SECTION 106 EVALUATION AND DETERMINATION OF EFFECTS CASE STUDY REPORT OF VENETIAN CAUSWAY FROM NORTH BAYSHORE DRIVE IN THE CITY OF MIAMI TO PURDY AVENUE IN THE CITY OF MIAMI BEACH

MIAMI-DADE COUNTY

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Prepared for:

Florida Department of Transportation
District 6
1000 NW 111th Avenue
Miami, Florida 33172

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EXECUTIVE SUMMARY

At the request of the Florida Department of Transportation (FDOT), District 6, Janus Research prepared a Section 106 Evaluation and Determination of Effects Case Study Report for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach, Miami-Dade County, Florida. In accordance with the provisions of Section 106 of the *National Historic Preservation Act (NHPA) of 1966* (Public Law 89-665, as amended), as implemented by 36 CFR 800 -- *Protection of Historic Properties* (incorporating amendments effective August 5, 2004), this case study report documents potential effects of the proposed improvements to the *National Register of Historic Places* (National Register)–listed and eligible resources identified during the *Cultural Resources Assessment Survey (CRAS) for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach* (Janus Research 2019).

The 2019 CRAS resulted in the identification of three significant resources: Collins Canal (8DA11375), Terrace Towers (8DA11754), and the Venetian Islands Resource Group (8DA14395). This report was prepared as part of a project studying several alternatives for the rehabilitation or replacement of the twelve historic Venetian Causeway bridges, which are all contributing to the Venetian Islands Resource Group (8DA14395). In a letter dated June 25, 2019, the State Historic Preservation Officer (SHPO) concurred with the findings of the 2019 CRAS (Appendix A).

Various alternatives were evaluated during the PD&E Study. The No-Action and TSM&O Alternatives would result in no effect to the significant resources. The Rehabilitation Alternatives would result in impacts to the significant resources and their characteristic elements and features, and they would adversely affect the contributing bridges and therefore the Venetian Islands Resource Group. The preferred alternative includes Replacement Alternative 7 for the fixed bridges, Railing Alternative T1, and Replacement Alternative M4 for the moveable bridge. This alternative will also result in an adverse effect the contributing bridges and the Venetian Islands Resource Group.

During the course of this project, Section 106 consultation took place during three Cultural Resources Committee (CRC) meetings on September 24, 2014, May 14, 2015, and March 6, 2018 with the SHPO, United States Coast Guard, FDOT, Cities of Miami and Miami Beach, Miami-Dade County, Dade Heritage Trust, Miami Design Preservation League, and the consultant project team. These meetings focused on the Section 106 process, proposed alternatives, the historic resources, and potential effects.

Based upon the Section 106 process, potential effects that the improvements may have on the identified National Register resources were evaluated. Subsequently, this report includes a summary description of the project and a summary description of the significant historic resources. The Criteria of Adverse Effect, as defined in 36 CFR Part 800.5, were applied to the significant historic resources and the subsequent analysis of effects is also discussed in this report. In consideration of available project information, the Preferred Alternative will have no

adverse effect on Collins Canal (8DA11375) or Terrace Towers (8DA11754). Due to the removal of the bridges, the alternative will have an adverse effect on the Venetian Islands Causeway Resource Group. This adverse effect finding is primarily related to the bridge structures and will not affect other contributing resources or elements of the resource group.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

INTRODUCTION

At the request of the Florida Department of Transportation (FDOT), District 6, Janus Research conducted a Section 106 Evaluation and Determination of Effects Case Study Report for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach, Miami-Dade County, Florida. In accordance with the provisions of Section 106 of the *National Historic Preservation Act (NHPA) of 1966* (Public Law 89-665, as amended), as implemented by 36 CFR 800 -- *Protection of Historic Properties* (incorporating amendments effective August 5, 2004), this case study report documents potential effects of the proposed improvements to the *National Register of Historic Places* (National Register)–eligible resources identified during the *Cultural Resources Assessment Survey (CRAS) for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach* (Janus Research 2019).

In February of 2019, the CRAS was prepared and resulted in the identification of three significant resources: Collins Canal (8DA11375), Terrace Towers (8DA11754), and the Venetian Islands Resource Group (8DA14395). This report was prepared as part of a project studying several alternatives for the rehabilitation or replacement of the twelve historic Venetian Causeway bridges, which are all contributing to the Venetian Islands Resource Group (8DA14395). In a letter dated June 25, 2019, the SHPO concurred with the findings of the 2019 CRAS (Appendix A).

Figure 1 depicts the general location of the project area, which is in Sections 31, 32, and 33 of Township 53 South, Range 42 East on the Miami (1994) United States Geological Survey (USGS) quadrangle map.

Based upon the Section 106 process, potential effects that the improvements may have on the identified National Register historic resources were evaluated. Subsequently, this report includes a summary description of the project and a summary description of the significant historic resources. The Criteria of Adverse Effect, as defined in 36 CFR Part 800.5, were applied to the significant historic resources and the subsequent analysis of effects is also discussed in this report.

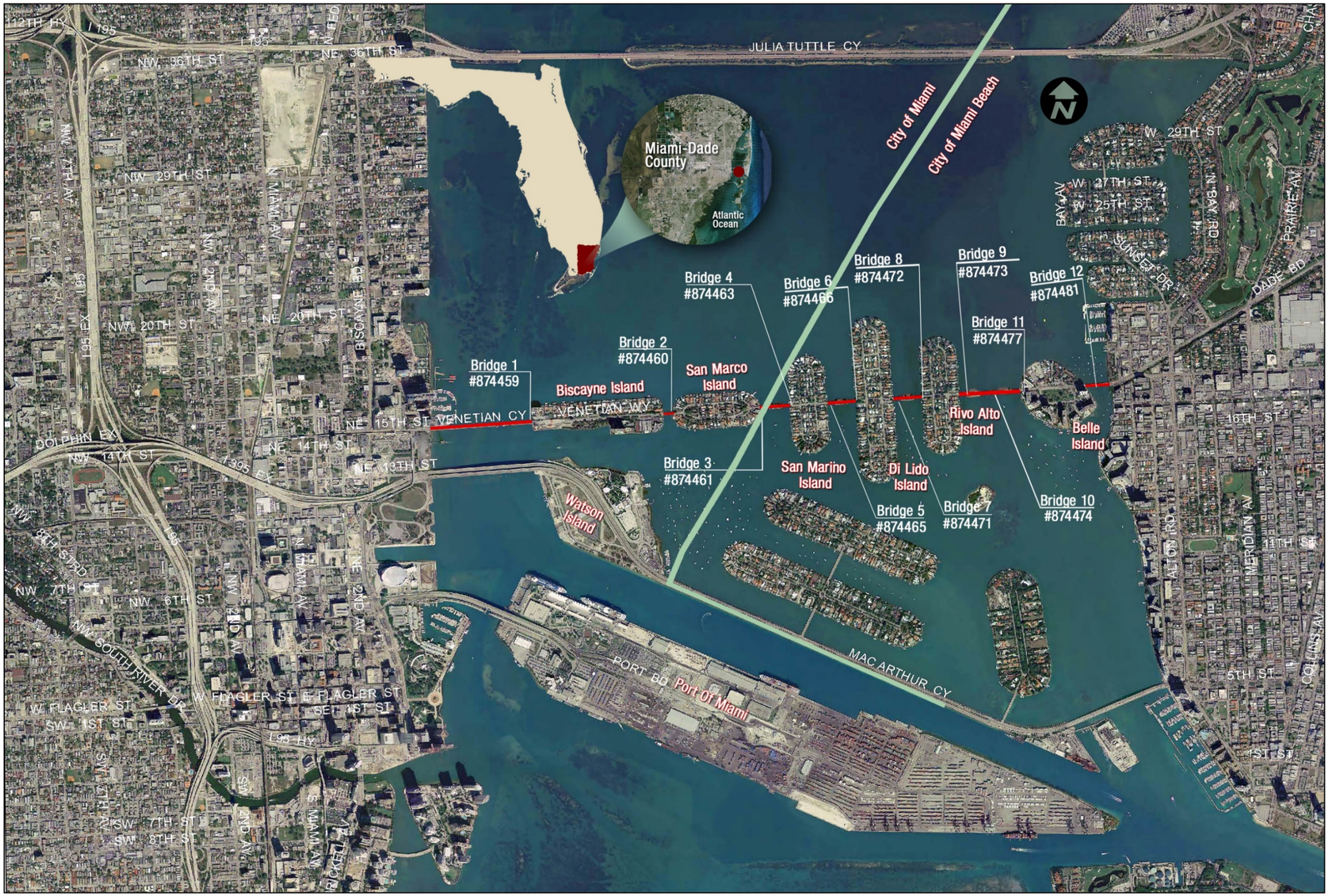


Figure 1: General Location of the Project Area

Purpose and Need

The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges (ten low-level fixed spans and two movable bascules) through potential alternatives such as replacement or rehabilitation. The improvements are anticipated to meet the following identified needs:

Structural and Functional Deficiencies

The Venetian Causeway is classified as an urban minor arterial in Miami-Dade County and is a significant transportation route connecting the City of Miami with the City of Miami Beach. The bridges along the Venetian Causeway were originally built in 1926 with an anticipated design life of 50 years. The bridges have exceeded their design life by over 40 years and, in some cases, have been classified as functionally obsolete. Due to the accelerated state of deterioration, inspection dates are being increased from the biennual minimum required by Federal Highway Administration (FHWA) to bi-annual inspections. Bridge Inspection Reports (conducted between October 2018 and January 2019) yielded sufficiency ratings between 16 and 67.6 on a scale of 100.0 for the various bridges.

The superstructure of each of these bridges displays advanced corrosion with section loss of several members that is significant enough to warrant supplemental supports and/or load restrictions. The bridge inspection reports also cite:

- Under-deck cracks,
- Failure of compression joints,
- Delamination and cracks on pier walls and abutments,
- Corrosion and section loss of substructure members,
- Major deficiencies in the bridge tender's facility,
- Major deck pavement deterioration,
- Substandard signing,
- Pavement marking and signalization, and
- Major Americans with Disabilities Act (ADA) deficiencies on both sidewalks along the bridges.

Project Description

The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges (ten low-level fixed spans and two movable bascules) through potential alternatives such as replacement or rehabilitation. The project is guided by the Project Development and Environment (PD&E) Manual, Section 339.155(6)(b) Florida Statutes, Executive Orders 11990 and 11988, Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the National Environmental

Policy Act (NEPA) and 23 CFR 771. Successful completion of the PD&E process must precede the formal decision to proceed with the preferred improvement.

The Venetian Causeway is approximately 2.5 miles long and is primarily a two-lane undivided facility that provides a major link between the City of Miami and the City of Miami Beach in Miami-Dade County, Florida. The causeway includes ten fixed span bridges and two bascule leaf span bridges over the Intracoastal Waterway (bridge numbers 874459, 874460, 874461, 874463, 874465, 874466, 874471, 874472, 874473, 874474, 874477, and 874481) extending from North Bayshore Drive (City of Miami) to Purdy Avenue (City of Miami Beach). The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges through potential alternatives such as replacement or rehabilitation.

The causeway bridges are mainly short span reinforced concrete arch beam bridges. Each bridge section consists of two 12-ft. travel lanes with 4-ft. bike lanes and 4-ft. sidewalks on each side. In 1996, the bridges underwent a major rehabilitation consisting of gunite repairs to the superstructure arch beams and full replacement of all sidewalks and railings. The western bascule bridge (Bridge 1) and its spans 17 through 41 were also replaced. Presently, the bridges exhibit severe deterioration because of their proximity to the very aggressive marine environment. Due to new design codes, these bridges do not meet current design and safety requirements. The corridor is tolled and owned and operated by Miami-Dade County.

Alternatives were developed and evaluated based on the ability of each to meet the project needs. The development and analysis of the alternatives included No-Build and several Build Alternatives (Rehabilitation or Replacement). Table 1 lists the alternatives that are being studied during the PD&E Study.

The Rehabilitation Build Alternative was developed by combining a Fixed Bridge Rehabilitation Alternative with the corresponding Bascule Bridge Rehabilitation Alternative. The Replacement Build Alternative was developed by combining a Bridge Typical Section Alternative with a Fixed Bridge Alternative and a Movable Bridge Alternative.

The Build Alternatives only considered bridges 2 through 12. Bridge 1 has already been replaced and was not included for evaluation because it is not part of this current undertaking.

Table 1: No-Build and Build Alternatives (Rehabilitation or Replacement)

NO-BUILD ALTERNATIVES	
1	**No-Action** – The bridges remain as is with routine maintenance only.
2	**Transportation Systems Management & Operations (TSM&O)** – The bridges remain as is with routine maintenance only. Transit and other operational improvements would be made to facilitate transportation along the corridor.
BUILD ALTERNATIVES - REHABILITATION	
3	**Fixed Bridge Rehabilitation w/out Beam Strengthening** – Rehabilitation of the fixed bridges to improve safety and load carrying capacity.
4	**Fixed Bridge Rehabilitation with Beam Strengthening** – Rehabilitation of the fixed bridges to improve safety and load carrying capacity. Includes beam strengthening to achieve a higher load carrying capacity.
M1	**Bascule Bridge Rehabilitation** – Rehabilitation of the eastern movable bridge to improve safety and achieve a higher load carrying capacity.
BUILD ALTERNATIVES - REPLACEMENT	
Typical Sections – The replacement of the bridges would require that a new typical section be selected along with the railing type.	
T1	**Venetian Railing** – This railing replicates the existing railing on the bridges, but may not satisfy the current standards for railings.
T2	**Wyoming Railing TL-4 at coping** – This railing is different from the existing railing, but it allows views of the water from the bridges and satisfies the current standards for railings.
T3	**Wyoming Railing TL-3 at curb and Original Venetian Railing at Coping** – This alternative places the Wyoming railing between the bike lane and the sidewalk with a replication of the original Venetian railing at the bridge coping. This would allow the traffic railings on the bridges to meet current standards, yet maintain the Venetian Railing on the outside of the sidewalk at the bridge coping.
T4	**Wyoming Railing TL-3 at curb and Custom Railing at Coping** – This alternative places the Wyoming railing between the bike lane and the sidewalk with a new pedestrian railing at the bridge coping. This would allow the traffic railings on the bridges to meet current standards.
Fixed Bridge Alternatives – The replacement of the bridges would require that the structural system for the fixed bridges be selected.	
5	**Tunnel** – This alternative replaces the movable bridges with a tunnel that maintains navigational traffic and connects to the residential islands.
6	**High-Level Fixed Bridge** – This alternative replaces the movable bridges with a high-level bridge that maintains navigational traffic.
7	**Arched Beams** – This alternative provides low-level bridges, replicates the arched beams and maintains the look of the existing bridges.
8	**Florida I Beams (FIB) with Arched Fascia** – This alternative provides low-level bridges, replicates the existing arched beams at the fascia of the bridge and uses FIB for the interior beams.
9	**Florida I Beams (FIB)** – This alternative provides low-level bridges, uses FIB for all the beams.
10	**Cast-in-Place Slab (Flat/Variable Depth)** – This alternative provides low-level bridges that use a cast-in-place deck that can have either a flat profile or a variable profile that approximates an arch beam.
11	**Infill Spoil Islands** – It was suggested during the Alternatives Public Workshop that removing the existing bridges and filling to create a long spoil island that would bridge the gap to the residential island be evaluated as an alternative.
12	**Value Engineering Alternative** – This alternative consists of seven alternatives for addressing bridges 2 through 12 and 3 alternatives for the typical section.
Movable Bridge Alternatives – The replacement of the eastern movable bridge would require that the movable bridge type be selected.	
M2	**Swing Bridge** – The existing double leaf bascule bridge (drawbridge) would be replaced with one that pivots around a center support and swings open to allow the passage of boats.
M3	**Vertical Lift Bridge** – The existing double leaf bascule bridge (drawbridge) would be replaced with one that lifts the bridge deck vertically to allow the passage of boats below the raised deck.
M4	**Double Leaf Bascule Bridge** – The existing bridge would be replaced in kind.
M5	**Single Leaf Bascule Bridge** – The existing double leaf bascule bridge (drawbridge) would be replaced with one that has only one leaf instead of two.

Bridge 1 (West Bascule – 874459)

The easternmost spans of this bridge were partially replaced in 1999 and then the westernmost spans were replaced in 2016 in the Emergency Repair Project. As such, the bridge is in good condition. The following repairs should only be considered as part of any future rehabilitation to extend the life of the bridge. These costs were not included in the cost estimates for the project.

