DRAFT PRELIMINARY ENGINEERING REPORT

Florida Department of Transportation

District 4

SR 5/US 1 at Aviation Boulevard

Limits of Project: n/a

Indian River County, Florida

Financial Management Number: 441693-1-22-02

ETDM Number: 14475

Date: 05/14/2024

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

_____
Authorized Signature

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Print/Type Name

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Title

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Address

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Address

Seal

Project Development & Environment (PD&E) Study

SR 5/US 1 at Aviation Boulevard

Milepost 7.217

Financial Management Number: 441693-1-22-02
ETDM Number: 14475
Indian River County, Florida

Draft

PRELIMINARY ENGINEERING REPORT

Prepared for:

Florida Department of Transportation

District 4

Prepared by:

WGI, Inc.
2035 Vista Parkway
West Palm Beach, FL 33411

May 2024

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

PROFESSIONAL ENGINEER CERTIFICATION

PRELIMINARY ENGINEERING REPORT

Project: SR 5/US 1 at Aviation Boulevard

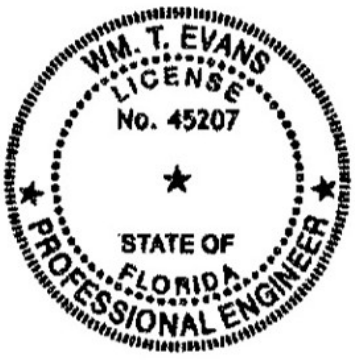
ETDM Number: 14475

Financial Project ID: 441693-1-22-02

Federal Aid Project Number: N/A

This preliminary engineering report contains engineering information that fulfills the purpose and need for the SR 5/US-1 at Aviation Boulevard Project Development & Environment Study in (Indian River County), Florida. I acknowledge that the procedures and references used to develop the results contained in this report are standard to the professional practice of transportation engineering as applied through professional judgment and experience.

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



This item has been digitally signed and sealed by *[William Evans, PE]* on the date adjacent to the seal.

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

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1.0 PROJECT SUMMARY

1.1 Project Description

The project intersection of SR 5/US 1 and Aviation Boulevard is located within the urbanized area of the City of Vero Beach in Indian River County (IRC), Florida. This is a 4-legged, signalized intersection that accommodates the Florida East Coast (FEC) Railroad crossing on the eastbound approach. The FEC Railroad, which is part of the Strategic Intermodal System (SIS) Railroad Corridor, includes double-tracks running north-south parallel to SR 5/US 1 on the west side. Pedestrian crosswalks are provided on the northbound and westbound approaches of the intersection. There are no dedicated bicycle facilities. Nearby landmarks include Vero Beach Regional Airport, Cleveland Clinic Indian River Hospital and Indian River Medical Center, and downtown Vero Beach. The intersection is near a Runway Protection Zone (RPZ) of the Vero Beach Regional Airport.

The project proposes operational and capacity improvements to the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. Various alternatives were considered during the Project Development & Environment (PD&E) study, which included at-grade and grade-separated crossings over the FEC Railroad. Additional features were considered such as multi-modal improvements. To account for potential grade separation and other solutions that address the purpose and need, the north-south limits of the PD&E study extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue. The PD&E study limits are shown in **Figure 1-1**.

SR 5/US 1 constitutes the north and south approaches of the intersection, as a four-lane divided facility with a painted center turn-lane, curb and gutter on both sides, and a sidewalk on the east side. SR 5/US 1 has a functional classification of Urban Principal Arterial Other and a context classification of C4 Urban General since there are mostly non-residential land uses along the corridor with residential neighborhood connections. Indian River County has designated SR 5/US 1 corridor as a hurricane evacuation route.

At the eastbound approach of the intersection, Aviation Boulevard crosses the FEC Railroad. This is a 2-lane undivided roadway with no pedestrian facilities. Aviation Boulevard has a functional classification of Urban Minor Arterial and a context classification of C3 Commercial due to the non-residential land uses. The westbound approach is served by 32nd Street as a local 2-lane undivided street serving limited commercial and residential properties.

Figure 1-1 Project Location Map

1.2 Purpose & Need

Purpose

The primary purpose of the project is to evaluate intersection improvement solutions to address existing and projected traffic demands, improve safety, support economic growth, and improve modal interrelationships with rail, bicycle, and pedestrian modes.

Need

Project Status

The project is listed in the Indian River Metropolitan Planning Organization's (MPOs) 2045 Long Range Transportation Plan (LRTP) Cost Feasible Plan Projects as Project ID 2 with as a “New Interchange” with an implementation timeframe between 2036 to 2045. This project is also listed as Priority Project #6 in the MPOs 2021/2022 Priority Projects Report. The project is programmed for funding for Preliminary Engineering (PE) phase in the

Transportation Improvement Program (TIP) and the State Transportation Improvement Plan (STIP). The project is planned for funding for the right of way and construction phases according to the 2045 LRTP.

Traffic Demand and Capacity

According to the IRC MPO 2021 Priority Projects Report, the intersection is currently failing or nearly failing during peak periods and in peak directions.

As part of this PD&E study, FDOT District 4 developed, under a separate study, the Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support, dated November 2, 2021. The Efficient Transportation Decision Making (ETDM) traffic forecasting section is updated as follows.

The SR 5/US 1 at Aviation Blvd intersection operates in the year 2021 at Level of Service (LOS) C/D in the AM/PM peak periods. The eastbound and westbound approaches are operating at LOS E or F during both peak periods, with the eastbound queue length exceeding the available storage.

The future No-Build (without improvements) shows the 2045 traffic demand increasing due to population and employment growth as well as planned capacity improvements in the immediate network; therefore, conditions are expected to degrade at this intersection without improvements.

According to the analysis forecast developed from the Treasure Coast Regional Planning Model (TCRPM), the Annual Average Daily Traffic (AADT) is projected to increase 61% between the years 2021 and 2045. Along SR 5/US 1 south of Aviation Boulevard, No-Build traffic volumes are projected to increase from 26,500 to 42,600 AADT for the analysis years 2021 and 2045, respectively. To the north of Aviation Boulevard, SR 5/US 1 traffic volumes will increase from 34,200 to 55,000 AADT. Along Aviation Boulevard, the increase is from 12,000 to 19,300 AADT.

It is anticipated that traffic operations will degrade to LOS F by 2045 at the intersection of SR 5/US 1 at Aviation Boulevard without improvements under the No-Build condition. Delays will reach 135/156 seconds per vehicle during AM/PM peak periods. The eastbound and westbound approaches would operate at LOS F with delays reaching 206/135 seconds of delay per vehicle, and the eastbound queue length exceeding the available storage by 169%.

The IRC Aviation Boulevard extension project, which is a separate nearby project, has construction funds committed according to the IRC Capital Improvement Element adopted in December 2020. At the time of this study, construction had not begun on the

project, but the County has started the right-of-way acquisition process and design. The Preferred Alternative will connect with that new road that extending Aviation Boulevard to the east from US 1 to 41st Street. According to the IRC MPO 2045 LRTP, other planned nearby capacity improvements include widening of Aviation Boulevard from 2 to 4 lanes, from 27th Avenue to the subject intersection with SR 5/US1. These projects will increase the traffic demand at the intersection of SR 5/US 1 and Aviation Boulevard as well.

