PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

District 1

DeSoto Bridge Replacement SR 55 US 301/US 41

Manatee Avenue East (SR 64) to Haben Boulevard

Manatee, Florida

Financial Management Number: 442630-1

ETDM Number: 14510

Date 3/13/2024

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

PROFESSIONAL ENGINEER CERTIFICATION

PRELIMINARY ENGINEERING REPORT

Project: DeSoto Bridge Replacement SR 55 US 301/US 41

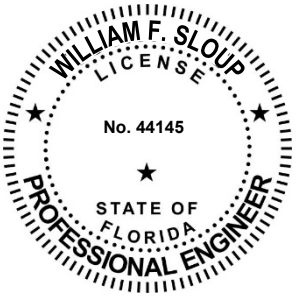
ETDM Number: 14510

Financial Project ID: 442630-1-22-01

Federal Aid Project Number: XXXX XXX X

This preliminary engineering report contains engineering information that fulfills the purpose and need for the DeSoto Bridge Project Development & Environment Study SR 55 US 301/US 41from Manatee Avenue East (SR 64) to Haben Boulevard in Manatee Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

I hereby certify that I am a registered professional engineer in the State of Florida practicing with TranSystems Corporation, and that I have prepared or approved the evaluation, findings, opinions, conclusions, or technical advice for this project.



This item has been digitally signed and sealed by **William F. Sloup, P.E.** on the date adjacent to the seal.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

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1. PROJECT SUMMARY

1.1 Project Description

The Florida Department of Transportation (FDOT), District 1, is conducting a Project Development and Environment (PD&E) Study in support of the National Environmental Policy Act (NEPA) to evaluate the structural and modal improvements for in-kind replacement alternatives of the Hernando DeSoto Bridge (DeSoto Bridge) along SR 55 US 301/US 41 from Manatee Avenue East (SR 64) to Haben Boulevard, covering a distance of 1.3 miles of Manatee County. This bridge is one of three north-south crossings of the Manatee River that connect the Cities of Bradenton and Palmetto and is considered navigable waters (see **Figure 1-1**).

The DeSoto Bridge was originally constructed in 1957. It is one of four bridges in Manatee County (along with Anna Maria Bridge, Cortez Bridge, and Longboat Pass Bridge) that need to be replaced. Each has surpassed its 50-year life expectancy and is experiencing similar advanced corrosion issues, making rehabilitation no longer a feasible option. The bridge is a mid-level fixed structure consisting of two 12-foot travel lanes in each direction (four lanes total) separated by a four-foot median with a concrete Jersey barrier, two-foot outside shoulders, with traffic railings along the outside travel lanes. It is 62 feet-1 inch wide, 2,225 feet long, and consists of 30 concrete approach spans and three steel main spans. No shoulders or bicycle/pedestrian facilities are present on the bridge, although pedestrians often walk and bike on the traffic railing.

The southerly roadway approach to the bridge includes two 12-foot travel lanes in each direction, with a continuous right-turn lane to Manatee Memorial Hospital and Bradenton Skate Park northbound, and to SR 64 southbound. The traffic is separated by a median traffic separator that transitions to a median barrier wall. North of the bridge, the two 12-foot travel lanes in each direction are separated by a raised concrete and/or grass median with left and right turn lanes to the Palmetto Estuary. There is no sidewalk in the northbound direction, except for a small segment in front of the 7-Eleven convenience store at the north end of the project. There is a short segment of sidewalk in the southbound direction from SR 64 to 3rd Avenue West. While no transit service operates north-south along SR 55, Manatee County Area Transit (MCAT) Route 3-Manatee Avenue operates along SR 64.

To avoid having all four bridges become structurally deficient at the same time, which would create challenging mobility issues for the traveling public and an unacceptable schedule of work in the geographic area, the FDOT District 1 has staggered the replacement of the bridges through a controlled schedule across several years. The DeSoto Bridge has been recommended for replacement as it is expected to be classified as structurally deficient by year 2030.

Figure 1-1 - Project Location

FDOT	Hernando DeSoto Bridge Replacement PD&E Study FPID 442630-1 Manatee County	**Project Location Map** **February 2024**

1.2 Purpose & Need

The purpose of this project is to address the structural degradation and substandard design elements of the existing DeSoto Bridge along SR 55 located between SR 64 and Haben Boulevard within the Cities of Bradenton and Palmetto in Manatee County. Other goals of the project are to 1) maintain a critical link for regional travel and 2) accommodate multimodal activity within the area. The need for the project is based on the following criteria:

PRIMARY NEED:

BRIDGE DEFICIENCIES: Address Continued Structural Degradation and Substandard Design Elements

As noted within the FDOT District 1 2023 Summary Report regarding the condition of the DeSoto Bridge, the bridge has exceeded its design life of 50 years. The bridge superstructure is composed of 1950s pre-American Association of State Highway and Transportation Officials (AASHTO) standards post-tensioned (PT) concrete beams reinforced with steel PT bars. These beams have a long history of problems in Florida and are of concern due to their tendency to excessively deteriorate and the possibility of sudden failure. Although corrosion has not substantially affected the anchorage of the bridge beams to date, corrosion has been identified on the beam end anchorage zones. The substructure is also rapidly deteriorating; gunite repairs previously performed on the footers are now failing on 93% of the footers. In addition, as revealed through an assessment of the bridge conducted by FDOT District 1 in March 2019 (which included corrosion testing of the concrete bridge material and rate of future corrosion progression), DeSoto Bridge falls on the low end of the fair condition per National Bridge Inspection ratings (with poor, fair, and good serving as the ratings). The substructure elements that were tested exceed the threshold levels (two to three times) for chloride intrusion and for corrosion potential concentrations. There is evidence that the high chloride contamination levels in the existing concrete are causing recent concrete repairs to fail prematurely; the pier columns and footings have reached a point where repairing concrete materials is no longer an option to provide long-term corrosion control.

The existing DeSoto Bridge does not meet current Florida Department of Transportation (FDOT) design standards due to its lack of the required inside and outside shoulder widths and bicycle and pedestrian facilities. According to the 2024 FDOT Design Manual, the typical section for this type of bridge requires 12-foot lanes, 10-foot outside shoulders, and 6-foot inside shoulders. Sidewalks and/or bicycle facilities need to be considered to allow for the safe movement of pedestrians and bicyclists along the bridge. The lack of inside and outside shoulders on the bridge restricts the ability of drivers to avoid hazards or react to changing driving conditions within the directional travel lanes without causing crashes. In addition, the current bridge configuration constrains emergency and service vehicle access, particularly during periods of congestion.

The project is intended to address the bridge's systemic deterioration and design deficiencies.

SECONDARY NEEDS:

SYSTEM LINKAGE: Maintain a Critical Link for Regional Travel

The DeSoto Bridge is integral to facilitating the movement of regional commuter, visitor, and freight traffic as one of three crossings US 41 Bus (Green Bridge), and the I-75 bridges over the Manatee River on Florida's west coast. According to United States Census Longitudinal Employer-Household Dynamics data, 10,633 jobs exist within 0.25 mile of the project corridor; 99.7% of these jobs are filled by individuals who commute from outside the area within a 0.25-mile radius. Over 30 percent of the workforce/regional traffic (Central Manatee Network Alternatives Analysis Origin-Destination Study Technical Memorandum) uses the DeSoto, Green, and I-75 Bridges to access the provided jobs. This percentage is anticipated to increase because Sarasota and Manatee Counties are expected to reach a regional population of over 1.1 million by 2050.

In addition, Transform 2045 (the Sarasota/Manatee Metropolitan Planning Organization's [MPO] Long Range Transportation Plan [LRTP], October 26, 2020, identifies the safe and convenient crossing of the Manatee River as a major transportation concern. The plan notes that improvements to all river crossings are critical in maintaining access between Tampa Bay and the surrounding the region. LRTP as two of the primary surface transportation routes used to transport goods to and through the region, underscoring the importance of the DeSoto Bridge to the local and regional economies and associated transportation network.

Maintaining and enhancing this regional link allows commuters, visitors, and freight providers to access to area jobs, services, tourist destinations, and distribution centers.

MODAL INTERRELATIONSHIPS: Accommodate Multimodal Activity

Currently, no pedestrian or bicycle facilities are present on the DeSoto Bridge. The closest crossing of the Manatee River with bicycle and pedestrian accommodations is the Green Bridge (US 41 Business/8th Ave) located 0.5 mile to the west. In addition, no transit service operates north-south on the project corridor; only one Manatee County Area Transit bus route (Route 3-Manatee Avenue) operates along SR 64 (southern project limit).

The current population, projected population growth, the concentrated efforts by both cities to invest in and revitalize their respective older central cores (designating an Opportunity Zone in the City of Bradenton and a Community Redevelopment Area in the City of Palmetto), and the appeal of destinations within the area to tourists [i.e. Bradenton Area Convention Center and waterfront recreational features] have created latent demand for increased bicycle and pedestrian activity in the area. Additionally, the areas around the bridge approaches are home to a significant transit-dependent population. This group includes low-income individuals, those who are young

or of driving age but unable to drive, and households without access to a vehicle. They are more likely to walk, bike, or use public transportation to reach essential services. Recognizing these factors highlights the urgent need to provide diverse transportation options. The inclusion of bicycle and pedestrian facilities in the design of the proposed replacement bridge is expected to improve multimodal connectivity and accessibility across the Manatee River, thereby supporting local transportation planning objectives.

PROJECT STATUS

Within the FDOT 2023-2027 Work Program and current FDOT State Transportation Improvement Program (STIP), $3,070,000 was programmed for the PD&E Study in Fiscal Year (FY) 2023 under Financial Project Identification (FPID) 442630-1, and a total of $184,430,363 is allocated for Design ($6,550,000) in FY 2024, Right of Way Acquisition ($8,000,000) in FY 2025, Design Build ($168,430,651), and Post Design Services ($1,449,712) in FY 2027 under FPID 442630-2. The project is also included in the FYs 2022/23-2026/27 Sarasota/Manatee MPO Transportation Improvement Program (TIP). Anticipated Location Design Concept Acceptance (LDCA) is Fall 2024.

1.3 Commitments

FDOT is including the following commitments as part of the project:

- The most recent version of the USFWS Standard Protection Measures for the Eastern Indigo Snake will be adhered to during construction of the proposed project.
- The most recent version of the USFWS Standard Manatee Conditions for In-Water Work will be adhered to during construction of the proposed project.
- The NMFS Protected Species Construction Conditions (NOAA Fisheries Southeast Regional Office, 2021) will be adhered to during construction of the proposed project.
- Surveys for gopher tortoise burrows, as well as commensal species, will be conducted during the design phase and permits to relocate tortoises and commensals as appropriate will be obtained from the FWC.
- Standard Specification for Road and Bridge Construction and the NMFS' Protected Species Construction Conditions (NOAA Fisheries Southeast Regional Office, 2021) (Appendix C) will be utilized.
- Updated surveys for SAV will be conducted during the design phase of the project.
- Consultation will be re-initiated with NMFS during final design.

1.4 Alternatives Analysis Summary

An alternatives analysis process consists of developing, evaluating, and eliminating project alternatives based on the purpose and need for the project. This process also considers the engineering and environmental factors, along with public and stakeholder input. The No-Build Alternative, West Alternative, and East Alternative (preferred alternative) are presented in this document.

THE NO BUILD ALTERNATIVE:

Under the provisions of NEPA, the effects of not implementing the proposed action must be considered in the decision-making process. The No-Build (or No-Action) Alternative also serves as the baseline for comparing the impacts of the Build Alternative.

Under the No-Build Alternative, the Department will continue maintenance and repairs of the aging DeSoto Bridge. This option will not alter the existing typical section and will not include a bridge replacement. Advantages of the No-Build include no impacts to the natural environment and no new costs for design and construction. However, the No-Build option has other costs associated with it; maintenance becomes increasingly costly and disruptive, and each repair requires programming funds for design and construction.

The No-Build Alternative is inconsistent with the Sarasota/Manatee County MPO 2045 LRTP. Additionally, the No-Build Alternative does not meet the project purpose and need, including the need to: address continued structural degradation and substandard design elements, maintain a critical link for regional travel, and accommodate multimodal activity.

WEST ALTERNATIVE

The West Alternative proposes a new 4-lane bridge, with SR 55 being designed west of the existing DeSoto Bridge structure. The differences between the East and West alternatives are relatively minor; however, the West Alternative impacts an additional commercial parcel. This parcel, owned by the City of Bradenton, is located on the south side of the Manatee River along the west side of SR 55. Encroachment would affect multiple parking spaces, potentially reducing activity for nearby businesses. Furthermore, the West Alternative results in a Section 4(f) impact adjacent to the City of Bradenton's Riverwalk and Bradenton Riverwalk Skatepark on the south side, as well as diminishing the green space available to utilize best management practices (BMP)for drainage attenuation.

The East and West alternatives, along with their proposed typical sections, were presented at public meetings, outreach events, small group meetings, and to agencies. Public meetings, both in-person on October 17 and virtual on October 19, 2023, gathered feedback that generally favored the addition of wide shoulders and bicycle/pedestrian facilities as shown in the proposed bridge's typical section. While some comments expressed a preference for constructing the new

bridge to the west of the existing structure, many attendees indicated no preference between the East and West Alternatives. The written comments received did not reveal a clear preference for either alternative.

The costs estimate for the East and West Alternative are not a deciding factor because the total difference is approximately $33,200 (less than 0.02 percent of the total project cost of more than $180,166,400).

1.5 Description of Preferred Alternative

The Preferred East Alternative involves shifting SR 55 east of the existing bridge to construct a new mid-level fixed bridge over the Manatee River. As depicted in **Figure 1-2**, the proposed roadway's typical section, from SR 64 to the begin bridge, will include two 12-foot travel lanes in each direction. These lanes will be separated by a median barrier wall, featuring 10-foot inside shoulders and Type F curb & gutter on the outside lane. North of the bridge, the typical section transitions to include a 22-foot raised median with Type E curb & gutter and 4-foot inside shoulders, and a 6-foot-6-inch outside shoulders, with Type E curb & gutter in **Figure 1-3**. Pedestrian features will include a 12-foot wide shared-use path on the southbound side, while the northbound direction will feature a combination of a sidewalk and a 12-foot wide shared-use path. The typical section north of the bridge will required a design variation for clear zone from the travel lane to the shared use path. This alternative will also require approximately 0.6 acres of new right-of-way.

The proposed bridge will meet United States Coast Guard (USCG) minimum vertical clearance requirements of 40 feet for a mid-level fixed bridge, which is similar to the existing bridge. As shown in **Figure 1-4**, the proposed bridge will have two, 12-foot travel lanes in each direction, 10-foot inside shoulders, and 12-foot outside shoulders, and a 12-foot shared-use path on each side. The pedestrians and bicycles will be protected by a raised barrier and railing.

The preferred alternative involves a strategic shift, which is necessary to allow for the construction of the northbound half of the bridge while maintaining traffic flow on the existing bridge. This approach ensures that all lanes will remain open to traffic during peak travel times, minimizing disruptions during the anticipated 3½ year construction schedule. Once this phase is complete, traffic will be shifted to the newly constructed section, allowing for the demolition of the existing bridge and the construction of the remaining southbound half. This project is designed to tie into the existing alignment and roadway typical section at both ends.

The proposed design, posted, and target speed is 45 miles per hour (mph) from the begin project to the beginning of the bridge. From the beginning of the bridge to the end of the project, the proposed design, posted and target speed will be 50 mph.

Figure 1-2 – Proposed Typical Section South of Manatee River

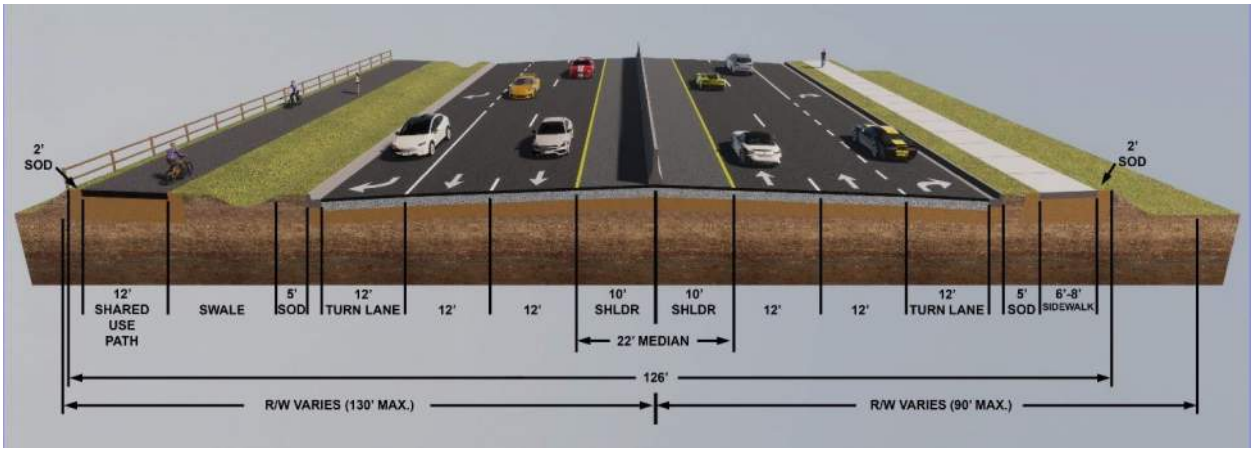


Figure 1-3 – Proposed Typical Section North of Manatee River

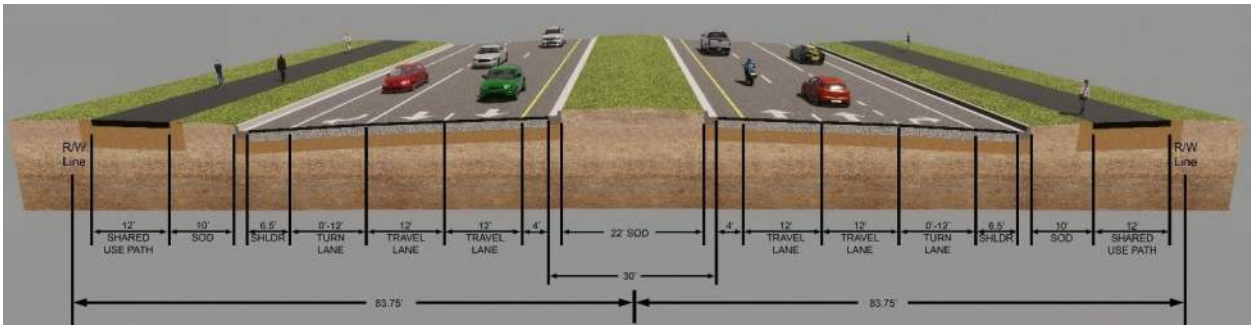
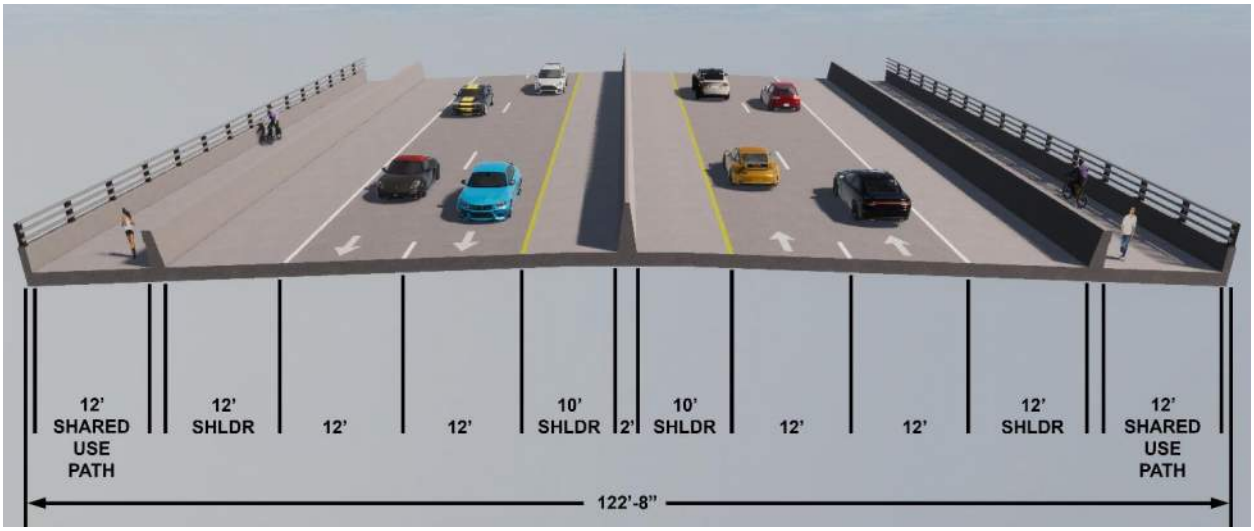


Figure 1-4 – Proposed Bridge Typical Section Over the Manatee River



1.6 List of Technical Documents

The following technical reports, documents, engineering and environmental studies and analyses were conducted as part of the PD&E Study phase:

Public Involvement

- Public Involvement Plan (PIP) (April 2023)
- Public Hearing Transcript (DATE of FINAL)
- Comments and Coordination Report (DATE of FINAL)

Environmental

- Type 2 Categorical Exclusion (March 2024)
- Natural Resources Evaluation Report (NRE) (February 2024)
- Contamination Screening Evaluation Report (CSER) (February 2024)
- Cultural Resource Assessment Survey (CRAS) (January 2024)
- Noise Study Report (NSR) (February 2024)

Engineering

- Draft Preliminary Engineering Report (March 2024)
- Utility Assessment Package (DATE of FINAL)

2. EXISTING CONDITIONS

The existing conditions summarized below for SR 55 within the project limits were identified from GIS data, available as-built construction plans, FDOT Roadway Characteristics Inventory (RCI), straight-line diagrams (SLD), right-of-way maps, field reviews, survey information, and as documented in supporting technical studies and reports.

2.1 Previous Planning Studies

In 2017, FDOT District 1 conducted the Central Manatee Network Alternatives Analysis (CMNAA) Study in partnership with the Sarasota/Manatee MPO, Manatee County and the Cities of Palmetto and Bradenton. The goal was to identify and program a series of transportation projects to improve both local and regional mobility for all users while supporting the long-term multi-modal vision for the Cities of Bradenton and Palmetto. The final study, released in May 2019, recommended replacement of the Desoto Bridge and further analysis of six corridors identified in the CMNAA study. One of the corridors under consideration is the SR 55 corridor, which includes the DeSoto Bridge. This analysis would be conducted in the Bradenton-Palmetto Connector Alternative Corridor Evaluation (ACE) Study to address capacity, regional mobility, and multi-modal concerns within the Cities of Bradenton and Palmetto.

2.2 Existing Roadway Conditions

The existing posted and design speed is 50 mph. The surrounding land uses are comprised of commercial, retail, institutional, community recreational areas, high density residential, and undeveloped/open land. The study area also contains uplands, wetlands, and the Manatee River Estuary. The City of Bradenton designates the areas within the study area and within its jurisdiction as Urban Central Business District according to the 2010-2030 Future Land Use Map. The portion of the project that falls within the jurisdiction of the City of Palmetto designates areas within the study area as Public Use and Planned Community according to their respective future land use map.

1.2.1 Roadway Typical Sections

The existing SR 55 typical section south of the bridge is a four-lane, divided urban roadway with 12-foot travel lanes, continuous right turn lanes, a median separator that transitions to a median barrier with Type F curb & gutter and sporadic sidewalks at the beginning of the project near SR 64 to 3rd Street West, the right of way varies from 106-foot to 206-foot right-of-way - see **Figure 2-1**. North of the bridge the typical section changes to a rural roadway with five-foot paved flush outside shoulders with turn lanes. There is a 22-foot median with type E curb & gutter. The right of way is 130-foot. There is a sidewalk in front of the 7-Eleven Convenience Store near Haben Boulevard, see **Figure 2-2**.

Figure 2-1 – Existing Typical Section – South of Bridge

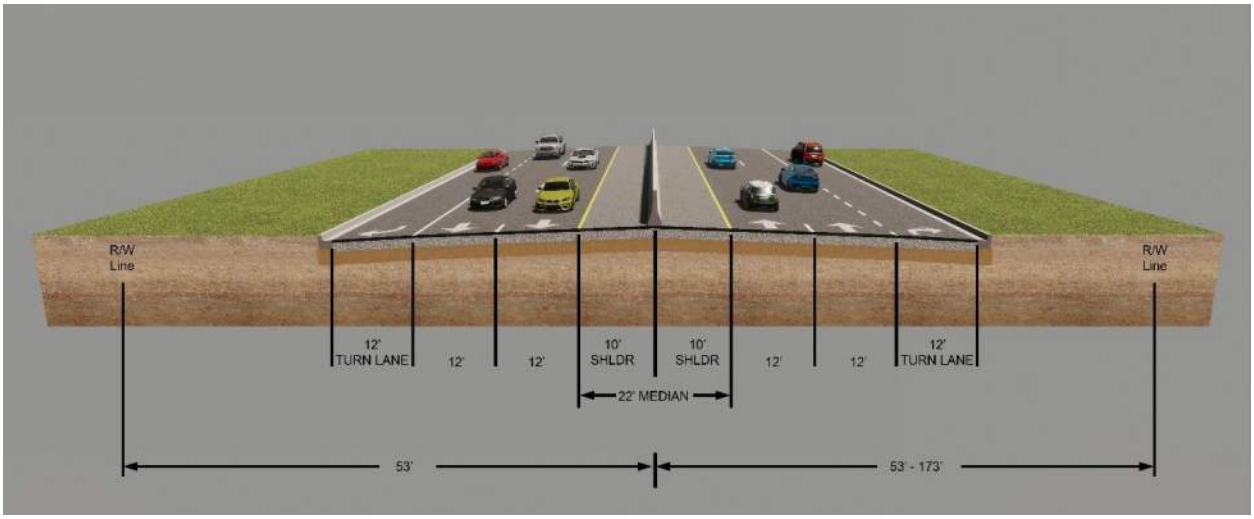
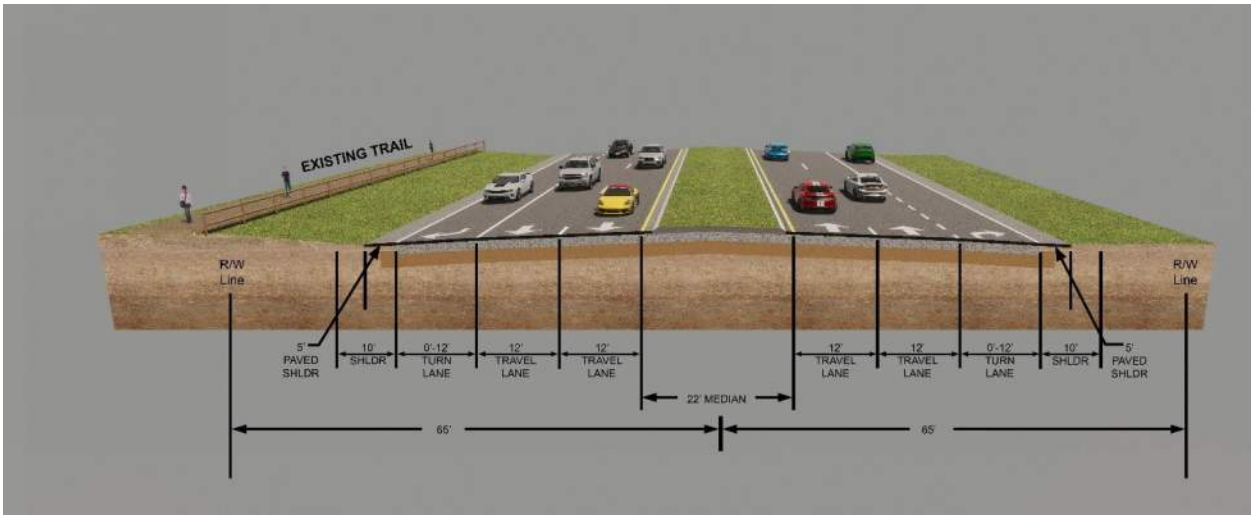


Figure 2-2 – Existing Typical Section – North of Bridge



1.2.2 Roadway Functional & Context Classifications

SR 55 has a functional classification of an Urban Principal Arterial Other with a context classification of C3C within the project limits.

1.2.3 Access Management Classification

Access management along the divided corridor is restrictive. North of SR 64, there is only one driveway leading to Manatee Memorial Hospital. Access for northbound traffic include Manatee Memorial Hospital, Palmetto Estuary Preserve, and 1st Street East. Access for southbound traffic include, 3rd Avenue West, Bradenton Riverwalk, Bradenton Riverwalk Skatepark, and Manatee Memorial Hospital; and Palmetto Estuary Preserve. In both directions, dedicated left and right turn

lanes are provided for the Palmetto Estuary Preserve, with right turn lanes designated for Manatee Memorial Hospital, Bradenton Riverwalk, and Bradenton Riverwalk Skatepark.

Existing access management along SR 55 is designated as Access Class 5 due to its restrictive median type and connection spacing range per Florida Design Manual (FDM) Table 201.3.2.

1.2.4 Right-of-Way

The right-of-way width varies throughout the project limits. Corresponding right-of-way width are summarized below:

Table 2-1 – Existing Right-of-Way

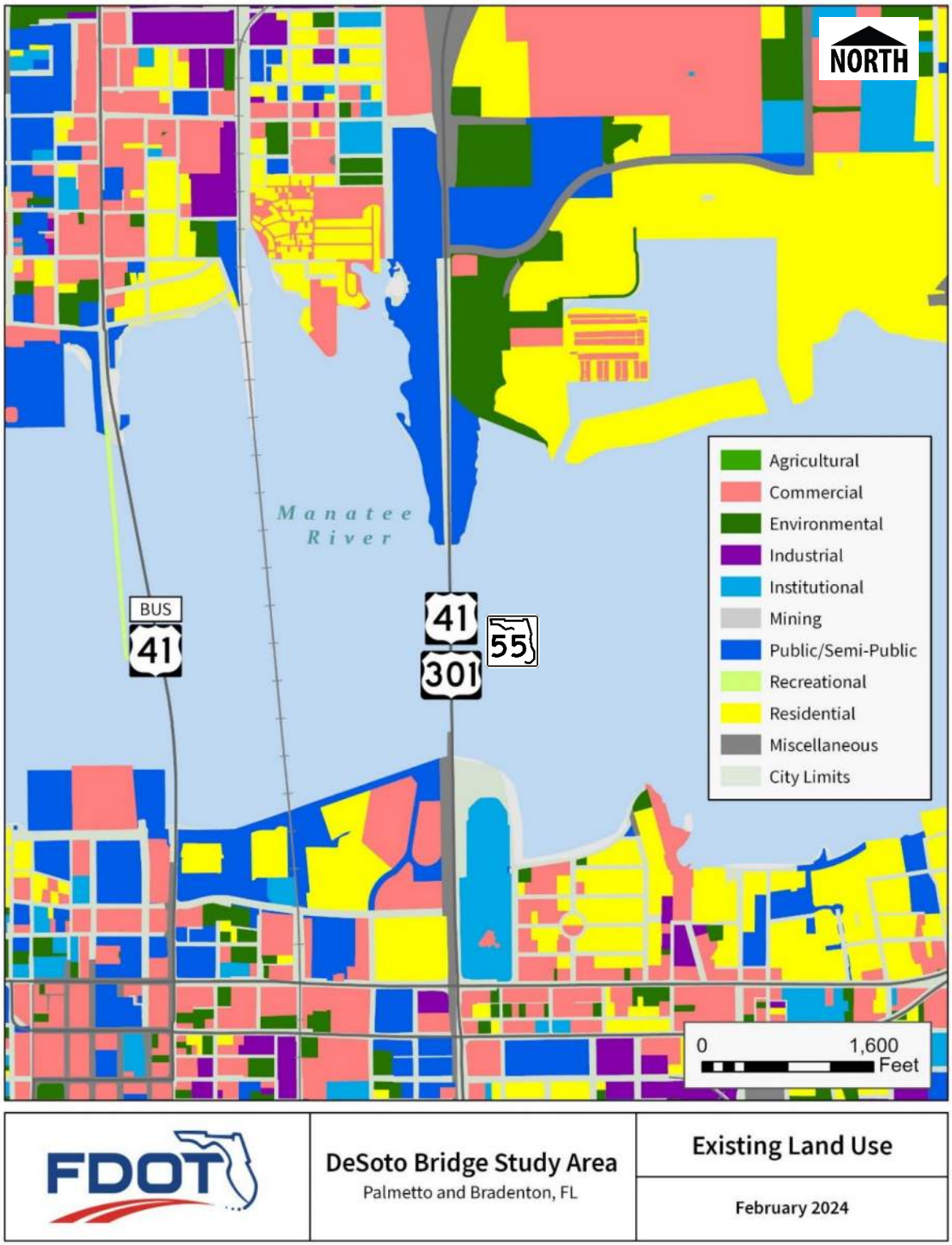
Section	MP to MP	Right-of-Way
SR 64 to begin bridge	2.255 - 2.617	106' - 226'
DeSoto Bridge	2.617 - 3.038	700'
End bridge to Haben Boulevard	3.308 - 3.552	130'

1.2.5 Adjacent Land Use

The area south of the bridge contains a mixture of commercial, retail, community recreation, high density residential, and institutional land use with the Manatee Memorial Hospital located east of SR 55. The Bradenton Riverwalk as well as the Bradenton Riverwalk Skatepark are located near the southern bridge approach. The existing land use map is shown in **Figure 2-3**.

The area surrounding the existing corridor to the north of the DeSoto Bridge consists predominantly of undeveloped land zoned for community development, in addition to open land designated for public use. The Riviera Dunes community is situated to the east of SR 55, set back from the roadway. A 7-Eleven Convenience Store is in the southeast quadrant of the intersection at Haben Boulevard and SR 55. The Palmetto Estuary Preserve, an open space area, is found on the west side of SR 55, south of 1st Street East.

Figure 2-3 - Existing Land Use



1.2.6 Pavement Type and Condition

The overall condition of pavement along the project limits is fair condition with light to moderate cracking extending through the full depth of the pavement and minimal rutting. The 2022 pavement condition survey was performed by the State Materials Office and the results are included in the table below. Mile Post 2.255 to Mile Post 3.552 includes the section of the DeSoto Bridge Replacement for the purposes of this study.

Table 2-2 - Existing Pavement Conditions

			Left Roadway			Right Roadway		
Section	**Mile Post**	**Age**	**Crack**	**Ride**	**Rut**	**Crack**	**Ride**	**Rut**
13130000	1.661-2.617	16	6.0	6.3	8.0			
13130000	2.208-2.617	16				6.0	7.1	9.0
13130000	3.038-5.819	22	6.0	7.8	9.0			
13130000	3.038-5.819	22				6.5	7.8	9.0

A planned resurfacing project (FPID 447379-1-52-01; SR 55 (US 301/US 41/SR 45/US 19) from 23rd Avenue West to 39th Street East) will improve pavement conditions within the project limits. Construction is scheduled for FY 2025 at a construction cost of $15,840,888.

1.2.7 Existing Design and Posted Speed

The existing design speed and posted speed limit is 50 mph from SR 64 to Haben Boulevard.

1.2.8 Horizontal Alignment

The existing horizontal alignment follows a north-south direction of travel. The alignment is a straight line between SR 64 and Haben Boulevard at a bearing of N00° 02′ 13″ E. There are no curves or deflections within the project limits.

1.2.9 Vertical Alignment

The vertical alignment of SR 55 is influenced by the surrounding terrain. The highway has a gradual slope from the south and north, with an elevation of about 5-feet above sea level. The original as-built bridge plans show a down grade of 0.71% then a 200-foot vertical curve going to a flat 0% grade leading up to the 3% grade going over the river, and a 3% down grade going to a 0% grade. The crest vertical curve length over the Manatee River is 1000-feet, with the sag vertical curves of 400-feet at both ends of the 3% grade.

1.2.10 Multi-modal Facilities

On the south side of the DeSoto Bridge in the City of Bradenton, sidewalk is present on the west side of the facility from SR 64 to First Avenue West. A crosswalk with pedestrian refuges is located at the intersection of SR 64 and SR 55, connecting the sidewalk on the west side to the sidewalk along the north side of SR 64.

On the north side of the bridge in the City of Palmetto, sidewalk is present on the east side of SR 55, from the 7-Eleven Convenience Storee to Haben Boulevard. Two crosswalks, spanning Haben Boulevard and SR 55 connect the sidewalk on the east side to a small section of sidewalk on the west side adjacent to Palmetto Estuary Nature Preserve.

There are no continuous bike lanes on SR 55 within the project limits. Bicyclists currently use the outside travel lane south of the bridge and the shoulders north of the bridge. There is no bicycle keyhole lane provided at the Haben Boulevard intersection or SR 64 intersection.

There is no bus service along SR 55 within the project limits.

1.2.11 Intersections

There are two signalized intersections located within the project study area. These intersections include SR 64 and Haben Boulevard This project begins before the signalized intersection and will tie in north of the Haben Boulevard intersection.

1.2.12 Physical or Operational Restrictions

There are no physical or operational restrictions within the project area.

1.2.13 Traffic Data

This is a bridge replacement project, therefore the traffic data utilized is from the resurfacing project FPID 447379-1-52-01; SR 55 (US 301/US 41/SR 45/US 19) from 23rd Avenue West to 39th Street East). The Existing Year (2024) AADT volumes from this project are depicted in **Table 2-3**.

The is no bicycle or pedestrian connectivity within the project limits, therefore pedestrian and bicycle counts are not required.

Table 2-3 - Existing Traffic Data (2024)

Roadway	AADT
SR 55 US 301/US 41	68,200

K = 9.0% D = 55.8% T = 4.7% (24 HOUR)

1.2.14 Roadway Operational Conditions

N/A - This is a bridge replacement project.

1.2.15 *Managed Lanes*

There are no managed lanes within the project area.

1.2.16 Crash Data

Crash data for the SR 55 segment along the DeSoto Bridge was obtained for the most recent five-year period (2018-2022). According to crash data, there have been a total of 633 crash events along the DeSoto Bridge. Of these 633 crash events, 2 crashes (0.32%) resulted in fatalities, one of which was a collision with a bicyclist. The remaining 631 crashes (99.68%) resulted in either property damage and/ or injury. Along the project corridor, 3 crashes (0.47%) involved a pedestrian, while 1 crash (0.16%) involved a bicyclist. The most common crash type to occur along the bridge was rear end collision, with 384 crashes (60.66%) occurring during the data collection period. The second most common crash type to occur during the data collection period was the sideswipe with 131 crashes (20.70%). All crash events documented along the DeSoto Bridge during the five-year data collection period are summarized in the table below:

Table 2-4 - Crash Data Along DeSoto Bridge

Dates	01/01/2018-12/31/2018	01/01/2019-12/31/2019	01/01/2020-12/31/2020	01/01/2021-12/31/2021	01/01/2022-12/31/2022	**Total**
Total Crashes	114	109	125	162	123	633
Fatalities	1	0	0	0	1	2
Bicycle	0	0	0	0	1	1
Pedestrian	1	0	0	1	1	3
Angle	1	3	1	2	3	10
Animal	0	0	0	0	0	0
Head On	2	1	1	1	1	6
Rear End	78	71	73	96	66	384
Left Turn	4	1	2	6	4	17
Right Turn	1	1	2	2	2	8
Off Road	0	4	6	6	5	21
Rollover	0	0	1	0	0	1
Sideswipe	20	21	22	37	31	131
Unknown	1	3	5	5	2	16
Other	6	4	12	6	7	35
Total	114	109	125	162	123	633

1.2.17 Railroad Crossings

There are no railroad crossings within the project area.

1.2.18 Drainage

The SR 55 project corridor traverses over the Manatee River from the Cities of Bradenton to Palmetto via the Desoto Bridge. The existing drainage system south of the bridge is an urban drainage system and includes curb inlets and storm sewer. To the north of the bridge, runoff is conveyed through roadside ditches. The ultimate outfall for both systems discharge directly into the Manatee River. No stormwater management facilities serve the SR 55 roadway or bridge. The bridge is drained via scuppers which allows runoff to flow directly into the Manatee River below. No culverted cross drains exist within the project limits.

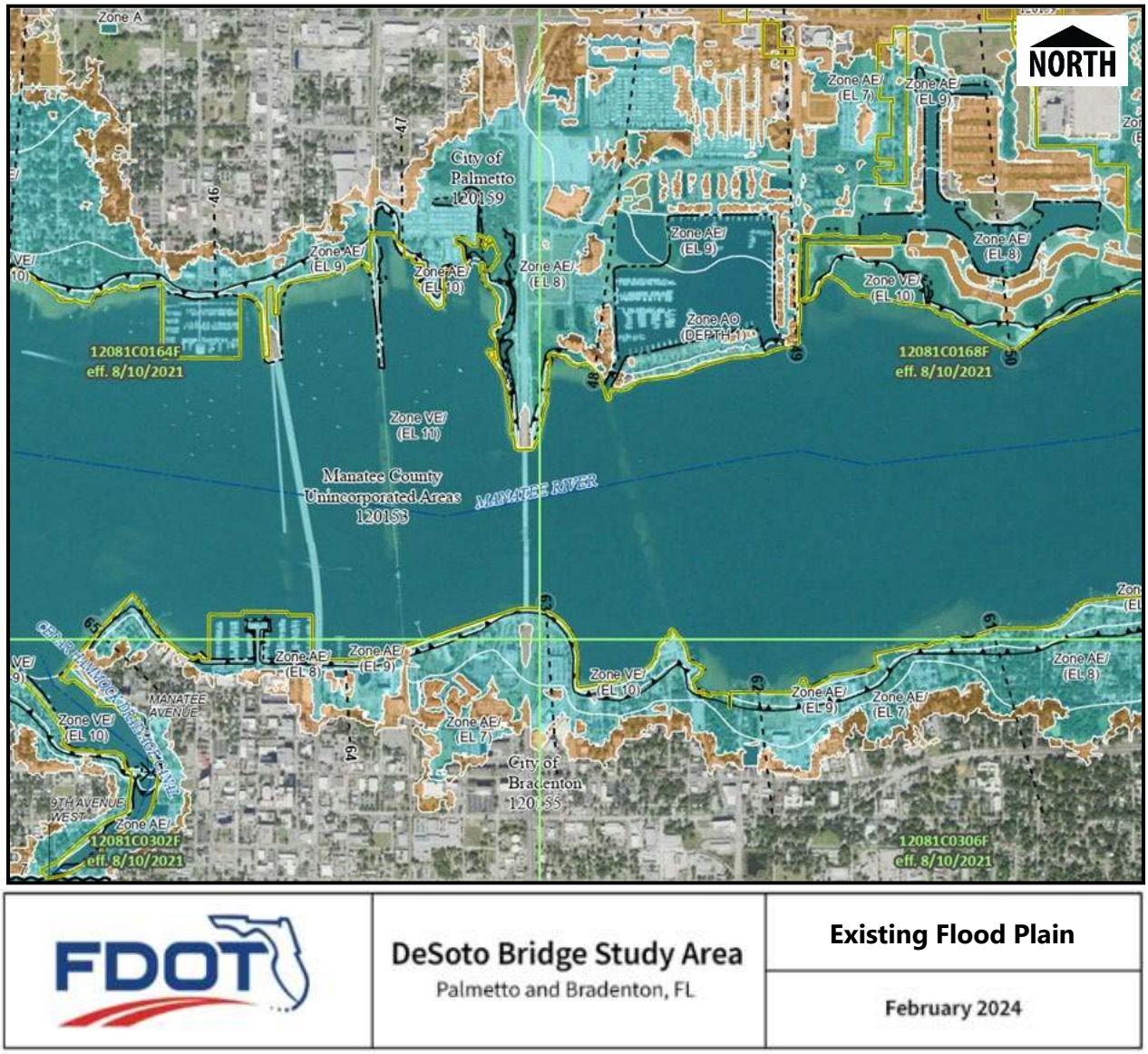
The project is located within the Manatee River Below the Braden River Basin. The Florida Department of Environmental Protection (FDEP) has declared the Water Basin ID (WBID) #1848A as not impaired for nutrients. The Southwest Florida Water Management District (SWFWMD) maintains jurisdiction over Manatee County for FDOT transportation projects and will be the Environmental Resource Permit (ERP) issuing entity.

According to the National Resources Conservation Services (NRCS) Soil Survey website, the predominant soil type at both the north and south approaches to the Desoto Bridge is Canaveral fine sand (#9). Its hydrologic soil group (HSG) is A/D. Other soil types encountered within the project limits include Bradenton fine sand (#5, HSG = B/D) to the south and Cassia find sand (#12, HSG = A) to the north. Estero muck (#21, HSG = A/D) is the primary soil type within the wetland areas nearest to the Manatee River.

The National Oceanic and Atmospheric Administration Tides & Currents resource established a monitoring station at the Redfish Point on the Manatee River. There, the mean high water (MHW) and mean low water elevations are estimated at 2.04 ft and 0.33 ft, respectively.

The designated floodplain is identified on the Federal Emergency Management Agency's Flood Insurance Rate Map #12081C0164F as elevation 11.0 ft. The effective date of this elevation is 8/10/2021. The project is also located within a designated velocity zone.

Figure 2-4 - Existing Flood Plain

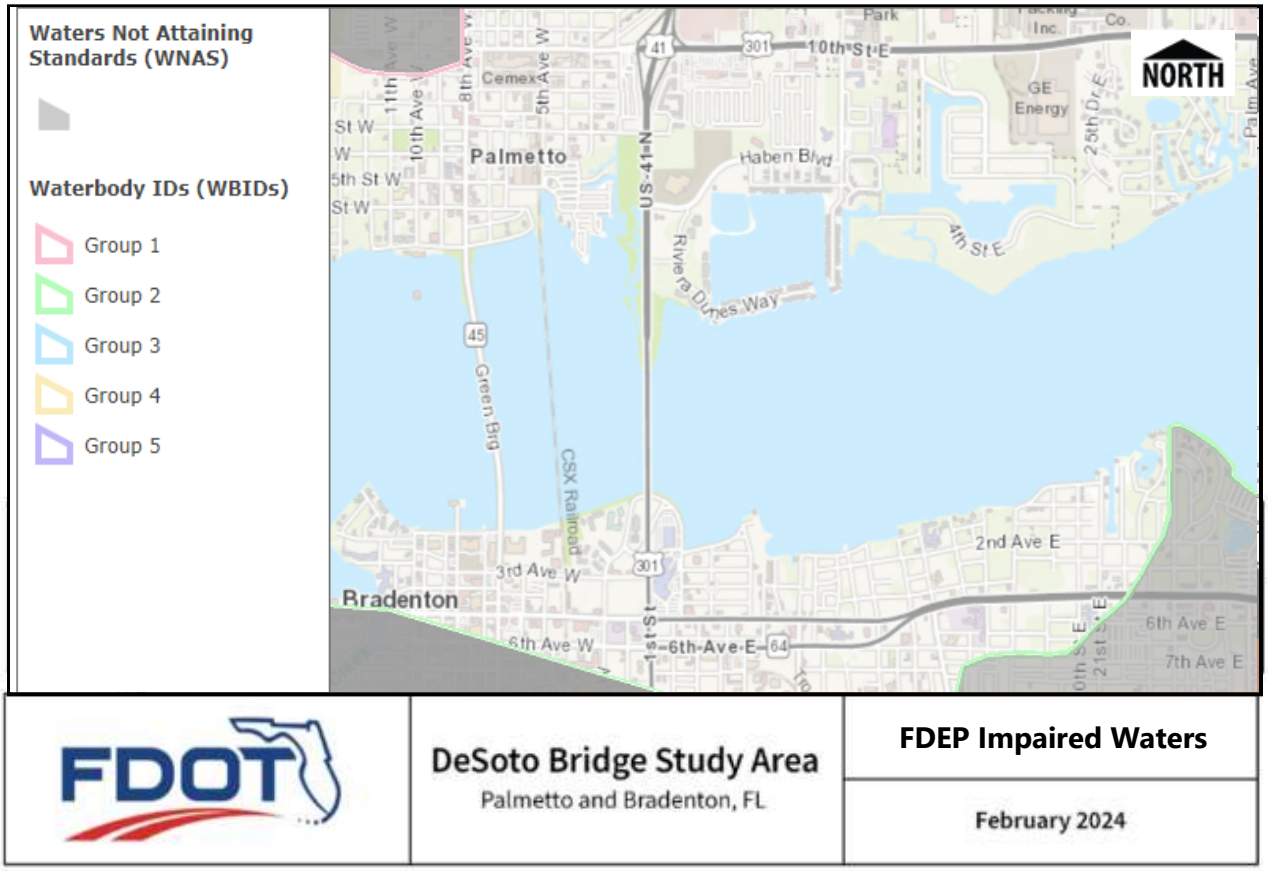


ArcGIS Pro was utilized to view georeferenced Manatee County stormwater drainage system asset inventory (https://www.mymanatee.org/gisits/rest/services/opendata/utilities/FeatureServer). The existing Manatee County drainage systems provide for conveyance of both public and private runoff and performs independently of the FDOT drainage systems. There are no cross drains within the existing project limits and no reported localized flooding because of the SR 55 drainage system.

Local topographic resources referred to include the 2018 LiDAR-derived digital elevation model from the USGS (https://www.usgs.gov/the-national-map-data-delivery/gis-data-download) and aerials available from ESRI ArcGIS Online

https://services.arcgisonline.com/ArcGIS/rest/services/World_Imagery/MapServer). Review of these resources and from field reviews performed, the project does not appear to have any offsite contributing runoff draining into the FDOT drainage system.

Figure 2-5 - FDEP Impaired Waters



1.2.19 Lighting

There is consistent lighting within the project limits, including the DeSoto Bridge. The light poles are Drop Glass HPS GE Cobra head and are owned by FDOT District One, and Florida Power and Light poles.

1.2.20 Utilities

Thirteen Utility Agencies/Owners (UAO) have been identified within the project area through utility coordination efforts and a Sunshine 811 Design Ticket. **Table 2-5** identifies the UAO's contacted, and a description of their facilities located within the project study area. Utility contact information will be included in the Utility Assessment Package. Base maps were sent to utility providers with a request to provide information on existing and planned utilities. At the time of utility coordination efforts, Manatee County will upgrade their 16" subaqueous water line.

Construction is anticipated to begin in 2025. None of the other UAOs indicated future planned facilities or upgrades to existing facilities within the project limits.

Table 2-5 - Existing Utilities

Utility Agency/Owners	***Facilities Within Corridor***	***Description of Existing Utilities***
City of Bradenton	Yes	1. City of Bradenton has a 20" ductile iron potable water line running east to west along the north side or Riverfront Blvd crossing US 41 and exiting the project limits in both directions. 2. City of Bradenton has a 2" PVC force main just west of US 41 that crosses from the north side of Riverfront Blvd to the south side and continues west exiting the project limits.
Crown Castle	Yes	1. Crown Castle has 4 x 1.5" conduit with 72 count FOC running east and west along the south side of Manatee Ave E crossing US 41 and exiting the project limits in both directions. 2. Crown Castle has 4 x 1.5" conduit with 216 count FOC at the southeast corner of the Manatee Ave E and US 41 intersection that runs north crossing the bridge before going aerial approximately 260' north of the bridge. 3. Crown Castle has 4 x 1.5" conduit with 96 count FOC at the southeast corner of the 3rd Ave W and US 41 intersection that crosses to a handhole on the east side of US 41 and continues east exiting the project limits. 4. Crown Castle has an aerial 288 count FOC approximately 260' north of the bridge running north along the west side of US 41 exiting the project to the north. 5. Crown Castle has 4 x 1.5" conduit with 288 county FOC at the southeast corner of the Haben Blvd and US 41 intersection that crosses to a handhole on the east side of US 41.
Florida Power & Light – Distribution	Yes	1. FPL has an overhead electric line at the northwest corner of the Haben Blvd and US 41 intersection that runs south to Desoto Bridge where it goes subaqueous crossing to the south side but exiting the project limits. 2. FPL has a buried electric line running west along the south side of 3rd Ave W that crosses US 41 to feed the hospital on the east side of US 41.
Frontier	Yes	1. Frontier has 5 buried 4" PVC with fiber north of Haben Blvd running south along the east side of US 41 to a 3'x5' hanhole just north of the Desoto Bridge where the lines go subaqueous to cross to the south side of the bridge and cross to a hanhole on the southside of Riverfront Blvd. 2. Frontier has 2 buried 4" PVC with fiber running east and west along the south side of Riverfront Blvd that cross US 41 and exit the project limits in both directions.
Manatee County Transportation	Yes	1. Manatee County Transportation has facilities running south along the west side of US 41 until reaching the northwest corner of the Haben Blvd and US 41 intersection where they cross to the northeast intersection.

Manatee County Transportation Continued		2. Manatee County Transportation has facilities at the northwest corner of the Haben Blvd and US 41 intersection that run to the southwest corner and cross to the southeast corner. 3. Manatee County Transportation has facilities starting at the north end of the project running south along the west side of US 41 to the northwest corner of the Haben Blvd and US 41 intersection. 4. Manatee County Transportation has facilities at the northwest corner of the Haben Blvd and US 41 intersection that crosses to the northeast corner then to the southeast corner and crosses to the southwest corner. 5. Manatee County Transportation has facilities at the northwest corner of the Haben Blvd and US 41 intersection that runs south ending just north of 1st St E.
Manatee County Utilities	Yes	1. Manatee County Utilities has a 16" DIP water main starting at the north end of the project running south along the east side of US 41 eventually becoming subaqueous to cross to 1st St E. 2. Manatee County Utilities has a 16" DIP water main running south east of 1st St E before ending at the northeast corner of the 3rd Ave W and1st St E intersection.
MCI	Yes	1. MCI has 2 x 2" HDPE conduit with FOC just south of 3rd Ave W that runs north along the west side of US 41 where it goes subaqueous to cross along the west side of the bridge eventually exiting the project limits to the north. 2. MCI has 2 x 2" HDPE conduit with FOC just south of 3rd Ave W that runs north along the east side of US 41 where it goes subaqueous to cross along the east side of the bridge eventually exiting the project limits to the north.
Spectrum		1. Spectrum has underground facilities at the northeast corner of the Manatee Ave and US 41 intersection that cross to the northwest corner and continue north going subaqueous at the bridge and crossing to the east side of US 41 just north of the end of the bridge. 2. Spectrum has underground facilities just north of the bridge on the east side of US 41 running north until exiting the project.
Uniti Fiber	Yes	1. Uniti has underground facilities north of Haben Blvd running south along the west side of US 41 attaching to the bridge to continue south along the west side.
Zayo Group	Yes	1. Zayo has a buried fiber line at the southwest corner of the Manatee Ave and US 41 intersection that runs north before going subaqueous and crossing to the north end of the bridge. 2. Zayo has a buried fiber line just north of the bridge that runs north along the west side of US 41 to the southwest corner of the Haben Blvd and US 41 intersection. 3. Zayo has a buried fiber line at the southwest corner of the Haben Blvd and US 41 intersection that crosses to the southeast corner and then runs north exiting the project limits

1.2.21 Soils and Geotechnical Data

For the purposes of this report, the project study area consists of the footprint of all build alternatives and a 250-foot buffer of those limits. According to the NRCS Soil Survey of Manatee County (1983), there are eight (8) soil types and one (1) water classification present within the project study area. The two (2) most prevalent features in the project study area are Waters of the Gulf of Mexico and Canaveral Sand, Filled. Four (4) of the eight (8) soil types within the study area are classified as hydric. All soils documented within the project study area and their relative acreages are in the **Table 2-6** below:

Table 2-6 - NRCS Soil Classifications

NRCS Code	NRCS Soil Description	Hydric Status	Acres	Percent of Total
5	Bradenton Fine Sand, Limestone Substratum	Hydric	17.57	8.8
9	Canaveral Sand, Filled	Non-Hydric	48.24	24.2
12	Cassia Fine Sand, Moderately Well Drained	Non-Hydric	29.00	14.5
13	Chobee Loamy fine Sand, Frequently Ponded, 0 to 1 Percent Slopes	Hydric	7.18	3.6
14	Chobee Variant Sandy Clay Loam	Hydric	0.22	0.1
20	Eaugallie-Eaugallie Wet, Fine Sand, 0 to 2 Percent Slopes	Non-Hydric	0.24	0.1
21	Estero Muck, Tidal, 0 to 1 Percent Slopes	Hydric	19.52	9.8
48	Wabasso-Wabasso, Wet, Fine Sand, 0 to 2 Percent Slopes	Non-Hydric	5.27	2.6
100	Waters of the Gulf of Mexico	Unranked	72.25	36.2
		Total	**199.49**	**100.0**

Figure 2-6 - NRCS Soil Classification

1.2.22 Aesthetics Features

The visual aesthetics is considered commercial in the City of Bradenton, and rural views of the Palmetto Estuary Preserve in the City of Palmetto. Riviera Dunes is set back approximately 48-feet from SR 55. The view of the Manatee River is considered a unique visual resource in the project corridor. Notable stakeholders that may be sensitive to aesthetic effects of the project include the Riveria Dunes and recreational users (i.e., boaters).

1.2.23 Traffic Signs

There is one overhead truss, and one cantilever structure within the project limits, as shown below. There are four northbound, and five southbound multi-post signs as shown in **Table 2-7,** along with numerous single post signs.

Table 2-7 - Existing Signs

Mile Post	Sign Message	Sign Type
	Northbound	
2.298	PALMETTO 1 TAMPA 41	Multi-post
3.189	BIRD SANCTUARY WELCOME TO BEAUTIFUL HISTORIC PALMETTO	Multi-Post
3.344	Haben Blvd NEXT SIGNAL	Multi-Post
3.401	Bradenton Area Convention Center	Multi-Post

Mile Post	Sign Message	Sign Type
	Southbound	
2.324	Bradenton ↑ Hospital Downtown → LECOM Park DeSoto Monument	Multi-Post
2.418	SARASOTA 12	Multi-Post
2.455	Bradenton Performing Arts Ctr. → Riverwalk ArtCenter Museum Downtown	Multi-Post
2.576	Bradenton ↑ Downtown LECOM Park Riverwalk → Hospital →	Multi-Post
2.615	Bradenton CITY LIMIT	Multi-Post

MP 2.513 NB Cantilever


MP 2.324 – SB Overhead Truss

1.2.24 Noise Walls and Perimeter Walls

There are no noise walls or perimeter walls within the project area.

1.2.25 Intelligent Transportation Systems (ITS)/Transportation System Management and Operations (TSM&O) Features

There are no ITS features within the project limits. There are no TSM&O features within the project limits.

2.3 Existing Bridges and Structures

The Desoto Bridge (Structure No. 130053) was constructed in 1957 and carries SR 55 over the Manatee River. The existing structure spans 2,225-foot and consists of a three-span main channel unit (70'-105'-70' continuous steel girders) and fifteen approach spans (66-foot pre-AASHTO post-tensioned (PT) concrete beams) on both sides. The superstructure is supported on concrete multi-column piers. The main channel piers are founded on mudline footings with steel h-piles and all the approach piers in the water are founded on waterline footings and the last three approach piers on the south side are founded on buried footings using both battered and plumb composite concrete and steel h-piles.

The existing typical section for the structure is a divided four-lane highway that is comprised of 2-12-foot lanes and a 2-foot outside shoulder in each direction with a 4-foot raised median, with a median barrier wall, see **Figure 2-7**. The mid-level fixed structure provides a clear navigational width of 75-foot (measured between the inside face of the fenders) and a 40-foot vertical navigational clearance above MHW.

Recent rehabilitation projects have been undertaken in 2002, 2010, 2012 and 2017 to address maintenance issues with the structural steel, scour, concrete deck, PT beams, piles, columns, footings, and fender system. Based on the bridge inspection report conducted in January 2022, the existing structure received a sufficiency rating of 74.5. The health index is 78.53 and the bridge has sub-standard elements with design deficiencies, including narrow shoulders, no pedestrian facilities, and substandard bridge rails. The Desoto Bridge has reached a critical threshold in which deterioration is expected to accelerate. Based on the age of the bridge with respect to its intended design life and structural condition, the bridge was programmed by FDOT for replacement.

Figure 2-7 - Existing Bridge Typical Section

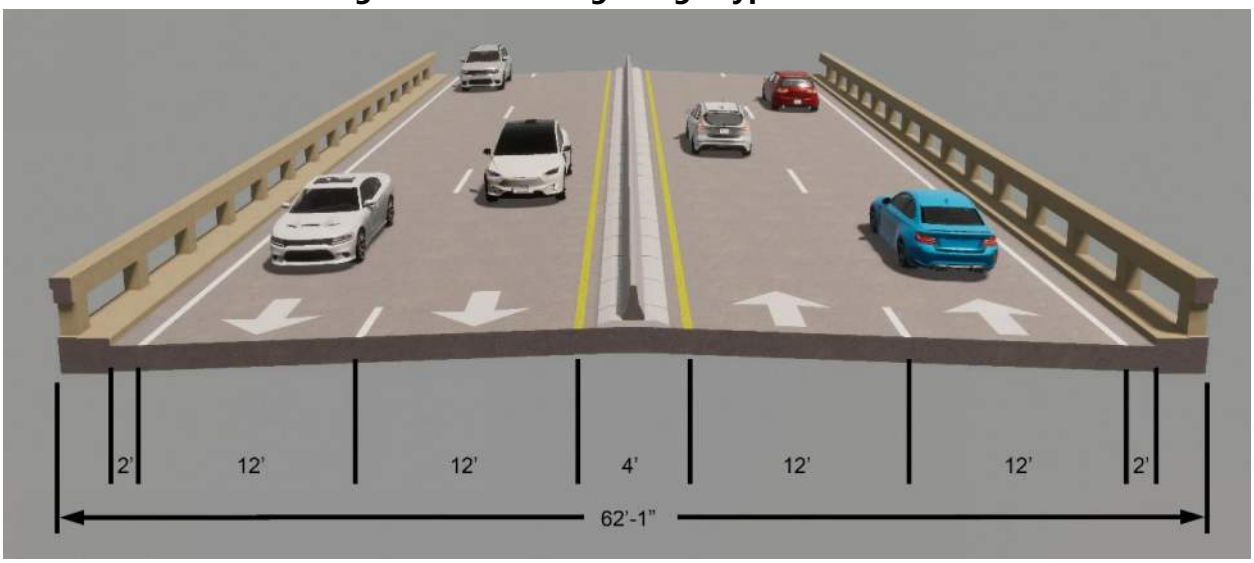


Table 2-8 - Existing Bridge Data and Structure Condition

Structure Name / ID	Hernando DeSoto Bridge / 130053
Facility Carried	SR 55 (US 301 / US 41) over Manatee River
Year Built	1957
Year Reconstructed	N/A
Superstructure Type (Approach / Main)	Pre-AASHTO PT Concrete Beams / Steel Girders
Number of Spans	33
Bridge Length	2,225'
Maximum Span Length	105'
Roadway Width	26' (Each Direction)
Lane / Shoulder Width	2-12' lanes / 1-2' shoulder (Each Direction)
Overall National Bridge Inventory Ratings	
Sufficiency Rating	74.5
Deck	6
Superstructure	6
Substructure	6
Channel	6
Clearances	
Vertical Clearance	40' above Mean High Water
Horizontal Clearance	75' between existing bridge fenders
Pier Protection	
Channel Piers	Bridge Fender System

2.4 Existing Environmental Features

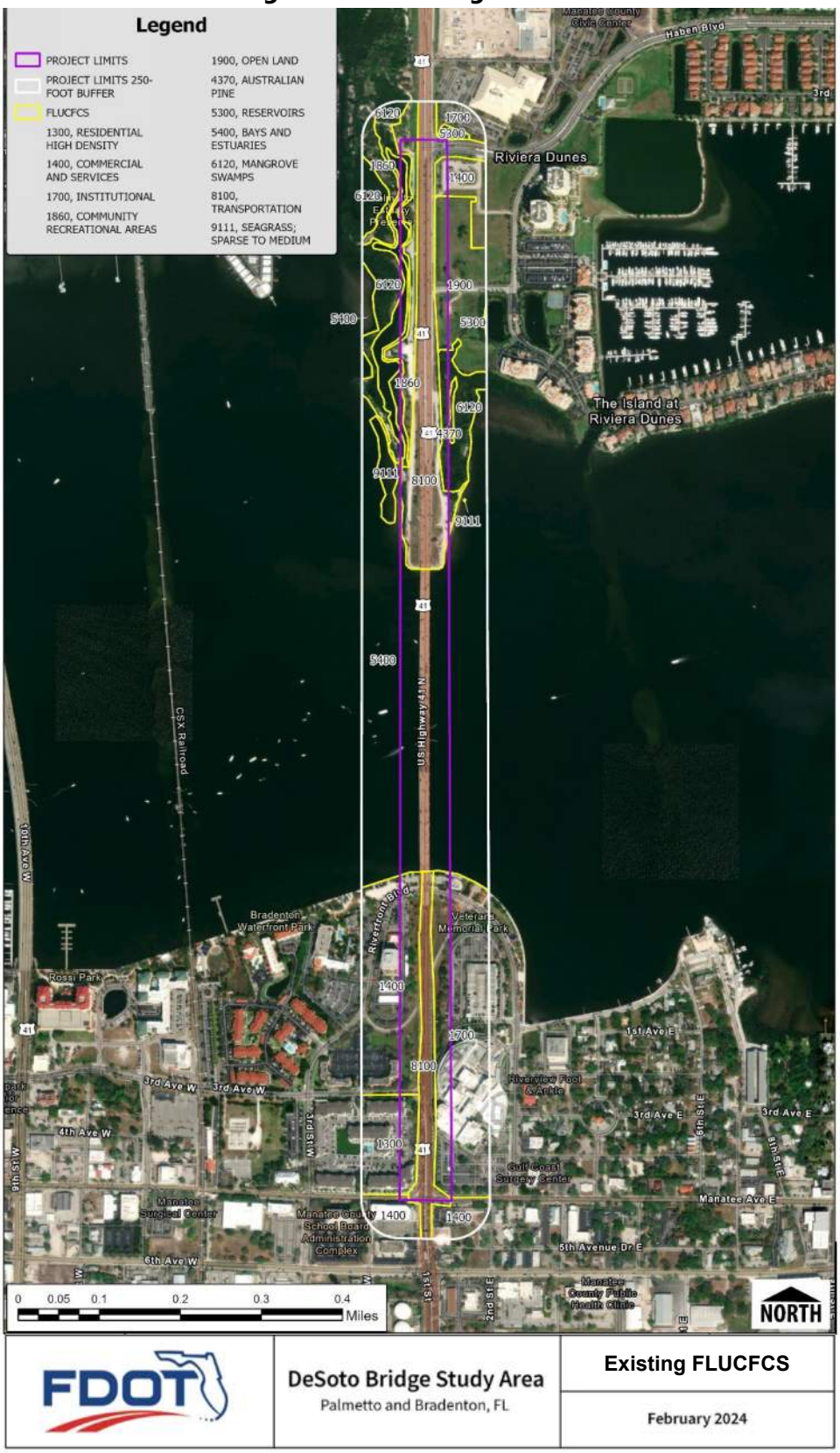
The project study area was evaluated for Critical Habitat (CH) as defined by Congress 17 CFR 35.1532. The project area falls within U.S. Fish and Wildlife Services (USFWS)-designated CH for

the West Indian manatee (*Trichechus manatus latirostris*). The proposed project will not result in the destruction or adverse modification of CH, and appropriate compensatory mitigation will be purchased to offset impacts to wetlands and surface waters within the CH.

Based on literature and field reviews, fifty-five (55) species of protected plants and animals are known to occur in Manatee County. Twenty-four (24) of the species are federally listed endangered or threatened. After evaluating the habitat requirements for each species, the types of habitats present within the project study area, and habitats being impacted by alternatives, effect determinations were made for each wildlife and plant species. Fifty-four (54) of the 55 listed species are state listed endangered or threatened. One (1) species is not listed as endangered or threatened but is still managed and protected, which includes the bald eagle (*Haliaeetus leucocephalus*). Thirty (30) species are state listed as endangered or threatened. One (1) species is not listed as endangered or threatened but is still managed and protected, which includes the bald eagle (Haliaeetus leucocephalus). Additionally, multiple species of state protected bats are known to occur within the project study area. Effect determinations were made for each wildlife and plant species after evaluating the habitat requirements for each species, the types of habitats present within the project study area.

Four (4) wetland and surface water community types were identified within the project study area: reservoirs (FLUCFCS 5300/USFWS: PUBHx (Palustrine, Unconsolidated Bottom, Permanently Flooded, Excavated), bays and estuaries (FLUCFCS: 5400/USFWS: E1UB2 (Estuarine, Subtidal, Unconsolidated Bottom, Sand)), mangrove swamps (FLUCFCS: 6120/USFWS: E2FO3N (Estuarine, Intertidal, Forested, Broad-Leaved Evergreen, Regularly Flooded)), and seagrass, sparse to medium (FLUCFCS: 9111/USFWS: E1AB3L (Estuarine, Intertidal, Aquatic Bed, Rooted Vascular, Subtidal)) see **Figure 2-8.**

Figure 2-8 - Existing FLUCFCS



3. FUTURE CONDITIONS

3.1 Future Conditions Considerations

This project is a replacement bridge that will not add additional lanes to the bridge. The bridge will have wider inside and outside shoulders for vehicles to pull over or travel through as needed. Pedestrian and bicycle features will be added to allow for safe travels across the bridge as well as improve connectivity to either side of the Manatee River. A crashworthy bridge barrier would be installed to prevent vehicles involved in crashes from going over the bridge. Consequently, the future roadway context classification for SR 55 will remain Suburban Commercial (C3C) from SR 64 to Haben Boulevard As such, a PTAR was not developed for this project. Traffic data from the resurfacing project FPID 447379-1-52-01 was utilized.

The lane use along the SR 55 corridor around the DeSoto Bridge is commercially developed on the south side of the bridge, which includes residential apartments (Aria), commercial businesses, and the Manatee Memorial Hospital. On the north side, there are Palmetto Estuary environmentally sensitive lands, vacant developable property, and a 7-Eleven Convenience Store at the corner of Haben Boulevard.

4. DESIGN CONTROLS & CRITERIA

4.1 Design Controls

- Roadway Context Classification – C3C
- Functional classification and SIS designation – 05 – SIS – N/A
- Traffic and Design Year – 2050
- Access Management – Class 5 – Restrictive
- Design Speed and Target Speed – 45 mph begin project to begin bridge
- Design Speed and Target Speed – 50 mph begin bridge to end project
- Capacity and LOS Target – N/A
- Design vehicle – WB-62FL
- Pedestrian and bicycle requirements – Yes
- Physical constraints – N/A
- Environmental constraints – N/A
- Type of stormwater management facilities – closed drainage system
- Navigational requirements – 40-foot vertical clearance; 75-foot horizontal clearance
- Design high water, including impacts from projections
- Design wave heights for coastal bridges – N/A

4.2 Design Criteria

Table 4-1 - Design Criteria

Design Criteria		
Design Element	**Design Standard**	**Sources**
Design Vehicle	WB-62FL	2024 FDM, Section 201.62
Design Speed		
SR 55	45 mph to 50 mph	2024 FDM, Table 201.5.1
Shared-Use Path	18 mph	2024 FDM, Section 224.9
Median Widths		
SR 55	22-ft	2024 FDM, Table 210.3.1
Border Width		
SR 55	14-ft	2024 FDM, Table 210.7.1
Maximum Degree of Curve		
SR 55	8 Deg 15-ft, e max 0.05	2024 FDM, Table 210.9.2
Shared-Use Path	25 Deg	2024 FDM, Table 224.10.1
Horizontal Curve Length (Min)		
SR 55	675-ft (Desired), (400-ft min)	2024 FDM, Table 210.8.1
Min. Stopping Sight Distance		
SR 55	360-ft (<2%) 385-ft (4% Downgrade) 339-ft (4% Upgrade)	2024 FDM, Table 210.11.1
Shared-Use Path	156-ft	2024 FDM, Table 224.10.2
Decision Sight Distance		
SR 55	800 lf (Avoid. Maneuver B)	2018 AASHTO, Table 3-3, pg. 3-7
Maximum Profile Grades		
SR 55	4%	2024 FDM, Table 210.10.1
Shared-Use Path	5% (w/o landings)	2024 FDM, Section 224.6
Maximum Change in Grade without a VC		
SR 55	0.70%	2024 FDM, Table 210.10.2
Crest Vertical Curves (L MIN)		
SR 55	K=98, L=135-ft	2024 FDM, Table 210.10.3 and 20.10.4
Sag Vertical Curves (L MIN)		
SR 55	K=79, L=135-ft	2024 FDM, Table 210.10.3 and 20.10.4
Vertical Clearance		
Road over Roadway	16.50-ft	2024 FDM, Table 260.6.1
Road over Roadway (Construction affecting Existing Bridge)	16.00-ft	2024 FDM, Table 260.6.1
Road over Waterway	6 FT above MHW	2024 FDM, Table 260.8
Overhead Signs	17.50-ft	2024 FDM, Table 210.10.3

Traffic Signals	17.50-ft	2024 FDM, Table 210.10.3
Lane Widths & Roll-Over		
SR 55	11-ft	2024 FDM, Table 210.2.1
Single-Lane Ramp	15-ft min	2024 FDM, Table 211.2.1
Maximum Lane "Roll-Over"	4% Tangent Sections	2024 FDM, Figure 210.2.1 / 2024 FDM, Figure 211.2.1
Maximum Δ in Cross Slope at Cross Over Line (%)	6% Ramp Gores <35mph	2024 FDM, Table 211.2.2
Roadway Cross-Slopes in same direction	2 lanes 2%; Additional Lane 3%	2024 FDM, Figures 210.2.1, 211.2.1, & Section 260.4
Lane Width – Shared-Use Path	10-ft (12-ft standard)	2024 FDM, Section 224.4
Shoulder Width – Bridges		
SR 55	6-ft Inside, 10-ft Outside (Min.)	2024 FDM, Figure 260.1.1
Max. Deflections w/o Curve		
SR 55	45 minutes	2024 FDM, Section 210.8.1

5. Alternatives Analysis

5.1 No-Build (No-Action) Alternative

NEPA requires that the impacts of not implementing a proposed action be considered in the decision-making process. The advantages of the No-Build Alternative include the absence of construction replacement costs, not impact to the natural environment, or inconvenience to the traveling public. The Department would continue with the maintenance and repairs of the existing roadway and DeSoto Bridge. The 2022 inspection report showed that the DeSoto Bridge is at the lower end of the fair condition rating, as per the National Bridge Inventory, given its longevity of service thus far. However, a disadvantage of the No-Build Alternative is its inconsistency with the Sarasota/Manatee County MPO 2045 LRTP. Furthermore, the No-Build Alternative doesn't meet the project's purpose and need, and does not address the substandard design elements and the structural degradation that will continue to worsen over time.

