bridge.	Sidewalk and railing used by park visitors, storm drain	
Sidewalk from pier structure to A1A	Rocks/Revetment fronting and under sidewalk	Sidewalk and railing used by park visitors	
Dredged Material Management Area (DMMA)	All features of DMMA and stormwater treatment area. Any damage incurred during District work projects shall be repaired to the same condition as existed prior to work project	Coordinated use, administration of easement. Any Park projects within the easement area to be coordinated with the District.	Gopher Tortoise relocation by District
North side shed housing computer/modem for offshore ADCP	Maintain shed, equipment, connections and cable to ADCP		
South Jetty	rocks, lights and devices for navigational purposes.	Decking and railings used by park visitors, Walkway/sidewalk from A1A Bridge leading to jetty with railing. Lights for upland visitor use purposes.	District responsible for all revetment/rocks fronting walkway

FEATURE	DISTRICT	STATE PARK	NOTES
T-Dock on south side	Repairs or modifications associated with sand trap and dredging operations	Recreational access, normal maintenance and repairs outside sand trap and dredging usage	50: 50 cost-share between District and FIND
Coconut Point	Maintaining and controlling erosion around edges of Coconut Point	Recreational access and parking	
Sand Trap	Associated dredging activities	None	
Channel Markers	Maintenance of all associated channel markers for navigation	None	
R-8 Beach Access	Hauling access within designated corridor; environmental protection, erosion control, security of access, and contractor management related to hauling activities	Recreational access and associated park management activities	
Coconut Point Boat Ramp	Channel markers leading to ramp. Maintenance dredging of channel to ramp to be coordinated between State and District at a maximum 50: 50 ratio	Ramps and floating piers Coordinated maintenance dredging of channel to ramp.	

SCHEDULE 2
CURRENT AND EXPIRED ENCUMBRANCES

Document References	141290	25082	TFI	Y		4-28-1970 ESMT FOR PIPELINE ACROSS STATE LANDS, S'LY OF INLET.
Document References	141916	27943	TFI	N		TEMP EASEMENT FOR SUBMERGED LANDS DREDGING AREA OF N'LY SHORE OF INLET - EXPIRED IN 1992
Document References	143041	24963	TFI	Y		SUBMERGED LANDS EASEMENT
Document References	143296	30247	TFI	Y		2 ACCESS ROUTES FROM HWY TO BEACH S'LY OF INLET AREA. 50 YR TERM EXPIRES IN 2049.
Document References	300498	28298	TFI	Y		RELEASE OF TWO PIPELINE ROUTES ACROSS LANDS S'LY OF BRIDGE
Document References	328833	00027	TFI	Y		EASEMENT FOR DREDGE SITE OUT IN INLET-SUBMERGED LANDS. MODIFICATION OF 00027. ACTIVE.
Document References	300505	28298	TFI	Y		PARTIAL RELEASE OF 2 AREAS COVERED BY PARENT EASEMENT
	142206	28298	TFI			SUBMERGED LANDS EASEMENT - EXPIRED ON 1/1/2015
	363355	32057	TFI			EASEMENT FOR SPOIL DISPOSAL AREA- 50YR TERM EXPIRES IN 2060.
	328834 *	00077	TFI			SUBMERGED LANDS EASEMENT ASSOC W/ ERP PERMIT 31-244773-4 & MEMO OF AGMT DATED 11/17/1988
	356370 current	00027	TFI			SUBMERGED LANDS EASEMENT IN INNER INLET-20 YR TERM EXP 11-22-2008 – RENEWED UNTIL 10-01-2028
	2959		ADF			AGENCY DEED FILE - SUBJECT TO TERMS AND CONDITIONS OF AGMT DATED JULY 11, 1964
	2975		ADF			DISCLAIMER FROM INLET DIST FOR PIPELINE ROUTE
	363349	28298	TFI			RELEASED A SPOIL AREA ON N'LY SHORE OF INLET 4-16-2010
	300510	28298	TFI			AMENDED AREA EXPIRED AT END OF ESMT TERM IN 2015

LEGEND

*00077 expired 2014 per Certification of Board Action

CURRENT ENCUMBRANCES (i.e. easements)

EXPIRED OR RELEASED ENCUMBRANCES

SCHEDULE 3

RULES, CONDITIONS AND DEFINITIONS

Sebastian Inlet State Park Rules for Jetties and Fishing Decks

For everyone's safety we have established the following rules:

1. The Jetty was built to aid boaters in navigation through the inlet and provide public access onto the deck. While using the Fishing Deck, please yield to boaters until they pass safely through the inlet.
2. Throwing or casting of objects at vessels, surfers and snorkeler/divers is prohibited.
3. No cast netting is allowed on the eastern portion of the deck.
4. Cast netters using the rest of the deck must return unused marine life back into the water. This is one of the few jetties that allows netting please do not abuse the privilege.
5. No Alcoholic beverages, glass containers, pets other than service animals. The use of bicycles, skateboards or scooters or similar devices are not permitted on the deck.
6. Use clam shell shucking station and discard shells safely into the water. Trash and discarded fishing line must be placed in the provided receptacles.
7. No clam shells, fish, trash or discarded fishing line may be left on the jetty.
8. All fish harvested must be placed in a container as soon as possible.
9. Jumping and Diving from the deck and jetties is prohibited.
10. No canopies or tents are allowed. Umbrella's may be used but cannot be attached to the deck or railing.
11. There is a limit of two fishing rods per person and they must be attended.
12. No loud music, profanity or rude behavior is allowed.
13. No open flame or grills are allowed.
14. Be courteous when using lights after dark, red lights are strongly encouraged.
15. No propeller driven craft may be launched or landed on the jetty.
16. All Marine life not for harvest must be returned to the water without intentional harm and in whole condition as quick and safe as possible.
17. Please adapt fishing methods when birds are actively feeding so they are not caught. Every effort should be made to release them unharmed if caught or entangled.
18. Targeting Goliath Grouper, a Protected Species is prohibited. Do not tie lines to the railing or any part of the structure.
19. Please exit the jetty during periods of inclement weather which may result in lightening and rough seas.