Safety

The 2021 Florida Strategic Highway Safety Plan (FSHSP) has identified intersections as an emphasis area while rail crossings are an evolving emphasis area. A historical crash evaluation of the intersection of SR 5/US 1 and Aviation Boulevard revealed a total of 54 crashes observed over a five-year period between 2016 and 2020. Approximately 23% of these crashes resulted in injuries. The majority of these crashes were rear end at approximately 42% followed by sideswipe at 26% and left turn crashes at 15%. These types of crashes may be correlated to congested conditions at the intersection. One crash involved an FEC Railroad train and a vehicle which resulted in injury. Two crashes involved the FEC Railroad crossing gate. The existing facility's safety performance crash rate was calculated at 0.92 which is significantly higher than the Statewide crash rate of 0.53 and the Districtwide crash rate of 0.34. This indicates a potential safety concern. The SR 5/US 1 corridor has been designated by IRC as an evacuation route.

Social Demands or Economic Development

According to the IRC MPO 2045 LRTP, the County's population is projected to grow 41% between the year 2015 to 2045 (143,326 population in 2015 to 201,839 in 2045). Similarly, employment is projected to grow 24% (76,386 employed during 2015 to 94,626 in 2045).

The City of Vero Beach Comprehensive Plan (April 2018) shows existing undeveloped lands along SR 5/US 1 in the vicinity of the intersection with Aviation Boulevard. The Future Land Use map presents a transformation of this area with mixed-use development, commercial, mixed residential, and residential medium. This indicates potential land development growth in the immediate area of the project.

Based on the IRC Comprehensive Plan, the IRC/City of Vero Beach Enterprise Area includes an area from SR 5/US 1 as the eastern boundary, 43rd Avenue as the western boundary, 53rd Street as the northern boundary, and Atlantic Boulevard as the southern boundary. The Enterprise Area encourages economic growth and investment through tax incentives which may increase traffic demand in the area.

The Vero Beach Regional Airport Master Plan includes an Airport Commercial Village and proposes to increase daily passenger traffic and identifies aircraft storage. Moreover, the master plan forecasts an annual average growth rate for aircraft operations at 1.5% indicating an increase an air traffic to/from the airport.

Modal Interrelationships

The intersection of SR 5/US 1 and Aviation Boulevard currently serves numerous modes of transportation, including: vehicles, pedestrians (sidewalks and crosswalks), transit, and the FEC Railroad crossing at the eastbound approach of the intersection. IRC's transit system, GoLine, includes three bus routes along SR 5/US 1 and one route along Aviation Boulevard based on the 2021 transit system map. In addition, the Vero Beach Regional Airport is located directly northwest of the intersection with direct access along Aviation Boulevard.

The existing bicycle and pedestrian networks are limited in the vicinity of the project. There are no bicycle lanes, and sidewalks are only present on the east side of SR 5/US 1. Guided by the 2015 Bicycle and Pedestrian Plan, the Indian River MPO 2045 LRTP proposes new sidewalks and bicycle facilities in conjunction with roadway improvement projects along Aviation Boulevard between SR 5/US 1 and 43rd Avenue which is the entire southern boundary of the Vero Beach Regional Airport. The plan also proposes a new bicycle facility along SR 5/US 1 north of Aviation Boulevard which supports a vision to have a bicycle facility along most SR 5/US 1 within the County.

The Indian River MPO 2045 LRTP, which is based on the IRC Transit Development Plan (TDP), presents several transit needs in the immediate area of the intersection of SR 5/US 1 including a potential bus shelter at the intersection, new/modified route service along SR 5/US 1, and improved route operations along Aviation Boulevard.

The FEC Railroad, which is parallel and abutting west of SR 5/US 1, is part of the FDOT SIS. According to the Indian River MPO 2045 LRTP, a performance evaluation goal is to enhance the FDOT SIS by constructing a flyover at the FEC Railroad at the intersection of SR 5/US 1 and Aviation Boulevard (Objective 1.04, Policy 1.04.1, and Performance Indicator 1.041.1).

In 2016, the Vero Beach Regional Airport released their master plan that identified numerous needs such as an "Airport Commercial Village" along Aviation Boulevard which would function as a key commercial district. In addition, the plan describes improvements to Aviation Boulevard which is the gateway and primary access to the Airport.

1.3 Commitments

Project commitments are as follows:

1. DRAFT: FDOT is committed to continue coordination with Camp Haven Rehabilitation Center during the design and right of way process.

2. DRAFT: FDOT is committed to archaeological monitoring by a professional archaeologist during earth-disturbing construction activities.

3. DRAFT: Noise abatement measures are not recommended for construction as part of the proposed project. If changes occur to the conceptual Preferred Alternative, additional analysis may be warranted. If this occurs, the FDOT commits to the construction of feasible and reasonable noise abatement measures at noise-impacted locations contingent on the following:

    - Final recommendations on the construction of the abatement measure are determined during the project's final design and through the public involvement process;

    - Detailed noise analyses during the final design process support the need, feasibility, and reasonableness of providing abatement;

    - Cost analysis indicates that the cost of the noise barrier(s) will not exceed the cost reasonable criterion;

    - Community input supporting types, heights, and locations of the noise barrier(s) is provided to the District Office;

    - Safety and engineering aspects as related to the roadway user and the adjacent property.

4. DRAFT: The FDOT is committed to continued coordination with the Florida East Coast Railway and City of Vero Beach during the design phase to identify acceptable railroad risk counter measures and potential closure of the 14th Ave railroad crossing.

5. DRAFT: FDOT is committed to coordinating the FDOT project with the Indian River County project that extends Aviation Boulevard east of SR 5/US 1.

1.4 Alternatives Analysis Summary

Alternatives analysis is the process of developing, evaluating, and eliminating potential project alternatives based on the purpose and need of the project. The analysis focused

on the intersection and approaches at SR 5/US 1 and Aviation Boulevard. The IRC MPO LRTP included a feasibility study into the PD&E study to consider grade separating the intersection over the railroad. The process also included a separate RPZ alternatives analysis requested by the Federal Aviation Administration (FAA) to evaluate effects to Runway 30L operations and safety.

The alternatives analysis process included a screening of eight alternatives, elimination of four alternatives, and four alternatives considered for additional study. The 'No-Build' alternative is defined as the alternative in which the proposed project improvements would not take place and is used as the baseline against which 'Build' alternatives are evaluated. Local coordination with the public, Vero Beach Regional Airport, City of Vero Beach, IRC Public Works and MPO occurred throughout the alternatives analysis process.

1.4.1 Alternatives Considered

No Build Alternative: This alternative does not implement improvements and maintains the existing conditions through the project with only periodic maintenance improvements.

Alternatives 1 through 6 represent the at-grade and grade separated alternatives. Alternatives 7 and 8 resulted from the Intersection Control Evaluation (ICE) process.

Alternative 1 Conventional Intersection: This alternative reconstructs the intersection and adds turn lanes to all approaches. This alternative adds one westbound through lane on Aviation Boulevard to accept the dual left and right turns. The Indian River Farms Water Control District (IRFWCD) Main Canal bridge along SR 5/US 1 located north of 28th Street is replaced due to the widening of the roadway typical section. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 2 One-way Pair: This alternative splits SR 5/US 1 into a pair of roadways. The existing SR 5 serves southbound traffic, and a new two-lane roadway is located 600 feet to the east. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 3 US-1 Overpass Alternative: This alternative elevates the four through lanes of SR 5/US 1 over Aviation Boulevard with ramps to provide for turning movements and local access. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints. The SR 5/US 1 overpass is outside of the runway protection zone (RPZ) and below the 40:1 flight surface.