5.2 Transportation Systems Management and Operations (TSM&O) Alternative

There are no TSM&O Alternatives studied within the project limits.

5.3 Multimodal Alternatives

The in-kind bridge replacement will accommodate multimodal facilities by bringing the bridge to current standards with either a 12-ft shared use path and/or a sidewalk on both sides of the bridge and roadway to provide bicycle/pedestrian connectivity.

5.4 Build Alternatives

The build alternatives were developed with the primary objective of replacing the existing bridge with an in-kind structure that meets current FDOT design standards, causes the least impacts to the natural, physical, cultural, and social environments and maintains the existing number of traffic lanes throughout the construction process. The ETAT comments in the ETDM pointed out the existing environmental features including the Palmetto Estuary Preserve and the 4f features south of the bridge. Both alternatives were designed to avoid or minimize impacts to these features. he West and East Alternatives under consideration are described as follows:

West Alternative

The southbound half of the new bridge would begin construction independently of the existing bridge, with a centerline shift of approximately 41 feet to the west. This arrangement will allow for a spacing of about 10 feet between the new and old bridges, maintaining all traffic as usual on the existing bridge and roadway while the construction of the new bridge proceeds without interference. After the completion of the southbound half of the new bridge, temporary striping will provide four lanes, with two lanes in each direction, for all traffic to be shifted onto the new bridge. The old DeSoto Bridge will then be removed, and the northbound half of the new bridge

will be constructed and joined with the southbound structure. The new bridge includes 12-foot protected shared-use paths on both sides, 12-foot outside shoulders, and 10-foot inside shoulders, along with two 12-foot travel lanes, barrier-separated, in both directions. The new bridge will be approximately 2,225 feet in length and have grades of ±3.2%. It will have a minimum vertical channel clearance of 40 feet above the mean water level and 75 feet of horizontal clearance. The new bridge will meet all current FDOT design standards and could be widened in the future under a separate project.

Traffic patterns on the landsides will not change, as the through lanes will remain consistent with existing conditions. The roadway will have to be slightly adjusted and will begin to skew westward approximately 825 feet from the start of the project at SR 64. Shared-use paths on both the northern and southern ends will be implemented to accommodate the new paths on the bridge. Most improvements are located within the existing right-of-way, but additional right-of-way will need to be purchased throughout the corridor in areas to accommodate the proposed sidewalks and shared-use path infrastructure.

East Alternative

The East Alternative is similar to the West Alternative except the northbound half of the new bridge will be constructed first. The bridge length and width and profile will be the same.

Traffic patterns on the landside will not change, as the through lanes will remain consistent with existing conditions. The roadway will have to be slightly adjusted and will begin to skew eastward approximately 490 feet from the project's start at SR 64. A new sidewalk that will transition into the shared-use path is proposed closer to the Manatee Memorial Hospital parking lot, but this infrastructure will be constructed within the existing right-of-way. Most improvements are located within the existing right-of-way, but some will need to be purchased throughout the corridor in areas to accommodate additional new sidewalks and the shared-use paths. Shared-use paths on both the northern and southern ends will be implemented to accommodate the new paths on the bridge.

5.5 Comparative Alternatives Evaluation

The comparative evaluation results of the No-Build and Build Alternatives is provided in **Table 5-1**. The matrix includes estimated project effects such as future operating conditions, environmental (natural, cultural, physical) impacts, and estimated costs. Design and construction costs are documented in the Long-Range Estimate (LRE) (February 2024), located in **Appendix C**. Right-of-way costs were estimated in September 2023. Construction, engineering, and inspection costs were calculated to be 12% of the construction cost. As of April 2024, the rates for mitigation credits available at Mangrove Point Mitigation Bank are $332,000 for one acre. The mitigation

credit prices, and availability are subject to change. **Table 5-1** shows that the No-Build Alternative does not meet the project purpose and need but it is included as a baseline for comparison.

Table 5-1 - Alternatives Evaluation Matrix

DeSoto Bridge PD&E Study				
Evaluation Factors	**Alternative**	**No Build**	**Alternative – West**	**Alternative - East**
	Roadway	**No Improvements**	**Left Replacement with Curb & Gutter North of Bridge**	**Right Replacement with Curb & Gutter North of Bridge**
	Bridge	**No Replacement**	**Replace Bridge with Mid-Level Fixed**	**Replace Bridge with Mid-Level Fixed**
Ability to meet Purpose and Need				
Address structural degradation and substandard design		☒	☑	☑
Maintain critical link for regional travel		☒		
Accommodate multimodal Activity		☒		
Potential Right of Way Impacts				
Parcels (#Business | #Residential | #Other*)		0	8 | 0 | 1	7 | 0 | 1
Area of Impact (ac)		0	0.7	0.8
Residential Relocations		0	0	0
Business Relocations		0	0	0
Utilities		No	Yes	Yes
Environmental Impacts				
Protected Species		None	Low	Low
Contamination Sites		None	1	1
Wetland (ac)		0	0.1	0.2
Seagrass (ac)		0	0.00	0.00
Surface Water		0	Minimal	Minimal
Public Parks 4(f)		No	Minimal	None
Archaeological & Historic Resources (#)		No	1	1
Noise Sensitive Receptors (#)**		0	22	22
Estimated Project Costs (2024 $)				
Right of Way		-	$400,000	$400,000
Reimbursable Utility Relocation		-	TBD	TBD
Non-Reimbursable Utility Relocation		-	$6,100,000	$6,100,000
Wetland Mitigation		-	$33,200	$66,400
Final Design & Roadway Construction		-	$152,000,000	$152,000,000
Construction Engineering & Inspection		-	$21,600,000	$21,600,000
Preliminary Estimate of Total Project Cost		-	**$180,133,200**	**$180,166,400**

* Manatee Memorial Hospital sign

** Includes 20 residences within Aria Bradenton Apartments, and portions of 2 recreation uses (Bradenton Skatepark/Riverwalk and Palmetto Estuary Preserve

5.6 Selection of the Preferred Alternative

The Preferred Alternative is the East Alternative. Although both Build Alternatives would meet the project purpose and need, the East Alternative was selected because it:

- Eliminates Section 4F impacts south of the DeSoto Bridge at the Bradenton Riverwalk and the Bradenton Riverwalk Skatepark.
- Eliminates a parcel acquisition from the City of Bradenton which would impact parking to businesses.
- Provides an increased green area to provide Best Management Practices (BMP) as requested by the SWFWMD.

The preliminary design plans for the Preferred Alternative are included in **Appendix A.**

6. AGENCY COORDINATION & PUBLIC INVOLVEMENT

6.1 Agency Coordination

Coordination has been ongoing throughout the project with local government entities and the public. In addition to the scheduled public meetings, there were 20 meetings held with elected and appointed officials and agencies, such as Manatee County, the City of Bradenton, and the City of Palmetto, to share information about the project and receive feedback. Four presentations were given to the Sarasota/Manatee County MPO and their committees. Throughout all the meetings no preference of an alternative was prevalent from meeting participants.

6.2 Public Involvement

A PIP was developed and approved in April 2023. The PIP was implemented in compliance with Part 1, Chapter 11 of the FDOT *Project Development and Environment Manual (PD&E Manual)*; Florida Statute 339.155; Executive Orders 11990 and 11988; Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (NEPA) and 23 CFR 771.

FDOT utilized the PIP to obtain input and involvement from the public, key stakeholder groups, and others who could be affected by, benefit from, and/or have an interest in the proposed project. Most of the public involvement resources have been directed toward communicating with people who live, work, or have an interest in the DeSoto Bridge PD&E Study. One of the primary goals was to provide affected communities with clear, consistent, accurate, and current information about the project throughout the NEPA process including the alternatives being examined. The Comments and Coordination Report will provide documentation of outreach activities the FDOT has conducted and the comments that have been submitted.

6.3 Public Hearing

A Public Hearing is scheduled for April 30, 2024. The hearing will inform the public of the results of the PD&E Study associated with the No-Build and the Preferred East Alternative.

7. PREFERRED ALTERNATIVE

7.1 Typical Sections

The proposed roadway improvements utilize a realignment of SR 55, allowing construction to take place without closing the DeSoto Bridge. The approach roadway includes two 12-foot travel lanes in each direction separated by a 22-foot raised median with Type E and F curb along the inside and outside lanes, respectively. A 12-foot wide shared-use path is proposed on each side of SR 55 (see **Figure 7-1**). The typical section package is included in **Appendix B**. The target, design, and posted speed will be 45 mph from the begin project to the beginning of the proposed bridge. The target, posted, and design speed increases from 45 to 50 mph from the begin bridge of the end of the project.

Figure 7-1 - Proposed DeSoto Bridge Typical Section

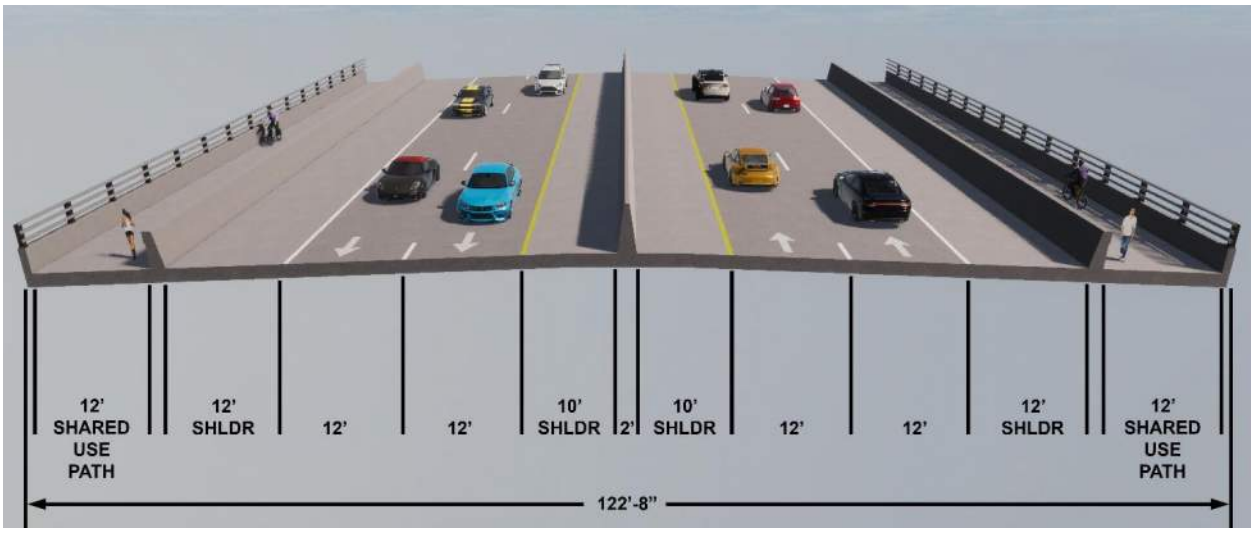


Figure 7-2 - Proposed Typical Section South of the Manatee River

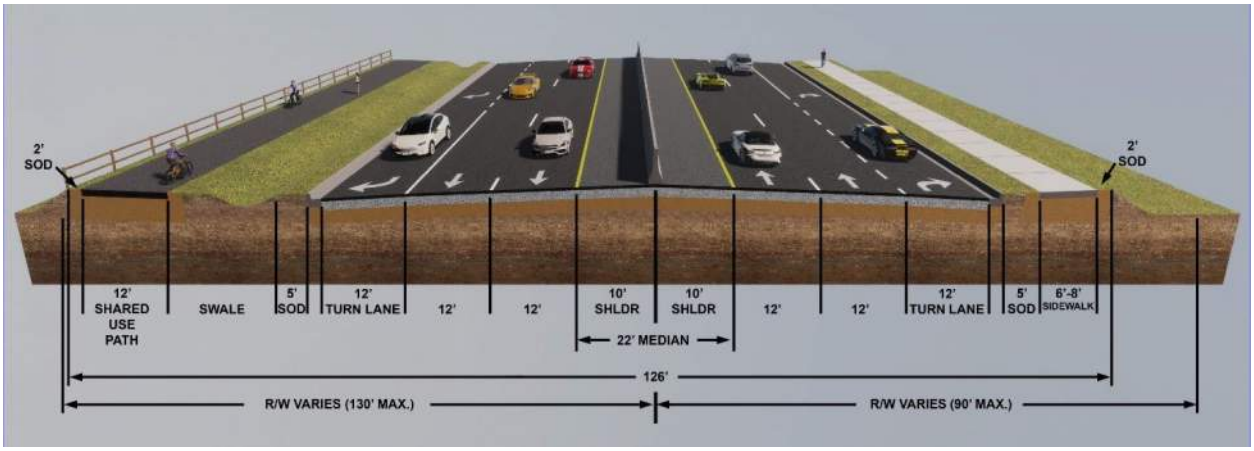
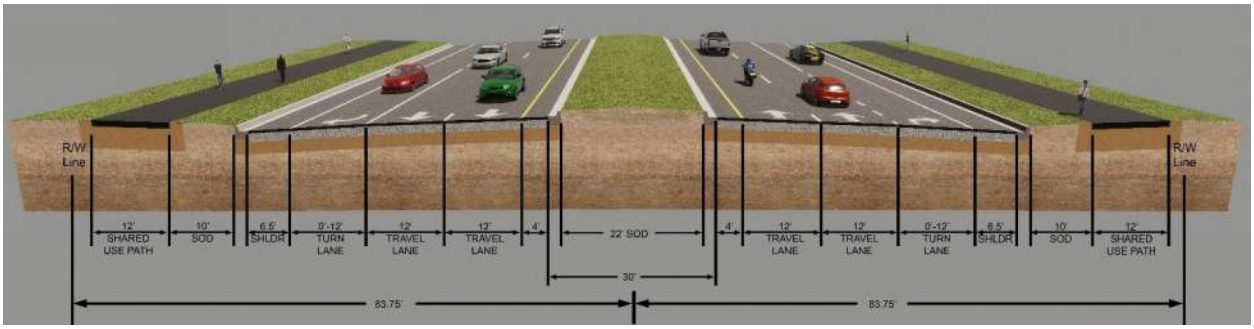


Figure 7-3 – Proposed Typical Section North of the Manatee River



7.2 Access Management

There are no access management changes based on the proposed alternatives.

7.3 Right of Way

The proposed project, as currently designed, will not displace any residences, businesses, or other uses. The Preferred Alternative would require approximately 0.8 acres of additional right-of way from 7 parcels. Should this change over the course of the project, a Right of Way and Relocation Assistance Program will be carried out in accordance with Florida Statute 421.55, Relocation of displaced persons, and the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646 as amended by Public Law 100-17).

7.4 Horizontal and Vertical Geometry

The Preferred East Alternative maintains the existing horizontal alignment 500 ft north of the intersection between SR 55 and SR 64; then tie back to the existing horizontal alignment 1300 ft south of Haben Boulevard. Both alternatives shift to accommodate traffic remaining on the existing bridge during the construction of the improved bridge. Preliminary concept plans showing the horizontal geometry for the Preferred Alternative are provided in **Appendix A.**

The Preferred Alternative will utilize a 3.2% grade to achieve a 40-foot clearance over the Manatee River.

7.5 Design Variations and Design Exceptions

A variation for border width near Manatee Memorial Hospital will be required.

7.6 Multimodal Accommodations

Bicycle and pedestrian facilities will be included within the project limits and on the in-kind replacement bridge with the addition of a 12-foot shared-use path along both sides of SR 55. The 12-foot shared-use path will continue along the edges of the bridge deck, separated with a crash tested barrier.

South of the bridge, a 6 to 8 feet sidewalk will be included on both sides of SR 55 in portions of the corridor. These sidewalks will connect to the 12-ft share use path at the southern approach of

the bridge. In addition, the shared use path on the west side of the facility will have a connection to Riverfront Boulevard, allowing pedestrians and bicyclists access to community recreational spaces along the waterfront. North of the bridge, the 12-ft shared use paths will continue along both sides of SR 55 ending at Haben Boulevard.

7.7 Intersection / Interchange Concepts and Signal Analysis

There are no intersection concepts or signals analyzed within the project areas.

7.8 Tolled Projects

There are no tolled roads within the project area.

7.9 Intelligent Transportation System and TSM&O Strategies

There are no TSM&O improvements within the proposed project limits.

7.10 Landscape

There are locations on both sides of the bridge suitable for landscaping. The design firm will collaborate with local agencies to determine the locations for the proposed landscaping opportunities.

7.11 Lighting

Proposed lighting will be required throughout most of the corridor, due to the impacts to the existing lighting.

7.12 Wildlife Crossings

There are no wildlife crossings within the project area.

7.13 Permits

The U.S. Army Corps of Engineers (USACE) and SWFWMD regulate impacts to wetlands within the project area. Other agencies, including the USFWS, U.S. Environmental Protection Agency, and the Florida Fish and Wildlife Conservation Commission, review and comment on wetland permit applications. The Fish and Wildlife Commission has authority to issue permits for gopher tortoise relocation activities and protected bird nest take. No gopher tortoise burrows, or nests were recorded within the project study area. (refer to the NRE). Additional surveys and coordination may be required during the permitting phase. In addition, the FDEP regulates stormwater discharges from construction sites. The USCG reviews permit applications for new bridges over navigable waters. It is anticipated that the following permits will be required for this project:

Permit	Issuing Agency
Section 404 Dredge and Fill Permit (Nationwide 14)	USACE
ERP	SWFWMD
National Pollutant Discharge Elimination System (NPDES) Permit	FDEP
Bridge Permit	USCG

Section 404 Dredge and Fill Permit

It is anticipated that a Nationwide 14 permit will be required from the USACE. Wetland and surface water impacts are related to proposed modifications to abutments and bridge approaches, and the realigned access roads to the Palmetto Estuary Preserve. A standard permit will require compliance with the 404(b)(1) guidelines, avoidance and minimization, and that unavoidable impacts have been mitigated in the form of wetlands creation, restoration, and/or enhancement.

ERP

SWFWMD requires an ERP when construction of any project results in the creation or modification of a surface water management system or results in impacts to jurisdictional wetlands. This project is anticipated to require an individual permit because of the extent of work proposed over wetlands and surface waters [this includes the Manatee River] exceeds the 0.5-acre threshold of the 0.443 bridge replacement General Permit.

NPDES

According to 40 CFR Part 122, discharging stormwater from point sources into the waters of the U.S. without an NPDES permit is prohibited. Under the State of Florida's authority, delegated to administer the NPDES program, the construction activities associated with this project, which will disturb more than one acre, are required to obtain an individual permit issued in accordance with Chapter 62-620, FAC.

Bridge Permit

The new DeSoto Bridge over the Manatee River will require a Bridge Permit from the USCG due to the Manatee River being a navigable waterway.

7.14 Drainage and Stormwater Management Facilities

The SR 55 project area drains into the Manatee River (WBID #1848A), which is not recognized as an impaired water basin. Roadway widening projects typically require presumptive water quality treatment. However, according to the ERP Pre-Application Meeting on September 7, 2023, water quality treatment is not required for this project because it proposes to replace the existing bridge without adding additional travel lanes. Since the SR 55 crossing of the Manatee River is located at its tidal mouth leading to the Gulf of Mexico, water quantity attenuation is also not required.

Additionally, no floodplain compensation is expected, as the existing floodplain is influenced by tidal conditions.

In summary, no stormwater management facilities or additional right-of-way is required for the ERP. Considering these circumstances, the FDOT will explore the use of best management practices during the final design phase with the goal of improving the quality of conveyed roadway runoff before discharge to the Manatee River.

Based on gutter spread calculations, bridge end drainage is recommended and will be an improvement to the existing bridge with scuppers which drain the bridge runoff directly into the river. Drainage for the proposed bridge will be collected in curb inlets located at either ends of the bridge and, conveyed with the SR 55 roadway runoff to a facility that takes advantage of the proposed condition at the outfall locations. For example, at the south end of the bridge, the western roadside will have expanded green space, which can be utilized as a bioretention swale. The south bridge end drainage and the SR 55 runoff draining from north of Manatee Ave can be discharged to this area. The bioretention system can be equipped with a filtration strip and a perforated pipe which would then convey the treated water north to Manatee River.

Similarly, on the north end of the bridge, the bridge end drainage can be collected by curb inlets at the northern bridge end and conveyed with the rest of the project runoff draining from south of Haben Boulevard to the western roadside area. In this location, one of the drainage junction structures required could serve as a structural facility, such as a Continuous Deflection Separation unit, to hydrodynamically separate debris, sediment, and hydrocarbons before discharging to the Manatee River see **Appendix G**, **Drainage Map for East Alternative**.

7.15 Floodplain Analysis

Due to tidal conditions, there is no existing floodplain within the project area.

7.16 Bridge and Structure Analysis

The East Alternative will replace the existing structure (Bridge No. 130053) with a fixed bridge with navigational clearances of 40-foot minimum vertical and 75-foot horizontal. The structure design for the PD&E Study is based on the following elements:

Bridge Environmental Classification

The bridge is in an area classified as a marine environment and is anticipated to be classified as "extremely aggressive" for both the substructure and superstructure.

Bridge Superstructure

A superstructure consisting of approximately 150' spans using simple span precast concrete FIB-72 or FIB-78 girders. These span lengths are considered reasonable for standard delivery methods and routes, and the weight of these beams is not expected to require special

coordination with FDOT's Permit Office for Over-Weight/Over-Dimension vehicles. The arrangement of the spans and the type of superstructure will be further evaluated during the design phase and documented in the Bridge Development Report (BDR).

Aesthetics Features

The viewsheds within this area include the Manatee River and nearby parks with some of the immediately adjacent and surrounding area providing scenic views of natural resources including vegetation and wildlife.

Bridge Aesthetics

Bridge aesthetics include multi-column piers placed side-by-side to produce a visually appealing structure. Aesthetics will be further evaluated during the design phase and documented in the BDR.

Bridge Substructure

A substructure consisting of two multi-column piers that can be independently constructed during the two construction phases (see section 7.18 Constructability). It is anticipated that all piers will be in the water and will utilize waterline footings, except the first pier on the south side which will have a buried footing. Repetitive details could be utilized to reduce cost, increase constructability, and enhance the feasibility of using precast elements for the footings and columns if desired. The substructure type will be further evaluated during the design phase and documented in the BDR.

Bridge Foundation

Based on limited available project geotechnical data, it is anticipated that 24" precast concrete piles could be utilized. Installation of the proposed piles without impacting the existing piles appears possible since the majority of the proposed piers can be located away from existing foundations. This minimizes the potential for vibration impacts during construction of proposed pilings and avoids potential conflicts with the existing piles, allowing them to remain in place and be cut off a minimum of 2' below the groundline. It is possible that proposed pier locations may be located where there is a potential for conflict between the existing and proposed piles. Therefore, removal of the existing piles may be required, but will be avoided if possible, by carefully evaluating footing locations. The foundation types and location will be further evaluated during the design phase and documented in the BDR.

Horizontal And Vertical Geometry

The horizontal and vertical geometry for the Preferred Alternative is discussed below and shown on the concept plans included in **Appendix A**.

Bridge Layout

The proposed span arrangement of the new bridge was based on maintaining a 75' horizontal clearance between bridge fenders to match the existing navigational channel. This can be accomplished with an approximate 150' main channel span and seven approximate 150' approach spans on both sides. The preliminary span arrangement was chosen to maximize the distance to existing bridge foundations and to minimize bridge hydraulics impacts. It is anticipated that piers may need to be placed near Riverside Boulevard and Bradenton Riverwalk Skatepark near existing pier locations. Mechanically-stabilized earth (MSE) retaining walls are anticipated to be utilized to eliminate the use of embankment slopes and limit the need for additional ROW. The span arrangement and wall layout will be further evaluated during the design phase and documented in the BDR.

Bridge Horizontal Alignment

For the Preferred East Alternative, the horizontal alignment of the roadway mirrors that of the existing road before incorporating reverse curves. This adjustment shifts the centerline of the new bridge to the east of the existing bridge, facilitating phased construction of the bridge.

Bridge Vertical Alignment

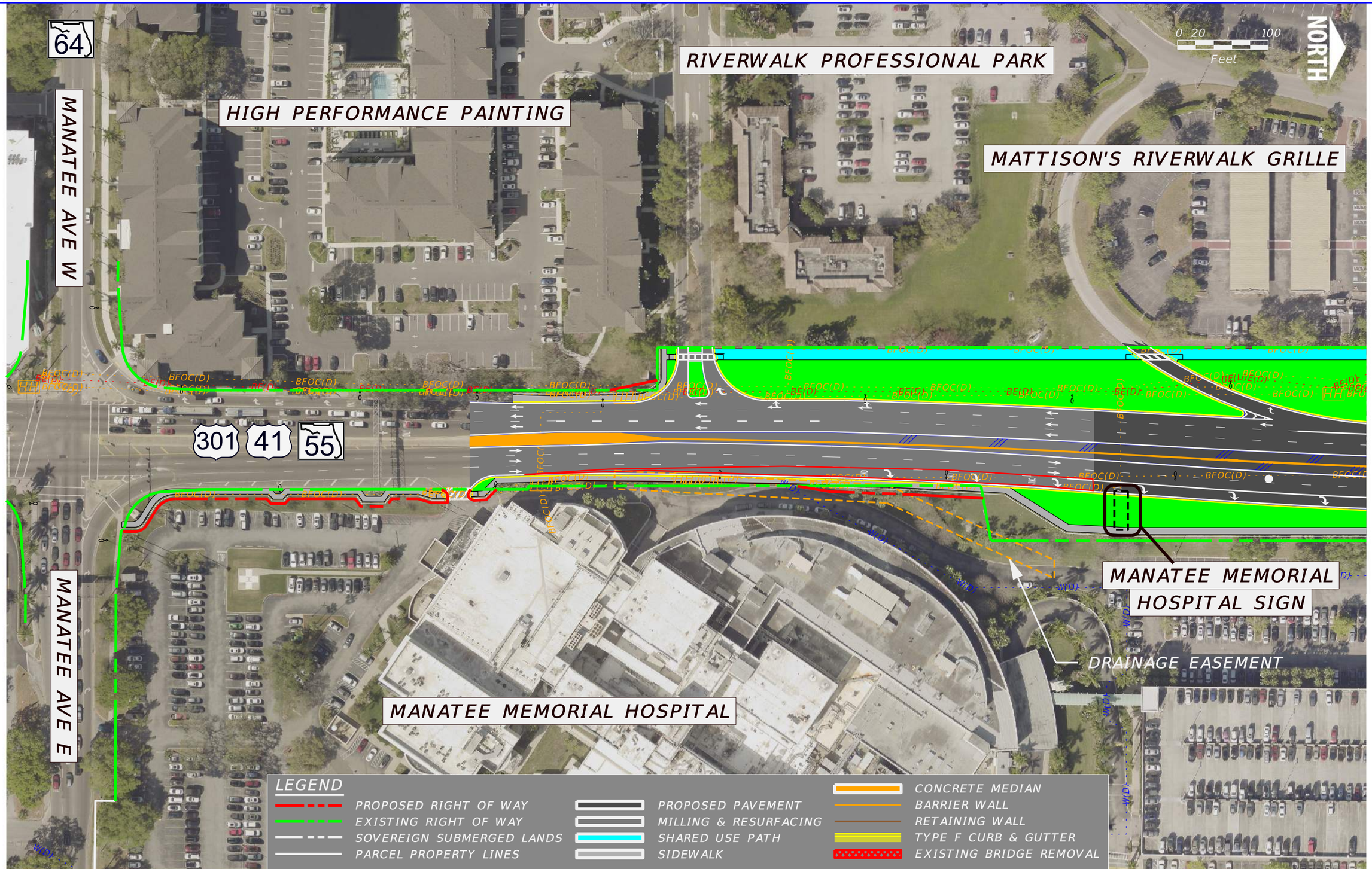
The vertical alignment is based on a vertical clearance evaluation that considered the purpose and need for the project, impacts on both the north and south, channel location and topography, surrounding resources, maintenance, and connectivity. The preliminary clearance determination received from our USCG coordination meeting February 2024, noted that a minimum vertical clearance of 40-foot above MHW for a fixed bridge will meet the reasonable needs of navigation for this bridge crossing.

7.17 Transportation Management Plan

The objectives of the Transportation Management Plan are to ensure that existing traffic along SR 55 experiences minimal disruptions. Construction activities on SR 55, particularly in sections of the existing roadway, will be conducted in phases to maintain four lanes of traffic (two in each direction) during peak travel hours, with lane closures occurring at night during off-peak hours. These lane closure schedules will be coordinated with Manatee County, and the Cities of Bradenton and Palmetto. Resurfacing project FPID 447379-1 will eliminate the need to accommodate bicyclists and pedestrians on the bridge due to thrie beam being constructed on the existing traffic railing.

Further coordination will be necessary with Manatee Memorial Hospital and Manatee County Emergency Services during the final design phase to ensure uninterrupted access to the hospital is maintained throughout the construction period. This coordination with local emergency service providers is critical for facilitating accommodations and planning for emergency vehicle routes

APPENDIX A – Preliminary Concept Plans



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DATE	DESCRIPTION	DATE	DESCRIPTION	GAIL L. WOODS, P.E. LICENSE NUMBER 45424 TRANSYSTEMS CORPORATION CONSULTANTS 200 EAST ROBINSON STREET, SUITE 600 ORLANDO, FL 32801	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		1
					SR 55	MANATEE	44263025201		

$DATES $TIMES $USERS $FILES

THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

COURTYARD MARRIOTT BRADENTON

RIVERFRONT BLVD.

BRADENTON RIVERWALK SKATE PARK

MANATEE RIVER

0 20 100
Feet

NORTH

MATTISON'S RIVERWALK GRILLE

301 41 55

BRADENTON RIVERWALK SKATE PARK

RIVERFRONT BLVD.

MANATEE MEMORIAL

LEGEND

- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- SOVEREIGN SUBMERGED LANDS
- PARCEL PROPERTY LINES
- PROPOSED PAVEMENT
- MILLING & RESURFACING
- SHARED USE PATH
- SIDEWALK
- CONCRETE MEDIAN
- BARRIER WALL
- RETAINING WALL
- TYPE F CURB & GUTTER
- EXISTING BRIDGE REMOVAL

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

GAIL L. WOODS, P.E.
LICENSE NUMBER 45424
TRANSYSTEMS CORPORATION CONSULTANTS
200 EAST ROBINSON STREET, SUITE 600
ORLANDO, FL 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 55	MANATEE	44263025201

DESOTO BRIDGE REPLACEMENT
EAST ALTERNATIVE

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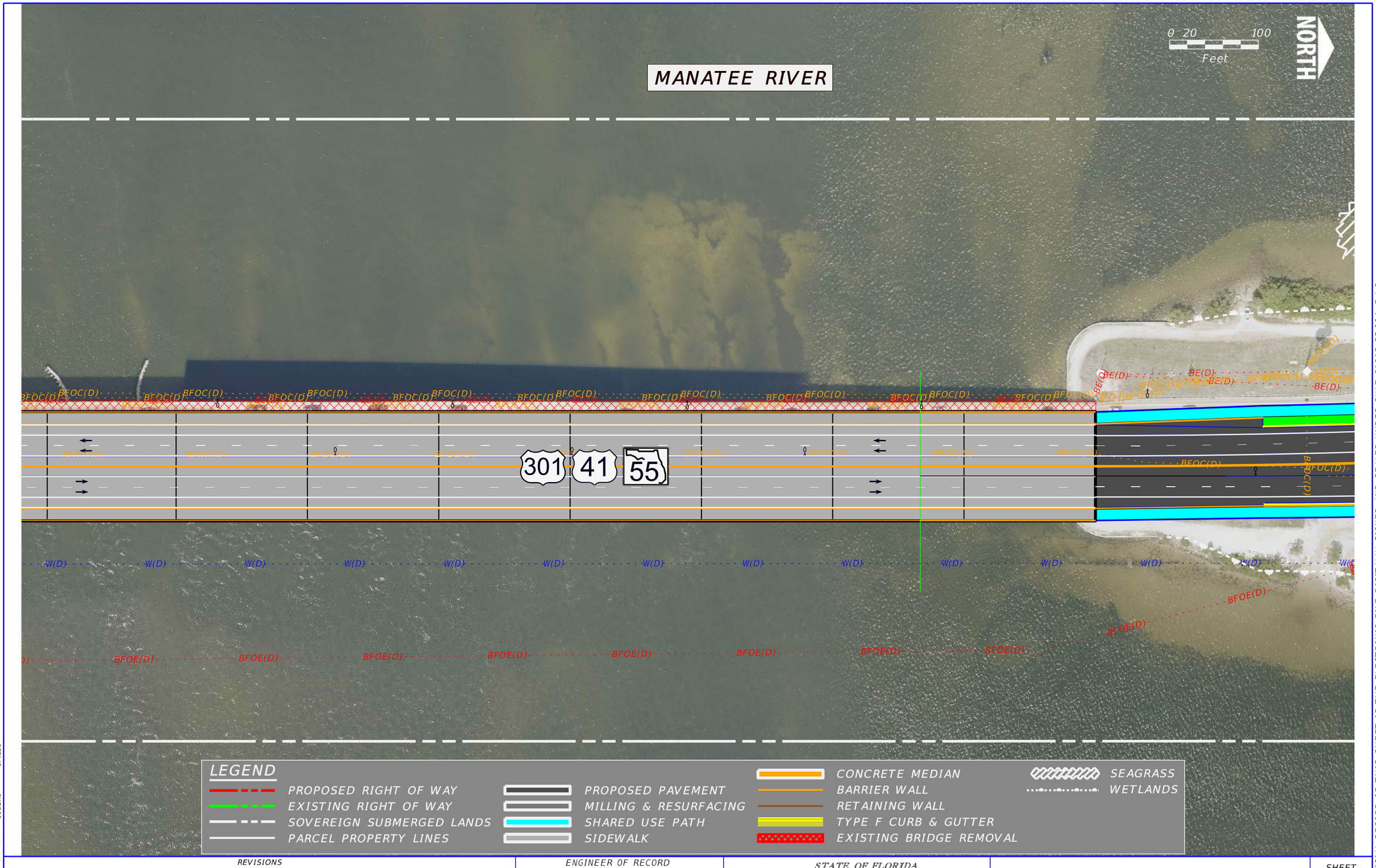

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

GAIL L. WOODS, P.E.
LICENSE NUMBER 45424
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ORLANDO, FL 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 55	MANATEE	44263025201

DESOTO BRIDGE REPLACEMENT EAST ALTERNATIVE

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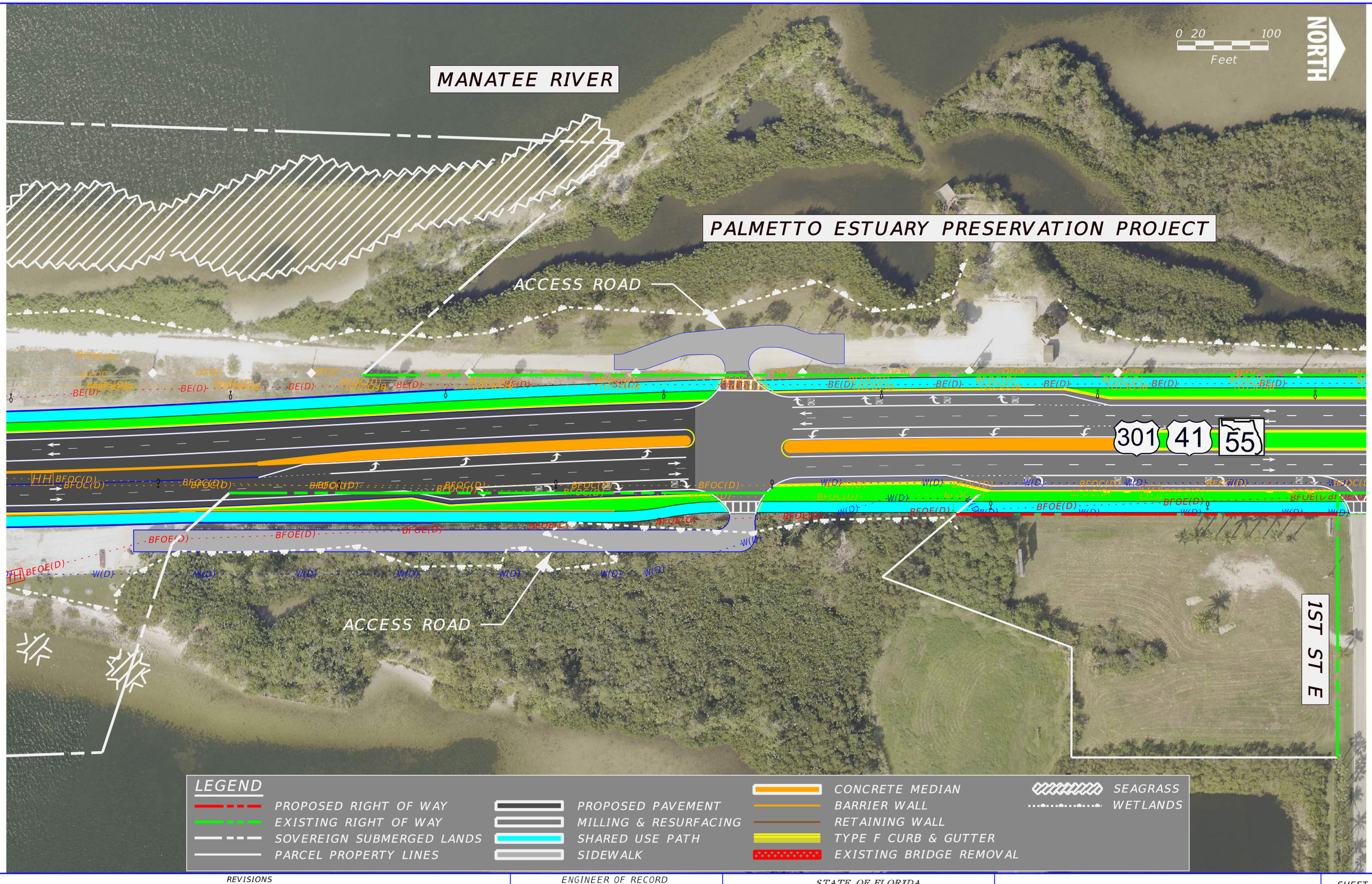

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GAIL L. WOODS, P.E.
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TRANSYSTEMS CORPORATION CONSULTANTS
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ORLANDO, FL 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 55	MANATEE	44263025201

DESOTO BRIDGE REPLACEMENT EAST ALTERNATIVE

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PALMETTO ESTUARY PRESERVATION PROJECT

0 20 100
Feet

NORTH

301 41 55

1ST ST E

7 ELEVEN STORE

HABEN BLVD

LEGEND

- PROPOSED RIGHT OF WAY
- EXISTING RIGHT OF WAY
- SOVEREIGN SUBMERGED LANDS
- PARCEL PROPERTY LINES
- PROPOSED PAVEMENT
- MILLING & RESURFACING
- SHARED USE PATH
- SIDEWALK
- CONCRETE MEDIAN
- BARRIER WALL
- RETAINING WALL
- TYPE F CURB & GUTTER
- EXISTING BRIDGE REMOVAL
- SEAGRASS
- WETLANDS

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

GAIL L. WOODS, P.E.
LICENSE NUMBER 45424
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ORLANDO, FL 32801

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 55	MANATEE	44263025201

DESOTO BRIDGE REPLACEMENT
EAST ALTERNATIVE

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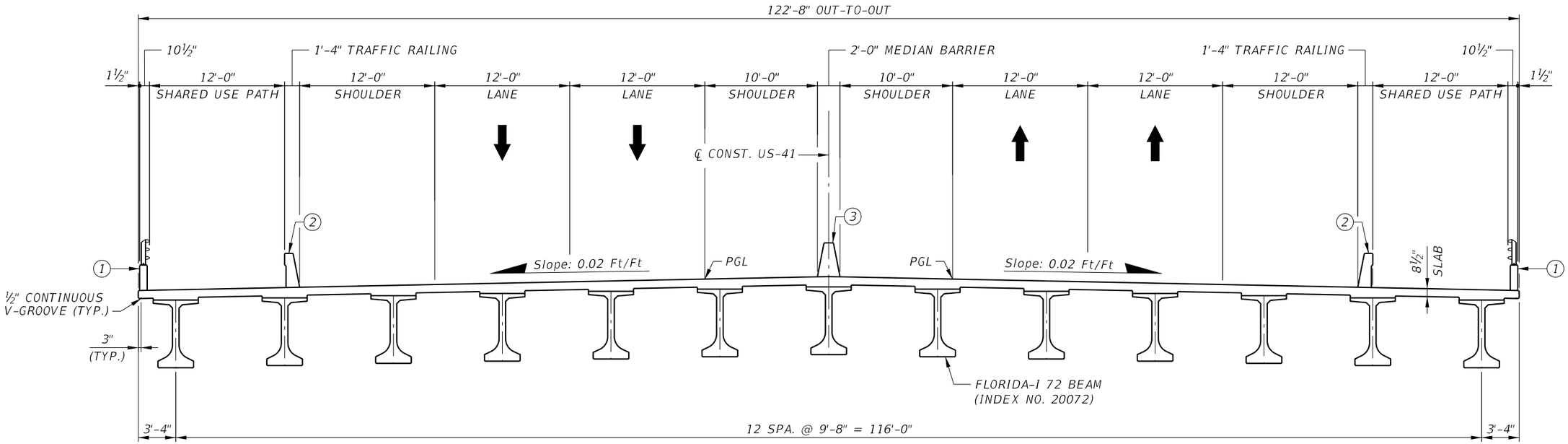

PROPOSED TYPICAL SECTION

LEGEND:

(1) 27" CONCRETE PARAPET PEDESTRIAN/BICYCLE WITH BULLET RAILING (INDEX 521-820) (TYP.)

(2) TRAFFIC RAILING (36" SINGLE SLOPE) (INDEX 521-427) (TYP.)

(3) TRAFFIC RAILING (MEDIAN 36" SINGLE SLOPE) (INDEX 521-426)

BRIDGE NO. XXXXXX

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Transystems Corporation Consultants
12802 Tampa Oaks Blvd., Suite 330
Tampa, FL. 33637
PH. (813) 379-2218
Kenneth R. Kerr, P.E. 60888

DRAWN BY: RLL
CHECKED BY:
DESIGNED BY:
CHECKED BY:

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 41	MANATEE	442630-1-22-01

SHEET TITLE: PROPOSED TYPICAL SECTION

REF. DWG. NO.

PROJECT NAME: DESOTO BRIDGE REPLACEMENT OVER MANATEE RIVER

SHEET NO.

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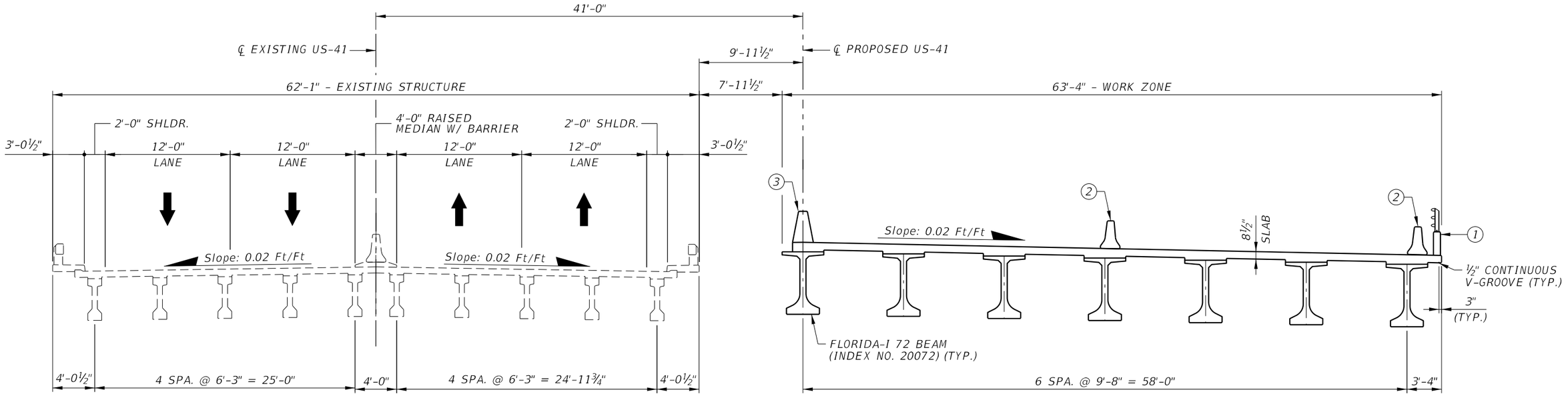
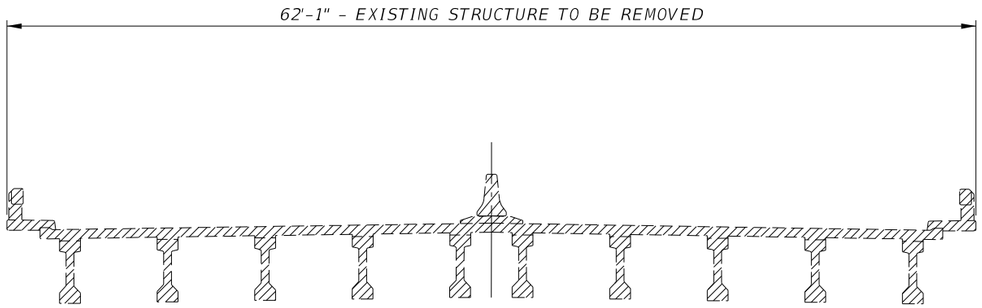


LEGEND:

(1) 27" CONCRETE PARAPET PEDESTRIAN/BICYCLE WITH BULLET RAILING (INDEX 521-820) (TYP.)

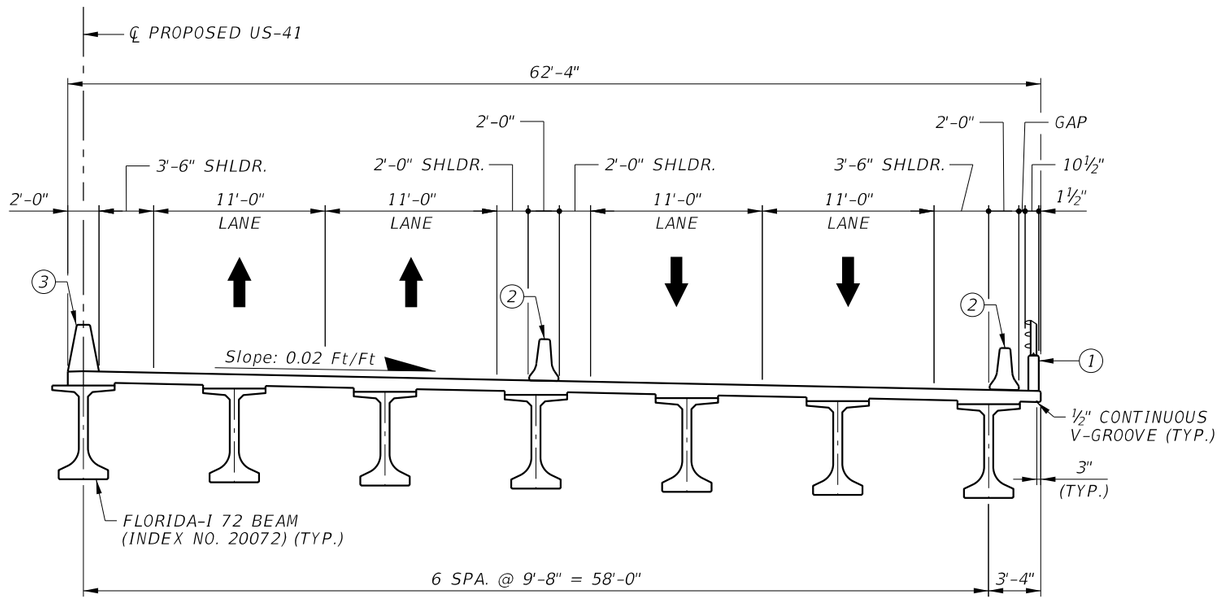
(2) TYPE K TEMPORARY CONCRETE BARRIER SYSTEM (INDEX 102-110) (TYP.)

(3) TRAFFIC RAILING (MEDIAN 36" SINGLE SLOPE) (INDEX 521-426)



PHASE 1 CONSTRUCTION

PHASE 1 CONSTRUCTION NOTES:
1. CONSTRUCT PORTION OF PROPOSED STRUCTURE.
2. PLACE TYPE K TEMPORARY BARRIER SYSTEMS ON PROPOSED STRUCTURE.



PHASE 2 DEMOLITION

PHASE 2 DEMOLITION NOTES:
1. SHIFT TRAFFIC FROM EXISTING STRUCTURE TO PROPOSED STRUCTURE.
2. DEMOLISH/REMOVE EXISTING STRUCTURE.

BRIDGE NO. XXXXXX

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Transystems Corporation Consultants
12802 Tampa Oaks Blvd., Suite 330
Tampa, FL. 33637
PH. (813) 379-2218
Kenneth R. Kerr, P.E. 60888

DRAWN BY: RLL
CHECKED BY:
DESIGNED BY:
CHECKED BY:

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

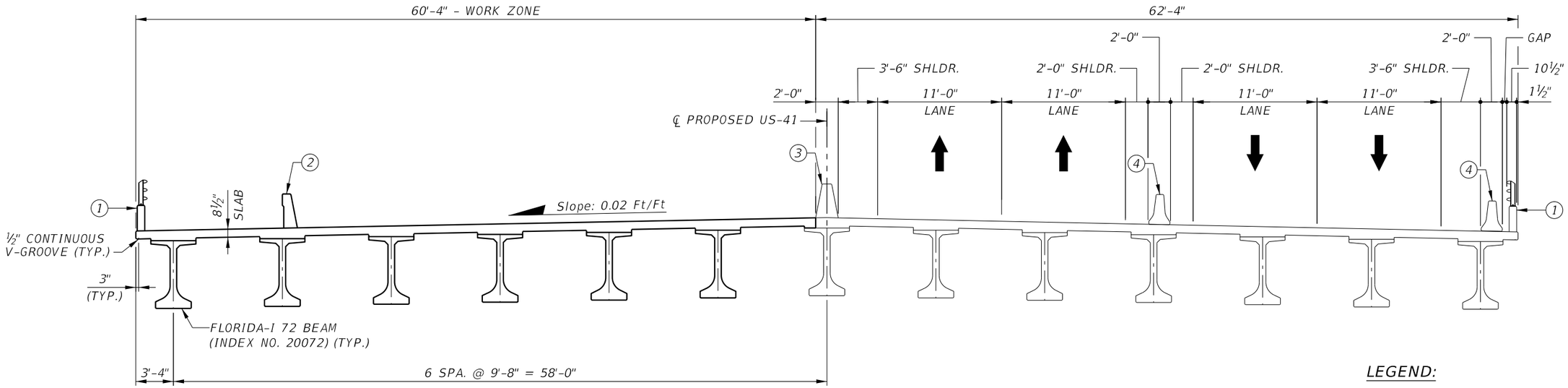
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 41	MANATEE	442630-1-22-01

SHEET TITLE: CONSTRUCTION SEQUENCE EAST ALTERNATIVE (1 OF 2)

REF. DWG. NO.

PROJECT NAME: DESOTO BRIDGE REPLACEMENT OVER MANATEE RIVER

SHEET NO.

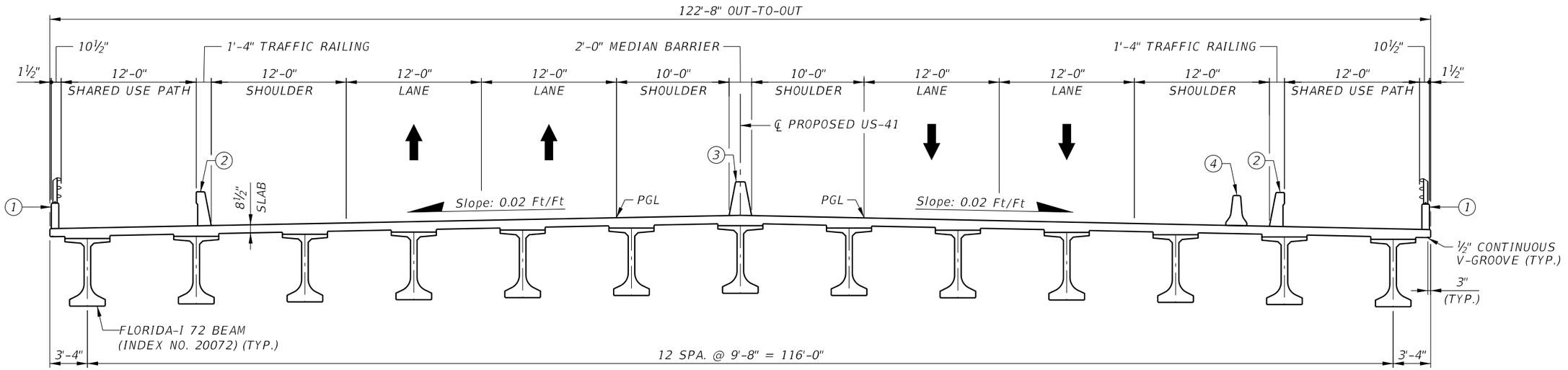


PHASE 2 CONSTRUCTION

PHASE 2 CONSTRUCTION NOTES:
1. CONSTRUCT REMAINDER OF PROPOSED STRUCTURE.

LEGEND:

1. 27" CONCRETE PARAPET PEDESTRIAN/BICYCLE WITH BULLET RAILING (INDEX 521-820) (TYP.)
2. TRAFFIC RAILING (36" SINGLE SLOPE) (INDEX 521-427) (TYP.)
3. TRAFFIC RAILING (MEDIAN 36" SINGLE SLOPE) (INDEX 521-426)
4. TYPE K TEMPORARY CONCRETE BARRIER SYSTEM (INDEX 102-110) (TYP.)



PHASE 3 CONSTRUCTION

PHASE 3 CONSTRUCTION NOTES:
1. REMOVE/MODIFY TYPE K TEMPORARY CONCRETE BARRIER SYSTEMS.
2. SHIFT TRAFFIC TO FINAL CONFIGURATION
3. CONSTRUCT 36" SINGLE-SLOPE TRAFFIC RAILING.

BRIDGE NO. XXXXXX

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

Transystems Corporation Consultants
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Tampa, FL. 33637
PH. (813) 379-2218
Kenneth R. Kerr, P.E. 60888

DRAWN BY: RLL
CHECKED BY:
DESIGNED BY:
CHECKED BY:

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
US 41	MANATEE	442630-1-22-01

SHEET TITLE: CONSTRUCTION SEQUENCE EAST ALTERNATIVE (2 OF 2)

REF. DWG. NO.

PROJECT NAME: DESOTO BRIDGE REPLACEMENT OVER MANATEE RIVER

SHEET NO.

APPENDIX B – Typical Section Package

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

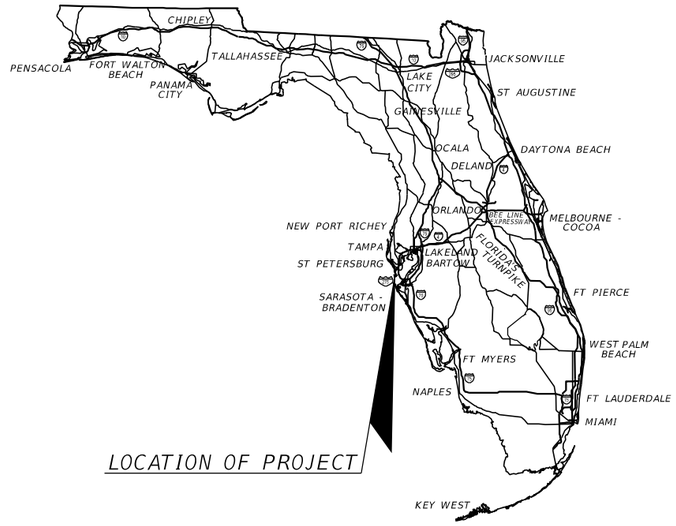
FINANCIAL PROJECT ID 442630-1-22-01
(FEDERAL FUNDS)

MANATEE COUNTY (13130)

STATE ROAD NO. 55 (US 301/US 41)

FROM MANATEE AVENUE WEST (SR 64) TO HABEN BLVD.

PROJECT LOCATION URL:	https://tinyurl.com/2h2r365b
PROJECT LIMITS:	BEGIN MP 2.255 - END MP 3.552
EXCEPTIONS:	N/A
BRIDGE LIMITS:	BR#130053 MP 2.617 - MP 3.038
RAILROAD CROSSING:	N/A



FDOT DISTRICT DESIGN ENGINEER

CONCURRING WITH:
TYPICAL SECTION ELEMENTS
TARGET SPEED
DESIGN & POSTED SPEEDS

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

CONCURRING WITH:
TARGET SPEED
DESIGN & POSTED SPEEDS

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

CONCURRING WITH:
CONTEXT CLASSIFICATION
TARGET SPEED

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

CONCURRING WITH:
TYPICAL SECTION ELEMENTS

FHWA TRANSPORTATION ENGINEER

CONCURRING WITH:
TYPICAL SECTION ELEMENTS

LOCAL TRANSPORTATION ENGINEER

CONCURRING WITH:
TYPICAL SECTION ELEMENTS

NOT USED

CONCURRING WITH:

NOT USED

CONCURRING WITH:

GAIL L WOODS
LICENSE
No 45424
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

THIS ITEM HAS BEEN
DIGITALLY SIGNED AND
SEALED BY

ON THE DATE ADJACENT TO THE SEAL

PRINTED COPIES OF THIS DOCUMENT ARE
NOT CONSIDERED SIGNED AND SEALED
AND THE SIGNATURE MUST BE VERIFIED
ON ANY ELECTRONIC COPIES.

TRANSYSTEMS CORPORATION CONSULTANTS
200 EAST ROBINSON STREET, SUITE 600
ORLANDO, FLORIDA 32801
GAIL L. WOODS, P.E. NO. 45424

THE ABOVE NAMED PROFESSIONAL ENGINEER SHALL BE RESPONSIBLE FOR THE FOLLOWING SHEETS IN ACCORDANCE WITH RULE 61G15-23.004, F.A.C.

INDEX OF SHEETS

SHEET NO.
01

PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

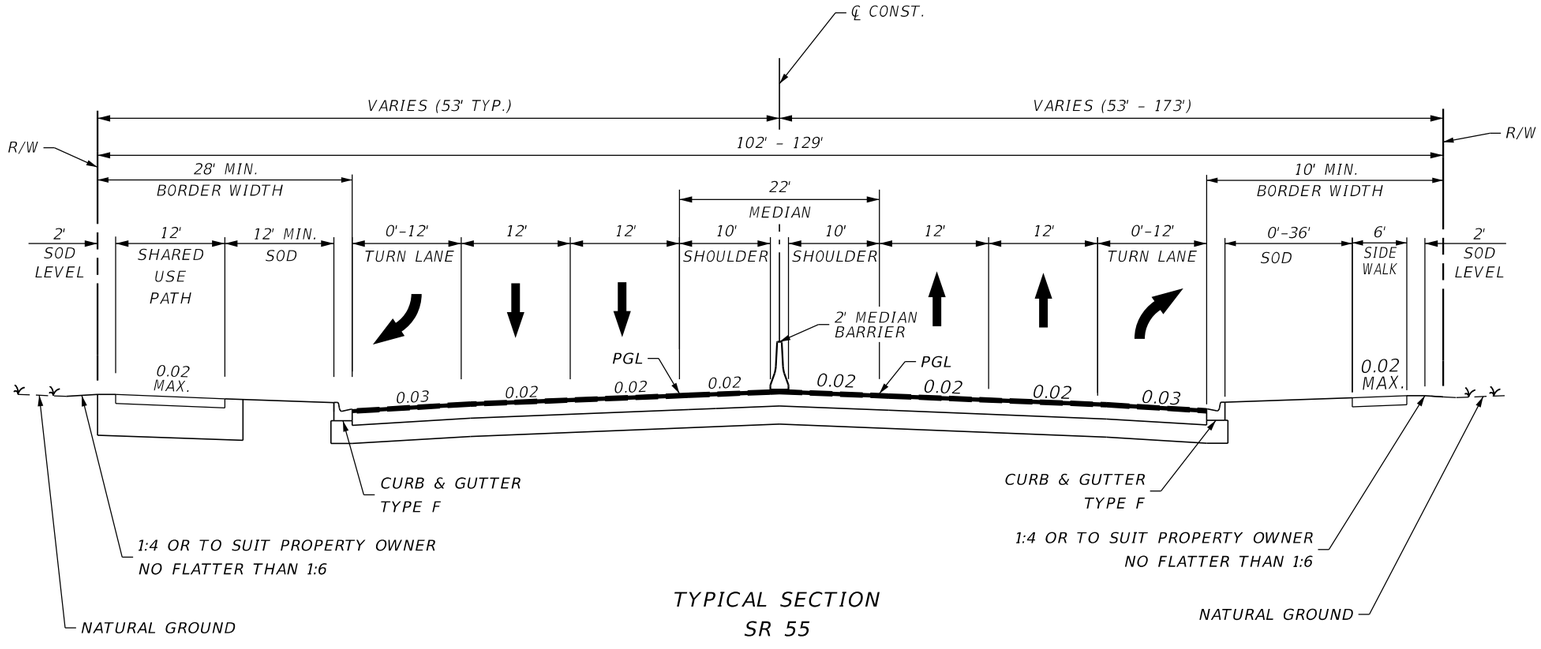
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

- (X) BORDER WIDTH VARIATION ADJACENT TO MANATEE MEMORIAL HOSPITAL

TYPICAL SECTION No. 01



TYPICAL SECTION
SR 55

MP 2.255 TO MP 2.617

TRAFFIC DATA

CURRENT YEAR = 2024 AADT = 68,200
ESTIMATED OPENING YEAR = 2030 AADT = 73,700
ESTIMATED DESIGN YEAR = 2050 AADT = 92,100
K = 9.0% D = 54% T = 7.3% (24 HOUR)
DESIGN HOUR T = 3.7%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
TARGET SPEED = 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
442630-1-22-01	02

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

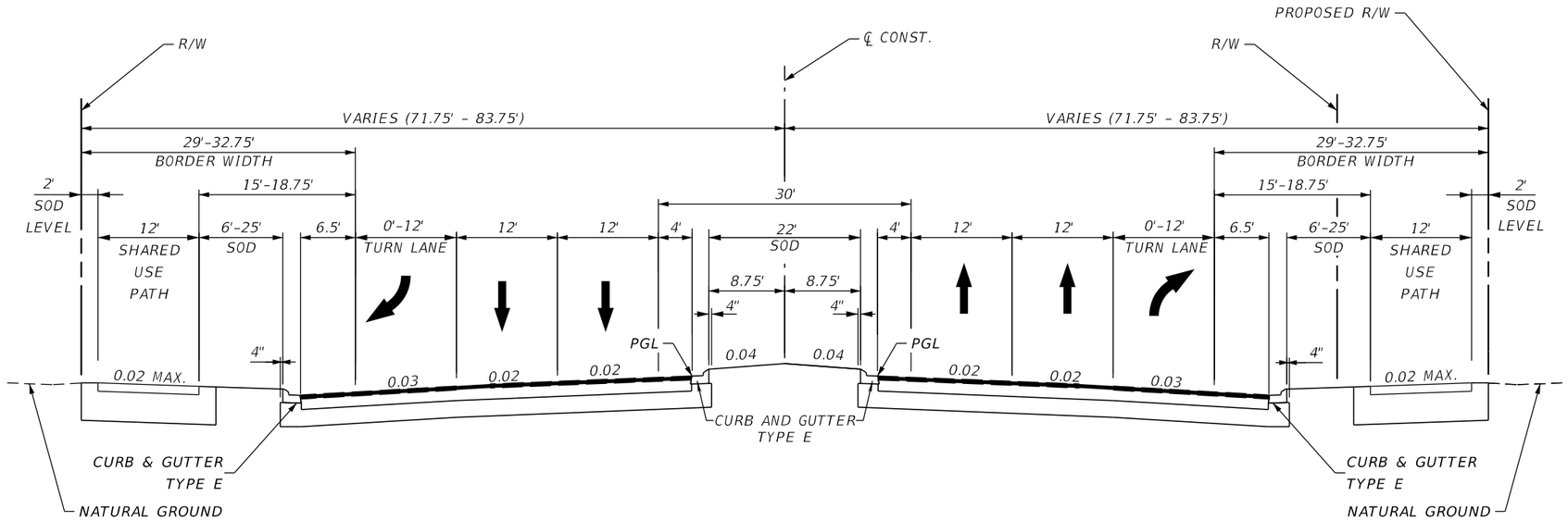
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

(X) BORDER WIDTH VARIATION

TYPICAL SECTION No. 02



TYPICAL SECTION
SR 55

MP 3.038 TO MP 3.552

TRAFFIC DATA

CURRENT YEAR = 2024 AADT = 68,200
ESTIMATED OPENING YEAR = 2030 AADT = 73,700
ESTIMATED DESIGN YEAR = 2050 AADT = 92,100
K = 9.0% D = 54% T = 7.3% (24 HOUR)
DESIGN HOUR T = 3.7%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

FINANCIAL PROJECT ID	SHEET NO.
442630-1-22-01	03

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

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

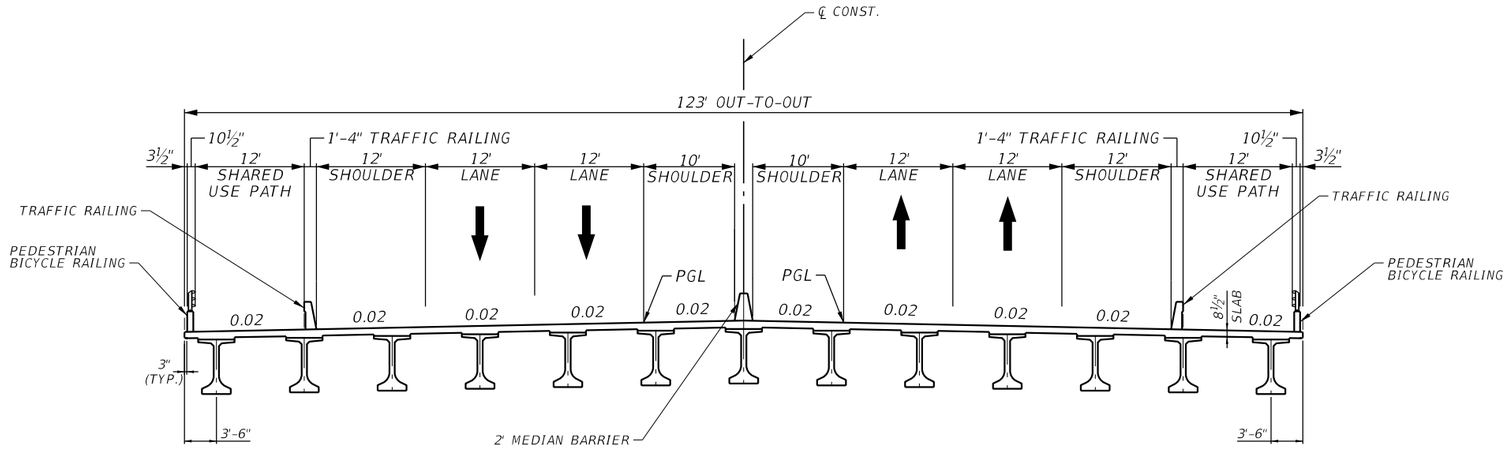
CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

(X) BORDER WIDTH VARIATION

TYPICAL SECTION No. 03



TYPICAL SECTION
SR 55

MP 2.617 TO MP 3.038

TRAFFIC DATA

CURRENT YEAR = 2024 AADT = 68,200
ESTIMATED OPENING YEAR = 2030 AADT = 73,700
ESTIMATED DESIGN YEAR = 2050 AADT = 92,100
K = 9.0% D = 54% T = 7.3% (24 HOUR)
DESIGN HOUR T = 3.7%
DESIGN SPEED = 50 MPH
POSTED SPEED = 50 MPH
TARGET SPEED = 50 MPH

FINANCIAL PROJECT ID	SHEET NO.
442630-1-22-01	04

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.