Video Surveillance in Use

It is the fisherman's responsibility to know and follow all current FWC rules and regulations in harvesting marine life. All limits and seasons are strictly enforced.

When in doubt release it.

Failure to follow these rules may result in loss of Fishing privileges.

Rude or aggressive behavior will not be tolerated and may result in being trespassed from the State Park.

Sebastian Inlet State Park Conditions and Limits for Use of Supplemental Security and Special Detail Responsibilities:

1. Detail Shifts
   a. Four hour shifts three shifts per week for a one-month trial period.
   b. An attempt will be made to schedule shifts to start two hours before incoming tide change and end two hours after tide change.
   c. Shifts should rotate between day and evenings Wednesday, Friday, Saturday or Holidays.
2. Communication
   a. Deputies should pick up a Park Radio at the North Ranger station at the beginning of the shift. And return it after the shift.
   b. Deputies should use their normal means of communication for all emergencies.
   c. Resource violations will be immediately reported to the Park Manager through the Park Radio; and FWC through normal law enforcement communications channels for necessary compliance or enforcement actions.
3. Primary Responsibilities
   a. The main responsibility of the Special Detail is to interpret and educate our visitors on sharing a major fishing resource and following the jetty rules.
   b. The deputies should make every effort to prevent altercation through early intervention.
   c. Deputies should document incident using their normal protocol and provide copies of the reports to Sebastian Inlet State Park and the Sebastian Inlet Tax District.
   d. Visitors who repeatedly violate jetty rules should be asked to leave the jetty and not return for a period of one year with Park Manager's approval and proper documentation.
   e. Visitors that are rude and abusive should be trespassed from the park for one year with Park Managers approval and proper documentation.
   f. The Deputies always have the option to make arrest or take any necessary action when considering public safety.
   g. Every effort should be made to use common sense and courtesy when interacting with the different user groups. Generally, the person that is using the area first should have the priority. The exception is when inlet conditions are safest close to the jetty, fishermen from the deck should pull in their lines until the boat passes through.
4. Safety
   a. Deputies should always respond to incidents using their level of training and call for assistance using normal protocol.
   b. The North Ranger Station should be notified as soon as possible so Rangers can respond and gather information for reports.
   c. Deputies should become familiar with the life rings and receive training if needed.

d. Deputies may be asked to assist in clearing the jetty of visitors during times of inclement weather and high seas.

5. Protecting Wildlife Resources
   a. Deputies should become familiar with basic fishing regulation and ask for voluntary compliance.
   b. Deputies should coordinate with FWC to protect our resources and to make sure our fishing regulations are followed.
   c. Keeping the deck clean and returning unwanted fish to the water alive should be a high priority. Visitors repeatedly failing to follow the rules of the jetty should be asked to leave the jetty.

DEFINITIONS:

Deck – The concrete cap atop the jetty pilings, inclusive of metal grates and handrails. The multi-use deck provides access to the public for fishing, sightseeing, observing nature, etc.

Jetty – The structure extending into the water, or fronting the waterway, for protection of the inlet, inclusive of rocks, piles, decking and sidewalks.

Jetty Rocks – Primarily the boulders and rocks between the pilings forming the rib of the jetty. Also includes the boulders lining both sides of the jetty extending into the water from the beach.

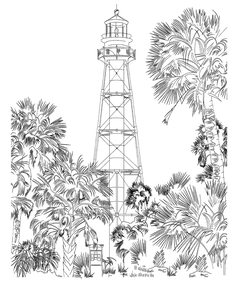
Pier – When used, means the elevated portion of the deck over water, atop the pilings.

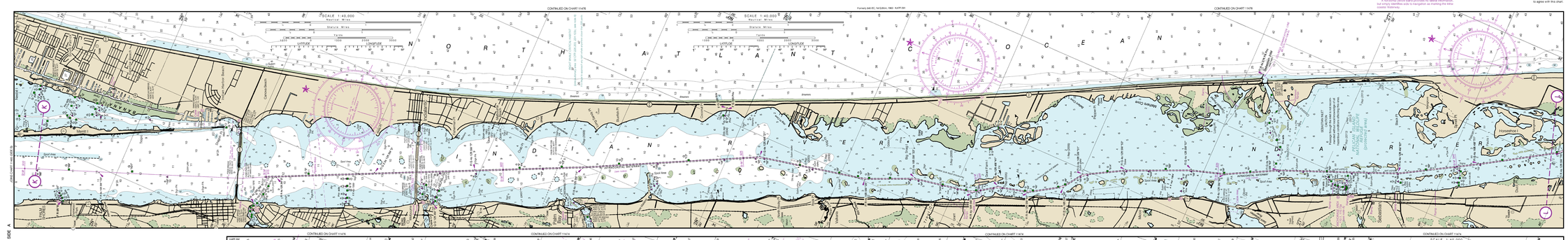
Revetment – Rocks and boulders lining the inlet shoreline and embankment protecting the shoreline from erosion.

Sidewalk – The concrete walkway leaving the elevated deck, sitting atop the rock revetment.

ATTACHMENT D

NOAA Nautical Chart # 11472





HURRICANES AND TROPICAL STORMS

Hurricanes, tropical storms and other major storms may cause considerable damage to marine structures, aids to navigation and moored vessels, resulting in submerged debris in unknown locations.

Charted soundings, channel depths and shoreline may not reflect actual conditions following these storms. Fixed aids to navigation may have been damaged or destroyed. Buoys may have been moved from their charted positions, damaged, sunk, extinguished or otherwise made inoperative. Mariners should not rely upon the position or operation of an aid to navigation. Wrecks and submerged obstructions may have been displaced from charted locations. Pipelines may have become uncovered or moved.

Mariners are urged to exercise extreme caution and are requested to report aids to navigation discrepancies and hazards to navigation to the nearest United States Coast Guard unit.

NOAA encourages users to submit inquiries, discrepancies or comments about this chart at http://www.nauticalcharts.noaa.gov/staff/contact.htm.

ACKNOWLEDGMENT

The National Ocean Service acknowledges the exceptional cooperation received from members of the Vero Beach Power Squadrons, District 8, and the Banana River Power Squadron, District 23 of United States Power Squadrons, for continually providing essential information for revising this chart.