Alternative 4 Aviation Boulevard Overpass (with railroad grade-separation): This alternative elevates Aviation Boulevard over SR 5/US 1 and eliminates the at-grade FEC

railroad crossing and signalized intersection on SR 5/US 1. A new four-lane quadrant street connection provides for turning movements to/from the overpass. The overpass and approaches are within the RPZ and below the 40:1 flight surface. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 5 Aviation Boulevard Underpass (with railroad grade-separation): This alternative depresses Aviation Boulevard and eliminates the at-grade FEC railroad crossing and signalized intersection on SR 5/US 1. A new four-lane quadrant street connection provides for turning movements to/from the underpass. Two (2) new bridge structures would be required to carry the FEC railroad and SR 5/US 1 roadway over the underpass. This depressed, open-cut type roadway is within the RPZ. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 6 Aviation Boulevard Overpass (with partial railroad grade-separation): This alternative elevates Aviation Boulevard through lanes over the FEC railroad and SR 5/US 1 and retains an at grade railroad crossing for turning movements and the signalized intersection at SR 5/US 1. The Aviation Boulevard overpass embankment is within the RPZ and below the 40:1 flight surface with 17.8 ft of clearance between the bridge profile and flight surface. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 7 Displaced Left Turn (DLT): This alternative is at-grade with the northbound SR 5/US 1 left turn displaced or deflected to the west side of the SR 5/US 1 right of way via a signalized directional median and a two-lane, two-way parallel roadway located between southbound lanes of SR 5/US 1 and the FEC right of way. The Main Canal bridge is replaced. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

Alternative 8 Median U-Turn with Roundabout: This alternative eliminates three of the four left turns and incorporates a roundabout and quadrant road to provide for the left turns on the northbound, westbound, and southbound approaches. The eastbound left turn remains in place. The Main Canal bridge is replaced. The at-grade railroad crossing is improved. Shared use paths are provided in lieu of on-street bike lanes due to right of way constraints.

1.4.2 Alternatives Considered and Eliminated

The alternatives analysis process included several coordination meetings with the city, county, airport, FAA, FEC RR, and MPO. The FAA required a RPZ alternatives analysis that evaluated the PD&E alternatives and alternatives that modified the runway. The RPZ analysis concluded that at-grade PD&E alternatives were the best solution for aviation safety and operations. The FAA, airport, and city officials concurred with the findings of the RPZ alternatives analysis and supported only at-grade railroad crossing alternatives. A screening matrix compared the eight alternatives' operations, impacts and cost. The four at-grade alternatives scored best. Alternatives 3, 4, 5, and 6 were eliminated from further study.

1.4.3 Alternatives Considered for Further Evaluation

Alternatives 1, 2, 7, and 8, which are the at-grade railroad crossing alternatives, were advanced into detailed PD&E analysis. A public alternatives workshop was held and further coordination with the city, county, airport, FAA, FEC RR, and MPO occurred. Alternative 1 scored the best, was supported by the city, county and public and became the Preferred Alternative.

1.5 Description of Preferred Alternative

The Preferred Alternative was identified based on the results of the alternatives evaluation, public involvement, and coordination with local officials. No design exceptions or variations are anticipated with the Preferred Alternative, shown in **Figure 1-2**.

The Preferred Alternative reconstructs the SR5/US 1 and Aviation Boulevard intersection:

- Limits of Construction:
    - SR 5/US 1 limits begin at 28th Street and end 1300 ft north of Aviation Boulevard, for a total length of 2700 ft.
    - Aviation Boulevard limits begin 750 ft west of Airport N. Drive and end 670 ft east of SR 5/US 1, for a total length of 2200 ft.
- The existing SR5 5/US 1 bridge (no. 880085) over the Indian River Farms Water Control District (IRFWCD) Main Canal will be replaced and includes a 12-ft shared use path on the east side.
- A 2.52-acre dry retention pond is proposed and located adjacent to the project between 30th Street and 31st Street.

- SR 5/US 1 at Aviation Boulevard intersection configuration:
    - Northbound approach: two left turns, two travel lanes, and one right turn lane,
    - Southbound approach: one left turn, two travel lanes, and two right turn lanes,
    - Westbound approach: one left turn lanes, one travel lane, one right turn lane,
    - Eastbound approach: two left turn lane, one travel lane, one right turn lane,
    - Bicycle lanes are provided on SR 5/US 1 from 29th Street to approximately 350 ft north of 33rd Street.
    - Bicycle lanes are provided on Aviation Boulevard from SR 5/US 1 to 33rd Street in the eastbound and westbound direction; and from SR 5/US 1 to Airport N. Drive in the westbound direction only. The bicyclist will use the shared use path in the eastbound direction within the airport property.
- The alignment east of SR 5/US 1 curves to the north and connects with 33rd Street to be compatible with the proposed alignment of the Aviation Boulevard Extension project being conducted by IRC. At the Main Canal Bridge, SR 5/US 1 is shifted 15 feet to the east for additional maintenance access between the bridge and FEC Railroad right-of-way.
- Bus bays are provided on SR 5/US 1, north and south of the intersection.
- A 12-ft shared use path is provided along the east side of SR 5/US 1 throughout the study area and a 12-ft shared use path is provided on the south side of Aviation Boulevard west of SR 5/US 1.
- High emphasis crosswalks are provided on the south and east approach of the intersection.
- Access to Airport N. Drive is provided with one westbound right turn lane and one eastbound left turn lane.
- Approximately 7.64 acres of additional right-of-way is needed from 27 parcels. A potential of four (4) business relocations and zero (0) residential relocations are anticipated. One outdoor advertising sign (#CB560) will require acquisition.

The conceptual plans for the Preferred Alternative are shown in **Appendix A** and the proposed typical sections for SR 5/US 1 and Aviation Boulevard are shown in **Figure 1-2, 1-3** and **Figure 1-4,** respectively.