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APPENDIX C – Long Range Estimate (LRE)

TO BE UPDATED

Date: 9/29/2023 11:55:50 AM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 442630-2-52-01 **Letting Date:** 07/2026

Description: DESOTO BRIDGE FROM 21ST AVE W TO US 19 BRIDGE #130053

District: 01 **County:** 13 MANATEE **Market Area:** 10 **Units:** English

Contract Class: 9 **Lump Sum Project:** N **Design/Build:** Y **Project Length:** 5.242 MI

Project Manager: JMK-MJB-JJM

Version 6 Project Grand Total **$147,846,102.30**

Description: Markups from Version 5P-9/28/23

Sequence: 1 MIS - Miscellaneous Construction **Net Length:** 0.000 MI 0 LF

Description: Bridge No. 130053

Special Conditions: total quantities for twin bridges

BRIDGES COMPONENT

Bridge 130053

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Type	Misc/Rehab
Structure No.	130053
Description	US 41 OVER MANATEE RIVER

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	138,533.00	SF	$46.52	$6,444,555.16

Bridge X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-10	CONC CLASS II, APPROACH SLABS	130.00	CY	$607.00	$78,910.00
400-4-4	CONC CLASS IV, SUPERSTRUCTURE	8,917.00	CY	$1,405.33	$12,531,327.61
400-4-5	CONC CLASS IV, SUBSTRUCTURE	329.00	CY	$1,664.08	$547,482.32
400-4-25	CONC CLASS IV, MASS, SUBSTRUCTURE	16,432.00	CY	$1,027.21	$16,879,114.72
400-7-1	BRIDGE DECK GROOVING	23,123.00	SY	$7.62	$176,197.26
400-9-1	BRIDGE DECK PLANING	23,123.00	SY	$7.45	$172,266.35
400-147	COMPOSITE NEOPRENE PADS	320.00	CF	$1,190.12	$380,838.40
415-1-4	REINF STEEL- SUPERSTRUCTURE	1,828,081.00	LB	$1.27	$2,321,662.87
415-1-5	REINF STEEL- SUBSTRUCTURE	3,581,943.00	LB	$1.40	$5,014,720.20
415-1-9	REINF STEEL- APPROACH SLABS	25,989.00	LB	$1.29	$33,525.81
450-2-84	PREST BEAMS: FLORIDA-I BEAM 84"	15,420.00	LF	$455.12	$7,017,950.40
455-34-6	PRESTRESSED CONCRETE PILING, 30" SQ	75,735.00	LF	$295.37	$22,369,846.95

455-133-2	SHEET PILING STEEL, TEMPORARY-CRITICAL	7,200.00	SF	$18.34	$132,048.00
455-143-6	TEST PILES-PREST CONCRETE,30" SQ	3,000.00	LF	$436.42	$1,309,260.00
458-1-11	BRIDGE DECK EXPANSION JNT,NEW,POURED	1,392.00	LF	$57.72	$80,346.24
460-71-2	METAL TRAF RAILING, STEEL POST AND RAIL	4,930.00	LF	$103.27	$509,121.10
471-1-1	FENDER SYS,PLASTIC MARINE LUMBER,REINF	472.00	MB	$23,893.98	$11,277,958.56
506-2	BRIDGE DRAINAGE PIPE	1,000.00	LF	$203.01	$203,010.00
506-3	BRIDGE DRAINS	4.00	EA	$3,503.95	$14,015.80
515-2-213	PED/BICYCLE RAILING,STL, 42" TYPE 3	4,930.00	LF	$130.95	$645,583.50
521-5-12	CONC TRAF RAIL- BRG, 36" MED SING SLOPE	60.00	LF	$145.98	$8,758.80
521-5-13	CONC TRAF RAIL- BRIDGE, 36" SING SLOPE	4,800.00	LF	$119.87	$575,376.00
630-2-16	CONDUIT, F& I, EMBEDDED-BARR./RAILINGS	4,920.00	LF	$10.73	$52,791.60
635-3-13	JUNCTION BOX, FURNISH & INSTALL, EMBED	20.00	EA	$582.24	$11,644.80
	Bridge 130053 Total				$88,788,312.45
	Bridges Component Total				$88,788,312.45

MISCELLANEOUS COMPONENT

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
108-1	MONITOR EXISTING STRUCTURES- SETTL	1.00	LS	$5,000.00	$5,000.00
108-2	MONITOR EXISTING STRUCTURES- VIBRA	1.00	LS	$5,000.00	$5,000.00
108-3	MONITOR EXISTING STRUCTURES- GROUN	1.00	LS	$5,000.00	$5,000.00
	Miscellaneous Component Total				$15,000.00

Sequence 1 Total $88,803,312.45

Sequence: 2 NDU - New Construction, Divided, Urban **Net Length:** 0.379 MI 2,000 LF

Description: 1000 feet of roadway approach work for each side of bridge

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	100.00 / 100.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.379
Top of Structural Course For Begin Section	110.00
Top of Structural Course For End Section	110.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	9.19	AC	$39,035.03	$358,731.93
120-6	EMBANKMENT	124,410.37	CY	$12.29	$1,529,003.45
	Earthwork Component Total				$1,887,735.38

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Roadway Pavement Width L/R	36.00 / 36.00
Structural Spread Rate	330
Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	18,293.92	SY	$10.64	$194,647.31
285-709	OPTIONAL BASE,BASE GROUP 09	16,000.51	SY	$17.79	$284,649.07
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,640.08	TN	$162.02	$427,745.76
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	1,320.04	TN	$171.87	$226,875.27

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
102-2-1	SPECIAL DETOUR 1	1.00	LS	$250,000.00	$250,000.00
102-2-2	SPECIAL DETOUR 2	1.00	LS	$250,000.00	$250,000.00
102-71-15	TEMPORARY BARRIER, F&I, ANCHORED	4,600.00	LF	$26.04	$119,784.00
102-71-16	TEMPORARY BARRIER, F&I, FREE STAND	2,000.00	LF	$20.24	$40,480.00
102-71-25	TEMPORARY BARRIER, REL, ANCHORED	4,600.00	LF	$8.82	$40,572.00

102-71-26	TEMPORARY BARRIER, REL, FREE STAND	2,000.00 LF	$7.50	$15,000.00
536-8-111	CUARDR CONN TO RIGID BA, F&I, APPR N2	8.00 EA	$2,757.77	$22,062.16
536-85-20	GUARDRAIL END TREAT-TRAILING ANCHORAGE	8.00 EA	$1,770.93	$14,167.44

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	256.00	EA	$3.78	$967.68
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.52	GM	$1,082.67	$1,645.66
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	1.52	GM	$490.45	$745.48
711-16-101	THERMOPLASTIC, STD-OTH, WHITE, SOLID, 6"	1.52	GM	$4,624.25	$7,028.86
711-16-131	THERMOPLASTIC, STD-OTH, WHITE, SKIP, 6"	1.52	GM	$1,428.87	$2,171.88

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 0.00
Bike Path Structural Spread Rate	0
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
339-1	MISCELLANEOUS ASPHALT PAVEMENT	16.67	TN	$431.12	$7,186.77
536-1-1	GUARDRAIL- ROADWAY, GEN TL-3	500.00	LF	$29.06	$14,530.00
	Roadway Component Total				$1,920,259.34

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	12.25 / 12.25
Total Outside Shoulder Perf. Turf Width L/R	5.00 / 5.00
Sidewalk Width L/R	5.00 / 5.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	2,222.29	SY	$82.86	$184,138.95

570-1-2	PERFORMANCE TURF, SOD	2,222.29	SY	$5.70	$12,667.05

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	4,200.00	LF	$34.76	$145,992.00

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	4,000.13	LF	$2.65	$10,600.34
104-11	FLOATING TURBIDITY BARRIER	6,000.00	LF	$10.46	$62,760.00
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	94.70	LF	$6.87	$650.59
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$3,016.20	$3,016.20
104-18	INLET PROTECTION SYSTEM	20.00	EA	$144.20	$2,884.00
107-1	LITTER REMOVAL	9.64	AC	$50.49	$486.72
107-2	MOWING	9.64	AC	$95.21	$917.82
	Shoulder Component Total				$424,113.67

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	5.34

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	4,000.13	LF	$38.50	$154,005.00
570-1-1	PERFORMANCE TURF	1,186.70	SY	$2.69	$3,192.22

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-5-12	TRAF SEP CONC-TYPE I, 6' WIDE	750.00	LF	$99.22	$74,415.00
521-1-11	MEDIAN CONC BARRIER, 38" HEIGHT	1,900.00	LF	$138.17	$262,523.00
	Median Component Total				$494,135.23

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	14.00	EA	$6,316.82	$88,435.48
425-1-451	INLETS, CURB, TYPE J-5, <10'	4.00	EA	$9,416.67	$37,666.68
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00	EA	$7,839.86	$15,679.72
425-2-41	MANHOLES, P-7, <10'	2.00	EA	$3,880.57	$7,761.14
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,008.00	LF	$145.59	$146,754.72
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	96.00	LF	$254.61	$24,442.56

430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,896.00 LF	$321.30	$609,184.80
430-524-100	STRAIGHT CONC ENDW 24", SINGLE, 0 ROUND	1.00 EA	$4,371.17	$4,371.17
430-536-100	STRAIGHT CONC ENDW 36", SINGLE, 0 ROUND	1.00 EA	$5,811.68	$5,811.68
430-548-200	STRAIGHT CONC ENDW 48", DOUBLE, 0 ROUND	1.00 EA	$15,214.48	$15,214.48
570-1-1	PERFORMANCE TURF	115.16 SY	$2.69	$309.78
	Drainage Component Total			$955,632.21

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	10.00	AS	$470.22	$4,702.20
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,371.01	$1,371.01
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	$7,323.57	$7,323.57
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	1.00	AS	$14,214.85	$14,214.85
	Signing Component Total				$27,611.63

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MIN

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,000.06	LF	$13.17	$26,340.79
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	396.98	LF	$27.40	$10,877.25
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	14.00	EA	$994.60	$13,924.40
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	7,304.78	LF	$2.79	$20,380.34
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	14.00	EA	$726.31	$10,168.34

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-61-321	LIGHT POLE CMPLT,STD,F&I, 40'MH,10'ARM L	14.00	EA	$8,856.44	$123,990.16
	Subcomponent Total				$205,681.28
	Lighting Component Total				$205,681.28

Sequence 2 Total $5,915,168.74

Sequence: 3 WDU - Widen/Resurface, Divided, Urban

Net Length: 0.455 MI 2,400 LF

Description: Milling and Resurfacing

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	25.00 / 25.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.454
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Existing Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	4.00 % / 4.00 %
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.75	AC	$39,035.03	$107,346.33
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	2,203.57	CY	$16.97	$37,394.58
	Earthwork Component Total				$144,740.91

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	6
Existing Roadway Pavement Width L/R	28.00 / 28.00
Structural Spread Rate	330
Friction Course Spread Rate	165
Widened Outside Pavement Width L/R	12.00 / 12.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	275
Widened Friction Course Spread Rate	165

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	7,775.22	SY	$10.64	$82,728.34
285-709	OPTIONAL BASE,BASE GROUP 09	6,575.34	SY	$17.79	$116,975.30
327-70-3	MILLING EXIST ASPH PAVT,4 1/2" AVG DEPTH	14,931.84	SY	$6.07	$90,636.27
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,463.75	TN	$162.02	$399,176.78
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	879.91	TN	$162.02	$142,563.02
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	1,231.88	TN	$171.87	$211,723.22

337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	527.95 TN	$171.87	$90,738.77

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	4

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	307.00 EA	$3.78	$1,160.46
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	3.64 GM	$1,082.67	$3,940.92
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	3.64 GM	$490.45	$1,785.24
	Roadway Component Total			$1,141,428.32

SHOULDER COMPONENT

User Input Data

Description	Value
Existing Total Outside Shoulder Width L/R	12.25 / 12.25
New Total Outside Shoulder Width L/R	7.25 / 19.25
Total Outside Shoulder Perf. Turf Width L/R	5.00 / 5.00
Sidewalk Width L/R	0.00 / 12.00

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,399.76 LF	$34.76	$83,415.66
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,399.76 LF	$34.76	$83,415.66
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	3,199.68 SY	$82.86	$265,125.48
570-1-1	PERFORMANCE TURF	2,666.40 SY	$2.69	$7,172.62

Erosion Control

Pay Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	4,799.52 LF	$2.65	$12,718.73
104-11	FLOATING TURBIDITY BARRIER	45.45 LF	$10.46	$475.41
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	45.45 LF	$6.87	$312.24
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	$3,016.20	$3,016.20
104-18	INLET PROTECTION SYSTEM	21.00 EA	$144.20	$3,028.20
107-1	LITTER REMOVAL	3.96 AC	$50.49	$199.94
107-2	MOWING	3.96 AC	$95.21	$377.03
	Shoulder Component Total			$459,257.17

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	22.00
Performance Turf Width	5.34

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
570-1-1	PERFORMANCE TURF	1,423.86	SY	$2.69	$3,830.18
	Median Component Total				$3,830.18

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	17.00	EA	$6,316.82	$107,385.94
425-1-451	INLETS, CURB, TYPE J-5, <10'	5.00	EA	$9,416.67	$47,083.35
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	256.00	LF	$145.59	$37,271.04
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	72.00	LF	$254.61	$18,331.92
570-1-1	PERFORMANCE TURF	138.17	SY	$2.69	$371.68
	Drainage Component Total				$210,443.93

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	10.00	AS	$470.22	$4,702.20
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,371.01	$1,371.01
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	$289.50	$289.50
700-1-60	SINGLE POST SIGN, REMOVE	10.00	AS	$35.71	$357.10
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00	AS	$6,455.77	$6,455.77
700-2-60	MULTI- POST SIGN, REMOVE	1.00	AS	$826.65	$826.65
	Signing Component Total				$14,002.23

Sequence 3 Total $1,973,702.74

Date: 9/29/2023 11:55:50 AM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 442630-2-52-01 **Letting Date:** 07/2026

Description: DESOTO BRIDGE FROM 21ST AVE W TO US 19 BRIDGE #130053

District: 01 **County:** 13 MANATEE **Market Area:** 10 **Units:** English

Contract Class: 9 **Lump Sum Project:** N **Design/Build:** Y **Project Length:** 5.242 MI

Project Manager: JMK-MJB-JJM

Version 6 Project Grand Total **$147,846,102.30**

Description: Markups from Version 5P-9/28/23

Project Sequences Subtotal			**$96,692,183.93**
102-1	Maintenance of Traffic	15.00 %	$14,503,827.59
101-1	Mobilization	10.00 %	$11,119,601.15
Project Sequences Total			**$122,315,612.67**
Project Unknowns		5.00 %	$6,115,780.63
Design/Build		15.00 %	$19,264,709.00

Non-Bid Components:

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	$150,000.00	$150,000.00
Project Non-Bid Subtotal					**$150,000.00**
Version 6 Project Grand Total					**$147,846,102.30**

APPENDIX D - Agency Coordination

U.S. Coast Guard Coordination Meeting
January 25, 2024
9:30 am – 10:30 am

1. Introductions

Nicole Monies (FDOT) opened the meeting with introductions. Meeting attendees are shown below.

Nicole Monies	FDOT, Permits Coordinator
Steven Andrews	FDOT, Project Manager
Ryan Ellis	FDOT, Environmental Management Office (EMO)
Emily Barnett	FDOT, EMO
Omar Beciero	U.S. Coast Guard
Rafael Rosales	U.S. Coast Guard
Gail Woods, PE	TranSystems, Consultant Project Manager
Kenneth Kerr, PE	TranSystems, Lead Structural Engineer
Will Sloup, PE	TranSystems, Deputy Project Manager
Jonathan Sonek	TranSystems
Tori Kuba	ESA Senior Environmental Scientist
Sandy Scheda	ESA Senior Environmental Scientist

2. Project Overview

Nicole provided a brief overview of the project:

a. In-kind replacement of the DeSoto Bridge (US 301/US 41/SR 55) over the Manatee River. Connects Bradenton & Palmetto.
b. Bridge is past its 50-year life expectancy and is experiencing advanced corrosion issues and requires replacement.
c. Paved shoulders and bicycle/pedestrian facilities will be considered to bring the bridge up to current FDOT design safety standards.

3. Discuss DeSoto Bridge

Gail provided a detailed overview of the project using the roll plot. She explained that the current 4-lane bridge will be replaced with a 4-lane bridge, but that the typical section will be wider inside and outside shoulders, barriers and a shared-use path. The existing bridge typical section is 61 feet wide and the proposed typical section is 123 feet wide. The length and profile of the proposed bridge are essentially the same as the existing bridge.

a. Existing DeSoto Bridge information:
    i. Mid-level fixed structure
    ii. 40-foot Vertical Clearance
    iii. 75-foot Horizontal Clearance
    iv. 2,225-foot Bridge Length
    v. 62-foot Bridge Width

b. Proposed bridge replacement information:
    i. Mid-level fixed structure
    ii. 40-foot Vertical Clearance
    iii. 75-foot Horizontal Clearance
    iv. 2,225-foot Bridge Length
    v. 123-foot Bridge Width

c. Project Alternatives:
Gail described that this PD&E study examined two build alternatives (East, West) along with the No-Build alternative. Construction of each of the build alternatives would be phased in the same way: build new bridge for two travel lanes in one direction, demolish old bridge, then build second new bridge for two travel lanes in the other direction. Through the study of potential impacts, it has been determined that the East Alignment is the Preferred Alternative.
    i. East Alignment
    ii. West Alignment

d. Description of other bridges crossing the Manatee River
Gail described the existing bridges both upstream and downstream of the DeSoto Bridge (see information below). Omar (U.S. Coast Guard) indicated that since the upstream and downstream both have a vertical clearance of 40 feet, the 40-foot vertical clearance proposed for the DeSoto Bridge replacement is acceptable. In addition, 75 feet is an acceptable horizontal clearance since the navigation window is going to remain the same.
    i. I-75 Bridge (Upstream)
        1. 40-foot Vertical Clearance
        2. 75-foot Horizontal Clearance
    ii. CSX Bascule Railroad Bridge (Downstream)
        1. 5-foot Vertical Clearance
        2. 75-foot Horizontal Clearance
    iii. Green Bridge (US 41 Business) (Downstream)

1. 41-foot Vertical Clearance
2. 84-foot Horizontal Clearance

e. Current status and schedule
   i. PD&E
      1. Preferred Alternative: Eastern Alignment
      2. Public Hearing Scheduled for April 2024
   ii. Design
      1. Permit Applications anticipated in early 2026
   iii. Construction
      1. Letting – Spring 2027

4. Permitting Implications

a. Bridge Project Questionnaire
   i. Permit anticipated; therefore, BPQ not needed (Omar agreed that a BPQ was not needed since everyone concurred that the replacement bridge would require a U.S. Coast Guard Bridge permit.)

b. Navigational Impact Study

Tori led the discussion of the navigational impact study. Omar indicated that this study will not be required because the navigation window is being maintained. In addition, the public along the waterway will have an opportunity to comment during the PD&E and permitting processes, so a formal study will not be required

   i. Current nearby water-based land uses
   ii. Navigation through DeSoto Bridge is constrained by upstream and downstream bridge clearances which are similar to DeSoto Bridge clearances.

5. Questions

a. Omar asked if there is federal funding involved in the project.
Response – Gail replied “yes”.

b. Kenneth asked a question about channel alignment, and if the USCG has any data that can be provided.
Response - Omar responded that he is not familiar with channel alignment data, but he could look into it. He indicated that if the data is related to dredging, the U.S. Army Corps of Engineers will have this information.

c. Sandy asked where the permit for this project would be signed.
Response - Omar indicated that this permit will be signed at the District level (it will not go to Washington, DC).

6. Action Items

a. Sandy will prepare and distribute meeting minutes.
b. The project team will continue coordination with the U.S Coast Guard during the design phase of the project and submit a permit application.

Exhibits:

- Project Location Map
- Preferred East Alternative Roll Plot
- Bridge Photos
- Aerial view of DeSoto Bridge
- Adjacent properties within ½ mile (highlight those with water base use i.e. marinas, marine repair, boat ramps, restaurants with docks, etc.)

Meeting Description: SWFWMD Pre-application Meeting **Date:** September 20, 2023

Project Number: 442630-1-22-01 (related to 442630-1-32-01)

Project Name: US 41 Desoto Bridge Replacement PD&E

The following is a summary of the project drainage agenda items and the corresponding discussions during our Pre-Application Meeting with the Southwest Florida Water Management District (SWFWMD) and the Florida Department of Transportation (FDOT) on September 7, 2023. This meeting was conducted virtually. Discussion items from the meeting are provided below in bold italics.

Those in attendance include the following.

- SWFWMD: Chris Kuzlo, PE; Al Gagne
- FDOT: Brent Setchell, PE
- Transystems: Gail Woods, PE; Will Sloup, PE
- ESA: Sandy Scheda; Tori Kuba
- B&N: Mike Mills, PE

I. Introduction of PD&E Project

a. US 41 Desoto Bridge over Manatee River – Bridge replacement, connects Bradenton (south) to Palmetto (north)
b. Existing facility
    i. Bridge – 4-lane w/scuppers
    ii. South of the bridge – urban
        1. Southbound – 2 lanes + turn lanes
        2. Northbound – 2 lanes + turn lanes
    iii. North of the bridge – rural
        1. Southbound – 2 lanes + turn lanes
        2. Northbound – 2 lanes + turn lanes
c. Proposed facility
    The typical sections for the roadway north & south of the bridge, and for the bridge was shared and discussed. The typical sections shown are attached.

    i. Bridge
        1. 4 lanes
        2. 2 outside shoulders
        3. 2 inside shoulders
        4. 2 shared use paths
    ii. South of bridge - urban
        1. Southbound – 2 lanes + turn lanes
        2. Northbound – 2 lanes + turn lanes

3. 2 inside shoulders
4. 2 sidewalk/shared use path

iii. North of bridge - urban
1. Southbound – 2 lanes + turn lanes
2. Northbound – 2 lanes + turn lanes
3. 2 shared use paths

d. Project length
i. Total length – 1.3 miles (6864'); N. of Manatee Ave to Haben Blvd
ii. Bridge reconstruction length– 0.422 miles (2230')
iii. Roadway approach length– 0.878 miles (4634')
e. Public kickoff meeting was held on May 23rd with favorable responses from attendees.

II. Drainage

a. Existing Conditions
i. WBID 1848A – Manatee River Below Braden River: Not a Verified List Waterbody
ii. Manatee River is not an OFW
iii. Hydrologic Soil Group A/D & A
iv. Floodplain – Zone VE (Elevation 11.0)
b. Proposed Conditions
Chris Kuzlo agreed with the following conclusions regarding the primary elements of stormwater management, based on the discussion of the Existing Conditions items listed above.
i. Water quality treatment – presumptive criteria
ii. Water quantity attenuation – not applicable (tidal receiving waters)
iii. Floodplain compensation – not applicable (tidal floodplain)
c. Project Status
i. PD&E
ii. Pond siting
iii. Concept plans to be developed.
iv. Proposed design-build in 2026
d. Pond Siting Considerations
i. Limited existing R/W
ii. Lack of undeveloped lands
iii. 4-lane bridge reconstruction, not widening
Mike Mills made the claim that water quality treatment should not be required for the project. Justification for not requiring water quality treatment was summarized as follows.
1. ***No additional travel lanes are proposed.***
2. ***Improvements proposed (shoulders, sidewalks and/or shared use paths) are all exempt activities.***
3. ***Receiving waters are not OFW's or designated as impaired.***

It was agreed the Desoto Bridge Replacement project would require an Individual Permit because of the extent of work proposed over wetlands and surface waters exceeds the 0.5 acre threshold of the .443 bridge replacement General Permit. However, it is still unclear why this bridge replacement project would be required to provided water quality treatment since the same number of travel lanes is proposed along with the other (exempt) safety improvements.

Chris Kuzlo seemed to agree but stated he would have to research the rule further before making a final decision.

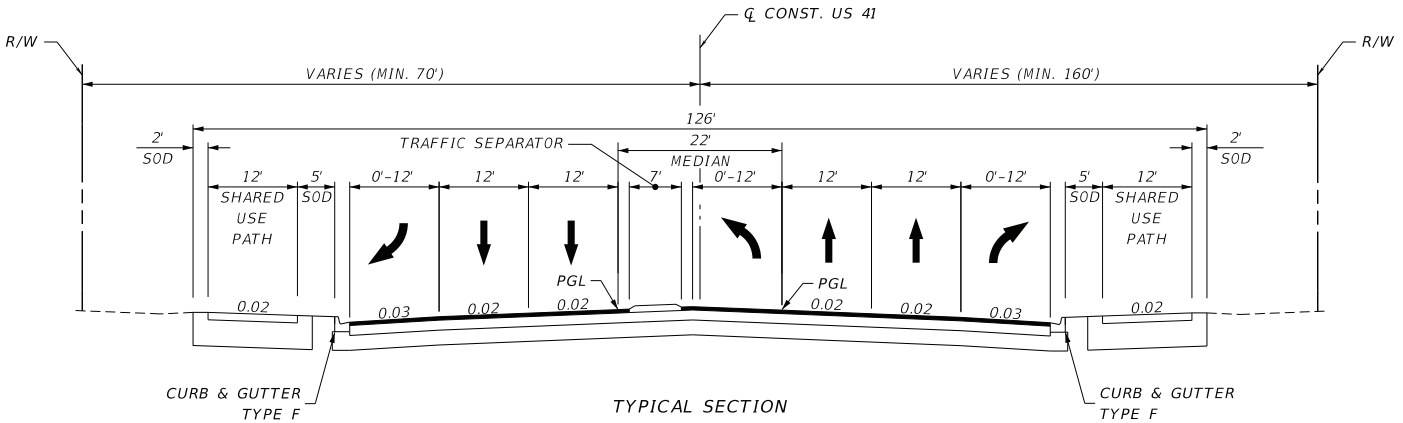
Subsequent to the meeting, Chris replied by email, dated 9/11/23, stating, "I was able to confirm the District would not require a formal water quality treatment for the project."

iv. Water quality treatment requirements for bridge reconstruction
In the event SWFWMD requires water quality treatment for the Desoto Bridge Replacement, the following alternatives for managing the stormwater from the bridge was discussed to confirm their permitability.

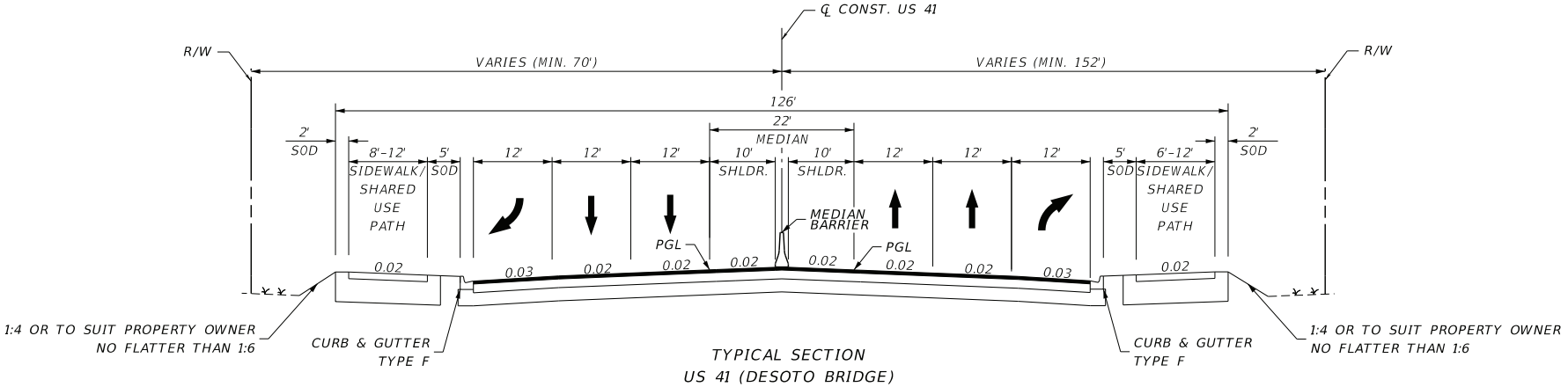
1. Treat runoff from bridge travel lanes at both bridge ends; use two SMFs. ***This approach is the most conventional means for stormwater management and is acceptable.***
2. Treat equivalent runoff from roadway travel lanes at both approaches; use two SMFs and scupper proposed bridge. ***Providing compensatory treatment by treating the runoff from the roadway north and south of the bridge, rather than the bridge runoff, is acceptable.***
3. Treat equivalent runoff from half of bridge travel lanes and the roadway travel lanes from one of the bridge approaches; use one SMF, and scupper other half of bridge. ***Providing compensatory treatment by treating the runoff from half the bridge and half the roadway in a single SMF is acceptable.***
4. Request use of surplus treatment (3.44 acft) from Manatee County (Bradenton Area Convention Center Expansion, #43044753.001, 6/2/23). ***For this alternative, the FDOT would have to obtain an easement over the stormwater management facility(s) from Manatee County. The application would have to show that the surplus treatment being provided is for similar land uses with similar pollutant loadings. Confirmation will be required showing that the surplus treatment is not proposed as credit for future improvements by Manatee County.***
5. ELA opportunities? ***SWFWMD was not aware of any ELA opportunities within the vicinity of the Desoto Bridge. Chris Kuzlo recommended researching surplus FDOT-owned properties. He also stated that any ELA considerations should be located upstream of the project.***

III. **Environmental**

a. Preliminary draft wetland and seagrass limits
    i. Too early in PD&E process to quantify impacts to wetlands (if any). Impacts will be avoided/minimized.
    ii. Impacts to seagrass beds will be avoided
b. Project expected to be entirely within existing SSL easement. If project is outside additional coordination will be needed for SSL easement modification.



TYPICAL SECTION
US 41 (DESOTO BRIDGE)
NORTH OF BRIDGE



TYPICAL SECTION
US 41 (DESOTO BRIDGE)
SOUTH OF BRIDGE

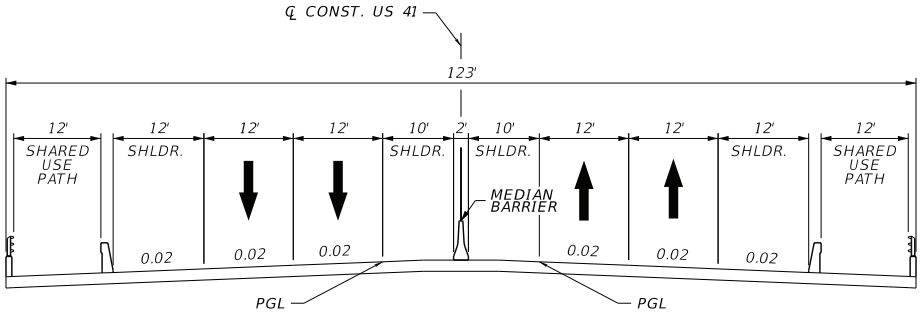
REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID

TYPICAL SECTIONS

SHEET NO. 01

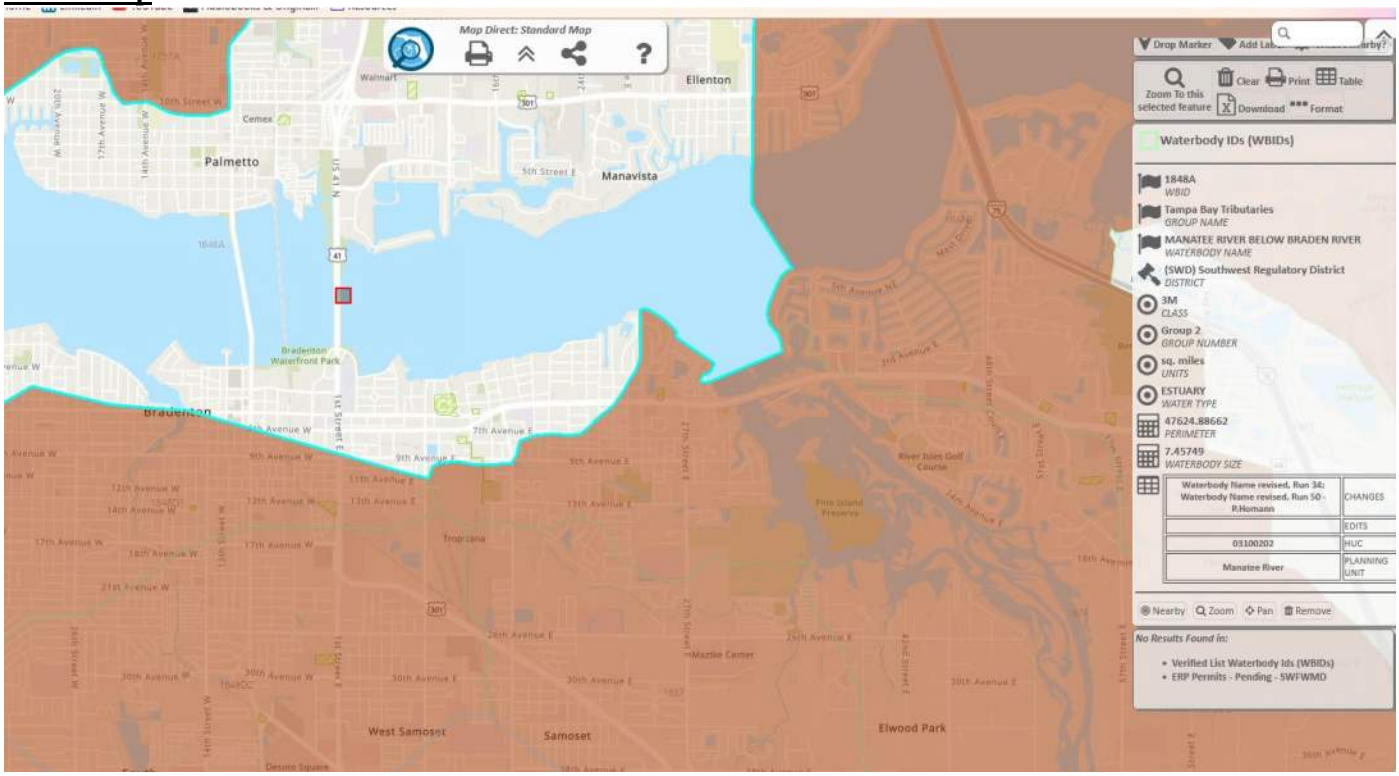


TYPICAL SECTION
US 41 (DESOTO BRIDGE)

REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TYPICAL SECTIONS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		02

6/23/2023 10:50:40 AM gfecheverria
c:\transystems\pw_local\transystcorp-pw1\a-e_gfecheverria\d12180a7\TYPSRD01.dgn

WBID Map


Map Direct: Standard Map
Ellenton
Palmetto
Manavista
Bradenton
Bradenton Waterfront Park
West Samoset
Samoset
Elwood Park
Waterbody IDs (WBIDs)
1848A
WBID
Tampa Bay Tributaries
GROUP NAME
MANATEE RIVER BELOW BRADEN RIVER
WATERBODY NAME
(SWD) Southwest Regulatory District
DISTRICT
3M
CLASS
Group 2
GROUP NUMBER
sq. miles
UNITS
ESTUARY
WATER TYPE
47624.88662
PERIMETER
7.45749
WATERBODY SIZE
Waterbody Name revised, Run 34; Waterbody Name revised, Run 50 - P.Homann
CHANGES
EDITS
03100202
HUC
Manatee River
PLANNING UNIT
No Results Found in:
Verified List Waterbody Ids (WBIDs)
ERP Permits - Pending - SWFWMD

Soils Map

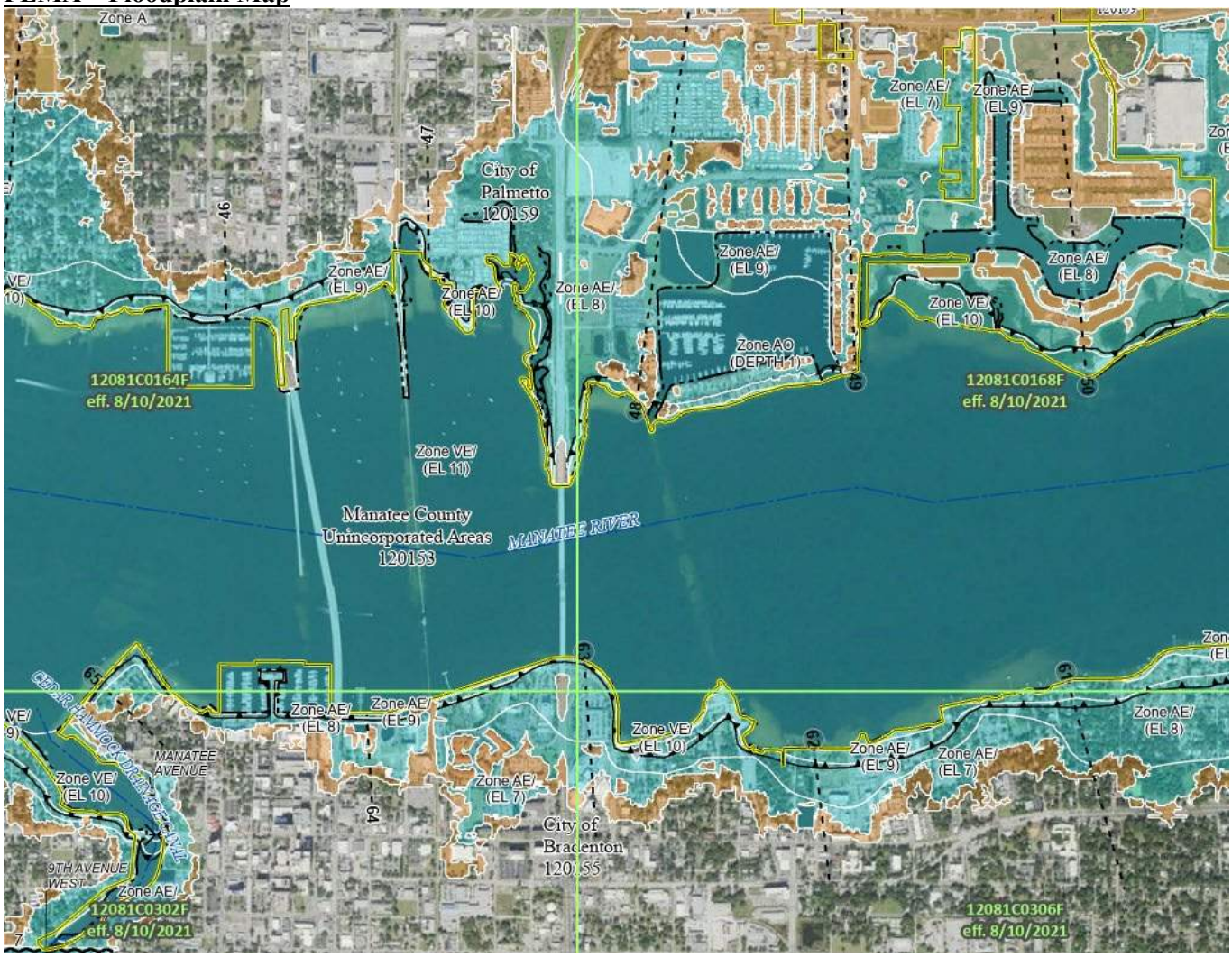
Tables — Depth to Water Table — Summary By Map Unit

Summary by Map Unit — Manatee County, Florida (FL081)

Summary by Map Unit — Manatee County, Florida (FL081)

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
5	Bradenton fine sand, limestone substratum	15	6.2	5.6%
9	Canaveral sand, filled	56	43.9	40.1%
12	Cassia fine sand, moderately well drained	130	11.5	10.4%
21	Estero muck, tidal, 0 to 1 percent slopes	0	12.5	11.4%
100	Waters of the Gulf of Mexico	>200	35.6	32.4%
Totals for Area of Interest			**109.6**	**100.0%**

FEMA – Floodplain Map



APPENDIX E: DeSoto Bridge Inspection Report

BRIDGE INSPECTION REPORT

PREPARED FOR: FLORIDA DEPARTMENT OF TRANSPORTATION

BRIDGE OWNER: FLORIDA DEPARTMENT OF TRANSPORTATION

DCS

INSPECTED BY:

KCA

BRIDGE NO. 130053 **CONTENTS OF REPORT** **INSPECTION DATE:** 01/27/2022

- BrM Report
- CIDR
- Scour Elevation (Profile)
- Addendum (Element Notes & Photos/Sketches)
- U/W Inspection Report
- * Fracture Critical Data
- * Load Rating Analysis Summary

*This section is not included in this report.

Hernando Desoto Bridge **0.6 Mile North of SR-64**

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

BY:	Kisinger Campo and Associates	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV. TYPE UNDER:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 1/27/2022 UNDERWATER: 12/1/2021

SUFFICIENCY RATING: 74.5
HEALTH INDEX: 78.53

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

BY:	Kisinger Campo and Associates	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV. TYPE UNDER:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS

☐ THIS BRIDGE IS SCOUR CRITICAL

☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 1/27/2022 UNDERWATER: 12/1/2021

OVERALL NBI RATINGS:

DECK:	6 Satisfactory	CHANNEL:	6 Bank Slumping
SUPERSTRUCTURE:	6 Satisfactory	CULVERT:	N N/A (NBI)
SUBSTRUCTURE:	6 Satisfactory	SUFF. RATING:	74.5
PERF. RATING:	Good	HEALTH INDEX:	78.53

FIELD PERSONNEL / TITLE / NUMBER:	INITIALS
Carter, Kevin - Bridge Inspector (CBI#00579) (lead)	
Beamer, David - Bridge Inspection Technician	
Hoogland, Keith - Bridge Inspector (CBI #00341) - Lead Diver	
Popp, Jacob - Diver	
Austin, Kevin - Diver	

REVIEWING BRIDGE INSPECTION SUPERVISOR:

McMinn, Brice - Bridge Inspector (CBI#00405) _____

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

Cochran, Robert - PE #45177 Kisinger Campo & Associates
4524 Oak Fair Blvd.
Certificate of Authorization #2317
Tampa FL 33610

SIGNATURE: _____

DATE: _____

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Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

All Elements

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	12 / 4	Re Concrete Deck	106755	77.06	31554	22.78	218	0.16	0	.	138527 sq.ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	383	63.73	218	36.27	0	.	601 sq.ft
0	1090 / 4	Exposed Rebar	0	.	1	100	0	.	0	.	1 sq.ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	558	100	0	.	0	.	558 sq.ft
0	1130 / 4	Cracking (RC and Other)	0	.	7205	100	0	.	0	.	7205 sq.ft
0	1190 / 4	Abrasion(PSC/RC)	0	.	23407	100	0	.	0	.	23407 sq.ft
0	510 / 4	Wearing Surfaces	17046	99.98	0	.	3	0.02	0	.	17049 sq.ft
0	3210 / 4	Del/Spall/Patch/Pot(Wear Surf)	0	.	0	.	3	100	0	.	3 sq.ft

Element Inspection Notes:

12/4 Note: The left overhang underside has a 4-1/2in. fiberglass utility pipe attached. The right overhang underside has a 2in. conduit attached. Anchorage types are unknown. Spans 14, 16, 17 and 18 deck top have an asphalt overlay and Spans 16, 17, and 18 have observable live load deflection.

CS1 = Spans 1 through 13, 15 and 19 through 33 have map cracking up to 1/32in. wide spaced more than 12in. apart.

CS2 1130 = Spans 11 and 12 have map cracking up to 1/16in. wide spaced more than 6in. apart. (7205SF)

CS1 = There are numerous longitudinal and transverse epoxy injected cracks up to 1/16in. wide.

CS2 1190 = The deck top in Spans 1 through 13, 15 and 19 through 33 have moderate abrasive wear primarily in the wheel paths. (23407SF)

CS2 1080 = There is a 16ft. long x 10ft. wide area of fire damage to the deck top of Span 27 mid-span Lane 2 (160SF)

CS1 = Lane 1 in Span 31 SB has a 30ft. long x 1/32in. wide longitudinal crack.

CS2 and CS3 1080 = The deck top and underside have sound repairs, spalls/delaminations, some with exposed steel, and unsound repairs. Refer to photo 1 and Table 1 for sizes and locations. (CS2 223SF) (CS3 18SF)

CS2 1090 = The left overhang has a 1ft. long exposed rebar at Pier 12. (1SF)

CS2 1120 = The deck underside in all spans have transverse, diagonal and longitudinal cracks up to 1/64in. wide, with efflorescence. Spans 16, 17 and 18 are the most dense. (558SF)

CS3 1080 = The deck underside at the built-up sections adjacent to the steel beams in Spans 16, 17, 18 has intermittent edge spalls up to 6ft. x 4in. x 1in. (200SF)

INCIDENTAL:
The left curb of Span 26 has minor spalls and scrapes up to 3ft. x 1in. x 1/4in.

There are sound repairs in the curbs up to 20in. x 10in. at the following locations: Abutment 1 left, Span 17 southbound at half point, Span 25 right curb at Pier 25 and Span 27 left curb at Pier 27.

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Span 5 southbound left curb has seven sound patches up to 5in. long x 4in. wide.

Span 13 northbound right sidewalk 18in. long x 4in. wide unsound patch.

Span 33 SB right curb has a 3ft. long x 9in. wide unsound patch.

The deck top along the shoulders has intermittent areas of concrete spillage up to 6ft. x 3ft. x 3in.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Refer to Table 1 in the 1-30-2020 report for locations of CS3 1080 defect deck repairs. 215SF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above was noted in the FARC as to be completed under an upcoming future project 444308-1. A recommendation will not be repeated in this report.

1080/4 Refer to Parent Element

1090/4 Refer to Parent Element

1120/4 Refer to Parent Element

1130/4 Refer to Parent Element

1190/4 Refer to Parent Element

510/4 Note: This element represents the asphalt overlay in Spans 14, 16, 17, 18 and 19.

CS3 3210 = The asphalt in Span 18 SB has a 2ft. 5in. x 1ft. 5in. unsound area in the right wheel path of Lane 1 at Pier 18. (previously noted Pier 19) Refer to photo 2. (3SF)

3210/4 Refer to Parent Element

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	301 / 4	Pourable Joint Seal	1042	98.86	12	1.14	0	.	0	.	1054 ft
0	2360 / 4	Adjacent Deck or Header	0	.	12	100	0	.	0	.	12 ft

Element Inspection Notes:

301/4 Note: The construction joints in the continuous deck over Piers 17 and 18 are not included in this element. The quantity represents the pourable joint sealant at Abutment 1, Piers 2, 3, 5, 7, 9, 12, 13, 14, 15, 16, 19, 22, 24, 30, 32 and Abutment 34. Pier 16 and 19 joints have armor headers with pourable sealant. Abutment 1 and 34 joints are not visible due to the asphalt overlay.

CS1 = There is light dirt and debris in the joint shoulders - NEW.

CS2 2360 = The headers have intermittent spalls less than 6in. x 3in. x 1in. throughout; however, most have been filled with pourable sealant - DECREASED. (12FT)

INCIDENTAL:
The asphalt over Abutment 1 and 34 joints are heaving up to 3/4in. at the shoulder areas with minor impending potholes in the travel lanes.

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Pier 16 joint, Lane 2 south armor header rings hollow when sounded; but it is secure.

Pier 19 joint, Lane 2 north armor header rings hollow when sounded; but it is secure.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair areas of adhesion loss in SB at Piers 5 13 and 22 NB at Piers 3 7 13 15 22 24 and 30. 33FT

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

2360/4 Refer to Parent Element

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	302 / 4	Compressn Joint Seal	780	96.77	26	3.23	0	.	0	.	806 ft
0	2350 / 4	Debris Impaction	0	.	24	100	0	.	0	.	24 ft
0	2360 / 4	Adjacent Deck or Header	0	.	2	100	0	.	0	.	2 ft

Element Inspection Notes:

302/4 Note: This element represents the compression seals at Pier 4, 6, 8, 10, 11, 21, 23, 26, 27, 28, 29, 31 and 33 joints.

CS2 2350 = The compression seals have intermittently settled up to 2in., allowing for significant amounts of dirt to buildup in areas of the joints. (24FT)

CS2 2360 = Pier 10 joint southbound Lane 1 has two sound patches up to 10in. long x 4in. wide - NEW. (2FT)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair header spalls at Pier 10 in Lane 1 southbound. 2FT

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

2350/4 Refer to Parent Element

2360/4 Refer to Parent Element

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 4	Channel	0	.	1	100	0	.	0	.	1 (EA)
0	9120 / 4	Degradation	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8290/4 Note: This element includes the seawalls with concrete caps and sheet pile bulkhead under Spans 4 and 33 and evaluated as channel protection. Armor mat was installed in the past around Bents 31, 32 and 33. Before installation, the top layer of oysters were removed. The edges of the mats were jetted down below the groundline.

INCIDENTAL:
The northwest seawall cap has cracks up to 20ft. long x 1/16in. wide.

The north seawall cap has spalls with exposed steel and unsound repairs up to 30ft. x 9in. x 4in. Refer to photo 3.

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The following was noted by the underwater inspectors:
CS2 9120 = The armor mat on the south edge of Bent 33 has an undermined area, intermittently full length x 10in. high x 4ft. of penetration - INCREASE. (1EA)

There is an abandoned fender system lower platform lying on the channel bottom, between the north fender and east of Pier 18 and between the south fender and west of Pier 17, not obstructing marine traffic.

South seawall, east end, 12ft. west of outfall pipe, from cap down, delamination/spall, 12in. x 12in. x 1in.

There is debris (bike wheel, construction debris) in the channel.

There are changes in the channel bottom greater than 2ft., the reason is unknown. See the channel profile.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair spalls delaminations and unsound repairs in the north seawall cap. 40MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above was noted in the FARC as to be completed under an upcoming future project 444308-1. A recommendation will not be repeated in this report.

9120/4 Refer to Parent Element

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	321 / 4	Re Conc Approach Slab	1160	100	0	.	0	.	0	.	1160 sq.ft
0	510 / 4	Wearing Surfaces	992	90.51	104	9.49	0	.	0	.	1096 sq.ft
0	3230 / 4	Effectiveness (Wearing Surface)	0	.	104	100	0	.	0	.	104 sq.ft

Element Inspection Notes:

321/4 Note: The approach slabs are not visible due to an asphalt overlay.

510/4 CS2 3230 = The south and north approach slab asphalt overlay along the abutment joints are deteriorated in the southbound lanes with upheaving up to 3/4in. in the shoulder areas with minor impending potholes along the Abutments 1 and 34 joints in the travel lanes - INCREASE. (104SF)

3230/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	205 / 4	Re Conc Column	84	87.5	0	.	12	12.5	0	.	96 each
0	1080 / 4	Delamination/Spall/Patched Area	0	.	0	.	12	100	0	.	12 each

Element Inspection Notes:

205/4 Note: This element represents the columns above the footers at Piers 2 through 33 (96 total), Piers 17 and 18 each have 3 columns however, they transition into pier walls without sub-piles.

CS3 1080 = The columns above the footers have intermittent unsound and spalled repairs. Refer to photo 4. (12EA)

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Column 5-2 unsound area 30in. x 20in. northwest corner. (1EA)
Column 6-1 spalled area 44in. x 6in. x 2in. east face of column. (1EA)
Column 6-1 unsound repair 6ft. x 3ft. south edge in and above.
Column 7-2 unsound area 2ft. x 16in. southwest corner. (1EA)
Column 8-1 unsound area 6ft. x 1ft. south face and southeast edge. (1EA)
Column 8-3 unsound area 2ft. 6in. x 1ft. southwest corner. (1EA)
Column 9-2 unsound repair 4ft. x 1ft. north face from the footer up 4ft. (1EA)
Column 18-3 unsound area 2ft. x 8in. northwest edge at top of pier wall. (1EA)
Column 19-1 unsound repair 5ft. x 1ft. southeast edge at top of repair. (1EA)
Column 28-1 unsound repair 30in. x 9in. north face at footing. (1EA)
Column 29-1 unsound repair 1ft. x 1ft. east face at top of repair. (1EA)
Column 29-2 unsound repair 6ft. x 2ft. southwest and southeast edges and west face at footer. (1EA)
Column 33-1 spall/delamination 43in. x 24in. x 2in. south and east face of column - INCREASE. (1EA)

INCIDENTAL:
Piers 17 and 18 each have three columns and a web wall between the columns.
There are 1/32in. wide vertical cracks in the web walls from above water extending a maximum of 6in. into the marine growth.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair DEL & SPLS in Columns 5-2 6-1 7-2 8-1 8-3 9-2 18-3 19-1 28-1 29-1 29-2 & 33-1. 80MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above was noted in the FARC as to be completed under an upcoming future project 444308-1. A recommendation will not be repeated in this report.

1080/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	215 / 4	Re Conc Abutment	124	86.11	20	13.89	0	.	0	.	144 ft
0	4000 / 4	Settlement	0	.	20	100	0	.	0	.	20 ft

Element Inspection Notes:

215/4 CS2 4000 = Abutment 1 cap at the groundline is exposed and undermined up to 20ft. x 3in. x 3ft. back under due to erosion. (20FT)

INCIDENTAL:
Both abutment caps have a light accumulation of dirt and debris.

4000/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	220 / 4	Re Conc Pile Cap/Ftg	177	20.92	226	26.71	443	52.36	0	.	846 ft
0	1080 / 4	Delamination/Spall/Patched Area	12	2.9	107	25.85	295	71.26	0	.	414 ft
0	1090 / 4	Exposed Rebar	0	.	0	.	2	100	0	.	2 ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	0	.	140	100	0	.	140 ft
0	1130 / 4	Cracking (RC and Other)	0	.	119	95.2	6	4.8	0	.	125 ft

Element Inspection Notes:

220/4 (A) = Aggressive Environment

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Note: Bottom of footings were above marine growth but inspected by Divers due to minimal clearance. Refer to Table 2 for deficiencies in the footers above and below water.

The following was noted by the underwater inspectors:
CS2 1130(A) = Bottoms of numerous footings have intermittent longitudinal and transverse cracks, up to full length/width x 1/32in. wide in the original concrete. (119FT)

CS3 1080 = The bottom of Footings 5-1, 8-2, 9-1, 12-2, 13-1, 15-1, 15-2, 15-3, 21-1, 21-3, 23-1, 24-3, 26-1, 27-1, 27-2, 28-3, 29-1, 29-2, 29-3, 30-1, 31-3 and 33-3 have delaminations/spalls/honeycomb up to 6ft. x 6ft. x 2in. – INCREASE. Refer to photo 5. (114FT)

CS3 1120 = Bottom of Footings 5-2, 8-2, 10-2, 10-3, 11-1, 11-2, 11-3, 12-1, 12-3, 13-2, 13-3, 14-2, 14-3, 16-1, 16-2, 16-3, 19-3, 20-1, 20-3, 21-2, 21-3, 22-3, 23-2, 26-2 and 31-1 have delaminations up to 6ft. long x 6ft. wide, with corrosion bleedout – DECREASE. Refer to photo 6. (100FT)

CS3 1120 = Bottom of Footings 6-1, 7-1, 7-3, 8-1 and 8-2 have areas corrosion bleedout, up to 12in. long x 12in. wide. (8FT)

CS3 1080 = The bottom of Footings 6-2, 6-3, 7-1, 7-2, 8-1, 8-3 and 13-3 have areas of honeycomb/voids up to 24in. x 35in. x 2in. – INCREASE. (9FT)

CS2 1080 = Bottom of Footings 6-2, 7-2, 7-3, 8-3, 19-1, 19-2 and 33-2 between the piles have delaminations up to 6ft. wide x 6ft. wide – DECREASE. (25FT)

CS3 1080 = The bottom of Footings 6-3, 7-1, 8-1, 14-1, 19-3, 20-1, 20-2, 20-3, 21-2, 22-1, 22-2, 23-2, 23-3, 24-1, 24-2, 25-1, 26-3, 27-3, 28-1, 28-2, 30-2, 30-3, 31-2, 32-1, 32-2, 32-3 and 33-1 have delamination/spalls up to 6ft. x 6ft. x 2in. – INCREASE. (120FT)

CS3 1080 = Bottom of Footing 9-1: NE corner of Pile 3, honeycomb, 12in. x 12in. x 3-1/2in., with exposed steel. (1FT)

CS3 1080 = Bottom of Footings 9-2, 9-3, 10-1, 25-2 and 25-3 have delaminations/spalls/honeycomb, up to 6ft. x 6ft. x 2in., with corrosion bleedout – INCREASE. (28FT)

CS3 1080 = Footing 11-3: SE corner at bottom edge, unsound patch, 3ft. long x 24in. wide. (2FT)

CS3 1090 = Footing 13-3: NE corner of Pile 15, bottom of footing, honeycomb/void, 12in. x 8in. x 5in., with exposed rebar with delaminative corrosion and section loss. Refer to photo 7. (1FT)

CS3 1080 = Bottom of Footing 13-3: SW corner of Pile 16, honeycomb, 12in. x 4in. x 3in., with exposed steel. (1FT)

CS3 1090 = Footing 29-2: Between Piles 8 and 10, honeycomb, 11in. x 5in. x 3in., with exposed steel; 50% section remaining. (1FT)

CS2 1080 = Bottom of Footing 31-2: NE corner of Pile 31-9, sound patch, 17in. long x 15in. wide. (2FT)

INCIDENTAL:
The gunite repairs on the undersides of the footings have cracks up to 1/32in. wide, several with corrosion bleedout and/or efflorescence

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PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair 29 CS2 and CS3 deficiencies listed in Table 2 of the 01-30-2020 report. 150MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will not be repeated in this report.

1080/4 Refer to Parent Element

1090/4 Refer to Parent Element

1120/4 Refer to Parent Element

1130/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	227 / 4	Re Conc Pile	387	79.14	58	11.86	44	9	0	.	489 (EA)
0	1080 / 4	Delamination/Spall/Patched Area	0	.	31	49.21	32	50.79	0	.	63 (EA)
0	1120 / 4	Efflorescence/Rust Staining	0	.	0	.	12	100	0	.	12 (EA)
0	1130 / 4	Cracking (RC and Other)	0	.	27	100	0	.	0	.	27 (EA)

Element Inspection Notes:

227/4 (A) = Aggressive Environment

Note: This element represents the piles below the footers at Piers 5 through 16 and 19 through 33. The piles are heavily covered with marine growth from approximately 12in. below the footers down to the mudline. There is gunite overspray at the top of the piles from footing repairs.

The following was noted by the underwater inspectors:
CS2 1080 = Piles 5-12 (NW), 6-14 (SE), 6-16 (NE), 7-6 (NE/NW), 7-7 (NE), 8-12 (NW), 8-16 (NE), 9-2 (SE), 10-2 (NW), 11-8 (SE), 11-13 (SW) (NEW), 11-16 (NE), 11-18 (NE), 12-7 (NE/SE/SW), 13-1 (SW), 13-7 (SE), 13-8 (SW), 14-14 (NE), 14-17 (SE), 15-13 (SW), 15-16 (SE/NE), 19-5 (NW), 19-7 (SE), 21-2 (NW), 22-4 (SW), 22-6 (SW), 22-10 (NW), 22-17 (SE), 22-18 (NE), 23-2 (SE), 27-18 (NE), 28-18 (SE), 29-1 (SE), 31-10 (east face) and 32-5 (NW) have corner spalls less than 6in. x 6in. x 1in. – DECREASE. (31EA)

CS2 1130 (A) = Piles 5-12, 5-17, 13-16, 30-7 and 32-14 have horizontal cracks, up to 10in. x 1/32in. – INCREASE. (5EA)

CS3 1080 = Piles 5-13 (SE), 6-13 (SE/SW) (NEW), 6-15 (SE), 8-1 (SW), 8-3 (SE), 8-11 (NW), 8-13 (NE/NW), 9-15 (NW), 11-8 (SE) (NEW), 12-4 (NW), 12-15 (SE), 13-4 (SE), 13-15 (NE), 13-18 (NE), 15-6 (SW), 16-12 (NE), 21-3 (NE), 21-14 (SE), 24-1 (NW), 24-7 (NE), 25-4 (SW), 26-13 (south face), 28-8 (NE), 28-14 (SE), 30-14 (SW), 30-18 (NE) and 31-14 (SE) have spalls up to 30in. x 6in. x 1in., largest being Pile 13-4. – DECREASE. Refer to photo 8. (26EA)

CS3 1080 = Pile 5-14: SE corner 20in. below footing, spall/unsound patch, 12in. x 4in. x 1-1/2in. (1EA)

CS2 1130 (A) = Piles 5-17, 6-9, 9-8, 12-8, 12-14, 13-18, 14-2, 15-13, 16-4, 23-2, 24-1, 25-14, 25-18, 26-4, 26-16, 27-16, 27-18, 30-7, 30-8, 30-18, 31-1, 31-4, 31-14 and 31-16 have vertical cracks up to 3ft. x 1/32in. – INCREASE. (21EA)

CS3 1120 = Pile 6-5: East face 8in. below footing, delamination, 10in. x 6in., with

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corrosion bleedout. (1EA)

CS3 1080 = Piles 6-13: NE corner 20in. below corner, spall, 3ft. x 8in. x 3in. (1EA)

CS3 1080 = Pile 6-17: SE corner 3ft. below footing, spall/void. 5ft. x 12in. x 1-1/2in. (1EA)

CS3 1080 = Pile 7-15: SW corner 6ft. below footing, spall, 12in. x 12in. x 2in. (1EA)

CS3 1120 = Pile 9-3: SE corner, footing underside down, vertical crack, 18in. x 1/32in., with corrosion bleedout. Refer to photo 9. (1EA)

CS3 1080 = Pile 12-8: SW corner 7in. below footing, spall, 7in. x 5in. x 2in. – INCREASE. (1EA)

CS3 1120 = Piles 11-4, 13-16, 15-11, 21-1, 22-1, 22-14, 23-2, 24-10, 26-6, 28-14 and 29-6 below the footing, have vertical cracks, up to 18in. x 1/64in., with corrosion bleedout – INCREASE. (10EA)

CS3 1080 = Pile 16-14: NW corner at groundline, spall, 28in. x 8in. x 4in. (1EA)

The previously reported spalls in Piles 10-11, 12-18, 21-4, 24-14, 24-15 and 27-16 were not found this inspection.

The previously reported vertical crack in Pile 21-7 was not found this inspection.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair Piles 5-14 6-5 6-13 6-17 7-15 and 16-14. 100MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above was noted in the FARC as to be completed under an upcoming future project 444308-1. A recommendation will not be repeated in this report.

1080/4 Refer to Parent Element

1120/4 Refer to Parent Element

1130/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	234 / 4	Re Conc Pier Cap	1846	98.72	14	0.75	10	0.53	0	.	1870 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	14	58.33	10	41.67	0	.	24 ft

Element Inspection Notes:

234/4 CS3 1080 = Pier 3 cap, north face between Beams 3-9 and 3-10, has a 7in. x 6in. x 1/2in. spall. (1FT)

CS3 1080 = Pier 6 cap at Beam 6-10 in the top north edge has a 10in. x 3in. x 1/2in. spall. (1FT)

CS3 1080 = Pier 8 cap at Beam 8-6 in the top north edge has a 1ft. x 4in. x 1in. spall. (1FT)

CS3 1080 = Pier 9 cap, top south edge under Beam 8-9, has a 16in. x 4in. x 1in. spall. (2FT)

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CS3 1080 = Pier 9 cap, top north edge near Beam 9-5 has a 1ft. x 6in. x 1in. spall. (1FT)

CS3 1080 = Pier 9 cap, top north edge under Beam 9-8 has two spalls up to 1ft. x 6in. x 1in. (2FT)

CS3 1080 = Pier 32 cap underside has a 2ft. long x 1ft. wide unsound repair between Column 32-1 and 32-2 - NEW. Refer to photo 10. (2FT)

CS2 1080 = Pier 30, 31 and 33 caps have sound repairs in the bottom face between Columns 1 and 2 up to 4ft. long x 2ft. wide - NEW. (14FT)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair unsound repairs in the bottom face of Pier 30 through 33 caps. 40MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

1080/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8298 / 4	Pile Jacket Bare	75	100	0	.	0	.	0	.	75 (EA)
0	520 / 4	Conc Re Prot Sys	3144	100	0	.	0	.	0	.	3144 sq.ft

Element Inspection Notes:

8298/4 Note:
This element represents the jackets on Piles 5-4, 6-2, 6-6, 8-18, 9-1, 9-8, 10-7, 10-18, 11-3, 11-5, 14-2, 14-3, 14-5, 14-8, 14-10, 14-12, 14-18, 15-2, 15-3, 15-5, 15-8, 15-14, 15-15, 15-17, 16-8, 20-9, 20-10, 22-3, 23-1, 23-4, 23-5, 23-6, 23-14, 23-17, 23-18, 24-3, 25-5, 25-10, 25-13, 25-16, 25-17, 26-2, 26-3, 26-9, 26-10, 26-11, 26-12, 26-18, 27-4, 28-2, 29-5, 29-7, 29-10, 29-13, 29-14, 29-16, 29-17, 29-18, 30-1, 30-2, 30-4, 30-5, 30-6, 30-11, 30-13, 30-15, 31-1, 31-2, 31-5, 31-9, 31-16, 31-17, 31-18, 32-2 and 33-12.
Pile 9-1 is jacketed 12in. below the footer with a 24in. square x 6ft. long fiberglass formed jacket.

The following was noted by the underwater inspectors:

INCIDENTAL:
The anode wires are not properly routed inside the jackets, intermittently throughout.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair broken PVC conduit elbows at top of Jackets 14-8 14-12 29-16 30-4 30-6 and 31-9. 30MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

520/4 Note: The anodes on Jackets 5-4, 9-1, 10-7, 23-17, 26-2, 26-9, 27-4, 28-2, 29-5, 29-7, 29-13, 29-17, 29-18, 30-2, 30-5, 30-6, 30-11, 31-1, 31-2, 31-5, 31-9, 31-17, 32-2 and 33-12 are buried.

The following was noted by the underwater inspectors:
CS1 = Anodes have 80% or more section remaining.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair the detached round bar from the zinc anode and jacket wiring at Jacket 15-5. 8MH

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CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8387 / 4	PS Fender/Dolphin	292	91.82	0	.	26	8.18	0	.	318 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	0	.	20	100	0	.	20 ft
0	1110 / 4	Cracking (PSC)	0	.	0	.	6	100	0	.	6 ft

Element Inspection Notes:

8387/4 (A) = Aggressive environment.

INCIDENTAL:
Fender Hardware = Approximately 50% of the connection hardware is heavily corroded.

The following was noted by the underwater inspectors:
CS3 1080 = Ten piles have corner spalls, up to 10in. x 4in. x 1in. – INCREASE. Refer to photo 11. (20FT)

CS3 1110(A) = North fender, 14th and 15th clusters from west end plumb piles, west and east faces, 13th cluster from west end plumb pile at marine growth, vertical cracks, up to 24in. long x 1/64in. wide, with corrosion bleedout. Refer to photo 12. (6FT)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Replace 80 fender planks that are heavily deteriorated missing and or loose. 20MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

1080/4 Refer to Parent Element

1110/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 4	Other Abutment Slope Protection	4069	100	0	.	0	.	0	.	4069 (SF)

Element Inspection Notes:

8396/4 Note: This element represents the sand-cement riprap bag slope protection at Abutment 34 only. No slope protection is present along Abutment 1.

INCIDENTAL:
The joints of the abutment slope protection has intermittent areas of vegetation.

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	311 / 4	Moveable Bearing	0	.	0	.	316	100	0	.	316 each
0	1020 / 4	Connection	0	.	0	.	16	100	0	.	16 each
0	2210 / 4	Movement	0	.	0	.	300	100	0	.	300 each
0	8516 / 4	Painted Steel	0	.	581	91.93	0	.	51	8.07	632 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	581	91.93	0	.	51	8.07	632 sq.ft

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Element Inspection Notes:

311/4 CS3 2210 = The steel bearing assemblies have restricted movement due to painted-over corrosion. Refer to photo 13. (300EA)

The bearings at Beams 9-1 through 9-7 at Pier 9 are misaligned up to 2in. north; however, limits are tolerable and there is no visible distress to the assemblies. Refer to photo 14.

CS3 1020 = The bearing assemblies and anchor bolts at Piers 17 and 19 have recurring fretting corrosion, are skewed and the nuts are not seated. Refer to photo 15. (16EA)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Clean and paint corroded areas on all movable bearing assemblies. 100MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed; however, recurring.

1020/4 Refer to Parent Element

2210/4 Refer to Parent Element

8516/4 CS2 3440 = The paint on the movable bearing assemblies and hardware is substantially effective due to corrosion. (581SF)

CS4 3440 = The paint on the movable bearing assemblies and hardware has areas of failed paint. Refer to photos 13 and 15. (51SF)

3440/4 Refer to Parent Element

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	313 / 4	Fixed Bearing	0	.	0	.	316	100	0	.	316 each
0	1020 / 4	Connection	0	.	0	.	16	100	0	.	16 each
0	2210 / 4	Movement	0	.	0	.	300	100	0	.	300 each
0	8516 / 4	Painted Steel	0	.	587	92.88	0	.	45	7.12	632 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	587	92.88	0	.	45	7.12	632 sq.ft

Element Inspection Notes:

313/4 CS3 2210 = The steel bearing assemblies have restricted movement due to painted-over corrosion. Refer to photo 16. P3WO (300EA)

CS3 1020 = The anchor bolts have recurring corrosion and sheared/missing bolts at Piers 16 and 18. Refer to photo 17. (16EA)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Clean and paint all fixed bearing assemblies. 100MH

CORRECTIVE ACTION EVALUATION:
The corrective action noted above has been completed; however, recurring. A recommendation will be repeated in this report.

1020/4 Refer to Parent Element

2210/4 Refer to Parent Element

8516/4 CS2 3440 = The paint on the fixed bearing assemblies and hardware is

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substantially effective due to corrosion. (587SF)

CS4 3440 = The paint on the fixed bearing assemblies and hardware has areas of failed paint. Refer to photos 16 and 17. P3WO (45SF)

3440/4 Refer to Parent Element

SUPERSTRUCTURE : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8572 / 4	Conduit & Junction Box	0	.	1	100	0	.	0	.	1 (EA)
0	1000 / 4	Corrosion	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8572/4 Note: This element represents the conduit and junction boxes on the access platforms at Piers 17 left and 18 right.

CS2 1000 = The junction boxes have light intermittent surface corrosion. (1EA)

1000/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	107 / 4	Steel Opn Girder/Beam	0	.	1976	100	0	.	0	.	1976 ft
0	1000 / 4	Corrosion	0	.	1976	100	0	.	0	.	1976 ft
0	8516 / 4	Painted Steel	0	.	15808	100	0	.	0	.	15808 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	15808	100	0	.	0	.	15808 sq.ft

Element Inspection Notes:

107/4 Note: This element represents the steel beams in Spans 16, 17 and 18.

CS2 1000 = The beams have intermittent areas of painted-over pitting up to 1/8in. deep, primarily in the bottom flange and cover plates. (1976FT)

1000/4 Refer to Parent Element

8516/4 CS2 3440 = The paint on the beams is substantially effective. (15808SF)

3440/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	109 / 4	Pre Opn Conc Girder/Beam	19591	98.64	119	0.6	152	0.77	0	.	19862 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	119	46.48	137	53.52	0	.	256 ft
0	1110 / 4	Cracking (PSC)	0	.	0	.	15	100	0	.	15 ft

Element Inspection Notes:

109/4 Note: The beam spalls in the haunches at the sole plates are documented under this element.

CS2 1080 = The beams have intermittent spalls of various sizes throughout. Refer to Table 3 with this report for sizes and locations of deficiencies. (119FT)

CS3 1080 = The beams have intermittent spalls/delaminations, some with exposed steel.

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Refer to photo 18 and Table 3 with this report for sizes and locations of deficiencies. (137FT)

CS3 1110 = Cracks were observed in Beams 12-10 and 14-10. Refer to photo 19 and Table 3 with this report for sizes and locations. (15FT)

INCIDENTAL:
The beam end diaphragms have intermittent spalls/delamination some with exposed steel. Refer to Table 3 with this report for sizes and locations.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair beam deficiencies listed in Table 3 of the 01-30-2020 report. 400MH

CORRECTIVE ACTION EVALUATION:
The recommendation noted above was noted in the FARC as to be completed under an upcoming future project 444308-1. A recommendation will not be repeated in this report.

1080/4 Refer to Parent Element

1110/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	331 / 4	Re Conc Bridge Railing	6654	99.27	48	0.72	1	0.01	0	.	6703 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	48	97.96	1	2.04	0	.	49 ft

Element Inspection Notes:

331/4 Note: This element represents the left and right concrete post and beam bridge rails and the Jersey-type median barrier.

CS1 = The median barrier and bridge rails have intermittent cracks up to 1/32in. wide.

CS2 1080 = There are spalls up to 4in. x 3in. x varying in depths up to 1in. throughout. (41FT)

CS2 1080 = Bridge Rail 3-7 right has a 3ft. long x 4in. wide sound patch in the west face. (3FT)

CS3 1080 = Bridge Rail 5-6 right inside traffic face has a 7in. x 4in. x 1in. spall with exposed steel - NEW. Refer to photo 20. P3WO (1FT)

CS2 1080 = Bridge Rail Post 17-14 left has a 7in. long x 4in. wide sound patch in the west face. (1FT)

CS2 1080 = The east face of Bridge Rail 18-6 left has a 10in. long x 3in. wide sound patch in the east face. (1FT)

CS2 1080 = Bridge Rail 29-2 left has a 11in. long x 5in. wide sound patch in the west face. (1FT)

CS2 1080 = Bridge Rail 32-9 right has a 8in. long x 4in. wide sound patch in the southeast corner. (1FT)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair the spall with exposed steel at Bridge Rail 29-2 left. 1FT

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CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

1080/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8580 / 4	Navigational Lights	0	.	0	.	1	100	0	.	1 (EA)
0	9020 / 4	Operation	0	.	0	.	1	100	0	.	1 (EA)

Element Inspection Notes:

8580/4 Note: This element represents the one system comprised of four navigational lights on the fender system, the two attached to the structure above center channel. Anchorages for the center navigational lights unknown. The conduit and wiring have been removed and solar-powered nav lights have been installed.

CS3 9020 = The center of channel navigation light in Span 18 Right (east) side attached to the deck fascia has broken off and not functioning - NEW. Refer to photo 21. (1EA) P2WO

9020/4 Refer to Parent Element

Total Number of Elements*: 20
*excluding defects/protective systems

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Inspector Recommendations

UNIT: 0 **SUPERSTRUCTURE**

ELEMENT/ENV: 313 / 4 Fixed Bearing **ELEM CATEGORY: Bearings**

CONDITION STATE			PRIORITY
3	MMS Quantity: 100 mh	Element Estimated Quantity: 316 each	3

WORK ORDER RECOMMENDATION:

Clean and paint corroded areas on all fixed bearing assemblies. 100MH

ELEMENT/ENV: 331 / 4 Re Conc Bridge Railing **ELEM CATEGORY: Superstructure**

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 1 lf	Element Estimated Quantity: 6703 ft	3

WORK ORDER RECOMMENDATION:

Repair Sp 5 at P6 NB RT BR Post inside traffic face. 1FT

ELEMENT/ENV: 8580 / 4 Navigational Lights **ELEM CATEGORY: Superstructure**

CONDITION STATE			PRIORITY
3	MMS Quantity: 4 mh	Element Estimated Quantity: 1 (EA)	2

WORK ORDER RECOMMENDATION:

Repair center of channel navigation light in Span 18 right. 4MH

Structure Notes

TRAFFIC RESTRICTION: According to the load rating analysis dated 06/10/08, posting is not required. This bridge is not posted.

Bridge inventoried from south to north.

Bridge No. 130083 is south and Bridge No. 130002 is north of this Bridge No. 130053.

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INSPECTION NOTES: DXRR 1/27/2022

Sufficiency Rating Calculation Accepted by KNKCARX at 3/14/2022 7:46 AM

LOAD CAPACITY EVALUATION:
The findings of this inspection reveal no reason to warrant a new analysis; therefore, the current load rating results still govern.

The following elements were inspected underwater by the divers:
8290 Channel
220 Re Conc Sub Pile Cap/Ftg
205 Re Conc Pile
8298 Pile Jacket/Bare
520 Conc Re Prot Sys
8387 P/S Fender/Dolphin

The NBI rating for SIA Item 58 Deck is coded a 6-Satisfactory due to deterioration.

The NBI rating for SIA Item 59 Superstructure is coded a 6-Satisfactory due to deterioration.

The NBI rating for SIA Item 60 Substructure is coded a 6-Satisfactory due to deterioration.

The NBI rating for SIA Item 61 Channel is coded a 6-Bank Slumping due to undermining.

NON-STRUCTURAL ITEMS:

APPROACH BARRIERS:
The south and north approach median barriers have full height vertical cracks with associated spalls up to 6in. x 2in. x 1in.

APPROACH GUARDRAILS:
Approach guardrail panels at the southeast, northwest and northeast corners of the bridge have minor impact damage and areas of light to moderate corrosion.

UTILITIES:
The utility junction box attached to Abutment 1 backwall on the right side of Beam 1-10 is missing a plug, the conduit is separated, and the box and hardware have light corrosion.

The following light poles are missing: left side at Piers 4, 8, 16, and right side at Piers 2, 17, 25 and 33. Refer to photo 22. REPAIR

Utility conduits on the right overhang are sagging at Piers 5 and 11. Refer to photo 23. REPAIR

The utility conduit at the right overhang in Span 13 is separated from the pull elbow. Refer to photo 24. REPAIR

Pier 19 southbound left light pole missing handhole access cover - NEW. Refer to photo 25. REPAIR

The utility conduit at Abutment 34 has a corrosion hole - NEW. Refer to photo 26. REPAIR

CORRECTIVE ACTION TAKEN:
1) Light pole at Pier 25 has been removed.
2) Graffiti in Spans 1 and 34 have been painted over.