Structural:

- Recondition Bascule Span Superstructure (Reduce Maintenance):
    a. Replace Steel Coating System
        i. Use Metalized Primer for Enhanced Corrosion Resistance
    b. Replace Bolts
        i. Use Mechanically Galvanized Structural Bolts for Enhanced Corrosion Resistance
        ii. Use Stainless Steel (Type 316) Fasteners for Miscellaneous Components
- Modify Bascule Span Superstructure (Improve Functionality/Maintenance):
    a. Replace Sidewalk Plates and Install New Curb Assembly (5-ft. Sidewalk)
    b. Install Machinery Room Access Platforms
    c. Modify Bridge Railing to Accept Railing Mounted Span Locks
- Repair Bascule Pier Concrete (Extend Concrete Service Life):
    a. Clean and Seal Cracks
    b. Replace Class 5 Applied Finish Coating
- Recondition Fender System (Reduce Maintenance):
    a. Replace Timber Components with Plastic Marine Lumber
    b. Replace Hardware with Stainless Steel (Type 316) Hardware
    c. Replace Access Ladders and Cages

Mechanical:

- Recondition Hydraulic Cylinder Drive System (Improve Reliability/Reduce Maintenance):
    a. Recondition Hydraulic Cylinders
        i. New Seals, Rod Bearings
        ii. Clean and Polish Rods
        iii. Replace Lubrication Fittings
        iv. Flush and Clean Clevis Assemblies
        v. Replace Flexible Hosing and Fittings
        vi. Recondition Hydraulic Power Units
        vii. Replace Motors and Pumps
        viii. Replace Seals

        ix. Replace Valves
        x. Replace Electronic Controls
        xi. Replace Flexible Hosing and Fittings
        xii. Replace Fluid, Clean and Flush System
    b. Recondition Trunnion Assemblies
        i. Clean and Polish Journal Surfaces
        ii. Replace Lubrication Ports, Flush and Clean Bearings
    c. Properly Balance Spans
    d. Adjust Live Load Shoes
        i. Replace Shims and Hardware
    e. Replace Span Lock Assemblies
        i. Mount in Modified Bridge Railings with Access from Sidewalks

Electrical:

- Replace Electrical Power Distribution System (Improve Reliability/Reduce Maintenance):
    a. New Conduit, Wiring, Junction Boxes, Receptacles, Pier Lighting
        i. Use Improved Materials for Enhanced Corrosion Resistance
    b. Recondition Motor Control Center
    c. New Service Entrance
    d. Recondition Standby Generator and Automatic Transfer Switch
    e. New Grounding and Surge Suppression System
    f. New Submarine Cable Installed in Permanent Duct
- Replace Electrical Control System (Improve Reliability/Reduce Maintenance):
    a. Recondition Control Desk, Control Panels, Relays/PLC
    b. New Limit Switches
- Replace Navigation Lighting (Improve Reliability/Reduce Maintenance)
- Replace Warning Gates and Signals (Improve Reliability/Reduce Maintenance)

Architectural:

- Renovate Control House
    a. Replace Windows and Doors
    b. Install Closed Circuit Television (CCTV) Camera System
    c. Clean and Paint Interior
    d. Replace Flooring

The following evaluation criteria were used to examine the alternatives:

- Ability to satisfy the Purpose and Need for Project
- Project costs
- Right-of-Way (ROW) Required
- Potential Natural, Social and Physical Environmental Impacts
- Section 4(f) as described in 49 U.S.C 303
- Section 106 criteria of the NHPA

Alternatives Considered for Additional Study

The following alternatives shown in Table 2 Viable Alternatives were selected for additional study:

Table 2: Viable Alternatives

NO-BUILD ALTERNATIVES	
1	**No-Action** – The bridges remain as is with routine maintenance only.
2	**Transportation Systems Management & Operations (TSM&O)** – The bridges remain as is with routine maintenance only. Transit and other operational improvements would be made to facilitate transportation along the corridor.
BUILD ALTERNATIVES - REHABILITATION	
4	**Fixed Bridge Rehabilitation with Beam Strengthening** – Rehabilitation of the fixed bridges to improve safety and load carrying capacity. Includes beam strengthening to achieve a higher load carrying capacity.
M1	**Bascule Bridge Rehabilitation** – Rehabilitation of the eastern movable bridge to improve safety and achieve a higher load carrying capacity.
BUILD ALTERNATIVES - REPLACEMENT	
Typical Sections – The replacement of the bridges would require that a new typical section be selected along with the railing type.	
T1	**Venetian Railing** – This railing replicates the existing railing on the bridges, but may not satisfy the current standards for railings.
Fixed Bridge Alternatives – The replacement of the bridges would require that the structural system for the fixed bridges be selected.	
7	**Arched Beams** – This alternative provides low-level bridges, replicates the arched beams and maintains the look of the existing bridges.
Movable Bridge Alternatives – The replacement of the eastern movable bridge would require that the movable bridge type be selected.	
M4	**Double Leaf Bascule Bridge** – The existing bridge would be replaced in kind.

<u>Rehabilitation Alternative 4: Fixed Bridge Rehabilitation with Beam Strengthening</u>

Rehabilitation Alternative 4 would correct physical and design criteria deficiencies of the existing bridges to extend their service life. This rehabilitation alternative includes deck replacement, beam strengthening and foundation strengthening. This alternative was developed in order to maintain the existing bridges in their location without major changes,

and to extend service life by 25 years. Raising and widening the bridge is addressed as part of the replacement alternative as this is not possible with the rehabilitation.

This alternative achieves the established rehabilitation criteria and includes the following:

- Replace the existing 6.5-in. deck with a new higher strength concrete 8.5-in. deck;
- Strengthen the existing foundations by installing new drilled shafts (Figures 2 and 3);
- Foundations designed to resist wave force vulnerability;
- Encase existing and new footings to strengthen the foundations;
- Repair concrete spalls and cracks in the beams and diaphragms;
- Repair jacketed piles;
- Strengthen interior beams by widening by 8-in. on both sides and strengthening exterior beams by widening by 8-in. on the inside face;
- Strengthened beams, cast-in-place deck and strengthened foundation will provide adequate resistance to meet current FDOT/AASHTO (American Association of State highway and Transportation Officials) live load requirements;
- Strengthened foundation to meet the standards for scour resistance, wave force resistance (classified as Extremely Critical) and vessel impact resistance (classified as Critical). Refer to the Bridge Hydraulics/ Design Scour Report dated November 20, 2017;
- Cathodic protection impressed current system for the beams and diaphragms. Refer to Conceptual Cathodic Protection Design for Bridge Superstructure and Substructure Components dated June 15, 2016;
- Bridges to be closed one at a time during construction, and detours to be provided;
- Utility services to be maintained on the bridge during its construction time.

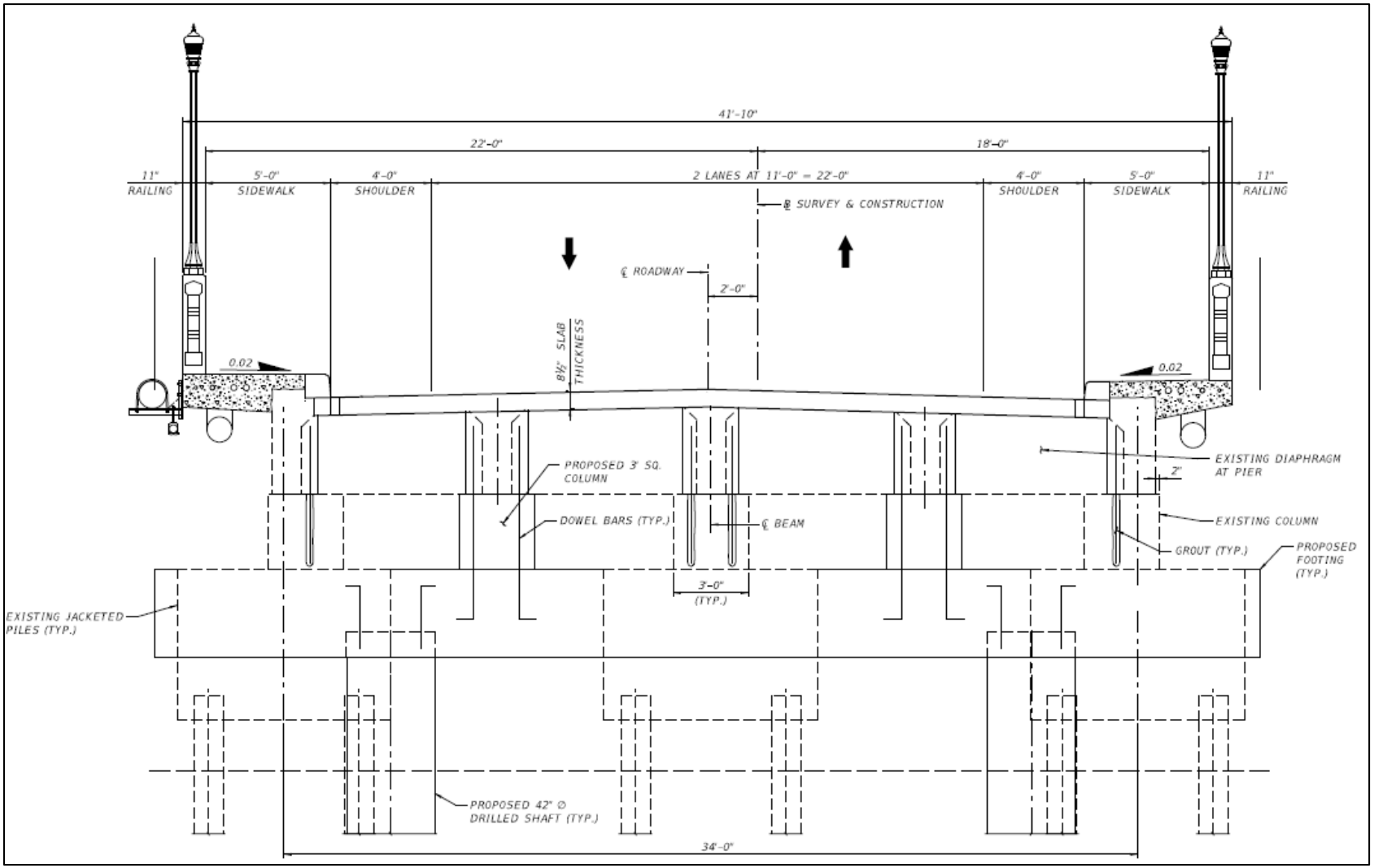


Figure 2: Rehabilitation Alternative 4: Beam and Foundation Strengthening Concept

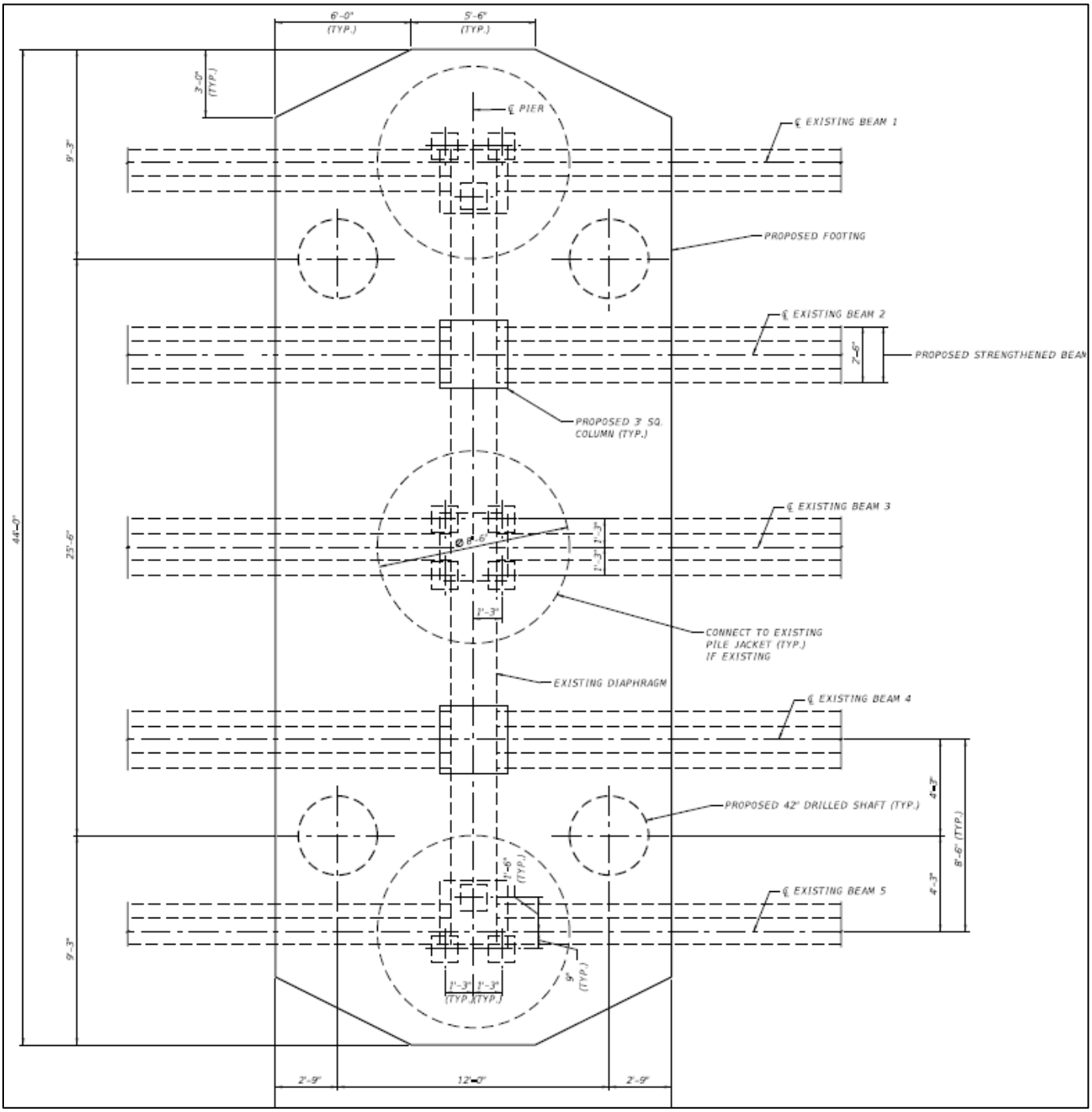


Figure 3: Rehabilitation Drilled Shaft Foundation Strengthening

Estimated ROW Acquisition: None

Anticipated Cost: $43 Million

Rehabilitation Alternative M1: Bascule Bridge Rehabilitation

The rehabilitation of the movable span bridge 10 (Figure 4) includes modifications to the existing bridge to improve safety aspects and eliminate structural, mechanical and electrical deficiencies. The rehabilitation would be designed to extend the life of the bridge for a minimum of 25 years with routine maintenance and periodic repairs. This rehabilitation alternative would not include changes in the horizontal or vertical clearance. The bridge would not be widened; therefore, the existing sidewalks and lane configurations would remain the same.

The following scope of work is recommended for the Rehabilitation Alternatives:

Bridge 10 (East Bascule – 874474)

This bridge was completely rehabilitated in 1999 to include new electrical and mechanical systems as well as new bascule leaves. In 2016, there was also a structural, mechanical, and electrical rehabilitation to improve existing conditions. This rehabilitation would extend the life of the bridge by 25 years.