RULES OF THE ROAD
(ABRIDGED)

Motorless craft have the right-of-way in almost all cases.
Sailing vessels and motorboats less than sixty-five feet in length shall not hamper, in a narrow channel, the safe passage of a vessel which can navigate only inside that channel.
A motorboat being overtaken has the right-of-way.
Motorboats approaching head to head or nearly so should pass port to port.
When motorboats approach each other at right angles or obliquely, the boat on the right has the right-of-way in most cases.
Motorboats must keep to the right in narrow channels when safe and practicable.
Mariners are urged to become familiar with the complete text of the Rules of the Road in U.S. Coast Guard publication "Navigation Rules."

CAUTION
WARNINGS CONCERNING LARGE VESSELS

The "Rules of the Road" state that recreational boats shall not impede the passage of a vessel that can navigate only within a narrow channel or fairway. Large vessels may appear to move slowly due to their large size but actually transit at speeds in excess of 12 knots, requiring a great distance in which to maneuver or stop. A large vessel's superstructure may block the wind with the result that sailboats and sailboards may unexpectedly find themselves unable to maneuver. Bow and stern waves can be hazardous to small vessels. Large vessels may not be able to see small craft close to their bows.

RADAR REFLECTORS

Radar reflectors have been placed on many floating aids to navigation. Individual radar reflector identification on these aids has been omitted from this chart.

CAUTION
BASCULE BRIDGE CLEARANCES

For bascule bridges, whose spans do not open to a full upright or vertical position, unlimited vertical clearance is not available for the entire charted horizontal clearance.

WARNING

The prudent mariner will not rely solely on any single aid to navigation, particularly on floating aids. See U.S. Coast Guard Light List and U.S. Coast Pilot for details.

CAUTION
SUBMARINE PIPELINES AND CABLES

Charted submarine pipelines and submarine cables and submarine pipeline and cable areas are shown as:

Pipeline Area
Cable Area

Additional uncharted submarine pipelines and submarine cables may exist within the area of this chart. Not all submarine pipelines and submarine cables are required to be buried, and those that were originally buried may have become exposed. Mariners should use extreme caution when operating vessels in depths of water comparable to their draft in areas where pipelines and cables may exist, and when anchoring, dragging, or trawling.

Covered wells may be marked by lighted or unlighted buoys.

CAUTION

Limitations on the use of radio signals as aids to marine navigation can be found in the U.S. Coast Guard Light Lists and National Geospatial-Intelligence Agency Publication 117.

Radio direction-finder bearings to commercial broadcasting stations are subject to error and should be used with caution.

Station positions are shown thus:
⊙(Accurate location) o(Approximate location)

NOTE A

Navigation regulations are published in Chapter 2, U.S. Coast Pilot 4. Additions or revisions to Chapter 2 are published in the Notice to Mariners. Information concerning the regulations may be obtained at the Office of the Commander, 7th Coast Guard District in Miami, Florida, or at the Office of the District Engineer, Corps of Engineers in Jacksonville, Florida.

Refer to charted regulation section numbers.

NOTE B

The daybeacons are private and positions are approximate.

ABBREVIATIONS (For complete list of Symbols and Abbreviations, see Chart No. 1.)
Aids to Navigation (lights are white unless otherwise indicated):

AERO aeronautical	G green	Mo morse code	R TR radio tower
Al alternating	IQ interrupted quick	N nun	Rot rotating
B black	Iso isophase	OBSC obscured	s seconds
Bn beacon	LT HO lighthouse	Oc occulting	SEC sector
C can	M nautical mile	Or orange	St M statute miles
DIA diaphone	m minutes	Q quick	VQ very quick
F fixed	MICRO TR microwave tower	R red	W white
Fl flashing	Mkr marker	Ra Ref radar reflector	WHIS whistle
		R Bn radiobeacon	Y yellow

Bottom characteristics:

Blds boulders	Co coral	gy gray	Oys oysters	so soft
bk broken	G gravel	h hard	Rk rock	Sh shells
Cy clay	Grs grass	M mud	S sand	sy sticky

Miscellaneous:

AUTH authorized	Obstn obstruction	PD position doubtful	Subm submerged
ED existence doubtful	PA position approximate	Rep reported	

21 Wreck, rock, obstruction, or shoal swept clear to the depth indicated.
(2) Rocks that cover and uncover, with heights in feet above datum of soundings.
COLREGS: International Regulations for Preventing Collisions at Sea, 1972.
Demarcation lines are shown thus: — — — —

Ⓟ Pump-out facilities

POLLUTION REPORTS

Report all spills of oil and hazardous substances to the National Response Center via 1-800-424-8802 (toll free), or to the nearest U.S. Coast Guard facility if telephone communication is impossible (33 CFR 153).

AIDS TO NAVIGATION

Consult U.S. Coast Guard Light List for supplemental information concerning aids to navigation.

CAUTION

Temporary changes or defects in aids to navigation are not indicated on this chart. See Local Notice to Mariners.

Improved channels, shown by broken lines are subject to shoaling, particularly at the edges.

RACING BUOYS

Racing buoys within the limits of this chart are not shown hereon. Information may be obtained from the U.S. Coast Guard District Offices as racing and other private buoys are not all listed in the U.S. Coast Guard Light List.

CAUTION

Small craft should stay clear of large commercial and government vessels even if small craft have the right-of-way.

PLANE COORDINATE GRID
(based on NAD 1927)

Florida State Grid, East Zone, is indicated by dashed ticks at 10,000 foot intervals.
The last three digits are omitted.

INTRACOASTAL WATERWAY
Project Depths

12 feet Norfolk, VA to Fort Pierce, FL; 10 feet Fort Pierce, FL to Miami, FL; 7 feet Miami, FL to Cross Bank in Florida Bay.

Consult the U.S. Army Corps of Engineers for controlling depths and U.S. Coast Guard Local Notice to Mariners for other navigation hazards or restrictions.

Uncharted shoals may exist in areas which have not been recently surveyed. Please report shoals and obstructions at: http://nauticalcharts.noaa.gov/staff/contact.htm

Distances

The general location of the Waterway is indicated by a magenta line. Mariners are advised to follow the aids to navigation and avoid charted shoals and obstructions.