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Photo 1 - Element 12 Re Concrete Deck

Span 18 deck underside right (NB) at Pier 19 spall with exposed rebar

WORK ORDER RECOMMENDATION:
None

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Photo 2 - Element 12 Re Concrete Deck (510 Wearing Surfaces)

Unsound area in the right wheel path of Lane 1 at Pier 18

WORK ORDER RECOMMENDATION:
None

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Photo 3 - Element 8290 Channel

Typical spall with exposed steel in the north seawall cap

WORK ORDER RECOMMENDATION:
None

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Photo 4 - Element 205 Re Conc Column

Column 33-1 delamination and associated spalls in the south face

WORK ORDER RECOMMENDATION:
None

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Photo 5 - Element 220 Re Conc Pile Cap/Ftg

Footing 5-1 Spall delamination

WORK ORDER RECOMMENDATION:
None

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Photo 6 - Element 220 Re Conc Pile Cap/Ftg

Footing 5-2 corrosion Bleedout

WORK ORDER RECOMMENDATION:
None

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Photo 7 - Element 220 Re Conc Pile Cap/Ftg

Footing 13-3 northeast corner of Pile 15 void with exposed steel

WORK ORDER RECOMMENDATION:
None

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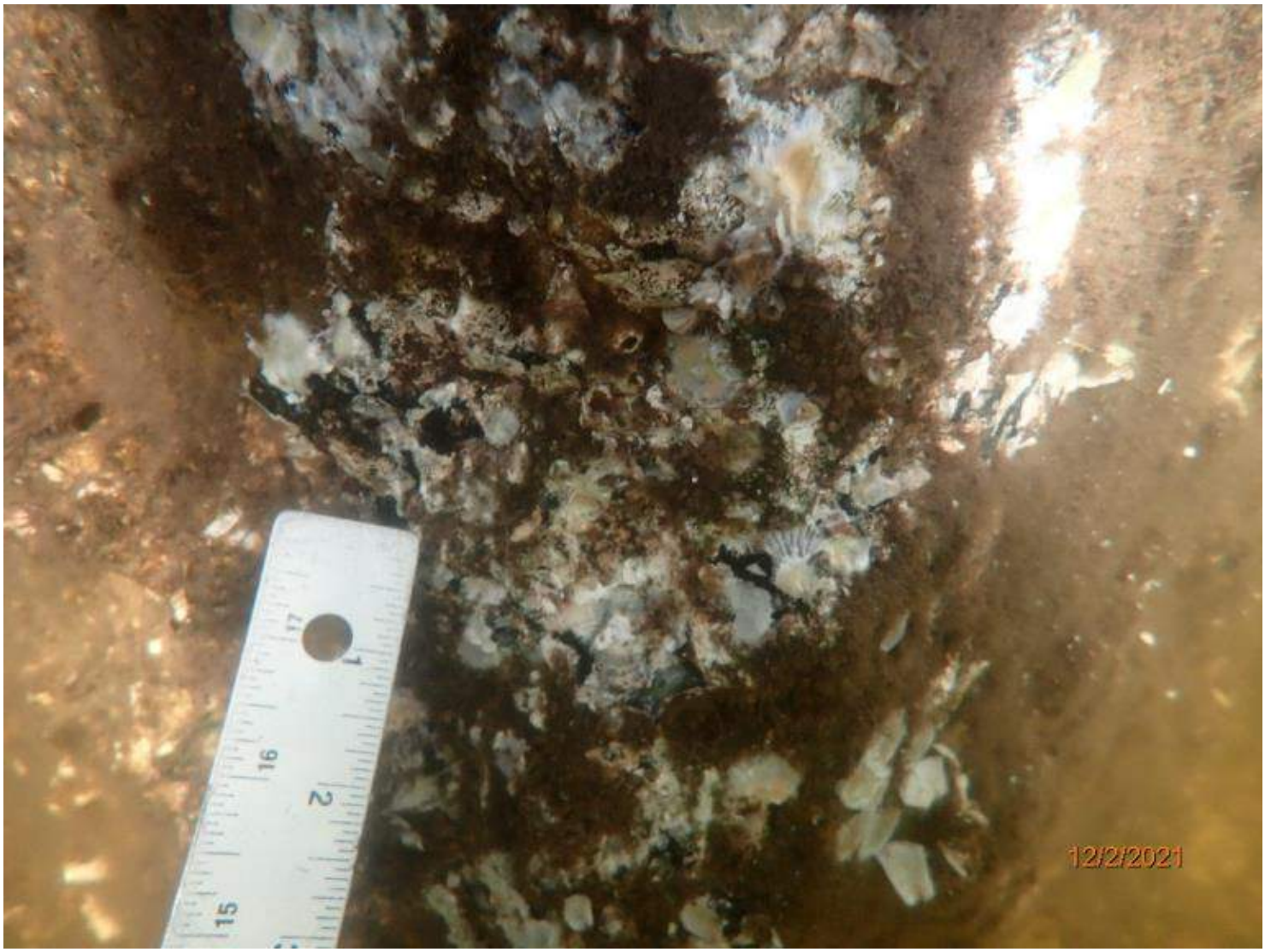

Photo 8 - Element 227 Re Conc Pile

Spall in southeast corner of Pile 13-4

WORK ORDER RECOMMENDATION:
None

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Photo 9 - Element 227 Re Conc Pile

Vertical crack with corrosion bleedout at the southeast corner of Pile 9-3

WORK ORDER RECOMMENDATION:
None

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Photo 10 - Element 234 Re Conc Pier Cap

Unsound repair Pier 32 cap underside, between columns 32-1 and 32-2

WORK ORDER RECOMMENDATION:
None

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Photo 11 - Element 8387 PS Fender/Dolphin

Typical corner spall in south fender pile

WORK ORDER RECOMMENDATION:
None

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Photo 12 - Element 8387 PS Fender/Dolphin

Typical vertical crack with corrosion bleedout at north fender (14th cluster shown)

WORK ORDER RECOMMENDATION:
None

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Photo 13 - Element 311 Moveable Bearing (8516 Painted Steel)

Typical bearing with painted over corrosion

WORK ORDER RECOMMENDATION:
None

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Photo 14 - Element 311 Moveable Bearing

Bearing 9-5 over Pier 9 misaligned to the north

WORK ORDER RECOMMENDATION:
None

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Photo 15 - Element 311 Moveable Bearing (8516 Painted Steel)

Bearing 18-7 over Pier 19 fretting corrosion

WORK ORDER RECOMMENDATION:
None

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Photo 16 - Element 313 Fixed Bearing (8516 Painted Steel)

Typical bearing condition, restricted movement and associated corrosion

WORK ORDER RECOMMENDATION:
P3WO: Clean and paint corroded areas on all fixed bearing assemblies. 100MH

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Photo 17 - Element 313 Fixed Bearing (8516 Painted Steel)

Bearing 16-8 over Pier 16 missing anchor bolt and typical areas of corrosion

WORK ORDER RECOMMENDATION:
Refer to photo 16.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 18 - Element 109 Pre Opn Conc Girder/Beam

Spall with exposed steel in Beam 20-5 over Pier 21

WORK ORDER RECOMMENDATION:
None

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 19 - Element 109 Pre Opn Conc Girder/Beam

Typical crack in Beam 14-10 right at Pier 15

WORK ORDER RECOMMENDATION:
None

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 20 - Element 331 Re Conc Bridge Railing

Spall with exposed steel at Bridge Rail 5-6 right in the traffic face

WORK ORDER RECOMMENDATION:
P3WO: Repair Sp 5 at P6 NB RT BR Post inside traffic face. 1FT

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 21 - Element 8580 Navigational Lights

Center of channel navigation light in Span 18 right broken off and not functioning

WORK ORDER RECOMMENDATION:
P2WO: Repair center of channel navigation light in Span 18 right. 4MH

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 22 - Inspection Notes

Pier 25 right missing light pole

REPAIR RECOMMENDATION:
Install light poles on left side at Piers 4 8 and 16 and right side Piers 2 17 25 and 33.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 23 - Inspection Notes

Pier 5 right sagging utilities

REPAIR RECOMMENDATION:
Properly attach utilities at Piers 5 11 and Span 13.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 24 - Inspection Notes

Span 13 separated utilities right side

REPAIR RECOMMENDATION:
Refer to photo 22.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 25 - Inspection Notes

Light pole missing handhole access cover at Pier 19 left

REPAIR RECOMMENDATION:
Install a new handhole access cover for light pole at Pier 19 left.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/27/2022 DXRR**

Photo 26 - Inspection Notes

Corrosion hole in Abutment 34 utility conduit

REPAIR RECOMMENDATION:
Repair or replace the conduit at Abutment 34.

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005 | **Structure ID: 130053** | **CIDR** | **DATE PRINTED: 3/14/2022**

Description

Structure Unit Identification

Bridge/Unit Key: 130053 0
Structure Name: HERNANDO DESOTO BRIDGE
Description: SPANS 16 THRU 18
Type: M - Main

Structure Unit Identification

Bridge/Unit Key: 130053 1
Structure Name: HERNANDO DESOTO BRIDGE
Description: SPANS 1 THRU 15 & 19 THRU 33
Type: A - Approach

Roadway Identification

NBI Structure No (8): 130053
Position/Prefix (5): 1 - Route On Structure
Kind Hwy (Rte Prefix): 2 U.S. Numbered Hwy
Design Level of Service: 1 Mainline
Route Number/Suffix: 00041 / 0 N/A (NBI)
Feature Intersect (6): MANATEE RIVER 2ND ST E
Critical Facility: Not Defense-crit
Facility Carried (7): US-41/US-301
Mile Point (11): 2.617
Latitude (16): 027d30'12.9" Long (17): 082d33'47.0"

Roadway Traffic and Accidents

Lanes (28): 4 Medians: 1 Speed: 50 mph
ADT Class: 4 ADT Class 4
Recent ADT (29): 63000 Year (30): 2020
Future ADT (114): 109305 Year (115): 2042
Truck % ADT (109): 8
Detour Length (19): 1 mi
Detour Speed: 50 mph
Accident Count: -1 Rate: -1

Roadway Classification

Nat. Hwy Sys (104): 1 On the NHS
National base Net (12): 1 - On Base Network
LRS Inventory Rte (13a): 13 130 000 Sub Rte (13b): 00
Functional Class (26): 14 Urban Other Princ
Federal Aid System: ON
Defense Hwy (100): 0 Not a STRAHNET hwy
Direction of Traffic (102): 2 2-way traffic
Emergency: [X]

Roadway Clearances

Vertical (10): 99.99 ft Appr. Road (32): 58.4 ft
Horiz. (47): 26.9 ft Roadway (51): 51.8 ft
Truck Network (110): 0 Not part of natl netwo
Toll Facility (20): 3 On free road
Fed. Lands Hwy (105): 0 N/A (NBI)
School Bus Route: [X]
Transit Route: [X]

NBI Project Data

Proposed Work (075A): 38 Other Structural
Work To Be Done By (075B): 1 Contract
Improvement Length (076): 2224.41 ft

Improvement Cost (094): $ 70,000.00
Roadway Improvement Cost (095): $ 5,000.00
Total Cost (096): $ 75,000.00
Year of Estimate (097): 1996

NBI Rating

Channel (61): 6 Bank Slumping
Deck (58): 6 Satisfactory
Superstructure (59): 6 Satisfactory
Substructure (60): 6 Satisfactory

Culvert (62): N N/A (NBI)
Waterway (71): 8 Equal Desirable
Unrepaired Spalls: -1 sq.ft.
Review Required: [X]

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005 | **CIDR** | **DATE PRINTED: 3/14/2022**

Structure ID: 130053

Structure Identification

Admin Area: Sarasota/Manatee
District (2): D1 - Bartow
County (3): (13)Manatee
Place Code (4): Bradenton
Location (9): 0.6 MI NORTH OF SR-64
Border Br St/Reg (98): Not Applicable (P) Share: 0 %
Border Struct No (99):
FIPS State/Region (1): 12 Florida Region 4-Atlanta
NBIS Bridge Len (112): Y - Meets NBI Length

Parallel Structure (101): No || bridge exists
Temp. Structure (103): Not Applicable (P)
Maint. Resp. (21): 1 State Highway Agency
Owner (22): 1 State Highway Agency
Historic Signif. (37): 5 Not eligible for NRHP

Geometrics

Spans in Main Unit (45): 3
Approach Spans (46): 30
Length of Max Span (48): 105 ft
Structure Length (49): 2234.3 ft
Total Length: 2278.3 ft
Deck Area: 138527 sqft
Structure Flared (35): 0 No flare

Age and Service

Year Built (27): 1957
Year Reconstructed (106): 0
Type of Service On (42a): 1 Highway
Under (42b): 6 Highway-waterway
Fracture Critical Details: Not Applicable

Structure Type and Material

Curb/Sidewalk (50): Left: 2 ft Right: 2 ft
Bridge Median (33): 3 Closed Med w/Barriers
Main Span Material (43A): 4 Steel Continuous
Appr Span Material (44A): 5 Prestressed Concrete
Main Span Design (43B): 02 Stringer/Girder
Appr Span Design (44B): 02 Stringer/Girder

Deck Type and Material

Deck Width (52): 62 ft
Skew (34): 0 deg
Deck Type (107): 1 Concrete-Cast-in-Place
Surface (108): 0 None
Membrane: 0 None
Deck Protection: None

Appraisal

Structure Appraisal

Open/Posted/Closed (41): A Open, no restriction
Deck Geometry (68): 4 Tolerable
Underclearances (69): 5 Above Tolerable
Approach Alignment (72): 7-No Accel/Reduce Curve
Bridge Railings (36a): 0 Substandard
Transitions (36b): 0 Substandard

Approach Guardrail (36c): 0 Substandard
Approach Guardrail Ends (36d): 0 Substandard
Scour Critical (113): 7 Countermeasures

Navigation Data

Navigation Control (38): Permit Required
Nav Vertical Clr (39): 39.7 ft
Nav Horizontal Clr (40): 75.4 ft
Min Vert Lift Clr (116): 0 ft
Pier Protection (111): 2 In-Place, Functioning

NBI Condition Rating

Sufficiency Rating: 74.5
Health Index: 78.53
Structural Eval (67): 6 Equal Min Criteria
Deficiency: Not Deficient

Minimum Vertical Clearance

Over Structure (53): 99.99 ft
Under (reference) (54a): H Hwy beneath struct
Under (54b): 14.4 ft

Minimum Lateral Underclearance

Reference (55a): H Hwy beneath struct
Right Side (55b): 11.8 ft
Left Side (56): 0 ft

Schedule

Current Inspection

Inspection Date: 01/27/2022
Inspector: KNKCACK - Kevin Carter
Bridge Group: E1U95
Alt. Bridge Group:
Primary Type: Regular NBI
Review Required: [X]

Next Inspection Date Scheduled

NBI: 01/27/2024
Element: 01/27/2024
Fracture Critical:
Underwater: 12/01/2023
Other/Special:
Inventory Photo Update Due: 01/30/2030

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005
Structure ID: 130053
CIDR
DATE PRINTED: 3/14/2022

Schedule Cont.

Inspection Types Performed NBI [X] Element [X] Fracture Critical [ ] Underwater [X] Other Special [ ]

Inspection Intervals	Required (92)	Frequency (92)		Last Date (93)	
Fracture Critical	[ ]		mos		
Underwater	[X]	24	mos	12/01/2021	
Other Special	[ ]		mos	04/27/2013	
NBI		24	mos (91)	01/27/2022	(90)

Inspection Resources

Crew Hours:	16
Flagger Hours:	0
Helper Hours:	0
Snooper Hours:	0
Special Crew Hours:	23
Special Equip Hours:	10

Bridge Related

General Bridge Information

Parallel Bridge Seq:
Channel Depth: 16 ft
Radio Frequency: -1
Phone Number:
Exception Date:
Exception Type: Unknown
Accepted By Maint: 01/01/1957
Warranty Expiration: 00/00/0000
Performance Rating: Good

Bridge Rail 1: Concrete post & beam
Bridge Rail 2: Concrete jersey type
Electrical Devices: Combination values 1-7
Culvert Type: Not applicable
Maintenance Yard: 194-Manatee Ops
FIHS ON / OFF: No Routes on FIHS
Previous Structure:
2nd Previous Structure:
Replacement Structure:

Permitted Utilities: Power [ ] Water [ ] Gas [ ] Fiber Optic [X] Sewage [ ] Other [ ]

Bridge Load Rating Information

Inventory Type (065): 1 LF Load Factor
Operating Type (063): 1 LF Load Factor
Original Design Load (031): 5 MS 18 (HS 20)
Date: 06/10/2008
Initials: SDW
Load Rating Rev. Recom.: No
Load Rating Plans Status: Design or Construction

Inventory Rating (066): 39.0 tons
Operating Rating (064): 65.1 tons
FL120 Permit Rating: -1.0 tons
HS20/FL120 Max Span Rating: 94.8 tons
Dynamic Impact in Percent: 26 %
Governing Span Length: 64.2 ft
Minimum Span Length:
Distribution Method: SALOD

Load Rating Notes:

LEGAL LOADS

SU2: 59.6 tons
SU3: 61.6 tons
SU4: 62.1 tons
C3: 72.2 tons
C4: 69.7 tons
C5: 70.2 tons
ST5: 81.5 tons
Posting (070): 5 At/Above Legal Loads
Open/Posted/Closed (041): A Open, no restriction

POSTING

Recom. SU Posting: 99 tons
Recom. C Posting: 99 tons
Recom. ST5 Posting: 99 tons
Actual SU Posting: 99 tons
Actual C Posting: 99 tons
Actual ST5 Posting: 99 tons
Actual Blanket Posting: 99 tons
Emergency Vehicle: 1 EV inapplicable

FLOOR BEAM (FB) FB Present: No

FB Span Length, Gov: 0.0 ft
FB Spacing, Gov: 0.0 ft
FB OPR Rating: 0.0 tons
FB SU4 OPR Rating: 0.0 tons
FB FL120 Rating: 0.0 tons

SEGMENTAL (SEG)

SEG Wing-Span: -1.0 ft
SEG Web-to-Web Span: -1.0 ft
SEG Transverse HL93 Operating: -1.00 RF

Bridge Scour and Storm Information

Pile Driving Record: All pile driving records
Foundation Type: Foundation details
Mode of Flow: Tidal
Rating Scour Eval: Scour Critical
Highest Scour Eval: Phase IV completed
Scour Evaluation Method:

Scour Recommended I: Perform countermeasures
Scour Recommended II: Perform add'l monitoring
Scour Recommended III: Not Applicable
Scour Elevation: 0 ft
Action Elevation: 0 ft
Storm Frequency: 100

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR/Bridge Profile Report**

Structure ID: 130053 — **CIDR** — **DATE PRINTED: 3/14/2022**

Elements

Inspection Date: 01/27/2022 **DXRR**

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	12 / 4	Re Concrete Deck	106755	77.06	31554	22.78	218	0.16	0	.	138527 sq.ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	383	63.73	218	36.27	0	.	601 sq.ft
0	1090 / 4	Exposed Rebar	0	.	1	100	0	.	0	.	1 sq.ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	558	100	0	.	0	.	558 sq.ft
0	1130 / 4	Cracking (RC and Other)	0	.	7205	100	0	.	0	.	7205 sq.ft
0	1190 / 4	Abrasion(PSC/RC)	0	.	23407	100	0	.	0	.	23407 sq.ft
0	510 / 4	Wearing Surfaces	17046	99.98	0	.	3	0.02	0	.	17049 sq.ft
0	3210 / 4	Del/Spall/Patch/Pot(Wear Surf)	0	.	0	.	3	100	0	.	3 sq.ft

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	301 / 4	Pourable Joint Seal	1042	98.86	12	1.14	0	.	0	.	1054 ft
0	2360 / 4	Adjacent Deck or Header	0	.	12	100	0	.	0	.	12 ft

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	302 / 4	Compressn Joint Seal	780	96.77	26	3.23	0	.	0	.	806 ft
0	2350 / 4	Debris Impaction	0	.	24	100	0	.	0	.	24 ft
0	2360 / 4	Adjacent Deck or Header	0	.	2	100	0	.	0	.	2 ft

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 4	Channel	0	.	1	100	0	.	0	.	1 (EA)
0	9120 / 4	Degradation	0	.	1	100	0	.	0	.	1 (EA)

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	321 / 4	Re Conc Approach Slab	1160	100	0	.	0	.	0	.	1160 sq.ft
0	510 / 4	Wearing Surfaces	992	90.51	104	9.49	0	.	0	.	1096 sq.ft
0	3230 / 4	Effectiveness (Wearing Surface)	0	.	104	100	0	.	0	.	104 sq.ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	205 / 4	Re Conc Column	84	87.5	0	.	12	12.5	0	.	96 each
0	1080 / 4	Delamination/Spall/Patched Area	0	.	0	.	12	100	0	.	12 each

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	215 / 4	Re Conc Abutment	124	86.11	20	13.89	0	.	0	.	144 ft
0	4000 / 4	Settlement	0	.	20	100	0	.	0	.	20 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	220 / 4	Re Conc Pile Cap/Ftg	177	20.92	226	26.71	443	52.36	0	.	846 ft
0	1080 / 4	Delamination/Spall/Patched Area	12	2.9	107	25.85	295	71.26	0	.	414 ft

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005 **Structure ID: 130053** **CIDR** **DATE PRINTED: 3/14/2022**

0	1090 / 4	Exposed Rebar	0	.	0	.	2	100	0	.	2 ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	0	.	140	100	0	.	140 ft
0	1130 / 4	Cracking (RC and Other)	0	.	119	95.2	6	4.8	0	.	125 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	227 / 4	Re Conc Pile	387	79.14	58	11.86	44	9	0	.	489 (EA)
0	1080 / 4	Delamination/Spall/Patched Area	0	.	31	49.21	32	50.79	0	.	63 (EA)
0	1120 / 4	Efflorescence/Rust Staining	0	.	0	.	12	100	0	.	12 (EA)
0	1130 / 4	Cracking (RC and Other)	0	.	27	100	0	.	0	.	27 (EA)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	234 / 4	Re Conc Pier Cap	1846	98.72	14	0.75	10	0.53	0	.	1870 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	14	58.33	10	41.67	0	.	24 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8298 / 4	Pile Jacket Bare	75	100	0	.	0	.	0	.	75 (EA)
0	520 / 4	Conc Re Prot Sys	3144	100	0	.	0	.	0	.	3144 sq.ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8387 / 4	PS Fender/Dolphin	292	91.82	0	.	26	8.18	0	.	318 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	0	.	20	100	0	.	20 ft
0	1110 / 4	Cracking (PSC)	0	.	0	.	6	100	0	.	6 ft

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 4	Other Abutment Slope Protection	4069	100	0	.	0	.	0	.	4069 (SF)

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	311 / 4	Moveable Bearing	0	.	0	.	316	100	0	.	316 each
0	1020 / 4	Connection	0	.	0	.	16	100	0	.	16 each
0	2210 / 4	Movement	0	.	0	.	300	100	0	.	300 each
0	8516 / 4	Painted Steel	0	.	581	91.93	0	.	51	8.07	632 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	581	91.93	0	.	51	8.07	632 sq.ft

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	313 / 4	Fixed Bearing	0	.	0	.	316	100	0	.	316 each
0	1020 / 4	Connection	0	.	0	.	16	100	0	.	16 each
0	2210 / 4	Movement	0	.	0	.	300	100	0	.	300 each
0	8516 / 4	Painted Steel	0	.	587	92.88	0	.	45	7.12	632 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	587	92.88	0	.	45	7.12	632 sq.ft

SUPERSTRUCTURE : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8572 / 4	Conduit & Junction Box	0	.	1	100	0	.	0	.	1 (EA)
0	1000 / 4	Corrosion	0	.	1	100	0	.	0	.	1 (EA)

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005
Structure ID: 130053
CIDR
DATE PRINTED: 3/14/2022

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	107 / 4	Steel Opn Girder/Beam	0	.	1976	100	0	.	0	.	1976 ft
0	1000 / 4	Corrosion	0	.	1976	100	0	.	0	.	1976 ft
0	8516 / 4	Painted Steel	0	.	15808	100	0	.	0	.	15808 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	15808	100	0	.	0	.	15808 sq.ft

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	109 / 4	Pre Opn Conc Girder/Beam	19591	98.64	119	0.6	152	0.77	0	.	19862 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	119	46.48	137	53.52	0	.	256 ft
0	1110 / 4	Cracking (PSC)	0	.	0	.	15	100	0	.	15 ft

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	331 / 4	Re Conc Bridge Railing	6654	99.27	48	0.72	1	0.01	0	.	6703 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	48	97.96	1	2.04	0	.	49 ft

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8580 / 4	Navigational Lights	0	.	0	.	1	100	0	.	1 (EA)
0	9020 / 4	Operation	0	.	0	.	1	100	0	.	1 (EA)

Total Number of Elements*: 20
*excluding defects/protective systems

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report

REPORT ID: INSP005
Structure ID: 130053
CIDR
DATE PRINTED: 3/14/2022

Inspection Information

Inspection Date: 01/27/2022 **Type:** Regular NBI

Inspector: KNKCACK - Kevin Carter

Inspection Notes: Sufficiency Rating Calculation Accepted by KNKCARX at 3/14/2022 7:46 AM

LOAD CAPACITY EVALUATION:
The findings of this inspection reveal no reason to warrant a new analysis; therefore, the current load rating results still govern.

The following elements were inspected underwater by the divers:
8290 Channel
220 Re Conc Sub Pile Cap/Ftg
205 Re Conc Pile
8298 Pile Jacket/Bare
520 Conc Re Prot Sys
8387 P/S Fender/Dolphin

The NBI rating for SIA Item 58 Deck is coded a 6-Satisfactory due to deterioration.

The NBI rating for SIA Item 59 Superstructure is coded a 6-Satisfactory due to deterioration.

The NBI rating for SIA Item 60 Substructure is coded a 6-Satisfactory due to deterioration.

The NBI rating for SIA Item 61 Channel is coded a 6-Bank Slumping due to undermining.

NON-STRUCTURAL ITEMS:

APPROACH BARRIERS:
The south and north approach median barriers have full height vertical cracks with associated spalls up to 6in. x 2in. x 1in.

APPROACH GUARDRAILS:
Approach guardrail panels at the southeast, northwest and northeast corners of the bridge have minor impact damage and areas of light to moderate corrosion.

UTILITIES:
The utility junction box attached to Abutment 1 backwall on the right side of Beam 1-10 is missing a plug, the conduit is separated, and the box and hardware have light corrosion.

The following light poles are missing: left side at Piers 4, 8, 16, and right side at Piers 2, 17, 25 and 33. Refer to photo 22. REPAIR

Utility conduits on the right overhang are sagging at Piers 5 and 11. Refer to photo 23. REPAIR

The utility conduit at the right overhang in Span 13 is separated from the pull elbow. Refer to photo 24. REPAIR

Pier 19 southbound left light pole missing handhole access cover - NEW. Refer to photo 25. REPAIR

The utility conduit at Abutment 34 has a corrosion hole - NEW. Refer to photo 26. REPAIR

CORRECTIVE ACTION TAKEN:
1) Light pole at Pier 25 has been removed.
2) Graffiti in Spans 1 and 34 have been painted over.

Structure Notes

TRAFFIC RESTRICTION: According to the load rating analysis dated 06/10/08, posting is not required. This bridge is not posted.

Bridge inventoried from south to north.

Bridge No. 130083 is south and Bridge No. 130002 is north of this Bridge No. 130053.

Schedule Notes

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM

REPORT ID: INSP005 — **Inspection/CIDR/Bridge Profile Report**

Structure ID: 130053 — **CIDR** — **DATE PRINTED: 3/14/2022**

Under Route Information

Roadway Identification

NBI Structure No (8): 130053
Position/Prefix (5): 2 - One Route Under
Kind Hwy (Rte Prefix): 5 City Street
Design Level of Service: 1 Mainline
Route Number/Suffix: 00000 / 0 N/A (NBI)
District (2): D1 - Bartow
County (3): (13)Manatee
Place Code (4): Bradenton
Feature Intersect (6): MANATEE RIVER 2ND ST E
Facility Carried by Structure (7): US-41/US-301
Critical Facility: Not Defense-crit
Roadway Name: 2ND ST. E.
Mile Point (11): 0.000
Latitude (16): 027d30'12.9" Long (17): 082d33'47.0"

Roadway Traffic and Accidents

Lanes (28): 2 Medians: 0 Speed: 25 mph
ADT Class: 3 ADT Class 3
Recent ADT (29): 1500 Year (30): 2014
Future ADT (114): 2603 Year (115): 2034
Truck % ADT (109): 1
Detour Length (19): 0 mi
Detour Speed:
Accident Count: -1 Rate:

Roadway Classification

Nat. Hwy Sys (104): 0 Not on NHS
National base Net (12): 0 - Not on Base Network
LRS Inventory Rte (13a): 13 000 000 Sub Rte (13b): 00
Functional Class (26): 19 Urban Local
Federal Aid System: OFF
Defense Hwy (100): 0 Not a STRAHNET hwy
Direction of Traffic (102): 2 2-way traffic
Emergency: ☐

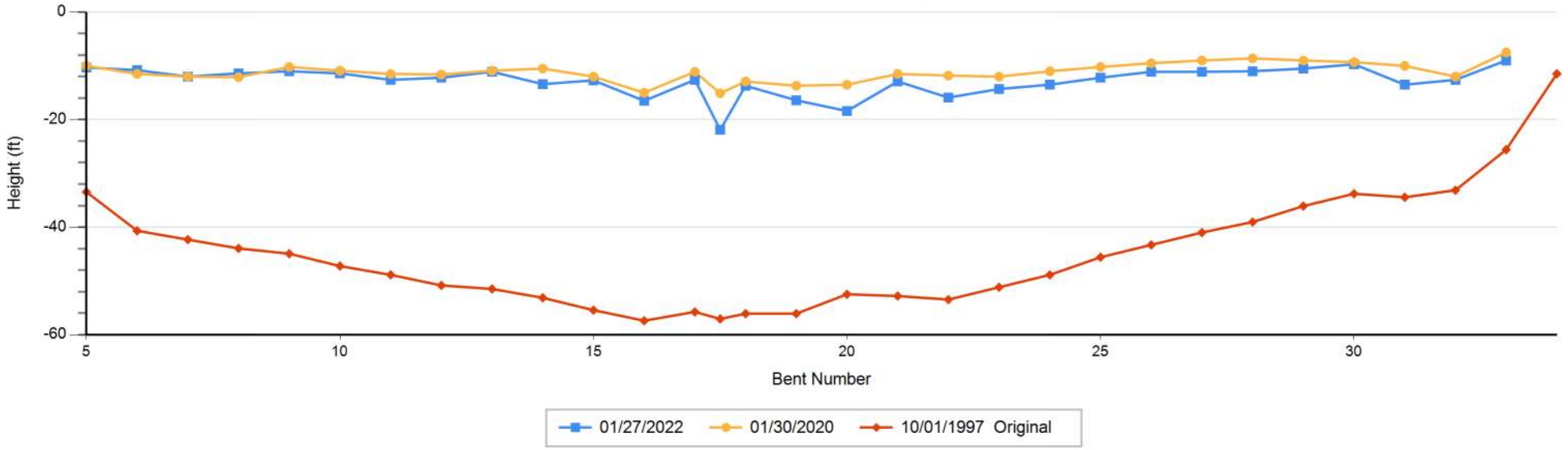
Roadway Clearances

Vertical (10): 14.4 ft Appr. Road (32): 64.4 ft
Horiz. (47): 64.4 ft Roadway (51): 64.4 ft
Truck Network (110): 0 Not part of natl netwo
Toll Facility (20): 3 On free road
Fed. Lands Hwy (105): 0 N/A (NBI)
School Bus Route: ☐
Transit Route: ☐

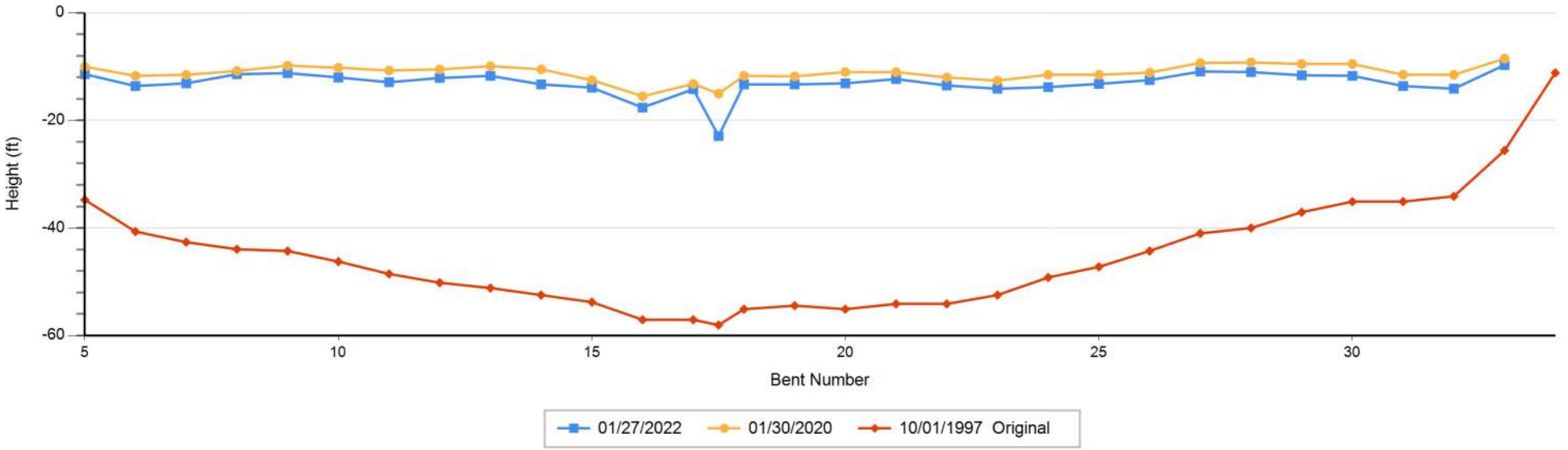
FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

DATE PRINTED: 3/14/2022 7:50:18 AM

Left Profile by Inspection



Right Profile by Inspection



FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

DATE PRINTED: 3/14/2022 7:50:18 AM

Profile Data - Numerical Summary

Inspection Date and Key: 1/27/2022 DXRR

Bent #	Left Height	Right Height
		(All Heights are in Feet)
5	10.30	11.40
6	10.80	13.60
7	12.00	13.10
8	11.40	11.40
9	11.00	11.20
10	11.40	12.00
11	12.60	12.90
12	12.20	12.10
13	11.10	11.70
14	13.40	13.30
15	12.70	13.90
16	16.50	17.60
17	12.60	14.20
17.5	21.90	22.90
18	13.70	13.30
19	16.40	13.30
20	18.40	13.10
21	12.90	12.30
22	15.90	13.50
23	14.30	14.10
24	13.50	13.80
25	12.20	13.20
26	11.10	12.50
27	11.10	10.90

Profile Data - Numerical Summary

Bent #	Left Height	Right Height
28	11.00	11.00
29	10.50	11.60
30	9.70	11.70
31	13.50	13.60
32	12.60	14.10
33	9.00	9.70

(All Heights are in Feet)

Air Temp:

Profile Notes:

Measurements were referenced from the top of the footers.
Waterline was taken at Pier 5: Left and Right = 6.9ft.
No measurements were taken at Abutments 1 through Pier 4 and Abutment 34 due to them being out of the channel.
The reason for changes of greater than 2ft. are unknown.

Inspection Date and Key: 1/30/2020 HRNV

5	10.00	10.00
6	11.50	11.70
7	12.00	11.50
8	12.10	10.80
9	10.20	9.80
10	10.90	10.20
11	11.50	10.70
12	11.60	10.50
13	10.90	9.90
14	10.50	10.50
15	12.00	12.50
16	15.00	15.50
17	11.10	13.20

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

DATE PRINTED: 3/14/2022 7:50:18 AM

Profile Data - Numerical Summary

Bent #	Left Height	Right Height
17.5	15.10	15.00
18	12.90	11.70
19	13.70	11.80
20	13.50	11.00
21	11.50	11.00
22	11.80	12.00
23	12.00	12.60
24	11.00	11.50
25	10.20	11.50
26	9.50	11.10
27	9.00	9.30
28	8.60	9.20
29	9.00	9.50
30	9.30	9.50
31	10.00	11.50
32	12.00	11.50
33	7.50	8.50

(All Heights are in Feet)

Air Temp:

Profile Notes:

Measurements were referenced from the top of the footers.
Waterline was taken at Pier 5: Left and Right = 6.5ft.
No measurements were taken at Abutments 1 through Pier 4 and Abutment 34 due to them being out of the channel.

Inspection Date and Key: 10/1/1997 STRT

(Original Inspection)

5	33.46	34.78
6	40.68	40.68

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

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Profile Data - Numerical Summary

Bent #	Left Height	Right Height
7	42.32	42.65
8	43.96	43.96
9	44.95	44.29
10	47.24	46.26
11	48.88	48.56
12	50.85	50.20
13	51.51	51.18
14	53.15	52.49
15	55.45	53.81
16	57.41	57.09
17	55.77	57.09
17.5	57.09	58.07
18	56.10	55.12
19	56.10	54.46
20	52.49	55.12
21	52.82	54.13
22	53.48	54.13
23	51.18	52.49
24	48.88	49.21
25	45.60	47.24
26	43.31	44.29
27	41.01	41.01
28	39.04	40.03
29	36.09	37.07
30	33.79	35.10
31	34.45	35.10

(All Heights are in Feet)

FLORIDA DEPARTMENT OF TRANSPORTATION BRIDGE MANAGEMENT SYSTEM
Inspection/CIDR/Bridge Profile Report
Bridge Profile

DATE PRINTED: 3/14/2022 7:50:18 AM

Profile Data - Numerical Summary

Bent #	Left Height	Right Height
32	33.14	34.12
33	25.59	25.59
34	11.48	11.15

(All Heights are in Feet)

Air Temp:
Profile Notes:

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Bridge Inspection Report Addendum

ELEMENT NOTES

Element Category

12 Bare Concrete Deck (Continued)

TABLE 1

This table represents the deck top and underside deficiencies:

Span	CS	Location	Deficiency	Defect Element	Size	P3WO
8-SB	3	Left overhang at Pier 9	Spall with exposed steel	1080	1ft. x 4in. x 2in. (1SF)	NO
10-NB	2	Right overhang at Pier 11	Delamination	1080	1ft. x 2in. (1SF)	NO
10-SB	3	Left overhang at Pier 11	Spall with exposed steel	1080	1ft. x 3in. x 2in. (1SF)	NO
12-NB	3	Lane 2 left wheel path, 10ft. from Pier 13	Spall	1080	8in. x 7in. x 1in. (1SF)	NO
13-SB	3	Left overhang at Pier 13	Spall with exposed steel	1080	1ft. x 2in. x 1in. (1SF)	NO
13-NB	2	Deck top	Six sound patches	1080	Up to 8ft. x 3ft. (144SF)	NO
13-NB	3	Right sidewalk Pier 13	Unsound patch	1080	18in. x 4in. (2SF)	NO
14-SB	3	Left overhang at Pier 14	Spall/delamination	1080	1ft. x 2in. x 1/2. (1SF)	NO
15-NB	2	Deck top	Six Sound patches	1080	Up to 5ft. x 2ft. (60SF)	NO
18-SB	3	Deck underside in Bays 18-1 and 18-2	Spall/delamination	1080	14in. x 9in. x 2in. (4SF)	NO
19-NB	2	Right overhang, 6ft. from Pier 19	Sound patch	1080	7in. x 8in. (1SF)	NO
20-SB	2	Left overhang at Pier 21	Sound patch	1080	8in. x 3in. (1SF)	NO
22-SB	3	Left overhang at Pier 23	Spall with exposed steel	1080	8in. x 6in. x 1in. (1SF)	NO
24-NB	2	Right overhang at Pier 24	Sound patch	1080	8in. x 4in. (1SF)	NO
24-NB	3	Right overhang at Pier 25	Unsound patch	1080	14in. x 10in. (2SF)	NO
24-SB	2	Left fascia at Pier 25	Sound patch	1080	4in. x 1in. (1SF)	NO
31-NB	3	Right overhang	Spall with exposed steel	1080	1ft. x 6in. x 2in. (1SF)	NO
31-SB	2	Left overhang at Pier 31	Sound patch	1080	2ft. x 2ft. (2SF)	NO
31-SB	1	Lane 1 at centerline	Longitudinal crack	-	30ft. long x 1/32in. wide	NO
31-SB	2	Lane 1 near Pier 32	Two sound patches	1080	2ft. x 3ft. (12SF)	NO
33-NB	3	Right overhang	Unsound patch/spall - NEW	1080	3ft. x 2ft. x 1in. (3SF)	NO

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ELEMENT NOTES

Element Category

TABLE 2

220 R/C Sub Pile Cap/Ftg (Continued)

This table represents the footer deficiencies above and below water:

CS	Defect	Footer	Location	Deficiency	Size	P3WO
3	1080	3-2	SE corner	Spall	7in. x 4in. x 2in. (1FT)	NO
3	1080	4-1	NE corner	Spall	7in. x 4in. x 1in. (1FT)	NO
2	1080	7-1	SE corner	Sound patch	3ft. x 2ft. (3FT)	NO
2	1080	7-2	SW corner	Sound patch	2ft. x 2ft. (2FT)	NO
3	1080	8-1	SW corner	Unsound repair	4ft. x 2ft. (4FT)	NO
3	1120	8-1	N face	Delamination/CBO	3ft. x 2ft. (3FT)	NO
3	1080	8-2	S face	Unsound repair	4ft. x 2ft. (4FT)	NO
3	1120	8-2	East face	Delamination/CBO	4ft. x 2ft. (1FT)	NO
3	1080	9-1 U/W	Bottom of footer at the northeast corner of Pile 3	Honeycomb with exposed steel	1ft. x 1ft. x 3-1/2in. (1FT)	NO
3	1080	10-1	Bottom SW corner	Unsound repair	2ft. x 2ft. (2FT)	NO
2	1080	11-2	SW corner	Sound patch	3ft. x 2ft.	NO
2	1080	11-2	Top face, intermittent	Delaminations	Up to 4ft. x 2ft. (4FT)	NO
3	1120	11-2	Bottom east edge	Delamination/CBO	5ft. x 1ft. (1FT)	NO
3	1130A	11-3	Bottom west edge	Horizontal crack w/CBO	4ft. long x 1/16in. wide (1FT)	NO
2	1080	13-2	SW corner	Sound patch	3ft. x 2ft. (3FT)	NO
2	1080	13-3	Bottom of footer at the northeast corner of Pile 16	Sound patch	3in. x 3in. (1FT)	NO
3	1080	13-3 U/W	Bottom of footer at the southwest corner of Pile 16	Honeycomb with exposed steel	12in. x 4in. x 3in. (1FT)	NO
2	1080	14-2	SW corner	Sound patch	2ft. x 2ft. (2FT)	NO
3	1120	14-3	North face	CBO	2in. Diameter (1FT)	NO
3	1120	15-2	North face	Delaminations/CBO	Up to 8ft. x 1ft. (8FT)	NO
3	1130A	15-2	East face	Crack w/efflorescence	5ft. long x 1/16in. wide (5FT)	NO
3	1120	17-1	Lower south and north edges	Delaminations/CBO	Up to 5ft. x 1ft. (10FT)	NO
3	1120	17-2	Lower north edge	Delaminations/CBO	Up to 7ft. x 1ft. (7FT)	NO
3	1120	19-3	East face	CBO	2in. diameter (1FT)	NO
3	1080	20-3	Bottom north face	Unsound repair CBO	2ft. x 2ft. (2FT)	NO
2	1080	21-2	North and south faces	Sound patch	Up to 8ft. x 2ft. (12FT)	NO
3	1080	21-3	NE corner	Spall	16in. x 8in. x 1/2in. (2FT)	NO
2	1080	26-1	SE corner and top face	Sound patch	4ft. x 1ft. (1FT)	NO
2	1080	28-2	South face	Sound patch	4ft. x 1ft. (4FT)	NO
2	1080	28-2	North face	Sound patch	3ft. 6in. x 18in. (3FT)	NO

ELEMENT NOTES

Element Category

TABLE 2

220 R/C Sub Pile Cap/Ftg (Continued)

This table represents the footer deficiencies above and below water:

CS	Defect	Footer	Location	Deficiency	Size	P3WO
2	1080	29-2	South face	Sound patch	2in. diameter (1FT)	NO
2	1080	30-2	SE corner and top face	Sound patch	4ft. x 1ft. (1FT)	NO
2	1080	30-3	Lower north edge	Sound patch	8ft. x 1ft. (1FT)	NO
2	1080	31-1	NE Upper Corner	Delamination	1ft. x 1ft. (1FT)	NO
2	1080	31-2 U/W	Bottom of footer at the Northeast edge of Pile 31-9	Sound patch	17in. x 15in. (2FT)	NO
3	1080	32-1	SE corner	Unsound patch	2ft. x 1ft. (2FT)	NO
2	1080	32-1	Lower south and west faces	Sound patch	Up to 8ft. (8FT)	NO
2	1080	32-2	Lower south, east and west edges	Sound patch	Up to 8ft. x 1ft. (8FT)	NO
2	1080	32-3	All lower faces	Sound patch	Up to 8ft. x 1ft. (8FT)	NO
2	1080	33-1	Lower edges, all faces	Sound patch	Up to 8ft. x 2ft. (8FT)	NO
2	1080	33-2	Lower edges, all faces	Sound patch	Up to 8ft. x 1ft. (8FT)	NO
2	1080	33-3	Lower edges, all faces	Sound patch	Up to 8ft. x 1ft. (8FT)	NO

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BRIDGE MANAGEMENT SYSTEM
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ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
2	1080	1-1 at ABT 1	Bottom face of right flange	Delamination	12in. x 4in. (1FT)	NO
2	1080	1-4 at ABT 1	Bottom face of right flange	Spall	4in. x 3in. x 1/2in. (1FT)	NO
3	1080	1-5 at Pier 2	Bottom face of right flange	Spall/delamination	8in. x 10in. x 2in. (1FT)	NO
3	1080	1-9 at ABT 1	Bottom face of Left and Right flange	Spalls	Up to 7in. x 4in. x 1in. (1FT)	NO
2	1080	1-9 at mid-span	Bottom face of right flange	Spall	3in. sq. x 1/2in. (1FT)	NO
3	1080	1-10 at ABT 1	Bottom face of east flange	Spall w/exposed steel	16in. x 6in. x 2in. (2FT)	NO
3	1080	3-1 at Pier 4	Bottom face of beam haunch	Spall	1ft. x 4in. x 1in. (1FT)	NO
3	1080	3-10	Bottom east face at 1/2 point	Spall	1ft. x 7in. x 3/4in. (1FT)	NO
3	1080	4-1 at Pier 4	Bottom face of beam haunch	Spall	1ft. x 4in. x 1in. (1FT)	NO
3	1080	4-2 at Pier 4	Bottom face of beam haunch	Spall	1ft. x 4in. x 1in. (1FT)	NO
3	1080	4-2 at mid-span	Bottom face of right flange	Spall	7in. x 3in. x 1in. (1FT)	NO
1	INCID	Diaphragm at Pier 5	Bay 4-4 diaphragm	Spall w/exposed steel	7in. x 4in. x 4in.	NO
3	1080	4-6 at Pier 4	Bottom face of beam haunch	Spall	7in. x 4in. x 1in. (1FT)	NO
1	INCID	4-10 at Pier 4	Beam end	Delamination	6in. x 12in.	NO
3	1080	4-2 at Pier 5	Right face over bearing area	Spall/delamination	2ft. x 2ft. x 1in. (2FT)	NO
3	1080	4-3 at Pier 5	Left face of beam	Spall	1ft. x 8in. x 2in. (1FT)	NO
2	1080	4-4 at Pier 5	Left face of beam	Delamination	2ft. x 1ft. (2FT)	NO
1	INCID	4-6 at Pier 5	Beam end	Sound patch	1ft. x 6in.	NO
3	1080	5-2 at Pier 5	Right face bottom flange	Spall	2ft. x 6in. x 2in. (2FT)	NO
2	1080	5-5 at Pier 5	Beam end and east face lower flange	Sound patch	1ft. x 6in. (1FT)	NO
1	INCID	5-6 at Pier 5	South face of beam end diaphragm	Sound patch	14in. x 4in.	NO
2	1080	5-9 at Pier 5	Left face over bearing 5-9	Sound patch	1ft. x 1ft. (1FT)	NO
3	1080	5-6	Bottom face of beam, 10ft. from Pier (painted over)	Exposed trash steel w/spall	1ft. x 3in. x 1/4in. (1FT)	NO
3	1080	5-8 at Pier 6	Bottom face of beam haunch	Spall	1ft. x 6in. x 1in. (1FT)	NO
3	1080	6-3 at Pier 6	Bottom face of beam haunch	Spall/delamination	7in. x 5in. x 1/2in. (1FT)	NO
2	1080	6-6 at Pier 6	Beam end and east and west faces of beam over haunch	Delamination	2ft. x 6in. (2FT)	NO
3	1080	6-8 at Pier 6	Bottom face of beam haunch	Spall	1ft. x 4in. x 1in. (1FT)	NO
3	1080	6-10 at Pier 6	Bottom face of the beam haunch	Spalled repair w/exposed Steel	2ft. x 7in. x 2in. (2FT)	NO
3	1080	6-5 at Pier7	Right face, beam end and diaphragm	Spall	1ft. x 6in. x 2in. (1FT)	NO
2	1080	7-1 at Pier 7	Bottom east face	Delamination	1ft. 6in. x 6in. (1FT)	NO

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BRIDGE MANAGEMENT SYSTEM
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ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size		P3WO
3	1080	7-6 at Pier 7	Right face, beam end and diaphragm	Spall	18in. x 8in. x 1- 1/2in.	(2FT)	NO
2	1080	7-7 at Pier 7	Left face over bearing	Delamination	2ft.x 1ft.	(2FT)	NO
1	INCID	7-10 at Pier 7	Poured beam end, Left and Right face	Delamination	3ft. x 1in.		NO
1	INCID	7-1 to 7-9 at Pier 8	Right and left beam end diaphragms	Spalls/delaminations	Up to 18in. x 4in. x 1in.		NO
2	1080	7-3 at Pier 8	Beam haunch	Delamination	1ft. x 4in.	(1FT)	NO
3	1080	7-7 at Pier 8	Bottom face of beam haunch	Spalls/delaminations	1ft. x 6in. x 1in.	(1FT)	NO
3	1080	7-10 at Pier 8	Bottom face of right flange	Spall	7in. x 4in. x 1/2in.	(1FT)	NO
3	1080	8-3 at Pier 8	Bottom face of beam haunch	Spall	16in. x 4in. x 1/2in.	(2FT)	NO
2	1080	8-9 at Pier 8	Beam haunch	Delamination	1ft. x 4in.	(1FT)	NO
3	1080	8-10 at Pier 8	Beam haunch	Spall	7in. x 4in. x 1/2in.	(1FT)	NO
2	1080	8-1 at Pier 9	Left face over bearing	Delamination	1ft. x 4in.	(1FT)	NO
2	1080	8-2 at Pier 9	Right face over bearing	Delamination	1ft. x 1ft.	(1FT)	NO
3	1080	8-5 at Pier 9	Left face	Unsound patch	1ft. x 2ft.	(1FT)	NO
2	1080	8-8 at Pier 9	Left face over bearing	Delamination	1ft. x 1ft.	(1FT)	NO
2	1080	8-10 at Pier 9	Right face over bearing	Delamination	1ft. x 4in.	(1FT)	NO
3	1080	9-4 at Pier 9	Bottom beam haunch	Spall	8in. x 4in. x 1in.	(1FT)	NO
1	INCID	9-1 to 9-10 at Pier 10	Right and left faces, beam end diaphragms	Delaminations	Up to 1ft. x 4in.		NO
3	1080	10-1 at Pier 10	Right face over Bearing 10-1	Spall	2ft. x 1ft. x 1in.	(2FT)	NO
3	1080	10-2 at Pier 10	Bottom face of beam haunch	Spall	10in. x 4in. x 3/4in.	(1FT)	NO
3	1080	10-3 at Pier 10	Bottom face of beam haunch	Spall	8in. x 4in. x 3.4in.	(1FT)	NO
2	1080	10-4 at Pier 10	Bottom face of beam haunch	Spall	4in. x 4in. x 3/4in.	(1FT)	NO
2	1080	10-5 at Pier 10	Bottom face of beam haunch	Spall	5in. x 4in. x 3/4in.	(1FT)	NO
3	1080	10-7 at Pier 10	Bottom face of beam haunch	Spall	16in. x 4in. x 1in.	(2FT)	NO
2	1080	10-8 at Pier 10	Beam haunch	Delamination	1ft. x 4in.	(1FT)	NO
3	1080	10-9 at Pier 10	Bottom face of beam haunch	Spall	6in. x 5in. x 1in.	(1FT)	NO
2	1080	11-7 at Pier 11	Beam haunch	Delamination	1ft. x 4in.	(1FT)	NO
2	1080	11-5 at Pier 12	Beam haunch	Delamination	1ft. x 4in	(1FT)	NO
3	1080	11-6 at Pier 12	Bottom face of beam haunch	Spall	6in. x 3in. x 1in.	(1FT)	NO
3	1080	11-8 at Pier 12	Beam haunch	Spall	16in. x 4in. x 1/2in.	(2FT)	NO
2	1080	11-10 at Pier 12	Bottom face of haunch	Sound patch	10in. x 4in.	(1FT)	NO

ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
3	1080	12-1 at Pier 12	Bottom face of haunch	Spall	10in. x 4in. x 1in. (1FT)	NO
3	1080	12-3 at Pier 12	Bottom face of haunch	Spall/Delam	1ft. x 4in. x 3/4in. (1FT)	NO
3	1080	12-6 at Pier 13	Bottom west face	Spall	9in. x 5in. x 2in. (1FT)	NO
3	1080	12-8 at Pier 12	Bottom face of beam haunch	Spall	10in. x 5in. x 1in. (1FT)	NO
3	1080	12-10 at Pier 12	Beam haunch	Spall	16in. x 4in. x 1in. (2FT)	NO
3	1110	12-10 at 12 to Pier 13	Right face near top of web intermittently from Pier 12 to Pier 13	Horizontal and diagonal cracks	Up to 5ft. 7in. long x 1/64in. wide (12FT)	NO
2	1080	13-2 at Pier 13	West face of beam over bearing	Delamination	2ft. x 1ft. (2FT)	NO
1	INCID	13-4 at Pier 13	Beam end	Spall w/exposed steel	1ft. x 4in. x 2in.	NO
1	INCID	Bay 13-5 at Pier 13	Diaphragm in Bay 13-5	Spall w/exposed painted steel	7in. diameter x 3/4in.	NO
3	1080	13-8 at Pier 13	Bottom face of beam haunch	Spall w/exposed steel	6in. x 3in. x 1in. (1FT)	NO
2	1080	13-10 at Pier 13	Bottom face of beam haunch	Delamination	3in. x 2in. (1FT)	NO
2	1080	13-1 at Pier 14	Beam haunch	Delamination	1ft. x 4in. (1FT)	NO
2	1080	13-2 at Pier 14	Beam haunch	Delamination	1ft. x 4in. (1FT)	NO
3	1080	13-8 at Pier 14	Bottom face both sides of beam haunch	Spall	6in. x 3in. x 1in. (1FT)	NO
3	1080	13-10 at Pier 14	Bottom face of beam haunch	Spall	6in. x 4in. x 1in. (1FT)	NO
3	1080	14-4 at Pier 14	Beam haunch	Spall/delamination	1ft. x 4in. x 1in. (1FT)	NO
3	1080	14-6 at Pier 14	Bottom face of beam haunch	Spall	6in. x 4in. x 1in. (1FT)	NO
2	1080	14-7 at Pier 14	Bottom face of beam haunch	Spall	3in. x 4in. x 1in. (1FT)	NO
3	1080	14-8 at Pier 14	Bottom face	Spall	1ft. x 6in. x 1in. (1FT)	NO
2	1080	14-1 at Pier 15	Bottom face of beam haunch	Delamination	6in. x 1in. (1FT)	NO
3	1080	14-3 at Pier 15	Right face, beam end and diaphragm	Spall	6in. x 5in. x 2in. (1FT)	NO
2	1080	14-9 at Pier 15	Left face of Beam	Delamination	2ft. x 1ft. (2FT)	NO
3	1110	14-10 at Pier 15	Top right fillet	Cracks	3ft. long x 1/64in. wide (3FT)	NO
1	INCI	15-2, 3, 4 at Pier 15	Left face of beam end	Spall/delamination	1ft. x 6in. x 1in.	NO
3	1080	15-5 at Pier 15	Bottom face of beam haunch	Spall	8in. x 3in. x 1in. (1FT)	NO
3	1080	15-6 at Pier 15	Left face of bottom flange	Spall	8in. x 6in. x 3/4in. (1FT)	NO
3	1080	15-7 at Pier 15	Bottom face of beam haunch	Spall	8in. x 4in. x 1in. (1FT)	NO
2	1080	15-9 at Pier 15	Bottom left face beam end	Delamination	2ft. x 1in. (2FT)	NO
2	1080	15-10 at 1/3pt.	Bottom face of bottom flange	Sound patch	8in. x 1/2in. (1FT)	NO
2	1080	15-2 at Pier 16	Bottom face of beam haunch	Delamination	1ft. x 4in. (1FT)	NO

ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
2	1080	15-3 at Pier 16	Bottom face of beam haunch	Delamination	1ft. x 4in. (1FT)	NO
3	1080	15-4 at Pier 16	Bottom face of beam haunch	Spall	1ft. x 6in. x 1in. (1FT)	NO
3	1080	15-6 at Pier 16	Left face, beam end and diaphragm	Spall/delamination	2ft. x 10in. x 3in. (2FT)	NO
3	1080	15-7 at Pier 16	Left and right faces beam end diaphragm & bottom face of beam haunch	Spall/delamination	18in. x 4in. x 1in. (2FT)	NO
3	1080	15-7 at Pier 16	Bottom face of beam haunch	Spall	10in. x 4in. x 1in. (1FT)	NO
1	INCID	15-8 at Pier 16	Left and right faces, beam end diaphragm	Delamination	8in. x 4in. x 1in.	NO
2	1080	15-8 at Pier 16	Bottom face of beam haunch	Spall/delamination	4in. x 3in. x 1in. (1FT)	NO
3	1080	15-9 at Pier 16	Bottom face of beam haunch	Spall	11in. x 4in. x 1in. (1FT)	NO
3	1080	19-2 at Pier 19	Bottom face of beam haunch	Spall/delamination	16in. x 4in. x 1in. (2FT)	NO
3	1080	19-5 at Pier 19	Beam end	Spall/delamination	16in. x 4in. x 1in. (2FT)	NO
2	1080	19-2 at Pier 20	Bottom face of beam haunch	Delamination	16in. x 4in. (2FT)	NO
2	1080	19-10 at Pier 20	Left face, top flange	Sound patch	1ft. x 1in. (1FT)	NO
3	1080	20-10 at Pier 20	Right face, beam end and diaphragm	Unsound patch	8in. x 6in. (1FT)	NO
2	1080	20-1 at Pier 21	Bottom face of beam haunch	Delamination	16in. x 4in. (2FT)	NO
2	1080	20-4 at Pier 21	Bottom face of beam haunch	Two spalls	Less than 6in. x 4in. x 1in. (2FT)	NO
2	1080	20-5 at Pier 21	Bottom face of beam haunch	Trash Steel and spall	3in diameter x 1/2in. (1FT)	NO
2	1080	20-9 at Pier 21	Bottom face of beam haunch	Delamination	16in. x 4in. (2FT)	NO
2	1080	20-6 at Pier 21	Bottom face of beam haunch	Spall	Less than 6in. x 4in. x 1-1/4in. (1FT)	NO
3	1080	21-2 at Pier 21	Bottom flange, right face	Lack of cover spalls w/exposed steel	10in. x 1in. x 1/2in. (1FT)	NO
3	1080	21-2 at Pier 21	Bottom face of beam haunch	Spall	16in. x 4in. x 1/2in. (2FT)	NO
3	1080	21-3 at Pier 21	Bottom face of beam haunch	Spall	16in. x 4in. x 3/4in. (2FT)	NO
3	1080	21-4 at Pier 21	Bottom face of beam haunch	Spall w/exposed steel	16in. x 4in. x 1in. (2FT)	NO

ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
3	1080	21-6 at Pier 21	Bottom face of beam haunch	Spall	1ft. x 2in. x 1in. (1FT)	NO
2	1080	21-7 at Pier 21	Bottom face of beam haunch	Delamination	16in. x 4in. (2FT)	NO
3	1080	21-9 at Pier 21	Bottom face of beam haunch	Spall	7in. x 3in. x 3/4in. (1FT)	NO
3	1080	21-10 at Pier 21	Bottom face of beam haunch	Spall	16in. x 4in. x 3/4in. (1FT)	NO
2	1080	21-5 at Pier 22	Right face over bearing area	Delamination	1ft. x 1ft. (1FT)	NO
2	1080	21-9 at Pier 22	Right face over bearing area	Delamination	1ft. x 1ft. (1FT)	NO
1	INCID	22-2 at Pier 22	Left face, beam end	Spall/delamination	8in. x 4in. x 1/2in.	NO
2	1080	22-4 at Pier 22	Left face of beam end and	Delamination	18in. x 14in. (2FT)	NO
2	1080	22-7 at Pier 22	Left and right faces, beam end	Delamination	1ft. x 4in. (1FT)	NO
3	1080	22-2 at Pier 23	Bottom face of beam haunch	Spall	16in. x 4in. x 1in. (2FT)	NO
3	1080	22-6 at Pier 23	Bottom face of beam haunch	Spall	16in. x 4in. x 1/2in. (2FT)	NO
3	1080	22-10 at Pier 23	Bottom flange at bearing	Delamination	16in. x 2in. high (2FT)	NO
2	1080	23-2 at Pier 23	Bottom face of beam haunch	Spall w/exposed steel	3in. diameter x 1in. (1FT)	NO
2	1080	23-8 at Pier 23	Bottom face of beam haunch	Delamination	16in. x 16in. (2FT)	NO
2	1080	23-5 at Pier 24	Diaphragm and both faces on either side of haunch	Sound patch	12in. x 12in. (1FT)	NO
1	INCID	24-2 at Pier 24	Right face, beam end	Delamination	1ft. x 4in.	NO
2	1080	24-2 at Pier 25	Left face of beam	Delamination	8in. x 3in. (1FT)	NO
3	1080	24-3 at Pier 25	Bottom face of beam haunch	Spall	16in. x 4in. x 1in. (2FT)	NO
2	1080	25-1 at Pier 25	Bottom face of beam haunch	Delamination	1ft. x 3in. (1FT)	NO
3	1080	25-2 at Pier 25	Bottom face of beam haunch	Spall	1ft x 4in. x 1in. (1FT)	NO
3	1080	25-6 at Pier 25	Bottom face of beam haunch	Spall	6in. x 4in. x 1in. (1FT)	NO
1	INCID	25-5, 8 at Pier 25	Left face, beam end diaphragm	Delamination	8in. x 5in.	NO
2	1080	25-8 at Pier 25	Bottom face of beam haunch	Spall	2in. diameter x 1/2in. (1FT)	NO
2	1080	26-1, 10ft. N of Pier 26	West face of web	Sound patch	6in. x 3in. (1FT)	NO
1	INCID	26-3 at Pier 26	Right face, beam end diaphragm	Sound patch	18in. x 4in.	NO
3	1080	26-5 at Pier 26	Right face of beam	Unsound patch	10in. x 8in. (1FT)	NO
3	1080	26-6 at Pier 26	Left and right faces, beam end and diaphragm	Unsound patch/spall	Up to 18in. x 18in. x 3in. (2FT)	NO
3	1080	26-1 at Pier 27	Bottom face of beam haunch	Spall	16in. x 2in. x 1in. (2FT)	NO
3	1080	26-3 at Pier 27	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO
3	1080	26-4 at Pier 27	Bottom face of beam haunch	Spall	12in. x 4in. x 3/4in. (1FT)	NO
1	INCID	26-5 at Pier 27	Left face, beam end diaphragm	Spalled repair	18in. x 4in. x 2in.	NO
2	1080	26-6 at Pier 27	Bottom face of beam haunch	Sound patch	16in. x 4in. (2FT)	NO
2	1080	26-6 at Pier 27	Left face of beam	Delamination	8in. x 4in. (1FT)	NO
2	1080	26-6 at Pier 27	Beam end	Delamination	1ft. x 5in. (1FT)	NO

ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
2	1080	26-7 at Pier 27	Beam end	Delamination	8in. x 4in. (1FT)	NO
2	1080	26-8 at Pier 27	Bottom face of beam haunch	Delamination	16in. x2in. (2FT)	NO
2	1080	27-1 at Pier 27	Right face and beam end	Delamination	1ft. x 4in. (1FT)	NO
2	1080	27-1 at Pier 27	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO
2	1080	27-2 at Pier 27	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO
3	1080	27-3 at Pier 27	Bottom face of beam haunch	Spall	16in. x 2in. x 1in. (2FT)	NO
3	1080	27-4 at Pier 27	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO
3	1080	27-5 at Pier 27	Left face over the bearing	Delamination	1ft. x 6in. (1FT)	NO
3	1080	27-6 at Pier 27	Bottom face of beam haunch	Delamination	2ft. x 4in. (2FT)	NO
3	1080	27-7 at Pier 27	Bottom face of beam haunch	Spall	8in. x 4in. x 3/4in. (1FT)	NO
2	1080	27-8 at Pier 27	Bottom face of beam haunch	Spall	3in. x 4in. x 1in. (1FT)	NO
2	1080	27-10 at Pier 27	Bottom face of beam haunch and right face over the bearing	Sound patch	2ft. x 4in. (2FT)	NO
2	1080	27-6 at Pier 28	Beam end and right side	Sound patch	8in. x 4in. (1FT)	NO
3	1080	28-1 at Pier 29	Bottom face of beam haunch	Spall	12in. x 6in. x 2in. (1FT)	NO
3	1080	28-2 at Pier 29	Bottom face of beam haunch	Spall	6in. x 4in. x 1-1/2in. (1FT)	NO
3	1080	28-2 at Pier 29	Bottom face of beam haunch	Spall	6in. x 4in. x 1-1/2in. (1FT)	NO
2	1080	28-5 at Pier 29	Bottom face of beam haunch	Spall	4in. x 2in. x 1/2in. (1FT)	NO
3	1080	29-2 at Pier 29	Bottom face of beam haunch	Spall/delamination	16in.x 4in. x 4in. (2FT)	NO
2	1080	29-3 at Pier 29	Bottom face of beam haunch	Spall	4in. x 4in. x 1in. (1FT)	NO
2	1080	29-3 at Pier 29	Right bottom flange, mid-span	Sound patch	4in. x 2in. (1FT)	NO
3	1080	29-4 at Pier 29	Bottom faces and beam haunch	Spalls	6in. x 4in. x 1in. (1FT)	NO
2	1080	29-5 at Pier 29	Left face of beam and beam end	Delamination	2ft. 4in. (2FT)	NO
2	1080	29-7 at Pier 29	Bottom faces and beam haunch	Delamination	16in. x 2in. (2FT)	NO
2	1080	29-10 at Pier 29	Left face of beam	Delamination	2ft. x 3in. (2FT)	NO
2	1080	29-5 at Pier 30	Right face over bearing, beam end and diaphragm	Sound patch	1ft. x 10in. (1FT)	NO
3	1080	29-7 at Pier 30	Bottom face of beam haunch	Spall	16in. x 3in. x 1in. (2FT)	NO
3	1080	29-8 at Pier 30	Bottom face of beam haunch	Spall	16in. x 4in. x 1in. (2FT)	NO
3	1080	29-9 at Pier 30	Bottom face of beam haunch	Spall	6in. x 4in. x 2in. (1FT)	NO
2	1080	30-1 at Pier 31	Bottom face of beam haunch	Spall	3in. x 3in. x 1in. (1FT)	NO
2	1080	30-2 at Pier 31	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Bridge Inspection Report Addendum

ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
3	1080	30-3 at Pier 31	Bottom face of beam haunch	Spall	8in. x 2in. x 1in. (1FT)	NO
2	1080	30-5 at Pier 31	Bottom face of beam haunch	Spall	4in. x 2in. x 1/2in. (1FT)	NO
2	1080	30-7 at Pier 31	Bottom face of beam haunch	Spall	4in. x 4in. x 1/2in. (1FT)	NO
2	1080	30-8 at Pier 31	Bottom face of beam haunch	Spall	4in. x 4in. x 1/2in. (1FT)	NO
2	1080	30-9 at Pier 31	Bottom face of beam haunch	Two spalls	4in. x 4in. x 1/2in. (1FT)	NO
3	1080	31-1 at Pier 31	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO
3	1080	31-2 at Pier 31	Bottom face of beam haunch	Delamination	16in. x 2in. (2FT)	NO
3	1080	31-3 at Pier 31	Bottom face of beam haunch	Spall	6in. x 4in. x 1in. (1FT)	NO
3	1080	31-5 at Pier 31	Bottom face of beam haunch	Spall	8in. x 4in. x 1/2in. (1FT)	NO
3	1080	31-7 at Pier 31	Beam haunch and left face of beam	Spall	4in. x 4in. x 1in. (1FT)	NO
3	1080	31-9 at Pier 31	Bottom face of beam haunch	Spall	6in. x 4in. x 1in. (1FT)	NO
3	1080	31-10 at Pier 31	Bottom face of beam haunch	2 Spalls each	4in. x 4in. x 1in. (1FT)	NO
3	1080	31-4 at Pier 32	Bottom left face of beam	Unsound patch	8in. x 4in. – NEW (1FT)	NO
2	1080	31-6 at Pier 32	Bottom face of beam haunch	Delamination	8in. x 5in. – NEW (1FT)	NO
3	1080	31-7 at Pier 32	Right face of beam over bearing	Delamination	1ft. x 8in. (1FT)	NO
3	1080	31-8 at Pier 32	Right face of beam over bearing	Delamination	1ft. x 1ft. (1FT)	NO
2	1080	31-10 at Pier 32	Right face of beam over bearing	Delamination	2ft. x 1ft. (2FT)	NO
2	1080	32-5 at Pier 32	Left face of beam over bearing	Delamination	2ft. x 1ft. (2FT)	NO
3	1080	32-6 at Pier 32	Left face of beam end	Spall	1ft. x 3in. x 1in. (1FT)	NO
3	1080	32-6 at 3/4 point	Bottom face of beam	Spall	7in. x 3in. x 1in. (1FT)	NO
2	1080	32-9 at Pier 32	Left face of beam over bearing	Delamination	2ft. x 1ft. (2FT)	NO
2	1080	32-10 at Pier 32	Left face of beam over bearing	Delamination	1ft. x 6in. (1FT)	NO
2	1080	32-1 at Pier 33	Bottom face of beam haunch	Spall	3in. x 2in. x 1/2in. (1FT)	NO
3	1080	32-2 at Pier 33	Bottom face of beam haunch	Spall	14in. x 3in. x 1in. (1FT)	NO
3	1080	32-3 at Pier 33	Bottom face of beam haunch	Spall w/exposed steel	14in. x 4in. x 1in. (1FT)	NO
2	1080	32-5 at Pier 33	Bottom face of beam haunch	Spall	5in. x 3in. x 1in. (1FT)	NO
2	1080	32-7 at Pier 33	Bottom face of beam haunch	Spall	4in. x 2in. x 1in. (1FT)	NO
2	1080	33-1	Bottom left flange at mid-span	Spall	4in. x 3in. x 1/2in. (1FT)	NO
3	1080	33-2	Bottom left flange at mid-span	Spalls	Up to 7in. x 6in x 3/4in. (1FT)	NO
2	1080	33-4 at Pier 33	Bottom face of beam haunch	Spalls	Up to 4in. x 4in. x 1in. (1FT)	NO

ELEMENT NOTES

Element Category

109 P/S Conc Open Girder (Continued)

TABLE 3

This table lists beam and beam end deficiencies:

CS	Defect	Beam at Pier	Location	Deficiency	Size	P3WO
2	1080	33-5 at Pier 33	Bottom face of beam haunch	Spall	Up to 16in. x 4in. x 1in. (2FT)	YES
2	1080	33-6 at Pier 33	Bottom face of beam haunch	Spall	5in. x 4in. x 1in. (1FT)	NO
2	1080	33-7 at Pier 33	Bottom face of beam haunch	Spall	5in. x 4in. x 1in. (1FT)	NO
2	1080	33-9 at Pier 33	Bottom face of beam haunch	Spall	5in. x 4in. x 1in. (1FT)	NO
2	1080	33-10 at Pier 33	Bottom face of beam haunch	Spall	5in. x 4in. x 1in. (1FT)	NO
2	1080	33-4 at Abt 34	Bottom face of beam haunch	Spall	5in. x 4in. x 1in. - NEW (1FT)	NO
3	1080	33-5 at Abt 34	Bottom face of beam haunch	Spall	16in. x 4in. x 1in. - NEW (2FT)	NO
2	1080	33-7 at Abt 34	Bottom face of beam haunch	Spall	5in. x 4in. x 1in. - NEW (1FT)	NO
3	1080	33-10 at Abt 34	Bottom face of beam haunch	Spall	8in. x 4in. x 1in. - NEW (1FT)	NO

Routine Underwater Bridge Inspection Report
VOLKERT, INC.
for
KISINGER CAMPO & ASSOCIATES, CORP.

NBI Structure ID. (8): **130053** Underwater Date (93): 12/01/21

Structure/Roadway Identification:

District (2):	01
County (3):	Manatee
Feature Intersected (6):	Manatee River 2nd St. E
Facility Carried (7):	US-41/US-301

Underwater Inspection Details:

Special Crew Hours:	23.2
Max. Depth:	13ft. at Bent 20
Type of Dive Insp.:	Level II (SCUBA)
Type of Boat Used:	19ft. Skiff
Water Type/Marine Growth:	Brackish – Barnacles/Oysters

Previous Inspection:

Lead Diver:	P.E./C.B.I. No.:	Inspection Date:
Qualls, Dion C.	00470	12/10/19

Inspection Personnel:

Field Personnel:	Title	P.E./C.B.I. No.:	Duty:	Signature:
Hoogland, Keith S.	SUCBI	00341/Lead	Dive	Keith S Hoogland Digitally signed by Keith S Hoogland Date: 2022.02.18 15:18:37-05'00'
Popp, Jacob J.	AUBI		Dive	
Austin, Kevin D.	AUBI		Tend	

8290 CHANNEL **1** EA. = **CS-2:** 1EA.

NOTE: The seawalls under Spans 4 and 33 were evaluated as channel protection.
Armor mat has been installed around Piers 31, 32 and 33.

CS2 9120 = The armor mat on the south edge of Bent 33 has an undermined area, intermittently full length x 10in. high x 4ft. of penetration – INCREASE. (1EA)

There is an abandoned fender system lower platform lying on the channel bottom, between the north fender and east of Pier 18 and between the south fender and west of Pier 17, not obstructing marine traffic.

South seawall, east end, 12ft. west of outfall pipe, from cap down, delamination/spall, 12in. x 12in. x 1in.

There is debris (bike wheel, construction debris) in the channel.

NOTE: The north seawall has less than 3ft. of water/marine growth and will not be reported in the underwater report next cycle if condition remains.

205 RE CONC COLUMN **6** EA. = **CS-1:** 6EA.

NOTE: This element represents the three columns at each of Piers 17 and 18. The web wall between the columns is incidental to this element.

INCIDENTAL:
There are 1/32in. vertical cracks in the web walls from above water extending 6in. into the marine growth.

Cleaning Log: Random strips on Pier 17.

220 RE CONC PILE CAP/FTG **689** FT. = **CS-1:** 158FT. **CS-2:** 146FT. **CS-3:** 385FT.

NOTE: Bottom of footings were above marine growth but inspected by Divers due to minimal clearance.
A = Aggressive environment.