Structural:

- Recondition Bascule Span Superstructure (Reduce Maintenance):
    a. Replace Bolts. Use Mechanically Galvanized Structural Bolts for Enhanced Corrosion Resistance
    b. Use Stainless Steel (Type 316) Fasteners for Miscellaneous Components
- Modify Bascule Span Superstructure (Improve Functionality/Maintenance):
    a. Replace Sidewalk Plates and Install New Curb Assembly (5-ft. Sidewalk)
    b. Install Machinery Room Access Platforms
- Repair Bascule Pier Concrete (Extend Concrete Service Life):
    a. Remove Surface Concrete to Depth of Reinforcement
        i. Removes Unsound and Contaminated Material
    b. Supplement Deteriorated Reinforcing Steel (as Required)
    c. Install Cathodic Protection System
    d. Use Corrosion Resistant Concrete
    e. Replace Class 5 Applied Finish Coating
- Strengthen Bascule Pier Foundations (Resist Wave Loading):
    a. Remove Bascule Pier Deck and Deck Joints between Curbs
    b. Remove Live Load Support Beams and Concrete Brackets
    c. Temporarily Remove Bascule Leaves
        i. Float-out on Barges
    d. Install Drilled Shafts or Driven Concrete Piles between Footings
    e. Install Steel Sheet Pile Cofferdam with Tremie Concrete Seal and Dewater
        i. Facilitates Construction in the Dry

    f. Install Reinforcing Steel and Anchor to Pier Footings
    g. Form and Pour Concrete Strut between Pier Footings
    h. Cut-off or Remove Steel Sheet Piles
- Construct Counterweight Enclosure (Prevent Submersion of Counterweight/Improve Protection)
    a. Construct Precast Enclosure Slab/Walls
    b. Install Precast between Pier Columns and Seal with Supplemental Forms
    c. Install Tremie Concrete Seal and Dewater
        i. Facilitates Construction in the Dry
    d. Install Reinforcing Steel and Anchor to Pier Columns, Beams and Diaphragms
    e. Form and Pour Concrete Slab and Walls
    f. Reinstall Bascule Leaves
        i. Float-in on Barges
    g. Reconstruct Live Load Shoe Support Beams and Concrete Bracket
- Reconstruct Bascule Pier Deck between Curbs
- Install Galvanized Steel Screen and Gate along Front Wall (Prevent Unauthorized Access)
- Recondition Fender System (Reduce Maintenance):
    a. Replace Timber Components with Plastic Marine Lumber
    b. Replace Hardware with Stainless Steel (Type 316) Hardware
    c. Replace Access Ladders

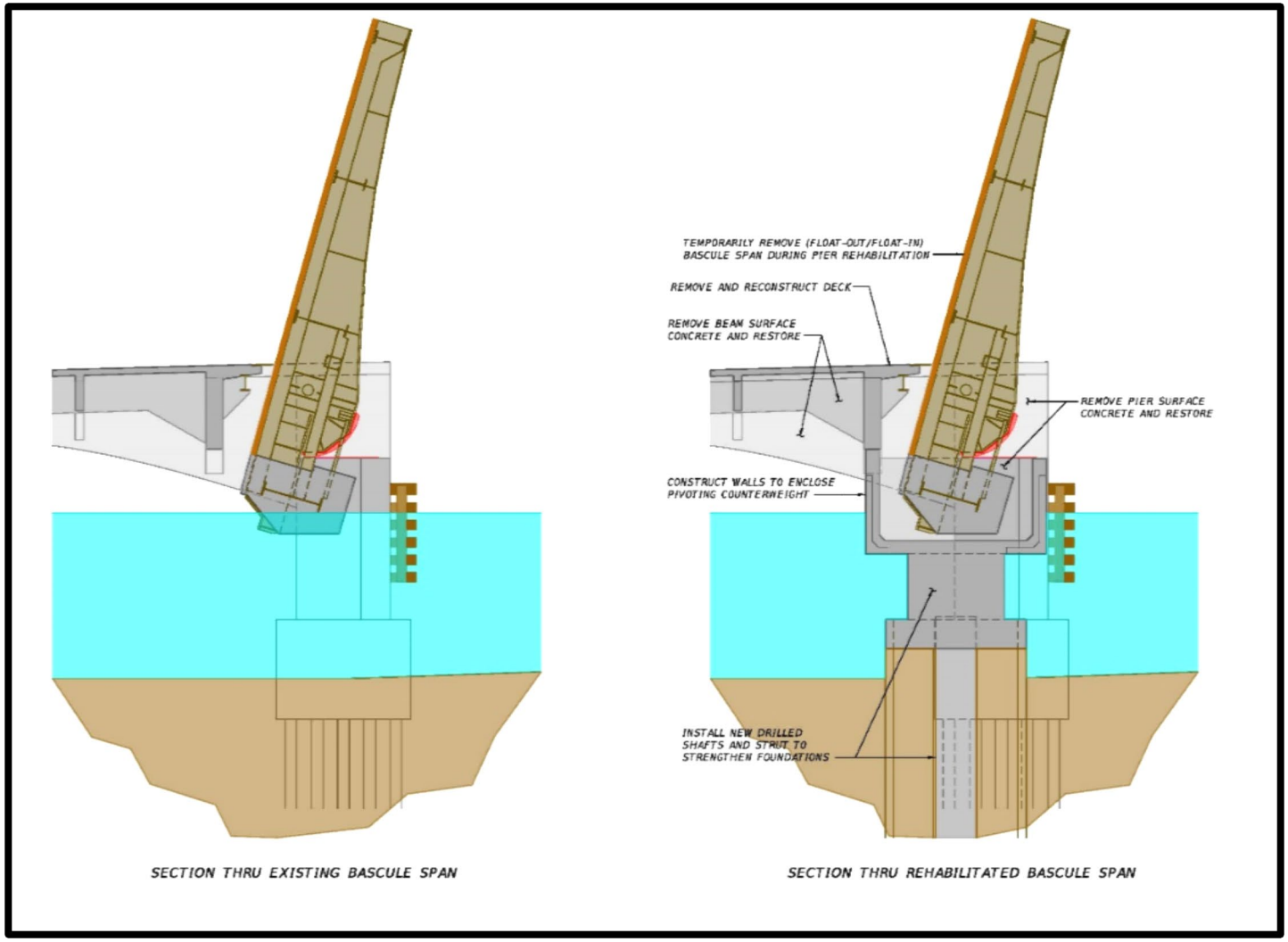


Figure 4: Bridge 10 Bascule Leaf Rehabilitation Concept

Mechanical:

- Recondition Drive Train (Improve Reliability/Reduce Maintenance):
    a. Replace Steel Coating System
        i. Use Metalized Primer for Enhanced Corrosion Resistance
    b. Recondition Gear Boxes
        i. Replace Gaskets, Breathers, and Sight Glasses
    c. Recondition Bearings
        i. Clean and Polish Surfaces
        ii. Replace Lubrication Ports, Flush and Clean

Electrical:

- Replace Electrical Power Distribution System (Improve Reliability and Reduce Maintenance):
    a. New Conduit, Wiring, Junction Boxes, Receptacles, Pier Lighting
        i. Use Improved Materials for Enhanced Corrosion Resistance
    b. New Motor Control Center
    c. New Service Entrance
    d. New Standby Generator and Automatic Transfer Switch
    e. New Grounding and Surge Suppression System
    f. New Submarine Cable Installed in Permanent Duct
- Replace Navigation Lighting (Improve Reliability/Reduce Maintenance)
- Replace Warning Gates and Signals (Improve Reliability/Reduce Maintenance)

Architectural:

- Renovate Control House
    a. Replace Windows and Doors
    b. Install CCTV Camera System
    c. Clean and Paint Interior
    d. Replace Flooring

Anticipated Cost: $9 Million

<u>Replacement Alternative T1: Venetian Railing</u>

Bridge railings are required for the protection of traffic and pedestrians from drop offs and other obstacles and must function to contain and redirect errant vehicles using the structure. Bridge railings are designed to satisfy requirements provided by AASHTO's Guide Specification for Bridge Railings. AASHTO requires railings to have performance characteristics based on a number of factors such as: roadway classification, design speed, average daily traffic, percentage of truck traffic, alignments and bridge conditions.

The T1 alternative maintains the existing Venetian Railing at the coping, and maintains the historical character of the causeway (Figure 5). The existing Venetian Railing is different from the original Venetian Railing. During the 1996 to 1999 Rehabilitation Project, the original railings were replaced with heavier railings designed for vehicular impact consistent with the AASHTO requirements at the time, but not the geometric sphere requirements and the requirement for the posts to be setback behind the railing. The provision of a curbed sidewalk in front of the railing was introduced on both sides of the bridge to mitigate for any geometric deficiencies. The existing Venetian Railing was also used in the 2016 Emergency Repair Project for Bridge 1. The existing Venetian Railing maintains the historic appearance of the causeway. The railing will not comply with all the geometric requirements of AASHTO's Guide Specification for Bridge Railings so a variation or exception will be required.

Figure 5: Replacement Alternative T1 Typical Section

<u>Replacement Alternative 7: Arched Beams</u>

The arched beam superstructure replacement alternative supports the required AASHTO HL-93 load. The structural system mimics the dimensions and appearance of the original structure. The superstructure consists of variable depth arched beams. The variable depth beams are approximately 2-ft. deep at midspan and 4-ft. deep at beam ends (See Figure 6).

Figure 6: Replacement Alternative 7 - Arched Beam Elevation View

The proposed approach span bridge section would be increased 16-ft. from the existing 41-ft. 10-in. wide section. The 57-ft. 10-in. wide bridge section includes two 8-ft. sidewalks, two 1-ft. 6-in. shoulders, two 7-ft. buffered bicycle lanes and two 11-ft. travel lanes (See Figure 7).

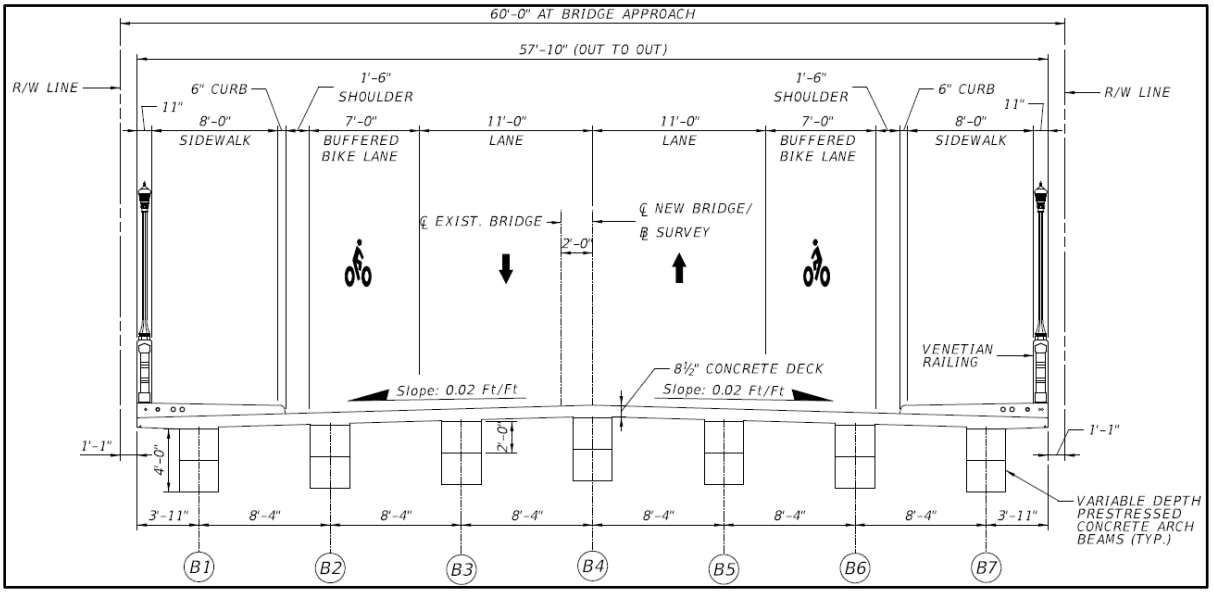


Figure 7: Replacement Alternative 7 - Arched Beam Typical Section

Bridge height affects the extent of potential impacts to right-of-way and connecting streets. The vertical alignment of the new fixed bridges would be raised a minimum of 1-ft. above the existing clearance to Biscayne Bay. The raised bridge profile will require modifications to the roadway approaches (See Figure 8). The design speed will be 10 mph over the current posted speed.

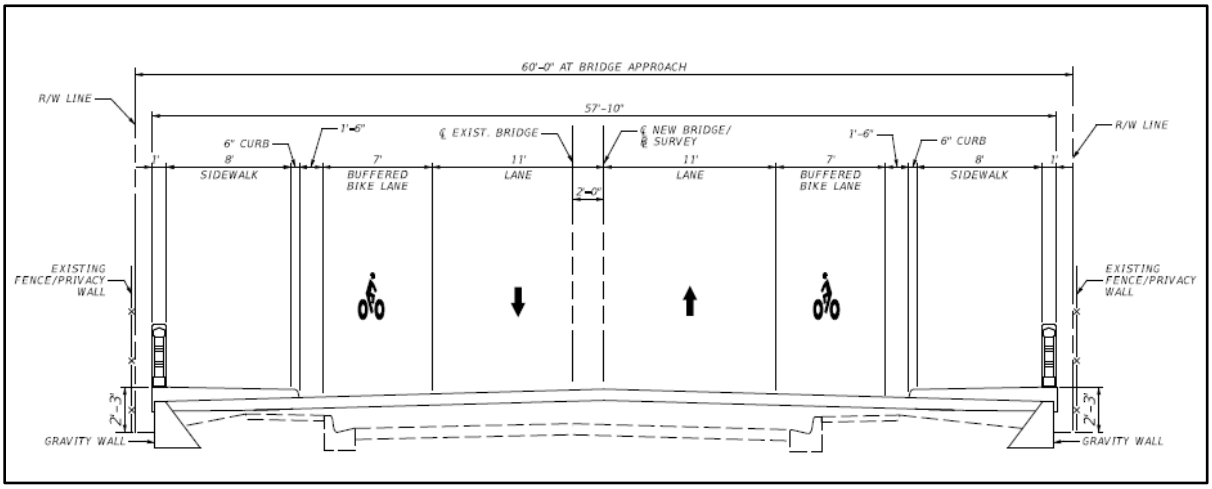


Figure 8: Replacement Alternative 7 – Raised Bridge Profile

Substructure

Two foundation types were considered for the replacement alternatives:

- 24-in. Square Prestressed Concrete Piles
- 48-in. Drilled Shafts

<u>24-in. Square Prestressed Concrete Piles</u>

Deep foundations with piles consist of a footing or pile cap supported by precast, prestressed concrete square piles. Piles are slender members that support the foundation loads when the soil is not capable of doing so. The piles resist and transfer the vertical and horizontal bridge loads to the soil or rock.

Advantages of piles include:

- Elimination of need for cofferdams and dewatering if pile caps are used;
- Fewer environmental impacts would be incurred; and
- Piles are less prone to scour and erosion.

Disadvantages of piles include:

- Driving piles may incur impacts to adjacent bridges and homes in close proximity;
- Piles are more susceptible to marine collision damage especially if they are exposed when pile caps are used; and
- Piles would require more specialized testing and inspection.

<u>48-in. Drilled Shafts</u>

Deep foundations with drilled shafts are cast-in-place reinforced concrete piles. They are larger than driven piles, therefore they can take larger loads than piles as well as resist more vertical loads and moments. Drilled shafts are constructed by drilling to the required depth, cleaned, inspected, reinforced with a reinforcing steel cage, and concrete placed in the hole. The

construction process has more environmental impacts than piles due to the drilling operation; however, noise impact would be greatly reduced for this alternative.

Despite the high cost of drilled shafts, they are recommended for this project to reduce noise impacts. Additionally, drilled shafts were proven to be effective during the partial Bridge 1 replacement in 1999 and 2016.

Estimated ROW Acquisition: None

Anticipated Cost: $47 Million

Replacement Alternative M4: Double Leaf Bascule Bridge

This alternative would replace the existing Bridge 10 movable bridge with a new double leaf bascule bridge 10. Advantages to the double leaf bascule bridges include:

- Unlimited vertical clearance in the raised position;
- The design can be laid out in a symmetrical arrangement which is an advantage when an "arched" look is desired; and
- They provide natural barriers to vehicular traffic when in the open position.

The existing bascule span provides 6-ft. minimum vertical clearance above mean high water at the face of fenders and 10-ft. at the center of the navigation channel with the span lowered. The existing horizontal clearance is 56-ft. between fenders. There are no established official US Coast Guard (USCG) vertical or horizontal guide clearances for this waterway crossing. However, a USCG Bridge Permit will be required for the replacement bridge and the USCG will make a determination concerning acceptable vertical and horizontal clearances for the proposed replacement bridge. For reference, the bridges at the east end of Julia Tuttle Causeway (I-195) to the north and MacArthur Causeway (SR A1A) to the south are high-level bridges with fixed spans over the navigation channel that provide 35-ft. minimum vertical clearance above mean high water. They both provide 75-ft. of horizontal clearance between fenders.