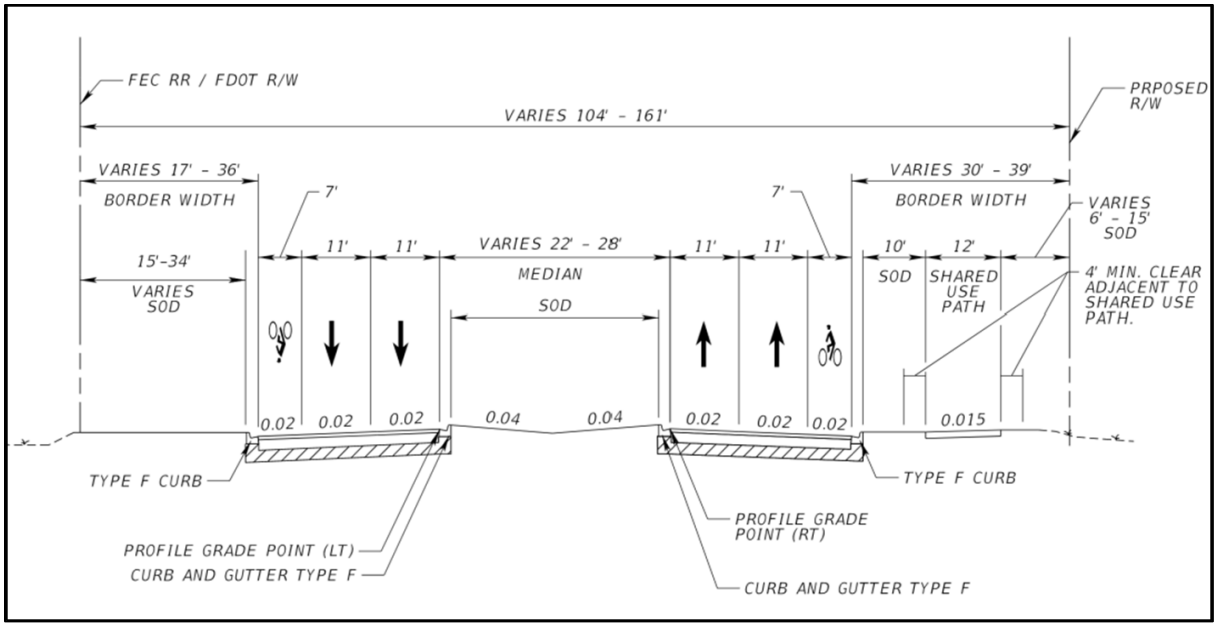


Figure 1-2 Proposed Typical Section for SR 5/US 1

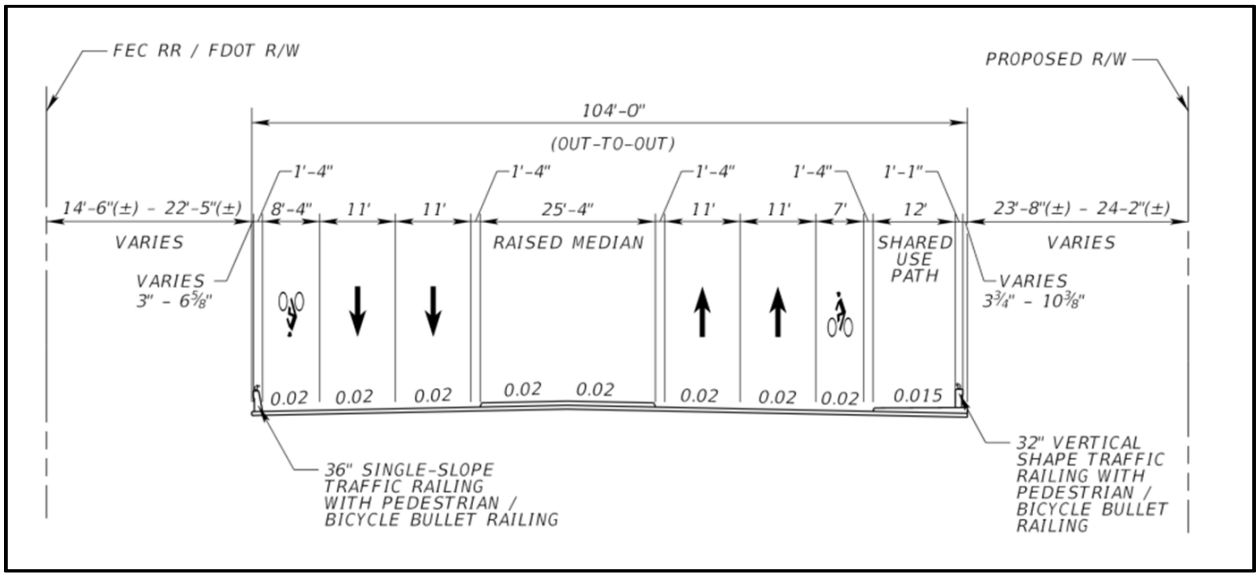


Figure 1-3 Proposed Typical Section for SR 5/US 1 Main Canal Bridge

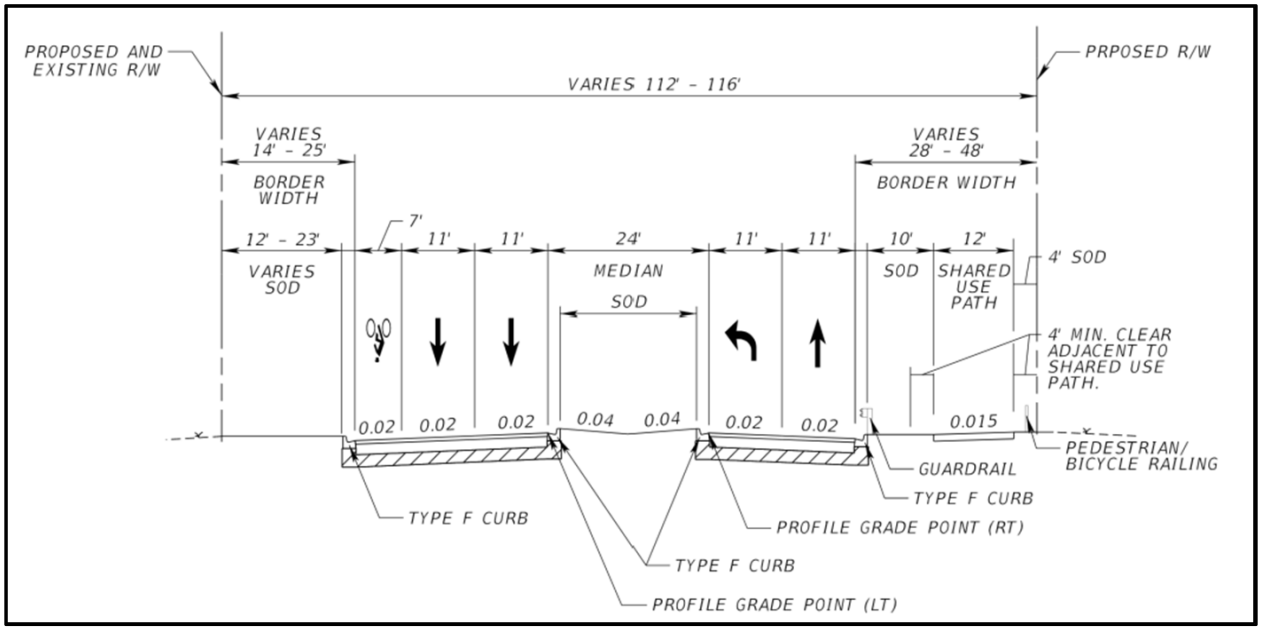


Figure 1-4 Proposed Typical Section for Aviation Boulevard

1.6 List of Technical Documents

Below is a list of technical documents prepared as a part of this PD&E Study and included as part of the project file in FDOT's State-Wide Environmental Project Tracker (SWEPT).

Public Involvement:

- Public Involvement Plan – Final July 2022
- Comments and Coordination Report – Draft May 2024
- Public Hearing Transcript – planned June 2024

PD&E Engineering:

- Conceptual Design Plan Set – Draft May 2024
- Geotechnical Report – Final May 2024
- Location Hydraulics Report – Draft March 2024
- Pond Siting Report – Draft March 2024
- Preliminary Engineering Report – Draft May 2024
- Project Traffic Analysis Report – Final March 2024
- Typical Section Package – Draft May 2024
- Utilities Assessment Package – Draft April 2024

Environment:

- Conceptual Stage Relocation Plan – Draft Apil 2024
- Contamination Screening Evaluation Report (CSER) – Final March 2024
- Cultural Resource Assessment Survey – Draft April 2024
- Noise Study Report – Draft April 2024
- Section 4(f) Determination of Applicability (DOA) – Final July 2023
- Sociocultural Effects Evaluation (SCE) – Draft May 2024
- Type II Categorical Exclusion – Draft May 2024
- Water Quality Impact Evaluation – Draft March 2024

General:

- Planning Consistency Form – Draft March 2024
- Project Commitments Record – Draft May 2024

2.0 EXISTING CONDITIONS

2.1 Roadway

The SR 5/US 1 at Aviation Boulevard PD&E Study area includes SR 5/US 1 from 21st Street to 41st Street, and Aviation Boulevard from 27th Avenue to SR 5/US 1 and 32nd Street from SR 5/US 1 to 13th Avenue. The SR 5/US 1 existing typical section contains two (2) travel lanes in each direction with a center flush paved median for left turns and a concrete sidewalk along the east side. FEC railroad tracks run parallel to SR 5/US 1 along the west side. SR 5/US 1 Bridge No. 880085 over the Main Canal follows the same typical section as the roadway and includes two-foot shoulders on either side of the bridge. Most of the SR 5/US 1 corridor is flanked by curb and gutter and has a normal crown. The existing typical section (with normal crown) for SR 5/US 1 can be seen in **Figure 2-1**.