CS2 1130(A) = Bottoms of numerous footings have intermittent longitudinal and transverse cracks, up to full length/width x 1/32in. wide in the original concrete. (119FT)

CS3 1080 = The bottom of Footings 5-1, 8-2, 9-1, 12-2, 13-1, 15-1, 15-2, 15-3, 21-1, 21-3, 23-1, 24-3, 26-1, 27-1, 27-2, 28-3, 29-1, 29-2, 29-3, 30-1, 31-3 and 33-3 have delaminations/spalls/honeycomb up to 6ft. x 6ft. x 2in. – INCREASE. (114FT)

CS3 1120 = Bottom of Footings 5-2, 8-2, 10-2, 10-3, 11-1, 11-2, 11-3, 12-1, 12-3, 13-2, 13-3, 14-2, 14-3, 16-1, 16-2, 16-3, 19-3, 20-1, 20-3, 21-2, 21-3, 22-3, 23-2, 26-2 and 31-1 have delaminations up to 6ft. x 6ft., with corrosion bleedout – DECREASE. (100FT)

CS3 1120 = Bottom of Footings 6-1, 7-1, 7-3, 8-1 and 8-2 have areas corrosion bleedout, up to 12in. x 12in. (8FT)

CS3 1080 = The bottom of Footings 6-2, 6-3, 7-1, 7-2, 8-1, 8-3 and 13-3 have areas of honeycomb/voids up to 24in. x 35in. x 2in. – INCREASE. (9FT)

CS2 1080 = Bottom of Footings 6-2, 7-2, 7-3, 8-3, 19-1, 19-2 and 33-2 between the piles have delaminations up to 6ft. x 6ft. – DECREASE. (25FT)

CS3 1080 = The bottom of Footings 6-3, 7-1, 8-1, 14-1, 19-3, 20-1, 20-2, 20-3, 21-2, 22-1, 22-2, 23-2, 23-3, 24-1, 24-2, 25-1, 26-3, 27-3, 28-1, 28-2, 30-2, 30-3, 31-2, 32-1, 32-2, 32-3 and 33-1 have delamination/spalls up to 6ft. x 6ft. x 2in. – INCREASE. (120FT)

CS3 1080 = Bottom of Footing 9-1: NE corner of Pile 3, honeycomb, 12in. x 12in. x 3-1/2in., with exposed steel. (1FT)

CS3 1080 = Bottom of Footings 9-2, 9-3, 10-1, 25-2 and 25-3 have delaminations/spalls/honeycomb, up to 6ft. x 6ft. x 2in., with corrosion bleedout – INCREASE. (28FT)

CS3 1080 = Footing 11-3: SE corner at bottom edge, unsound patch, 3ft. x 24in. (2FT)

CS3 1090 = Footing 13-3: NE corner of Pile 15, bottom of footing, honeycomb/void, 12in. x 8in. x 5in., with exposed rebar with delaminative corrosion and section loss. (1FT)

CS3 1080 = Bottom of Footing 13-3: SW corner of Pile 16, honeycomb, 12in. x 4in. x 3in., with exposed steel. (1FT)

CS3 1090 = Footing 29-2: Between Piles 8 and 10, honeycomb, 11in. x 5in. x 3in., with exposed steel; 50% section remaining. (1FT)

CS2 1080 = Bottom of Footing 31-2: NE corner of Pile 31-9, sound patch, 17in. x 15in. (2FT)

INCIDENTAL:
The gunite repairs on the undersides of the footings have cracks up to 1/32in. wide, several with corrosion bleedout and/or efflorescence.

227 RE CONC PILE **486** EA. = **CS-1:** 384EA. **CS-2:** 58EA. **CS-3:** 44EA.

NOTE: This element represents the piles below the footings at Piers 5 through 16 and 19 through 33.
The piles are heavily covered with marine growth from approximately 12in. below the footings down to the mudline.
There is gunite overspray at the top of the piles from footing repairs.
A = Aggressive environment.

CS2 1080 = Piles 5-12 (NW), 6-14 (SE), 6-16 (NE), 7-6 (NE/NW), 7-7 (NE), 8-12 (NW), 8-16 (NE), 9-2 (SE), 10-2 (NW), 11-8 (SE), 11-13 (SW) (NEW), 11-16 (NE), 11-18 (NE), 12-7 (NE/SE/SW), 13-1 (SW), 13-7 (SE), 13-8 (SW), 14-14 (NE), 14-17 (SE), 15-13 (SW), 15-16 (SE/NE), 19-5 (NW), 19-7 (SE), 21-2 (NW), 22-4 (SW), 22-6 (SW), 22-10 (NW), 22-17 (SE), 22-18 (NE), 23-2 (SE), 27-18 (NE), 28-18 (SE), 29-1 (SE), 31-10 (east face) and 32-5 (NW) have corner spalls less than 6in. x 6in. x 1in. – DECREASE. (31EA)

CS2 1130 (A) = Piles 5-12, 5-17, 13-16, 30-7 and 32-14 have horizontal cracks, up to 10in. x 1/32in. – INCREASE. (5EA)

CS3 1080 = Piles 5-13 (SE), 6-13 (SE/SW) (NEW), 6-15 (SE), 8-1 (SW), 8-3 (SE), 8-11 (NW), 8-13 (NE/NW), 9-15 (NW), 11-8 (SE) (NEW), 12-4 (NW), 12-15 (SE), 13-4 (SE), 13-15 (NE), 13-18 (NE), 15-6 (SW), 16-12 (NE), 21-3 (NE), 21-14 (SE), 24-1 (NW), 24-7 (NE), 25-4 (SW), 26-13 (south face), 28-8 (NE), 28-14 (SE), 30-14 (SW), 30-18 (NE) and 31-14 (SE) have spalls up to 30in. x 6in. x 1in., largest being Pile 13-4. – DECREASE. (26EA)

CS3 1080 = Pile 5-14: SE corner 20in. below footing, spall/unsound patch, 12in. x 4in. x 1-1/2in. (1EA)

CS2 1130 (A) = Piles 5-17, 6-9, 9-8, 12-8, 12-14, 13-18, 14-2, 15-13, 16-4, 23-2, 24-1, 25-14, 25-18, 26-4, 26-16, 27-16, 27-18, 30-7, 30-8, 30-18, 31-1, 31-4, 31-14 and 31-16 have vertical cracks up to 3ft. x 1/32in. – INCREASE. (22EA)

CS3 1120 = Pile 6-5: East face 8in. below footing, delamination, 10in. x 6in., with corrosion bleedout. (1EA)

CS3 1080 = Piles 6-13: NE corner 20in. below corner, spall, 3ft. x 8in. x 3in. (1EA)

CS3 1080 = Pile 6-17: SE corner 3ft. below footing, spall/void. 5ft. x 12in. x 1-1/2in. (1EA)

CS3 1080 = Pile 7-15: SW corner 6ft. below footing, spall, 12in. x 12in. x 2in. (1EA)

CS3 1120 = Pile 9-3: SE corner, footing underside down, vertical crack, 18in. x 1/32in., with corrosion bleedout. (1EA)

CS3 1080 = Pile 12-8: SW corner 7in. below footing, spall, 7in. x 5in. x 2in. – INCREASE. (1EA)

CS3 1120 = Piles 11-4, 13-16, 15-11, 21-1, 22-1, 22-14, 23-2, 24-10, 26-6, 28-14 and 29-6 below the footing, have vertical cracks, up to 18in. x 1/64in., with corrosion bleedout – INCREASE. (10EA)

CS3 1080 = Pile 16-14: NW corner at groundline, spall, 28in. x 8in. x 4in. (1EA)

NOTE: The previously reported spalls in Piles 10-11, 12-18, 21-4, 24-14, 24-15 and 27-16 were not found this inspection.

The previously reported vertical crack in Pile 21-7 was not found this inspection.

Cleaning Log: Piles 5-1, 5-2, 5-3, 5-5 through 5-18, 9-2, 9-3, 9-4, 9-5, 9-6, 9-7, 9-9 through 9-18, 10-1, 10-2, 10-3, 10-4, 10-5, 10-6 and 10-8 through 10-17

8298 PILE JACKET BARE **75** EA. = **CS-1:** 75EA.

NOTE: This element represents the jackets on Piles 5-4, 6-2, 6-6, 8-18, 9-1, 9-8, 10-7, 10-18, 11-3, 11-5, 14-2, 14-3, 14-5, 14-8, 14-10, 14-12, 14-18, 15-2, 15-3, 15-5, 15-8, 15-14, 15-15, 15-17, 16-8, 20-9, 20-10, 22-3, 23-1, 23-4, 23-5, 23-6, 23-14, 23-17, 23-18, 24-3, 25-5, 25-10, 25-13, 25-16, 25-17, 26-2, 26-3, 26-9, 26-10, 26-11, 26-12, 26-18, 27-4, 28-2, 29-5, 29-7, 29-10, 29-13, 29-14, 29-16, 29-17, 29-18, 30-1, 30-2, 30-4, 30-5, 30-6, 30-11, 30-13, 30-15, 31-1, 31-2, 31-5, 31-9, 31-16, 31-17, 31-18, 32-2 and 33-12.

INCIDENTAL:
The anode wires are not properly routed inside the jackets, intermittently throughout.

CAT: The previously reported broken PVC wiring conduit elbows in Jackets 14-8, 14-12, 29-16, 30-4, 30-6 and 31-9 have been repaired.

520 CONC RE PROT SYS **3144** SF. = **CS-1:** 3144SF.

NOTE: The anodes on Jackets 5-4, 9-1, 10-7, 23-17, 26-9, 27-4, 28-2, 29-5, 29-7, 29-13, 29-17, 29-18, 30-1, 30-2, 30-4, 30-5, 30-6, 30-11, 31-1, 31-2, 31-9, 31-17, 32-2 and 33-12 are buried.

CS1 = Anodes have 80% or more section remaining.

CAT: The previously reported detached round bar in Jacket 15-5 has been reattached.

8387 PS FENDER/DOLPHIN **318** FT. = **CS-1:** 285FT. **CS-3:** 26FT.

CS3 1080 = Ten piles have corner spalls, up to 10in. x 4in. x 1in. (20FT)

CS3 1110 = North fender, 14th and 15th clusters from west end plumb piles, west and east faces, 13th cluster from west end west plumb pile, south face at marine growth, vertical cracks, up to 24in. x 1/64in., with corrosion bleedout. (6FT)

INSPECTION NOTES: Divers inspected Channel, Piers 17 and 18 each with three columns, Footings, Piers 5 through 16 and 19 through 33 each with eighteen reinforced concrete piles, Jackets, Concrete Reinforcing Protective System and Fender System.
STRUCTURE NOTES: Structure inventoried south to north.

PHOTO LOG:
No.1: Structure ID
No. 2: West elevation
No. 3: North fender Cluster 14 from west plumb bile, crack with corrosion bleedout
No. 4: Footing 5-1, delamination/spall/honeycomb
No. 5: Footing 5-2, delamination with corrosion bleedout
No. 6: Pile 5-14 SE corner, delamination/spall
No. 7: Pile 5-17 north face, vertical crack
No. 8: Pile 5-17 north face, horizontal crack
No. 9: Pile 6-5 NE corner, delamination with corrosion bleedout
No. 10: Footing 6-2, typical honeycomb
No. 11: Footing 6-2, delamination
No. 12: Footing 6-3, delamination/spall
No. 13: Pile 6-13 NE corner, spall
No. 14: Pile 6-17 SE corner, void
No. 15: Footing 9-1 delamination/spall with corrosion bleedout
No. 16: Pile 9-3 SE corner, vertical crack with corrosion bleedout
No. 17: Footing 11-3 SE corner, unsound patch
No. 18: Footing 13-3 NE corner of Pile 15, honeycomb with exposed steel
No. 19: Pile 13-4 SE corner, spall
No. 20: Pile 16-14 NW corner, spall
No. 21: South fender, typical spall
No. 22: Armor mat at Bent 33, undermining
No. 23: North seawall, less than 3ft. of water/marine growth
No. 24: Footing 16-3, typical cracks with corrosion bleedout in gunite

APPENDIX F – Technical Memorandum – Hernando DeSoto Bridge Condition Assessment

TECHNICAL MEMORANDUM

Hernando Desoto Bridge Condition Assessment
SR 55 (US-41/US301) Over Manatee River
Manatee County, Florida

Financial Project Identification (FPID) Number: 412550-1-32-12

Prepared for:

FLORIDA DEPARTMENT OF TRANSPORTATION
DISTRICT ONE
801 North Broadway Avenue
Bartow, Florida 33831

March 2019

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SECTION 1.0
INTRODUCTION

The Florida Department of Transportation (FDOT) is conducting a Bridge Condition Assessment for Hernando Desoto Bridge (Bridge Number 130053) at US 41/ US 301 over Manatee River, in Manatee County, Florida.

1.1 PURPOSE

The purpose of the Condition Assessment is to provide documented engineering analyses to assist the FDOT in comparing the alternatives between rehabilitation versus replacement of the bridge. The assessment includes corrosion testing of the concrete, the rate of future corrosion progression, bridge rehabilitation and replacement alternatives in order to accommodate future transportation needs in a safe and efficient manner.

The purpose of this Technical Assessment is to document the bridge corrosion condition and rehabilitation and replacement alternatives. The bridge corrosion condition is conducted based on corrosion testing, visual observation during testing, and criteria for corrosion potential that is essential for the development of testing result. The preliminary rehabilitation alternatives are evaluated based on the current status of corrosion, current inspection rating, upgrading to current bridge standards, bridge loading capacity, cost effectiveness, remaining service life of structure, and corrosion progression.

1.2 PROJECT DESCRIPTION

The Assessment limits encompass the portion of SR 55 at milepost (MP) 2.617 within the City of Bradenton, 0.6 miles (mi) north of SR 64. The project is located in Section 13130, Township 34 South, and Range 17 East, within the City of Bradenton. The existing Hernando Desoto Bridge was constructed in 1957. The Hernando Desoto Bridge (Bridge Number 130053) is a divided four-lane mid-level fixed structure that spans the Manatee River, a marked federal navigational channel which generally runs between the mainland or the Strategic Intermodal System (SIS). In addition, SR 55 is a designated evacuation route by the Florida State Emergency Response Team (SERT).

SR 55 is a north-south urban principal arterial that provides one of three vehicular access routes to the north and south of Manatee County. SR 55 is classified as an urban collector. SR 55 is four lanes from I-275 to SR 789 by the Manatee County Comprehensive Plan. Land use north of the bridge is generally commercial and residential, with the Manatee Memorial Hospital located adjacent to SR 55 south of the bridge. Access to these adjacent properties is provided by two bridges – the Hernando Desoto Bridge and the Green Bridge. These two bridges are vital connections for the Residents of the City of Palmetto and Ellenton to be able to connect to the hospital.

The bridge is currently maintained by FDOT District One's Asset Maintenance Contractor (AMC), DBi Services.

During its six decades of service, numerous repairs have been made on this structure. The most recent is a rehabilitation project in 2017 for deck repairs, pile jackets, concrete repairs and prestressed beam repairs, and cathodic protection monitoring and maintenance. As the service life of the bridge is extended, it is likely that more repairs will be required for this aging structure.

SECTION 2.0
BRIDGE CORROSION CONDITION

Testing was performed in September 2018. Report was finalized in November 2018. Visual inspection, corrosion testing and evaluation of performance of existing cathodic protection systems of the various components of the Hernando Desoto Bridge was performed as directed by the FDOT State Materials Office. The visual inspection and corrosion testing and sampling were performed by William Scannell, Corrosion Specialist from Concorr Florida, Inc. Except for spans 14 to 18, the top of deck is covered with an overlay and was not able to be visually inspected from the top side.

Locations on the structure exhibiting deficiencies were selected as potential test sites. In addition, a few intact sites were also selected. Piles and jackets were tested from 2012 to 2018 using non-destructive methods. These tests helped determine the integrity of previously installed jackets.

In September 2018, concrete core samples were taken of the various concrete bridge components (deck, beams, pier caps, pier columns, pier struts, and footings), and measurements of the corrosion potentials were made in selected locations. At the end of the field testing, samples were delivered to FDOT State Materials Office laboratory for chemical analysis to determine the degree of chloride intrusion into the concrete.

2.1 TESTING

A total of 16 concrete cores of the various bridge components were extracted for sampling and testing. Some of these cores were taken at sound original concrete, along cracks in original concrete, and repaired areas. These included corrosion potential tests for deck, beams, pier caps, piers columns, pier struts, and footings, and chloride intrusion analysis. The concrete core samples were extracted at 16 locations, for laboratory analysis of the level of chloride intrusions at varying depths (3.5” to 7”) along the sample. After any coring or cutting, the concrete was patched to its original neat lines.

2.2 FINDINGS DURING FIELD TESTING

During the core testing, a minor degree of corrosion was observed on the reinforcing steel in sound original concrete in the deck, pier caps, columns, and struts. No corrosion was found on the reinforcing steel in cracked original concrete in the deck, but the cracks did not extend to the depth of the reinforcing steel. More advanced corrosion, described here as ‘moderate’ corrosion, was found on the reinforcing steel in cracked original concrete in the column although the crack was a surface crack only (Core 9). A moderate degree of corrosion was also found in a cracked patch repair on the column and, in this instance, the crack extended to the depth of the reinforcing steel (Core 10). Reinforcing steel in the footing had a moderate amount of corrosion in sound original concrete, in cracked original concrete where the crack extended to the reinforcing steel depth, and in a sound gunite repair (Cores 1, 3, and 4).

During the beam testing, a core was drilled to the depth of the duct on a post-tensioned bar in the bottom flange. The duct of the post-tensioned bars was not corroded. During the 2011 FDOT-SMO investigation report, no corrosion was found on the exterior surfaces of the ducts. A minor degree of corrosion was found on the inside surfaces of the ducts and on the post-tensioned bars, no discernable pitting was observed on the bars. It was surmised that the observed corrosion on the ducts and post-tensioned bars probably existed at the time of construction and was not the result of ongoing active corrosion.

A visual inspection was performed and soundings were conducted randomly. The findings were categorized in accordance with the following deterioration rating scale:

1 Little or no deterioration: There may be hairline cracking and/or efflorescence.
2 Minor cracks, delamination, and/or spalls, but with no corrosion bleed out: There may be exposed rebar with no corrosion, but there is no exposure of prestressed steel.
3 Moderate cracks, delaminations, and/or spalls: There may be corrosion bleed out, exposed rebar with minor corrosion, and/or some exposure of prestressed steel, but with no corrosion.
4 Severe cracks, delaminations, and/or spalls: There may be exposed rebar with significant corrosion and/or exposed and corroded prestressed steel.
5 January 2018 Bridge Inspection Report (BIR) has indicated exposed beam ends, spalls and delaminations. There are 9 beam end deficiencies at CS3 and 8 beams at CS2. There are a total of 93 beams in CS3 that have with cracks, spalls or delaminations.

The concrete deficiency is following the AASHTO Manual for Bridge Element Inspection in different condition state. The definitions are defined as below:

Condition State Definitions

Defect	Condition State 1	Condition State 2	Condition State 3	Condition State 4
Cracking	None to hairline	Narrow size and/or density	Medium size and/or density	The condition is beyond the limits established in condition state three (3) and/or warrants a structural review to determine the strength or serviceability of the element or bridge.
Spalls / Delaminations/ Patched Areas	None	Moderate spall or patch areas that are sound	Severe spall or patched area showing distress	
Efflorescence	None	Moderate without rust	Severe with rust staining	
Load Capacity	No reduction	No reduction	No reduction	

Sealed cracks and/or patch repairs were present on the top surface in 14 of the 33 spans. The top surface of the deck for all spans was rated 2. Except for spans 14 to 18, the deck is covered with an overlay and was not able to be visually inspected from the top side. The bottom surface of the deck was rated 1 for 29 spans, had a rating of 2 for one span, and a rating of 3 for three spans.

The condition rating was 1 for 298 of the 300 post-tensioned beams. The condition rating on the interior portion of Beams 1-10 and 2-2 was a 3 and 2, respectively. Forty of the fifty beam ends that were inspected had no repairs. The condition rating for original concrete on 21 of those beam

ends was a 1. The condition rating for original concrete on the remaining unrepaired 19 beam ends was a 2. Eight of the 10 beam ends that had been repaired were assigned a condition rating of 1 and the other two repaired beam ends were assigned a condition rating of 2.

Steel girders are found on spans 16 to 18 of the bridge. January 2018 BIR has indicated steel girder paint on the girder is substantially effective. The steel girders have intermittent areas of painted-over pitting up to 1/8in. deep, primarily in the bottom flange and cover plates. It is rated CS2.

The original concrete on 29 of the 32 pier caps were assigned a condition rating of 1. The original concrete on Pier Caps 3 and 31 was assigned a condition rating of 2 and the original concrete on Pier Cap 32 was assigned a condition rating of 4. There are four repaired pier caps that were assigned a condition rating of 2.

There are a total 96 columns for the 32 piers. The condition rating for original concrete on the columns was a 1 for 62 columns, a 2 for 22 columns, a 3 for five columns, and a 4 for seven columns. The repairs were in good condition (rated 1) on 23% of columns and the remaining 77% had repairs with a condition rating of 2.

The condition rating for original concrete on the waterline footings was a 1 for 57 footings, a 2 for 13 footings, a 3 for 10 footings, and a 4 for one footing. All 81 of the waterline footings had sealed cracks, patched areas, and/or areas that had been repaired with gunite and 93% of the repaired areas were assigned a condition rating of 2.

2.3 CRITERIA FOR CORROSION POTENTIAL

One of the challenges is to determine when the potential for corrosion exists prior to the actual process becoming evident. This structure is located over saltwater, so the environment is classified as “extremely aggressive” promoting corrosion of any exposed components. This is compensated for in design by increasing concrete cover over the reinforcing steel, increasing concrete durability and hardness, and by limiting stresses within the materials.

This structure was designed in the 1950s when many of these current preventive practices had not yet been adopted. The Hernando Bridge entered service in 1957, according to the FDOT inspection report data. The structural design methodology of that period was Working Stress Design (WSD), which is somewhat more conservative than the current design codes. As a result, the components were not designed to the high design stresses prevalent today. This helps provide some degree of corrosion resistance, but is not enough by itself. The concrete mix was standard for the period, consisting of 3,000 psi strength Class A concrete used for cast-in-place elements and 5000 psi Class P Concrete used for the precast beam elements. While the beam concrete has somewhat higher resistance to corrosion, the cast-in-place concrete lacks this level of resistance.

The generally accepted concentration for chloride ions within concrete at a depth of 2 inches is 1.20 pounds per cubic yard (lbs/cy). The level at which corrosion potentials exist is tested using a corrosion potential measurement. ASTM C876 suggests there is a 95% chance of corrosion activity when the observed potentials are more negative than (-350) mV. However this is only a guideline,

and the level at which corrosion is active at this site may be different. The tests need to be reviewed in conjunction with the chloride intrusion results.

2.4 TESTING RESULTS

The concrete chloride intrusion test and the corrosion potential test results are included in Appendix B.

In the discussion that follows, the corrosion potential tests were conducted at the surface of the concrete elements. The chloride concentration levels discussed below are all at the reinforcing depths of the elements being discussed. When it is noted that threshold levels exceed a given level, the observed results were more negative than the threshold.

2.4.1 Chloride Intrusion Test

2.4.1.1 Deck

The chloride ion intrusion tests had concentrations less than the 1.20 lbs/cy thresholds for the entire deck thickness. Although there are some chlorides found at the deck concrete, the chloride has not yet reached the depth of the reinforcing steel.

2.4.1.2 Precast Beam

Per core 16, the threshold chloride intrusion has reached 1.5” of the concrete cover. The beam has a 1.125” diameter post-tension bar. The cover to the duct of the post-tensioned reinforcement is 2.13” per the 2011 Corrosion Evaluation of Post-tensioned Concrete Girder report. The beams still have 0.63” of good concrete. It is estimated that the beams still have good concrete cover for another 20 to 25 years of protection.

2.4.1.3 Pier Caps

Pier caps have shown a chloride intrusion to the depth of 6.6 inches beyond the reinforcing steel cover at core 15. The chloride is more than three times greater than corrosion threshold. This confirms corrosion activity is occurring and that there is an unknown amount of concrete delaminating on the pier caps.

2.4.1.4 Pier Column

In some areas on the columns, the chloride concentrations exceed the threshold level beyond the reinforcing steel depth. At the cracked areas, the chloride content is three times the threshold limit. The columns have reached a point where repairing concrete materials will not be able to provide

long-term corrosion control. We have some evidence of the repaired concrete material not being able to provide a long-term solution for the repair. The concrete patched areas shows severe cracking on the surface.

2.4.1.5 Pier Strut

A significant amount of chlorides has infiltrated the outer one inch or so of concrete on the struts, but the chloride content at the reinforcing steel depth is negligible. The struts are generally in good condition.

2.4.1.6 Footing

All cores have indicated the footing chloride intrusion has reached beyond the reinforcing steel depth. Some samples revealed well above two times the threshold limit in sound and cracked concrete beyond the reinforcing steel depth. As a result, the concrete patches that were installed not long ago are failing. This is due to the proximity of the saltwater to the footings. The old gunite repairs are failing on 93% of the footings. Widespread corrosion activity is occurring in the sound concrete. The threshold has approached 6.5 inches of concrete cover.

2.4.2 Corrosion Potential Test

Corrosion potential measurements are provided in Appendix B. All of the measurements taken on the deck, pier caps, and struts indicate that no corrosion activity is occurring. No corrosion found in sound concrete of the column but it is uncertain in delaminated patched areas of column. Corrosion potential measurements taken along a metallic duct in the beam also indicated that no corrosion is occurring. However, because the duct is comprised of some type of electroplated metal and it is highly likely that the duct is in contact with a post-tensioned bar and conventional reinforcing steel at some point or points along its length, the corrosion potential measurements cannot be accurately interpreted using the criteria provided in ASTM C876. Corrosion potential measurements on the footings indicate that corrosion activity is occurring in sound gunite on the lower portion of the repaired areas on the sides of the footing.

2.4.3 Evaluation of Existing CP Systems on Pile

Cathodic Protection (CP) is a technique used to control the corrosion of a metal surface by making it the cathode of an electrochemical cell. A simple method of protection connects the metal to be protected to a more easily corroded "sacrificial metal" to act as the anode. The sacrificial metal then corrodes instead of the protected metal. Impressed current cathodic protection uses anodes of a type that are not easily dissolved into metallic ions. This causes an alternative reaction: the oxidization of the dissolved chloride ions. Impressed current is typically used in seawater environments, which have high electrical currents due to the salt content. Metallizing is the process of coating the surface of a non-metallic object with a thin metallic film to aid in prevention of corrosion.

The sacrificial CP system was installed on 75 of the concrete piles from 2012 to 2017. The test results have shown all piles with cathodic protection systems have corrosion potentials over -1000mV CSE, which exceeds the threshold of -350mV and indicates that active corrosion is occurring within the tested area. However, these piles have sacrificial zinc anodes to protect them. Even the piles having the CP protection, the reading is high above the threshold. We can assume the remaining 411 piles that have no CP protection will soon need CP protection since they are located in the tidal zone.

2.5 REPORT FINDINGS

The results of the field testing and laboratory analysis reveal the Hernando Desoto Bridge is in low end of the fair condition NBI rating considering the longevity of its service thus far. While most of the testing suggests fair corrosion resistance for the superstructure, the substructure elements (except the struts) tested exceed the threshold levels for chloride intrusion or for corrosion potential concentrations.

The corrosion processes already present cannot be reversed. The testing has indicated that the reinforcing of the structure is losing cover protection on the concrete elements. The presence of chloride ions within the concrete materials will remain at the levels observed in the testing, and increase as the structure age increases. The substructure is starting to show signs of deterioration and section loss in reinforcing steel, which could lead to reduction in structural capacity. Although currently 75 of 411 piles are strengthened by new structural pile jackets, this is a temporary solution for the bridge.

The pier caps, columns, footings and piles are the elements in distress on this bridge. The next scheduled project for the bridge rehabilitation is in FY22 under FPID 444308-1-52-01 is taking steps to remediate some of the deficiencies. Remediatiation methods such as removal and repair of the deficient concrete, cleaning the corroded reinforcing steel, strengthening of the piles, and sealing of cracked concrete are currently in the works. The footings and piles currently exhibit high levels of corrosion potential. Continued maintenance as currently performed on the structure can help mitigate these problems. However, we have seen signs of failing concrete patching. Other costly method may be needed to be considered, such as impressed current and concrete metalizing. Both of the CP systems will require routine monitoring and maintenance. The metalizing also needs to be replaced every 5-7 years.

The element hidden from direct observation is the corrosion potential in the post-tensioned tendons for the precast beams. The 2011 report has monitored the tendons and concluded that the precast concrete beams are in good shape. A near future testing may be needed to update the findings of the 2011 report. The steel girders have some pitting on the members and are generally in good shape. Coating will be needed over time to prevent the corrosion of the steel girders.

The load rating for this bridge suggests there is currently adequate flexural capacity without the need for posting. This rating considers the contribution of an intact PT tendon and the fair condition of the deck.

As this structure enters its seventh decade of service, capacity of its substructure is beginning to decline. In some locations, this loss of capacity is already evident through testing and sampling. Continued aggressive maintenance, accompanied by inspection will help keep this bridge in service.

The following actions are recommended as a result of this corrosion assessment:

- **Prepare remediation plans for pile strengthening.**
  As deterioration continues, pile failures due to corrosion become more likely. When new distress or settlement is observed, a more expensive solution such as crutch bent can be performed.

- **Install CP system to substructure.**
  Install CP system metalizing to the pier cap and column, impress current to footing, and pile CP jacket for the remaining pile.

- **Planning for a replacement structure**
  The preventative measures outlined above will provide FDOT time to plan and construct a replacement structure or perform a major rehabilitation for this bridge. As the current structure is kept in service, maintenance costs will continue to increase. There is a limited period of time that the structure can be maintained, and that time should be used to prepare for the structures replacement.

SECTION 3.0
RECOMMENDATION

The objective of this section is to establish the basic parameters for bridge rehabilitation vs. replacement for the Hernando Desoto Bridge. The bridge rehabilitation option primarily involves bridge preservation work associated with mitigating the deterioration of the bridge and extending the service life for another 25 years whereas replacement option is to replace the bridge with a new structure with a 75-year service life. This section will review possible concepts for extending the service life of the structure.

3.1 EXISTING BRIDGE LAYOUT

The Hernando Desoto Bridge is a midlevel, fixed span bridge that carries two-way traffic on S.R. 55 (South Tamiami Trail) alignment in generally north/south direction in Manatee County, FL. The 2,225 feet (ft) long bridge, built in 1957, consists of 30 concrete approach spans, and three steel main spans. The south and north concrete approach spans are both comprised of 15 post-tensioned concrete beam spans, and a steel span that are adjacent to the steel main span. Approach Spans 1-15 and 19-33 are each 66ft-0in, long simple spans comprised of post-tensioned concrete beams. Spans 16 and 18 are each 70ft-0in long, comprised of plate steel girder. The main span is 105ft-0in long as measured between the piers. A minimum 75ft wide navigation channel is centered within the span.

3.2 EXISTING CONDITIONS

3.2.1 Current Bridge Inspection Report

The NBI and Sufficiency Ratings for recent years are listed below:

NBI Ratings	2018	2016	2014	2012
Deck	6	6	6	6
Superstructure	6	6	6	6
Substructure	6	6	6	6
Channel	6	6	6	6
Sufficiency Rating	74.4	74.9	76.1	74.9
Health Index	80.12	91.68	76.25	72.68

NBI Rating Classification: 1-“Imminent” Failure; 2-Critical; 3-Serious; 4-Poor; 5-Fair; 6-Satisfactory; 7-Good; 8-Very Good; 9-Excellent

Sufficiency Rating is a tool that is used to help determine whether a bridge that is structurally deficient or functionally obsolete should be repaired or replaced. The sufficiency ratings for bridges are part of a formula used by the Federal Highway Administration when it allocates federal funds to the states for bridge replacement.

Health Index is a tool that measures the overall condition of a bridge. The health index typically includes about 10 to 12 different elements that are evaluated by the Department. A lower health index means that more work would be required to improve the bridge to an ideal condition. A health index below 85 generally indicates that some repairs are needed, although it doesn't mean the bridge is unsafe. A low Health Index may also indicate that it would be more economical to replace the bridge than to repair it.

3.2.2 Bridge Corrosion Condition

The overall ratings from the referenced bridge inspection report do not indicate any serious issues. However, by performing the corrosion analysis, test results suggest that the superstructure is on the low end of fair corrosion resistance for the longevity of service, and substructure pier caps, columns, footings and pile elements tested exceed threshold levels at which corrosion is likely initiated.

3.3 STRUCTURAL ALTERNATIVE

The structural system consists of two major components: superstructure and substructure. Overall the concrete structural elements were found to be in satisfactory condition per the NBI Ratings. However, the testing performed from this Condition Assessment has indicated that the substructure has deterioration with elements exceeding the corrosion threshold limit. In addition, the frequency of the repairs has increased. The Department's repair cycle scheduled for most of the bridges is approximately every 10 years. This bridge will most likely need to be repaired every 5 years.

3.3.1 Future Superstructure Repairs

The bridge's superstructure, precast concrete beams, steel girders and deck are generally in good condition. As the structure is kept in service, 10-year routine repairs will be required for the superstructure.

3.3.2 Future Substructure Repairs

The existing substructure indicates significant deterioration on the footings and piles. These two elements have a substantial potential for corrosion. In addition, the columns and pier caps also exceed the threshold for chloride intrusion. Some of the concrete repairs performed over the past years are deemed ineffective. The test report for this Condition Assessment indicates that Cathodic Protection preservation methods are required instead of conventional repairs. It is recommended to use metalizing, molten arc zinc spray cathodic protection system for the columns and pier caps and impressed current cathodic protection systems for the footings. Prior to installation of the titanium mesh jacket for the impressed current system, the existing gunite repairs on the footings will need to be removed in entirety and surface of the footings leveled with new concrete repairs. 411 piles will need to be protected with zinc mesh cathodic protection jackets. After installation,

the pile jackets will require routine monitoring and maintenance to keep in service for an additional 25 years. This CP system will require monitor and maintenance. The metalizing and pile anode will be required to be replaced every 5-7 years.

In the event of capacity loss of multiple piles on a single bent due to aging and corrosion, installation of a crutch bent will likely be required. This will be under emergency conditions, and will be a more expensive alternative than periodic installation of additional pile jackets.

3.4 CONCLUSION

In order to extend the service life of the substructure for another 25 years, a major rehabilitation with CP systems will be required. In addition, existing maintenance costs will continue to escalate as the structure ages. Conventional repair methods have shown signs of ineffectiveness due to the corrosion building up in the concrete from the "extremely aggressive" environment. The existing concrete already has chloride intrusion beyond the reinforcing depth. Test results have shown that the chlorides will remain in the concrete and no conventional repair methods will suffice.

The other alternative is to replace the bridge and bring it up to the current standards. The existing bridge has no shoulders or sidewalk. The proposed bridge will have two 5'-0" sidewalks, four 12'-0" travel lanes, two 10'-0" outside shoulders and two 6'-0" inside shoulders.

3.4.1 Cost

The table below is a comparison between bridge rehabilitation vs. replacement.

Alternative Cumulative Cost Comparison (PDC) (Hernando Desoto Bridge)					
* Bridge Replacement	Cost to Keep Current Bridge in Service				
	Initial CP	5 Yr.	10 Yr.	15 Yr.	20 Yr.
$44,944,000	$17,623,000	$17,648,000	$23,938,000	$27,233,000	$33,523,000

Alternative Cumulative Cost Comparison (PDC) (Hernando Desoto Bridge)				
* Bridge Replacement	Cost to Keep Current Bridge in Service			
	25 Yr.	30 Yr.	35 Yr.	40 Yr.
$44,944,000	$33,548,000	$39,838,000	$43,133,000	$46,153,000

Note: * Cumulative 40-year cost for the bridge replacement
PDC – Present Day Cost

Cost comparison above is a cumulative cost for the two alternatives indicates that the rehabilitation option will catch up in year 39 to the cost of the bridge replacement alternative. Financially, the rehabilitation is not a feasible option. The bridge replacement alternative provides a 75-year design

service life. The rehabilitation cost can accrue more after the CP systems are installed. Routine CP systems monitoring and maintenance will be required every 5 to 7 year for $3,275,000. In addition to the bridge rehabilitation, with the purpose of restoring structural integrity, other work will be required, such as steel span painting, concrete repair work, bulkhead repair work, bearing repair work. Typically, the bridge rehabilitation is $3,000,000 every 10 years. The impressed current will require electricity to operate the system that will cost $5,000 per year. The cumulative cost is not feasible in comparison to the replacement bridge with Initial construction cost of $42,944,000 and $500,000 every 10 year rehabilitation.

3.4.2 Operation and Maintenance

The Annual Operations and Maintenance (O&M) costs are estimated at $0.39 per square foot of deck area. The total estimate annual O&M costs for this bridge is of $54,025.53.

3.4.3 Recommendation

In addition, the bridge rehabilitation alternative is also not desirable for the following reasons:

a. Bridge CP rehabilitation will extend service life of certain components by 25 years; however, the existing bridge will have exceeded it design service life by over 60% in those 25 years.
b. The substructure may become overstressed by corrosion. It will need to be addressed with an expensive rehabilitation, which includes the installation of crutch bents.
c. The corrosion report for this Condition Assessment shows extensive corrosion on the substructure that can be controlled with cathodic protection but it is not reversible.
d. The rehabilitation will keep the existing non-standard roadway width. Additional width to accommodate additional shoulders to meet the current standards may not be possible due to the existing substructure’s allowable structural capacity.

It is our recommendation that the bridge be replaced within seven to ten years, before the next 10-year cycle rehabilitation. Since a major rehabilitation is not adopted at this point, routine repairs will only suffice for a limited period of time. Advancing the replacement of the bridge is a more economically feasible solution for the next 75 years is spending less $25,219,000 than bridge CP system with monitoring, maintenance and rehabilitation.

APPENDIX A

COST ESTIMATE

Bridge 130053 Bridge Initial CP Rehab Cost

	Quantities	Unit	Unit Cost	Amount
Cap Metalizing	24624	SF	$50.00	$1,231,200.00
Column Metalizing	30480.3	SF	$50.00	$1,524,015.00
Footing Surface Concrete Repair	12636	SF	$200.00	$2,527,200.00
Footing CP Impress Current	27783	SF	$100.00	$2,778,300.00
411 Pile CP Jacket	4110	LF	$1,800.00	$7,398,000.00
			Sub Total	$15,458,715.00
			Maintenance of Traffic (7%)	$ 1,082,110
			Mobilization (7%)	$ 1,082,110
			Total	$17,622,935.10
			Said Total	**$17,623,000**

7 year CP Replacement and Maintenance cost

	Quantities	Unit	Unit Cost	Amount
Cap Metalizing	24624	SF	$50.00	$1,231,200.00
Column Metalizing	30480.3	SF	$50.00	$1,524,015.00
Footing CP Impress Current	7	YR	$5,000.00	$35,000.00
411 Pile CP Jacket Annode	411	EA	$200.00	$82,200.00
			Sub Total	$2,872,415.00
			Maintenance of Traffic (7%)	$ 201,069
			Mobilization (7%)	$ 201,069
			Total	$3,274,553.10
			Said total	**$3,275,000**

CP Impress Current Operating Cost

Impress Current Electricity Bill	**$5,000**	per year

Bridge 130053 Bridge Replacement Cost

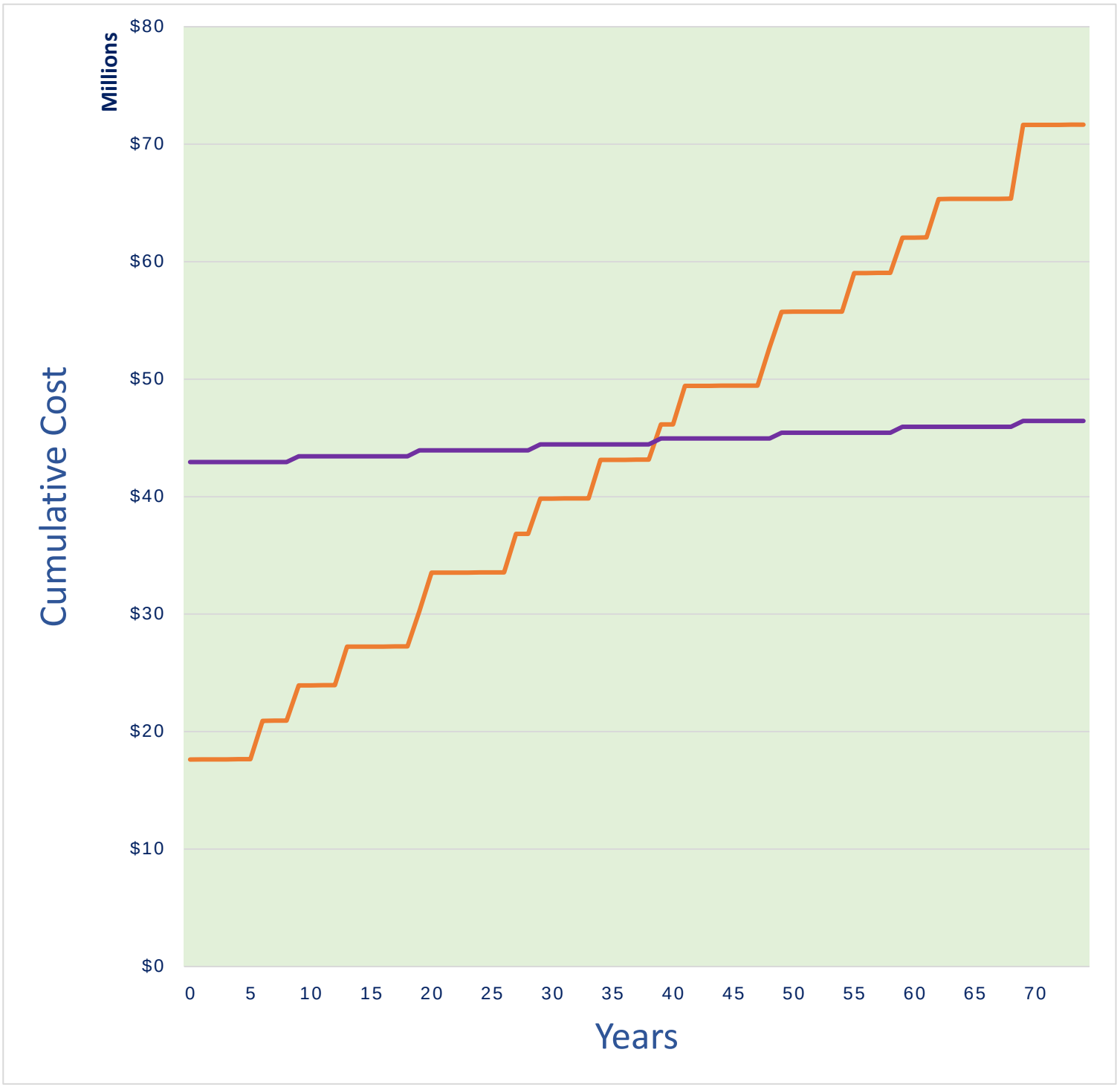
Bridge width	96	LF
Bridge Length	2225	LF
Total New Bridge Area	213600	SF
Unit Cost per SF from SDG	145	SF

Replacement Bridge	$	30,972,000
Maintenance of Traffic (10%)	$	3,097,200
Mobilization (10%)	$	3,097,200
Demolition ($35/SF)	$	4,848,445
Construction over water 3%	$	929,160
Total	**$**	**42,944,005**

Life Cycle Compare

Year	CP Rehabilitation	CP Cumulate	Replacement	Replacement Cum
0	$17,623,000	$17,623,000	$42,944,000	$42,944,000
1	$5,000	$17,628,000	$0	$42,944,000
2	$5,000	$17,633,000	$0	$42,944,000
3	$5,000	$17,638,000	$0	$42,944,000
4	$5,000	$17,643,000	$0	$42,944,000
5	$5,000	$17,648,000	$0	$42,944,000
6	$3,275,000	$20,923,000	$0	$42,944,000
7	$5,000	$20,928,000	$0	$42,944,000
8	$5,000	$20,933,000	$0	$42,944,000
9	$3,000,000	$23,933,000	$500,000	$43,444,000
10	$5,000	$23,938,000	$0	$43,444,000
11	$5,000	$23,943,000	$0	$43,444,000
12	$5,000	$23,948,000	$0	$43,444,000
13	$3,275,000	$27,223,000	$0	$43,444,000
14	$5,000	$27,228,000	$0	$43,444,000
15	$5,000	$27,233,000	$0	$43,444,000
16	$5,000	$27,238,000	$0	$43,444,000
17	$5,000	$27,243,000	$0	$43,444,000
18	$5,000	$27,248,000	$0	$43,444,000
19	$3,000,000	$30,248,000	$500,000	$43,944,000
20	$3,275,000	$33,523,000	$0	$43,944,000
21	$5,000	$33,528,000	$0	$43,944,000
22	$5,000	$33,533,000	$0	$43,944,000
23	$5,000	$33,538,000	$0	$43,944,000
24	$5,000	$33,543,000	$0	$43,944,000
25	$5,000	$33,548,000	$0	$43,944,000
26	$5,000	$33,553,000	$0	$43,944,000
27	$3,275,000	$36,828,000	$0	$43,944,000
28	$5,000	$36,833,000	$0	$43,944,000
29	$3,000,000	$39,833,000	$500,000	$44,444,000
30	$5,000	$39,838,000	$0	$44,444,000
31	$5,000	$39,843,000	$0	$44,444,000
32	$5,000	$39,848,000	$0	$44,444,000
33	$5,000	$39,853,000	$0	$44,444,000
34	$3,275,000	$43,128,000	$0	$44,444,000
35	$5,000	$43,133,000	$0	$44,444,000
36	$5,000	$43,138,000	$0	$44,444,000
37	$5,000	$43,143,000	$0	$44,444,000
38	$5,000	$43,148,000	$0	$44,444,000
39	$3,000,000	$46,148,000	$500,000	$44,944,000
40	$5,000	$46,153,000	$0	$44,944,000
41	$3,275,000	$49,428,000	$0	$44,944,000
42	$5,000	$49,433,000	$0	$44,944,000
43	$5,000	$49,438,000	$0	$44,944,000
44	$5,000	$49,443,000	$0	$44,944,000

45	$5,000	$49,448,000	$0	$44,944,000
46	$5,000	$49,453,000	$0	$44,944,000
47	$5,000	$49,458,000	$0	$44,944,000
48	$3,275,000	$52,733,000	$0	$44,944,000
49	$3,000,000	$55,733,000	$500,000	$45,444,000
50	$5,000	$55,738,000	$0	$45,444,000
51	$5,000	$55,743,000	$0	$45,444,000
52	$5,000	$55,748,000	$0	$45,444,000
53	$5,000	$55,753,000	$0	$45,444,000
54	$5,000	$55,758,000	$0	$45,444,000
55	$3,275,000	$59,033,000	$0	$45,444,000
56	$5,000	$59,038,000	$0	$45,444,000
57	$5,000	$59,043,000	$0	$45,444,000
58	$5,000	$59,048,000	$0	$45,444,000
59	$3,000,000	$62,048,000	$500,000	$45,944,000
60	$5,000	$62,053,000	$0	$45,944,000
61	$5,000	$62,058,000	$0	$45,944,000
62	$3,275,000	$65,333,000	$0	$45,944,000
63	$5,000	$65,338,000	$0	$45,944,000
64	$5,000	$65,343,000	$0	$45,944,000
65	$5,000	$65,348,000	$0	$45,944,000
66	$5,000	$65,353,000	$0	$45,944,000
67	$5,000	$65,358,000	$0	$45,944,000
68	$5,000	$65,363,000	$0	$45,944,000
69	$6,275,000	$71,638,000	$500,000	$46,444,000
70	$5,000	$71,643,000	$0	$46,444,000
71	$5,000	$71,648,000	$0	$46,444,000
72	$5,000	$71,653,000	$0	$46,444,000
73	$5,000	$71,658,000	$0	$46,444,000
74	$5,000	$71,663,000	$0	$46,444,000


Millions
$80
$70
$60
$50
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$0
Cumulative Cost
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
Years

APPENDIX B

CONCRETE DAMAGE & CORROSION CONDITION ASSESSMENT

Florida Department of Transportation
State Materials Office

RICK SCOTT
GOVERNOR

MIKE DEW
SECRETARY FDOT

CONCRETE DAMAGE AND CORROSION CONDITION ASSESSMENT OF SUPERSTRUCTURE AND SUBSTRUCTURE COMPONENTS ON THE HERNANDO DESOTO BRIDGE (BRIDGE NO. 130053) IN FDOT DISTRICT 1

FINAL REPORT
NOVEMBER 19, 2018

CONCRETE DAMAGE AND CORROSION CONDITION ASSESSMENT OF SUPERSTRUCTURE AND SUBSTRUCTURE COMPONENTS ON THE HERNANDO DESOTO BRIDGE (BRIDGE NO. 130053) IN FDOT DISTRICT 1

FINAL REPORT
NOVEMBER 19, 2018

Prepared for:

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District 1 Structures Maintenance Office
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I. INTRODUCTION

Bridge No. 130053 was constructed in 1957 and consists of 33 spans. The bridge is located on US 41 over the Manatee River in FDOT District 1. Concrete repairs have been made on the bridge and, for corrosion control purposes, sacrificial cathodic protection (CP) systems have been installed on a total of 75 of the concrete piles on the bridge.

The FDOT District 1 Structures Maintenance Office (FDOT-D1) requested a two-phase study to be performed on the bridge in order to determine the cost-effectiveness of replacing the structure or rehabilitating the structure to extend its service life. The specific bridge components included in the study are the deck, beams, pier caps, columns, struts, footings, and piles. Typical superstructure and substructure components on the bridge are shown in Figure 1.

Figure 1. Typical superstructure and substructure components on Bridge No. 130053.

The first phase of the study has been completed and is the subject of this report. That portion of the study involved gathering concrete damage information, performing corrosion testing on various superstructure and substructure components, and evaluating the performance of the existing CP systems. The findings will be used in the second phase of the study (to be performed by FDOT-D1) to estimate future damage progression on the various types of bridge components and to perform a cost analysis of rehabilitation versus replacement of the bridge.

II. WORK PERFORMED

A brief visual inspection and limited sounding surveys were conducted on the deck, beams, pier caps, columns, struts, footings, and above water portions of the piles. A condition rating was assigned for the original concrete on each individual deck span and on each of the other individual bridge elements except for the piles as discussed later in this report. Where one or more repairs were evident on a deck span or on other individual bridge elements, a second condition rating was assigned for those areas.

Findings from the cursory visual inspections and limited sounding surveys were then used to select one deck span, beam, pier cap, column, strut, and footing for more detailed examination and testing. For each type of bridge component, the intent was to choose a single element that represented an approximate average of the extent of concrete damage and repairs for that component type. Evaluation of each of the selected components included the following:

- conducting detailed visual and sounding surveys on all accessible surfaces,
- collecting cores from sound original concrete and, when possible, from cracked original concrete and from repaired areas,
- measuring crack widths and depths,
- measuring the concrete cover over reinforcing steel,
- directly observing the condition of reinforcing steel,
- measuring corrosion potentials, and
- conducting chemical analysis of the concrete to determine the extent of chloride intrusion that has occurred.

The condition and performance of the existing CP systems on 75 of the concrete piles were evaluated by conducting visual inspections on accessible portions of the CP systems and by collecting CP system test data. This portion of the work was performed in accordance with standard protocol developed by the FDOT State Materials Office (FDOT-SMO) for the type of CP system involved.

The on-site work was performed in September 2018 by Concorr Florida, Inc. under contract with FDOT-SMO. FDOT D1 provided traffic control and a snooper truck needed to perform work on the bridge deck and high elevation portions of the bridge. The laboratory analysis work was performed by FDOT-SMO.

III. FINDINGS

Condition Ratings

Condition ratings assigned to various types of components were based upon brief visual

inspections and limited sounding surveys. For areas with original concrete, a condition rating scale from 1 to 4 was used as follows:

1 Little or no deterioration. There may be hairline cracking and/or efflorescence.

2 Minor cracks, delamination, and/or spalls, but with no corrosion bleed out. There may be exposed rebar with no corrosion, but there is no exposure of prestressed steel.

3 Moderate cracks, delaminations, and/or spalls. There may be corrosion bleed out, exposed rebar with minor corrosion, and/or some exposure of prestressed steel, but with no corrosion.

4 Severe cracks, delaminations, and/or spalls. There may be exposed rebar with significant corrosion and/or exposed and corroded prestressed steel.

The condition rating for areas that had been repaired by patching or crack sealing was either a 1 (the repair is sound although patched areas may have shrinkage cracks) or 2 (the repair has failed as evidenced by cracking in patched areas, widening or lengthening of sealed cracks, corrosion staining, delamination, and/or spalling). Each individual span or component was assigned a single condition rating for all repaired areas regardless of the number of separate repair areas involved or if different types of repair were present. The condition ratings assigned for original concrete and repaired areas are summarized below.

Deck Spans

Visual inspections and random sounding surveys were conducted on the top surface of the deck. Since traffic control was restricted to the outside northbound and southbound lanes, visual inspections of the top surface of the inside lanes were conducted from a short distance away (i.e. from the adjacent lane) and no sounding surveys were performed in those lanes. Inspection of the bottom surface of the deck spans was accomplished from a boat and was therefore limited to visual observations made from varying distances depending on the elevation of the deck. The overhangs along the sides of the deck were not surveyed.

The top surface of the deck in Spans 14, 16, 17, and 18 is covered with an overlay. The original concrete on the top surface of all of the other spans was assigned a condition rating of 2. Typical cracking observed on the top surface of the deck is shown in Figure 2. Sealed cracks and/or patch repairs were present on the top surface in 14 of the 33 spans. The repaired areas were in good condition (see Figure 3) except in Span 9 where patch repairs were assigned a condition rating of 2. The condition rating for original concrete on the bottom surface of the deck was a 1 in 29 spans, a 2 in one span, and a 3 in three spans (there is an overlay on the top surface of these three spans). The condition rating of 3 was due to the extent of cracks and spalls adjacent to the top flanges of the beams. No repairs were observed on the bottom surface of the deck.

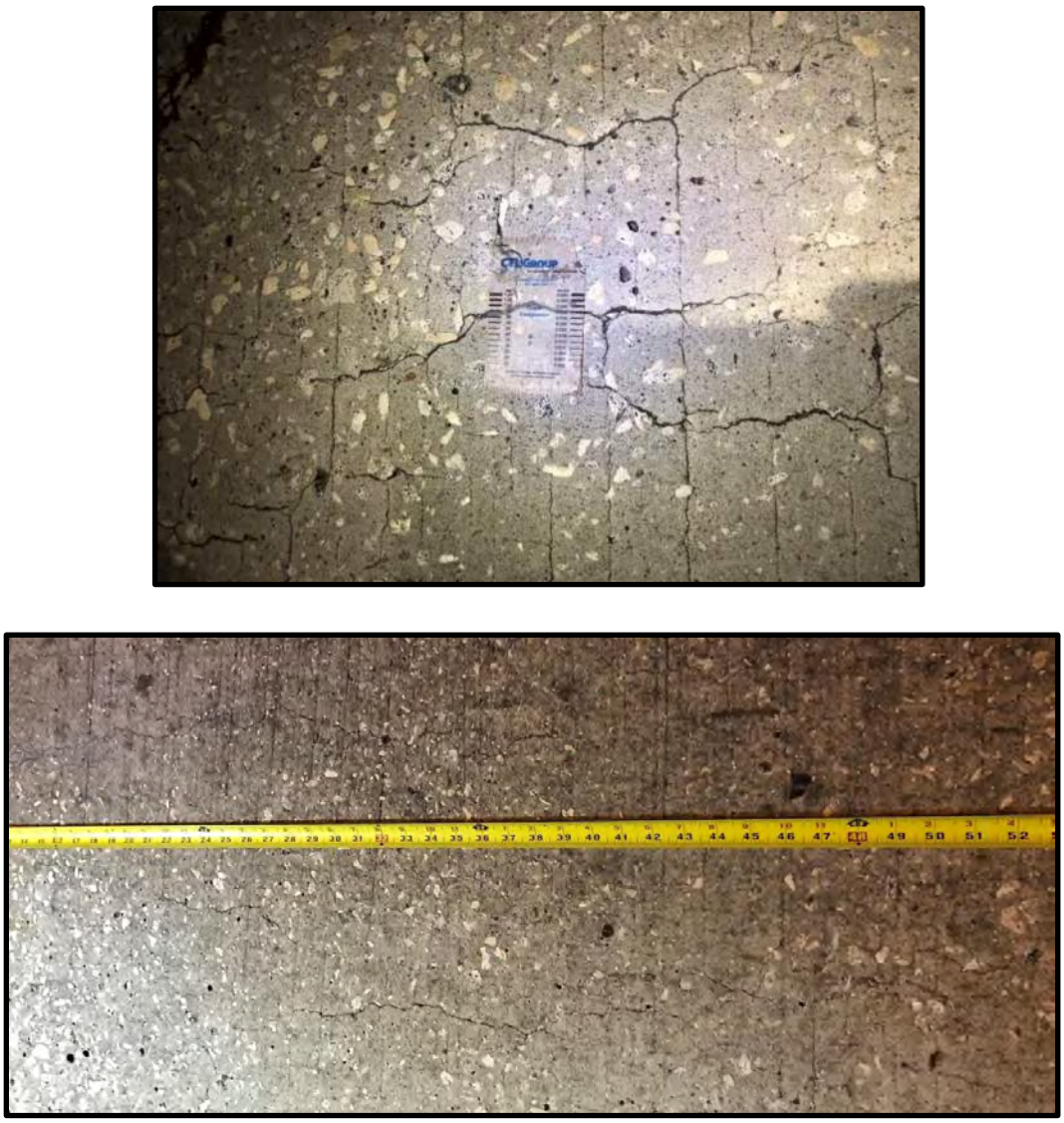


Figure 2. Typical cracking on the top surface of the deck.

Figure 3. Typical patches on the top surface of the deck.

Beams

The beams in Spans 1, 2, and 3 are over land and the beams in Spans 5 to 33 are over water. Span 4 traverses land and water. The beams in Spans 1 to 15 and Spans 19 to 33 are post-tensioned concrete beams (there are ten beams in each span) and the beams in Spans 16 to 18 are coated steel beams (there are eight beams in each span). In 2011, the FDOT-SMO conducted a corrosion condition evaluation of the post-tensioned concrete beams. According to the report that was prepared at that time, there were numerous locations where concrete spalling had occurred at the ends of the beams and corroded post-tensioned bars and anchorages were exposed in the spalled areas. Many of the damaged areas have since been repaired. Based on this information and observations that were made while inspecting the beams in September 2018, it was decided that the first approximately 12" at each end of each concrete beam (hereafter referred to as the ends of the beams) would be assigned a separate condition rating from the rest of the length of each beam (hereafter referred to as the interior portion of the beams). At the same time, it was discovered that the condition at the ends of most of the concrete beams could not be adequately assessed from the ground or from a boat. For this reason, the ends of the concrete beams were more closely inspected from a snooper truck. However, due to time constraints, inspection of the ends of the concrete beams could only be accomplished on one end of each beam in a total of five spans. The interior portions of the concrete beams were visually inspected from the ground or from a boat at varying distances depending on the elevation of the beams.

The condition rating for original concrete on the interior portion of 298 of the 300 post-tensioned beams was a 1. The condition rating on the interior portion of Beams 1-10 and 2-2 was a 3 and 2 respectively (these two beams are located over land). There were no repairs on the interior portion of the beams. One end of each of the concrete beams in Spans 8, 10, 23, 24, and 26 were inspected (total of 50 beams). Forty of the beam ends had no repairs. The condition rating for original concrete on 21 of those beam ends was a 1. The condition rating for original concrete on the remaining 19 beam ends was a 2. Eight of the 10 beam ends that had been repaired were assigned a condition rating of 1 and the other two repaired beam ends were assigned a condition rating of 2. In addition, there is a total of 10 beams listed in the January 25, 2018 routine bridge inspection report that have spalls with exposed steel at the ends of the beams.

Proper inspection of the coated steel beams required the snooper truck which, due to time constraints, limited the inspection of these beams to one span only. Extensive pitting was observed on all eight of the steel beams in Span 18. The coating was applied over the pitting and there were numerous small areas with corrosion staining as shown in Figure 4. There were also areas that appeared to have corrosion products under the coating (see Figure 5).

Pier Caps

Pier Caps 2, 3, and 4 are on land and Pier Caps 5 to 33 are over water. Inspection of the pier caps was accomplished from the ground level or from a boat and was therefore

Figure 4. Typical pitting and corrosion staining on a steel beam in Span 18.

Figure 5. Apparent corrosion products under the coating on a steel beam in Span 18.

limited to visual observations made from varying distances depending on the elevation of the caps. The original concrete on 29 of the 32 pier caps was assigned a condition rating of 1. The original concrete on Pier Caps 3 (located on land) and 31 (located over water) was assigned a condition rating of 2 and the original concrete on Pier Cap 32 (located over water) was assigned a condition rating of 4. There were no repairs on 28 of the pier caps. Four of the pier caps had one or more patched areas. The repaired areas on all four pier caps were assigned a condition rating of 2. It is believed that these repairs were made in 2017.

Columns

There are three columns at each of the 32 piers (total of 96 columns); the columns at the first three piers are on land and the columns at all of the other piers are over water. Visual inspection of each entire column was accomplished from the ground level or from a boat. Limited sounding surveys were also conducted on the lower portions of the columns. Table 1 shows the condition ratings that were assigned to each column. The condition rating for original concrete on the columns was a 1 for 62 columns, a 2 for 22 columns, a 3 for five columns, and a 4 for seven columns. All of the columns with a condition rating of 2, 3, or 4 for original concrete were located over water. Forty-eight (or half) of the columns had sealed cracks, patched areas, and/or areas that had been repaired with gunite (there were no repairs on any of the columns located on land). The repairs were in good condition on 23% of those columns and the remaining 77% had repairs with a condition rating of 2. Also, the repairs with a condition rating of 2 included all three types of repairs that had been made. Figure 6 shows examples of column repairs that were assigned a condition rating of 2.

Figure 6. Examples of column repairs that were assigned a condition rating of 2.

Table 1. Condition ratings for the columns.

Pier No.	Condition Ratings									
	Original Concrete			Repair Concrete						
	Column No.			Column No.						
	1	2	3	1		2		3		
				CR	TR	CR	TR	CR	TR	
2	1	1	1	N/A		N/A		N/A		
3	1	1	1	N/A		N/A		N/A		
4	1	1	1	N/A		N/A		N/A		
5	1	2	1	N/A		N/A		N/A		
6	3	1	3	2	G	N/A		2	P	
7	1	2	1	1	SC	2	P	N/A		
8	3	2	2	1	SC	N/A		2	SC	
9	1	2	2	1	P	2	P/G	2	P	
10	1	1	1	N/A		1	P/G/SC	2	P	
11	1	1	1	N/A		N/A		2	P	
12	1	1	1	2	P	2	G	2	G	
13	1	1	2	N/A		N/A		N/A		
14	1	1	1	N/A		N/A		N/A		
15	2	1	1	2	P	1	SC	2	P	
16	1	2	1	2	G/SC	1	P	N/A		
17	1	2	1	N/A		2	P/SC	N/A		
18	2	1	2	N/A		N/A		N/A		
19	1	2	1	2	P/G	2	P	2	P	
20	1	2	2	2	P	2	P	N/A		
21	1	2	1	2	P/G	N/A		N/A		
22	2	1	1	N/A		1	SC	2	P	
23	2	1	1	2	P	2	P	2	P	
24	4	2	2	2	P	2	P	2	P/G	
25	1	1	1	1	SC	N/A		N/A		
26	4	1	2	2	P/G	N/A		1	SC	
27	4	1	2	N/A		N/A		2	P	
28	4	3	3	2	P/SC	2	G	1	G	
29	1	4	1	2	G/SC	2	P/G/SC	2	P	
30	1	1	1	N/A		N/A		N/A		
31	1	1	1	N/A		N/A		N/A		
32	4	1	1	N/A		N/A		N/A		
33	4	1	1	2	P/SC	2	P	1	P	

CR = condition rating, TR = type of repair, P = patching that is not gunite, G = gunite, and SC = sealed cracks.

Struts

Piers 7 to 28 each have two struts (for the purpose of this report, the portions of the web walls that are above the water at Piers 17 and 18 were considered struts). Inspection of the struts was accomplished from a boat and included visual observation of all surfaces of each strut and limited sounding surveys as needed. The original concrete was assigned a condition rating of 1 for all of the struts except at Piers 17 and 18 where the condition rating of the original strut (or web wall) concrete was a 2. No repairs were observed on any of the struts.

Footings

Piers 2, 3, and 4 each have three footings on land (total of nine footings). Piers 5 to 16 and 19 to 33 each have three waterline footings (total of 81 footings). Inspection of the footings was accomplished from the ground level or from a boat and included visual observations and limited sounding surveys on the top and side surfaces of each footing. Table 2 shows the condition ratings that were assigned to each footing. The condition rating for original concrete on all of the footings on land was a 1 and there were no repairs on any of those footings. The condition rating for original concrete on the waterline footings was a 1 for 57 footings, a 2 for 13 footings, a 3 for 10 footings, and a 4 for one footing. All 81 of the waterline footings had sealed cracks, patched areas, and/or areas that had been repaired with gunite and the repaired areas were assigned a condition rating of 2 at 93% of those footings. Also, the repairs with a condition rating of 2 included all three types of repairs that had been made. Figure 7 shows examples of footing repairs that were assigned a condition rating of 2.

At high tide water contacts the bottom of the footings. At low tide the water is below the bottom of the footings, but there is insufficient space to access the bottom face of the footings for visual inspection from a boat. Importantly, however, sounding surveys were conducted on a portion of the bottom surface of ten randomly selected waterline footings and extensive delaminations were found on all ten footings. In addition, according to the January 25, 2018 routine bridge inspection report, there are cracks, delaminations, spalls, and/or areas with corrosion bleed out on the bottom surface of numerous footings.

Piles

There are six concrete piles under each of the waterline footings at Piers 5 to 16 and 19 to 33 (total of 486 piles) and the top portion of the piles is in the tidal zone. At low tide, only a small length of each pile is exposed. Most of the exposed areas are covered with marine growth, cathodic protection jackets, and/or gunite overspray from footing repairs (see Figure 8) which significantly impedes access to the pile surfaces for inspection. Consequently, no attempt was made to determine a condition rating for each pile. Instead, the piles were briefly inspected visually and random sounding surveys were conducted in areas where pile surfaces were accessible. Cracks were found on six of the piles and the concrete on one of those piles was also delaminated. Figure 9 shows the cracks found on one of the piles. No concrete repairs were observed on any of the piles.

Table 2. Condition ratings for the footings.

Pier No.	Condition Ratings								
	Original Concrete			Repair Concrete					
	Footing No.			Footing No.					
	1	2	3	1		2		3	
				CR	TR	CR	TR	CR	TR
2	1	1	1	N/A		N/A		N/A	
3	1	1	1	N/A		N/A		N/A	
4	1	1	1	N/A		N/A		N/A	
5	2	3	1	2	G	2	G	2	G
6	1	1	1	2	G	2	G	2	P/G
7	2	3	2	2	P/G	2	P/G	2	G
8	3	3	1	2	G	2	G	2	G
9	1	1	2	2	P/G	2	G	2	G
10	1	1	1	2	P/G	2	P/G	2	P/G
11	1	4	3	2	P/G	2	P/G	2	P/G
12	1	1	1	2	P/G	2	P/G	2	P/G
13	1	3	1	2	P/G	2	P/G	2	P/G
14	1	2	1	2	P/G/SC	2	P/G	2	G/SC
15	1	3	1	2	P/G	2	P/G	2	P/G/SC
16	1	1	1	2	P/G/SC	2	P/G/SC	2	G
19	1	2	1	2	P/G/SC	2	G/SC	2	P/G/SC
20	1	1	1	2	P/G/SC	2	P/G/SC	2	P/G
21	1	3	1	2	P/G	2	P/G	2	P/G
22	1	1	1	2	P/G/SC	1	P/G/SC	2	G/SC
23	1	1	1	2	P/G/SC	2	P/G/SC	2	P/G/SC
24	1	1	1	2	P/G/SC	2	P/G/SC	2	P/G/SC
25	1	1	1	2	P/G	2	P/G/SC	2	G/SC
26	3	3	2	2	P/G	2	G/SC	2	P/G/SC
27	2	2	1	2	P/G/SC	2	G	2	P/G
28	2	1	1	2	P/G	2	P/G	2	G/SC
29	1	1	1	2	G	2	P/G/SC	2	P/G/SC
30	1	2	1	2	P/G/SC	2	P/G/SC	2	P/G/SC
31	2	1	2	2	P/G	2	P/G/SC	2	P/G
32	1	1	1	2	P/G	1	P	1	P
33	1	1	1	1	P	1	P	1	P

CR = condition rating, TR = type of repair, P = patching that is not gunite, G = gunite, and SC = sealed cracks.
The condition of the bottom surface of the footings is not included in this table.

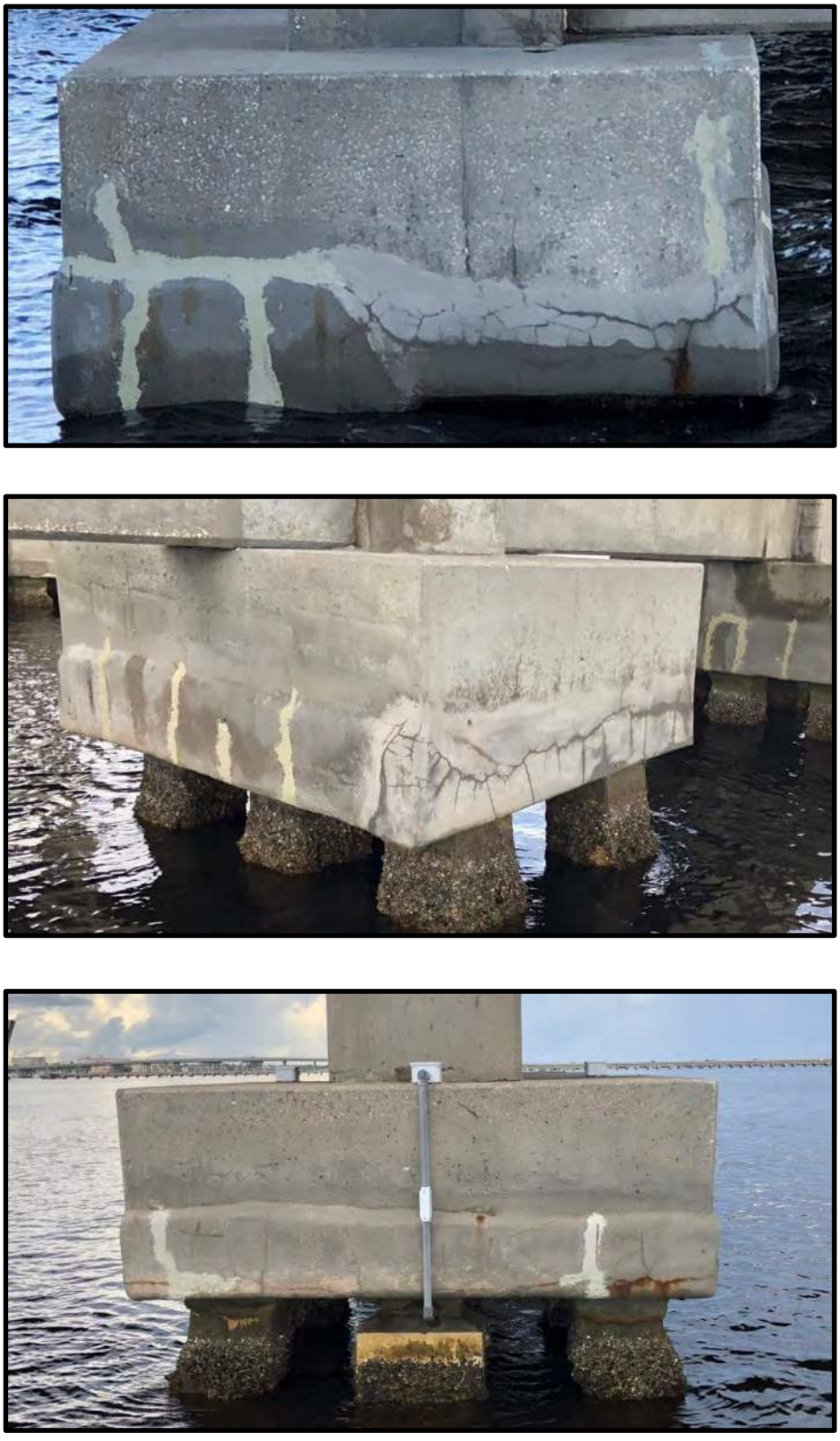


Figure 7. Examples of footing repairs that were assigned a condition rating of 2.

Figure 8. Typical exposed portions of piles at low tide.

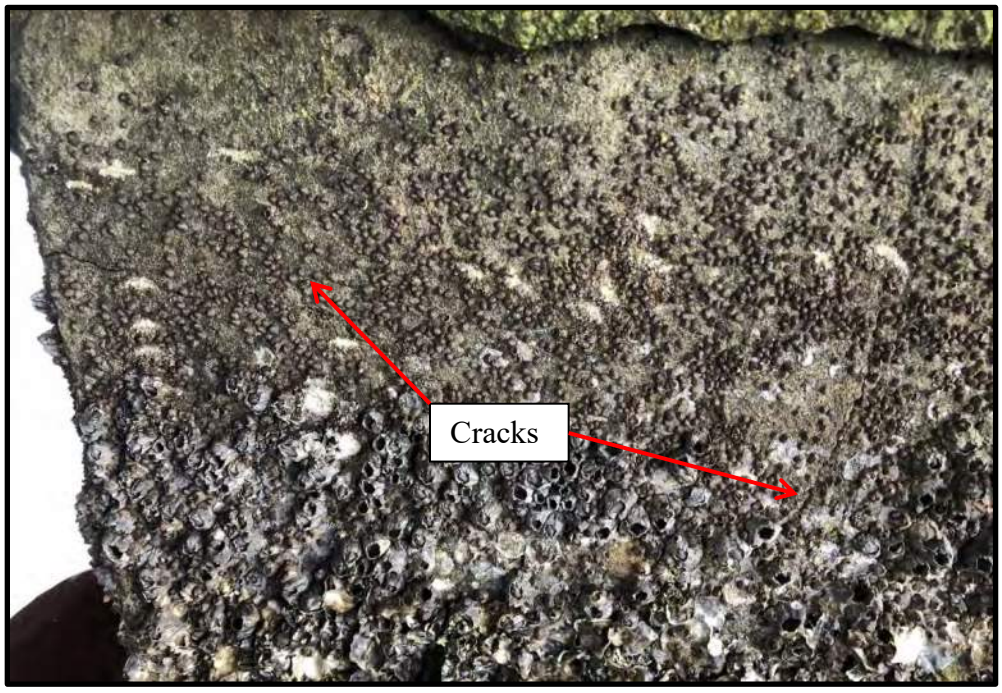


Figure 9. Cracks near the top of a pile.