A 75-ft. horizontal clearance between fenders is proposed for the movable span replacement option. This provides improved safety at the Venetian Causeway site and is consistent with bridges located to the north and south of the causeway. In order to span the proposed 75-ft. wide navigation channel, the bascule span will require a minimum overall structure depth (controlled by the depth of the main girders) at the face of fenders of approximately 10-ft. See Figure 9.

Figure 9: Replacement Alternative M4 - Double Leaf Bascule Bridge

For a movable span bridge, the vertical clearance in the closed position affects the number of bridge openings and traffic flow. Higher vertical clearance in the closed position would require fewer bridge openings. The existing bridge provides only 6-ft. of minimum vertical clearance at mean high water over the Intracoastal Waterway (ICWW) at the fenders in the closed position. Unlimited clearance is provided in the open position. The vessel height survey conducted on this bridge indicated the bridge would see less openings if the vertical clearance of the bridge was raised. The raising of the bridge has to take into consideration the impacts to the spoil islands and residential islands as well as the historic appearance of the causeway. The bridge vertical clearance alternatives considered for Bridge 10 include:

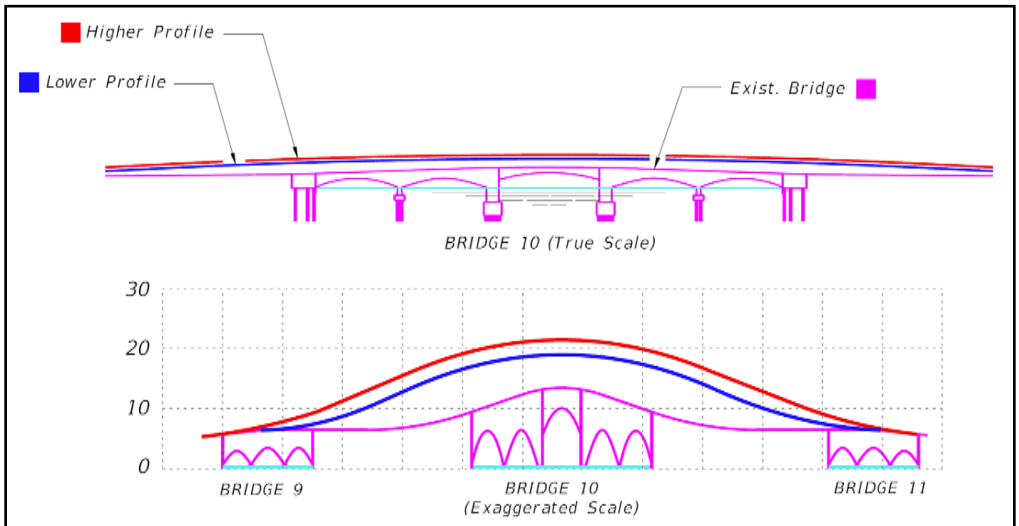
- 10.5-ft. of vertical clearance at the fender and 13.5-ft. of vertical clearance at centerline of channel. This profile maintains the drive machinery above the 100 year flood elevation. Although the bascule piers will flood during a storm event, the mechanical and electrical systems of the bridge will remain above the flood elevation. The spoil islands will have retaining walls. A ramp could be provided for pedestrian access to the islands.
- 13.0-ft. of vertical clearance at the fender and 16.0-ft. of vertical clearance at centerline of channel. This profile would maximize the height of the bridge by raising the profile beginning at the point where bridges 9 and 11 connect to the residential islands. The spoil islands will have retaining walls. A ramp could be provided for pedestrian access to the islands.

The lower profile bridge with 10.5-ft. vertical clearance at the fender and 13.5-ft. of vertical clearance at the centerline of the channel was requested by the public at the Alternatives Public Workshop, in order for the bridges to remain as low as possible and preserve its existing appearance.

Vertical profiles were prepared for the above alternatives to determine where each alternative would tie back into existing grade on the approach roadways. Both proposed profiles have a maximum vertical grade of five percent to meet ADA requirements for pedestrians (Figure 10).

A bridge profile with 10.5-ft. of vertical clearance at the fender and 13.5-ft. of vertical clearance at centerline of channel is proposed. This profile has the following benefits:

- Least impacts to the appearance of the causeway
- Reduces the need to raise bridges 9 and 11
- Minimizes the use of retaining walls
- Maintains pedestrian access to the spoil islands from the roadway
- Has the least impacts to the aesthetics and view shed of the causeway



NAVIGATION CLEARANCE POINT	VERT. CLEAR. (ABOVE MEAN HIGH WATER)		
	EXISTING	HIGHER	LOWER
at Fender	6.0'	13.0'	10.5'
at Center	10.0'	16.0'	13.5'
DECK ELEVATION AT PEAK	13.45'	21.45'	18.96'

BRIDGE 10 - VERTICAL PROFILE ALTERNATIVES

Figure 10: Bridge 10 Vertical Profile

Anticipated Cost: $43 Million

Comparative Alternative Evaluation

An evaluation matrix was developed to compare and contrast the performance of each alternative in meeting the evaluation criteria, and to quantify its impacts to the natural, social cultural and physical environment. Numerical ratings for specific and relevant qualitative and quantifiable criteria included a direct comparison of each of the alternatives such that the Preferred Alternative could be identified.

Evaluation Criteria includes:

- Purpose and Need
- Current Safety Standards
- Service Life
- Typical Section Functionality
- Structural Capacity
- Hurricane Resistance
- Vessel Collision Resistance
- Bridge Clearances
- Maintenance of Traffic during construction
- Utility Services
- Economic Impacts
- Constructability
- Pedestrian and Bicycle Facilities
- Environmental impacts, and
- Project Costs

A workshop was held with representatives from FDOT, Miami-Dade County, the project team and the public (using the ballot results from the Alternatives Public Workshop). The alternatives were compared and ranked based on the extent to which each alternative met each evaluation criterion.

The anticipated degree of impact to each criterion was ranked from low to high on a scale of zero to five - zero representing no benefit or not applicable, and five representing the least impacts or most beneficial. See Table 3.

Table 3: Evaluation Criterion Ranking

Score	Description
0	No Benefit or Not Applicable
1	Most impactful or least benefit
2	Very impactful or little benefit
3	Moderate impact or moderate benefit
4	Little impact or very beneficial
5	Least impactful or most benefit

The total score was calculated for each alternative to indicate the degree to which the alternative satisfies the evaluation criterion. See Table 4.

The evaluation matrix is used to:

- Clarify the benefits and shortcomings of the alternatives;
- Summarize likely or potential impacts; and to
- Present a score to show how well each alternative meets the project's purpose and need, and satisfies the evaluation criteria.

Please note that almost half of the matrix considers environmental aspects and one section is specifically cultural and historic (Table 4).

Table 4: Evaluation Matrix

Criteria		No Build Alternatives				Build Alternatives			
						Rehabilitation		Replacement	
		Alt 1 - No-Action	Score	Alt 2 - Transportation System Management and Operations	Score	Alt 4 - Rehabilitation with Beam Strengthening and Alt M1 - Bascule Bridge Rehabilitation	Score	Alt 7 - Arched Beams with T1 - Venetian Railing and Alt M4 - Double Leaf Bascule Bridge	Score
Meets Purpose and Need		No	0	No	0	Yes	3	Yes	5
Meets Current Safety Standards		No	1	No	1	Partially	3	Yes	5
Service Life		0-3 years	1	0-8 years	1	25 years	2	75 years	5
Typical Sectional Functionality		Substandard sidewalks and bicycle lanes	1	Substandard sidewalks and bicycle lanes	1	Substandard sidewalks and bicycle lanes	2	Meets current criteria	5
Structural Capacity		H-15	1	H-15	1	HL-93	5	HL-93	5
Hurricane Resistance		Not Satisfied	0	Not Satisfied	0	Satisfied	5	Satisfied	5
Vessel Collision Resistance		Not Satisfied	0	Not Satisfied	0	Satisfied	5	Satisfied	5
Bridge Clearances		Remain	1	Remain	1	Remain	1	Improved (Raised 1')	2
Maintenance of Traffic During Construction		N/A	5	N/A	5	82 months	1	48 months (phased construction)	3
Utility Services		Remain	3	Remain	3	Remain	3	Improved	5
Economic Impact		None	1	None	1	None	3	Improved	5
Constructability		No Impact	5	Minimal	4	Major Impact	1	Some Impact	3
Pedestrian and Bicycle Facilities		Remain as is	1	Remain as is	1	Pedestrian - Improved Bicycle - Remain as is	2	Improved	5
Environmental Impacts									
NATURAL	Benthic Resources	no impact	5	no impact	5	impact to corals from scour protection, substructure & beam strengthening	3	impact to corals from scour protection, substructure replacement, spoil island shoreline	2
NATURAL	Essential Fish Habitat	no impact	5	no impact	5	minimal impacts from construction means and methods	4	minimal impacts from construction means and methods/minimal impact to shoreline of spoil islands	3
NATURAL	Threatened & Endangered Species	no impact	5	no impact	5	minimal impacts from construction means and methods	4	minimal impacts from construction means and methods	3
NATURAL	Water Quality	Scuppers discharge to OFW	0	Scuppers discharge to OFW	0	Scuppers discharge to OFW	0	temporary impacts during construction/overall benefit	5
PHYSICAL	Noise Impacts	no impact	5	no impact	5	minimal impacts from construction means and methods	5	temporary impacts during construction	5
PHYSICAL	Air Quality	no impact	5	no impact	5	minimal impacts from construction means and methods	5	temporary impacts during construction	5
PHYSICAL	Contamination Impacts	Not Applicable	0	Not Applicable	0	Not Applicable	0	Not Applicable	0
Cultural and Historic	Historic - Section 106/4(f)	No Adverse Effect	5	No Adverse Effect	5	No Adverse Effect - some impact to resource	3	Adverse Effect - Resource replaced, National Register of Historic Places listing may be affected	1
SOCIAL and ECONOMI	Aesthetic/Visual Impacts	utilities remain	3	utilities remain	3	utilities remain	4	wider section, bridge aesthetics replicated, utilities hidden, arch and railings remain	4
SOCIAL and ECONOMI	Recreational Areas	Not Applicable	0	Not Applicable	0	Not Applicable	0	Not Applicable	0
SOCIAL and ECONOMI	Community Cohesion	no impact	3	no impact	3	temporary impact to access during construction	3	temporary impact to access during construction	5
Project Costs									
Engineering Costs (Bridges only)		$ -	5	$ -	5	$6.9 Million	3	$11.7 Million	1
Construction Costs (Bridges only)		$ -	5	$ -	5	$53 Million	3	$90 Million	1
Yearly Maintenance Costs (first 25 years)		$1.4 Million	1	$1.4 Million	1	$1.4 Million	1	$100,000	5
Life Cycle Costs over 75 years		Unknown	0	Unknown	0	$179 Million	1	$96 Million	3
Total Points			67		66		75		101

The alternative with the highest numerical total points represented the most desirable alternative. As shown in Table 4, Alternative 7 with T1 and M4 received the highest score of 101. This alternative consists of the Replacement Alternative 7 Arched Beams with T1 Venetian Railing and M4 Double Leaf Bascule Bridge, and is the Preferred Alternative. The Preferred Alternative does not include work to Bridge 1.

Preferred Alternative

There are currently 12 bridges along the Venetian Causeway; ten (10) fixed bridges and two (2) movable bridges. Bridge 1 has already been replaced and was not included for evaluation. The Preferred Alternative will replace the Venetian Causeway Bridges 2 through 12 and consists of the following:

- Replacement Alternative 7 – Arched Beams for Fixed Bridges 2 through 9, 11 and 12
- Typical Section and Railing Alternative T1 – Venetian Railing and,
- Replacement Alternative M4 – Double Leaf Bascule Bridge for Bascule Bridge 10.

Each of these alternatives are explained in the previous sections and this will be the focus of the following discussion regarding effects to the significant resource.

Typical Sections

A two-lane undivided roadway typical section was developed for the project. This typical section consists of one 11-ft. lane in each direction separated by a double yellow line at the center of the roadway, 7-ft. bicycle lanes, curb and gutter with 8-ft. sidewalks on each side and the Venetian Railing.

Horizontal and Vertical Geometry

Horizontal Alignment

The proposed horizontal alignment will follow the existing alignment through the length of the project area. The two-lane undivided roadway consists of one 11-ft. lane in each direction, separated by a double yellow line at the center of the roadway, 7-ft. bicycle lanes, curb and gutter with 8-ft. sidewalks on each side. The proposed section will be constructed within the existing ROW.

Vertical Alignment

The vertical alignment for the low-level fixed bridges 2 through 8 and 12 was developed to increase the vertical clearance of the bridges over the bay, and meet ADA and design criteria, for this class of roadway – without negatively impacting the adjacent intersections and driveways. The vertical alignment will continue to be relatively flat with a longitudinal slope

ranging from 0% to 2%. Symmetrical vertical curves with a high point at the center of the bridges will be provided to facilitate surface water runoff from the decks. To accommodate sea-level rise, the vertical alignments at the new fixed bridges will be raised such that the low member of the bridges are approximately 1-ft. above the low member of the existing bridges at a minimum. The proposed arched bridges will provide a greater vertical clearance than existing at the low members. The design flood elevation is 0.02 ft. (NAVD 88) and the proposed arched bridges will have a minimum low member elevation of 2.02 ft. (NAVD 88).

At Bridge 10 (the east bascule bridge), the recommended vertical profile provides 10.5-ft. of clearance at the fender and 13.5-ft. of clearance at the centerline of channel. The vertical profile maintains the bascule pier machinery above the 100-Year Storm Surge elevation, maintains the low-level appearance of the causeway and maintains pedestrian access to the spoil islands from the roadway. The vertical profiles at fixed bridges 9 and 11 are a continuation of the profile from bridge 10. To accommodate sea-level rise, the vertical alignments at Bridge 9 and 11 will be raised such that the low member of the bridges are approximately 1-ft. above the low member of the existing bridges.

Intersection/Interchange Concepts and Signal Analysis

The bridge alignments avoid impacts to the existing intersections along the causeway. Drawbridge signals exist on each side of the Bridge 10 and will be replaced with new signals, however, the current signals are not historic and the new ones will meet present day standards. The following will be implemented for the new signals to increase safety and reduce the potential of vehicular collisions with traffic gates:

- Provide backplates and retroreflective tapes to drawbridge signals to minimize impacts associated with glare of sunlight.
- Install transverse rumble strips on the approaches to drawbridge signals to alert motorists.
- Pedestrian gates will also be provided to restrict pedestrian access when the bridge is in the open position.

Bridge Analysis

The bridge superstructures were designed to support the required AASHTO HL-93 load. The arched beams of the fixed bridges mimic the dimensions and appearance of the original structure. The arched beams vary from approximately 2-ft. deep at mid-span and 4-ft. deep at beam ends. The structural, mechanical and electrical systems of the bascule bridge at Bridge 10 were designed to meet the current design criteria for bascule bridges.

Bridge Typical Sections

The new bridge typical sections will be increased from the existing 41-ft.10-in. to 57-ft. 10-in. to provide wider sidewalks and bicycle lanes. The height will also be at least one foot higher at its lowest point. The new typical section includes two 11-ft. travel lanes, two 7-ft. buffered bicycle lanes, two 1-ft. 6-in. shoulders and two 8-ft. raised sidewalks. The existing Venetian style railings will be provided along the bridge copings. The decks and sidewalks will include cross-slopes to convey storm water to the gutter lines where it will be channeled to drainage inlets located near the bridge's ends.

Bascule Piers

Fully enclosed bascule piers will house the operating equipment for the bascule span and the pivoting counterweights. Based on the height of the vertical profile above the water, and the required depth of the piers for the pivoting counterweights, the piers can be constructed without cofferdams. A precast enclosure slab with walls unit can be set into place, sealed with tremie concrete and dewatered – to allow the rest of the bascule pier to be constructed in the dry. A control house, with sidewalk level access, will be placed on one of the bascule piers to house a bridge operator. The control house will be located to provide the maximum visibility for the bridge operator to see pedestrians, vehicles and vessel traffic in proximity to the bridge.

Foundations

A geotechnical investigation of the project corridor indicates subsurface materials are suitable for deep foundations – consisting of either driven piles or drilled shafts. Driven concrete piles are generally more economical than drilled shafts for the anticipated lengths. However, drilled shafts typically minimize construction vibration and noise when compared to driven piles. Given the adjacent homes, local businesses and the community surrounding the Causeway, drilled shaft are recommended for this project. Mechanically Stabilized Earth (MSE) and cast-in-place cantilever or gravity retaining walls are suitable to retain embankment at the bridge approaches.