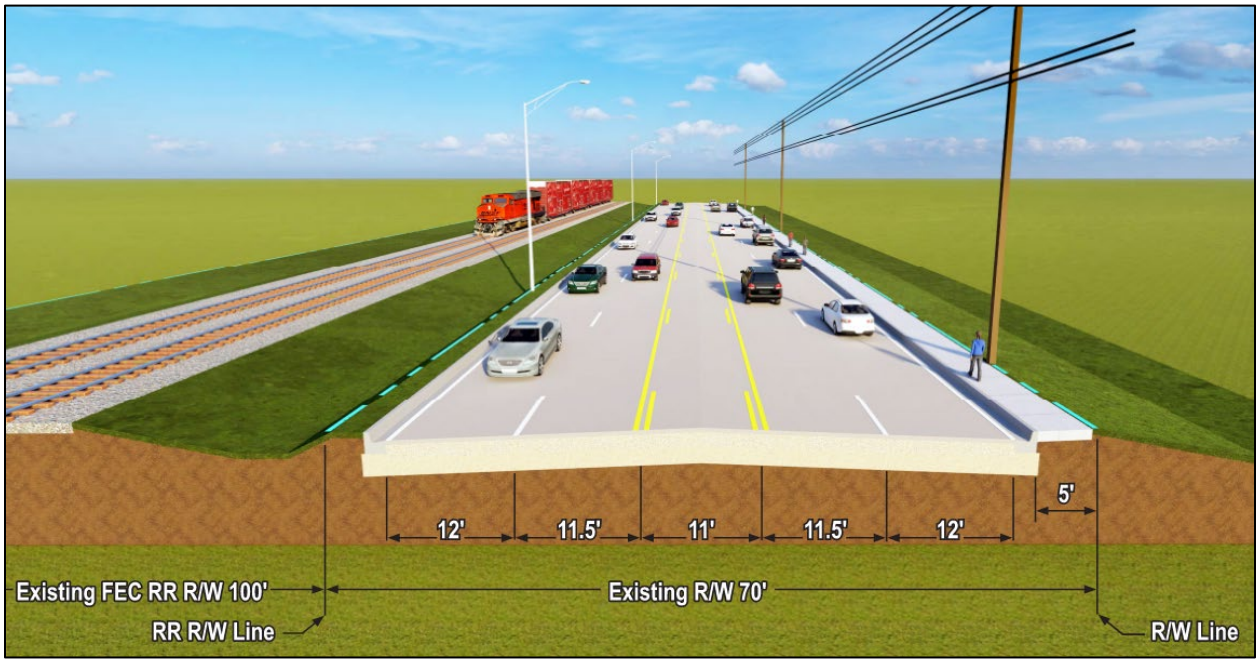
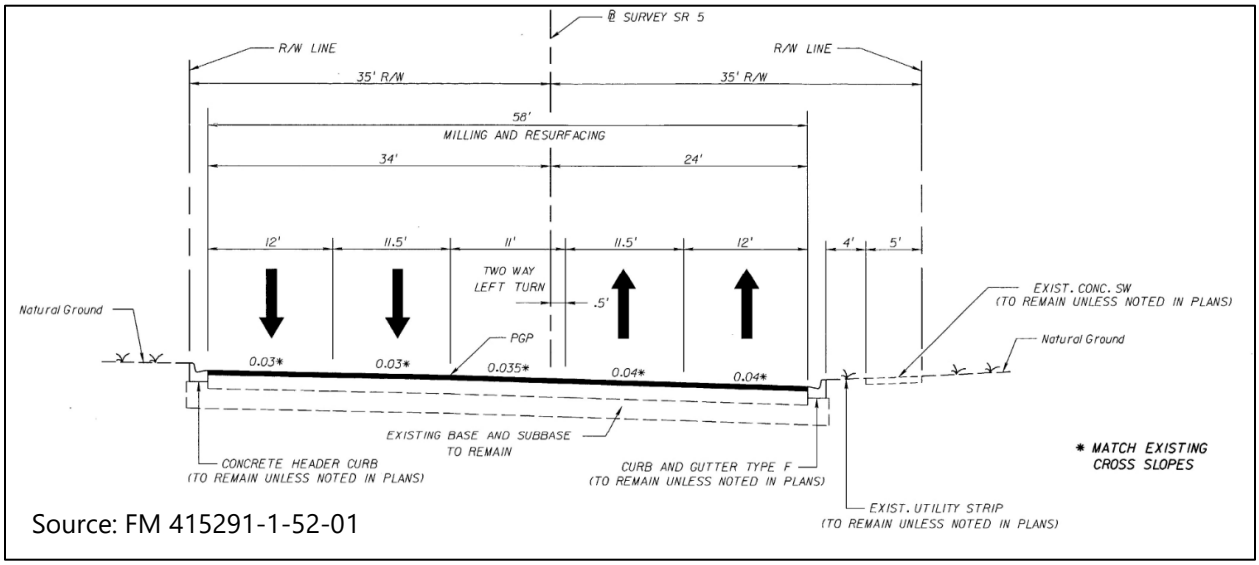


Figure 2-1 Existing Typical Section – SR 5/US 1

Within the study limits, there is approximately 750 feet of SR 5/US 1 that doesn't have normal crown and is comprised of a cross slope that is sloped down towards the east curb and gutter. This mono-pitched section of SR 5/US 1 occurs at the intersection with Aviation Boulevard. The second existing typical section (with mono-pitch cross slope) for SR 5/US 1 can be seen in **Figure 2-2**.



Source: FM 415291-1-52-01

Figure 2-2 Existing Typical Section 2 – SR 5/US 1

Aviation Boulevard is an IRC maintained roadway with one (1) travel lane in each direction with curb and gutter from 27th Avenue to 27th Street and grass shoulders from 27th Street to SR 5/US 1. The county is currently evaluating extending Aviation Boulevard east from SR 5/US 1 to the Cleveland Clinic Hospital, which would reconstruct the existing 32nd Street. The proposed extension would connect the intersection of SR 5/US 1 at Aviation Boulevard directly to 37th Street, go along the west perimeter of the hospital campus and extend north of 37th Street to 41st Street. The existing typical section for Aviation Boulevard can be seen in **Figure 2-3**.