Corrosion Condition Evaluation

Based on the findings from the brief visual inspections and limited sounding surveys, the following components were selected for more detailed examination and testing:

- Deck Span 26 (outside southbound lane).
- Beam 10-4.
- Pier Cap 24.
- Column 15-1.
- Strut 9-2.
- Footing 26-3.

Comprehensive visual and sounding surveys were conducted on all accessible surfaces of each of the listed components. Findings are summarized below (findings for the pier cap, column, strut, and footing are also shown on drawings in Appendix A).

- *Deck Span 26 (outside southbound lane):* There was random spider cracks and numerous longitudinal cracks (maximum width of 30 mils) on the top surface. There was no concrete damage on the bottom surface and there were no repairs on the top or bottom surfaces.

- *Beam 10-4:* There was no concrete damage or repairs.

- *Pier Cap 24:* There was no concrete damage on the side faces and there were four areas with concrete delaminations (total of 26 s.f.) on the bottom face. There were also cracks in the largest delaminated area. There were no repairs on the side or bottom faces.

- *Column 15-1:* There was a crack at the southwest corner (7 mils wide) and a delamination (approximately 4 s.f.) adjacent to a patch on the east face. There was a large patched area at the southeast corner (see Figure 10). There were cracks throughout the patched area and approximately two-thirds of the patch was delaminated.

- *Strut 9-2:* There were five cracks on the top face (maximum length of 12" and maximum width of 9 mils). There was no concrete damage on the side or bottom faces and there were no repairs on any of the faces.

- *Footing 26-3:* There were cracks (maximum width of 20 mils) on the top surface at the corners and on all four side faces. There were delaminations (see Figure 11) at the top southeast corner (less than 3 s.f.) and adjacent to a repaired area on the west face (less than 2 s.f.). The bottom two feet of the footing has been repaired on all four sides. The repair consists of standard patching, gunite,

and sealed cracks. There are numerous unsealed cracks (maximum width of 16 mils) within the repaired areas on all four sides and 40% of the repaired area on the east face is delaminated (see Figure 11). There was also a small area with corrosion staining in the repaired area on the north face.

Figure 10. Patched area at the southeast corner of Column 15-1 (delaminated areas are crosshatched in red and larger cracks are highlighted in yellow).

Figure 11. Conditions found on Footing 26-3 (delaminated areas are crosshatched in red and unsealed cracks are highlighted in yellow).

A total of 16 concrete cores were extracted from the same components where comprehensive visual and sounding surveys were conducted. Cores were taken in sound original concrete on each component. Since chloride diffusion coefficients are needed to estimate future damage progression in Phase 2 of this study, some of the cores were intensionally taken where there was no reinforcing steel so that the cores could be drilled sufficiently deep into the concrete without damaging any steel. In most cases, a second

core was obtained nearby and positioned directly over a reinforcing steel bar so that the bar could be visually examined in the cored hole. When possible, additional cores were also taken in cracked original concrete and in repaired areas. All cored holes were patched with a cementitious grout containing pea gravel after all testing was completed. Table 3 shows relevant details for each of the cores that were obtained including the condition of the concrete, the condition of reinforcing steel exposed in some of the cored holes, and the chloride content at various depths in the concrete.

A minor degree of corrosion was observed on the reinforcing steel in sound original concrete in the deck, pier cap, column, and strut. Figures 12 and 13 show photographs of the reinforcing steel in sound original concrete in the deck (Core 11), pier cap (Core 14), and column (Core 7). No corrosion was found on the reinforcing steel in cracked original concrete in the deck, but the crack did not extend to the depth of the reinforcing steel (see Core 13 in Figure 12). More advanced corrosion, described here as 'moderate' corrosion, was found on the reinforcing steel in cracked original concrete in the column although the crack was a surface crack only (see Core 9 in Figure 13). A moderate degree of corrosion was also found in a cracked patch repair on the column and, in this instance, the crack extended to the depth of the reinforcing steel (see Core 10 in Figure 13). Reinforcing steel in the footing had a moderate amount of corrosion in sound original concrete, in cracked original concrete where the crack extended to the reinforcing steel depth, and in a sound gunite repair (see Cores 1, 3, and 4 respectively in Figure 14). For the beam, a core was drilled to the depth of the duct on a post-tensioned bar in the bottom flange. The duct was 4.4" deep and was comprised of some type of electroplated metal. The duct was not corroded. Also, no corrosion was found on the exterior surfaces of the ducts that were investigated by FDOT-SMO in 2011. At that time however, a minor degree of corrosion was found on the inside surfaces of the ducts and on the post-tensioned bars, although no discernable pitting was observed on the bars. It was surmised that the observed corrosion on the ducts and post-tensioned bars probably existed at the time of construction and was not the result of ongoing active corrosion. The same study found that the ducts on the post-tensioned bars in two of the beams that were investigated were well filled with a hard and brittle grout while the ducts on the post-tensioned bars in another beam were insufficiently filled with grout and/or the grout itself was deteriorated. At that time, it was noted that insufficient or deteriorated grout could allow the onset of corrosion in the distant future.

Chloride content analyses of the core samples were performed by FDOT-SMO in accordance with the procedures defined in Florida Method 5-516 and assuming a concrete unit weight of 3,800 lb/yd^3. It is generally recognized that a total chloride content of about 1.2 lb/yd^3 of concrete is sufficient to initiate corrosion of reinforcing steel (this is typically called the 'corrosion threshold'), although other variables, such as oxygen and moisture availability and concrete quality, can significantly affect this benchmark. The chloride content results at various depths in the concrete (see Table 3) indicate the following:

Table 3. Core sampling and chloride content analysis.

Core Information				Reinforcing Steel Information		Sample Depth	Chloride Content, lb/yd^3
No.	Component / Face	Location	Concrete				
11	Deck Span 26 / Top	54" from N End, 82" from Curb	Sound Original	Transverse Bar at 3.1"	Minor Corrosion	No Testing Performed	
12		47" from N End, 83" from Curb	Sound Original	Transverse Bottom Bar at 7.7"	Bar Not Sufficiently Visible to Assess	0.0" to 0.5"	0.9
						0.5" to 1.5"	0.9
						1.5" to 2.5"	0.5
						2.5" to 3.5"	0.5
						3.5" to 4.5"	0.4
						4.5" to 5.5"	0.4
						5.5" to 6.5"	0.3
						6.5" to 7.0"	0.4
13		66" from N End, 86" from Curb	Cracked Original (9 mils wide, 1.75" deep)	Transverse Bar at 3.6"	No Corrosion	0.0" to 0.5"	1.0
						0.5" to 1.5"	0.6
						1.5" to 2.5"	0.5
						2.5" to 3.5"	0.4
16	Beam 10-4 / West	3.25" from Bottom, 118" from N End	Sound Original	No Reinforcing Steel	N/A	0.0" to 0.5"	6.2
						0.5" to 1.5"	1.3
						1.5" to 2.5"	0.1
						2.5" to 3.5"	0.0
14	Pier Cap 24 / North	4" from Bottom, 1/3 Length of Cap from W End	Sound Original	Longitudinal Bar at 3.6"	Minor Corrosion	No Testing Performed	
15		6" from Bottom, 1/3 Length of Cap from W End	Sound Original	No Reinforcing Steel	N/A	0.0" to 0.5"	3.3
						0.5" to 1.5"	4.5
						1.5" to 2.5"	4.5
						2.5" to 3.5"	3.6
						3.5" to 4.5"	3.7
						4.5" to 5.5"	3.6
						5.5" to 6.6"	3.5

Equals or exceeds typical corrosion threshold of 1.2 lb/yd^3.

Core 12: Bottom mat reinforcing steel was encountered, but the steel was only visible in the core bit trace.

Core 13: The crack was longitudinal.

Table 3 (cont'd). Core sampling and chloride content analysis.

Core Information				Reinforcing Steel Information		Sample Depth	Chloride Content, lb/yd^3
No.	Component / Face	Location	Concrete				
7	Column 15-1 / South	40.5" from Footing	Sound Original	Vertical Bar at 3.9"	Minor Corrosion	No Testing Performed	
8		40.5" from Footing	Sound Original	No Reinforcing Steel	N/A	0.0" to 0.5"	4.1
						0.5" to 1.0"	4.1
						1.0" to 1.5"	3.3
						1.5" to 2.0"	2.1
						2.0" to 2.5"	1.1
						2.5" to 3.0"	0.9
						3.0" to 3.5"	0.5
						3.5" to 4.0"	0.5
						4.0" to 4.5"	0.3
						4.5" to 5.0"	0.2
						5.0" to 5.5"	0.2
9		26" from Footing	Cracked Original (Surface Only)	Vertical Bar at 4"	Moderate Corrosion	1.5"-2.5"	3.6
						3.0"-3.6"	3.6
10		25" from Footing	Cracked Patch Repair (12 mils wide, 4.4" deep)	Vertical Bar at 4.4"	Moderate Corrosion	0"-0.5"	3.4
						1.5"-2.5"	1.4
						3.5"-4.4"	5.7
5	Strut 9-2 / North	6" from Bottom	Sound Original	Horizontal Bar at 4.4"	Minor Corrosion	No Testing Performed	
6		7" from Bottom	Sound Original	No Reinforcing Steel	N/A	0.0" to 0.5"	4.3
						0.5" to 1.0"	2.4
						1.0" to 1.5"	0.5
						1.5" to 2.0"	0.1
						2.0" to 2.5"	0.0
						2.5" to 3.0"	0.0
						3.0" to 3.5"	0.0
						3.5" to 4.0"	0.0
						4.0" to 4.5"	0.1
						4.5" to 5.0"	0.1
						5.0" to 5.5"	0.1

Equals or exceeds typical corrosion threshold of 1.2 lb/yd^3.

Core 9: The surface crack is likely a concrete defect from original construction because the core was taken in the vicinity of several honeycombed areas.

Table 3 (cont'd). Core sampling and chloride content analysis.

Core Information				Reinforcing Steel Information		Sample Depth	Chloride Content, lb/yd^3
No.	Component / Face	Location	Concrete				
1	Footing 26-3 / South	24" from Bottom	Sound Original	Vertical Bar at 4"	Moderate Corrosion	No Testing Performed	
2		23.5" from Bottom	Sound Original	No Reinforcing Steel	N/A	0.0" to 0.5"	6.2
						0.5" to 1.0"	5.7
						1.0" to 1.5"	3.7
						1.5" to 2.0"	5.1
						2.0" to 2.5"	4.6
						2.5" to 3.0"	3.4
						3.0" to 3.5"	2.8
						3.5" to 4.0"	2.2
						4.0" to 4.5"	1.7
						4.5" to 5.0"	1.5
						5.0" to 5.5"	1.6
3		25" from Bottom	Cracked Original (25 mils wide, 4.5" deep)	Vertical Bar at 4.5"	Moderate Corrosion	1.5"-2.5"	3.9
						3.5"-4.5"	1.7
4		13" from Bottom	Sound Gunite Repair	Vertical Bar at 7.1"	Moderate Corrosion	0.0" to 0.5"	8.5
						1.5" to 2.5"	2.2
						3.5" to 4.5"	1.9
						5.5" to 6.5"	1.0

Equals or exceeds typical corrosion threshold of 1.2 lb/yd^3.

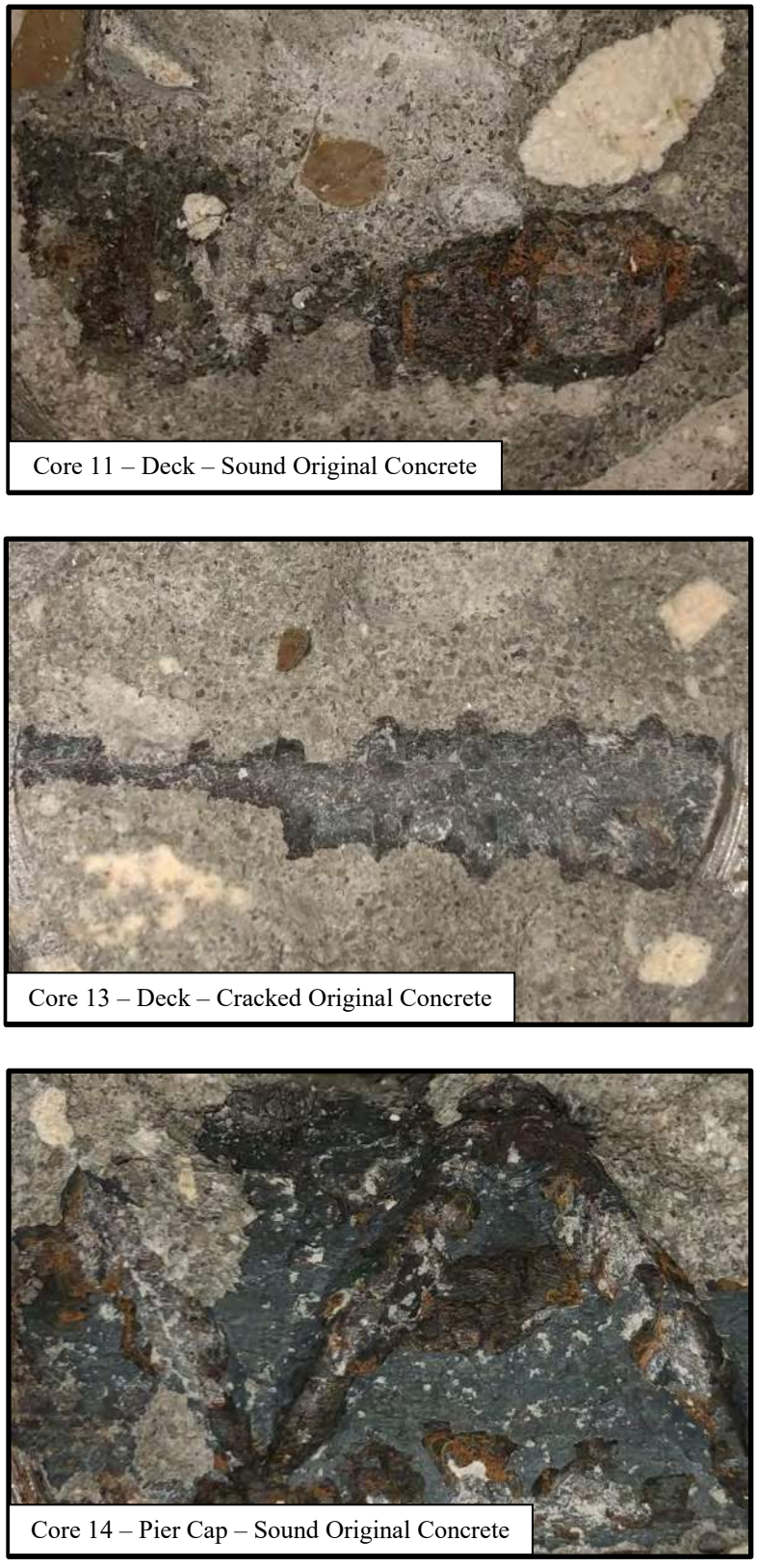


Figure 12. Condition of the reinforcing steel in deck and pier cap.

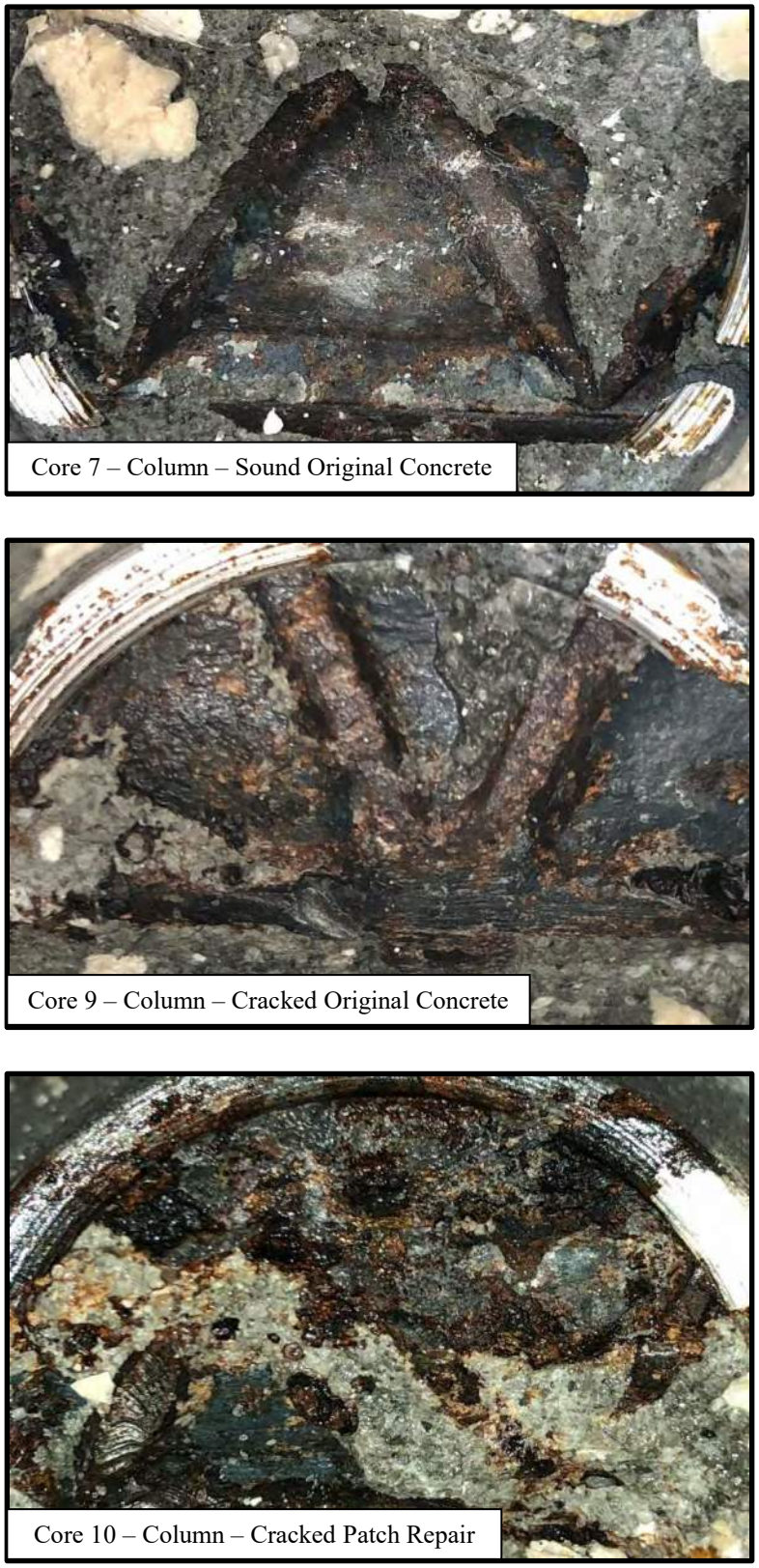


Figure 13. Condition of the reinforcing steel in Column 15-1.

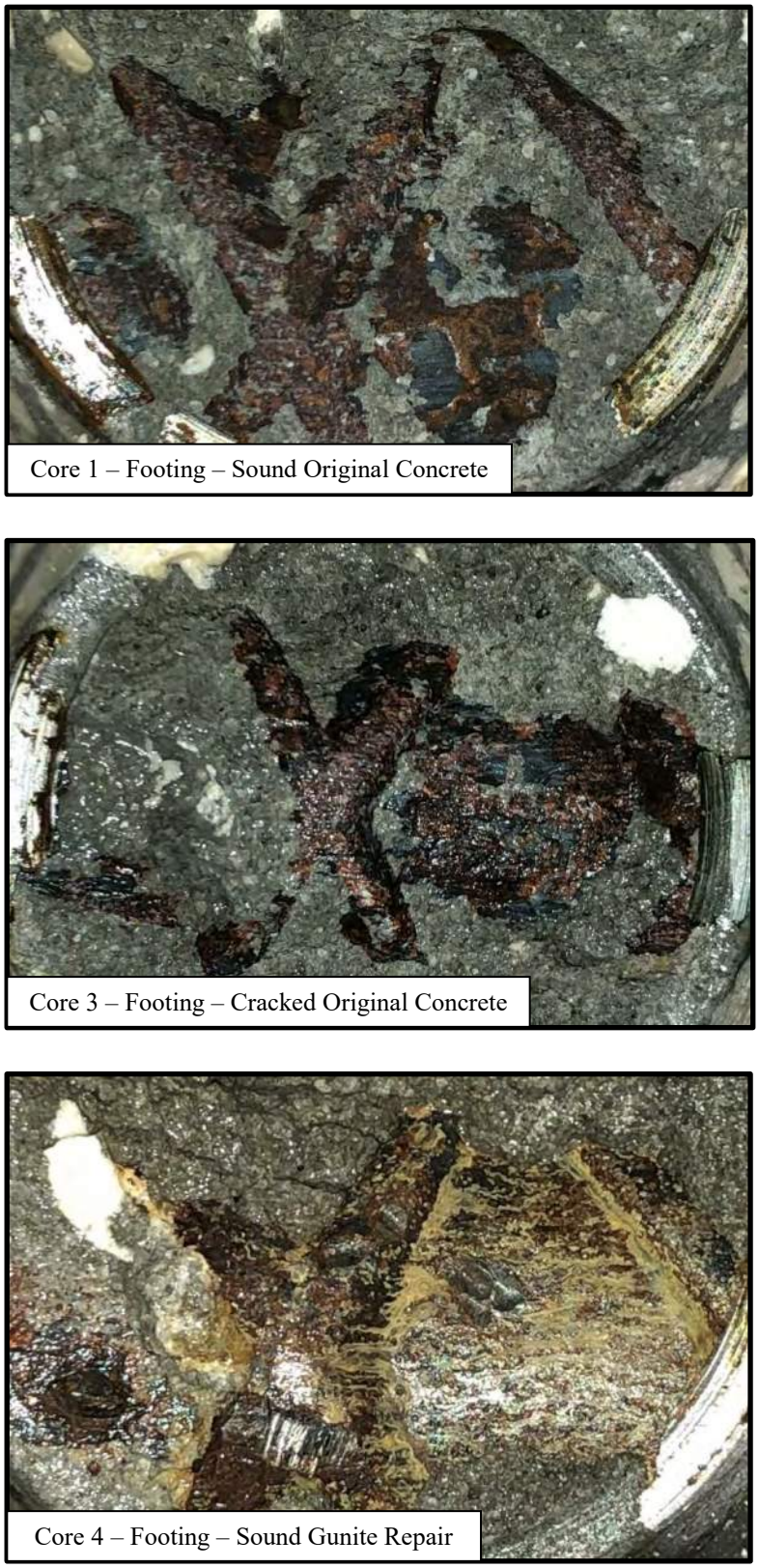


Figure 14. Condition of the reinforcing steel in Footing 26-3.

- A significant amount of chlorides have infiltrated into sound and cracked concrete on the deck, but the chloride content at the reinforcing steel depth is still well below the corrosion threshold.

- The chloride content in the beam exceeds the corrosion threshold up to a depth of about 1.5". However, the chloride content in the concrete at the depth of a duct on a post-tensioned bar was negligible. Also, based on the aforementioned investigation that was conducted in 2011, the chloride content at the depth of the ducts hasn't increased over the last seven years.

- The chloride content in sound original concrete on the pier cap is three times greater than the corrosion threshold at the reinforcing steel depth and the chloride content remains high even at a depth of more than 6".

- In some areas on the column, the chloride content in sound original concrete exceeds the corrosion threshold at the reinforcing steel depth. Also, the chloride content in a cracked patch repair was almost six times greater than the corrosion threshold at the depth of the reinforcing steel. Since the patch repair material has presumably been in place for a lesser period of time than the original concrete, the high chloride content that was found is likely the result of the crack and/or the quality of the patch material itself.

- A significant amount of chlorides have infiltrated the outer one inch or so of sound original concrete on the strut, but the chloride content at the reinforcing steel depth is negligible.

- The chloride content in sound original concrete on the footing exceeds the corrosion threshold up to 1.5" beyond the reinforcing steel depth. At the depths analyzed in cracked original concrete, the chloride content was similar to that in sound original concrete. Also, the chloride content in a sound gunite repair was high up to at least a depth of 4.5" and is approaching the corrosion threshold at a depth of 6.5".

Corrosion potential measurements were taken using a copper-copper sulfate reference electrode (CSE) placed at various locations on the same components where comprehensive visual and sounding surveys were conducted. Reinforcing steel exposed in cored holes was used as the ground when taking the measurements. An exception to this occurred on the beam where a metallic duct housing a post-tensioned bar was used as the ground when corrosion potential measurements were taken.

Although corrosion potential measurements can be affected by the moisture content of the concrete and other factors that may exist at the time measurements are taken, ASTM C876, "Standard Test Method for Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete," states the following:

- Corrosion potentials more negative than -350 mV CSE indicate that there is a greater than 90% probability that active corrosion is occurring within the tested area.

- Corrosion activity is uncertain if corrosion potentials are between -200 and -350 mV CSE.

- Corrosion potentials less negative than -200 mV CSE indicate with greater than 90% probability that active corrosion is not occurring within the tested area (i.e. the reinforcing steel is in a passive state).

Corrosion potential measurements are provided in Appendix B. Measurements were taken on sound and cracked original concrete on the deck and measurements on the pier cap and strut were taken on sound original concrete only. All of the measurements taken on the deck, pier cap, and strut indicate that no corrosion activity is occurring. Corrosion potential measurements taken along a metallic duct in the beam also indicate that no corrosion is occurring. However, because the duct is comprised of some type of electroplated metal and it is highly likely that the duct contacts a post-tensioned bar and conventional reinforcing steel at some point or points along its length, the corrosion potential measurements cannot be accurately interpreted using the criteria provided in ASTM C876.

No corrosion activity was detected in sound original concrete on the column and measurements on a delaminated patch indicate that corrosion activity there is uncertain. Corrosion potential measurements on the footing indicate that corrosion activity is occurring in sound gunite on the lower portion of the repaired areas on the sides of the footing. No corrosion activity was found in original concrete above the repaired areas on the sides of the footing.

Existing CP Systems

The sacrificial CP system that was installed on 75 of the concrete piles consists of a CP jacket and bulk zinc anode. The CP system was installed on 64 of the piles in 2012 and on 10 additional piles in 2017. The CP system on the remaining pile (Pile 9-1) was installed prior to 2016 (the exact year that this CP system was installed is unknown). All of the CP jackets that were installed in 2012 and 2017 are structural jackets and the remaining CP jacket is a non-structural jacket. None of the CP jackets have a potential monitoring access port because all of the jackets are submerged at high tide. Routine monitoring and maintenance was performed on 65 of the CP systems in August 2016 and no significant problems were found at that time. As part of the subject scope of work, routine monitoring and maintenance was performed again in September 2018.

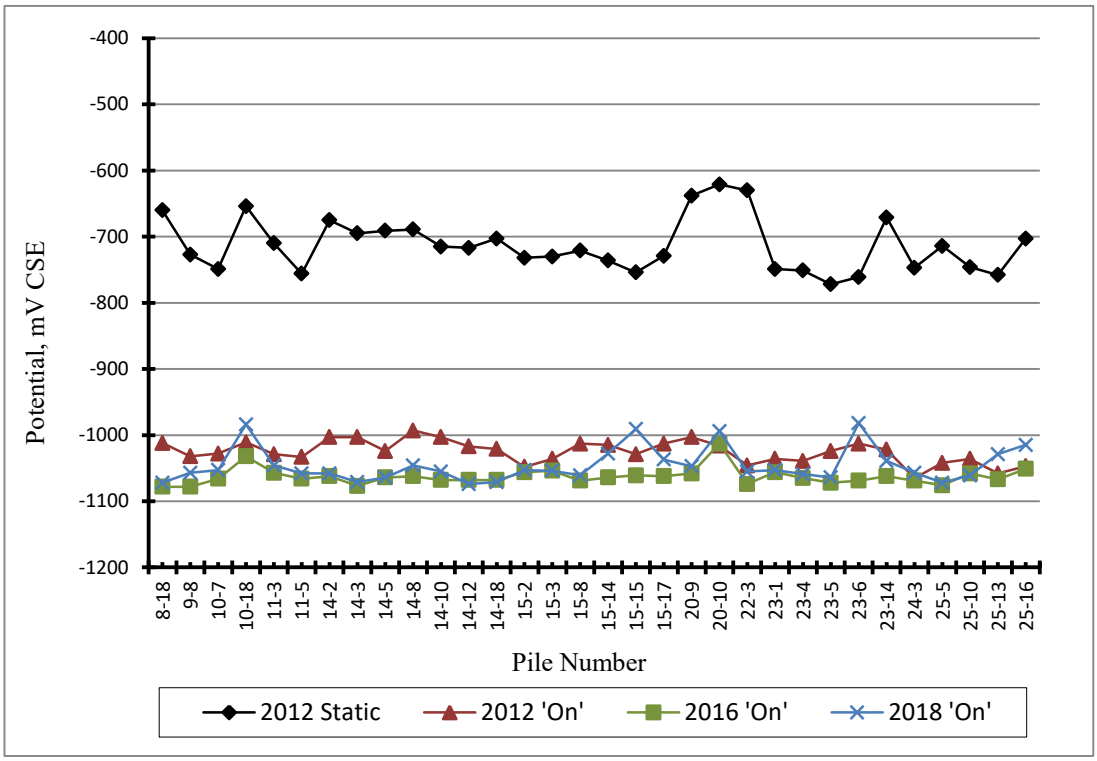
With respect to the above water portions of the CP systems, all of the jackets and chamfers were in good condition in September 2018. Most of the conduit and terminal

boxes were also in good condition, however the conduit was cracked, broken, or otherwise damaged on 16 of the piles. Other damage on the same group of piles included severed system negative wires on one pile, a broken terminal box on one pile, and exposed copper wire on several piles. The severed system negative wires included one wire connected to the pile reinforcing steel and one wire connected to reinforcing steel inside the jacket itself. Because of the redundancy of the system negative wires, the severed wires did not adversely impact the functionality of the CP system. The broken terminal box was originally installed near the water line instead of on the top surface of the footing as was done for all of the other CP systems. The exposure of copper wire was presumably caused by movement of broken conduit from wave action which eventually wore away the insulation on the wires. All of the damage that was found on the CP systems was repaired in October 2018 under a separate task work order that was issued by FDOT-SMO. When repairs were made at the pile that had a broken terminal box, additional conduit was installed so that the new terminal box was on the top surface of the footing.

CP system performance testing was also conducted on all 75 of the piles in September 2018. 'On' potentials obtained with a copper-copper sulfate reference electrode (CSE) in the water adjacent to each pile are shown in Figures 15 (CP systems installed in 2012) and 16 (CP systems installed in 2017). Figures 15 and 16 also include static potentials and historical 'on' potentials. The 'on' potential for Pile 9-1 (the CP system on this pile was installed prior to 2016) was -1091 mV CSE in September 2018. The static potential for this pile is unknown and the 'on' potential that was measured in 2016 was -978 mV CSE. The 'on' potentials for all 75 piles indicate that the CP systems are functioning satisfactorily. Also, according to the January 25, 2018 routine bridge inspection report, the bulk zinc anodes have approximately 80% or more of their section remaining.

Additional CP system performance testing was conducted on a total of nine piles. This group of piles included six piles where the CP systems were installed in 2012 (Pile Nos. 9-8, 14-8, 24-3, 26-9, 29-7, and 31-18), two piles where the CP systems were installed in 2017 (Pile Nos. 6-6 and 23-18), and Pile 9-1 where the CP system was installed prior to 2016. All of the test data were satisfactory except for the two piles where the CP systems were installed in 2017. Electrical shorts were found between reinforcing steel and zinc anodes on both of the piles in spite of the fact that no problems were identified in the September 2, 2017 report entitled 'Cathodic Protection Pile Jackets - SR55 - Bridge No. 130053 - Manatee County - FDOT Contract No. E1P56'. Consequently, FDOT-SMO issued a separate task work order to collect electrical continuity data between various combinations of system negative wires and zinc anode wires on all 10 of the piles where the CP systems were installed in 2017. For comparison purposes, similar testing was also conducted on two randomly selected piles where the CP systems were installed in 2012 (Pile Nos. 15-8 and 29-13). The continuity test data are shown in Table 4 and indicate the following:

- There is a direct short or a near short between reinforcing steel and the zinc anode inside the jacket on eight of the 10 piles where the CP systems were installed in 2017 (Pile Nos. 5-4, 6-2, 6-6, 15-5, 23-17, 23-18, 28-2, and 31-2).



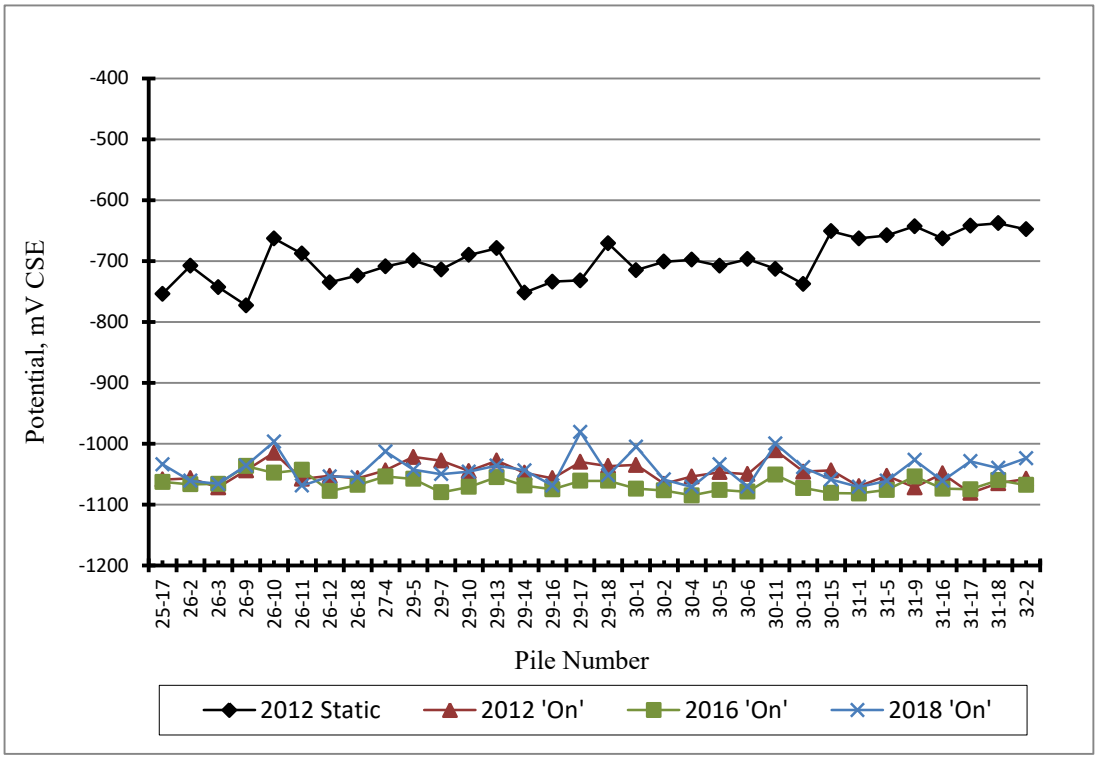


Figure 15. Satic and 'on' potentials for the CP pile jackets that were installed in 2012.

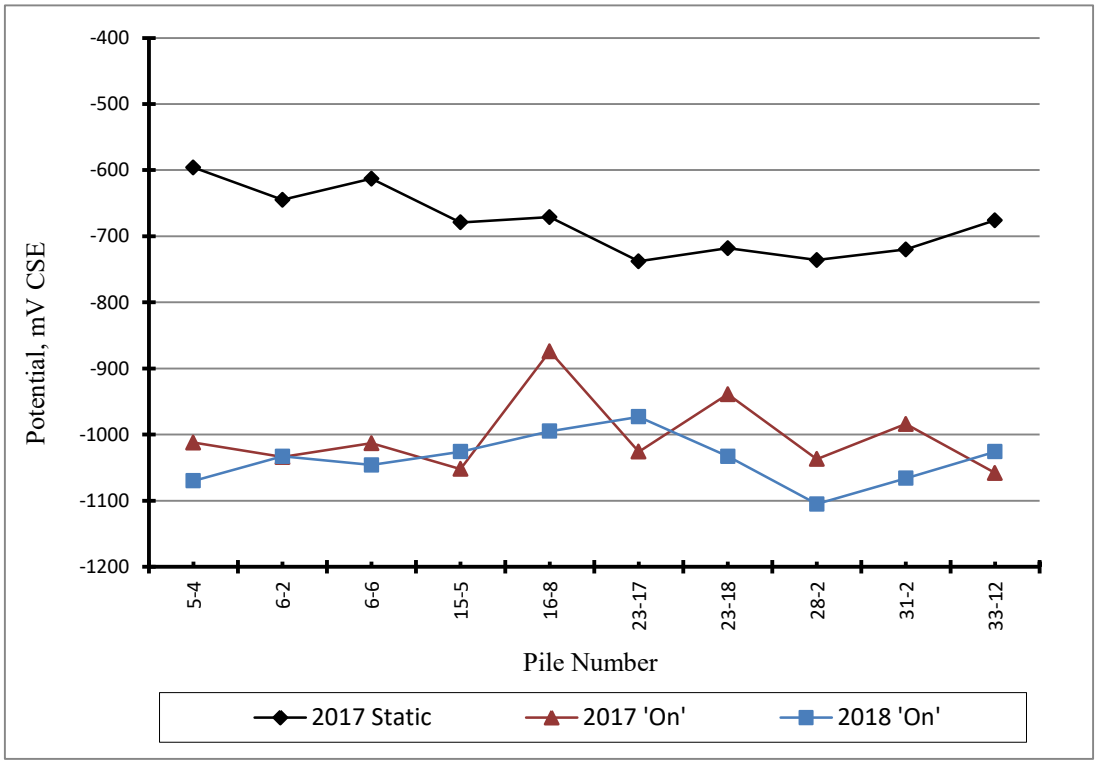


Figure 16. Satic and ‘on’ potentials for the CP pile jackets that were installed in 2017.

Table 4. Electrical continuity test data for select piles.

Pile No.	Wires Tested	DC Resistance, ohms		DC, mV
		Normal	Reversed	
5-4	SNP to SNC	2.4	3.7	0.5
	SNP to JZ	15.2	21.7	9.2
	SNC to JZ	21.9	19.2	10.3
	SNP to BZ	49.9	46.8	24.4
	SNC to BZ	43.3	51.3	23.7
6-2	SNP to SNC	2.4	5.9	2.1
	SNP to JZ	8.4	12.4	5.2
	SNC to JZ	14.4	16.6	7.8
	SNP to BZ	50.7	53.4	26.3
	SNC to BZ	50.4	45.5	24.3
6-6	SNP to SNC	10.9	7.0	4.5
	SNP to JZ	11.1	15.5	6.7
	SNC to JZ	1.9	3.9	1.5
	SNP to BZ	32.9	36.2	17.5
	SNC to BZ	22.3	27.9	12.8
15-5	SNP to SNC	12.8	16.3	7.4
	SNP to JZ	18.8	22.3	10.4
	SNC to JZ	5.6	7.4	3.3
	SNP to BZ	23.5	25.6	12.5
	SNC to BZ	7.5	13.1	4.9
16-8	SNP to SNC	19.1	22.6	10.5
	SNP to JZ	71.4	75.1	37.0
	SNC to JZ	52.6	54.5	27.0
	SNP to BZ	60.4k	61.3k	62.1
	SNC to BZ	104.6	100.2	51.4
23-17	SNP to SNC	3.8	6.0	2.6
	SNP to JZ	9.4	6.7	4.0
	SNC to JZ	3.5	2.2	1.4
	SNP to BZ	41.2	38.3	19.9
	SNC to BZ	36.8	33.0	17.4

Pile No.	Wires Tested	DC Resistance, ohms		DC, mV
		Normal	Reversed	
23-18	SNP to SNC	11.7	15.9	7.0
	SNP to JZ	12.5	16.7	7.4
	SNC to JZ	0.2	0.7	0.1
	SNP to BZ	44.4	46.7	22.9
	SNC to BZ	28.6	33.8	15.7
28-2	SNP to SNC	12.7	15.8	7.2
	SNP to JZ	17.2	14.0	7.7
	SNC to JZ	0.1	1.6	0.6
	SNP to BZ	74.4	71.1	36.5
	SNC to BZ	60.3	56.0	29.2
31-2	SNP to SNC	2.3	1.5	0.1
	SNP to JZ	2.1	2.5	0.4
	SNC to JZ	0.2	1.7	0.5
	SNP to BZ	53.0	49.8	25.8
	SNC to BZ	53.2	44.9	24.1
33-12	SNP to SNC	37.2	60.6	17.0
	SNP to JZ	82.9	77.0	40.2
	SNC to JZ	47.9	46.1	23.7
	SNP to BZ	54.7k	54.9k	54.3
	SNC to BZ	78.9	71.5	37.6
15-8	SNP to SNC	103.3	107.9	104.0
	SNP to JZ	80.3	81.6	81.7
	SNC to JZ	97.4	95.3	96.9
	SNP to BZ	67.1	66.9	68.7
	SNC to BZ	77.6	77.1	80.7
29-13	SNP to SNC	19.8	20.1	18.9
	SNP to JZ	36.7	34.3	35.4
	SNC to JZ	43.1	42.2	42.9
	SNP to BZ	59.2	58.1	51.8
	SNC to BZ	63.1	63.5	63.2

Notes: SNP is the system negative wires for the pile reinforcing steel.
SNC is the system negative wires for the new structural reinforcing steel.
JZ is the jacket zinc anode wires and BZ is the bulk zinc anode wire..

- There is a near short between reinforcing steel and the bulk zinc anode on one and possibly two of the 10 piles where the CP systems were installed in 2017 (Pile Nos. 6-6 and 15-5).

- The system negative wires for pile reinforcing steel are electrically continuous with the system negative wires for the new structural reinforcing steel on three of the 10 piles where the CP systems were installed in 2017 (Pile Nos. 5-4, 6-2, and 31-2).

It should be noted that, while determination of a direct short is straightforward, there are no established criteria for definitively identifying a near short. Therefore, the statements made above with respect to near shorts are based on experience and comparisons of similar data that were obtained on other piles. In order for the CP systems to function, the zinc anodes are normally shorted to the system negative lead wires by connecting all of the system wires together in a terminal box. Although the internal electrical shorts (i.e. inside the jacket limits) noted above prevent collection of accurate current outputs, static potentials, and instant-off potentials because the reinforcing steel cannot be disconnected from the anodes, they should not have an adverse impact on the long-term operation or effectiveness of the CP systems.

According to the previously mentioned September 2, 2017 report, the system negative wires for pile reinforcing steel were electrically discontinuous with the system negative wires for the new structural reinforcing steel on all 10 of the piles where the CP systems were installed in 2017. As noted above however, the system negative wires for pile reinforcing steel were determined to be electrically continuous with the system negative wires for the new structural reinforcing steel on three of the piles. Although this situation prevents separate measurements of CP current output to pile reinforcing steel and new structural reinforcing steel, it does not have an adverse impact on the long-term operation or effectiveness of the CP system.

Table 5 shows the other CP system performance test data that were collected on six of the piles where the CP systems were installed in 2012, five of the piles where the CP systems were installed in 2017, and Pile 9-1 where the CP system was installed prior to 2016. The remaining five piles where the CP systems were installed in 2017 (Pile Nos. 6-6, 23-17, 23-18, 28-2, and 31-2) are not shown in Table 5 because there is a direct short between reinforcing steel and the zinc anode inside the jacket on each of these piles. All of the test data shown in Table 5 were satisfactory.

Environmental Corrosion Classification

FDOT-SMO conducted laboratory analyses on a water sample that was taken at the bridge in 2011 and, based on parameters provided in the FDOT Structures Design Guidelines, the results indicated that the environmental corrosion classification at the bridge is ‘extremely aggressive’.

Table 5. Cathodic protection system performance test data for select piles.

Pile No.	Year	AC Res., ohms		Total Current Output, mA	Potential Measurements, mV CSE					
		LJ/SN	BZ/SN		Static	On	IO	Hrs. Decay	Decay Pot.	Polar. or Depol.
9-1	2016	0.6	0.7	11		-978	-974	24	-907	67
	2018	0.9	0.9	5		-1091	-1090	45	-949	141
9-8	2012	0.4	0.8	65	-727	-1032	-1006			279
	2016	0.3	0.6	42		-1078	-1069	24	-983	86
	2018	0.4	0.8	13		-1057	-1055	45	-946	109
14-8	2012	0.3	0.5	91	-689	-993	-960			271
	2016	0.2	0.6	40		-1062	-1056	24	-972	84
	2018	0.3	0.6	7		-1046	-1045	45	-972	73
24-3	2012	0.3	0.6	57	-747	-1065	-1049			302
	2016	0.2	0.4	47		-1069	-1061	24	-991	70
	2018	0.3	0.6	29		-1057	-1052	27	-1015	37
26-9	2012	0.3	0.7	119	-773	-1044	-1005			232
	2016	0.3	0.6	16		-1037	-1034	24	-963	71
	2018	0.3	0.8	16		-1036	-1018	27	-1003	15
29-7	2012	0.4	0.8	113	-714	-1028	-997			283
	2016	0.4	0.7	26		-1080	-1074	26	-997	77
	2018	0.4	0.9	17		-1050	-1046	27	-1024	22
31-18	2012	0.3	0.9	70	-638	-1065	-1034			396
	2016	0.1	0.4	35		-1060	-1032	26	-952	80
	2018	0.3	0.6	55		-1040	-1029	27	-961	68
5-4	2017			92	-596	-1012	-969			373
	2018	0.9	1.0	10		-1070	-1067	48	-1006	61
6-2	2017			204	-645	-1034	-942			297
	2018	0.6	0.7	14		-1033	-1030	48	-1022	8
15-5	2017			152	-679	-1052	-1024			345
	2018	0.6	0.6	11		-1026	-1024	48	-1017	7
16-8	2017			405	-671	-874	-843			172
	2018	0.6	0.3	17		-995	-991	48	-958	33
33-12	2017			79	-676	-1058	-990			314
	2018	0.6	1.5	20		-1026	-1021	48	-954	67

Note: LJ = jacket zinc anodes, BZ = bulk zinc anode, and SN = system negatives.

IV. SUMMARY AND CONCLUSIONS

The Hernando Desoto Bridge has been in service in an extremely aggressive corrosion environment for over six decades and various repairs have been made on the bridge during that time. Findings from the subject investigation are summarized below for each of the bridge component types that were evaluated.

In spite of the widespread cracking on the top surface of the deck, ongoing active reinforcing steel corrosion is minimal. Although a significant amount of chlorides has infiltrated the deck concrete, the chloride front has not yet reached the depth of the reinforcing steel. Also, existing concrete repairs are generally in good condition and concrete damage on the bottom surface of the deck is currently isolated to a few spans. The deck in Spans 14, 16, 17, and 18 is covered with an overlay and no evaluation was performed in those areas.

From a corrosion perspective, the post-tensioned concrete beams are generally in good condition and have required minimal concrete repairs except at the ends of the beams. Also, the majority of the existing repairs are in good condition. Although the chloride content in the concrete at the depth of the ducts on post-tensioned bars is negligible and hasn't changed over the last seven years, chlorides are infiltrating the beam concrete and eventually this will cause corrosion. Also, the subject evaluation did not include investigating the condition of the post-tensioned bars in the beams, but a few of the post-tensioned bars were investigated in 2011. At that time, a minor degree of corrosion was found on the bars, although no discernable pitting was observed. Also, it was suspected that the observed corrosion existed at the time of construction and was not the result of ongoing active corrosion. However, the same study found that some of the ducts on the post-tensioned bars were insufficiently filled with grout and/or the grout itself was deteriorated which could allow the onset of corrosion in the distant future. With respect to the coated steel beams, it appears that the coating has either failed, is in the process of failing, and/or it was originally applied without proper surface preparation.

Although the visual condition of the pier caps is generally good, other testing and laboratory analysis from the subject investigation indicates that corrosion activity is occurring (i.e. minor corrosion was observed on a bar in sound original concrete) and that there is an unknown amount of concrete delamination on the pier caps. In addition, there is a high chloride content in sound original concrete, including at the reinforcing steel depth. Without effective corrosion control measures, corrosion activity is expected to become more widespread on the pier caps and lead to much more concrete damage in the future. Also, existing repairs are limited to only a few of the caps and all of the repairs have failed. Since it is believed that the repairs were made only about one year ago, the current condition of the repairs is probably not the result of ongoing active corrosion, but rather poor workmanship, improper construction techniques, and/or the use of inferior materials.

The columns located on land are in good condition and have no repairs. About 40% of the columns located over water have some amount of damage in original concrete.

Repairs, including sealed cracks and patched areas, have been made on about 55% of the columns located over water and the repairs on 77% of those columns have failed. In addition, corrosion was observed on a reinforcing steel bar in sound original concrete and the chloride content exceeds the corrosion threshold at the reinforcing steel depth in some of the sound original concrete. Corrosion was also observed on a reinforcing steel bar in a cracked patch where the crack extended to the reinforcing steel depth. The chloride content at the reinforcing steel depth at that location was much greater than the corrosion threshold. Since the patch repair material has presumably been in place for a lesser period of time than the original concrete, the high chloride content that was found is probably the result of the crack and/or the quality of the patch material itself. The columns have reached a point where long term corrosion control measures would be more cost-effective than repeated conventional concrete repairs.

The struts are in good condition and have no repairs. Minor corrosion was observed on a bar in sound original concrete and a significant amount of chlorides have infiltrated the outer one inch or so of the sound original concrete on the struts, but the chloride content at the reinforcing steel depth is still negligible. Overall, ongoing active reinforcing steel corrosion in the struts is considered to be minimal.

The footings located on land are in good condition and have no repairs. There is some amount of damage in the original concrete on the top and/or side surfaces on 30% of the waterline footings. Due to the proximity of the footings to the water, the bottom surface of the footings could not be thoroughly inspected. However, based on the information that was obtainable on the bottom surfaces of the footings, the percentage of the waterline footings that have damage in original concrete is much greater than 30%. Also, all of the waterline footings have repairs consisting of sealed cracks, patched areas, and/or areas that have been gunited and the repairs on 93% of the footings have failed. In addition, corrosion was observed on reinforcing steel bars in sound original concrete, cracked original concrete where the crack extended to the reinforcing steel depth, and in a sound gunite repair. The chloride content in sound and cracked original concrete exceeds the corrosion threshold at the reinforcing steel depth and the chloride content in sound gunite is high up to at least a depth of 4.5” and is approaching the corrosion threshold up to a depth of 6.5”. The fact that corrosion was found on reinforcing steel in a sound gunite repair and a large amount of chlorides have permeated well into the gunite is important because the repairs have been exposed to the environment at the bridge for presumably much less time than the original concrete. Overall, widespread corrosion activity is occurring in sound original concrete and in repair areas on the waterline footings and long term corrosion control measures will be required to cost-effectively extend the service life of these components.

The top portion of the piles is in the tidal zone and the small length of each pile that is exposed at low tide is mostly covered with marine growth, cathodic protection jackets, and/or gunite overspray from footing repairs. This situation prevented adequate inspection of the above water portion of the piles. Limited inspections were performed, however, and cracks and/or delaminations were found on six piles. No repairs were

observed on any of the piles, but the 75 piles that have cathodic protection (CP) jackets likely exhibited some amount of concrete damage at the time that the jackets were installed. Although no corrosion testing was conducted on the piles, based on the investigation findings obtained for other component types, the chloride content in the pile concrete is undoubtedly high. In support of this, chloride induced corrosion was presumably occurring on the piles that have CP jackets at the time that the jackets were installed.

All of the existing CP jackets and chamfers are in good condition and the bulk zinc anodes have approximately 80% or more of their section remaining. All of the conduit, terminal boxes, and CP system wiring are now also in good condition after necessary repairs were completed as part of the subject evaluation. CP system performance test data indicate that all of the CP systems are functioning satisfactorily. However, in spite of the fact that no problems were identified in the CP system installation and energization report that was prepared for the 10 piles that had CP systems installed in 2017, there is a direct short or a near short between reinforcing steel and the zinc anodes on eight of those piles. While the electrical shorts prevent collection of accurate current outputs, static potentials, and instant-off potentials, they should not have an adverse impact on the long-term operation or effectiveness of the CP systems. Also, a second problem was found on three of the eight piles that have shorts. On those piles, the system negative wires for pile reinforcing steel are electrically continuous with the system negative wires for the new structural reinforcing steel. This situation prevents separate measurements of CP current output to the pile reinforcing steel and the new structural reinforcing steel, but it does not have an adverse impact on the long-term operation or effectiveness of the CP systems.

V. RECOMMENDATIONS

The recommendations below are made from a long term corrosion mitigation standpoint only and do not take into account financial considerations, structural issues, or the remaining service life of the bridge. Any structural concerns should be addressed by a Bridge Structural Engineer. The recommended corrosion control measures are intended to address current and future reinforcing steel corrosion issues on the referenced bridge components. The recommendations are also intended to be used in the cost analysis that will be conducted in Phase 2 of this study.

Deck

It is likely that the service life of the deck can be extended long term by application of a methacrylate sealer on the entire top surface except in the spans that have an overlay and by completing standard concrete repairs on the bottom surface as needed. If this approach is employed, it is recommended that a small area be selected for a trial application of the sealer that would include testing to evaluate the effectiveness of the sealer prior to full scale application. Compatibility between the sealer and the various existing repairs on the deck should also be verified.

Beams

In order to minimize future chloride infiltration and extend the service life of the concrete beams, it is recommended that a penetrating sealer be applied to all exposed surfaces of the beams and that standard concrete repairs continue to be made as needed. A penetrating sealer should also be applied to future concrete repairs. Additionally, it is recommended that the condition of the grout and post-tensioned bars inside the ducts be investigated again in three years (i.e. 10 years after the last investigation was conducted). With respect to the steel beams, if the impact of the existing section loss due to corrosion is determined to be inconsequential by a Bridge Structural Engineer, it is recommended that the existing coating be removed entirely and that a new coating be applied after proper surface preparation is performed. An alternative and probably longer term approach for the steel beams would be to apply metalized zinc on the beams after the existing coating is removed. Also, the deck scuppers should be retrofitted to prevent water runoff onto the concrete and steel beams.

Pier Caps and Columns

The recommended corrosion control approach for the pier caps and columns is a metalized zinc cathodic protection (CP) system. Standard concrete repairs should be completed, including where existing repairs have failed, before the CP system is installed. For cost analysis purposes in Phase 2 of this study, a design service life of 5 to 7 years can be used for the metalized zinc CP system. Metalized zinc that remains after that time should be removed and new metalized zinc should be applied. It is also recommended that steps be taken to minimize leakage from deck joints above the pier caps onto the pier caps and columns.

Since corrosion activity on the pier caps is not currently as advanced as it is on the columns, implementation of the recommended corrosion control measures could be postponed on the pier caps. However, the cost of rehabilitating the pier caps will increase over time as corrosion activity progresses and the resulting extent of concrete damage increases.

Struts

No corrosion control measures are considered necessary for the struts at this time.

Footings

No corrosion control measures are considered necessary for the footings on land at this time. Since water only contacts a small portion of each waterline footing for a short time period each day, it is probable that a sacrificial CP system would not provide adequate corrosion control and that an impressed current CP system would be needed instead. Therefore, it is recommended that the waterline footings be restored to their original dimensions using standard concrete patching after all of the existing repairs and damaged original concrete are removed and that an impressed current CP system be installed. The

impressed current CP system would likely incorporate a titanium mesh anode encased in a concrete jacket or a titanium ribbon anode in sawcut slots backfilled with grout or a combination of these. For cost analysis purposes in Phase 2 of this study, a design service life of up to 50 years can be used for the impressed current CP system. Long term costs to monitor and maintain the CP system may be significant and should also be considered.

Piles

Monitoring and maintenance of the existing CP systems should be repeated every 3 to 5 years. Also, during the next monitoring effort, a potential decay period of at least three days should be used. For cost analysis purposes in Phase 2 of this study, a design service life of 25 years can be used for the existing CP systems. Long term costs to monitor and maintain the existing CP systems should also be considered.

There are 411 piles that don't have an existing CP system. These piles will require corrosion control at some point in time and, in that regard, there are two approaches that can be used. Corrosion control could be utilized on all of the piles at the same time or on groups of piles over time as corrosion activity and concrete damage progress. From a life cycle cost perspective, the former may be more cost effective than the latter depending on the associated service life and type of corrosion control used. The piles are fully submerged at high tide and the tidal range is approximately two feet. It is therefore, possible that the piles can be effectively protected from corrosion using only bulk zinc anodes without CP jackets. Importantly, if this is the case, a substantial cost savings could be realized considering the number of piles involved. To determine if bulk zinc anodes alone can provide adequate corrosion protection for the piles, it is recommended that a trial test be set up on at least two piles in the near future. For cost analysis purposes in Phase 2 of this study, virtually any reasonable design service life (as much as 75 to 100 years) can be used for the bulk zinc anode CP system because the design service life is only limited by the quantity of bulk zinc anodes that are installed on each pile. Long term costs to monitor and maintain any newly installed sacrificial CP systems should also be considered.

Appendix A
Visual and Sounding Survey Drawings

HERNANDO DESOTO BRIDGE NO. 130053
VISUAL & SOUNDING SURVEY FINDINGS ON A PIER CAP

Date: 9-11-18

Pier Cap No. 24

North Face

East End

No concrete damage or repairs.

West End

Bottom Face

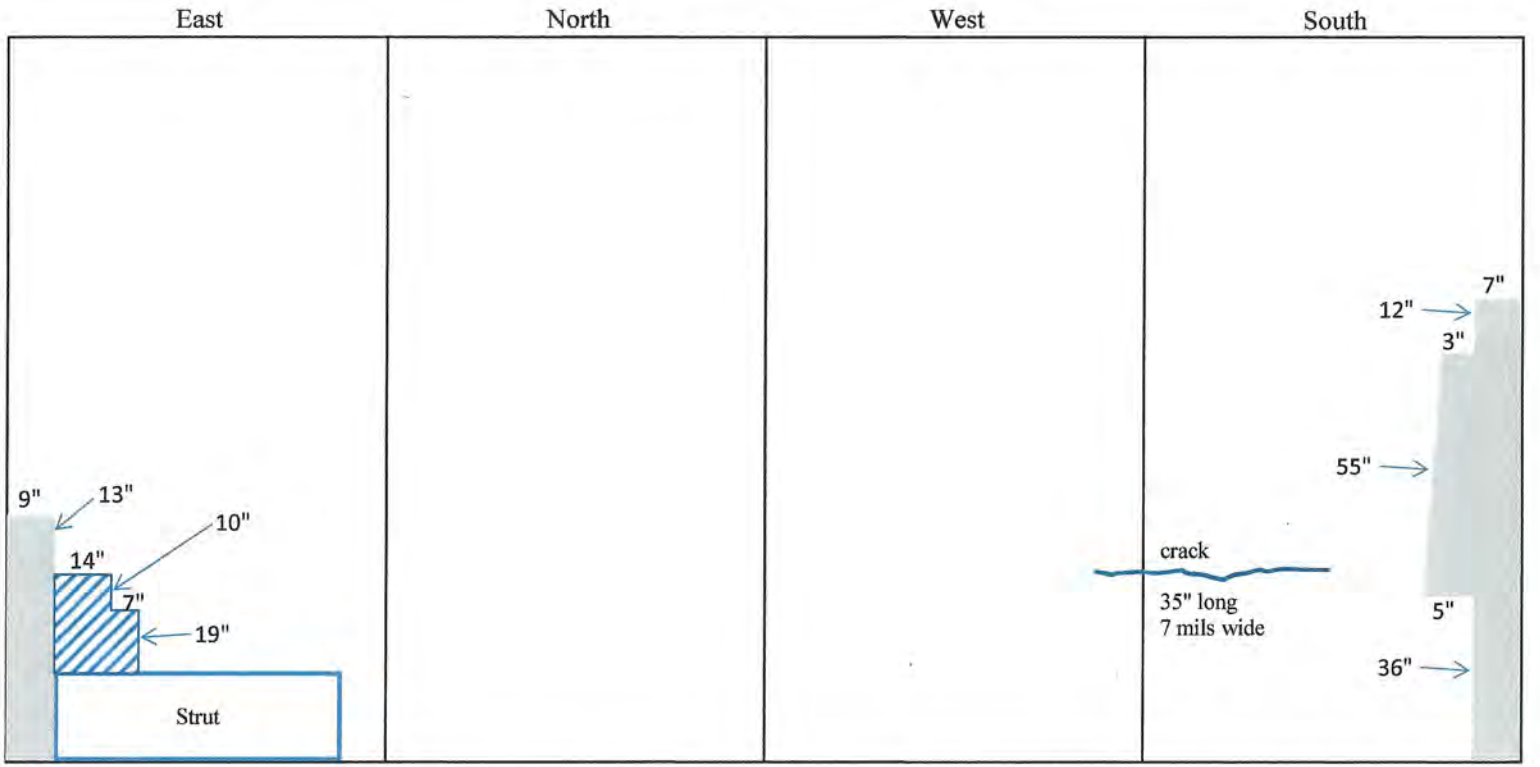
South Face

No concrete damage or repairs.

Notes: Hatched areas represent delaminated concrete. There were also cracks in the largest delaminated area.

HERNANDO DESOTO BRIDGE NO. 130053
VISUAL & SOUNDING SURVEY FINDINGS ON A COLUMN

Date: 9-5-18 Pier No. 15 Column No. 1



Notes: Shaded areas are patches with cracking throughout. Approximately 2/3 of the patched area is delaminated. There is also delaminated original concrete adjacent to the patch on the east face in the hatched area. There is honeycombing on the lower portion of the north and south faces.

HERNANDO DESOTO BRIDGE NO. 130053
VISUAL & SOUNDING SURVEY FINDINGS ON A STRUT

Date: 9-5-18 Pier No. 9 Strut Between Columns 2 & 3

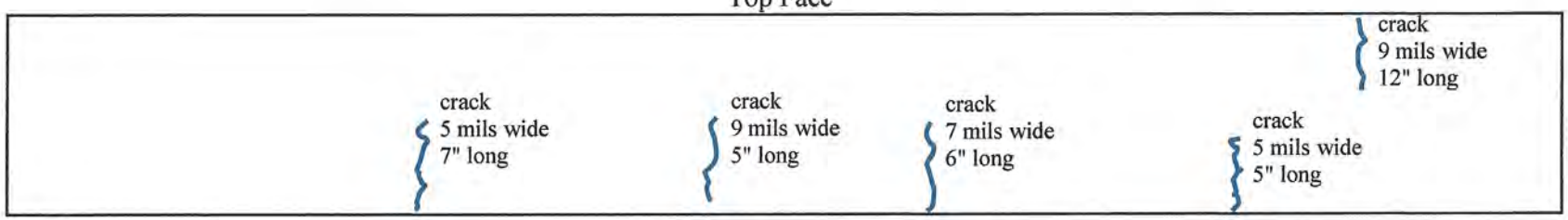
North Face

East End

No concrete damage or repairs.

West End

Top Face



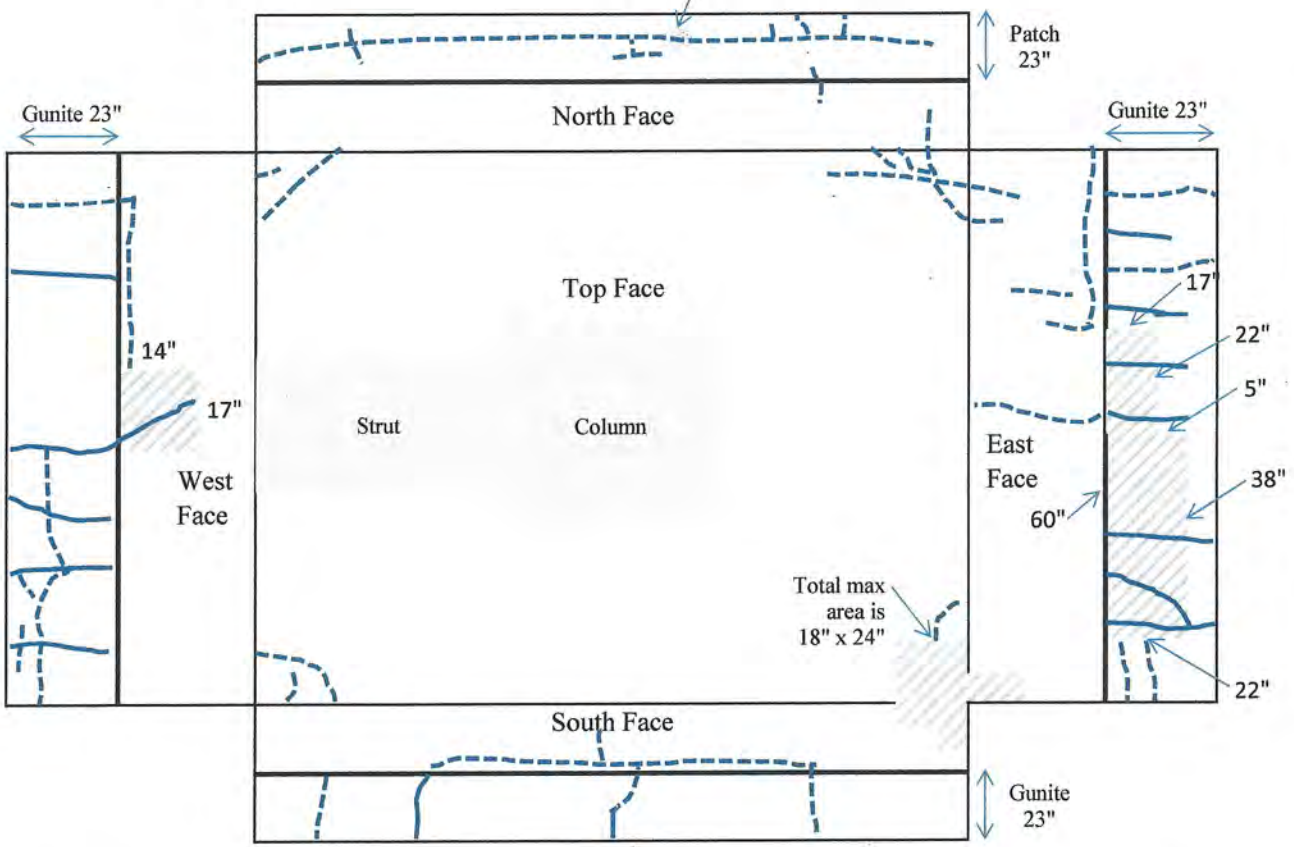
South Face

No concrete damage or repairs.

Notes: There is no concrete damage or repairs on the bottom face.

HERNANDO DESOTO BRIDGE NO. 130053
VISUAL & SOUNDING SURVEY FINDINGS ON A FOOTING

Date: 9-6-18 Pier No. 26 Footing No. 3



Piles not shown for clarity

Bottom Face

Could not access for visual inspection.
Extensive delaminations.

Notes: Maximum width of unsealed cracks in original concrete was 20 mils and in repaired areas was 16 mils.

Dashed blue lines are cracks. Solid blue lines are sealed cracks. Hatched areas represent delaminations.

Appendix B
Corrosion Potential Measurements

Table B1. Corrosion potential measurements.

Measurement Location	Corrosion Potentials, mV CSE							
	Deck Span 26 - Top Surface				Beam 10-4		Pier Cap 24	
	Core No. 13		Core No. 11		Core No. N/A		Core No. 14	
	Potential	Concrete	Potential	Concrete	Potential	Concrete	Potential	Concrete
1	+74	C/O	-33	S/O	-33	S/O	+10	S/O
2	+57	S/O	-52	C/O	+45	S/O	+1	S/O
3	+59	S/O	+43	C/O	+43	S/O	-36	S/O
4	+77	S/O	+37	S/O	+6	S/O	-58	S/O
5	+69	S/O	+30	S/O	-3	S/O	-188	S/O
6	+33	S/O	+11	C/O	+24	S/O	-83	S/O
7	+10	S/O	-6	C/O	+20	S/O	-54	S/O
8	-43	S/O	-108	S/O	+34	S/O	-70	S/O
9	+8	S/O	+6	S/O	+18	S/O	-69	S/O
10	+54	C/O	+57	S/O	+31	S/O	-71	S/O
11	+74	C/O	+59	C/O	-1	S/O	-75	S/O
12	+71	S/O	+32	C/O	-4	S/O	-71	S/O
13	+52	S/O	+56	C/O	-23	S/O	-58	S/O
14	+46	C/O			-2	S/O	-46	S/O
15					+6	S/O	-45	S/O
16					+41	S/O	-25	S/O
17					+22	S/O	-62	S/O
18					+39	S/O	-24	S/O
19					+64	S/O	-54	S/O
20							-9	S/O

S = sound, C = crack, O = original.
Measurements on the deck at 1' increments beginning at the curb and ending at the striping on the east side of the west SB lane.
Measurements on the beam began at the north end and were taken along the beam at 1' increments. A metalic duct for post-tensioned steel was used to make a ground connection (the duct was exposed in a drilled hole).
Measurements on the pier cap were taken at 1' increments beginning 10' west of Core #14 and ending 10' east of the core.

Table B1 (cont'd). Corrosion potential measurements.

Measurement Location	Corrosion Potentials, mV CSE					
	Column 15-1				Strut 9-2	
	Core Nos. 7 & 9		Core No. 10		Core No. 5	
	Potential	Concrete	Potential	Concrete	Potential	Concrete
1	-172	S/O	-249	D/P	-96	S/O
2	-131	S/O	-321	D/P	-22	S/O
3	-161	S/O	-295	D/P	-89	S/O
4	-176	S/O	-287	D/P	-132	S/O
5	-123	S/O	-236	D/P	-154	S/O
6	-110	S/O	-302	D/P	-108	S/O
7	+49	S/O	-215	D/P	-116	S/O
8	-54	S/O	-183	D/P	-150	S/O
9	+128	S/O	-46	S/O	-150	S/O
10	+52	S/O	+32	S/O	-151	S/O
11	+42	S/O	+28	S/O	-145	S/O
12			+21	S/O	-115	S/O
13					-83	S/O
14					-162	S/O
15					-99	S/O
16					-142	S/O
17					-96	S/O
18					-88	S/O
	Footing 26-3					
	Core No. 1		Core No. 3		Core No. 4	
	Potential	Concrete	Potential	Concrete	Potential	Concrete
1	-448	S/G	-481	S/G	-486	S/G
2	-384	S/G	-387	S/G	-423	S/G
3	-219	S/G	-247	S/G	-230	S/G
4	-196	S/G	-166	S/G	-206	S/G
5	-135	S/O	-70	C/O	-120	S/O
6	-33	S/O	-61	S/O	-139	S/O
7	-48	S/O	-43	S/O	-128	S/O
8	-37	S/O	+23	S/O	-108	D/O
9	+12	S/O	+20	S/O	-134	D/O

S = sound, C = crack, D = delaminated, P = patch, G = gunite, O = original.
Measurements on the column were taken vertically at 1' increments beginning 3" above the footing. Core Nos. 7 and 9 were taken along the same vertical bar. The crack at Core No. 9 did not extend to the reinforcing steel depth.
Measurements on the strut were taken at 1' increments along a bottom horizontal bar.
Measurements on the footing were taken vertically at 6" increments beginning 3" from the bottom of the footing.

APPENDIX C

2011 CORROSION CONDITION EVALUATION

POST-TENSIONED CONCRETE GIRDER

RICK SCOTT
GOVERNOR

Florida Department of Transportation
State Materials Office

CORROSION CONDITION EVALUATION OF POST-TENSIONED CONCRETE GIRDERS ON THE HERNANDO DESOTO BRIDGE (BRIDGE NO. 130053)

FINAL REPORT
JUNE 16, 2011

CORROSION CONDITION EVALUATION OF POST-TENSIONED CONCRETE GIRDERS ON THE HERNANDO DESOTO BRIDGE (BRIDGE NO. 130053)

FINAL REPORT
June 16, 2011

Prepared by:

William Scannell
Principal Corrosion Specialist
NACE Certified Corrosion Specialist #4468
Concorr Florida, Inc.
2458 Long Sandy Circle
Merritt Island, FL 32952

and

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State Materials Office
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Gainesville, FL 32609

Table of Contents

I. INTRODUCTION

The Hernando Desoto Bridge (Bridge No. 130053) was constructed in 1957. Currently, there are numerous locations where concrete spalling has occurred at the ends of girders and corroded post-tensioned anchorages and tendons are exposed in the spalled areas. Figure 1 shows typical examples of the concrete damage and exposed post-tensioned components.

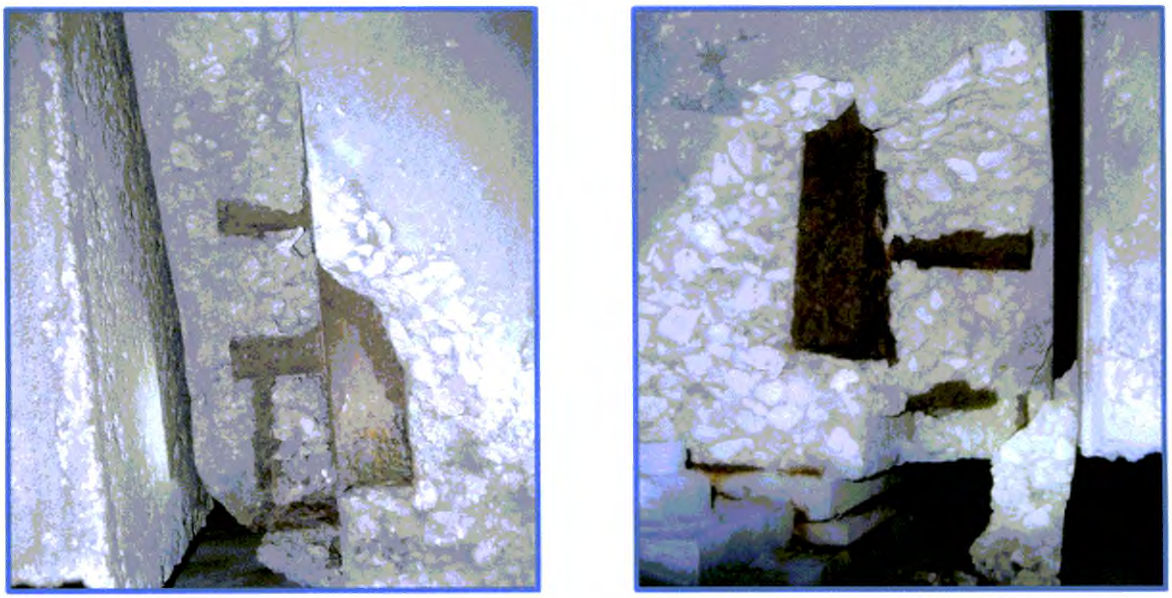


Figure 1. Typical examples of concrete damage and exposed post-tensioned components at the ends of girders.