Movable Span Deck

Historically, the deck on bascule leave-spans for Florida bridges has consisted of steel open grid roadway flooring. This is in order to reduce the weight of the span and corresponding size of the counterweight and operating machinery. However, advancements in lightweight concrete materials and composite deck systems have resulted in economical bascule span designs, with closed decks, that provide a smoother ride, improved skid resistance and less traffic-generated noise. A closed deck also improves maintenance by reducing the accumulation of moisture retaining debris that typically falls through the openings on steel open grid roadway flooring. A closed-deck system is recommended for the bascule leaves of the new movable-span bridge.

Bulkheads

Bulkheads (sometimes referred to as seawalls) typically wrap around the abutments of bridges over tidally influenced waterways and are recommended for this project. Bulkheads provide greater abutment protection from the effects of storm-induced scour and wave surges than rock-rubble riprap or sand-cement bags.

Construction Phasing

The Venetian Causeway corridor connects the City of Miami mainland with the City of Miami Beach and is utilized by a significant amount of vehicles, pedestrians and bicyclists. The preservation of safety, as well as the minimization of access disruption during construction are of great concern. The replacement of the existing fixed bridge structures is proposed in two (2) construction phases to allow the maintenance of at least one lane of two-way traffic and one sidewalk during the construction. The first construction phase requires partial demolition of the bridge that allows for one lane of traffic and sidewalk to be maintained on the remainder of the bridge. A portion of the new bridge could then be constructed. One lane of traffic and sidewalk can be maintained on the new portion of bridge while the remainder of the existing bridge is demolished, and the remainder of the new bridge is constructed.

The bascule bridge cannot be constructed in phases and will require the complete closure of the existing bridge during replacement. Traffic could either be detoured or a temporary bridge provided. A temporary movable bridge would allow for the maintenance of navigational traffic; however, a fixed temporary bridge would block navigational traffic for the duration of the construction. The Maintenance of Traffic (MOT) – Phased Construction Plan has been developed for the Recommended Build Alternative and includes both phases as well as the options at Bridge 10 in the Conceptual Bridge and Roadway Plans.

Right of Way

No ROW acquisition is anticipated; however, temporary construction easements are required for the harmonization of the roadway with the adjacent properties and driveway connections.

Construction Impacts

Residents and users of the causeway will be limited to one lane of two-way traffic during the construction. Additionally, unless a temporary bridge is provided at Bridge 10 a detour will have to be implemented. Additionally, the closure of Bridge 10 will result in impacts to navigational traffic.

Maintenance of traffic and sequence of construction will be planned and scheduled to minimize traffic delays throughout the project. Signs will be used to provide notice of access to local business and other pertinent information to the traveling public. All provisions of the latest

edition of the FDOT's *Standard Specifications for Road and Bridge Construction* will be followed.

The air quality effect will be short-term and will mainly be in the form of dust from earth work and unpaved roads. These impacts will be minimized by adherence to all applicable State and Local regulations and to the FDOT's *Standard Specifications for Road and Bridge Construction*.

The project area is lined with many noise sensitive residences and parks, these were included within the APE and are significant. Bridges are built with heavy construction equipment and there is potential for noise and vibration impacts. Early identification of potential noise and vibration sensitive sites along the project is important in minimizing these impacts. Construction noise and vibration impacts to these sites will be minimized by adherence to the controls listed in the latest edition of the FDOT's *Standard Specifications for Road and Bridge Construction*.

HISTORIC RESOURCES

The locations of the three National Register–eligible resources (8DA11375, 8DA11754, and 8DA14395) that were identified as part of the *CRAS for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach* (Janus Research 2019) are illustrated in relation to the study's area of potential effect (APE) in Figure 11a-11d. Following these figures are brief narratives and photographs of the three resources (Figures 12–18).

The APE for historic resources includes the footprint of existing bridges and the earthen structures, as well as the parcels immediately adjacent to where the current bridges touch down. Ms. Ginny Jones, former Architectural Historian with the Compliance and Review Section of the SHPO, participated in the Cultural Resources Committee (CRC) meetings and made several site visits to the Causeway. The APE was deemed appropriate for the project improvements.

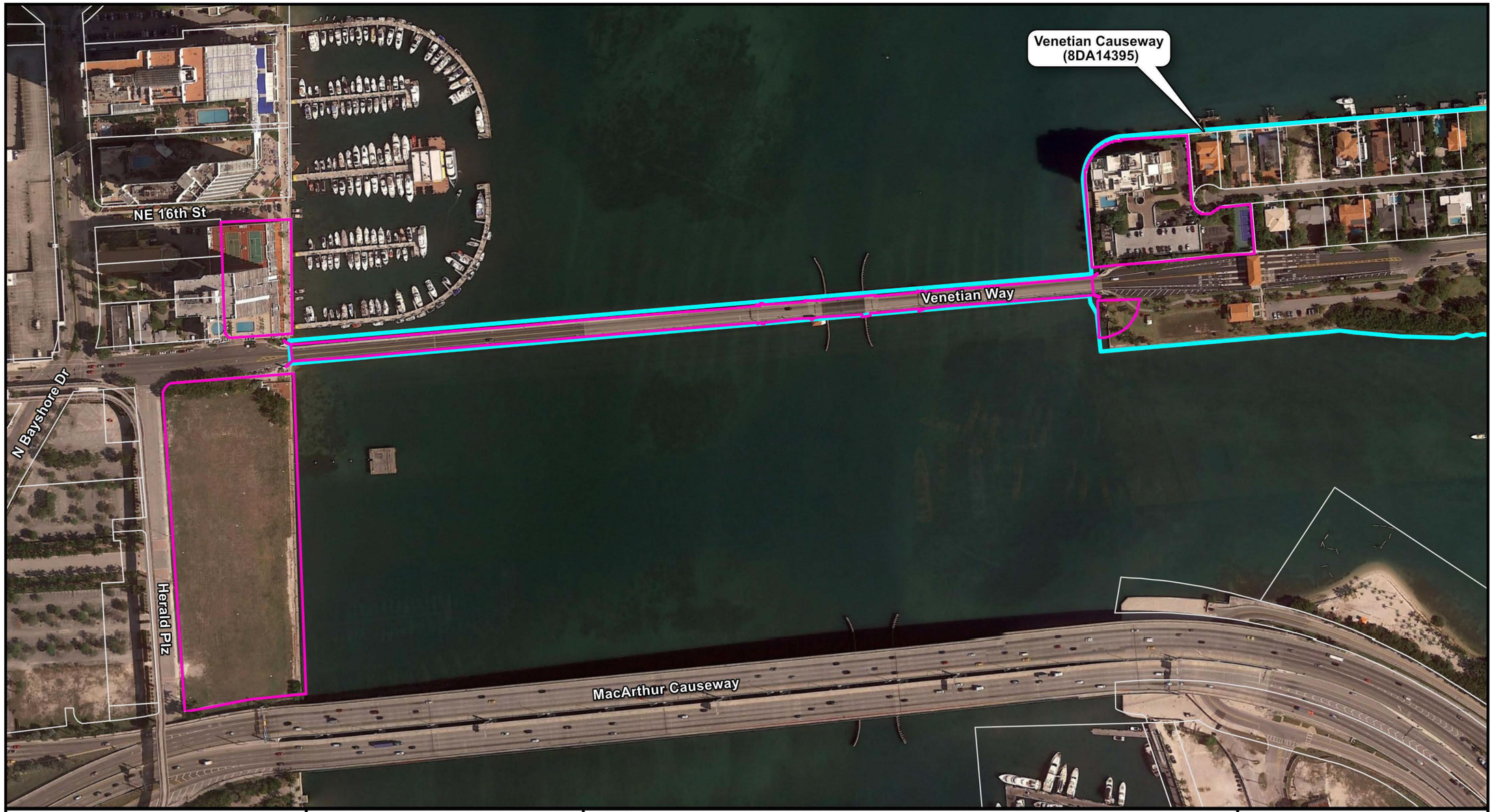


Figure 11a: Identified National-Eligible Resources (Map 1 of 4)

Venetian Causeway from North Bayshore Drive to Purdy Avenue (422713-2-22-01)

Historic Resources APE

Historic Resource Group

Miami-Dade County

Feet
0 150 300

Figure 11b: Identified National-Eligible Resources (Map 2 of 4)

Venetian Causeway from North Bayshore Drive to Purdy Avenue (422713-2-22-01)

Historic Resources APE

Historic Resource Group

Miami-Dade County

0 150 300 Feet

Figure 11c: Identified National-Eligible Resources (Map 3 of 4)

Venetian Causeway from North Bayshore Drive to Purdy Avenue (422713-2-22-01)

Historic Resources APE

Historic Resource Group

Miami-Dade County

0 150 300 Feet

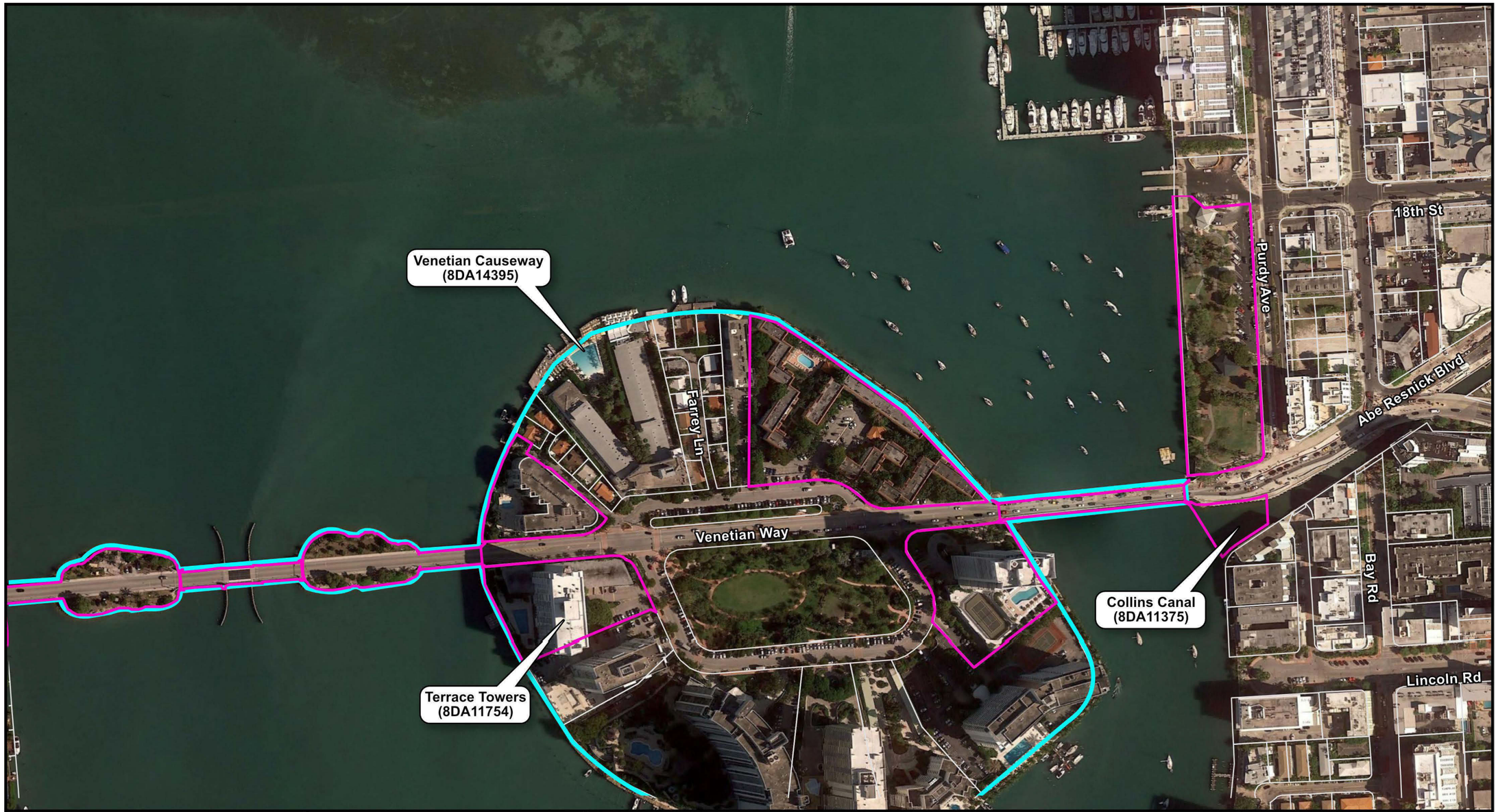


Figure 11d: Identified National-Eligible Resources (Map 4 of 4)

Venetian Causeway from North Bayshore Drive to Purdy Avenue (422713-2-22-01)

Historic Resources APE

Historic Resource Group

Miami-Dade County

Feet
0 150 300

Figure 12: Collins Canal (8DA11375), determined National Register–eligible, facing Southeast

8DA11375 Collins Canal

The Collins Canal is located in Section 33 of Township 53 South, Range 42 East on the Miami (1994) USGS quad map in the City of Miami Beach, Miami-Dade County, Florida (Figure 12). The canal is approximately 40 feet wide, except the westernmost portion which expands more than 100 feet as it opens up to Biscayne Bay. The canal runs parallel to Dade Boulevard until it joins Lake Pancoast at Collins Avenue. The canal features concrete seawalls and some surrounding fencing and vegetation.

The Collins Canal (8DA11375) was determined National Register–eligible on May 4, 2012 under Criteria A and C in the areas of Community Planning and Development, Engineering, and Transportation. The canal is significant as the oldest remaining manmade structure within the City of Miami Beach associated with one of the City's founders, John S. Collins (City of Miami Beach Planning Department 2000:24). Built by John Collins in 1912, it opened transportation to the island and created an efficient mode of transportation for the community's agricultural interests (Janus Research 2012). Outside of the project APE, the Collins Canal (8DA11375) is also considered a contributing resource to the City of Miami Beach's Palm View and Collins Waterfront (8DA11867) historic districts.

Figure 13: Terrace Towers (8DA11754), determined National Register–eligible, facing Southwest

<u>8DA11754</u> **<u>Terrace Towers</u>**

The Terrace Towers are located at 3 Island Way in Section 33 of Township 53 South, Range 42 East on the Miami (1994) USGS quad map in the City of Miami Beach, Miami-Dade County, Florida (Figure 13). This fourteen-story, Modern building was designed by Morris Lapidus and constructed by the Island Venetian Construction Company in 1961-1962. The building features strong horizontal and vertical elements, with water views from apartment with private balconies (Florida History LLC 2010).

Morris Lapidus and Bea, his wife, chose the building as their personal residence and lived in a two-story, 2,500 square-foot unit in the building until 2001 (City of Miami Beach Planning Department 2009). During the 1950s and 1960s, Lapidus designed some of the most prominent and influential buildings in the Miami-Modern style, such as the Fontainebleau (8DA11452) and the Eden Roc Hotel (8DA14166). The Terrace Towers (8DA11754) was initially documented as part of the *FCC Form 621 Collocation ("CO") Submission Packet: SFL-012, SW6-455/Tower Terrace, Miami-Dade County, Florida* (FMSF Manuscript No. 17942) conducted by Florida History, LLC in 2010. The building was determined National Register–eligible on January 5, 2011, under Criterion C in the area of Architecture.

8DA14395 Venetian Islands Resource Group

The Venetian Islands Resource Group (8DA14395) is located in Sections 31, 32, and 33 of Township 53 South, Range 42 East on the Miami (1994) USGS quad map in Miami-Dade County, Florida. The resource group was built between 1915 and 1926 and includes twelve bridges, six man-made islands, and five earthen causeway landings that span Biscayne Bay from NE 15th Street in the City of Miami to Dade Boulevard in the City of Miami Beach.