Mileage distances shown along the Waterway are in Statute Miles, southward from Norfolk, VA, and are indicated thus: —●—

One Statute Mile equals 0.87 Nautical Miles.

Courses are TRUE and must be CORRECTED for any variation and compass deviation.

INTRACOASTAL WATERWAY AIDS

The U.S. Aids to Navigation System is designed for use with nautical charts and the exact meaning of an aid to navigation may not be clear unless the appropriate chart is consulted.

Aids to navigation marking the Intracoastal Waterway exhibit unique yellow symbols to distinguish them from aids marking other waterways.

When following the Intracoastal Waterway southward from Norfolk, VA to Cross Bank in Florida Bay, aids with yellow triangles should be kept on the starboard side of the vessel and aids with yellow squares should be kept on the port side of the vessel.

A horizontal yellow band provides no lateral information, but simply identifies aids to navigation as marking the Intracoastal Waterway.

MERCATOR PROJECTION AT SCALE 1:40,000
SOUNDINGS IN FEET AT MEAN LOWER LOW WATER
NORTH AMERICAN DATUM OF 1983
(WORLD GEODETIC SYSTEM 1984)

HEIGHTS

Heights in feet above Mean High Water.

AUTHORITIES

Hydrography and topography by the National Ocean Service, Coast Survey, with additional data from the Corps of Engineers, Geological Survey, and U.S. Coast Guard.

SUPPLEMENTAL INFORMATION

Consult U.S. Coast Pilot 4 for important supplemental information.

CAUTION

This chart has been corrected from the Notice to Mariners (NM) published weekly by the National Geospatial-Intelligence Agency and the Local Notice to Mariners (LNM) issued periodically by each U.S. Coast Guard district to the dates shown in the lower left hand corner. Chart updates corrected from Notice to Mariners published after the dates shown in the lower left hand corner are available at nauticalcharts.noaa.gov.

HORIZONTAL DATUM

The horizontal reference datum of this chart is North American Datum of 1983 (NAD 83), which for charting purposes is considered equivalent to the World Geodetic System 1984 (WGS 84). Geographic positions referred to the North American Datum of 1927 must be corrected an average of 1.217" northward and 0.829" eastward to agree with this chart.

THE NATION'S CHARTMAKER SINCE 1807

NAUTICAL CHART 11472
INTRACOASTAL WATERWAY

FLORIDA
PALM SHORES TO WEST PALM BEACH

Chart 11472

Published at Washington, D.C.
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE
COAST SURVEY

Additional information can be obtained at nauticalcharts.noaa.gov.

CONTINUED ON CHART 11476

Formerly 845-SC, 1st Edition, 1963 KAPP 291

SAFETY HINTS

1. Keep your chart up to date by applying all Notices to Mariners corrections when you receive them.
2. Read carefully all notes printed on your chart, each is vital to your safety afloat.
3. Learning the meaning of each symbol and abbreviation on your chart from Chart No. 1.
4. The compass on your chart shows the variation from true north, however you must also correct your bearing for the deviation of your boat.
5. Constantly use your chart from the beginning to end of each trip. Keep in mind the orientation of your boat with respect to the chart.
6. Maintain your position on the chart by relating charted features with those you can identify in your surroundings.

PUBLIC BOATING INSTRUCTION PROGRAMS

The United States Power Squadrons (USPS) and U.S. Coast Guard Auxiliary (USCGAUX), National Organizations of Boatmen, conduct extensive boating instruction programs in communities throughout the United States. For information regarding these educational courses, contact the following sources:

USPS - Local Squadron Commander or USPS Headquarters, Post Office Box 30423, Raleigh, N.C. 27612, 919-821-0281.

USCGAUX - 7th Coast Guard District, Brickell Plaza Federal Building, 909 S.E., 1st Ave., Miami, Fla. 33131-3050, 305-350-5697 or USCG Headquarters (G-BAU), Washington, D.C. 20593-0001.

CAUTION

Survey platforms, signs, pipes, piles, and stakes, some submerged, may exist along the maintained channels. Piles and platforms are not charted where they interfere with a light symbol.

MARINE WEATHER FORECASTS
NATIONAL WEATHER SERVICE

CITY	TELEPHONE NUMBER	OFFICE HOURS
Melbourne, FL	*(321) 255-0212	8:00 AM-4:00 PM (Mon.-Fri.)
Miami, FL	(305) 229-4522	24 hours daily

*Recorded (24 hours daily)

WEATHER INFORMATION BY MARINE RADIOTELEPHONE

CITY	STATION	FREQUENCY	DAILY BROADCAST-EST	SPECIAL WARNING
Mayport, FL	NMA-10	2670 kHz 157.1 MHz	1:20 A.M. & P.M. 7:15 A.M. & 5:15 P.M.	+On Receipt +On Receipt
Miami, FL	NCF	2670 kHz	10:50 A.M. & P.M.	+On Receipt

+Preceded By Announcement on 2182 kHz/156.8 MHz

NOAA WEATHER RADIO BROADCASTS

CITY	STATION	FREQUENCY	BROADCAST TIMES
West Palm Beach, FL	KEC-50	162.475 MHz	24 Hours Daily
Fort Pierce, FL	WWF-69	162.425 MHz	24 Hours Daily
Melbourne, FL	WXJ-70	162.55 MHz	24 Hours Daily

CAUTION
BASCULE BRIDGE CLEARANCES

For bascule bridges, whose spans do not open to a full upright or vertical position, unlimited vertical clearance is not available for the entire charted horizontal clearance.

WEATHER RULES FOR SAFE BOATING

Before setting out:

1. Check local weather and sea conditions.
2. Obtain the latest weather forecast for your area from radio broadcasts.

When warnings are in effect, don't go out unless you are confident your boat can be navigated safely under forecast conditions of wind and sea.

While afloat:

1. Keep a weather eye out for:
   A. A sudden vertical cumulus cloud development
   B. A sudden change in wind direction
   C. A sudden noticeable increase in wind velocity
   D. A drop in temperature
2. Be alert to heavy static on your AM radio which may indicate approaching thunderstorms
3. Check radio weather broadcasts for latest forecasts and warnings

Thundersqualls often occur on warm, moist afternoons and are a great hazard to the mariner. They can have winds gusts up to 80 mph and hit almost without warning. To survive a squall, you must prevent being capsized or blown to leeward into danger.