The FDOT District Structures Maintenance Office (DSMO) and T.Y. Lin International requested the FDOT State Materials Office (SMO) to perform specific testing and sampling on a limited number of post-tensioned concrete girders for the purpose of evaluating the corrosion condition of the post-tensioned tendons at various distances away from the anchorages. The on-site investigation was performed by Concorr Florida, Inc. under contract with FDOT-SMO. Infrastructure Corporation of America provided a snooper truck to access the girders.

II. SCOPE OF WORK

At the time that the scope of work was developed, it was not known if the post-tensioned tendons were inside of a duct or what type of duct material may have been used and, therefore, it was not known if tendons could be precisely located non-destructively nor was is known what types of corrosion testing could be effectively accomplished. The

scope of work for the corrosion condition evaluation was developed in conjunction with Mr. Boon Chong, T.Y. Lin International, and is described below.

1. Select two girders (one at a high elevation and one at a low elevation) with exposed post-tensioned anchorages at one or both ends and perform the following work on each girder:

   A. Locate the bottom tendon in the bottom flange at a distance of about 43" from the end of the girder (not including the built-up portion of the girder at the end). Existing plans indicate that the bottom tendon is located 4" above the bottom face of the bottom flange. Locate the top tendon in the web approximately 5" on either side of mid-span. Existing plans indicate that the top tendon is located 16.5" above the bottom face of the bottom flange at mid-span.

   B. In order to avoid damaging tendons by coring, first saw cut one 4" by 4" area immediately adjacent to each of the two locations determined above. Carefully chip away concrete in each saw cut area and expose the tendon. Use extreme caution to avoid causing any damage to the tendons. Visually inspect the condition of each tendon and measure the concrete cover.

      If duct is encountered, visually inspect the condition of the duct and measure the concrete cover. Also, extract a sample of the duct material and, where possible, collect a sample of any grout material in the duct and then continue excavating to expose the tendon.

   C. Using the information obtained from each excavation, extract a 2" diameter core sample at each location determined in Step A. If there is no duct, drill each core to a depth that is 1/8" less than the concrete cover measured over the tendon in the adjacent excavation. If there is a duct, drill each core to the depth of the duct.

   D. If there is no duct, use the exposed tendon in each excavation as a ground and measure corrosion potentials along the tendon at a spacing of 6" for as long a distance as possible in both directions.

      If there is a metallic duct, use the exposed duct in each excavation as a ground and measure corrosion potentials along the duct at a spacing of 6" for as long a distance as possible in both directions.

   E. Obtain three concrete resistivity measurements at each location determined in Step A. Take one measurement 3" above the bottom face of the bottom flange, one measurement in the vertical center of the web, and one measurement 3" below the top surface of the top flange.

   F. Patch excavations and cored holes with a fast setting high quality cementitious grout material containing pea gravel.

2. If any of the tendons that are exposed in the excavations made exhibit corrosion, repeat all of the above work on a third girder that does not have any exposed post-tensioned anchorages at either end.

3. Collect a water sample at the site to determine the environmental classification at the bridge location.

On-site work was conducted on the evenings of June 6 and 7, 2011. Laboratory analyses of the concrete core samples and the water sample were performed by FDOT-SMO. Findings from the on-site work and the results of the laboratory analyses are presented below.

III. VISUAL OBSERVATIONS AND COVER MEASUREMENTS

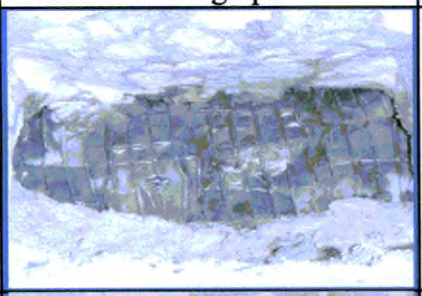
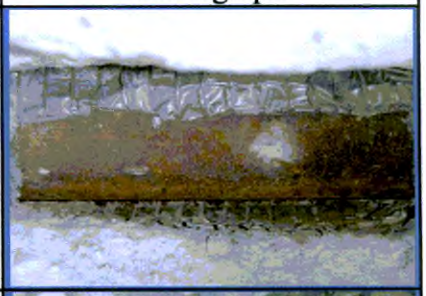
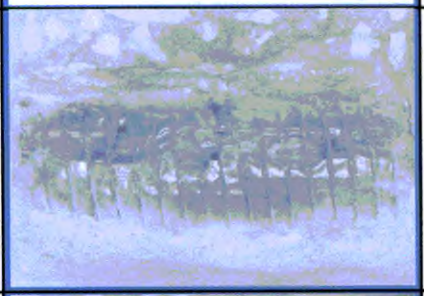
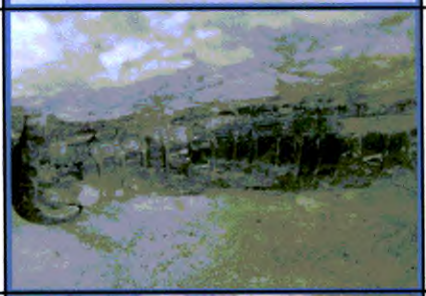
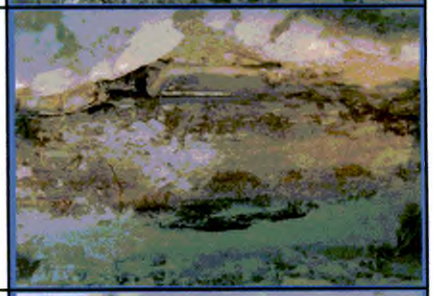
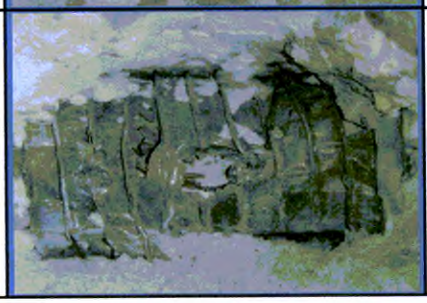
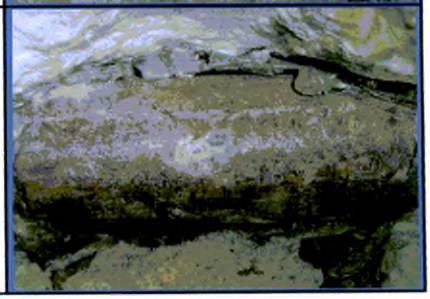
Girders 5-1 and 26-1 were selected for evaluation and, based on the findings on these girders, a third girder (Girder 22-1) with no exposed post-tensioned anchorages and no apparent past repairs at the ends of the girder was investigated. A bottom tendon and top tendon were located on each of the three girders at the approximate locations defined in the scope of work and excavations were made to expose the tendons. A corrugated metallic duct was found at all six of the locations where excavations were made. A sample of the duct was obtained at each location and the samples were provided to FDOT-SMO. In most cases, there was a 1/8" thick hard and brittle grout inside the duct (the diameter of the duct was apparently about 1/4" greater than the tendons). At the bottom tendon location on Girder 5-1, there was very little grout inside the duct and the grout that was present was soft and flaky. At the top tendon location on Girder 5-1, the grout was soft, but still brittle. The grout at each of the six locations was removed to expose the tendons. The depths of the duct and tendon measured in each excavation are shown in Table 1.

Table 1. Depth of ducts and tendons.

Girder	Location	Duct Depth, in.	Tendon Depth, in.
5-1	Bottom Tendon	4.25	4.38
	Top Tendon	3.00	3.13
26-1	Bottom Tendon	5.50	5.63
	Top Tendon	2.13	2.25
22-1	Bottom Tendon	4.88	5.00
	Top Tendon	2.63	2.75

Table 2 shows the condition of the duct (exterior surface) and tendon at each excavation. No corrosion was found on the exterior surface of the ducts. All of the tendons exhibited varying amounts of minor surface corrosion with no discernable pitting. The inside surface of the ducts had varying amounts of minor corrosion (see Figure 2).

Table 2. Condition of ducts and tendons.

Girder	Location	Exterior Surface of Duct		Tendon	
		Condition	Photograph	Condition	Photograph
5-1	Bottom Tendon	No corrosion.		Uniform minor surface corrosion, no pitting.	
	Top Tendon	No corrosion.		Spotty minor surface corrosion, no pitting.	
26-1	Bottom Tendon	No corrosion.		Spotty minor surface corrosion, no pitting.	
	Top Tendon	No corrosion.		Spotty minor surface corrosion, no pitting.	
22-1	Bottom Tendon	No corrosion.		Spotty minor surface corrosion, no pitting.	
	Top Tendon	No corrosion.		Spotty minor surface corrosion, no pitting.	

Girder 5-1 Bottom Tendon Duct

Girder 5-1 Top Tendon Duct

Girder 26-1 Bottom Tendon Duct

Girder 26-1 Top Tendon Duct

Girder 22-1 Bottom Tendon Duct

Girder 22-1 Top Tendon Duct

Figure 2. Condition on the inside surface of the ducts.

IV. ENVIRONMENTAL CLASSIFICATION

To determine the environmental classification at the location of the bridge (i.e. to characterize the corrosive properties of the water), laboratory analyses were performed on a water sample that was collected at the bridge. Chloride content, sulfate content, resistivity, and pH of the sample are shown in Table 3. Based on the laboratory test results and parameters provided in the FDOT Structures Design Guidelines, the corrosion classification for the bridge is "Extremely Aggressive".

Table 3. Results of laboratory testing of a water sample.

Chloride Content, ppm	Sulfate Content, ppm	Resistivity, ohm-cm	pH
12,046	3,383	22	7.68

V. CORROSION SAMPLING AND TESTING

Core samples were taken in accordance with the scope of work and all cores were drilled to the depth of the ducts. Due to the hard and brittle nature of the grout at four of the excavated areas and the minimal amount of soft and flaky grout at another location, only one grout sample could be obtained for chloride content analysis. This sample was taken on Girder 5-1 at the top tendon excavation. The grout at this location was soft and brittle allowing small chunks of the grout to be collected.

Chloride content analyses of the concrete core samples and the grout sample were performed in accordance with the procedures defined in Florida Method 5-516 and assuming a concrete unit weight of 3,800 lb/yd^3 and a grout unit weight of 3,105 lb/yd^3. Samples were extracted from the cores at or near the depth of the duct. Chloride content analyses results are shown in Table 4.

It is generally recognized that a total chloride content of about 1.2 lb/yd^3 (pcy) of concrete is sufficient to initiate corrosion of reinforcing steel, although other variables, such as oxygen and moisture availability and concrete quality can significantly affect this threshold. The test results in Table 4 indicate a negligible chloride content for all of the samples analyzed.

Table 4. Chloride content analysis of concrete and grout samples.

Girder	Core Location	Duct Depth, in.	Material Sampled	Chloride Content, pcy
5-1	Bottom Tendon	4.25	Concrete	0.1
	Top Tendon	3.00	Concrete	0.1
			Grout	0.2
26-1	Bottom Tendon	5.50	Concrete	0.1
	Top Tendon	2.13	Concrete	0.1
22-1	Bottom Tendon	4.88	Concrete	0.1
	Top Tendon	2.63	Concrete	0.1

Corrosion potential measurements were taken in accordance with the scope of work using a copper-copper sulfate reference electrode (CSE). Although corrosion potential

measurements can be affected by the moisture content of the concrete and other factors that exist at the time measurements are taken, ASTM C876, "Standard Test Method for Half-Cell Potentials of Uncoated Reinforcing Steel in Concrete," states the following:

- Corrosion potentials more negative than –350 mV CSE indicate that there is a greater than 90% probability that active corrosion is occurring within the tested area.
- If corrosion potentials are between –200 and –350 mV CSE, corrosion activity is uncertain.
- Measurements less negative than –200 mV CSE indicate with a greater than 90% probability that active corrosion is not occurring within the tested area (i.e. the reinforcing steel is in a passive state).

Corrosion potential measurements obtained along the metallic ducts are shown in Table 5. The test data indicate a high probability that no corrosion is occurring on the exterior surfaces of the ducts. However, FDOT-SMO determined that that the duct is comprised of some type of electroplated metal. In addition, the ducts probably contact the tendons at some point or points along their length. Consequently, the corrosion potential measurements may or may not be accurate. Due to the presence of the ducts, corrosion potential measurements could not be obtained along the tendons.

Table 5. Corrosion potential measurements on metallic ducts.

Girder	Location	Corrosion Potentials, mV CSE		
		Average	Minimum	Maximum
5-1	Bottom Tendon	-52	-131	158
	Top Tendon	-46	-87	71
26-1	Bottom Tendon	66	-7	135
	Top Tendon	72	-25	161
22-1	Bottom Tendon	20	-35	71
	Top Tendon	24	-148	94

Concrete resistivity measurements were taken in accordance with the scope of work for the purpose of determining the ability of the concrete to allow corrosion current to flow. Results of these measurements indicate the concrete electrical resistance to a depth of approximately 2 to 2.5 inches.

Corrosion criteria suggest that concrete resistivity measurements of about 12 kohm-cm or less indicate a very high probability that the concrete will allow corrosion current to flow. At higher resistivity values, the probability of corrosion current flow proportionally decreases. The concrete resistivity measurements obtained are shown in Table 6 and indicate a very high probability that the girder concrete will not permit corrosion current to flow through it.

Table 6. Concrete resistivity measurements.

Girder	Location	Concrete Resistivity, kohm-cm *		
		1	2	3
5-1	Bottom Tendon	214	**	**
	Top Tendon	324	649	**
26-1	Bottom Tendon	244	308	705
	Top Tendon	702	519	**
22-1	Bottom Tendon	512	633	523
	Top Tendon	683	**	**

* Locations 1, 2, and 3 are 3" above the bottom flange, vertical center of the web, and 3" below the top flange respectively.
** Unable to obtain a stable reading.

All excavations and cored holes were patched with Sika 1000 (a rapid set cementitious repair mortar) containing pea gravel after all testing was completed.

VI. CONCLUSIONS

At the time that the corrosion condition evaluation was conducted, the bridge had been exposed to an extremely aggressive corrosive environment for 54 years. Conclusions made based on the corrosion evaluation findings are as follows:

1. The chloride content in the concrete at the exterior surface of the metallic ducts and in the grout inside the ducts (only one grout sample was analyzed) is negligible.

2. No corrosion was found on the exterior surfaces of the ducts and this was supported by corrosion potential measurements.

3. A minor degree of corrosion was found on the inside surfaces of the ducts and on the tendons, however, no discernable pitting was observed on the tendons. It is believed that the corrosion seen on the ducts and tendons may have existed at the time of construction and is not the result of ongoing active corrosion.

4. The ducts on the tendons in two of the girders were well filled with a hard and brittle grout. However, the duct on the bottom tendon in a third girder was insufficiently filled with grout and the grout that was present was deteriorated. The grout in the duct on the top tendon in the same girder was also somewhat deteriorated. Although not a concern at this time, the lower quality grout could allow the onset of corrosion in the distant future.

APPENDIX D

BRIDGE INSPECTION REPORT

BRIDGE INSPECTION REPORT

PREPARED FOR: FLORIDA DEPARTMENT OF TRANSPORTATION

BRIDGE OWNER: FLORIDA DEPARTMENT OF TRANSPORTATION

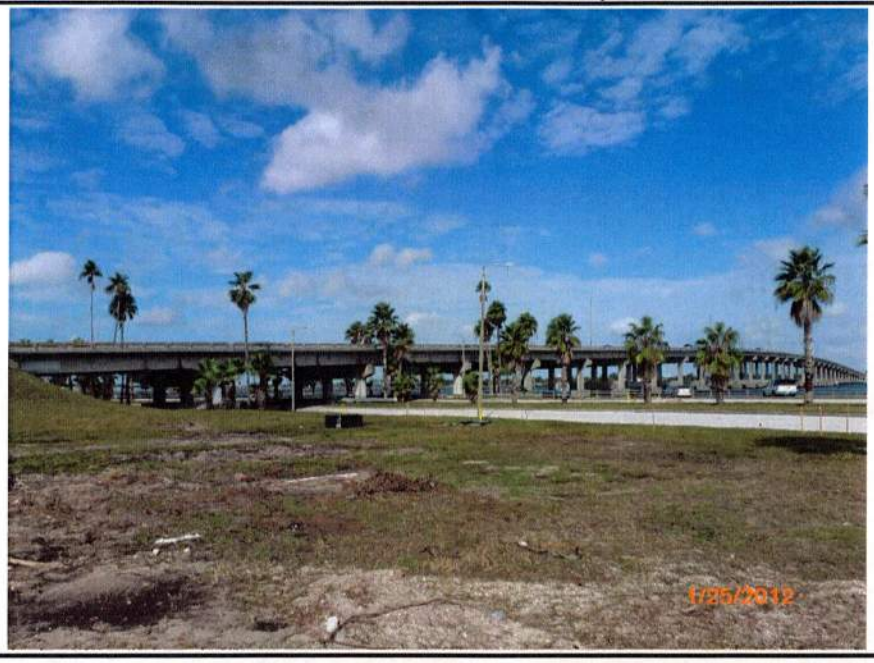
INSPECTED BY:

CENTURION
Consultant Group

BRIDGE NO. 130053 **CONTENTS OF REPORT** **INSPECTION DATE:** 01/25/2012

- Pontis Report
- CIDR
- Scour Elevation (Profile)
- Addendum (Element Notes & Photos/Sketches)
- U/W Inspection Report
- * Fracture Critical Data
- * Load Rating Analysis Summary

*This section is not included in this report.



HERNANDO DESOTO BRIDGE **0.6MI NORTH OF SR 64**

FLORIDA EPARTMENT OF TRANSPOI ATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CID Report with PDF attachment(s)

BY:	Centurion	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR 64	ROUTE:	00000
SERVICE TYPE ON:	1 Highway	FACILITY CARRIED:	US 41 US 301
SERV TYPE UND:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 01/25/2012 UNDERWATER: 11/30/2011

SUFFICIENCY RATING: 74.9

HEALTH INDEX: 72.68

FLORIDA EPARTMENT OF TRANSPO: ATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CID Report with PDF attachment(s)

BY: Centurion
OWNER: 1 State Highway Agency
MAINTAINED BY: 1 State Highway Agency
STRUCTURE TYPE: 4 Steel Continuous - 02 Stringer/Girder
LOCATION: 0.6 MI NORTH OF SR 64
SERVICE TYPE ON: 1 Highway
SERV TYPE UND: 6 Highway-waterway

STRUCTURE NAME: HERNANDO DESOTO BRIDGE
YEAR BUILT: 1957
SECTION NO.: 13 130 000
MP: 2.617
ROUTE: 00000
FACILITY CARRIED: US 41 US 301
FEATURE INTERSECTED: MANATEE RIVER 2ND ST E

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS
☐ THIS BRIDGE IS SCOUR CRITICAL
☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION
☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI
DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 01/25/2012 UNDERWATER: 11/30/2011

SMART FLAGS:
358 Deck Cracking SmFlag: Minor cracks

OVERALL NBI RATINGS:
DECK: 6 Satisfactory
SUPERSTRUCTURE: 6 Satisfactory
SUBSTRUCTURE: 6 Satisfactory
PERF. RATING: Good
CHANNEL: 6 Bank Slumping
CULVERT: N N/A (NBI)
SUFF. RATING: 74.9
HEALTH INDEX: 72.79

FIELD PERSONNEL / TITLE / NUMBER	INITIALS
Qualls, Dion - Bridge Inspector (CBI#00470) (lead)	
Coon, Elliott - Assistant Bridge Inspector	
Hays, Stephen - Bridge Inspector (CBI#00438)	
Elliott, Charles W. - C.B.I. Diver- Inspector (00363) (lead)	
Hoogland, Keith S. - C.B.I. Diver- Inspector (00341)	
Meccia, James S. - Diver-Inspector	

RECEIVED
MAR 22 2012
District 7
Structures Maintenance

REVIEWING BRIDGE INSPECTION SUPERVISOR:
Rhodes, Ritchie - Bridge Inspector (CBI #00209)

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:
Fielding, Robert - Professional Engineer (PE #53156)
Centurion
1907 US Hwy 301 North, Suite 160C
Certificate of Authorization #26928
Tampa, FL 33619

ROBERT ARTHUR FIELDING LICENSE No 53156 STATE OF FLORIDA PROFESSIONAL ENGINEER
21 Mar 12

SIGNATURE:
DATE:

EDMS SCANNED MAR 26 2012 BURTON

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 12/4 Bare Concrete Deck 138527 sf. ELEM CATEGORY: Decks/Slabs

CONDITION STATE (5)	DESCRIPTION	QUANTITY
3	Repaired areas and/or spalls/delaminations and/or cracks exist in the deck surface or underside. The combined area of distress is more than 10% but less than 25% of the total deck area.	138527 sf.

ELEMENT INSPECTION NOTES:

Note: The right overhang underside has a 2 in. conduit attached. Anchorage is unknown.

CS3:TOP
The deck top along the shoulders has intermittent areas of concrete spillage up to 6 ft. L x 3 ft. W x 3 in. H - INCREASE.

The deck top in Spans 1 through 15 and 19 through 33 have moderate wear and map cracking up to 1/32 in. W and Spans 11 and 12 have map cracking up to 1/16 in. W - INCREASE.

Span 13, Lane 3 at 9 ft., 18 ft. and 24 ft. from Pier 13 and Lane 4 at 9 ft. from Pier 13 has delaminated/spalled repair areas up to 1 ft. L x 2 ft. W x 1 in. D with exposed steel - NEW. P3WO

Span 14, Lane 1 has intermittent delaminations, spalls and delaminated/spalled repairs up to 1 ft. x 1 ft. x 1 in. D some with exposed steel. P3WO

Span 14 Lanes 3, 4 have 400 sf. of intermittent delaminations, delaminated repairs and spalls up to 2 ft. L x 1 ft. W x 1 in D some with exposed steel - NEW. Refer to Photo 1. P3WO

Spans 16, 17, 18 over steel beams have observable live load deflection and numerous longitudinal and transverse epoxy covered cracks up to 1/8 in. W, which are re-cracking up to 1/16 in. W. Refer to Photo 2. P3WO

Deck top and curbs have intermittent spalls/delaminations and delaminated repairs, some with exposed steel. Refer to Table 1 for sizes, locations and Photos 3 and 4. P3WO

UNDERSIDE
The underside of all spans have transverse, diagonal and longitudinal cracking up to 1/64 in. wide, some with efflorescence. Spans 16, 17 and 18 are the most dense. Refer to Photo 5.

The underside on the built-up sections adjacent to the steel beams in Spans 16, 17, 18 has intermittent edge spalls 8 in. x 4 in. x 1 in. Refer to Photo 6.

The underside and overhangs have delaminations/spalls with exposed steel. Refer to Table 1 for sizes and locations and Photos 7 and 8. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:

Reseal 1000FT of deck cracking in spans 16 17 & 18. MOT 315SF. Some cracks are epoxy covered. Repeat. See Table 1 for additional repairs.

ELEMENT/ENV: 301/4 Pourable Joint Seal 558 lf. ELEM CATEGORY: Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound.	482 lf.
2	Minor adhesion and/or cohesion failures may be present. Signs of seepage along the joint may be present. Joint may be slightly impacted with debris. Minor spalls in the deck and/or headers may be present adjacent to the joint.	75 lf.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 301/4 Pourable Joint Seal 558 lf. ELEM CATEGORY: Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
3	Major adhesion and/or cohesion failures may be present. Signs or observance of leakage along the joint may be present. Joint may be heavily impacted with debris and/or stones. Major spalls may be present in the deck and/or header adjacent to the joint.	1 lf.

ELEMENT INSPECTION NOTES:

NOTE: The construction joints in the continuous deck over Piers 17 and 18 are not included.

The quantity represents the pourable joint sealant in Joints: 1, 2, 9, 12, 13, 14, 16, 19, 22 and 34.

Joints 16 and 19 have armor headers with pourable sealant.

CS1: Abutment 1 and 34 joints are not visible due to the asphalt overlay. The asphalt is heaving up to 3/4 in. at the 4 shoulder areas.

CS2: Joint 16 Lane 2 south armor header rings hollow when sounded, but is secure - NEW.

Joint 19 Lane 2 north armor header rings hollow when sounded, but is secure - NEW.

The headers have intermittent spalls up to 6 in. L x 3 in. W x 1 in. D throughout; however, most have been filled with pourable sealant.

Joint 22 Lane 1 sealant has a 5 in. L section of minor adhesion loss - NEW.

CS3: Joint 16 right shoulder north and south armor headers adjacent to Lane 4 have severe corrosion 1 ft. L x 4 in. W with up to 0% section remaining - NEW. Refer to Photo 9. P3WO.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 302/4 Compressn Joint Seal 1302 lf. **ELEM CATEGORY:** Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound. If joint is armored, there are no signs of anchorage looseness.	262 lf.
2	Signs of seepage along the joint may be present. There may be small adhesion failures. The gland may show signs of abrasion or minor tearing. Significant debris is in all or part of the joint. Minor spalls in the deck and/or headers may be present adjacent to the joint. If joint is armored, looseness of the anchorage may be present.	950 lf.
3	Major adhesion failures may be present. The gland possibly has failed from abrasion or tearing. Signs or observance of leakage along the joint may be present. Major spalls may be present in the deck and/or header adjacent to the joint. If joint is armored, the anchorage has failed.	90 lf.

ELEMENT INSPECTION NOTES:

NOTE: The quantity represents the compression seals in Joints: 3, 4, 5, 6, 7, 8,10, 11, 15, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 and 33.

CS2: The compression seals have intermittently settled up to 2 in., allowing significant amounts of dirt to build up in parts of the joints - NEW.

CS3: Joint 3 in Lanes 1 and 2 has intermittent abrasion, tearing and settlement with compacted dirt and debris - NEW.

Joint 7 in Lanes 3 and 4 has abrasion, tearing and settlement with compacted dirt, debris and vegetation growth - NEW.

Joint 24 in Lane 1 has abrasion, tearing and settlement with compacted dirt and debris - NEW.

Joint 30 in Lanes 1 and 2 has abrasion, tearing and settlement with compacted dirt, debris and vegetation - INCREASE. Refer to Photo 10. P3WO ALL.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 331/4 Conc Bridge Railing 6703 lf. ELEM CATEGORY: Railing

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.	6603 lf.
2	Minor cracks, surface scaling or spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	57 lf.
3	Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	43 lf.

ELEMENT INSPECTION NOTES:

NOTE: The element quantifies the left and right concrete post and beam bridge rails and the jersey type median barrier.

CS2: The median barrier and bridge rails have intermittent cracks up to 1/32 in. wide, and minor impact scrapes and spalls up to 4 in. W x 3/4 in. D. x varying in length throughout.

CS3: The median barrier has delaminations and delaminated repairs as follows:
Span 16, top edges at north end has delaminations up to 3 in. L x 4 in. W - NEW.
Span 24, both faces along bottom, top and middle has delaminated repairs up to 8 ft. L x 1 ft. H - NEW. Refer to Photo 11.

The post and beam bridge rails have delaminations/spalls with exposed steel - INCREASE. Refer to Table 2 for CS3 deficiencies and Photos 12 and 13. P3WO ALL.

PREVIOUS WORK ORDER RECOMMENDATION:
Repair 14in x 6in x 3in spall on W bottom face of median barrier over span 15. MOT 2LF. Repaired. Refer to Table 2 for additional bridge rail repairs.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 107/4 Paint Stl Opn Girder 1969 lf. ELEM CATEGORY: Superstructure

CONDITION STATE (5)	DESCRIPTION	QUANTITY
2	There is little or no active corrosion. Surface corrosion has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.	1900 lf.
3	Surface corrosion is prevalent. There may be exposed metal but there is no active corrosion which is causing loss of section.	69 lf.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the steel beams in Spans 16, 17 and 18.

CS2: The paint system is chalking throughout. The beams have intermittent areas of painted over pitting up to 1/8 in. D primarily on the bottom flanges and cover plates. Refer to Photo 14.

CS3: The beams in Span 17 and 18 along the cover plates, diaphragms at the diaphragm stiffener welds and the bottom edges have intermittent surface corrosion and pitting up to 1/8 in. D, as follows:
Beam 17-2 north side of bottom cover plate - Refer to Photo 15.
Beam 17-6 along bottom flange and cover plate edges
Beam 18-1 west side of diaphragm at top of diaphragm stiffener to web weld
Beam 18-2 west side of diaphragm at top of diaphragm stiffener to web weld
Beam 18-3 east side of diaphragm at top of diaphragm stiffener to web weld
Beam 18-5 west side of diaphragm at top of diaphragm stiffener to web weld
Beam 18-6 west side of diaphragm at top of diaphragm stiffener to web weld - Refer to Photos 16 and 17. ALL NEW.
P3WO ALL.

PREVIOUS WORK ORDER RECOMMENDATION:
Remove corrosion & spot paint 1969ft at bottom flange of beams in spans 16 17 & 18. 100MH. Areas have been spot painted.

ELEMENT/ENV: 109/4 P/S Conc Open Girder 19862 lf. ELEM CATEGORY: Superstructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	19741 lf.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 109/4 P/S Conc Open Girder 19862 lf. ELEM CATEGORY: Superstructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
2	Minor cracks and spalls may be present and there may be exposed reinforcing with no evidence of corrosion. There is no exposure of the prestress system.	67 lf.
3	Some delaminations and/or spalls may be present. There may be minor exposure but no deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	54 lf.

ELEMENT INSPECTION NOTES:

NOTE: The beam spalls on the haunch at the sole plate are documented under this element. (Previously listed as bottom face of beam at sole plate.)

CS1: The beam end diaphragms have intermittent delamination/spalls with and without exposed steel. Refer to Table 3 for sizes and locations.

CS2: The beams have intermittent spalls of various sizes with no exposed steel throughout. Refer to Table 3 for sizes and locations.

CS3: The beams have intermittent delamination/spalls with exposed steel. Refer to Table 3 for sizes, locations, Photos 18,19, 20 and repairs. P3WO ALL.

ELEMENT/ENV: 311/4 Moveable Bearing 316 ea. ELEM CATEGORY: Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. The paint system, if present, is sound and functioning as intended to protect the metal. The bearing has minimal debris and corrosion. Vertical and horizontal alignment are within limits. Bearing support member is sound. Any lubrication system is functioning properly.	293 ea.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 311/4 Moveable Bearing 316 ea. ELEM CATEGORY: Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
2	The paint system, if present, may show moderate to heavy corrosion with some pitting but still functioning as intended. The assemblies may have moved enough to cause minor cracking in the supporting concrete. Debris buildup is affecting bearing movement. Bearing alignment is still tolerable.	7 ea.
3	Advanced corrosion with section loss. There may be loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions. Bearing alignment may be beyond tolerable limits. Shear keys may have failed. The lubrication system, if any, may have failed.	16 ea.

ELEMENT INSPECTION NOTES:

CS1: The steel bearing assemblies have painted over pitting up to 1/4 in. D with areas of light corrosion throughout.

CS2: The bearings at Beams 9-1 through 9-7 at Pier 9 are misaligned up to 2 in. north; however limits are tolerable and there is no visible distress to the assembly - NEW. Refer to Photo 21.

CS3: The bearing assembly anchor bolts at Piers 17 and 19 have painted over corrosion, are askew and the nuts are not seated. Refer to Photo 22. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
Remove corrosion and spot paint the 20 moveable bearings over pier 30. 40MH. Painted.
Repair loose anchor bolt bearing assemblies over piers 17 and 19. 50MH. Not repaired. Repeat.

ELEMENT/ENV: 313/4 Fixed Bearing 316 ea. ELEM CATEGORY: Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. The paint system, if present, is sound and functioning as intended to protect the metal. Vertical and horizontal alignment are within limits. Bearing support member is sound.	300 ea.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 313/4 Fixed Bearing **316 ea.** **ELEM CATEGORY:** Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
3	There is advanced corrosion with section loss. There may be loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions. Shear keys may have failed.	16 ea.

ELEMENT INSPECTION NOTES:

CS1: The steel bearing assemblies have painted over pitting up to 1/4 in. D with areas of light corrosion throughout.

CS3: The bearing assemblies have moderate to heavy corrosion. The anchor bolts have painted over corrosion and sheared bolts at Piers 16 and 18. Refer to Photos 23 and 24. P3WO.

PREVIOUS REPAIR RECOMMENDATION:
Remove corrosion & spot paint 20 fixed bearings over both ABTs & 20 fixed bearings over pier 31. Repaired.
Repair 16 anchor bolts for fixed bearings over piers 16 and 18. 50MH. Not Repaired. Repeat.

ELEMENT/ENV: 563/4 Acc Ladd & Plat **8 ea.** **ELEM CATEGORY:** Movable

CONDITION STATE (5)	DESCRIPTION	QUANTITY
2	There is little or no active corrosion. Surface corrosion has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress, but there is no exposure of metal.	6 ea.
3	Surface corrosion is prevalent. There may be exposed metal, but there is no active corrosion which is causing loss of section.	1 ea.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 563/4 Acc Ladd & Plat 8 ea. ELEM CATEGORY: Movable

CONDITION STATE (5)	DESCRIPTION	QUANTITY
4	Corrosion may be present, but any section loss due to active corrosion does not yet warrant structural review. Anchors may be loose.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: There are access ladders and platforms attached to the ends of Piers 17 left and 18 right, the access hatches have no locks. Anchorage is unknown.

CS1: The Pier 17 left access ladder platform mount attachment is not flush to the deck fascia, but it is secure - NEW.

CS2: The paint system for all access ladders and platforms are chalking throughout.

CS3: The Pier 18 right access platform has small intermittent areas of surface corrosion - NEW.

CS4: The Pier 17 left access platform has small intermittent areas of surface corrosion with one small area of 100% section loss 1 in. L x 1/8 in. W - NEW. Refer to Photo 25. P3WO.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 572/4 Conduit & Junc. Box 1 ea. ELEM CATEGORY: Movable

CONDITION STATE (3)	DESCRIPTION	QUANTITY
2	There is some corrosion, supports may not be tight, junction box cover gaskets are not intact, wire connections and terminal strips are not tight. At least 2 % but less than 10 % of the conduit is not in good condition.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the conduit and junction boxes on the access platforms at Piers 17 left and 18 right.

CS2: Boxes have light intermittent corrosion - NEW.

ELEMENT/ENV: 580/4 Navigational Lights 1 ea. ELEM CATEGORY: Movable

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	Lights are operational, lenses are clean and not broken, there is no evidence of corrosion.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the one system comprised of four navigational lights on the fender system, the two attached to the structure above center channel, and the conduit and wiring associated with the entire navigational lighting system. Anchorages for the center navigational lights unknown.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 205/4 R/Conc Column **582 ea.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	457 ea.
2	Minor cracks, spalls and scaling may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	7 ea.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 205/4 R/Conc Column **582 ea.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations, moderate cracks, spalls and/or scaling may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	118 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the columns at Piers 2 through 33 (96 total), and the piling supporting the footings at Piers 5 through 16 and 19 through 33 (486 total). Bents 17 and 18 each have 3 columns (included) however, they transition into pier walls without sub-piles.

CS3: The columns above the footings have intermittent delaminated repairs, spalls/delaminations some with exposed steel. Refer to Table 4 for sizes, locations, repairs and Photos 26, 27 and 28. P3WO ALL.

The following was noted by the underwater team:

NOTE: This element quantifies the piling below the footings at Piers 5 through 16 and 19 through 33 and the six columns at Bent 17 and 18. The piling are heavily covered with marine growth from approximately 12 in. below the footings down to the mudline. There is gunite overspray at the top of the piling from footing repairs.

CS1: The piling have vertical cracking up to 4ft L x 1/32in W with no corrosion bleedout from the footing and scattered corner scrapes up to 8in H x 6in W x 1/2in D with no exposed steel.

Bents 17 and 18 each have three columns and a web wall between the columns. There are 1/32in cracks with no corrosion bleedout in the web wall from above water extending a maximum of 6in into the marine growth.

CS2: Pile 5-14, SE corner 20in below footing, spall/failed patch no exposed steel 12in x 4in x 1-1/2in
Pile 6-5, east face 8in below footing, vertical crack light efflorescence 6in x 1/64in
Pile 7-15 SW corner 6ft below footing, spall no exposed steel 12in x 12in x 2in
Pile 9-18 SW corner at groundline, spall no exposed steel 20in x 4in x 2in
Pile 16-14 NW corner at groundline, spall no exposed steel 28in x 8in x 3in
Pile 31-2 south and east faces 12in below footing, horizontal crack no corrosion bleedout 12in x 1/32ir
Pile 31-14 SE corner 12in below footing spall no exposed steel 10in x 8in x 1in
Refer to Table 5 and Photo 29 for 72 piles deficiencies, sizes and locations. P3WO ALL

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 215/4 R/Conc Abutment 144 lf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	144 lf.

ELEMENT INSPECTION NOTES:

CS1: Both abutment caps have light amounts of debris.

Abutment 1 cap at groundline is exposed up to 6 in. H x 12 ft. L x 2 ft. back under due to settlement.

ELEMENT/ENV: 220/4 R/C Sub Pile Cap/Ftg 92 ea. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	40 ea.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 220/4 R/C Sub Pile Cap/Ftg 92 ea. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations, moderate cracks, spalls and/or scaling may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	52 ea.

ELEMENT INSPECTION NOTES:

CS3: The footings have areas of cracks up to 1/16 in. W, delaminations in the original concrete and gunite repairs some with corrosion bleedout. Refer to Table 6 for list of deficiencies, repairs and Photos 30, 31 and 32. P3WO ALL. (Above and below water deficiencies were combined into Table 6.)

The following was noted by the underwater team:
NOTE: Bottom of footings were above water but inspected by Divers.

CS3: Typically the gunite repair on the undersides and sides of the footings are delaminated up to 4 ft. L x 4 ft. W between the piles and on the bottom edges and the footers have areas of honeycombing up to 1-1/2 in. deep. There are also horizontal and vertical cracks in the original concrete, several with corrosion bleedout, up to 10 ft. L x 1/16 in. W and delaminations along the bottom edge up to 6 ft. L x 12 in. H - INCREASE. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
The previously reported honeycombing on Footings 6-3, 9-2, 23-1, 23-3, 27-1, 27-3 and 28-1 have been repaired.

ELEMENT/ENV: 234/4 R/Conc Cap 1870 lf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	1869 lf.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 234/4 R/Conc Cap **1870 lf.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
2	Minor cracks, spalls and scaling may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	1 lf.

ELEMENT INSPECTION NOTES:

CS2: Pier 6 cap at Beam 6-10 on the top north edge has a spall 10 in. L x 3 in. W x 1/2 in. D.

PREVIOUS WORK ORDER RECOMMENDATION:
Repair 1ft x 1ft x 2in spall with exposed steel on NW corner of pier cap 22 at column 22-1. Repaired.

ELEMENT/ENV: 299/4 Pile Jacket/Cath Pro **1 ea.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	There is little or no deterioration. Surface defects only are in evidence.	1 ea.

ELEMENT INSPECTION NOTES:

The following was noted by the underwater team:
NOTE: This element quantifies the pile jacket with Cathodic protection on Pile 9-1.

CS1: Pile 9-1 is jacketed 12 in. below the footing with a 24 in. square shape x 6 ft. long fiberglass formed jacket. Anode has up to 10% section loss.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 387/4 P/S Fender/Dolphin 318 lf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	318 lf.

ELEMENT INSPECTION NOTES:

The following was noted by the underwater team:
CS1: The piling have some corner spalling with no exposed steel up to 10 in. H x 4 in. W x 3/4 in. D.

The lower connecting hardware and cable clamps are moderately to heavily corroded.

There is marine barrier (sic) activity on lower wale with up to 25% section loss - INCREASE.

ELEMENT/ENV: 396/4 Other Abut Slope Pro 4069 sf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	There is little or no deterioration. Surface defects only are in evidence. Random open joints may exist.	4069 sf.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the sand/cement bag slope protection at Abutment 34 only. No slope protection is present along Abutment 1.

CS1: The joints of the abutment slope protection has intermittent areas of vegetation growth - NEW.

All Elements

UNIT: 0 CHANNEL

ELEMENT/ENV: 290/4 Channel **1 ea.** **ELEM CATEGORY:** Channel

CONDITION STATE (4)	DESCRIPTION	QUANTITY
2	Bank protection is in need of minor repairs, bank may be beginning to slump, minor stream bed movement may be evident or debris may be present.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element refers to the seawall with concrete caps and sheet pile bulkhead under Spans 4 and 33 and evaluated as channel protection. (Previously element 393.)

CS2: The north bulkhead cap has minor cracks up to 1/32 in. wide.

The northwest bulkhead cap has cracks up to 1/16 in. W x 20 ft. L.

The south bulkhead cap has intermittent areas of delaminations up to 2 ft. H x 80 ft. long with horizontal cracking and corrosion bleed out - INCREASE. Refer to Photo 33. P3WO.

The following was noted by the underwater team:
NOTE: The seawall under Spans 4 and 33 were evaluated as channel protection.

Armor mat has been installed around Bents 31, 32 and 33. Before installation the top layer of oysters were removed. The edges of the mats were jetted down below the groundline.

CS2: There is an abandoned lower platform is lying on the channel bottom, between the south fender and west of Pier 17.

All Elements

UNIT: 0 SMART FLAG

ELEMENT/ENV: 358/4 Deck Cracking SmFlag 1 ea. **ELEM CATEGORY:** Smart Flags

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The surface of the deck is cracked, but the cracks are either filled/sealed or insignificant in size and density to warrant repair activities.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This smart flag is being used to monitor the cracking in the deck top and underside.

CS1: Refer to Element 12, Bare Concrete Deck, for details on deck cracking.

All Elements

UNIT: 0 MISCELLANEOUS

ELEMENT/ENV: 321/4 R/Conc Approach Slab 2 ea. **ELEM CATEGORY:** Other Elements

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The slab has not settled and shows no sign of deterioration other than superficial surface cracks.	2 ea.

ELEMENT INSPECTION NOTES:

NOTE: The approach slabs are overlaid with asphalt.

CS1: The south approach slab in Lane 1 at left side has a pothole 27 in. L x 6 in. W x 1 in. D - NEW.

PREVIOUS WORK ORDER RECOMMENDATION:
Provide leveling course for lane 3 of north approach slab bridge transition. The potholes at the north approach slab have been repaired.

Smart Flag Summary

UNIT: 0 SMART FLAG

ELEMENT/ENV: 358/4 Deck Cracking SmFlag 1 ea. ELEM CATEGORY:Smart Flags

CONDITION STATE(4)	DESCRIPTION	QUANTITY
1	The surface of the deck is cracked, but the cracks are either filled/sealed or insignificant in size and density to warrant repair activities.	1

ELEMENT INSPECTION NOTES:

NOTE: This smart flag is being used to monitor the cracking in the deck top and underside.

CS1: Refer to Element 12, Bare Concrete Deck, for details on deck cracking.

Inspector Recommendations

UNIT: 0 DECKS

ELEMENT/ENV:12/4 Bare Concrete Deck ELEM CATEGORY: Decks/Slabs

CONDITION STATE (5)		Priority
3	**400 sf.**	3

WORK ORDER RECOMMENDATION:
REP intermittent SPLs DELs with steel up to 2ft x 1ft x 1in Span 14 Lanes 3 & 4. 100MH 400SF MOT

3	**8 sf.**	3

WORK ORDER RECOMMENDATION:
REP 4 DELs & SPLs with steel in Span 13 Lane 3 & 4 up to 1ft x 2ft. 8MH 8SF MOT

3	**27 sf.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 1 in the 1-25-12 report for sizes & locations of 27 deck repairs. 20MH 27SF MOT

3	**1000 sf.**	3

WORK ORDER RECOMMENDATION:
Injection repair deck top CRks up to .125in in Spans 16 17 & 18. 80MH 1000SF MOT

3	**20 sf.**	3

WORK ORDER RECOMMENDATION:
REP intermittent SPLs DELs up to 1ft x 1ft x 1in with steel in Span 14 Lane 1. 20MH 20SF MOT

Inspector Recommendations

UNIT: 0 DECKS

ELEMENT/ENV:301/4 Pourable Joint Seal ELEM CATEGORY: Joints

CONDITION STATE (3)		Priority
3	**1 lf.**	3

WORK ORDER RECOMMENDATION:
REP JT 16 RT SHR N & S armor header corrosion 1ft x 4in with 0% section. 4MH 1LF MOT

ELEMENT/ENV:302/4 Compressn Joint Seal ELEM CATEGORY: Joints

CONDITION STATE (3)		Priority
3	**90 lf.**	3

WORK ORDER RECOMMENDATION:
RPR JTS with abrasion tearing settlement & debris as noted in 1.25.12 report. 10MH 90LF MOT

ELEMENT/ENV:331/4 Conc Bridge Railing ELEM CATEGORY: Railing

CONDITION STATE (4)		Priority
3	**34 lf.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 2 in 1-25-12 report addendum for sizes & locations of 33 railing SPL & DEL 20MH 34LF

Inspector Recommendations

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV:107/4 Paint Stl Opn Girder ELEM CATEGORY: Superstructure

CONDITION STATE (5)		Priority
3	**69 lf.**	3

WORK ORDER RECOMMENDATION:
Clean & paint SP 17 18 beam locations listed in 1.25.12 ELE notes.100MH UBT

ELEMENT/ENV:109/4 P/S Conc Open Girder ELEM CATEGORY: Superstructure

CONDITION STATE (4)		Priority
3	**81 lf.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 3 in 1-25-12 report addendum for sizes & locations on 143 beams 100MH 81LF UBT

ELEMENT/ENV:311/4 Moveable Bearing ELEM CATEGORY: Bearings

CONDITION STATE (3)		Priority
3	**16 ea.**	3

WORK ORDER RECOMMENDATION:
REP loose bearing assembly anchor bolts at Piers 17 and 19. 50MH UBT

ELEMENT/ENV:313/4 Fixed Bearing ELEM CATEGORY: Bearings

CONDITION STATE (3)		Priority
3	**16 ea.**	3

WORK ORDER RECOMMENDATION:
REP bearing assembly with corrosion & loose sheared bolts at Piers 16 & 18 50MH UBT

Inspector Recommendations

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV:563/4 Acc Ladd & Plat ELEM CATEGORY: Movable

CONDITION STATE (5)		Priority
4	**1 ea.**	3

WORK ORDER RECOMMENDATION:

Clean & paint corroded area 1in x 1/8in on left upper platform at Pier 17. 2MH

Inspector Recommendations

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV:205/4 R/Conc Column ELEM CATEGORY: Substructure

CONDITION STATE (4)		Priority
3	**72 ea.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 5 in 1.25.12 report add for sizes & locations of defs on 72 COL below FTG 300MH 133LF

3	**44 ea.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 4 in 1-25-12 report add for sizes & locations of defs on 44 COL above FTG 200MH 171LF

ELEMENT/ENV:220/4 R/C Sub Pile Cap/Ftg ELEM CATEGORY: Substructure

CONDITION STATE (4)		Priority
3	**50 ea.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 6 in 1-25-12 report addendum for sizes & locations of defs. on 50 FTGs 300MH 362SF

Inspector Recommendations

UNIT: 0 CHANNEL

ELEMENT/ENV:290/4 Channel ELEM CATEGORY: Channel

CONDITION STATE (4)		Priority
2	**1 ea.**	3

WORK ORDER RECOMMENDATION:

Repair DEL & CRKs in S channel bulkhead under the structure. 40MH 80LF

Structure Notes

TRAFFIC RESTRICTION: This bridge is not posted. Based on the load rating dated 6/10/2008, posting is not required.

Bridge inventoried south to north.

INSPECTION NOTES: JZLM 1/25/2012

Sufficiency Rating Calculation Accepted by knicadq-P at 2012-03-16 14:26:01

LOAD CAPACITY EVALUATION:
The load rating dated 6/10/08 applies to the current condition of this bridge.

NOTE: Due to placement of scour countermeasures at Piers 31, 32 and 33 this structure is no longer classified as scour critical and 100 ft. offsets are no longer required - NEW.

Element 393 Blkhd/Sewl Any Mater was deleted and the deficiencies were transferred into 290 Channel.

NON-STRUCTURAL ITEMS:

APPROACH BARRIERS:
The south and north approach median barriers have full height vertical cracks with associated spalling up to 6 in. H x 2 in. W x 1 in. D.

APPROACH GUARDRAILS:
Approach guardrail panels at all four corners have minor impact damage and areas of light to moderate corrosion

The guardrail system for 2nd Street under Span 3 has 9 concrete posts which are spalled/delaminated up to 3 ft. H x 1 ft. W x 3 in. D with exposed rebar throughout. Refer to Photo 34. REPAIR.

LIGHTING:
The utility junction box attached to Abutment 1 backwall on the right side of Beam 1-10 is missing a plug, the conduit is separated, and the box and hardware have light corrosion.

Recessed electrical box in right side Span 1 sidewalk at Pier 2 has a missing cover - NEW. Refer to Photo 35. REPAIR.

The following light poles are missing: Right side at Pier 2, left side at Piers 4, 8, 16, and right side at Piers 17 and 33. Refer to Photo 35. REPAIR.

The light pole at Pier 25 right side has an impact dent and tear at the base, and the top cap is loose. Refer to Photo 36. REPAIR.

Utility conduits on the right overhang are sagging at Pier 5 and Pier 11. Refer to Photo 37. REPAIR.

CORRECTIVE ACTION TAKEN:
The northwest and northeast guardrails have been repaired.

BRIDGE INSPECTION REPORT

PREPARED FOR: FLORIDA DEPARTMENT OF TRANSPORTATION

BRIDGE OWNER: FLORIDA DEPARTMENT OF TRANSPORTATION

ICA

INSPECTED BY:

ICA Engineering

BRIDGE NO. 130053 **CONTENTS OF REPORT** **INSPECTION DATE:** 01/31/2014

Pontis Report	U/W Inspection Report
CIDR	* Fracture Critical Data
Scour Elevation (Profile)	* Load Rating Analysis Summary
Addendum (Element Notes & Photos/Sketches)	

*This section is not included in this report.

HERNANDO DESOTO BRIDGE **0.6 MI NORTH OF SR-64**

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CID Report with PDF attachment(s)

BY:	ICA Engineering	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13,130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERVICE TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV TYPE UND:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 01/31/2014 UNDERWATER: 12/4/2013

SUFFICIENCY RATING: 76.1

HEALTH INDEX: 76.25

FLORIDA DEPARTMENT OF TRANSPORTATION
BRIDGE MANAGEMENT SYSTEM
Inspection/CID Report with PDF attachment(s)

BRIDGE ID: 130053
DISTRICT: 01 Bartow **INSPECTION DATE: 1/31/2014 PBDP**

BY: ICA Engineering
OWNER: 1 State Highway Agency
MAINTAINED BY: 1 State Highway Agency
STRUCTURE TYPE: 4 Steel Continuous - 02 Stringer/Girder
LOCATION: 0.6 MI NORTH OF SR-64
SERVICE TYPE ON: 1 Highway
SERV TYPE UND: 6 Highway-waterway

STRUCTURE NAME: HERNANDO DESOTO BRIDGE
YEAR BUILT: 1957
SECTION NO.: 13 130 000
MP: 2.617
ROUTE: 00041
FACILITY CARRIED: US-41/US-301
FEATURE INTERSECTED: MANATEE RIVER 2ND ST E

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS
☐ THIS BRIDGE IS SCOUR CRITICAL
☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION
☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI
DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 01/31/2014 UNDERWATER: 12/4/2013

SMART FLAGS:
358 Deck Cracking SmFlag: Minor cracks

OVERALL NBI RATINGS:
DECK: 6 Satisfactory
SUPERSTRUCTURE: 6 Satisfactory
SUBSTRUCTURE: 6 Satisfactory
PERF. RATING: Good
CHANNEL: 6 Bank Slumping
CULVERT: N N/A (NBI)
SUFF. RATING: 76.1
HEALTH INDEX: 76.25

FIELD PERSONNEL / TITLE / NUMBER — INITIALS

Ryan, William - Team Leader (CBI #00497) (lead)
Coon, Elliott - Assistant Bridge Inspector
Williams, Jeff - Assistant Bridge Inspector

RECEIVED
MAY 15 2014
District 7
Structures Maintenance

Hoogland, Keith - Bridge Inspector/Diver (CBI #00341) lead
Young, Ryan C. - Diver-Inspector
Flores, Christopher D. - Diver-Inspector

REVIEWING BRIDGE INSPECTION SUPERVISOR:
St. Clair, Clayton - Bridge Inspector (CBI #00374) CSC

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

Hampton, Marshall - Professional Engineer (PE#75587)
ICA Engineering
1907 US 301, Ste 160
Certificate of Authorization #26988
Tampa, FL 33619

MARSHALL THOMAS HAMPTON LICENSE No 75587 STATE OF FLORIDA PROFESSIONAL ENGINEER
Marshall Hampton 5/13/2014

SIGNATURE:
DATE:

EDMS SCANNED MAY 23 2014 C. NIETO

This report contains information relating to the physical security of a structure and depictions of the structure. This information is confidential and exempt from public inspection pursuant to sections 119.071(3)(a) and 119.071(3)(b), Florida Statutes. Only the cover page of this report may be inspected and copied.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 12/4 Bare Concrete Deck 138527 sf. ELEM CATEGORY: Decks/Slabs

CONDITION STATE (5)	DESCRIPTION	QUANTITY
3	Repaired areas and/or spalls/delaminations and/or cracks exist in the deck surface or underside. The combined area of distress is more than 10% but less than 25% of the total deck area.	138527 sf.

ELEMENT INSPECTION NOTES:

NOTE: Due to Pontis character limitations, refer to Page 1 of the addendum for all element notes and deficiencies.

ELEMENT/ENV: 301/4 Pourable Joint Seal 558 lf. ELEM CATEGORY: Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound.	482 lf.
2	Minor adhesion and/or cohesion failures may be present. Signs of seepage along the joint may be present. Joint may be slightly impacted with debris. Minor spalls in the deck and/or headers may be present adjacent to the joint.	75 lf.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 301/4 Pourable Joint Seal 558 lf. ELEM CATEGORY: Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
3	Major adhesion and/or cohesion failures may be present. Signs or observance of leakage along the joint may be present. Joint may be heavily impacted with debris and/or stones. Major spalls may be present in the deck and/or header adjacent to the joint.	1 lf.

ELEMENT INSPECTION NOTES:

NOTE: The construction joints in the continuous deck over Piers 17 and 18 are not included.

The quantity represents the pourable joint sealant in Joints: 1, 2, 9, 12, 13, 14, 16, 19, 22 and 34.

Joints 16 and 19 have armor headers with pourable sealant.

Abutment 1 and 34 joints are not visible due to the asphalt overlay.

CS1:The asphalt over Abutment 1 and 34 joints is heaving up to 3/4in. at the 4 shoulder areas.

CS2: Joint 16 Lane 2 south armor header rings hollow when sounded, but is secure.

Joint 19 Lane 2 north armor header rings hollow when sounded, but is secure.

The headers have intermittent spalls with no exposed steel up to 6in. x 3in. x 1in. throughout; however, most have been filled with pourable sealant.

Joint 22 Lane 1 sealant has a 5in. section of minor adhesion loss.

CS3: Joint 16 right shoulder north and south armor headers adjacent to Lane 4 have severe corrosion 1ft. x 4in. with up to 0% section remaining. Refer to Photo 6. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
REP JT 16 RT SHR N & S armor header corrosion 1ft. x 4in with 0% section. 4MH 1LF MOT - Not repaired. No action per FARC. Work will be completed under FPN 429048-1-52-01. Repeat.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 302/4 Compressn Joint Seal 1302 lf. **ELEM CATEGORY:** Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows minimal deterioration. Adhesion is sound with no signs of leakage. There are no cohesion cracks. The adjacent deck and/or header is sound. If joint is armored, there are no signs of anchorage looseness.	242 lf.
2	Signs of seepage along the joint may be present. There may be small adhesion failures. The gland may show signs of abrasion or minor tearing. Significant debris is in all or part of the joint. Minor spalls in the deck and/or headers may be present adjacent to the joint. If joint is armored, looseness of the anchorage may be present.	950 lf.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 302/4 Compressn Joint Seal 1302 lf. ELEM CATEGORY: Joints

CONDITION STATE (3)	DESCRIPTION	QUANTITY
3	Major adhesion failures may be present. The gland possibly has failed from abrasion or tearing. Signs or observance of leakage along the joint may be present. Major spalls may be present in the deck and/or header adjacent to the joint. If joint is armored, the anchorage has failed.	110 lf.

ELEMENT INSPECTION NOTES:

NOTE: The quantity represents the compression seals in Joints: 3, 4, 5, 6, 7, 8,10, 11, 15, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 and 33.

CS2: The compression seals have intermittently settled up to 2 in., allowing significant amounts of dirt to build up in parts of the joints.

CS3: Joint 3 in all lanes has intermittent abrasion, tearing and settlement with compacted dirt and debris - INCREASE.

Joint 7 in Lanes 3 and 4 has abrasion, tearing and settlement with compacted dirt, debris and vegetation growth.

Joint 24 in Lane 1 has abrasion, tearing and settlement with compacted dirt and debris.

Joint 30 in Lanes 1 and 2 has abrasion, tearing and settlement with compacted dirt, debris and vegetation. Refer to Photo 7. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
RPR JTS with abrasion tearing settlement & debris as noted in 1.25.12 report. 10MH 90LF MOT - Not repaired. No action per FARC. Work to be completed under FPN 429048-1-52-01. Repeat.

ELEMENT/ENV: 331/4 Conc Bridge Railing 6703 lf. ELEM CATEGORY: Railing

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without effect on strength and/or serviceability.	6590 lf.
2	Minor cracks, surface scaling or spalls may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	57 lf.

All Elements

UNIT: 0 DECKS

ELEMENT/ENV: 331/4 Conc Bridge Railing 6703 lf. ELEM CATEGORY: Railing

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations and/or spalls may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	56 lf.

ELEMENT INSPECTION NOTES:

NOTE: The element quantifies the left and right concrete post and beam bridge rails and the jersey type median barrier.

CS2: The median barrier and bridge rails have intermittent cracks up to 1/32in. wide, and minor impact scrapes and spalls with no exposed steel up to 4in. x 3/4in. x varying in length throughout.

Bridge Rail 3-7 right has a 35in. x 4in. x 1in. spall/scrape with no exposed steel on the west face - NEW

Bridge Rail Post 17-14 left has a 7in. x 4in. x 3/4in. spall with no exposed steel on the west face - NEW.

The east face of Bridge Rail 18-6 left has a 10in. x 3in. x 3/4in. spall with no exposed steel on the east face - NEW

Bridge Rail Post 20-12 left has a 4in. x 3in. x 1in. spall with no exposed steel on the northeast corner - NEW

Bridge Rail 32-9 right has a 8in. x 4in. x 1-1/2in. spall with no exposed steel on the southeast corner - NEW

CS3: The median barrier has delaminations and delaminated repairs as follows:
Span 16, top edges at north end has delaminations up to 4in. x 3in.
Span 24, both faces along bottom, top and middle has delaminated repairs up to 8ft. x 1ft. Refer to Photo 8.

The post and beam bridge rails have delaminations/spalls with exposed steel. Refer to Table 2 for CS3 deficiencies and Photos 9 and 10. P3WO

PREVIOUS WORK ORDER RECOMMENDATIONS:
Refer to the element notes in the inspection report dated 04-27-13 for a list of impact damage repairs. - Repaired.
Refer to Table 2 in 0-25-12 report addendum for sizes and locations of 33 railing SPL & DEL 20MH 34LF - Partial repair. No action per FARC. Work to be completed under FPN 429048-1-52-01. Repeat

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 107/4 Paint Stl Opn Girder 1969 lf. ELEM CATEGORY: Superstructure

CONDITION STATE (5)	DESCRIPTION	QUANTITY
1	There is no evidence of active corrosion and the paint system is sound and functioning as intended to protect the metal surface.	69 lf.
2	There is little or no active corrosion. Surface corrosion has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress but there is no exposure of metal.	1900 lf.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the steel beams in Spans 16, 17 and 18.

CS2: The beams have intermittent areas of painted over pitting up to 1/8in. deep, primarily on the bottom flanges and cover plates.

PREVIOUS WORK ORDER RECOMMENDATION:
Clean & paint Spans 17 & 18 beam locations listed in 1.25.12 ELE notes. 100MH UBT - Repaired.

ELEMENT/ENV: 109/4 P/S Conc Open Girder 19862 lf. ELEM CATEGORY: Superstructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	19731 lf.
2	Minor cracks and spalls may be present and there may be exposed reinforcing with no evidence of corrosion. There is no exposure of the prestress system.	93 lf.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 109/4 P/S Conc Open Girder 19862 lf. ELEM CATEGORY: Superstructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations and/or spalls may be present. There may be minor exposure but no deterioration of the prestress system. Corrosion of non-prestressed reinforcement may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	38 lf.

ELEMENT INSPECTION NOTES:

NOTE: The beam spalls on the haunch at the sole plate are documented under this element.

CS1: Several beam in Spans 1 and 34 have graffiti which is visible by the general public - NEW. Refer to Photo 11.

The beam end diaphragms have intermittent delamination/spalls with and without exposed steel. Refer to Table 3 for sizes and locations.

CS2: The beams have intermittent spalls of various sizes with no exposed steel throughout. Refer to Table 3 for sizes and locations.

CS3: The beams have intermittent delamination/spalls with exposed steel. Refer to Table 3 for sizes, locations, Photos 12 and 13. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
Refer to Table 3 in 1-25-12 report addendum for sizes and locations on 143 beams 100MH 81LF UBT - Not repaired. No action per FARC. Work will be completed under FPN 429048-1-52-01. Repeat.

ELEMENT/ENV: 311/4 Moveable Bearing 316 ea. ELEM CATEGORY: Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. The paint system, if present, is sound and functioning as intended to protect the metal. The bearing has minimal debris and corrosion. Vertical and horizontal alignment are within limits. Bearing support member is sound. Any lubrication system is functioning properly.	293 ea.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 311/4 Moveable Bearing **316 ea.** **ELEM CATEGORY:** Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
2	The paint system, if present, may show moderate to heavy corrosion with some pitting but still functioning as intended. The assemblies may have moved enough to cause minor cracking in the supporting concrete. Debris buildup is affecting bearing movement. Bearing alignment is still tolerable.	7 ea.
3	Advanced corrosion with section loss. There may be loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions. Bearing alignment may be beyond tolerable limits. Shear keys may have failed. The lubrication system, if any, may have failed.	16 ea.

ELEMENT INSPECTION NOTES:

CS1: The steel bearing assemblies have painted over pitting up to 1/4in. with areas of light corrosion throughout.

CS2: The bearings at Beams 9-1 through 9-7 at Pier 9 are misaligned up to 2in. north; however, limits are tolerable and there is no visible distress to the assembly. Refer to Photo 14.

CS3: The bearing assembly anchor bolts at Piers 17 and 19 have recurring fretting corrosion, are askew and the nuts are not seated. Refer to Photo 15. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
REP loose bearing assembly anchor bolts at Piers 17 and 19 - Not repaired. Repeat.

ELEMENT/ENV: 313/4 Fixed Bearing **316 ea.** **ELEM CATEGORY:** Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. The paint system, if present, is sound and functioning as intended to protect the metal. Vertical and horizontal alignment are within limits. Bearing support member is sound.	300 ea.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 313/4 Fixed Bearing **316 ea.** **ELEM CATEGORY:** Bearings

CONDITION STATE (3)	DESCRIPTION	QUANTITY
3	There is advanced corrosion with section loss. There may be loss of section of the supporting member sufficient to warrant supplemental supports or load restrictions. Shear keys may have failed.	16 ea.

ELEMENT INSPECTION NOTES:

CS1: The steel bearing assemblies have painted over pitting up to 1/4in. with areas of light corrosion throughout.

CS2: The anchor bolts have recurring corrosion and sheared bolts at Piers 16 and 18. Refer to Photo 16.

PREVIOUS REPAIR RECOMMENDATION:
REP bearing assemblies with corrosion & loose and sheared bolts at Piers 16 & 18 50MH UBT - Partial repair. The bearing assemblies have been cleaned and painted. A work order for loose and sheared bolts will not be repeated.

ELEMENT/ENV: 563/4 Acc Ladd & Plat **8 ea.** **ELEM CATEGORY:** Movable

CONDITION STATE (5)	DESCRIPTION	QUANTITY
2	There is little or no active corrosion. Surface corrosion has formed or is forming. The paint system may be chalking, peeling, curling or showing other early evidence of paint system distress, but there is no exposure of metal.	4 ea.
3	Surface corrosion is prevalent. There may be exposed metal, but there is no active corrosion which is causing loss of section.	1 ea.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 563/4 Acc Ladd & Plat **8 ea.** **ELEM CATEGORY:** Movable

CONDITION STATE (5)	DESCRIPTION	QUANTITY
4	Corrosion may be present, but any section loss due to active corrosion does not yet warrant structural review. Anchors may be loose.	3 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies 2 deck level platforms, 2 cap level platforms, 2 fender level platforms and 2 deck to fender level ladders.

CS2: The Pier 17 and Pier 18 deck level platform mount attachments are not flush to the deck fascia leaving gaps up to 1/4in., but it is secure - INCREASE.

The paint system for all access ladders and platforms are chalking throughout.

The top south diagonal support for the left access ladder is bent - NEW

CS3: The Pier 18 right deck level platform has small intermittent areas of surface corrosion with 1 small area of 100% section loss - INCREASE.

CS4: The Pier 17 left deck level platform has small intermittent areas of surface corrosion with two small areas of 100% section loss 1in. x 1/8in. and two areas of delaminative corrosion. One of the 2 hatch hinges is broken - INCREASE. Refer to Photos 17 and 18. P3WO

The ladder rungs for Pier 17 and 18 have areas of heavy corrosion with up to 50% section loss - NEW. Refer to Photo 19. P3WO

PREVIOUS WORK ORDER RECOMMENDATION:
Clean & paint corroded area 1in x 1/8in on left upper platform at Pier 17. 2MH - Not repaired. No action per FARC. Work will be completed under FPN 429048-1-52-01. Repeat.

All Elements

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV: 572/4 Conduit & Junc. Box 1 ea. ELEM CATEGORY: Movable

CONDITION STATE (3)	DESCRIPTION	QUANTITY
2	There is some corrosion, supports may not be tight, junction box cover gaskets are not intact, wire connections and terminal strips are not tight. At least 2 % but less than 10 % of the conduit is not in good condition.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the conduit and junction boxes on the access platforms at Piers 17 left and 18 right.

CS2: Boxes have light intermittent corrosion.

ELEMENT/ENV: 580/4 Navigational Lights 1 ea. ELEM CATEGORY: Movable

CONDITION STATE (3)	DESCRIPTION	QUANTITY
1	Lights are operational, lenses are clean and not broken, there is no evidence of corrosion.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the one system comprised of four navigational lights on the fender system, the two attached to the structure above center channel, and the conduit and wiring associated with the entire navigational lighting system. Anchorages for the center navigational lights unknown.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 205/4 R/Conc Column **582 ea.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	557 ea.
2	Minor cracks, spalls and scaling may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	7 ea.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 205/4 R/Conc Column **582 ea.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations, moderate cracks, spalls and/or scaling may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	18 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the columns at Piers 2 through 33 (96 total), and the piling supporting the footings at Piers 5 through 16 and 19 through 33 (486 total). Bents 17 and 18 each have 3 columns (included) however, they transition into pier walls without sub-piles.

CS3: The columns above the footings have intermittent delaminated repairs, spalls/delaminations some with exposed steel. Refer to Table 4 for sizes, locations, repairs and Photos 20 and 21. P3WO

The following was noted by the underwater team:

NOTE: This element quantifies the piling below the footings at Piers 5 through 16 and 19 through 33 and the six columns at Bent 17 and 18. The piling are heavily covered with marine growth from approximately 12 in. below the footings down to the mudline. There is gunite overspray at the top of the piling from footing repairs.

CS1: The piling have vertical cracking up to 4ft. x 1/32in. with no corrosion bleedout from the footing and scattered corner scrapes up to 8in. x 6in. x 1/2in. with no exposed steel.

Bents 17 and 18 each have three columns and a web wall between the columns. There are 1/32in cracks with no corrosion bleedout in the web wall from above water extending a maximum of 6in into the marine growth.

CS2: Pile 5-14, SE corner 20in below footing, spall/failed patch no exposed steel 12in x 4in x 1-1/2in
Pile 6-5, east face 8in below footing, vertical crack light efflorescence 6in x 1/64in
Pile 7-15 SW corner 6ft below footing, spall no exposed steel 12in x 12in x 2in
Pile 9-18 SW corner at groundline, spall no exposed steel 20in x 4in x 2in
Pile 16-14 NW corner at groundline, spall no exposed steel 28in x 8in x 3in
Pile 31-2 south and east faces 12in below footing, horizontal crack no corrosion bleedout 12in x 1/32ir
Pile 31-14 SE corner 12in below footing spall no exposed steel 10in x 8in x 1in

CS3: Refer to Table 5 and for 18 pile CS3 deficiencies, sizes and locations.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 215/4 R/Conc Abutment 144 lf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	144 lf.

ELEMENT INSPECTION NOTES:

CS1: Both abutment caps have light amounts of debris.

The Abutment 1 and 34 backwalls have graffiti which can be seen by the general public - NEW. Refer to Photo 11.

Abutment 1 cap at groundline is exposed and undermined up to 15ft. x 3in. x 3ft. back under due to settlement - INCREASE.

ELEMENT/ENV: 220/4 R/C Sub Pile Cap/Ftg 92 ea. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	64 ea.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 220/4 R/C Sub Pile Cap/Ftg 92 ea. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations, moderate cracks, spalls and/or scaling may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	28 ea.

ELEMENT INSPECTION NOTES:

CS3: The footings have areas of cracks up to 1/16 in. W, delaminations in the original concrete and gunite repairs some with corrosion bleedout. Refer to Table 6 for list of deficiencies and Photos 22 and 23 (above and below water deficiencies were combined into Table 6.). P3WO

The following was noted by the underwater team:
NOTE: Bottom of footings were above water but inspected by Divers.

CS3: Typically the gunite repair on the undersides and sides of the footings are delaminated up to 4ft. x 4ft. between the piles and on the bottom edges and the footers have areas of honeycombing up to 1-1/2in. deep. There are also horizontal and vertical cracks in the original concrete, several with corrosion bleedout, up to 10ft. x 1/16in. and delaminations along the bottom edge up to 6ft. x 12in. - INCREASE.

PREVIOUS WORK ORDER RECOMMENDATION:
Refer to Table 6 in 1-25-12 report addendum for sizes & locations of defs. on 50 FTGs 300MH 362SF - Partial repair. The previously reported honeycombing/delaminations on Footings 6-3, 9-2, 23-1, 23-3, 27-1, 27-3 and 28-1 have been repaired. Repeat.

ELEMENT/ENV: 234/4 R/Conc Cap 1870 lf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	1855 lf.
2	Minor cracks, spalls and scaling may be present but there is no exposed reinforcing or surface evidence of rebar corrosion.	3 lf.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 234/4 R/Conc Cap **1870 lf.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
3	Some delaminations, moderate cracks, spalls and/or scaling may be present and some reinforcing may be exposed. Corrosion of rebar may be present but loss of section is incidental and does not significantly affect the strength and/or serviceability of either the element or the bridge.	12 lf.

ELEMENT INSPECTION NOTES:

CS2: Pier 6 cap at Beam 6-10 on the top north edge has a 10in. x 3in. x 1/2in. spall with no exposed steel.

Pier 8 cap at Beam 8-6 on the top north edge has a 1ft. x 4in. x 1in. spall with no exposed steel - NEW

Pier 9 cap, top south edge under Beam 8-9 has a 1ft. x 4in. x 1in. spall with no exposed steel - NEW.

CS3: Pier Caps 30, 31, 32 and 33 have delaminations on the bottom faces between Columns 1 and 2 up to 4ft. x 2ft. - NEW. Refer to Photo 24. P3WO

ELEMENT/ENV: 299/4 Pile Jacket/Cath Pro **65 ea.** **ELEM CATEGORY:** Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	There is little or no deterioration. Surface defects only are in evidence.	65 ea.

ELEMENT INSPECTION NOTES:

The following was noted by the underwater team:
NOTE: The following piles have had 30in. square jackets installed between 3ft. to 4ft. high just below the footing: Piles 8-18, 9-8, 10-7, 10-18, 11-3, 11-5, 14-2, 14-3, 14-5, 14-8, 14-10, 14-12, 14-18, 15-2, 15-3, 15-8, 15-14, 15-15, 15-17, 20-9, 20-10, 22-3, 23-1, 23-4, 23-5, 23-6, 23-14, 24-3, 25-5, 25-10, 25-13, 25-16, 25-17, 26-2, 26-3, 26-9, 26-10, 26-11, 26-12, 26-18, 27-4, 29-5, 29-7, 29-10, 29-13, 29-14, 29-16, 29-17, 29-18, 30-1, 30-2, 30-4, 30-5, 30-6, 30-11, 30-13, 30-15, 31-1, 31-5, 31-9, 31-16, 31-17, 31-18 and 32-2.

Pile 9-1 is jacketed 12in. below the footing with a 24in. square x 6ft. long fiberglass formed jacket.

CS1: The anodes have up to 15% section loss - INCREASE.

All Elements

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV: 387/4 P/S Fender/Dolphin 318 lf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The element shows little or no deterioration. There may be discoloration, efflorescence, and/or superficial cracking but without affect on strength and/or serviceability.	318 lf.

ELEMENT INSPECTION NOTES:

The following was noted by the underwater team:
CS1: The piling have some corner spalling with no exposed steel up to 10in. x 4in. x 3/4in.