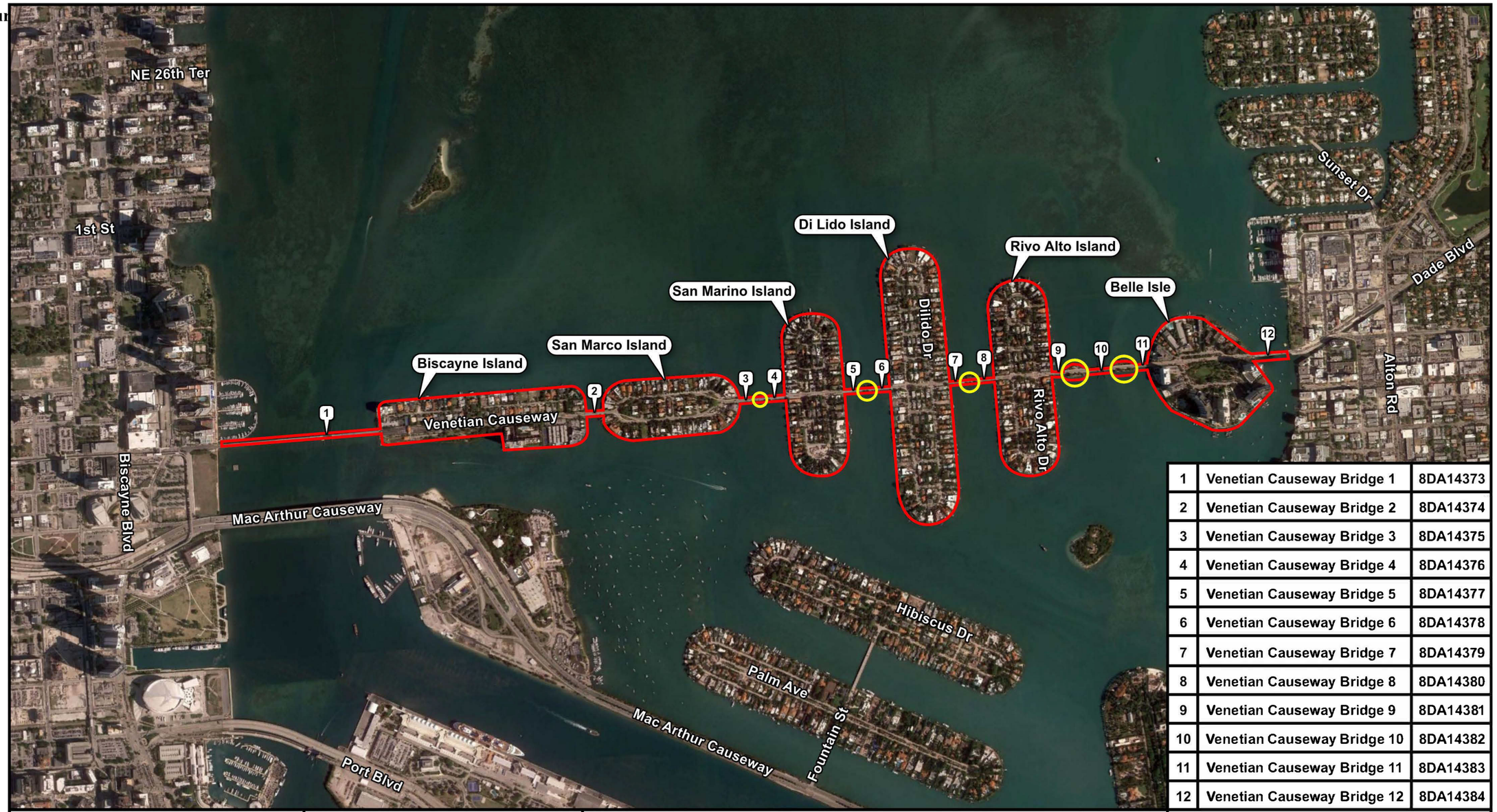
The islands, from east to west, are Belle Isle, Rivo Alto Island, Di Lido Island, San Marino Island, San Marco Island, and Biscayne Island (Figure 14). The islands are residential in character, with housing designs from a variety of periods and styles. Biscayne Island and Belle Isle, the islands at both ends of the Causeway have larger scale, high-rise residential development. They provide a transition from the commercial and mixed-use developments of Miami Beach and downtown Miami to the single-family residential development on the middle islands. The islands have mature street trees and tropical landscaping. The Venetian Islands were listed on the National Register in 1989 under Criteria A and C in the categories of Community Planning and Development, Transportation, Architecture, and Engineering (Bureau of Historic Preservation 1989).

Belle Isle, the earliest of the islands, was largely shaped of dredge material excavated from the surrounding bay bottom during construction of the Collins Canal and Collins Bridge. The island was formed surrounding the eastern portion of the Collins Bridge (Figure 15). During the 1920s, several large estates were constructed on the island, including J.C. Penney's residence known as "White Haven" (City of Miami 1990).

The remaining islands weren't planned or built until after World War I had ended. In 1921, the Bay Biscayne Improvement Company began an ambitious effort to construct a chain of islands across Biscayne Bay. The "Venetian Islands" were to be constructed from dredge material and deposited along Collins Bridge to form a series of residential isles inspired by the landscape of Venice, Italy. Once the islands were formed, a causeway was to be constructed to provide access to the newly-developed communities.

Island building began immediately with Rivo Alto in 1922 (Figure 16). The remaining islands of Di Lido, San Marco, and San Marino were platted by 1923 (Welcher 1989). When completed, the islands were expected to contain over four-hundred and fifty residential lots, as well as interior roads and access to the mainland via an elegant causeway. The Bay Biscayne Improvement Company immediately established two sales offices in Miami and began selling lots, still underwater, to would-be homeowners (City of Miami 1990). The final island of the chain, Biscayne Island, was formed from residual dredging material accumulated during the construction of the previous islands, however, was not immediately developed during the 1920s (Welcher 1989). The island was home to a small airport operated as the Viking Seaplane Base (Figure 17). In 1936, the Biscayne Island Corporation submitted a plat map showing subdivision for residential development on the island.

Figur



1	Venetian Causeway Bridge 1	8DA14373
2	Venetian Causeway Bridge 2	8DA14374
3	Venetian Causeway Bridge 3	8DA14375
4	Venetian Causeway Bridge 4	8DA14376
5	Venetian Causeway Bridge 5	8DA14377
6	Venetian Causeway Bridge 6	8DA14378
7	Venetian Causeway Bridge 7	8DA14379
8	Venetian Causeway Bridge 8	8DA14380
9	Venetian Causeway Bridge 9	8DA14381
10	Venetian Causeway Bridge 10	8DA14382
11	Venetian Causeway Bridge 11	8DA14383
12	Venetian Causeway Bridge 12	8DA14384

Figure 14: Boundaries and Contributing Features within the Venetian Islands Resource Group (8DA14395)

Venetian Causeway from North Bayshore Drive to Purdy Avenue (422713-2-22-01)

Historic Resource Group
Earthen Causeway Landing
Historic Bridge

Miami-Dade County

Meters 0 100
Feet 0 250

Figure 15: 1920s Aerial View of Belle Isle and Collins Bridge
Courtesy State Archives of Florida, Florida Memory Collection

Figure 16: 1925 Photograph of Construction on the Venetian Islands
Courtesy State Archives of Florida, Florida Memory Collection

Figure 17: 1930s Aerial Photograph of Biscayne Island and the Viking Seaplane Base
Courtesy State Archives of Florida, Florida Memory Collection

Beginning in 1925, the bridges and earthen causeways were constructed as the final phase in the development of the island communities (Figure 18). Plans included a combination of bridges and earthen causeway landings. The large islands would be connected using two bascule-span bridges, ten fixed-span bridges, and a series of earthen causeways. The bridges were completed in 1926, with a formal dedication occurring on February 28 of that year (Welcher 1989).

Figure 18: 1925 Photograph Showing Construction on the Venetian Causeway
Courtesy State Archives of Florida, Florida Memory Collection

As documented in the 1989 National Register nomination, the Causeway consists of "twelve bridges containing two bascule spans connected by a two-lane road" (Welcher 1989). In consultation with the SHPO/FMSF, the original FMSF site file for the Venetian Causeway (8DA4736) was converted from its classification as a historic bridge to a resource group during the 2019 CRAS. The Venetian Islands Resource Group (8DA14395) includes not only the twelve bridges, but also the six man-made islands, and the five earthen causeways. The recent CRAS identified these elements of the Venetian Causeway contributing to the resource group (Table 6). During the 2019 CRAS, the current streetscapes were visually surveyed and compared to descriptions of the original roadway and sidewalk widths. The CRAS found that the roadways, curbing, sidewalks, landscaping, and street lighting have all been updated since the time of construction. Therefore, these elements no longer retain sufficient integrity to convey significance and do not contribute to the Venetian Islands Resource Group (8DA14395). The SHPO determined the Venetian Islands Resource Group (8DA14395) and the contributing resources National Register–eligible; the concurrence letter is found in Appendix A.

Table 5: Contributing Features in the Venetian Islands Resource Group (8DA14395)

Resource Name	Construction Date
Belle Isle	c. 1915
Rivo Alto Island	c. 1922
Di Lido Island	c. 1923
San Marino Island	c. 1923
San Marco Island	c. 1923
Biscayne Island	c. 1923
Venetian Causeway Bridge 1 (8DA14373)	c. 1926
Venetian Causeway Bridge 2 (8DA14374)	c. 1926
Venetian Causeway Bridge 3 (8DA14375)	c. 1926
Venetian Causeway Bridge 4 (8DA14376)	c. 1926
Venetian Causeway Bridge 5 (8DA14377)	c. 1926
Venetian Causeway Bridge 6 (8DA14378)	c. 1926
Venetian Causeway Bridge 7 (8DA14379)	c. 1926
Venetian Causeway Bridge 8 (8DA14380)	c. 1926
Venetian Causeway Bridge 9 (8DA14381)	c. 1926
Venetian Causeway Bridge 10 (8DA14382)	c. 1926
Venetian Causeway Bridge 11 (8DA14383)	c. 1926
Venetian Causeway Bridge 12 (8DA14384)	c. 1926
Earthen Causeway Landings (five total)	c. 1926

HISTORIC RESOURCES EFFECTS ANALYSIS

Potential Effects to Historic Resources

The 2019 CRAS resulted in the identification of three significant resources: Collins Canal (8DA11375), Terrace Towers (8DA11754), and the Venetian Islands Resource Group (8DA14395). In a letter dated June 25, 2019, the State Historic Preservation Officer (SHPO) concurred with the findings of the 2019 CRAS.

For purposes of this effects assessment, the Criteria of Adverse Effect, as defined in 36 CFR Part 800.5 specified in Section 106 of the National Historic Preservation Act of 1966 were applied, and the potential effects that the improvements may have on the identified National Register historic resources were evaluated. As discussed in the Project Description, various alternatives were evaluated during the PD&E Study. The No-Action and TSM&O Alternatives will result in no effect to the significant resources. The Rehabilitation Alternatives, which were also described in the Project Description, will result in an adverse effect to the Venetian Islands Resource Group, as the bridges' notable characteristics and features will need to be substantially modified as part of the rehabilitation. The other significant resources, Collins Canal (8DA11375) and Terrace Towers (8DA11754), will not be adversely affected as part of the Rehabilitation Alternatives. Improvements will be limited to the bridges and immediate approach work. The Rehabilitation Alternatives will not require direct acquisitions of these two properties and will not indirectly affect other aspects that would then preclude them from being eligible for the National Register.

Potential effects that the Preferred Alternative may have on the three identified National Register resources were evaluated further as this is the focus of this effects study. The subsequent analysis of effects is discussed below.

36 CFR Part 800 defines the Criteria of Adverse Effect as the following:

> An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that have been identified subsequent to the original evaluation of the property's eligibility for the National Register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

In consideration of available project information, the proposed Preferred Alternative will have no adverse effect on Collins Canal (8DA11375) or Terrace Towers (8DA11754). However, due to the removal of the bridges, the Preferred Alternative will have an adverse effect on the Venetian Islands Resource Group (8DA14395).

During the course of this project, Section 106 consultation took place during three CRC meetings on September 24, 2014, May 14, 2015, and March 6, 2018 with the SHPO, United States Coast Guard, FDOT, Cities of Miami and Miami Beach, Miami-Dade County, Miami Design Preservation League, Dade Heritage Trust, and the consultant project team. These meetings focused on the Section 106 process, proposed alternatives, the historic resources, and potential effects.

During the most recent CRC meeting which took place in March of 2018, the alternative, which is now considered the Preferred Alternative, was presented to the attendees and discussed. The potential for adverse effects to the overall Venetian Islands Causeway was included within the discussion, as well as the need to consider mitigation options when moving forward with the Section 106 process. Ms. Ginny Jones, formerly of the SHPO, participated in the CRC meetings and was present during these discussions. Measures to minimize the effects were also presented during the third CRC meeting; these measures include a project design that acknowledges the historic appearance of the bridges, incorporating a low profile of the bridges and appearance of the original structure, using arched beams with same span configurations, geometrically designed concrete bridge railings that recognize the historic railing design, historically sensitive bridge lighting fixtures, and historically sensitive Bridge Tender House design for the New East Bascule Bridge. The minutes for the CRC meetings are included within Appendix B.

The Preferred Alternative will have no adverse effect on the National Register-eligible Collins Canal (8DA11375) or Terrace Towers (8DA11754); both resources will continue to maintain their significance and character-defining features following the construction of the project improvements. Both resources are located on Figure 11d, and as shown they are sited adjacent to roadway improvements, and there are bridge replacements taking place within close proximity.

The Collins Canal where it meets Biscayne Bay is within the APE. There is no work to the canal as part of this project, and the improvements in the immediate vicinity of Collins Canal will not require the modification of any physical characteristics of the canal, including the route or width. The canal will not be truncated or filled in as part of the improvements.

The improvements closest to the Terrace Towers will not require any ROW from the historic parcel and will follow the existing alignment through the length of the project area. Bridge 11, closest to the one-story portion of the building, will have some small gravity walls at the touchdown points on Venetian Way. For the adjacent fixed bridge approach work, MSE and cast-in-place cantilever or gravity retaining walls will support the nearby embankments; these walls will be low in profile and will not result in an adverse effect to the surrounding aesthetics or the views to and from the building. Based on the adjacent homes, local businesses and the community surrounding the Causeway, drilled shafts during construction are recommended for this project to minimize noise, air, and vibration effects. Additionally, the project improvements will not change access to the Terrace Towers. Figure 20 shows the current relationship between the existing roadway and Terrace Towers.

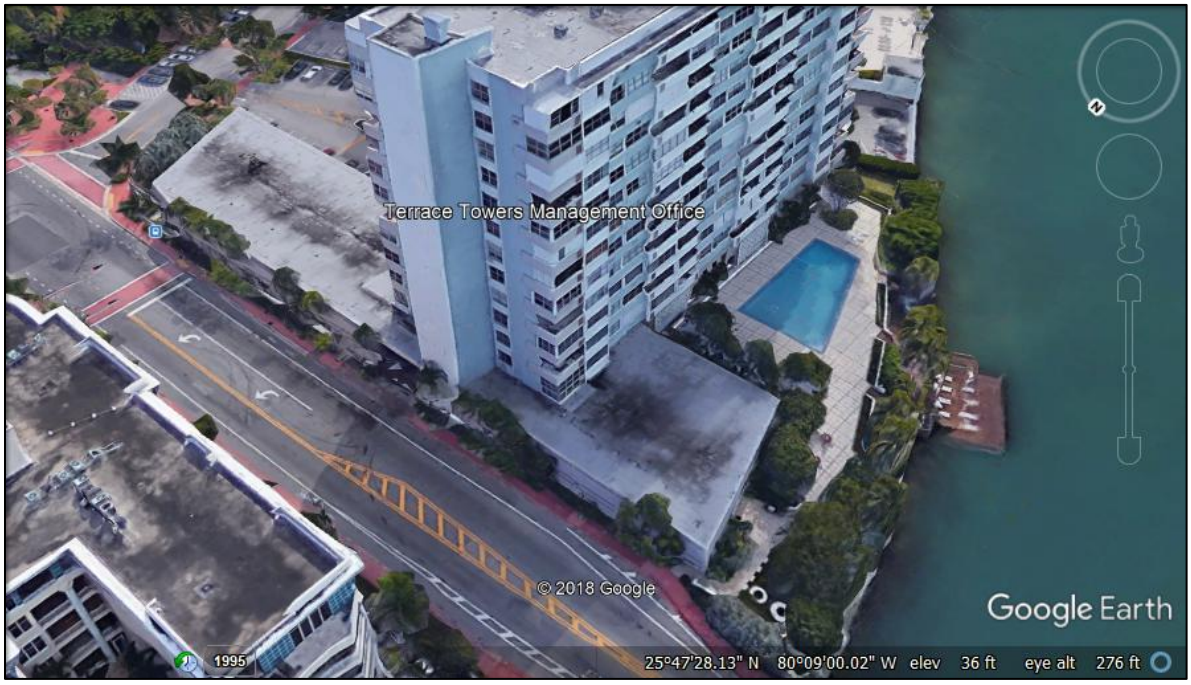


Figure 19: 2018 Image from Google Earth, which shows current relationship between the existing roadway and Terrace Towers

The Preferred Alternative improvements will require substantial modifications, such as the removal of the bridges that are included as contributing resources to the Venetian Islands Resource Group. As part of the removal of the bridges, the railings will also be removed and replaced. The typical section will also be wider than the existing typical section, but ROW will not be required from the residential properties along the Causeway. Additionally, there will be retaining walls added to the bridge touchdowns at the historic spoil islands. These changes to the Causeway and its contributing bridge resources will result in an adverse effect to the Venetian Islands Resource Group. However, as discussed previously, measures to minimize the effects were presented during the third CRC meeting. As the project the progresses a committee will be assembled to develop these measures, which will likely include a project design that acknowledges the historic appearance of the bridges, incorporating a low profile of the bridges and appearance of the original structure, using arched beams with same span configurations, geometrically designed concrete bridge railings that recognize the historic railing design, historically sensitive bridge lighting fixtures, and historically sensitive Bridge Tender House design for the New East Bascule Bridge.