NOTE X

Within the 12-nautical mile Territorial Sea, established by Presidential Proclamation, some Federal laws apply. The Three Nautical Mile Line, previously identified as the outer limit of the territorial sea, is retained as it continues to depict the jurisdictional limit of the other laws. The 9-nautical mile Natural Resource Boundary off the Gulf coast of Florida, Texas, and Puerto Rico, and the Three Nautical Mile Line elsewhere remain in most cases the inner limit of Federal fisheries jurisdiction and the outer limit of the jurisdiction of the states. The 24-nautical mile Contiguous Zone and the 200-nautical mile Exclusive Economic Zone were established by Presidential Proclamation. Unless fixed by treaty or the U.S. Supreme Court, these maritime limits are subject to modification.

PROJECT DEPTHS

Channel legends and tabulations, where indicated, reflect the U.S. Army Corps of Engineers (USACE) project depths. The channel may be significantly shoaler, particularly at the edges. For detailed channel information and minimum depths as reported by USACE, use NOAA Electronic Navigational Charts. USACE surveys and channel condition reports are available at http://navigation.usace.army.mil/Survey/Hydro.

TIDAL INFORMATION

PLACE		Height referred to datum of soundings (MLLW)		
NAME	(LAT/LONG)	Mean Higher High Water	Mean High Water	Mean Low Water
		feet	feet	feet
Sebastian	(27°48.7'N/80°27.8'W)	0.5	0.4	0.1
Vero Beach	(27°40.2'N/80°21.6'W)	3.9	3.6	0.2
Vero Beach, Indian River	(27°37.9'N/80°22.3'W)	0.9	0.8	0.1
Fort Pierce Inlet, South Jetty	(27°28.2'N/80°17.3'W)	3.0	2.8	0.2
Binney Dock	(27°28.1'N/80°17.8'W)	2.2	2.0	0.2
Fort Pierce, Indian River	(27°27.4'N/80°19.4'W)	1.5	1.4	0.2
Ankona	(27°21.3'N/80°16.5'W)	1.3	1.2	0.1
Seminole Shores	(27°11.0'N/80°09.5'W)	3.4	3.2	0.2
Sewall Point	(27°10.5'N/80°11.3'W)	1.2	1.1	0.1
Hobe Sound Bridge	(27°03.8'N/80°07.4'W)	1.8	1.7	0.1
A1A Highway Bridge	(26°56.8'N/80°05.4'W)	2.3	2.2	0.2
PGA Boulevard Bridge	(26°50.6'N/80°04.0'W)	3.0	2.8	0.1
Port of Palm Beach	(26°46.2'N/80°03.1'W)	3.1	2.9	0.2
Lake Worth Pier	(26°36.7'N/80°02.0'W)	3.0	2.9	0.1
Lake Worth Intracoastal Waterway	(26°36.8'N/80°02.8'W)	3.1	2.9	0.1

Dashes (- - -) located in datum columns indicate unavailable datum values for a tide station. Real-time water levels, tide predictions, and tidal current predictions are available on the Internet from http://tidesandcurrents.noaa.gov.

(Jan 2014)

CAUTION

Temporary changes or defects in aids to navigation are not indicated on this chart. See Local Notice to Mariners.

CAUTION

Improved channels shown by broken lines are subject to shoaling, particularly at the edges.

AIDS TO NAVIGATION

Consult U.S. Coast Guard Light List for supplemental information concerning aids to navigation.

PLANE COORDINATE GRID
(based on NAD 1927)

Florida State Grid, East Zone, is indicated by dashed ticks at 10,000 foot intervals.
The last three digits are omitted.

NOTE D

Depths charted within limits of Dump Sites are from surveys prior to 1963.

NOTE S

Regulations for Ocean Dumping Sites are contained in 40 CFR, Parts 220-229. Additional information concerning the regulations and requirements for use of the sites may be obtained from the Environmental Protection Agency (EPA). See U.S. Coast Pilots appendix for addresses of EPA offices. Dumping subsequent to the survey dates may have reduced the depths shown.

Ⓟ Pump-out facilities

CONTINUED ON CHART 11474

Formerly 845-SC, 1st Edition, 1963

Use NOAA electronic navigational charts for the most up-to-date information.

37th Ed., Dec. 2018. Last Correction: 9/18/2020. Cleared through:
LNM: 0121 (1/5/2021), NM: 0121 (1/2/2021)

To ensure that this chart was printed at the proper scale, the line below should measure six inches (152 millimeters).
If the line does not measure six inches (152 millimeters), this copy is not certified safe for navigation.

(POD) providers fulfill a vessel's requirement to carry a navigational chart "published by the National Ocean Service" in accordance with federal regulations, including but not limited to 33 C.F.R. 164.33(a), 33 C.F.R. 164.72(b), and 46 C.F.R. 28.225(a). POD charts meet stringent print standards and can be recognized by an official certification of authenticity printed on the chart. A list of POD providers can be found at: nauticalcharts.noaa.gov/pod

ATTACHMENT E

Vertical Alternative Evaluation Matrix

Vertical Clearance

Project Development and Environment Study
SR A1A over Sebastian Inlet Bridge 880005 - Bridge Replacement
Indian River County and Brevard County
FM No. 445618-1-22-02
ETDM 14433