The lower connecting hardware and cable clamps are moderately to heavily corroded.

There is marine barrier (sic) activity on lower wale with up to 25% section loss.

ELEMENT/ENV: 396/4 Other Abut Slope Pro 4069 sf. ELEM CATEGORY: Substructure

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	There is little or no deterioration. Surface defects only are in evidence. Random open joints may exist.	4069 sf.

ELEMENT INSPECTION NOTES:

NOTE: This element quantifies the sand/cement bag slope protection at Abutment 34 only. No slope protection is present along Abutment 1.

CS1: The joints of the abutment slope protection has intermittent areas of vegetation growth.

All Elements

UNIT: 0 CHANNEL

ELEMENT/ENV: 290/4 Channel **1 ea.** **ELEM CATEGORY:** Channel

CONDITION STATE (4)	DESCRIPTION	QUANTITY
2	Bank protection is in need of minor repairs, bank may be beginning to slump, minor stream bed movement may be evident or debris may be present.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This element refers to the seawall with concrete caps and sheet pile bulkhead under Spans 4 and 33 and evaluated as channel protection.

CS2: The northwest bulkhead cap has cracks up to 20ft. x 1/16in.

The south bulkhead cap has intermittent areas of delaminations up to 2ft. wide x 80ft. long with horizontal cracking and corrosion bleed out. Refer to Photo 25. P3WO

The north bulkhead has delaminated repairs up to 30ft. x 9in. - NEW.

The following was noted by the underwater team:
NOTE: The seawall under Spans 4 and 33 were evaluated as channel protection.

Armor mat was installed in the past around Bents 31, 32 and 33. Before installation the top layer of oysters were removed. The edges of the mats were jetted down below the groundline.

CS2: There is an abandoned fender system lower platform lying on the channel bottom, between the south fender and west of Pier 17.

PREVIOUS WORK ORDER RECOMMENDATION:
Repair DELs & CRKs in south channel bulkhead under the structure. 40MH 80LF - Not repaired. Repeat.

CORRECTIVE ACTION TAKEN:
The north bulkhead cracks have been sealed.

All Elements

UNIT: 0 SMART FLAG

ELEMENT/ENV: 358/4 Deck Cracking SmFlag 1 ea. **ELEM CATEGORY:** Smart Flags

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The surface of the deck is cracked, but the cracks are either filled/sealed or insignificant in size and density to warrant repair activities.	1 ea.

ELEMENT INSPECTION NOTES:

NOTE: This smart flag is being used to monitor the cracking in the deck top and underside.

CS1: Refer to Element 12, Bare Concrete Deck, for details on deck cracking.

All Elements

UNIT: 0 MISCELLANEOUS

ELEMENT/ENV: 321/4 R/Conc Approach Slab 2 ea. **ELEM CATEGORY:** Other Elements

CONDITION STATE (4)	DESCRIPTION	QUANTITY
1	The slab has not settled and shows no sign of deterioration other than superficial surface cracks.	2 ea.

ELEMENT INSPECTION NOTES:

NOTE: The approach slabs are overlaid with asphalt.

CS1: The north and south approach slab asphalt overlay is deteriorating in the southbound lanes allowing potholes up to 27in. x 6in. x 1in. with upheaving up to 3/4in. in the shoulder areas - INCREASE.

Smart Flag Summary

UNIT: 0 SMART FLAG

ELEMENT/ENV: 358/4 Deck Cracking SmFlag 1 ea. ELEM CATEGORY:Smart Flags

CONDITION STATE(4)	DESCRIPTION	QUANTITY
1	The surface of the deck is cracked, but the cracks are either filled/sealed or insignificant in size and density to warrant repair activities.	1

ELEMENT INSPECTION NOTES:

NOTE: This smart flag is being used to monitor the cracking in the deck top and underside.

CS1: Refer to Element 12, Bare Concrete Deck, for details on deck cracking.

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Inspector Recommendations

UNIT: 0 DECKS

ELEMENT/ENV:12/4 Bare Concrete Deck ELEM CATEGORY: Decks/Slabs

CONDITION STATE (5)		Priority
3	**50 sf.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 1 in the 01-31-2014 report Addendum for locations of 41 deck repairs.

3	**1000 sf.**	3

WORK ORDER RECOMMENDATION:
Injection repair deck top cracks up to 0.125in. in Spans 16 17 and 18.

ELEMENT/ENV:301/4 Pourable Joint Seal ELEM CATEGORY: Joints

CONDITION STATE (3)		Priority
3	**1 lf.**	3

WORK ORDER RECOMMENDATION:
Repair 1ft. x 4in. corroded joint 16 north and south armor headers.

ELEMENT/ENV:302/4 Compressn Joint Seal ELEM CATEGORY: Joints

CONDITION STATE (3)		Priority
3	**110 lf.**	3

WORK ORDER RECOMMENDATION:
Repair 110lf. of compression joint seal in Joints 3 7 24 and 30.

ELEMENT/ENV:331/4 Conc Bridge Railing ELEM CATEGORY: Railing

CONDITION STATE (4)		Priority
3	**46 lf.**	3

WORK ORDER RECOMMENDATION:
Refer to Table 2 in the 01-31-2014 report Addendum for sizes and locations of 42 BRL deficiencies.

Inspector Recommendations

UNIT: 0 SUPERSTRUCTURE

ELEMENT/ENV:109/4 P/S Conc Open Girder ELEM CATEGORY: Superstructure

CONDITION STATE (4)		Priority
3	**28 lf.**	3

WORK ORDER RECOMMENDATION:

Refer to Table 3 in the 01-31-2014 report Addendum for sizes and locations of 24 beam deficiencies.

ELEMENT/ENV:311/4 Moveable Bearing ELEM CATEGORY: Bearings

CONDITION STATE (3)		Priority
3	**16 ea.**	3

WORK ORDER RECOMMENDATION:

REP loose bearing assembly ABS at Piers 17 and 19 with painted over corrosion & unseated nuts.

ELEMENT/ENV:563/4 Acc Ladd & Plat ELEM CATEGORY: Movable

CONDITION STATE (5)		Priority
4	**3 ea.**	3

WORK ORDER RECOMMENDATION:

REP hinge on LT access ladder & CLN & PNT & REP corrosion holes on LT & RT access ladder & platforms

Inspector Recommendations

UNIT: 0 SUBSTRUCTURE

ELEMENT/ENV:205/4 R/Conc Column ELEM CATEGORY: Substructure

CONDITION STATE (4)		Priority
3	**18 ea.**	3

WORK ORDER RECOMMENDATION:

Refer to Table 5 in the 01-31-2014 report Addendum for sizes and locations of 18 R/Conc Column deficiencies.

ELEMENT/ENV:220/4 R/C Sub Pile Cap/Ftg ELEM CATEGORY: Substructure

CONDITION STATE (4)		Priority
3	**28 ea.**	3

WORK ORDER RECOMMENDATION:

Refer to Table 6 in the 01-31-2014 report Addendum for sizes and locations of 33 footing deficiencies.

ELEMENT/ENV:234/4 R/Conc Cap ELEM CATEGORY: Substructure

CONDITION STATE (4)		Priority
3	**12 lf.**	3

WORK ORDER RECOMMENDATION:

Repair delaminations up to 4ft. x 2ft. on bottom faces of Caps 30 through 33.

Inspector Recommendations

UNIT: 0 CHANNEL

ELEMENT/ENV:290/4 Channel ELEM CATEGORY: Channel

CONDITION STATE (4)		Priority
2	**1 ea.**	3

WORK ORDER RECOMMENDATION:

Repair delaminations in south bulkhead up to 80ft. x 2ft. with horizontal cracking and corrosion bleedout.

Structure Notes

TRAFFIC RESTRICTION: This bridge is not posted. Based on the load rating dated 6/10/2008, posting is not required.

Bridge inventoried south to north.

Bridge Number 130083 is the first bridge south and Bridge Number 130002 is the first bridge north of this bridge.

INSPECTION NOTES: PBDP 1/31/2014

Sufficiency Rating Calculation Accepted by knicawr-P at 2014-03-03 14:52:11

LOAD CAPACITY EVALUATION:
The load rating dated 6/10/08 applies to the current condition of this bridge.

NOTE: This structure is scheduled for rehabilitation under FPN 429048-1-52-01; therefore, no work orders or repair recommendations will be issued.

NON-STRUCTURAL ITEMS:

APPROACH BARRIERS:
The south and north approach median barriers have full height vertical cracks with associated spalling up to 6in. x 2in. x 1in.

APPROACH GUARDRAILS:
Approach guardrail panels at the southeast, northwest and northeast corners have minor impact damage and areas of light to moderate corrosion.

CORRECTIVE ACTION TAKEN:
The guardrail system for 2nd Street under Span 3 has 9 has been removed.

LIGHTING:
The utility junction box attached to Abutment 1 backwall on the right side of Beam 1-10 is missing a plug, the conduit is separated, and the box and hardware have light corrosion.

The following light poles are missing: Right side at Pier 2, left side at Piers 4, 8, 16, and right side at Piers 17 and 33. Refer to Photo 26. REPAIR

The light pole at Pier 25 right side has an impact dent and tear at the base, and the top cap is loose. Refer to Photo 27. REPAIR

Utility conduits on the right overhang are sagging at Pier 5 and Pier 11. Refer to Photo 28. REPAIR

CORRECTIVE ACTION TAKEN:
Recessed electrical box in right side Span 1 sidewalk at Pier 2 has been repaired.

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Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/26/2016 FFST**

BY:	Kisinger Campo and Assoc.	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV. TYPE UNDER:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 1/26/2016 UNDERWATER: 12/2/2015

SUFFICIENCY RATING: 74.9
HEALTH INDEX: 91.68

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BRIDGE MANAGEMENT SYSTEM
Inspection Report
Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/26/2016 FFST**

BY:	Kisinger Campo and Assoc.	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV. TYPE UNDER:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS

☐ THIS BRIDGE IS SCOUR CRITICAL

☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 1/26/2016 UNDERWATER: 12/2/2015

OVERALL NBI RATINGS:

DECK:	6 Satisfactory	CHANNEL:	6 Bank Slumping
SUPERSTRUCTURE:	6 Satisfactory	CULVERT:	N N/A (NBI)
SUBSTRUCTURE:	6 Satisfactory	SUFF. RATING:	74.9
PERF. RATING:	Good	HEALTH INDEX:	91.68

FIELD PERSONNEL / TITLE / NUMBER:	INITIALS
McMinn, Brice - Bridge Inspector (CBI#00405) (lead)	
Santiago, Pete - BI Tech	
Qualls, Dion - Bridge Inspector (CBI#00470) - Lead Diver	
Hoogland, Keith - Bridge Inspector (CBI #00341) - Diver	
Salazar, Pete - Diver	
Jensen, Denise - Diver	

REVIEWING BRIDGE INSPECTION SUPERVISOR:

Rothman, David - Bridge Inspector (CBI #00056) _____

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

LoCicero, Thomas - PE #31136
Kisinger Campo & Associates
9270 Bay Plaza Blvd., Suite 605
Certificate of Authorization #2317
Tampa, FL 33619

SIGNATURE: _____

DATE: _____

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Inspection

Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/26/2016 FFST**

All Elements

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	12 / 4	Re Concrete Deck	0	.	138527.22	100	0	.	0	.	138527.22 sq.ft
0	1130 / 4	Cracking (RC and Other)	0	.	138527.22	100	0	.	0	.	138527.22 sq.ft

Element Inspection Notes:

12/4 CS3 = Due to Pontis character limitations, refer to the additional Element Notes and Table 1 with this report for all noted deficiencies.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
1) Refer to Table 1 in the 01-31-2014 report Addendum for locations of 41 deck repairs.
2) Injection repair deck top cracks up to 0.125in. in Spans 16 17 and 18.

CORRECTIVE ACTION EVALUATION:
1) The recommendation noted above has been completed.
2) The recommendation noted above has not been completed. A recommendation will be repeated in this report.

1130/4 Refer to Parent Element

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	301 / 4	Pourable Joint Seal	482	86.38	75	13.44	0	.	1	0.18	558 ft

Element Inspection Notes:

301/4 Note: The construction joints in the continuous deck over Piers 17 and 18 are not included in this element.

The quantity represents the pourable joint sealant at Abutment 1, Piers 2, 9, 12, 13, 14, 16, 19, 22 and Abutment 34.

Pier 16 and 19 joints have armor headers with pourable sealant.

Abutment 1 and 34 joints are not visible due to the asphalt overlay.

CS1 = The asphalt over Abutment 1 and 34 joints is heaving up to 3/4in. at the shoulder areas.

CS2 = Pier 16 joint, Lane 2 south armor header rings hollow when sounded; but it is secure.

Pier 19 joint, Lane 2 north armor header rings hollow when sounded; but it is secure.

The headers have intermittent spalls up to 6in. x 3in. x 1in. throughout; however, most have been filled with pourable sealant.

Pier 22 joint, Lane 1, 3 and 4 has up to 2ft. section of sealant adhesion loss - INCREASE.

CS3 = Pier 16 joint, right shoulder, south and north armor headers adjacent to Lane 4 have severe corrosion areas, up to 1ft. x 4in. Refer to photo 4. P3WO

PREVIOUS RECOMMENDED CORRECTIVE ACTION:

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Repair 1ft. x 4in. corroded joint 16 north and south armor headers.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will be repeated in this report.

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	302 / 4	Compressn Joint Seal	282	21.66	950	72.96	0	.	70	5.38	1302 ft

Element Inspection Notes:

302/4 Note: This element represents the compression seals at Pier 3, 4, 5, 6, 7, 8,10, 11, 15, 20, 21, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32 and 33 joints.

CS2 = The compression seals have intermittently settled up to 2 in., allowing for significant amounts of dirt to buildup in parts of the joints.

CS3 = Pier 3 joint in all lanes has intermittent abrasion wear, tearing and settlement with compacted dirt and debris.

Pier 5 joint, Lanes 1 and 2 is settled with dirt and debris impaction – NEW. Refer to photo 5.

Pier 7 joint in Lanes 3 and 4 has abrasion wear, tearing and settlement with compacted dirt, debris and vegetation.

Pier 24 joint in Lane 1 has abrasion wear, tearing and settlement with compacted dirt and debris.

P3WO ALL

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair 110lf. of compression joint seal in Joints 3 7 24 and 30.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been partially completed (Pier 3, 7 and 24 joints remain as noted above). A recommendation will be repeated in this report.

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 4	Channel	0	.	1	100	0	.	0	.	1 (EA)
0	9120 / 4	Degradation	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8290/4 Note: This element includes the seawall with concrete caps and sheet pile bulkhead under Spans 4 and 33 and evaluated as channel protection. Armor mat was installed in the past around Bents 31, 32 and 33. Before installation, the top layer of oysters were removed. The edges of the mats were jetted down below the groundline.

INCIDENTAL:
The northwest bulkhead cap has cracks up to 20ft. x 1/16in.

The north bulkhead cap has delaminated repairs up to 30ft. x 9in.

The following was noted underwater by the divers:
CS2 9120 = The armor mat on the south edge of Bent 33 has an undermined area, full length

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x 18in. high x 3ft. of penetration – NEW.

There is an abandoned fender system lower platform lying on the channel bottom, between the north fender and east of Pier 18 and between the south fender and west of Pier 17, not obstructing marine traffic.

South seawall, east end, 12ft. west of outfall pipe, from cap down, delamination, 12in. diameter.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair delaminations in south bulkhead with horizontal cracks and corrosion bleed out. 80LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

9120/4 Refer to Parent Element

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	321 / 4	Re Conc Approach Slab	1001.04	100	0	.	0	.	0	.	1001.04 sq.ft

Element Inspection Notes:

321/4 Note: The approach slabs are overlaid with asphalt.

CS1 = The south and north approach slab asphalt overlay along the abutment joints is deteriorated in the southbound lanes with upheaving up to 3/4in. in the shoulder areas.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	215 / 4	Re Conc Abutment	144	100	0	.	0	.	0	.	144 ft

Element Inspection Notes:

215/4 CS1 = Both abutment caps have a light accumulation of dirt and debris.

Abutment 1 cap at the groundline is exposed and undermined up to 15ft. x 3in. x 3ft. back under due to erosion.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	220 / 4	Re Conc Pile Cap/Ftg	76	9.93	555	72.55	134	17.52	0	.	765 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	22	23.66	71	76.34	0	.	93 ft
0	1090 / 4	Exposed Rebar	0	.	0	.	2	100	0	.	2 ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	0	.	61	100	0	.	61 ft
0	1130 / 4	Cracking (RC and Other)	0	.	533	100	0	.	0	.	533 ft

Element Inspection Notes:

220/4 Note: The bottom of the footers were above water during this inspection, but were inspected by the divers due to minimal clearance.

CS3 = The footers have areas of cracks up to 1/16in. wide and delaminations in the original concrete and gunite repairs, some with corrosion bleed out. Refer to the additional Element Notes and Table 4 with this report for list of deficiencies above and below water. Refer to photos 17 and 18. P3WO

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The following was noted underwater by the divers:
CS2 1130 = Bottoms of numerous footings have longitudinal and transverse cracks, up to full length/width x 1/32in. wide in the original concrete. (533FT.)

CS3 1080 = The bottom of Footings 5-1, 6-2, 6-3, 7-1, 8-1, 8-2, 8-3, 9-1, 9-2, 10-1, 11-1, 12-2, 12-3, 13-1, 13-3, 14-1, 15-3, 20-2, 20-3, 20-1, 21-1, 21-2, 21-3, 22-1, 22-2, 23-1, 23-3, 24-3, 25-1, 25-3, 25-2, 26-1, 26-3, 27-2, 27-3, 28-1, 28-2, 28-3, 29-1, 30-3, 31-1, 31-2, 31-3 and 32-3 have areas of honeycomb/voids or delaminations/spalls up to 24in. x 35in. x 1-1/2in – INCREASE. (68FT.)

CS3 1120 = Bottom of Footings 5-1, 7-2, 7-3, 8-1, 8-2, 9-2, 9-3, 10-2, 10-3, 11-1, 11-2, 11-3, 12-1, 13-1, 13-2, 14-1, 14-2, 14-3, 15-1,15-2, 15-3, 16-1, 16-2, 16-3, 19-1, 19-3, 20-1, 20-2, 20-3, 21-1, 21-2, 22-1, 22-3, 23-1, 24-1, 24-3, 25-1, 25-3, 26-1, 27-1, 27-3, 28-3 and 29-3 have areas corrosion bleedout, up to 12in. x 12in. – INCREASE. (61FT.)

CS2 1080 = Bottom of Footings 5-2, 7-2, 7-3, 10-3, 11-3, 19-3, 28-2, 30-2, 32-3, 32-1, 32-2 and 33-3 between the piles have delaminations up to 6ft. x 24in. – INCREASE. (20FT.)

CS2 1080 = Footing 11-3: SE corner at bottom edge, sound patch, 3ft. x 24in. (2FT.)

CS-3 1090 = Footing 13-3: SW corner of Pile 16, bottom of footing, honeycomb/void, 12in. x 4in. x 3in., with exposed steel; 0% section remaining. (1FT.)

CS3 1080 = Footing 26-2: Bottom of footing between Piles 9 and 10, delamination/spall, 30in. x 30in. x ¼in. – NEW. (3FT.)

CS3 1090 = Footing 29-2: Between Piles 8 and 10, honeycomb, 11in. x 5in. x 3in., with exposed steel; 50% section remaining. (1FT.)

INCIDENTAL:
The gunite repairs on the undersides of the footings have cracks up to 1/32in. wide, several with corrosion bleedout and/or efflorescence.

NOTE: The previously reported delamination on the gunite repair underside was not found this inspection.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Refer to Table 4 in the 01-26-2016 report for sizes and locations of 30 footer deficiencies. 30EA

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed. A recommendation will be repeated in this report.

1080/4 Refer to Parent Element

1090/4 Refer to Parent Element

1120/4 Refer to Parent Element

1130/4 _

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	227 / 4	Re Conc Pile	565	97.08	7	1.2	10	1.72	0	.	582 (EA)

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Element Inspection Notes:

227/4 Due to Pontis character limitations, refer to the additional Element Notes and Table 3 with this report for a list of all noted deficiencies. Refer to photos 15 and 16.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	234 / 4	Re Conc Pier Cap	1855	99.2	3	0.16	12	0.64	0	.	1870 ft

Element Inspection Notes:

234/4 CS2 = Pier 6 cap at Beam 6-10 in the top north edge has a 10in. x 3in. x 1/2in. spall.

Pier 8 cap at Beam 8-6 in the top north edge has a 1ft. x 4in. x 1in. spall.

Pier 9 cap, top south edge under Beam 8-9, has a 1ft. x 4in. x 1in. spall.

CS3 = Pier 30, 31, 32 and 33 caps have delaminations in the bottom face between Columns 1 and 2 up to 4ft. x 2ft. Refer to photo 19. P3WO

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair delaminations up to 4ft. x 2ft. on bottom faces of Caps 30 through 33.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will be repeated in this report.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8298 / 4	Pile Jacket Bare	65	100	0	.	0	.	0	.	65 (EA)
0	520 / 4	Conc Re Prot Sys	1000	100	0	.	0	.	0	.	1000 sq.ft

Element Inspection Notes:

8298/4 Note: The following piles have had 30in. square jackets installed between 3ft. to 4ft. high just below the footing: Piles 8-18, 9-8, 10-7, 10-18, 11-3, 11-5, 14-2, 14-3, 14-5, 14-8, 14-10, 14-12, 14-18, 15-2, 15-3, 15-8, 15-14, 15-15, 15-17, 20-9, 20-10, 22-3, 23-1, 23-4, 23-5, 23-6, 23-14, 24-3, 25-5, 25-10, 25-13, 25-16, 25-17, 26-2, 26-3, 26-9, 26-10, 26-11, 26-12, 26-18, 27-4, 29-5, 29-7, 29-10, 29-13, 29-14, 29-16, 29-17, 29-18, 30-1, 30-2, 30-4, 30-5, 30-6, 30-11, 30-13, 30-15, 31-1, 31-5, 31-9, 31-16, 31-17, 31-18 and 32-2.

Pile 9-1 is jacketed 12in. below the footer with a 24in. square x 6ft. long fiberglass formed jacket.

The following was noted underwater by the divers:
CS1 = The anodes have up to 85% section remaining.

520/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8387 / 4	PS Fender/Dolphin	302	94.97	16	5.03	0	.	0	.	318 ft

Element Inspection Notes:

8387/4 The following is considered incidental to this element:
There is a sagging and broken utility conduit on the south fender walkway – NEW. Refer to

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photo 20. P3WO

The following was noted underwater by the divers:
CS1 = The lower connecting hardware and cable clamps are moderately to heavily corroded.

There is marine borer activity on the lower wales with up to 60% section remaining - INCREASE.

CS2 = The piles have some corner spalls up to 10in. x 4in. x 3/4in.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8396 / 4	Other Abutment Slope Protection	4068.99	100	0	.	0	.	0	.	4068.99 (SF)

Element Inspection Notes:

8396/4 Note: This element represents the sand-cement rip rap bag slope protection at Abutment 34 only. No slope protection is present along Abutment 1.

CS1 = The joints of the abutment slope protection has intermittent areas of vegetation.

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	311 / 4	Moveable Bearing	293	92.72	7	2.22	0	.	16	5.06	316 each
0	8516 / 4	Painted Steel	1000	100	0	.	0	.	0	.	1000 sq.ft

Element Inspection Notes:

311/4 CS2 = The steel bearing assemblies have painted-over pitting up to 1/4in. and areas of corrosion showing through the paint - INCREASE.

The bearings at Beams 9-1 through 9-7 at Pier 9 are misaligned up to 2in. north; however, limits are tolerable and there is no visible distress to the assemblies. Refer to photo 10.

CS3 = The bearing assembly anchor bolts at Piers 17 and 19 have recurring fretting corrosion, are askewed and the nuts are not seated. Refer to photo 11. P3WO

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
REP loose bearing assembly ABS at Piers 17 and 19 with painted over corrosion & unseated nuts.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will be repeated in this report.

8516/4 CS1 = The steel bearing assemblies have painted-over pitting up to 1/4in. and areas of light corrosion throughout.

CS2 = The anchor bolts have recurring corrosion and sheared bolts at Piers 16 and 18. Refer to photo 12.

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	313 / 4	Fixed Bearing	300	94.94	16	5.06	0	.	0	.	316 each
0	8516 / 4	Painted Steel	1000	100	0	.	0	.	0	.	1000 sq.ft

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Element Inspection Notes:

313/4 CS1 = The steel bearing assemblies have painted-over pitting up to 1/4in. and areas of light corrosion throughout.

CS2 = The anchor bolts have recurring corrosion and sheared bolts at Piers 16 and 18. Refer to photo 12.

8516/4 CS1 = The steel bearing assemblies have painted-over pitting up to 1/4in. and areas of light corrosion throughout.

CS2 = The anchor bolts have recurring corrosion and sheared bolts at Piers 16 and 18. Refer to photo 12.

SUPERSTRUCTURE : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8572 / 4	Conduit & Junction Box	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8572/4 Note: This element represents the conduit and junction boxes on the access platforms at Piers 17 left and 18 right.

CS2 = The junction boxes have light intermittent surface corrosion.

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	107 / 4	Steel Opn Girder/Beam	69	3.5	1900	96.5	0	.	0	.	1969 ft
0	8516 / 4	Painted Steel	1000	100	0	.	0	.	0	.	1000 sq.ft

Element Inspection Notes:

107/4 Note: This element represents the steel beams in Spans 16, 17 and 18.

CS2 = The beams have intermittent areas of painted-over pitting up to 1/8in. deep, primarily in the bottom flange and cover plates.

8516/4 CS1 = The steel bearing assemblies have painted-over pitting up to 1/4in. and areas of light corrosion throughout.

CS2 = The anchor bolts have recurring corrosion and sheared bolts at Piers 16 and 18. Refer to photo 12.

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	109 / 4	Pre Opn Conc Girder/Beam	19759.01	99.48	93	0.47	10	0.05	0	.	19862.01 ft

Element Inspection Notes:

109/4 Note: The beam spalls on the haunches at the sole plates are documented under this element.

CS1 = Several beams and diaphragms in Spans 1 and 34 have graffiti, which is not visible by the general public. Refer to photo 7.

CS2 = The beams have intermittent spalls of various sizes throughout. Refer to the additional Element Notes and Table 2 with this report for sizes and locations.

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CS3 = The beams have intermittent spalls/delaminations, some with exposed steel. Refer to the additional Element Notes and Table 2 with this report for sizes, locations. Refer to photos 8 and 9. P3WO

The following is considered incidental to this element:
The beam end diaphragms have intermittent spalls/delamination some with exposed steel. Refer to the additional Element Notes and Table 2 with this report for sizes and locations.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Refer to Table 3 in the 01-31-2014 report Addendum for sizes and locations of 24 beam deficiencies.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been partially completed; refer to Table 2 for remaining deficiencies.

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	331 / 4	Re Conc Bridge Railing	6642	99.09	57	0.85	4	0.06	0	.	6703 ft

Element Inspection Notes:

331/4 Note: This element represents the left and right concrete post and beam bridge rails and the Jersey type median barrier.

CS2 = The median barrier and bridge rails have intermittent cracks up to 1/32in. wide, and minor impact scrapes and spalls up to 4in. x 3/4in. x varying in length throughout.

Bridge Rail 3-7 right has a 35in. x 4in. x 1in. spall/scrape in the west face.

Bridge Rail Post 17-14 left has a 7in. x 4in. x 3/4in. spall in the west face.

The east face of Bridge Rail 18-6 left has a 10in. x 3in. x 3/4in. spall in the east face.

Bridge Rail Post 20-12 left has a 4in. x 3in. x 1in. spall in the northeast corner.

Bridge Rail 32-9 right has a 8in. x 4in. x 1-1/2in. spall in the southeast corner.

CS3 = Span 16 median barrier, top edges at north end has delaminations up to 4in. x 3in.

Span 18, east face of median barrier has a 1ft. 6in. x 1ft. x 1/2in. spall with exposed steel – NEW.

Span 32 at Pier 32, east face of median barrier has a 1ft. x 10in. x 1/2in. spall with exposed steel – NEW. Refer to photo 6. P3WO

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Refer to Table 2 in the 01-31-2014 report Addendum for sizes and locations of 42 BRL deficiencies.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8563 / 4	Access Ladder & Platform	0	.	5	62.5	3	37.5	0	.	8 (EA)

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Element Inspection Notes:

8563/4 Note: This element represents two deck level platforms, two cap level platforms, two fender level platforms and two deck to fender level ladders.

CS2 = Pier 17 and 18 deck level platform mount attachments are not flush to the deck fascia, leaving gaps up to 1/4in.; but, they are secure.

The paint system for all access ladders and platforms are chalking throughout.

The top south diagonal support for the left access ladder is bent.

CS3 = Pier 18 right deck level platform has small intermittent areas of surface corrosion with a small area of 0% section remaining.

CS4 = Pier 17 left deck level platform has small intermittent areas of surface corrosion with two small areas of 0% section remaining up to 1in. x 1/8in. and two areas of delaminative corrosion. Refer to photo 13. P3WO

The ladder rungs for Piers 17 and 18 have areas of heavy corrosion with up to 50% section remaining. Refer to photo 14. P3WO

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
REP hinge on LT access ladder & CLN & PNT & REP corrosion holes on LT & RT access ladder & platforms

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will be repeated in this report.

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8580 / 4	Navigational Lights	1	100	0	.	0	.	0	.	1 (EA)

Element Inspection Notes:

8580/4 Note: This element represents the one system comprised of four navigational lights on the fender system, the two attached to the structure above center channel, and the conduit and wiring associated with the entire navigational lighting system. Anchorages for the center navigational lights unknown.

Total Number of Elements*: 20
*excluding defects/protective systems

Structure Notes

TRAFFIC RESTRICTION: According to the load rating analysis dated 6/10/08, posting is not required. This bridge is not posted.

Bridge inventoried from south to north.

Bridge No. 130083 is south and Bridge No. 130002 is north of this Bridge No. 130053.

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INSPECTION NOTES: FFST 1/26/2016

Sufficiency Rating Calculation Accepted by KNKCADG-P at 2016-03-02 09:42:29

LOAD CAPACITY EVALUATION:
The findings of this inspection reveal no reason to warrant a new analysis; therefore, the current load rating results still govern.

NON-STRUCTURAL ITEMS:

APPROACH BARRIERS:
The south and north approach median barriers have full height vertical cracks with associated spalls up to 6in. x 2in. x 1in.

APPROACH GUARDRAILS:
Approach guardrail panels at the southeast, northwest and northeast corners of the bridge have minor impact damage and areas of light to moderate corrosion.

UTILITIES:
The utility junction box attached to Abutment 1 backwall on the right side of Beam 1-10 is missing a plug, the conduit is separated, and the box and hardware have light corrosion.

The following light poles are missing: Right side at Pier 2, left side at Piers 4, 8, 16, and right side at Piers 17 and 33. Refer to photo 22. REPAIR

The light pole at Pier 25 right side has an impact dent and tear at the base, and the top cap is loose. Refer to photo 23. REPAIR

Utility conduits on the right overhang are sagging at Pier 5 and Pier 11. Refer to photo 24. REPAIR

The following elements were inspected underwater by the divers:
205 R/Conc Column - Piers 5 through 16 and 19 through 33 each with eighteen 20in. piles and the six columns at Piers 17 and 18
220 R/C Sub Pile Cap/Ftg
299 Pile Jacket/Cath Pro
387 P/S Fender/Dolphin
290 Channel

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BY:	Kisinger Campo & Associates	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV. TYPE UNDER:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 1/25/2018 UNDERWATER: 12/7/2017

SUFFICIENCY RATING: 74.4
HEALTH INDEX: 80.12

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DISTRICT: D1 - Bartow **INSPECTION DATE: 1/25/2018 JNJW**

BY:	Kisinger Campo & Associates	STRUCTURE NAME:	HERNANDO DESOTO BRIDGE
OWNER:	1 State Highway Agency	YEAR BUILT:	1957
MAINTAINED BY:	1 State Highway Agency	SECTION NO.:	13 130 000
STRUCTURE TYPE:	4 Steel Continuous - 02 Stringer/Girder	MP:	2.617
LOCATION:	0.6 MI NORTH OF SR-64	ROUTE:	00041
SERV. TYPE ON:	1 Highway	FACILITY CARRIED:	US-41/US-301
SERV. TYPE UNDER:	6 Highway-waterway	FEATURE INTERSECTED:	MANATEE RIVER 2ND ST E

☐ THIS BRIDGE CONTAINS FRACTURE CRITICAL COMPONENTS

☐ THIS BRIDGE IS SCOUR CRITICAL

☐ THIS REPORT IDENTIFIES DEFICIENCIES WHICH REQUIRE PROMPT CORRECTIVE ACTION

☐ FUNCTIONALLY OBSOLETE ☐ STRUCTURALLY DEFICIENT

TYPE OF INSPECTION: Regular NBI

DATE FIELD INSPECTION WAS PERFORMED: ABOVE WATER: 1/25/2018 UNDERWATER: 12/7/2017

OVERALL NBI RATINGS:

DECK:	6 Satisfactory	CHANNEL:	6 Bank Slumping
SUPERSTRUCTURE:	6 Satisfactory	CULVERT:	N N/A (NBI)
SUBSTRUCTURE:	6 Satisfactory	SUFF. RATING:	74.4
PERF. RATING:	Good	HEALTH INDEX:	80.12

FIELD PERSONNEL / TITLE / NUMBER: **INITIALS**

Morris, Allan - Bridge Inspector C.B.I. #00441 (lead) _____

Ellison, Scott - Bridge Inspection Technician _____

Hoogland, Keith - Bridge Inspector (CBI #00341) - Lead Diver _____

Goldman, Derek - Diver _____

Fescina, Michael - Diver _____

REVIEWING BRIDGE INSPECTION SUPERVISOR:

Rothman, David - Bridge Inspector (CBI #00056) _____

CONFIRMING REGISTERED PROFESSIONAL ENGINEER:

Cochran, Robert - (PE #45177) Kisinger Campo & Associates
9270 Bay Plaza Boulevard
Certificate of Authorization #2317
Tampa FL 33619

SIGNATURE: _____

DATE: _____

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All Elements

DECKS : Decks/Slabs

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	12 / 4	Re Concrete Deck	106980	77.23	31336	22.62	211	0.15	0	.	138527 sq.ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	165	43.88	211	56.12	0	.	376 sq.ft
0	1090 / 4	Exposed Rebar	0	.	1	100	0	.	0	.	1 sq.ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	558	100	0	.	0	.	558 sq.ft
0	1130 / 4	Cracking (RC and Other)	0	.	7205	100	0	.	0	.	7205 sq.ft
0	1190 / 4	Abrasion(PSC/RC)	0	.	23407	100	0	.	0	.	23407 sq.ft
0	510 / 4	Wearing Surfaces	17049	100	0	.	0	.	0	.	17049 sq.ft

Element Inspection Notes:

12/4 Note: The right overhang underside has a 2in. conduit attached. Anchorage type is unknown.
Span 14, 16, 17 and 18 deck top has an asphalt overlay applied.

Spans 16, 17, and 18 have observable live load deflection; an asphalt overlay has been applied.

CS1 = Spans 1 through 13, 15 and 19 through 33 have map cracking up to 1/32in. wide.

CS2 1130 = Spans 11 and 12 have map cracking up to 1/16in. wide. (7205SF)

CS1 = There are numerous longitudinal and transverse epoxy injected cracks up to 1/16in. wide.

CS2 1190 = The deck top in Spans 1 through 13, 15 and 19 through 33 have moderate abrasive wear primarily in the wheel paths (23407SF)

CS2 1080 = There is a 16ft. x 10ft. area of fire damage to the deck top of Span 27 mid-span Lane 2 – NEW (160SF)

CS1 = Lane 1 in Span 31 SB has a 30ft. long x 1/32in. wide longitudinal crack.

CS2 and CS3 1080 = The deck top has sound repairs, spalls/delaminations, some with exposed steel, and unsound repairs. Refer to Table 1 for sizes and locations, and photo 1. P3WO (CS2 5SF) (CS3 11SF)

CS2 1090 = Refer to Table 1 for size and location of exposed rebar. P3WO (1SF)

CS2 1120 = The deck underside in all spans have transverse, diagonal and longitudinal cracks up to 1/64in. wide, with efflorescence. Spans 16, 17 and 18 are the most dense. (558SF)

CS3 1080 = The deck underside at the built-up sections adjacent to the steel beams in Spans 16, 17, 18 has intermittent edge spalls up to 8in. x 4in. x 1in. (200SF)

INCIDENTAL:
The left curb of Span 26 has minor spalls and scrapes up to 3ft. x 1in. x 1/4in. (3SF)

There are sound repairs in the curbs up to 20in. x 10in. at the following locations: Abutment 1 left, Span 17 southbound at half point, Span 25 right curb at Pier 25 and Span 27 left curb at Pier 27.

Span 5 southbound left curb seven spalls up to 5in. x 4in. 1-1/2in. with exposed steel.

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Span 13 northbound right sidewalk 18in. x 4in. unsound repair - NEW.

Span 33 SB right curb has a 3ft. x 9in. unsound repair.

The deck top along the shoulders has intermittent areas of concrete spillage up to 6ft. x 3ft. x 3in.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
1) Refer to Table 1 in the 01-26-2016 report Addendum for locations of 15 deck repairs. 57SF
2) Injection repair deck top cracks up to 0.125in. in Spans 16 17 and 18. 20SF

CORRECTIVE ACTION EVALUATION:
1) The recommendation noted above has been partially completed. A recommendation will be repeated in this inspection report.
2) The recommendation noted above has been completed.

1080/4 Refer to Parent Element

1090/4 Refer to Parent Element

1120/4 Refer to Parent Element

1130/4 Refer to Parent Element

1190/4 Refer to Parent Element

510/4 Note: This element represents the asphalt overlay in Spans 14, 16, 17, 18 and 19.

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	301 / 4	Pourable Joint Seal	1040	98.67	0	.	14	1.33	0	.	1054 ft
0	2320 / 4	Seal Adhesion	0	.	0	.	2	100	0	.	2 ft
0	2360 / 4	Adjacent Deck or Header	0	.	0	.	12	100	0	.	12 ft

Element Inspection Notes:

301/4 Note: The construction joints in the continuous deck over Piers 17 and 18 are not included in this element.
The quantity represents the pourable joint sealant at Abutment 1, Piers 2, 3, 5, 7, 9, 12, 13, 14, 15, 16, 19, 22, 24, 30, 32 and Abutment 34.
Pier 16 and 19 joints have armor headers with pourable sealant.
Abutment 1 and 34 joints are not visible due to the asphalt overlay.
Quantity change was field verified.

INCIDENTAL:
The asphalt over Abutment 1 and 34 joints is heaving up to 3/4in. at the shoulder areas.

Pier 19 joint, Lane 2 north armor header rings hollow when sounded; but it is secure.

CS3 2360 = The headers have intermittent spalls up to 6in. x 3in. x 1in. throughout; however, most have been filled with pourable sealant. (12FT)

CS3 2320 = Pier 22 joint, Lane 1, 3 and 4 has up to 8in. long sections of sealant adhesion loss - INCREASE. (2FT)

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Pier 16 joint, Lane 2 south armor header rings hollow when sounded; but it is secure.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Clean and paint 1ft. x 4in. corroded joint 16 north and south armor headers. 1LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

2320/4 Refer to Parent Element

2360/4 Refer to Parent Element

DECKS : Joints

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	302 / 4	Compressn Joint Seal	782	97.02	24	2.98	0	.	0	.	806 ft
0	2350 / 4	Debris Impaction	0	.	24	100	0	.	0	.	24 ft

Element Inspection Notes:

302/4 Note: This element represents the compression seals at Pier 4, 6, 8, 10, 11, 21, 23, 26, 27, 28, 29, 31 and 33 joints. Quantity change was field verified. Refer to Element 301 Pourable Joint Seal comments.

CS2 2350 = The compression seals have intermittently settled up to 2in., allowing for significant amounts of dirt to buildup in areas of the joints.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Clean and seal in Pier 3 5 7 and 24 joints. 70LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

2350/4 Refer to Parent Element

MISCELLANEOUS : Channel

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8290 / 4	Channel	0	.	1	100	0	.	0	.	1 (EA)
0	9120 / 4	Degradation	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8290/4 Note: This element includes the seawalls with concrete caps and sheet pile bulkhead under Spans 4 and 33 and evaluated as channel protection. Armor mat was installed in the past around Bents 31, 32 and 33. Before installation, the top layer of oysters were removed. The edges of the mats were jetted down below the groundline.

INCIDENTAL:
The northwest seawall cap has cracks up to 20ft. long x 1/16in. wide.

The north seawall cap has spalls with exposed steel and unsound repairs up to 30ft. x 9in. Refer to photo 2. P3WO

The following was noted by the underwater inspectors:
CS2 9120 = The armor mat on the south edge of Bent 33 has an undermined area, full length x 18in. high x 3ft. of penetration – NEW.

There is an abandoned fender system lower platform lying on the channel bottom, between

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the north fender and east of Pier 18 and between the south fender and west of Pier 17, not obstructing marine traffic.

South seawall, east end, 12ft. west of outfall pipe, from cap down, delamination, 12in. diameter.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair delaminations in south bulkhead with horizontal cracks and corrosion bleed out. 80LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

9120/4 Refer to Parent Element

MISCELLANEOUS : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	321 / 4	Re Conc Approach Slab	1160	100	0	.	0	.	0	.	1160 sq.ft
0	510 / 4	Wearing Surfaces	992	90.51	104	9.49	0	.	0	.	1096 sq.ft
0	3230 / 4	Effectiveness (Wearing Surface)	0	.	104	100	0	.	0	.	104 sq.ft

Element Inspection Notes:

321/4 Note: The approach slabs are not visible due to an asphalt overlay.

510/4 CS2 3230 = The south and north approach slab asphalt overlay along the abutment joints is deteriorated in the southbound lanes with upheaving up to 3/4in. in the shoulder areas. (104SF)

3230/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	205 / 3	Re Conc Column	84	87.5	0	.	12	12.5	0	.	96 each
0	1080 / 3	Delamination/Spall/Patched Area	0	.	0	.	12	100	0	.	12 each

Element Inspection Notes:

205/3 Note: This element represents the columns above the footers at Piers 2 through 33 (96 total), Piers 17 and 18 each have 3 columns however, they transition into pier walls without sub-piles.

CS3 1080 = The columns above the footers have intermittent unsound and spalled repairs. Refer to photo 3. (12EA)

Column 5-2 unsound area 30in. x 20in. north west corner. P3WO (1EA)
Column 6-1 spalled area 44in. x 6in. x 2in. east face of column. P3WO (1EA)
Column 6-1 unsound repair 6ft. x 3ft. south edge in and above.
Column 7-2 unsound area 2ft. x 16in. delaminated area. P3WO (1EA)
Column 8-1 unsound area 6ft. x 1ft. south face and southeast edge. P3WO (1EA)
Column 8-3 unsound area 2ft. 6in. x 1ft. southwest corner. P3WO (1EA)
Column 9-2 unsound repair 4ft. x 1ft. north face from the footer up 4ft. P3WO (1EA)
Column 18-3 unsound area 2ft. x 8in. northwest edge at top of pier wall. P3WO (1EA)
Column 19-1 unsound repair 5ft. x 1ft. Southeast edge at top of repair. P3WO (1EA)
Column 28-1 unsound repair 30in. x 9in. north face at footing. P3WO (1EA)

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Column 29-1 unsound repair 1ft. x 1ft. East face at top of repair. P3WO (1EA)
Column 29-2 unsound repair 6ft. x 2ft. southwest and southeast edges and west face at footer. P3WO (1EA)
Column 33-1 spall/delamination 43in. x 24in. x 1in. South and east face of column. P3WO (1EA)

INCIDENTAL:
Piers 17 and 18 each have three columns and a web wall between the columns.
There are 1/32in. vertical cracks in the web walls from above water extending a maximum of 6in. into the marine growth.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
1) Repair delaminations noted in Pier columns in Table 3. 8EA
2) Repair cracks and corrosion staining under footers of Piles 23-17 and 33-12. 2EA

CORRECTIVE ACTION EVALUATION:
1) The corrective action noted above has been partially repaired. A recommendation will be repeated in this inspection report.
2) The corrective action noted above has been repaired.

1080/3 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	215 / 4	Re Conc Abutment	129	89.58	15	10.42	0	.	0	.	144 ft
0	4000 / 4	Settlement	0	.	15	100	0	.	0	.	15 ft

Element Inspection Notes:

215/4 INCIDENTAL:
Both abutment caps have a light accumulation of dirt and debris.

4000/4 CS2 4000 = Abutment 1 cap at the groundline is exposed and undermined up to 15ft. x 3in. x 3ft. back under due to erosion. (15FT)

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	220 / 4	Re Conc Pile Cap/Ftg	0	.	648	76.6	198	23.4	0	.	846 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	106	53.81	91	46.19	0	.	197 ft
0	1090 / 4	Exposed Rebar	0	.	0	.	2	100	0	.	2 ft
0	1120 / 4	Efflorescence/Rust Staining	0	.	0	.	105	100	0	.	105 ft
0	1130 / 4	Cracking (RC and Other)	0	.	542	100	0	.	0	.	542 ft

Element Inspection Notes:

220/4 (A) = Aggressive Environment

Note: The bottom of the footers were above water during this inspection, but were inspected by the divers due to minimal clearance.

CS2 and CS3 1080 and CS3 1090 1120 1130A = The footers have areas of cracks up to 1/16in. wide and delaminations in the original concrete and gunite repairs, some with corrosion bleed out. Refer to the additional Element Notes and Table 2 with this report for list of deficiencies above and below water. Refer to photo 4. P3WO (CS2 1080 84FT) (CS3 1080 20FT) (CS3 1120 36FT) (CS2 1130A 9FT)

The following was noted by the underwater inspectors:

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CS2 1130A = Bottom of numerous footers have longitudinal and transverse cracks, up to full length/width x 1/32in. wide in the original concrete. (533FT.)

CS3 1080 = The bottom of Footers 5-1, 6-2, 6-3, 7-1, 8-1, 8-2, 8-3, 9-1, 9-2, 10-1, 11-1, 12-2, 12-3, 13-1, 13-3, 14-1, 15-3, 20-2, 20-3,
20-1, 21-1, 21-2, 21-3, 22-1, 22-2, 23-1, 23-3, 24-3, 25-1, 25-3, 25-2, 26-1, 26-3, 27-2, 27-3, 28-1, 28-2, 28-3, 29-1, 30-3, 31-1, 31-2, 31-3 and 32-3 have areas of honeycomb/voids or delaminations/spalls up to 24in. x 35in. x 1-1/2in – INCREASE. (68FT.)

CS3 1120 = Bottom of Footers 5-1, 7-2, 7-3, 8-1, 8-2, 9-2, 9-3, 10-2, 10-3, 11-1, 11-2, 11-3, 12-1, 13-1, 13-2, 14-1, 14-2, 14-3, 15-1,15-2, 15-3, 16-1, 16-2, 16-3, 19-1, 19-3, 20-1, 20-2, 20-3, 21-1, 21-2, 22-1, 22-3, 23-1, 24-1, 24-3, 25-1, 25-3, 26-1, 27-1, 27-3, 28-3 and 29-3 have areas corrosion bleedout, up to 12in. x 12in. – INCREASE. (61FT.)

CS2 1080 = Bottom of Footers 5-2, 7-2, 7-3, 10-3, 11-3, 19-3, 28-2, 30-2, 32-3, 32-1, 32-2 and 33-3 between the piles have delaminations up to 6ft. x 24in. – INCREASE. (20FT.)

CS2 1080 = Footer 11-3: SE corner at bottom edge, sound repair, 3ft. x 24in. (2FT.)

CS3 1090 = Footer 13-3: SW corner of Pile 16, bottom of footer, honeycomb/void, 12in. x 4in. x 3in., with exposed steel; 0% section remaining. (1FT.)

CS3 1080 = Footer 26-2: Bottom of footing between Piles 9 and 10, spall/delamination, 30in. x 30in. x 1/2in. – NEW. (3FT.)

CS3 1090 = Footer 29-2: Between Piles 8 and 10, honeycomb, 11in. x 5in. x 3in., with exposed steel; 50% section remaining. (1FT.)

INCIDENTAL:
The gunite repairs on the undersides of the footers have cracks up to 1/32in. wide, several with corrosion bleedout and/or efflorescence.

The previously reported delamination of the gunite repair on the underside was not found this inspection.

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Refer to Table 4 in the 01-26-2016 report for sizes and locations of 30 footer deficiencies. 30EA

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has partially been completed. Per FARC only 8-1, 10-1, 31-2. A recommendation will be repeated in this report.

1080/4 Refer to Parent Element

1090/4 Refer to Parent Element

1120/4 Refer to Parent Element

1130/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	227 / 4	Re Conc Pile	456	93.83	20	4.12	10	2.06	0	.	486 (EA)
0	1080 / 4	Delamination/Spall/Patched Area	0	.	12	54.55	10	45.45	0	.	22 (EA)

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0	1130 / 4	Cracking (RC and Other)	0	.	8	100	0	.	0	.	8 (EA)

Element Inspection Notes:

227/4 (A) = Aggressive Environment

Note: This element represents the piles below the footers at Piers 5 through 16 and 19 through 33. The piles are heavily covered with marine growth from approximately 12in. below the footers down to the mudline. There is gunite overspray at the top of the piles from footing repairs.

The following was noted by the underwater inspectors:
CS2 1130A = Piles 5-17, 12-8, 23-2, 24-1, 26-16, 30-8 and 30-7 have vertical cracks up to 12in. x 1/32in. – DECREASE. (7EA.)

CS2 1130A = Pile 6-5: East face 8in. below footer, vertical crack, 10in. x 1/64in., with light efflorescence. (1EA.)

CS2 1080 = Piles 5-1, 6-14, 6-16, 7-6, 8-16, 9-2, 11-8, 13-4, 14-14, 16-1, 22-6, 22-10 and 23-2 have corner spalls less than 6in. x 6in. x 1in. (12EA.)

CS3 1080 = Piles 6-13, 7-15, 9-15, 9-18, 12-4, 13-15, 16-12, 16-14 and 31-14 have spalls up to 28in. x 8in. x 3in., largest being Pile 16-14. Refer to photo 5 P3WO (9EA)

CS3 1080 = Pile 5-14: SE corner 20in. below footer, spall/unsound repair, 12in. x 4in. x 1-1/2in. P3WO (1EA.)

CORRECTIVE ACTION TAKEN:
Although not recommended for corrective action, piles 23-17 and 33-12 have been repaired.

1080/4 Refer to Parent Element

1130/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	234 / 4	Re Conc Pier Cap	1848	98.82	0	.	22	1.18	0	.	1870 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	0	.	22	100	0	.	22 ft

Element Inspection Notes:

234/4 CS3 1080 = Pier 6 cap at Beam 6-10 in the top north edge has a 10in. x 3in. x 1/2in. spall. (1FT)

CS3 1080 = Pier 8 cap at Beam 8-6 in the top north edge has a 1ft. x 4in. x 1in. spall. (1FT)

CS3 1080 = Pier 9 cap, top south edge under Beam 8-9, has a 1ft. x 4in. x 1in. spall. (1FT)

CS3 1080 = Pier 9 cap, top north edge near Beam 9-5 has a 1ft. x 6in. x 1in. spall - NEW (1FT)

CS3 1080 = Pier 9 cap, top north edge under Beam 9-8 has two spalls up to 1ft. x 6in. x 1in. - NEW (2FT)

CS3 = Pier 30, 31, 32 and 33 caps have unsound repairs in the bottom face between Columns 1 and 2 up to 4ft. x 2ft. Refer to photo 6. P3WO (16FT)

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PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair delaminations up to 4ft. x 2ft. in bottom face of Pier 30 through 33 caps. 12LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will be repeated in this report.

1080/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8298 / 4	Pile Jacket Bare	73	100	0	.	0	.	0	.	73 (EA)
0	520 / 4	Conc Re Prot Sys	2944	100	0	.	0	.	0	.	2944 sq.ft

Element Inspection Notes:

8298/4 NOTE: The following Piles have had 3ft. to 4ft. high, 30in. square jackets installed just below the footer:
Piles 5-4, 6-2, 8-18, 9-8, 10-7, 10-18, 11-3, 11-5, 14-2, 14-3, 14-5, 14-8, 14-10, 14-12, 14-18, 15-2, 15-3, 15-5, 15-8, 15-14, 15-15, 15-17, 15-8, 20-9, 20-10, 22-3, 23-1, 23-4, 23-5, 23-6, 23-14, 23-17, 23-18, 24-3, 25-5, 25-10, 25-13, 25-16, 25-17, 26-2, 26-3, 26-9, 26-10, 26-11, 26-12, 26-18, 27-4, 29-5, 29-7, 29-10, 29-13, 29-14, 29-16, 29-17, 29-18, 30-1, 30-2, 30-4, 30-5, 30-6, 30-11, 30-13, 30-15, 31-1, 31-2, 31-5, 31-9, 31-16, 31-17, 31-18, 32-2 and 33-12.
Pile 9-1 is jacketed 12in. below the footer with a 24in. square x 6ft. long fiberglass formed jacket.

The following was noted by the underwater inspectors:
CS1 = Anodes have 80% section remaining.

520/4 CS1 = Anodes have 80% or more remaining.

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8387 / 4	PS Fender/Dolphin	309	97.17	0	.	9	2.83	0	.	318 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	0	.	9	100	0	.	9 ft

Element Inspection Notes:

8387/4 The following was noted by the underwater inspectors:
CS3 1080 = Nine piles have corner spalls up to 10in. x 4in. x 3/4in. (9FT)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair conduit attached to the south fender walkway. 4MH

CORRECTIVE ACTION EVALUATION:
The corrective action noted above has been completed.
Although not recommended for corrective action, the lower connecting hardware has been replaced.
Although not recommended for corrective action, the lower wale has been replaced.

1080/4 Refer to Parent Element

SUBSTRUCTURE : Substructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty

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0	8396 / 4	Other Abutment Slope Protection	4069	100	0	.	0	.	0	.	4069 (SF)

Element Inspection Notes:

8396/4 Note: This element represents the sand-cement rip rap bag slope protection at Abutment 34 only. No slope protection is present along Abutment 1.

INCIDENTAL:
The joints of the abutment slope protection has intermittent areas of vegetation.

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	311 / 4	Moveable Bearing	0	.	0	.	316	100	0	.	316 each
0	1020 / 4	Connection	0	.	0	.	16	100	0	.	16 each
0	2210 / 4	Movement	0	.	0	.	300	100	0	.	300 each
0	8516 / 4	Painted Steel	0	.	0	.	632	100	0	.	632 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	0	.	632	100	0	.	632 sq.ft

Element Inspection Notes:

311/4 CS3 2210 = The steel bearing assemblies have have restricted movement due to painted over corrosion - NEW. Refer to photo 7. P3WO (300EA)

The bearings at Beams 9-1 through 9-7 at Pier 9 are misaligned up to 2in. north; however, limits are tolerable and there is no visible distress to the assemblies. Refer to photo 8.

CS3 1020 = The bearing assemblies and anchor bolts at Piers 17 and 19 have recurring fretting corrosion, are skewed and the nuts are not seated. Refer to photo 9. P3WO (16EA)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair loose bearing assembly anchor bolts at Piers 17 and 19 and unseated nuts.

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has not been completed. A recommendation will be repeated in this report.

1020/4 Refer to Parent Element

2210/4 Refer to Parent Element

8516/4 CS3 3440 = The paint on the bearing assemblies and hardware has limited effectiveness due to corrosion. (632SF)

3440/4 Refer to Parent Element

SUPERSTRUCTURE : Bearings

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	313 / 4	Fixed Bearing	0	.	0	.	316	100	0	.	316 each
0	1020 / 4	Connection	0	.	0	.	16	100	0	.	16 each
0	2210 / 4	Movement	0	.	0	.	300	100	0	.	300 each
0	8516 / 4	Painted Steel	0	.	0	.	632	100	0	.	632 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	0	.	632	100	0	.	632 sq.ft

Element Inspection Notes:

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313/4 CS3 2210 = The steel bearing assemblies have have restricted movement due to painted over corrosion - NEW. Refer to photo 10. P3WO (300EA)

CS3 1020 = The anchor bolts have recurring corrosion and sheared/missing bolts at Piers 16 and 18. Refer to photo 11. (16EA)

1020/4 Refer to Parent Element

2210/4 Refer to Parent Element

8516/4 CS3 3440 = The paint on the bearing assemblies and hardware has limited effectiveness due to corrosion. (632SF)

3440/4 Refer to Parent Element

SUPERSTRUCTURE : Other Elements

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8572 / 4	Conduit & Junction Box	0	.	1	100	0	.	0	.	1 (EA)
0	1000 / 4	Corrosion	0	.	1	100	0	.	0	.	1 (EA)

Element Inspection Notes:

8572/4 Note: This element represents the conduit and junction boxes on the access platforms at Piers 17 left and 18 right.

CS2 1000 = The junction boxes have light intermittent surface corrosion. (1EA)

1000/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	107 / 4	Steel Opn Girder/Beam	0	.	1976	100	0	.	0	.	1976 ft
0	1000 / 4	Corrosion	0	.	1976	100	0	.	0	.	1976 ft
0	8516 / 4	Painted Steel	0	.	15808	100	0	.	0	.	15808 sq.ft
0	3440 / 4	Eff (Stl Protect Coat)	0	.	15808	100	0	.	0	.	15808 sq.ft

Element Inspection Notes:

107/4 Note: This element represents the steel beams in Spans 16, 17 and 18.

CS2 1000 = The beams have intermittent areas of painted-over pitting up to 1/8in. deep, primarily in the bottom flange and cover plates. (1976FT)

1000/4 Refer to Parent Element

8516/4 CS2 3440 = The paint on the beams is substantially effective. (15808SF)

3440/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	109 / 4	Pre Opn Conc Girder/Beam	19588	98.62	97	0.49	177	0.89	0	.	19862 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	97	46.86	110	53.14	0	.	207 ft
0	1110 / 4	Cracking (PSC)	0	.	0	.	67	100	0	.	67 ft

Element Inspection Notes:

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109/4 Note: The beam spalls in the haunches at the sole plates are documented under this element.

CS2 1080 = The beams have intermittent spalls of various sizes throughout. Refer to the additional Element Notes and Table 3 with this report for sizes and locations of deficiencies. P3WO (97FT)

CS3 1080 = The beams have intermittent spalls/delaminations, some with exposed steel. Refer to the additional Element Notes and Table 3 with this report for sizes and locations of deficiencies. Refer to photos 12 and 13. P3WO (110FT)

CS3 = Cracks were observed in several of the beams. Refer to the additional Element Notes and Table 3 with this report for sizes and locations. (67FT).

INCIDENTAL:
Several beams and diaphragms in Spans 1 and 34 have graffiti, which is not visible by the general public. Refer to photo 14.
The beam end diaphragms have intermittent spalls/delamination some with exposed steel. Refer to the additional Element Notes and Table 3 with this report for sizes and locations. P3WO

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Refer to CS3 in Table 2 of the 01-26-2016 report for size and location of beam deficiencies. 10LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been partially completed. A recommendation will be repeated for all CS2 and CS3 beam deficiencies.

1080/4 Refer to Parent Element

1110/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	331 / 4	Re Conc Bridge Railing	6656	99.3	41	0.61	6	0.09	0	.	6703 ft
0	1080 / 4	Delamination/Spall/Patched Area	0	.	41	87.23	6	12.77	0	.	47 ft

Element Inspection Notes:

331/4 Note: This element represents the left and right concrete post and beam bridge rails and the Jersey type median barrier.

CS1 = The median barrier and bridge rails have intermittent cracks up to 1/32in. wide.

CS2 1080 = There are spalls up to 4in. x 3in. x varying in depths up to 1in. throughout. (41FT)

CS3 1080 = Bridge Rail 3-7 right has a 3ft. x 4in. x 1in. spall/scrape in the west face. (3FT)

CS3 1080 = Bridge Rail Post 17-14 left has a 7in. x 4in. x 3/4in. spall in the west face. (1FT)

CS3 1080 = The east face of Bridge Rail 18-6 left has a 10in. x 3in. x 3/4in. spall in the east face. (1FT)

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CS3 1080 = Bridge Rail 32-9 right has a 8in. x 4in. x 1-1/2in. spall in the southeast corner. (1FT)

PREVIOUS RECOMMENDED CORRECTIVE ACTION:
Repair spalls and delaminations in median barrier in Spans 16 18 and 32. 4LF

CORRECTIVE ACTION EVALUATION:
The recommendation noted above has been completed.

1080/4 Refer to Parent Element

SUPERSTRUCTURE : Superstructure

Str Unit	Elem/Env	Description	Qty1	%1	Qty2	%2	Qty3	%3	Qty4	%4	T Qty
0	8580 / 4	Navigational Lights	1	100	0	.	0	.	0	.	1 (EA)

Element Inspection Notes:

8580/4 Note: This element represents the one system comprised of four navigational lights on the fender system, the two attached to the structure above center channel.
Anchorages for the center navigational lights unknown.
The conduit and wiring have been removed and solar powered nav lights have been installed.

Total Number of Elements*: 20
*excluding defects/protective systems

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Inspector Recommendations

UNIT: 0 **DECKS**

ELEMENT/ENV: 12 / 4 Re Concrete Deck **ELEM CATEGORY: Decks/Slabs**

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 376 sf	Element Estimated Quantity: 138527 sq.ft	3

WORK ORDER RECOMMENDATION:

Refer to 1-25-18 report & Table 1 in the Addendum for 1080 defect deck repairs. 100MH

UNIT: 0 **MISCELLANEOUS**

ELEMENT/ENV: 8290 / 4 Channel **ELEM CATEGORY: Channel**

CONDITION STATE			PRIORITY
2	MMS Quantity: 20 mh	Element Estimated Quantity: 1 (EA)	3

WORK ORDER RECOMMENDATION:

Repair spalls delaminations and unsound repairs in the north seawall cap. 20MH

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Inspector Recommendations

UNIT: 0 **SUBSTRUCTURE**

ELEMENT/ENV: 205 / 3 Re Conc Column **ELEM CATEGORY: Substructure**

CONDITION STATE			PRIORITY
1 , 3	MMS Quantity: 80 mh	Element Estimated Quantity: 96 each	3

WORK ORDER RECOMMENDATION:

Repair DEL and SPLS in Columns 5-2 6-1 7-2 8-1 8-3 9-2 18-3 19-1 28-1 29-1 29-2 and 33-1. 80MH

ELEMENT/ENV: 220 / 4 Re Conc Pile Cap/Ftg **ELEM CATEGORY: Substructure**

CONDITION STATE			PRIORITY
2 , 3	MMS Quantity: 150 mh	Element Estimated Quantity: 846 ft	3

WORK ORDER RECOMMENDATION:

Repair 29 CS2 and CS3 deficiencies listed in Table 2 of the 01-25-2018 report. 150MH

ELEMENT/ENV: 227 / 4 Re Conc Pile **ELEM CATEGORY: Substructure**

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 100 mh	Element Estimated Quantity: 486 (EA)	3

WORK ORDER RECOMMENDATION:

Repair Piles 5-14 6-13 7-15 9-15 9-18 12-4 13-15 16-12 and 31-14. 100MH

ELEMENT/ENV: 234 / 4 Re Conc Pier Cap **ELEM CATEGORY: Substructure**

CONDITION STATE			PRIORITY
1 , 3	MMS Quantity: 40 mh	Element Estimated Quantity: 1870 ft	3

WORK ORDER RECOMMENDATION:

Repair unsound repairs in the bottom face of Pier 30 through 33 caps. 40MH

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Inspector Recommendations

UNIT: 0 **SUPERSTRUCTURE**

ELEMENT/ENV: 109 / 4 Pre Opn Conc Girder/Beam **ELEM CATEGORY: Superstructure**

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 400 mh	Element Estimated Quantity: 19862 ft	3

WORK ORDER RECOMMENDATION:

Repair beam deficiencies listed in Table 3 of the 01-25-2018 report. 400MH

CONDITION STATE			PRIORITY
1 , 2 , 3	MMS Quantity: 10 mh	Element Estimated Quantity: 1 ft	3

WORK ORDER RECOMMENDATION:

Repair beam ends with exposed steel in Table 3.

ELEMENT/ENV: 311 / 4 Moveable Bearing **ELEM CATEGORY: Bearings**

CONDITION STATE			PRIORITY
3	MMS Quantity: 100 mh	Element Estimated Quantity: 316 each	3

WORK ORDER RECOMMENDATION:

Clean and paint all bearing assemblies. 100MH

ELEMENT/ENV: 313 / 4 Fixed Bearing **ELEM CATEGORY: Bearings**

CONDITION STATE			PRIORITY
3	MMS Quantity: 100 mh	Element Estimated Quantity: 316 each	3

WORK ORDER RECOMMENDATION:

Clean and paint all bearing assemblies. 100MH

Structure Notes

TRAFFIC RESTRICTION: According to the load rating analysis dated 6/10/08, posting is not required. This bridge is not posted.

Bridge inventoried from south to north.

Bridge No. 130083 is south and Bridge No. 130002 is north of this Bridge No. 130053.

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Structure ID: 130053

DISTRICT: D1 - Bartow **INSPECTION DATE: 1/25/2018 JNJW**

INSPECTION NOTES: JNJW 1/25/2018

LOAD CAPACITY EVALUATION:
The findings of this inspection reveal no reason to warrant a new analysis; therefore, the current load rating results still govern.

NON-STRUCTURAL ITEMS:

APPROACH BARRIERS:
The south and north approach median barriers have full height vertical cracks with associated spalls up to 6in. x 2in. x 1in.

APPROACH GUARDRAILS:
Approach guardrail panels at the southeast, northwest and northeast corners of the bridge have minor impact damage and areas of light to moderate corrosion.

UTILITIES:
The utility junction box attached to Abutment 1 backwall on the right side of Beam 1-10 is missing a plug, the conduit is separated, and the box and hardware have light corrosion.

The following light poles are missing: Right side at Pier 2, left side at Piers 4, 8, 16, and right side at Piers 17 and 33. Refer to photo 15. REPAIR

The light pole at Pier 25 right side has an impact dent and tear at the base, and the top cap is loose. Refer to photo 16. REPAIR

Utility conduits on the right overhang are sagging at Piers 5 and 11. Refer to photo 17. REPAIR

The utility conduit at the right over hang in Span 13 is separated from the pull elbow - NEW. Refer to photo 18. REPAIR

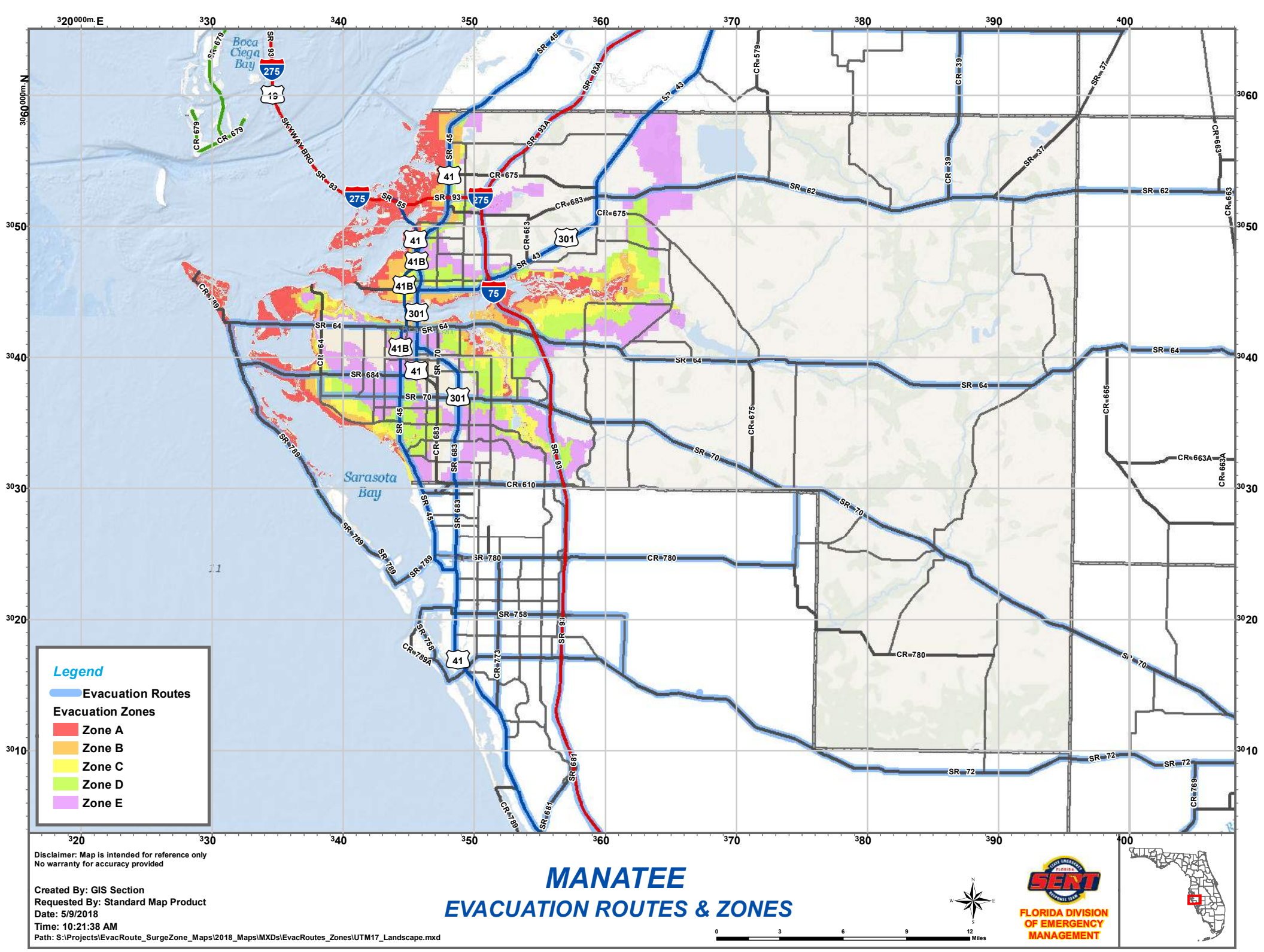
Element 8563 was deleted during this inspection due to removal of the access ladders and platforms from the structure.

The following elements were inspected underwater by the divers:
8290 Channel
220 Re Conc Sub Pile Cap/Ftg
205 Re Conc Pile - Piers 5 through 16 and 19 through 33 each with eighteen 20in. piles and the six columns at Piers 17 and 18
8298 Pile Jacket/Bare
8387 P/S Fender/Dolphin

Sufficiency Rating Calculation Accepted by knkcarl at 3/7/2018 9:10:29 AM

APPENDIX E

MANATEE COUNTY EVACUATION ROUTES & ZONES



Disclaimer: Map is intended for reference only
No warranty for accuracy provided

Created By: GIS Section
Requested By: Standard Map Product
Date: 5/9/2018
Time: 10:21:38 AM
Path: S:\Projects\EvacRoute_SurgeZone_Maps\2018_Maps\MXDs\EvacRoutes_Zones\UTM17_Landscape.mxd

MANATEE
EVACUATION ROUTES & ZONES

0 3 6 9 12 Miles

FLORIDA DIVISION OF EMERGENCY MANAGEMENT

during construction. It is anticipated that detours via US 41 Business (Green Bridge) instead of SR 55 and the DeSoto Bridge could result in additional travel times ranging from approximately 12 to 30 minutes, depending on the time of day.

7.18 Constructability

The construction of the northbound half of the new bridge will start independently from the existing bridge, with a shift of approximately 41 feet to the east. This adjustment creates a 10-foot space between the new northbound section and the existing bridge, allowing traffic to flow normally on the existing bridge and roadway while the new bridge is built without any disruption. Once the northbound half is completed, temporary striping will be applied to provide four lanes — two in each direction — enabling traffic to move to the new bridge. Subsequently, the old DeSoto Bridge will be dismantled, and the southbound half of the new bridge will be constructed and connected to the northbound section. See **Appendix A** for the construction phasing of the proposed bridge.

Traffic shifts, temporary pavement, and overbuild will be utilized to construct and maintain landside traffic patterns. Construction of the shared-use paths and sidewalks will be incorporated in the phasing plans.

7.19 Construction Impacts

This project includes several features that need to be protected during construction:

Palmetto Estuary Preserve

The City of Palmetto acquired the land as part of a land swap in the 1990s for the construction of Riviera Dunes, located on the west side of SR 55. The area was ecologically restored and has a 1.6-mile-long trail used for bird watching, hiking, and walking.

Bradenton Riverwalk and Bradenton Riverwalk Skatepark

The skatepark, spanning 15,000 square feet, is situated partially beneath the DeSoto Bridge adjacent to the Manatee River. It features a variety of structures including multiple ledges, hips, manual pads, stairs, and rails. Additionally, the park contains three granite elements, moguls, a mini bowl with a vertical wall, and a pool complete with tile and pool coping.

Boat Ramp

There is an existing boat ramp on the east side on the north end of the DeSoto Bridge. This unofficial boat ramp has picnic tables, and trash cans. The boat ramp is used periodically throughout the day.

7.20 Special Features

MSE retaining walls will be used to minimize the roadway footprint north of the bridge, thereby eliminating wetland impacts and reducing impacts to the access road to the Palmetto Estuary Preserve.

7.21 Utilities

To be completed after update is available.

7.22 Cost Estimates

Preliminary project costs for construction, preliminary engineering (PE), right-of-way, and construction, engineering and inspection were developed for the Preferred Alternative and are included in **Table 7-1**. The project's long-range estimate has been included within **Appendix D**, which summarizes the design and construction cost for the Preferred Alternative.

Table 7-1 - Preliminary Cost Estimate for the Preferred Alternative

Evaluation Factors	Estimate Project Costs (2024 $)
Right-of-Way for Roadway	$ 400,000.00
Wetland Mitigation	$ 66,400.00
Final Design and Construction	$ 152,000,000.00
Construction Engineering and Inspection	$ 21,600,000.00
Preliminary Estimate of Total Project Cost	$ 180,166,400.00

*Source: FDOT Long-Range Estimating System. Preliminary Estimate of Total Project Cost does not include maintenance costs; implementing the No-Build Alternative would result in higher maintenance costs.

APPENDIX G: Drainage Map East Alternative

Drainage Map for East Alternative