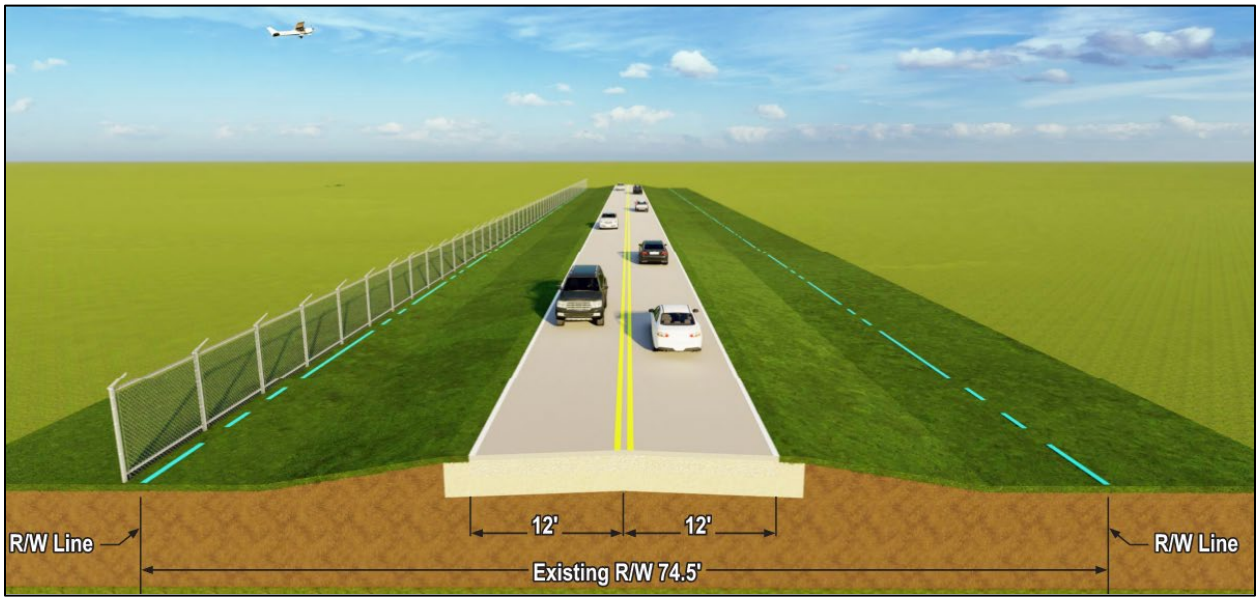


Figure 2-3 Existing Typical Section – Aviation Boulevard

2.2 Right-of-Way

The right-of-way width along SR 5/US 1 is 70 feet from 21st Street to 26th Street and from south of Main Canal Bridge No. 880085 to 37th Street. Between 26th Street and Main Canal Bridge No. 880085, the right-of-way expands to 104 feet with the increased right-of-way area on the east side of the roadway. Between 37th Street and 41st Street, the right-of-way on SR 5/US 1 varies from 70 feet to 120 feet.

The existing right-of-way along Aviation Boulevard is 74.5 feet and expands to 92 feet starting with the first of two horizontal curves leading to SR 5/US 1.

According to the FDOT Runway Protection Zone report, the roadway segment of Aviation Boulevard is on airport land with oversight/approval authority by the FAA. The Aviation Blvd right-of-way survey is in **Appendix B**.

> *Aviation Boulevard is located on Airport property and a portion of the right-of-way travels through the RPZ of Runway 30L. Aviation Boulevard is located outside of the RSA and the Runway Object Free Area. It appears from the Airport's Exhibit "A" that the land upon which Aviation Boulevard is located on Airport property was acquired through the Surplus Property Act of 1944. Additionally, the FAA has approval authority over any property that "i. Materially impacts the safety and efficient operation of aircraft at, to, or from the airport, and ii. adversely affects the safety of people or property on the ground adjacent to the airport as a result of aircraft operations" within the Airport property line through Section 163 of the FAA Reauthorization Act of 2018.*

2.3 Roadway Classification & Context Classification

Functional classification for SR 5/US 1 and Aviation Boulevard was obtained from FDOT straight line diagrams (**Appendix B**) and federal functional classification and urban area boundary maps for IRC, Florida. Project Level Context Classification (PLCC) was obtained from the FDOT Complete Streets Team via an email dated April 21, 2021. The functional and context classification for SR 5/US 1 and Aviation Boulevard within the study area are summarized in **Table 2-1**.

Table 2-1 Roadway Classification

Roadway	Limits	Functional Classification	Context Classification
SR 5/US 1	21st Street to 38th Lane	Urban Principal Arterial Other	C4 Urban General
Aviation Blvd	27th Ave to SR 5/US 1	Urban Minor Arterial	C3C Suburban Commercial

2.4 Adjacent Land Use and Vero Beach Airport

The PD&E study area is located within the FHWA Urban Area Boundary. The surrounding parcels feature a variety of land use throughout the SR 5/US 1 and Aviation Boulevard study corridors. SR 5/US 1 adjacent land use is primarily Airport Light Industrial, Commercial, Industrial, and Park zones. The surrounding parcels adjacent to Aviation Boulevard have existing land uses that are primarily Airport Light Industrial, Industrial, and Residential Single-Family zones. The City of Vero Beach's water treatment plant is located on the northwest of SR 5/US 1 and Aviation Boulevard. Undeveloped areas within the project study area are herbaceous (dry prairie), shrub and brushland, and streams and waterways. Existing land use, obtained from the City of Vero Beach and IRC, for the study area is shown in **Figure 2-4,** with the study corridors highlighted in yellow.

2.4.1 Vero Beach Regional Airport

At the time of the PD&E study, an airport master plan update was underway. Vero Beach Regional Airport (VRB) has three runways, with the longest runway measuring 7,314 feet. The airport serves all facets of general aviation, including intercontinental business jets and most air carrier aircraft. The mission of the Airport is to provide safe and efficient aviation facilities and associated services to both commercial and non-commercial users, while operating in harmony with the community's quality of life goals. The airport contributes $1.32 billion in direct, indirect, and induced economic impact, including over 5,500 jobs, to the City of Vero Beach. The airport facilities map from the VRB Airport Master Plan (working paper Jan/2023) are shown in **Figure 2-5. The Runway Protection Zone (RPZ) analysis was conducted and located in** Appendix B**.**