CONCLUSIONS

This Section 106 Evaluation and Determination of Effects Case Study Report documents the potential effects of the alternative improvements to the three significant historic resources within the project APE: Collins Canal (8DA11375), Terrace Towers (8DA11754), and the Venetian Islands Resource Group (8DA14395). The Criteria of Effect, as defined in 36 CFR Part 800.5, were applied to these resources. Various alternatives were evaluated during the PD&E Study. The No-Action and TSM&O Alternatives will result in no effect to the significant resources. The Rehabilitation Alternatives will result in adverse effect to the Venetian Islands Resource Group, as the bridges' notable characteristics and features will need to be substantially modified as part of the rehabilitation. The other significant resources, Collins Canal (8DA11375) and Terrace Towers (8DA11754), will not be adversely affected as part of the Rehabilitation Alternatives.

Based on the improvements that are proposed as part of the Preferred Alternative, there will be no adverse effect to the Collins Canal and Terrace Towers. The Preferred Alternative will require the removal and replacement of key resources within the Venetian Islands Resource Group, including the bridges and their railings. Additionally, there will be retaining walls added to the bridge touchdowns at the historic spoil islands. Therefore, the Preferred Alternative will result in an adverse effect to the Venetian Islands Resource Group.

Following the assessment of effects, further coordination and consultation will take place as part of the Section 106 process. A memorandum of agreement (MOA) will be prepared with input from affected parties, and this document will include the measures to minimize and mitigate adverse effects to the Venetian Islands Resource Group.

REFERENCES CITED

Bureau of Historic Preservation
1989 National Register nomination for Venetian Causeway (8DA4736). On file, Florida Department of State, Division of Historical Resources, Tallahassee, Florida.

City of Miami
1990 Venetian Causeway Designation Report. Online resource, http://www.historicpreservationmiami.com/pdfs/Venetian%20Causeway.PDF, accessed July 27, 2015.

City of Miami Beach, Planning Department
2000 *Collins Waterfront Historic District Designation Report*. Accessed online at: http://web.miamibeachfl.gov/planning/scroll.aspx?id=25676.
2009 Morris Lapidus / Mid-20th Century Historic District Designation Report. Online resource, http://web.miamibeachfl.gov, accessed July 27, 2015.

Florida History LLC
2010 Site File form for Terrace Towers (8DA11754). On file, Florida Department of State, Division of Historical Resources, Tallahassee, Florida.

Janus Research
2012 Site File form for Collins Canal (8DA11375). On file, Florida Department of State, Division of Historical Resources, Tallahassee, Florida.
2019 *Cultural Resources Assessment Survey for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach*. On file, Florida Department of State, Division of Historical Resources, Tallahassee, Florida.

Welcher, Vicki
1989 National Register of Historic Places, Venetian Causeway, Miami-Dade County, Florida, National Register # 89000852. Copies available from the Florida Department of State, Division of Historic Resources, Tallahassee, Florida.

APPENDIX A:

SHPO CONCURRENCE LETTER DATED JUNE 25, 2019

FDOT

Florida Department of Transportation

RON DESANTIS
GOVERNOR

1000 NW 111th Avenue
Miami, FL 33172-5800

KEVIN J. THIBAULT, P.E.
SECRETARY

April 17, 2019

Timothy A. Parsons, Ph.D.
Director, Division of Historical Resources, and
State Historic Preservation Officer
R.A. Gray Building
500 S. Bronough Street
Tallahassee FL 32399-0250

Attn: Dr. Adrianne Daggett, Transportation Compliance Review Program

Re: Cultural Resource Assessment Survey (CRAS) for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach, Miami-Dade County, Florida
Financial Planning ID [FPID] No. 422713-2-22-01

Dear Dr. Parsons,

Please find the Cultural Resource Assessment Survey (CRAS) for the Venetian Causeway Bridges from North Bayshore Drive in the City of Miami to Purdy Avenue in the City of Miami Beach, Miami-Dade County, Florida (Financial Planning ID [FPID] No. 422713-2-22-01). The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges through potential alternatives such as replacement or rehabilitation. The objective of this CRAS was to identify cultural resources and assess their eligibility for listing in the National Register of Historic Places (National Register) according to the criteria set forth in 36 CFR Section 60.4.

The Venetian Causeway is approximately 2.5 miles long and is primarily a two-lane undivided facility that provides a major link between the City of Miami and the City of Miami Beach in Miami-Dade County, Florida. The Causeway includes ten fixed span bridges and two bascule leaf span bridges over the Intracoastal Waterway (bridge numbers 874459, 874460, 874461, 874463, 874465, 874466, 874471, 874472, 874473, 874474, 874477, and 874481) extending from North Bayshore Drive (City of Miami) to Purdy Avenue (City of Miami Beach). The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges through potential alternatives such as replacement or rehabilitation.

This assessment complies with Section 106 of the *National Historic Preservation Act (NHPA) of 1966* (Public Law 89-665, as amended), as implemented by 36 CFR 800 -- *Protection of Historic Properties* (incorporating amendments effective August 5, 2004); Stipulation VII of the *Programmatic Agreement among the Federal Highway Administration (FHWA), the Advisory Council on Historic Preservation (ACHP), the Florida Division of Historical Resources (FDHR), the State Historic Preservation Officer (SHPO), and the FDOT Regarding Implementation of the Federal-Aid Highway Program in Florida* (Section 106 Programmatic Agreement, effective March 2016, amended June 7, 2017); Section 102 of the *National Environmental Policy Act (NEPA) of 1969*, as amended (42 USC 4321 et seq.), as implemented by the regulations of the Council on Environmental Quality (CEQ) (40 CFR Parts 1500–1508); Section 4(f) of the *Department of Transportation Act of 1966*, as amended (49 USC 303 and 23 USC 138); the revised Chapter 267, *Florida Statutes (F.S.)*; and the standards embodied in the FDHR's *Cultural Resource Management Standards and Operational Manual* (February 2003), and Chapter 1A-46 (*Archaeological and Historical Report Standards and Guidelines*), *Florida Administrative Code*. In addition, this report was prepared in conformity with standards set forth in Part 2, Chapter 8 (*Archaeological and Historical Resources*) of the FDOT *Project Development and Environment Manual* (effective June 14, 2017). All work also conforms to professional guidelines set forth in the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (48 FR 44716, as amended and annotated).

The archaeological APE consists of bridges and associated abutments located on man-made land. The substructural features associated with the bridges are also in an area of Biscayne Bay that has been subjected to dredging and disturbance resulting from installation of underwater cables and pipelines. Based on this, subsurface testing for archaeological sites was not conducted and the archaeological portions of the investigation focused on providing relevant documentation to support the low potential for archaeological sites.

The historic resources survey identified a total of 42 historic resources. There were two previously recorded buildings (8DA11740 and 8DA11754), two previously recorded linear resources (8DA11375 and 8DA12366), two newly recorded resource groups (8DA14395 and 8DA15805), twelve newly identified bridges (8DA14373-8DA14384) and twenty-four newly identified buildings (8DA14385-8DA14393, 8DA15806-8DA15821). The National Register-listed resource, Venetian Causeway (8DA4736), was converted to the Venetian Islands Resource Group (8DA14395) and includes the twelve individual bridges (8DA14373-8DA14384) that make up the Causeway, as well as six man-made islands and five earthen causeway landings that are contributing features within the historic designed landscape.

Two previously recorded resources are considered or determined to be National Register-ineligible. The previously recorded building, Venetian Isles Apartment (8DA11740), has not been evaluated by the SHPO, however the previous surveyor determined that the building was National Register-ineligible. Given its common design and lack of historic significance, this building is considered ineligible for listing in the National Register individually or as part of a historic district. The previously recorded

linear resource, Collins Canal Seawall (8DA12366), was determined to be National Register-ineligible by the SHPO on May 4, 2012.

Two previously recorded resources have been determined to be National Register-eligible. The previously recorded building, Terrace Towers (8DA11754), was determined to be National Register–eligible by the SHPO on January 5, 2011. It is considered eligible for listing in the National Register as the work of a master under Criterion C. The previously recorded linear resource, Collins Canal (8DA11375), was determined to be National Register–eligible by the SHPO on May 4, 2012. It is considered eligible for listing in the National Register under Criteria A and C in the categories of Transportation, Engineering, and Community Planning and Development.

As a result of the current project, the Venetian Islands Resource Group (8DA14395) was documented. This resource group subsumes the National Register-listed Venetian Causeway (8DA4736). Due to severe deterioration, the bridges are in need of rehabilitation or replacement, and spans of the westernmost bridge were recently replaced following consultation with SHPO. Each of the twelve bridges were given individual FMSF numbers and were included within the newly identified Venetian Islands Resource Group (8DA14395). In consultation with the SHPO/FMSF, the FMSF for the Venetian Causeway (8DA4736) will be converted from its current classification as a historic bridge to a resource group. The resource group classification serves as a comprehensive tool for documenting the entire landscape of the Venetian Islands, including the bridges.

While the Venetian Causeway remains National Register-listed, the individual bridges (8DA14373-8DA14384) were evaluated as part of the current project and are considered contributing resources within the Venetian Islands Resource Group (8DA14395). Additionally, the six islands and five earthen causeway landings of the Venetian Islands were included within this historic designed landscape. The resource group encompasses a designed landscape of man-made islands, bridges, and earthen causeways that resulted from developers' ambitious plans to create a residential development on Biscayne Bay. Despite the replacement of spans of the westernmost bridge in 2015, the Venetian Islands Resource Group (8DA14395) is considered National Register-eligible under Criteria A and C in the categories of Community Planning and Development, Transportation, Architecture, and Engineering.

The twenty-four newly identified historic buildings (8DA14385-8DA14393, 8DA15806-8DA15821) and one newly identified historic resource group (8DA15805) are considered National Register-ineligible, individually or as part of a historic district.

We kindly request that this cover letter and enclosed document be reviewed, and concurrence provided by your office. This information is provided in accordance with the provisions contained in 36 CFR, Part 800, as well as the provisions contained in the revised F.S. Chapter 267. If you have any questions regarding the subject project, please contact me at Barbara.Culhane@dot.state.fl.us or (305) 470-5231.

Sincerely,

Barbara B. Culhane, M.S., A.I.C.P.
District Cultural Resources Coordinator/
Environmental Supervisor II

The Florida State Historic Preservation Officer finds the attached Cultural Resource Assessment Survey Report complete and sufficient and ☑ concurs/ ☐ does not concur with the recommendations and findings provided in this cover letter for SHPO/FDHR Project File Number 2016-4285B. Or, the SHPO finds the attached document contains_____insufficient information.

In accordance with the Programmatic Agreement among the FHWA, ACHP, FDHR, SHPO, and FDOT Regarding Implementation of the Federal-Aid Highway Program in Florida, if providing concurrence with a finding of No Historic Properties Affected for a project as a whole, or to No Adverse Effect on a specific historic property, SHPO shall presume that FHWA will proceed with a *de minimis* Section 4(f) finding at its discretion for the use of land from the historic property.

SHPO Comments:

For Deputy SHPO 6/25/2019

Timothy A. Parsons, Ph.D., Director, and
State Historic Preservation Officer
Florida Division of Historical Resources

[DATE]

APPENDIX B:

CRC Meeting Minutes

MEETING MINUTES

Cultural Resource Committee (CRC) - Meeting No.1
September 24, 2014
Project Development & Environment (PD&E) Study
Venetian Causeway
from North Bayshore Drive to Purdy Avenue in Miami-Dade County
Financial Project Number: 422713-2-22-01
ETDM Number: 12756

ATTENDEES

FDOT District Six:
- Dat Huynh, P.E., Project Manager
- Barbara Culhane
- Aileen Varela Margolles
- Hong Benitez, P.E.

State Historic Preservation Office/Tallahassee:
- Ginny Jones, State Historic Preservation Officer, Architectural Historian
- Dan McClarnon, State Historic Preservation Officer, Archaeologist

Federal Highway Administration (FHWA):
- Cathy Kendall, Environmental Specialist

City of Miami:
- Megan Schmitt , Preservation Officer

City of Miami Beach:
- Debbie Tackett, Senior Planner
- Jake Seiberling, Planner

United States Coast Guard:
- Darayl Tompkins, Bridge Management Specialist
- Evelyn Smart, Bridge Management Specialist

Miami Design Preservation League:
- Daniel Ciraldo, Director

General Public:
- Arva Parks, Historian

Project Team:
- Rick Crooks, P. E. – EAC Consulting
- Rodney C. Devera, P. E. – EAC Consulting
- Daniel Greenberg – EAC Consulting
- Ken Hardin – Janus Research
- Amy Streelman – Janus Research
- Maria Fernandez Porrata – Cunningham Group

MEETING LOCATION

- 1000 Venetian Causeway (Clubhouse), Miami Beach, Florida 33139

MEETING SUMMARY

- Meeting began at 3:12 p.m.
- Dat Huynh, P.E., FDOT Project Manager introduced the project team. He welcomed everyone and invited each attendee to introduce themselves. Mr. Huynh stated that this was the first CRC meeting being held to introduce, welcome and present the project

overview, existing conditions, PD&E process, milestones, and timeline. Mr. Huynh stated that all participants are encouraged to provide their expertise, opinions and commitment to the project and its process to completion.

- Mr. Huynh turned the meeting over to Rick Crooks, Consultant Project Manager
- Mr. Crooks gave a PowerPoint presentation prepared specifically for the CRC which highlighted the following topics:
    - PD&E Process
    - Purpose of the CRC
    - Existing Condition
    - Rehabilitation Parameters
    - Section 106 Process
    - Historic Significance
    - Next Steps
- During Mr. Crooks' presentation the following points were discussed among the committee members and the public present:
    - Darayl Tompkins/U.S. Coast Guard stated that if the bridge is just going to be rehabilitated the U.S. Coast Guard would not require a permit.
    - Dan McClarnon/State Preservation Office asked a question in reference to the reduction of the sufficiency rating throughout the corridor in different bridges over the last three years and what was being done to address this. Mr. Huynh replied that this study will analyze the existing conditions and present the most feasible alternative. Mr. Huynh noted that safety was a top priority for FDOT on this project. During the time for the project to be completed, the County will continue to maintain the bridges. Mr Huynh further stated that generally FDOT inspects bridges within the state system every two years, however, the bridges along the Venetian Causeway are being inspected and closely monitored on a yearly basis.
    - Cathy Kendall/FHWA asked Mr. Huynh about the "Purpose and Need" for the project and if safety was the main concern. Mr. Huynh noted that while safety is a top concern, the study will take into consideration all factors to derive the most feasible alternative.
    - Ms. Kendall asked about the Class Action determination type and timeframe. Mr. Huynh replied that it a Class of Action (COA) has not yet been established, but an Environmental Assessment (EA) was being recommended. The final COA depends on how the study develops and the extent of the impacts of the recommended alternative. The timeframe, as shown on Slide 49 of the presentation would be approximately three years.
    - Ginny Jones/State Historic Preservation Officer asked about the difference in the designations of non-critical, critical and extreme, as noted on Slide 32 (Hurricane Resistance) of the presentation.
    - Mr. Crooks explained the differences and confirmed that for this study FDOT is using the designation of "critical" and that the final designation would be made by the County, the owner of the bridges.
    - Ms. Kendall asked about the type of funding FDOT is using for this project. She asked whether federal funding was being sought. Mr. Huynh stated that the project does not have federal funding. He stated that the project had SIGP and local funding only.
    - Ms. Kendall stated that if the project did not have federal funding, then FHWA would not be involved in the project and will not require approvals or signage on any of the permitting or supporting documentation. She stated that if there is a bridge replacement project without federal funding, the U.S. Coast Guard would be responsible for any permitting and the execution of documentation related to the project.