Vertical Alternatives Evaluation Matrix - Vertical Clearance

Evaluation Criteria / Category	No Build Alternative	39-Feet Fixed Bridge Existing Bridge Vertical Clearance	51-Feet Fixed Bridge	65-Feet Fixed Bridge
		Design Speed - 50 mph	Design Speed - 50 mph	Design Speed - 50 mph
Benefit to Marine Traffic	No Change	Benefit to marine traffic is similar to No Build	Benefit to marine traffic with increased vertical clearance. Will allow for taller vessels to pass under the bridge.	Benefit to marine traffic with increased vertical clearance. Will allow for larger vessels to pass under the bridge.
	0	0	+	+
Benefit to Vehicular Traffic	No Change	Existing vertical clearance has no direct effect to vehicular traffic. Benefit to vehicular traffic results from the addition of shoulders to the bridge and approaches.	Increased vertical clearance has no direct effect to vehicular traffic. Benefit to vehicular traffic results from the addition of shoulders to the bridge and approaches.	Increased vertical clearance has no direct effect to vehicular traffic. Benefit to vehicular traffic results from the addition of shoulders to the bridge and approaches.
	-	+	+	+
Impact to Sebastian Inlet State Park North Entrance	No Impact	No Impact	Minor Impact	Minor Impact
	0	0	-	-
Impact to Sebastian Inlet State Park South Entrance	No Impact	No Impact	Minor Impact	Moderate
	0	0	-	- -
Impact to Sebastian Inlet District (SID) North Access Road	No Impact	Minor Impact	Moderate Impact	Significant Impact
	0	-	- -	- - -
Bicycle and Pedestrian Facilities	No Change	Existing vertical clearance has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use path and sidewalk on bridge and approaches and eliminates gap in system linkage.	Increased vertical clearance has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use path and sidewalk on bridge and approaches and eliminates gap in system linkage.	Increased vertical clearance has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use path and sidewalk on bridge and approaches and eliminates gap in system linkage.
	- - -	0	0	0
Community Support	Minor number of supporters.	Community support is indicated for new bridge. In particular provision of bicycle and pedestrian facilities. Vertical clearance matters to a small number.	Community support is indicated for new bridge. In particular provision of bicycle and pedestrian facilities. Vertical clearance matters to a small number.	Community support is indicated for new bridge. In particular provision of bicycle and pedestrian facilities. Vertical clearance matters to a small number.
	0	+	+	+
Evacuation/Emergency Response	No Change	No Change. Vertical clearance does not affect evacuation/emergency response.	No Change. Vertical clearance does not affect evacuation/emergency response.	No Change. Vertical clearance does not affect evacuation/emergency response.
	0	0	0	0
Traffic Operations	No Change	Vertical clearance does not provide any additional benefit to traffic operations. Benefit to vehicular traffic results from the addition of shoulders to the bridge and approaches.	Vertical clearance does not provide any additional benefit to traffic operations. Benefit to vehicular traffic results from the addition of shoulders to the bridge and approaches.	Minor impact. Vertical clearance impacts traffic operations at the north and south park entrances and the SID access road.
	0	0	0	-

Vertical Alternatives Evaluation Matrix - Vertical Clearance

		39-Feet Fixed Bridge Existing Bridge Vertical Clearance	51-Feet Fixed Bridge	65-Feet Fixed Bridge
		Design Speed - 50 mph	Design Speed - 50 mph	Design Speed - 50 mph
Bridge Length (Feet)	No Change (1548 ft)	0 No Change (1548-feet)	0 No Change (1548-feet)	- - 1,808-feet
	0	0	0	0
Constructability	0	-	-	-
Design and CEI Cost (XX% of Construction)	0	-	-	-
Bridge Construction Cost *	0	-	- -	- - -
Positive Points	**0**	**+ 2**	**+ 3**	**+ 3**
Negative Points	**- 4**	**- 4**	**- 8**	**- 14**
TOTAL POINTS **VERTICAL ELEVATION / DESIGN SPEED**	**- 4**	**- 2**	**- 5**	**- 11**

Symbol	Description
+	The alternative meets or has a positive response to the evaluation criteria/category
0	The alternative has no effect or provides some benefit to the evaluation criteria/category
-	The alternative has a poor or negative response to the evaluation criteria/category

NOTE: +++ or - - - denote greater impact positively or negatively

***** The cost difference between the vertical clearances of 39-feet, 51-feet, and 65-feet does not vary significantly. Generally, the higher vertical clearance will result comparatively in a greater cost.

ATTACHMENT F

Vertical Alternative Evaluation Matrix

Horizontal Alignment

Project Development and Environment Study
SR A1A over Sebastian Inlet Bridge 880005 - Bridge Replacement
Indian River County and Brevard County
FM No. 445618-1-22-02
ETDM 14433