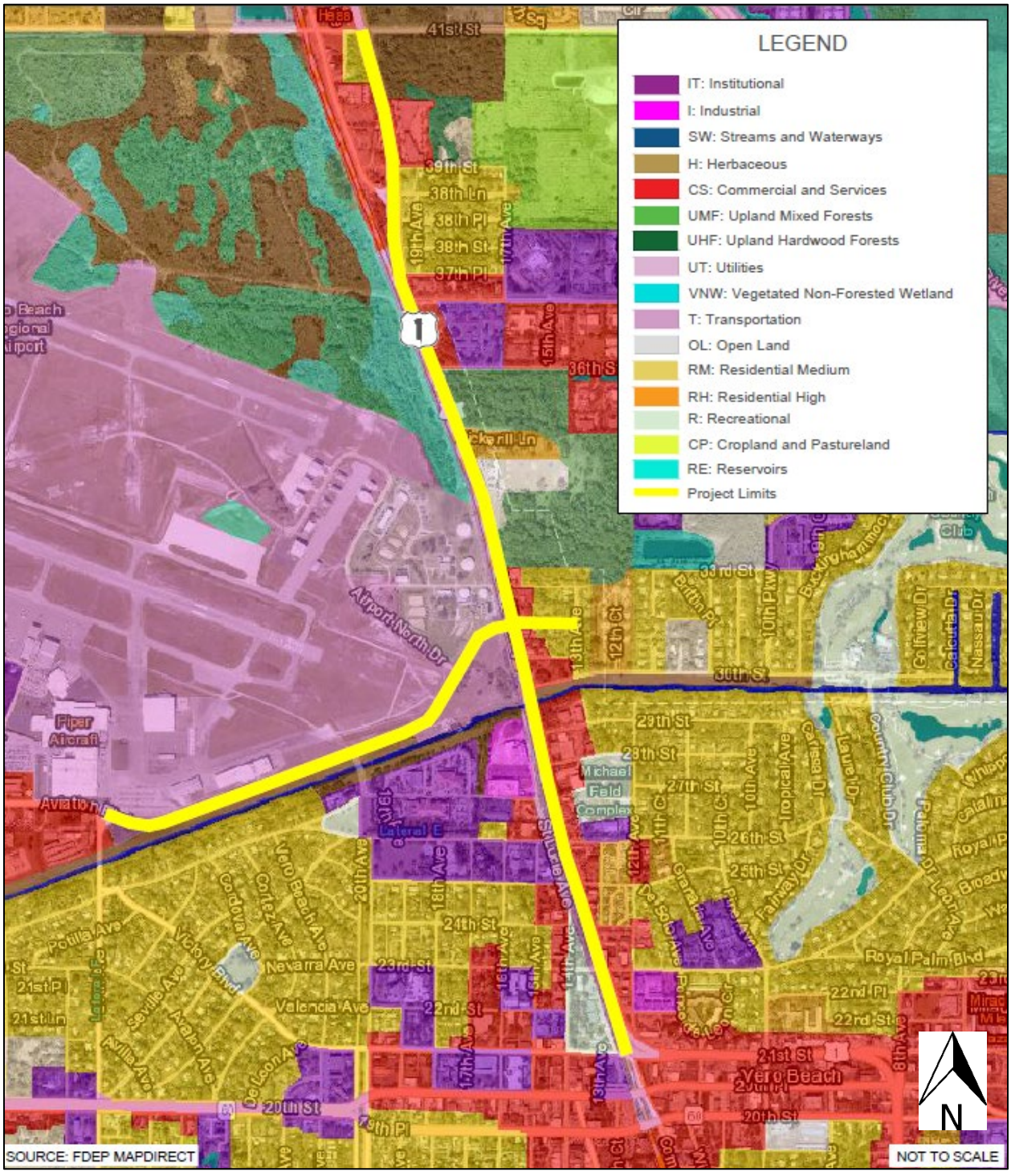


Figure 2-4 Existing Land Use

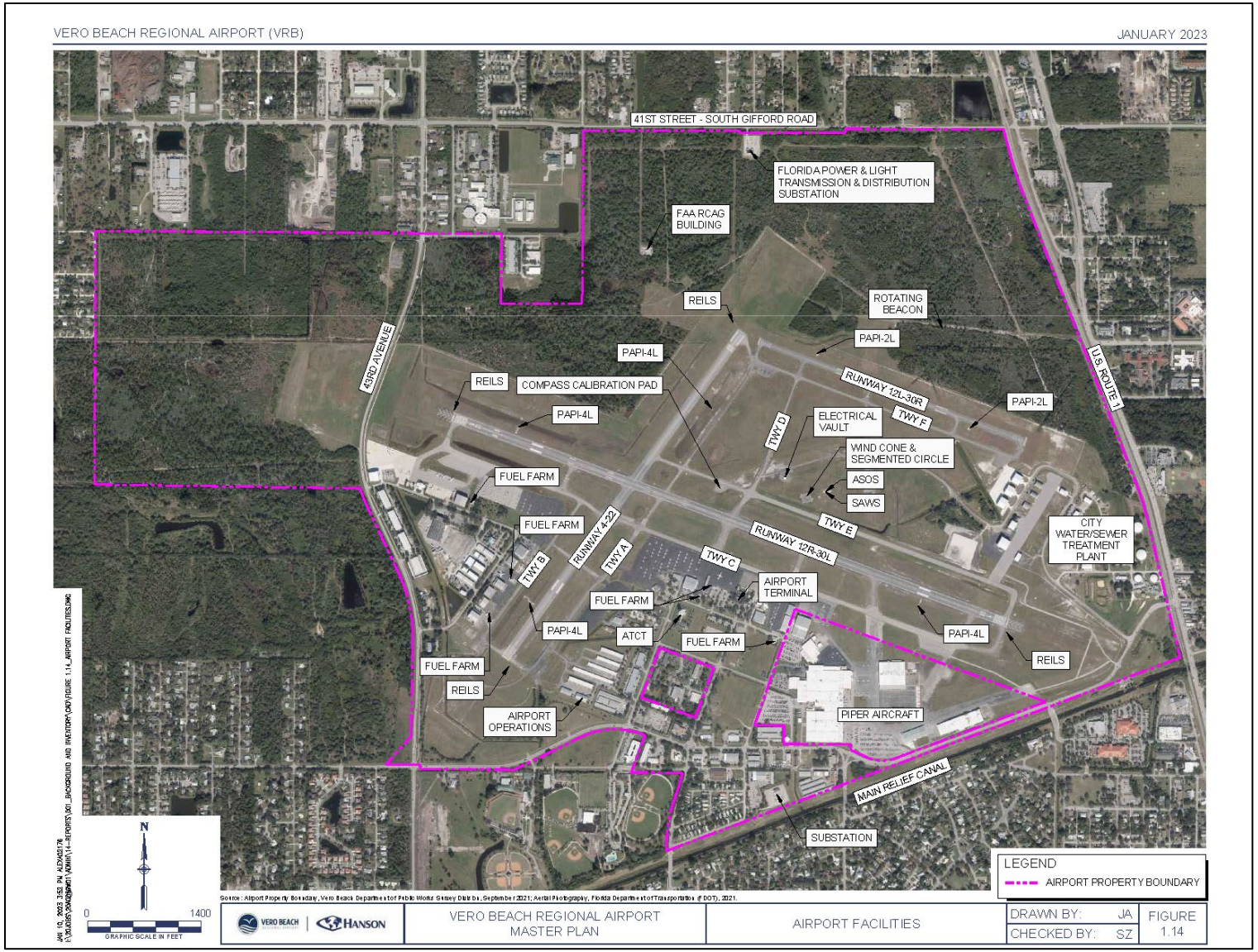


Figure 2-5 Airport Facilities Map

2.5 Access Management Classification

The segment of SR 5/US 1 from 21st Street to south of 39th Street is Access Class 6 and from south of 39th Street to 41st Street is Access Class 5. The entire study limits have a flush paved median. Aviation Boulevard intersects with SR 5/US 1 within the Access Class 6 section of SR 5/US 1. Access Class 6 criteria set by Rule 14-97 Florida Administrative Code (FAC) and included in the FDOT Florida Design Manual Table 201.4.2 is shown in **Table 2-2**. Aviation Boulevard is a county roadway and does not have a FDOT access classification.