- Evelyn Smart/U.S. Coast Guard commented that if the final alternative calls for a bridge replacement, it would definitely require full Coast Guard and Army Corps of Engineers permits. She stated that if the recommended alternative will excludes any work on the bascule bridges and the navigable channels; then, there will no Coast Guard permits required. In which case, only the Army Corps would be involved for the dredge and fill permit.
- Mr. Tompkins, concurred with the comment made by Ms. Kendall and added that the Army Corps of Engineers will be also part of the process during the permitting and final documentation approval for this project.
- Mr. Huynh mentioned that it is anticipated that the County will request federal funding for any project that results from the PD&E Study and that he would like to see all the agencies participate in the CRC process.
- Mr. Huynh asked that if any of the members present cannot attend a meeting in the future, they could assign a proxy to attend in their behalf. .
- Ken Hardin/Janus Research commented that due to the physical location of the project, both the cities of Miami and Miami Beach would be directly involved. He highlighted that both FDOT and Miami-Dade County will have to go through the appropriate processes for the required permits.
- Mr. Crooks turned the meeting over to Mr. Hardin who gave a detailed presentation regarding the Section 106 process. Mr. Hardin discussed the steps in the Section 106 process, where the project stands in the process, and the remaining tasks under Section 106. Mr. Hardin turned the meeting over to Amy Streelman/Janus Research who continued the discussion in reference to the bridges' history, historical significance, characteristics, future preservation and studies to continue under the Section 106 process.
- Ms. Smart asked about what other resources may be in the Area of Potential Effect, and Mr. Hardin noted these will be identified during the CRAS. This could possibly include a historic district of the bridges/causeway and the islands.
- Mr. Huynh presented a summary of action items and milestones for the project and stated that it was important to include the collaboration and input from all interested parties, the Project Advisory Group, the CRC and all intergovernmental agencies involved.
- Mr. Huynh gave the audience his personal contact information and links to the project webpage to obtain up dated project information.
- Mr. Huynh thanked all participants opened the floor for questions, and announced that everyone will receive an invitation for the next CRC meeting proposed to take place sometime in the winter of 2015. There were no additional questions or comments.

The meeting adjourned at 5:05 p.m.

MEETING MINUTES

Cultural Resource Committee (CRC)
May 14, 2015
Project Development & Environment (PD&E) Study
Venetian Causeway
from North Bayshore Drive to Purdy Avenue in Miami-Dade County
Financial Project Number: 422713-2-22-01
ETDM Number: 12756

ATTENDEES

FDOT District Six:
- Dat Huynh, P.E.,
- Barbara Culhane
- Aileen Varela Margolles
- Hong Benitez, P.E.
- Maria Perdomo, P.E.

State Historic Preservation Office/Tallahassee:
- Ginny Jones

Federal Highway Administration (FHWA):
- Cathy Kendall

City of Miami Beach:
- Lynn Bernstein

Dade Heritage Trust:
- Laura Lavernia

United States Coast Guard:
- Darayl Tompkins

Members of the CRC:
- Please see attached sign-in sheets.

Consultant Project Team:
- Please see attached sign-in sheets.

General Public:
- Please see attached sign-in sheets.

MEETING LOCATION

- 1000 Venetian Way Condominium (Clubhouse), Miami Beach, FL 33139

MEETING SUMMARY

- Formal presentation began at 2:28 p.m.
- Dat Huynh, P.E., FDOT Project Manager introduced the project team. Mr. Huynh provided an overview of the purpose of the Alternatives Public Workshop (APW) and discussed the ranking ballots and other information provided at sign-in.
- Mr. Huynh stated the ranking ballot results from the Alternatives Public Workshop that indicated support for Replacement and mentioned the suggestion to extend the spoil islands and eliminate the bridges.
- Mr. Huynh stated the next steps was the CRC 3 meeting in the beginning of 2016.
- Mr. Huynh turned the meeting over to Rick Crooks, P.E., Consultant Project Manager
- Mr. Crooks and Mr. Huynh gave a PowerPoint presentation prepared specifically for the CRC which included the following agenda:
    - Project Purpose and Need

    - Section 106 Process
    - Study Parameters
    - Alternatives Matrix and Ranking Ballot
    - No-Build Alternatives
    - Build Alternatives
    - Other Considerations
    - Evaluation Matrix
    - Next Steps

During the presentation the following points were discussed among the public present:

- Purpose and Need for Project
    - The purpose of the proposed project is to address identified structural and functional deficiencies of the twelve existing bridges (ten low-level fixed spans and two movable bascules), through potential alternatives such as replacement or rehabilitation.
- Purpose of Cultural Resource Committee (CRC)
    - To conduct and document good faith consultation with affected parties in compliance with Section 106 of the National Historic Preservation Act.
- Study Parameters
    - The agreed upon Rehabilitation and Replacement Parameters were presented as well as the requirements associated with the parameters.
    - An overview of the Venetian Causeway's historic resources
    - Ken Harden, Janus Research, addressed Ms. Liebman's questions about historic preservation. He explained the Section 106 and Section 4(f) processes that outline the approach to considering the impacts to the historic resource that would result from any improvements.
    - The requirement for measures to minimize harm as well as a binding Memorandum of Agreement on any proposed action in the event of an Adverse Effect to the historic resource. It was also explained that the process was documented in the slides with applicable references so attendees could research further if desired.
    - Cathy Kendall, FHWA questioned if the spoil Islands had any specific designation. If there was a special use for the islands? She stated that it is important to check the zoning for the spoil islands.
    - The required 25-year life for the Rehabilitation resulted in the consideration of Cathodic Protection (CP) for the existing bridges.
- Alternatives Matrix and Ranking Ballot
    - The Alternatives were presented in a Ballot format which allowed attendees to provide their opinion on the best improvement for the project. It was explained that this feedback would be considered by the project team as part of the study.
    - The Ballots were handed out at the APW and posted on the project website. The ballots where requested to be returned in person at the APW, e-mailed or mailed (post marked) by May 20, 2015 to Mr. Huynh.
- No Build Alternatives
    - The No Build Alternatives with continued routine maintenance were presented.
- Build Alternatives – Rehab
    - Rehab alternatives with and without beam strengthening was presented. The alternative with beam strengthening satisfied the required Rehabilitation Parameters.
    - The CP design and cost was presented.
- Build Alternatives – Replacement

    - Four typical section alternatives were presented that utilized different railing configurations.
    - The dimensions of the wider typical section was presented with wider sidewalks and bicycle lanes and a 1 ft. reduction in the travel lanes. It was explained that it resulted from the community's desire and need to better satisfy the high pedestrian and bicycle traffic.
    - The Tunnel Alternative was presented
    - Five Fixed Bridge Replacement alternatives were presented.
    - Four Movable Bridge Alternatives were presented and the differences explained.
- Other Considerations
    - Life cycle cost considerations were explained and the fact that the Rehab Alternatives would result in a 25-year life while the Replacement Alternatives a 75-year life.
    - Environmental and Historic Resource Impacts were presented.
    - Maintenance of Traffic options and Utility Considerations were presented.
- Evaluation Matrix
    - A sample evaluation matrix was presented and it was explained that a similar matrix would be utilized by the project team to select a recommended alternative.
    - The Ranking Ballot was again presented and it was requested that they be completed and returned so they may be considered by the project team.
- Summary and Next Steps
    - Mr. Huynh presented a summary of action items and milestones for the project and stated that it was important to include the collaboration and input from all interested parties including the public, the Project Advisory Group, the CRC and all intergovernmental agencies involved.
    - Mr. Huynh gave the audience his personal contact information and links to the project webpage to obtain up dated project information.
    - Mr. Huynh thanked all participants for attending the meeting and participating in the process. There were no additional questions or comments.
    - Rick Crooks asked if the Section 106 consultation process and CRC was going in accordance with their expectations and if SHPO or FHWA thought there needed to be any changes. They both replied that they were satisfied with the way things were going.
    - Mr. Crooks also asked Ms. Ginny Jones, SHPO, about the possibility of the Causeway maintaining its historic designation given the demolition of the remaining historic portion of the West Bridge. Ms. Jones indicated that it would maintain its historic designation. Mr. Crooks further questioned the possibility of this being the case if the rest of the bridges were replaced but maintained the historic character of the existing bridge. Ms. Jones indicated that this could be discussed further with SHPO.

The meeting adjourned at 4:30 p.m.

MEETING MINUTES

Cultural Resource Committee (CRC) Meeting No. 3
March 6, 2018
Project Development & Environment (PD&E) Study
Venetian Causeway
from North Bayshore Drive to Purdy Avenue in Miami-Dade County
Financial Project Number: 422713-2-22-01
ETDM Number: 12756

ATTENDEES

Florida Department of Transportation, District Six (FDOT)
- Dat Huynh, P.E., Project Manager
- Kelsey Condell
- Andrew Jungman
- Barbara Culhane, AICP

FDOT, Office of Environmental Management (OEM)
- Lindsey Guthrie, Project Delivery Coordinator
- Matthew Marino, Cultural Resources Specialist
- Michael Sykes, Engineering Specialist

Miami Design Preservation League (MDPL)
- Steven J. Pynes

Miami-Dade County Department of Transportation and Public Works (DTPW)
- Gabriel Delgado, P.E.

State Historic Preservation Office (SHPO)
- Ginny Jones

Consultant Project Team (CPT)
- Please see attached sign-in sheets.

MEETING LOCATION
- 1000 Venetian Condominiums (Third Floor, Clubhouse), Miami, FL 33139

MEETING SUMMARY
- Formal meeting began at 7:17 p.m.
- Mr. Dat Huynh, P.E. (FDOT) began the meeting with an introduction of the project team and agency attendees.
- Purpose and Need for Project
    - Mr. Huynh explained the purpose of the proposed project, which is to address identified structural and functional deficiencies of the twelve existing bridges (ten low-level fixed spans and two movable bascules), through potential alternatives such as No-Build, Replacement or Rehabilitation. He continued by presenting a chart that detailed the structural and functional deficiencies of all twelve Venetian bridges.
- Structural and Functional Deficiencies
    - Mr. Huynh reviewed the functional and sufficiency ratings for each of the twelve existing bridges.
- Mr. Huynh reviewed the presentation agenda:
    - Project Status
    - Purpose of CRC

        - Alternatives Analysis
        - Viable Alternatives
        - Evaluation Matrix
        - Recommended Alternative
        - Historic Resources
        - Section 106 Process
        - Next Steps
- Project Status
    - Mr. Huynh gave an update on the project status and explained the Class of Action Determination of an Environmental Assessment (EA) on November 10, 2016 by the Federal Highway Administration (FHWA) and the NEPA Assignment, which went into effect on December 14, 2016. Mr. Huynh continued to discuss the project status with a timeline of what has transpired to date during Project Scope Development and PD&E/NEPA Study.
- Purpose of the Cultural Resource Committee (CRC)
    - Mr. Huynh continued by outlining the purpose of the Cultural Resource Committee (CRC). Mr. Huynh turned the meeting over to Rick Crooks, P.E. to cover the remaining agenda items. Mr. Crooks began the presentation by giving a brief background on the Venetian Causeway.
- Alternatives Analysis
    - Mr. Crooks detailed the Alternatives Analysis and showed screening matrix of the various alternatives that were evaluated and presented at the Alternatives Public Workshop (APW). Mr. Crooks mentioned that during the APW, a ballot was used to assess the preferences of the attendees. Mr. Crooks noted that the results of the alternatives screening were comparable to the results of the ballots received by the public during the APW.
- Viable Alternatives
    - Mr. Crooks mentioned that based on the results of the alternatives screening, the viable alternatives to be considered for additional study were determined as follows:
        - No-Build:
            - Alternative 1 – Do Nothing
            - Alternative 2- Transportation Systems Management and Operations (TSM&O)
        - Build Alternatives:
            - Rehabilitation Alternative 4 – Fixed Bridge Rehabilitation with Beam Strengthening
                - Rehabilitation Alternative M1- Bascule Bridge Rehabilitation
            - Replacement Alternative 7 – Arched Beams
                - Replacement Alternative M4 – Double Leaf Bascule Bridge
        - Estimated Costs
            - Mr. Crooks provided a review of the estimated costs and service life for the No-Build, Rehabilitation and Replacement Alternatives. Mr. Crooks also evaluated the Life Cycle Cost for each Alternative.

        - Anticipated Schedule
            - Mr. Crooks presented the Anticipated Schedule for the various alternatives and explained the construction

process for each alternative. Mr. Crooks continued to describe the Maintenance of Traffic (MOT) that will be involved during the construction process of the project.

- Environment
  - Mr. Crooks turned the presentation over to Ken Hardin, Janus Research, to present the environmental impacts of the No-Build and Build Alternatives.
- Evaluation Matrix
  - Mr. Hardin turned the presentation back to Rick Crooks to review the Evaluation Matrix. Ginny Jones, State Historic Preservation Office (SHPO) asked Mr. Crooks about the popularity of the alternatives during the Alternatives Public Workshop (APW). Mr. Crooks detailed the voting process that took place during the APW to determine the public's preferred alternative. He stated that the meeting took place on May 13, 2015 and the majority voted for the Replacement Alternative for the project. Mr. Hardin and Mr. Crooks further elaborated on the voting process during the APW.
- Recommended Alternative
  - Mr. Crooks presented the Recommended Alternative as follows:
    - Alternative T1: Venetian Railing
    - Alternative 7: Arch Beam
    - Alternative M4: Double Leaf Bascule Bridge
  - Mr. Hardin elaborated on the construction that will be involved in the Replacement Alternative. Ms. Jones asked Mr. Crooks what the height of the gravity wall will be at its maximum. Mr. Crooks stated that the gravity wall height will be 2.3 ft. at its maximum.
  - Ms. Jones inquired about the need to acquire right-of-way parcels with the Replacement Alternative and the height of the gravity wall on the spoil islands. She was informed that no parcels would need to be acquired and that the roadway would be raised about a foot on the island and would require that fill be placed to accommodate the higher grade.

- Historic Resources
  - Mr. Crooks turned the presentation over to Amy Streelman, Janus Research, to discuss the historic resources and the potential historic impacts to the project area.
- Section 106 Process
  - Ms. Streelman continued the presentation with a brief description of Section 106 of the National Historic Preservation Act and next steps throughout the course of the study.
- Next Steps
  - Mr. Crooks continued the presentation with a timeline of the next steps during the PD&E study of the project. Ms. Jones stated that she would prefer the next CRC meeting take place following the upcoming Public Hearing. Mr. Huynh stated that a letter would be drafted to all the CRC

members asking if they would prefer a CRC meeting before or after the Public Hearing. Mr. Steven J Pynes, Miami Design Preservation League (MDPL), asked Mr. Hardin who would be leading the Memorandum of Understanding (MOU). Mr. Hardin stated that the MOU would be created with the participation of the cooperating parties: State Historic Preservation Office (SHPO), Office of Environmental Management (OEM), Miami-Dade County (MDC), United Stated Coast Guard (USCG), and the Army Corps of Engineers (ACE).

- Mr. Huynh asked if there were any additional questions as it relates to the presentation. Ms. Jones asked what would be required to build the gravity wall on the spoil islands. Mr. Crooks responded that they would have to put more fill, but it will be contained within the walls and the islands would be unchanged.
- Mr. Pynes asked if the bridges would still be considered a historic causeway after construction. Ms. Jones stated that the eligibility would be considered based on the historic characteristics of the causeway, an evaluation of the Section 106 and the impacts of the Recommended Alternative to the historic resource.
- Mr. Huynh concluded the meeting by thanking everyone for their continued participation throughout the PD&E process of the project.
- The meeting adjourned at 8:39 p.m.

The following minutes will be considered an accurate record of the meeting unless FDOT is notified in writing within ten (10) business days following the distribution date.

Minutes Prepared By: *Myrick Mitchell*

Myrick Mitchell
FDOT District Six Consultant Public Information Specialist/The Brand Advocates, Inc.

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