Vertical Alternative Evaluation Matrix - Horizontal Alignment

Criteria/Category	No Build Alternative	39-Feet Fixed Bridge Existing Bridge Vertical Clearance			51-Feet Fixed Bridge			65-Feet Fixed Bridge		
		Alignment			Alignment			Alignment		
		Center	East	West	Center	East	West	Center	East	West
Benefit to Marine Traffic	No Change	No Change	No Change	No Change	Horizontal alignment has no direct effect to marine traffic. Benefit to marine traffic with increased vertical clearance will allow for larger vessels to pass under the bridge.	Horizontal alignment has no direct effect to marine traffic. Benefit to marine traffic with increased vertical clearance will allow for larger vessels to pass under the bridge.	Horizontal alignment has no direct effect to marine traffic. Benefit to marine traffic with increased vertical clearance will allow for larger vessels to pass under the bridge.	Horizontal alignment has no direct effect to marine traffic. Benefit to marine traffic with increased vertical clearance will allow for larger vessels to pass under the bridge.	Horizontal alignment has no direct effect to marine traffic. Benefit to marine traffic with increased vertical clearance will allow for larger vessels to pass under the bridge.	Horizontal alignment has no direct effect to marine traffic. Benefit to marine traffic with increased vertical clearance will allow for larger vessels to pass under the bridge.
	0	0	0	0	0	0	0	0	0	0
Benefit to Vehicular Traffic	No Change	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.	Benefit to traffic is realized in the functional improvements associated with an improved typical section for the bridge and bridge approaches and associated improvements to park entrances.
	-	+	+	+	+	+	+	+	+	+
Requires Additional Right-of-Way	No Impact	No ROW required near north and south entrances	Minor ROW required near north and south entrances	Minor ROW required near north and south entrances	No ROW required	Minor ROW required near north and south entrances	Minor ROW required near north and south entrances	No ROW required	Minor ROW required near north and south entrances	Minor ROW required near north and south entrances
	0	0	-	-	0	-	-	0	-	-
Impact to North Approach	No Impact	Minor impacts with slight shift to the west	Minor impacts with slight shift to the east	Minor impacts with slight shift to the west	Minor impacts with slight shift to the west	Minor impacts with slight shift to the east	Minor impacts with slight shift to the west	Minor impacts with slight shift to the west	Minor impacts with slight shift to the east	Minor impacts with slight shift to the west
	0	-	-	-	-	-	-	-	-	-
Impact to South Approach	No Impact	Minor impacts with slight shift to the east	Moderate impacts with shift to the east	Moderate impacts with shift to the west	Minor impacts with slight shift to the east	Moderate impacts with shift to the east	Moderate impacts with shift to the west	Minor impacts with slight shift to the east	Moderate impacts with shift to the east	Moderate impacts with shift to the west
	0	-	- -	- -	-	- -	- -	-	- -	- -
Impact to Sebastian Inlet State Park North Entrance	No Impact	No Change	No Change	N o Change	No Change	Minor Impacts	Moderate Impacts	No Change	Moderate Impacts	Significant Impacts
	0	0	0	0	0	-	- -	0	- -	- - -
Impact to Sebastian Inlet State Park South Entrance	No Impact	Minor Impacts	Minor Impacts	Minor Impacts	Minor Impacts	Moderate Impacts	Moderate Impacts	Moderate Impacts	Significant Impacts	Significant Impacts
	0	-	-	-	-	- -	- -	- -	- - -	- - -
Impact to Sebastian Inlet State Park North Parking Area Under Bridge	No Impact	No Change	Minor Impacts	Minor Impacts	No Change	Moderate Impacts	Minor Impacts	No Change	Moderate Impacts	Minor Impacts
	0	0	-	-	0	- -	-	0	- -	-
Impact to Sebastian Inlet State Park South Parking Area Under Bridge	No Impact	No Change	Minor Impacts	Minor Impacts	No Change	Moderate Impacts	Minor Impacts	No Change	Moderate Impacts	Minor Impacts
	0	0	-	-	0	- -	-	0	- -	-
Impact to Sebastian Inlet District North Access Road	No Impact	Minor	Moderate Impacts	Significant Impacts	Minor Impacts	Moderate Impacts	Significant Impacts	Minor Impacts	Moderate Impacts	Significant Impacts
	0	-	- -	- - -	0	- -	- - -	0	- -	- - -
Impacts to Wetlands	No Impact	Minor wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the east side of SR A1A (north). Wetland impacts are not anticipated along the east side of SR A1A south of the bridge.	Minor wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the east side of SR A1A (north). Wetland impacts are not anticipated along the east side of SR A1A south of the bridge.	Moderate wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the west side of SR A1A (north). Wetland impacts are not anticipated along the west side of SR A1A south of the bridge.	Minor wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the east side of SR A1A (north). Wetland impacts are not anticipated along the east side of SR A1A south of the bridge. Potential wetland impacts are anticipated along the west side of SR A1A, south of the bridge near the south park entrance.	Moderate wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the east side of SR A1A (north). Wetland impacts are not anticipated along the east side of SR A1A south of the bridge. Potential wetland impacts are anticipated along the west side of SR A1A, south of the bridge near the south park entrance.	Moderate wetland impacts are anticipated with the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the west side of SR A1A (north). Wetland impacts are not anticipated along the west side of SR A1A south of the bridge. Potential wetland impacts are anticipated along the west side of the road, south of the northern entrance to the park and south of the bridge near the south park entrance.	Moderate wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the east side of SR A1A (north). Wetland impacts are not anticipated along the east side of SR A1A south of the bridge. Potential wetland impacts are anticipated along the west side of SR A1A, south of the bridge near the south park entrance.	Moderate wetland impacts are anticipated due to the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the east side of SR A1A (north). Wetland impacts are not anticipated along the east side of SR A1A south of the bridge. Potential wetland impacts are anticipated along the west side of SR A1A, south of the bridge near the south park entrance.	Significant wetland impacts are anticipated with the SID access road realignment, park entrance improvements, turn lanes, shared use path, and along the west side of SR A1A (north). Wetland impacts are not anticipated along the west side of SR A1A south of the bridge. Potential wetland impacts are anticipated along the west side of the road, south of the northern entrance to the park and south of the bridge near the south park entrance.
	0	-	-	- -	-	- -	- -	- -	- -	- - -

Vertical Alternative Evaluation Matrix - Horizontal Alignment										
Criteria/Category	**No Build Alternative**	**39-Feet Fixed Bridge Existing Bridge Vertical Clearance**			**51-Feet Fixed Bridge**			**65-Feet Fixed Bridge**		
		Alignment			**Alignment**			**Alignment**		
		Center	**East**	**West**	**Center**	**East**	**West**	**Center**	**East**	**West**
Impacts to Benthic Resources	No Impact	A wider bridge would shade a larger area of marine substrate. Because there is no submerged aquatic vegetation (SAV) within the project area, impacts would be limited to unvegetated bottom.	A wider bridge would shade a larger area of marine substrate. Because there is no submerged aquatic vegetation (SAV) within the project area, impacts would be limited to unvegetated bottom.	A wider bridge would shade a larger area of marine substrate. Because there is no submerged aquatic vegetation (SAV) within the project area, impacts would be limited to unvegetated bottom.	Increasing the bridge vertical clearance would allow more sunlight beneath the bridge and reduce shading impacts. The wider footprint of the bridge would increase shading impacts. Because there is no SAV within the project area, impacts would be limited to unvegetated bottom.	Increasing the bridge vertical clearance would allow more sunlight beneath the bridge and reduce shading impacts. The wider footprint of the bridge would increase shading impacts. Because there is no SAV within the project area, impacts would be limited to unvegetated bottom.	Increasing the bridge vertical clearance would allow more sunlight beneath the bridge and reduce shading impacts. The wider footprint of the bridge would increase shading impacts. Because there is no SAV within the project area, impacts would be limited to unvegetated bottom.	Increasing the bridge vertical clearance would allow more sunlight beneath the bridge and reduce shading impacts. The wider footprint of the bridge would increase shading impacts. Because there is no SAV within the project area, impacts would be limited to unvegetated bottom.	Increasing the bridge vertical clearance would allow more sunlight beneath the bridge and reduce shading impacts. The wider footprint of the bridge would increase shading impacts. Because there is no SAV within the project area, impacts would be limited to unvegetated bottom.	Increasing the bridge vertical clearance would allow more sunlight beneath the bridge and reduce shading impacts. The wider footprint of the bridge would increase shading impacts. Because there is no SAV within the project area, impacts would be limited to unvegetated bottom.
	0	-	-	-	+	+	+	+	+	+
Impacts to Wildlife	No Impact	Minor impacts are anticipated associated with the south park entrance. Impacts to the dune community along the east side of SR A1A south of the bridge and the fragmented wetlands north of the bridge are anticipated.	Minor impacts are anticipated associated with the south park entrance. Impacts to the dune community along the east side of SR A1A south of the bridge and the fragmented wetlands north of the bridge are anticipated.	Minor impacts are anticipated in the areas between the bridge/bridge approaches and western access roads.	Minor impacts are anticipated associated with the south park entrance. Impacts to the dune community along the east side of SR A1A south of the bridge and the fragmented wetlands north of the bridge are anticipated.	Minor impacts are anticipated associated with the south park entrance. Impacts to the dune community along the east side of SR A1A south of the bridge and the fragmented wetlands north of the bridge are anticipated.	Moderate impacts are anticipated with reconstruction of the southern park entrance and areas between the bridge/bridge approaches and western access roads.	Moderate impacts are anticipated with reconstruction of the southern park entrance, the dune community along the east side of SR A1A south of the bridge, and the fragmented wetlands north of the bridge.	Moderate impacts are anticipated with reconstruction of the southern park entrance, the dune community along the east side of SR A1A south of the bridge, and the fragmented wetlands north of the bridge.	Moderate impacts are anticipated with reconstruction of the southern park entrance, the dune community along the east side of SR A1A south of the bridge, and the fragmented wetlands north of the bridge/bridge approaches and western access roads.
	0	-	-	-	-	-	- -	- -	- -	- - -
Impacts to Section 4(f) Resources	No Impact	Minor additional right of way may be required from Section 4(f) lands for turn lane improvements near the northern park entrance on the west side of SR A1A.	Minor additional right of way is required from Section 4(f) lands for turn lane improvements near the northern park entrance on the west side of SR A1A and on the east side of SR A1A north of the southern park entrance.	Additional right of way is required from Section 4(f) lands for turn lane improvements near the north park entrance and for the shared use path on the west side of SR A1A and on the west side of SR A1A at the south park entrance.	Minor additional right of way may be required from Section 4(f) lands for turn lane improvements near the northern park entrance on the west side of SR A1A.	Minor additional right of way is required from Section 4(f) lands for turn lane improvements near the northern park entrance on the west side of SR A1A and on the east side of SR A1A north of the southern park entrance.	Additional right of way is required from Section 4(f) lands for turn lane improvements near the north and south park entrances and for the shared use path near the north and south park entrances on the west side of SR A1A.	Additional right of way is required from Section 4(f) lands for turn lane improvements near the north park entrance and for the shared use path on the west side of SR A1A and on the west side of SR A1A at the south park entrance.	Additional right of way is required from Section 4(f) lands for turn lane improvements near the north and south park entrances and for the shared use path near the north and south park entrances on the west side of SR A1A.	Additional right of way is required from Section 4(f) lands for turn lane improvements near the north park entrance and for the shared use path on the west side of SR A1A and on the west side of SR A1A at the south park entrance.
	0	-	-	-	-	-	- -	-	- -	- - -
Impacts to Archaeological Resources	No Impact	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.	Archaeological field investigation identified two prehistoric scatter sites, one prehistoric occurrence, and one historic artifact scatter. Sites are not considered eligible for the National Register of Historic Places and should not impact project design.
	0	0	0	0	0	0	0	0	0	0
Bicycle and Pedestrian Facilities	No Change	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.	Alignment has no direct effect to bicycle and pedestrian traffic. Benefit results from providing shared use paths on the bridge and approaches eliminating the gap in system linkage and improvement safety along the project area.
	- -	+	+	+	+	+	+	+	+	+
Evacuation/Emergency Response	No Change	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.	Benefit. With the addition of inside/outside shoulders evacuation/emergency response is improved.
	0	+	+	+	+	+	+	+	+	+

Vertical Alternative Evaluation Matrix - Horizontal Alignment

Criteria/Category	No Build Alternative	39-Feet Fixed Bridge Existing Bridge Vertical Clearance			51-Feet Fixed Bridge			65-Feet Fixed Bridge		
		Alignment			Alignment			Alignment		
		Center	East	West	Center	East	West	Center	East	West
Traffic Operations	No Change	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.	Benefit to traffic is realized in the functional improvement of the bridge, bridge approaches, and park entrances.
	0	+	+	+	+	+	+	+	+	+
Temporary Bridge Required	No	Yes	Not Required	Not Required	Yes	Not Required	Not Required	Yes	Not Required	Not Required
	0	- - -	0	0	- - -	0	0	- - -	0	0
Constructability	0	- - -	-	-	- - -	- -	- -	- - -	- -	- -
Bridge Construction Cost *	0	- - -	-	-	- - -	- -	- -	- - -	- - -	- - -
Positive Points	**0**	**+ 4**	**+ 4**	**+ 4**	**+ 5**	**+ 5**	**+ 5**	**+ 5**	**+ 5**	**+ 5**
Negative Points	**- 3**	**- 17**	**- 15**	**- 17**	**- 15**	**- 21**	**- 23**	**- 18**	**- 26**	**- 29**
TOTAL POINTS **HORIZONTAL ALIGNMENT**	**- 3**	**- 13**	**- 11**	**- 13**	**- 10**	**- 16**	**- 18**	**- 13**	**- 21**	**- 24**

Symbol **Description**

+ The alternative meets or has a positive response to the evaluation criteria/category
0 The alternative has no effect or provides some benefit to the evaluation criteria/category
- The alternative has a poor or negative response to the evaluation criteria/category

NOTE: +++ or - - - denote greater impact positively or negatively

* This rating reflects the cost difference between vertical clearances, horizontal alignment, and need for a temporary bridge. Generally, the alignment requiring a temporary bridge will result in a greater cost.