Table 2-2 Access Class 6 Criteria

Access Class	Median Type	Connection Spacing (ft)	Median Opening Directional (ft)	Median Opening Full (ft)	Signal Spacing (ft)
6	Non-Restrictive	440 > 45 mph 245 ≤ 45 mph	--	--	1320

Several locations along SR 5/US 1 do not meet the access spacing standards; existing spacing for access openings are summarized in **Table 2-3.**

Table 2-3 SR 5/US 1 Access Management

Existing Opening	Existing Median Opening Type	Existing Spacing (ft)	Existing Signal Spacing (ft)	Variance
21st Street	Full (unsignalized)	--	--	--
22nd Street	Full (unsignalized, t-intersection)	430	--	--
23rd Street/Royal Palm Blvd	**Full (signal)**	450	--	--
24th Street	Full (unsignalized, t-intersection)	450	--	--
25th Street	Full (unsignalized, t-intersection)	450	--	--
14th Avenue	Directional (unsignalized)	150	--	67%
26th Street	**Full (signal)**	285	1335	None
28th Street	Full (unsignalized, t-intersection)	775	--	--
29th Street	Full (unsignalized, t-intersection)	335	--	--
30th Street	Full (unsignalized, t-intersection)	460	--	--

Existing Opening	Existing Median Opening Type	Existing Spacing (ft)	Existing Signal Spacing (ft)	Variance
31st Street	Full (unsignalized, t-intersection)	325	--	--
Aviation Blvd/32nd Street	**Full (signal)**	350	2245	None
33rd Street	Full (unsignalized, t-intersection)	370	--	
Pickerill Lane	Full (unsignalized, t-intersection)	1,620	--	--
36th Street	Full (unsignalized, t-intersection)	650	--	--
37th Street	Full (signal)	720	3360	None
37th Place	Full (unsignalized, t-intersection)	300	--	
38th Street	Directional (unsignalized, t-intersection)	275	--	
38th Place	Directional (unsignalized, t-intersection)	265	--	
38th Lane	**Full (signal)**	270	1110	16%
39th Street	Directional	265		
41st Street	**Full (signal)**	1,400	1665	None

2.6 Design and Posted Speeds

Based on existing plans (Financial Management (FM) 415291-1-52-01), SR 5/US 1 has a design speed that matched the posted speed. Southbound SR 5/US 1 has a posted speed of 35 mph from the being project limit and transitions to a 45-mph posted speed limit north of the 31st Street intersection. Northbound SR 5/US 1 has a posted speed of 35 mph from the being project limit and transitions to a 45-mph posted speed south of the 28h Street intersection.

Target speed is dependent on several factors including the adjacent land use, mobility activity, and the posted and design speeds. The SR 5/US 1 segment from 21st Street to 33rd Street has 27 connecting driveways and side street connections along the east side or northbound lanes. North of 33rd Street to 41st Street there are approximately 12 connections along the northbound lanes of SR 5/US 1. Based on the posted speeds and access considerations, target speeds of 35 mph, 40 mph and 45 mph, from south to north, respectively, are noted in **Table 2-4**. This provides a transition from the flush paved

median section at 35 mph to the raised median section at 45 mph. A draft Target Speed Memorandum and coordination on 01/09/23 identified a 45-mph target speed with opportunity to use a 35 mph to 40 mph speed depending on the alternative. The PD&E build alternatives contain construction limits between 28th Street to south of 37th Street, which is identified to have a 45-mph design, posted and target speed.

Based on Aviation Boulevard Roadway Widening plans obtained from the City of Vero Beach, Aviation Boulevard has a design speed of 40 mph from station 150+92.00 to station 198+46.99 and a reduced design speed of 35 mph from station 198+46.99 to station 202+86.32 through the intersection with SR 5/US 1. Aviation Boulevard generally has a 40-mph posted speed limit. However, there is a 25-mph advisory speed limit posted for the reverse curve just west of the SR 5/US 1 intersection.

Table 2-4 Roadway Design, Posted and Target Speeds

Roadway	Segment	Existing Posted Speed	Context Classification per FDOT PLCC	Access Class	Proposed Design Speed	Proposed Posted Speed	Proposed Target Speed
SR 5/US 1	21st ST to 28th ST	35 mph	*C4 Urban General	Class 6 (non-raised median)	35 mph	35 mph	35 mph
SR 5/US 1	28th ST to 39th ST	45 mph	C4 Urban General	Class 6 (non-raised median)	45 mph	45 mph	45 mph
SR 5/US 1	39th ST to 41st ST	45 mph	C4 Urban General	Class 5 (raised median)	45 mph	45 mph	45 mph
Aviation Blvd	27th Ave to County Admin Rd	40 mph	C3C Suburban Commercial	Future 4-lane (raised)	35 mph	35 mph	35 mph
Aviation Blvd	County Admin Rd to SR 5/US 1	25 mph advisory	C3C Suburban Commercial	Future 4-lane (raised)	30 mph	30 mph	30 mph

*Note: The shaded rows are anticipated segments for the PD&E proposed Build improvements.

2.7 Vertical and Horizontal Alignment

Straight Line Diagrams and existing plans were obtained from FDOT and the City of Vero Beach and used in the evaluation of vertical alignments.

- FM 415291-1-52-01, SR 5 from 20th Place to south of 33rd Street, Resurfacing Plans, 10/7/2009.
- FM 406589-1-52-01, IRC (88010) Countywide, Signalization Plans, 1/3/2002

- State Project No 88010-3510, SR 5 (US 1), Widening and Resurfacing Plans, 9/23/1980

- City of Vero Beach Project No. 2011-11, Aviation Boulevard Widening Project from 43rd Avenue to US Hwy 1, 9/15/2011

Within the study area, the vertical alignments of SR 5/US 1 and Aviation Boulevard are relatively flat with grades of less than 1% along either corridor. SR 5/US 1 follows a sawtooth profile before the bridge over the Main Canal. North of the Main Canal bridge, the roadway profile has a slightly steeper grade with small vertical curves until the end of the project limits. Aviation Boulevard is also comprised of a sawtooth profile along the curbed sections of the roadway within the study limits. East of the intersection with County Admin/27th Street, the Aviation Boulevard profile remains flat and begins to drop as Aviation Boulevard approaches SR 5/US 1.

Survey data was collected for this PD&E Study and used in the horizontal alignment evaluation for both study corridors. Aviation Boulevard has three (3) superelevated curves throughout the project limits. SR 5/US 1 has four (4) horizontal curves within the project limits with survey information showing one (1) of the curves being superelevated. There is a deflection of approximately five (5) degrees through the intersection at 26th Street. Horizontal alignment information for both study corridors is summarized in **Table 2-5**.

Table 2-5 Existing Horizontal Alignment

PC Sta.	PT Sta.	Degree of Curvature	Radius (ft.)	Curve Length (ft.)	Superelevation	Plan Source of Data
SR 5/US 1						
2019+96.25	2023+54.49	1.44	3,973.8′	258.2′	Normal Crown	Survey
2054+84.87	2059+87.43	1.65	3,466.1′	502.6′	Normal Crown	Survey
2079+09.17	2085+49.22	2.87	1,994.3′	640.1′	3.5%	Survey
2090+86.15	2097+23.88	2.09	2,747.1′	637.7′	No survey info	Survey
Aviation Boulevard						
1001+79.52	1006+28.37	9.96°	575.4′	448.8′	4%	Survey
1032+35.63	1035+70.44	11.94°	479.7′	334.8′	5%	Survey
1042+85.35	1045+94.81	15.3°	375.1′	309.5′	5%	Survey

2.8 Existing Pedestrian and Bicycle Accommodations

Along SR 5/US 1, the sidewalk spans the entire length of the study area on the east side of SR 5/US 1 and measures approximately five (5) feet wide. The west side of SR 5/US 1 features only a small stretch of sidewalk between 38th Lane (Old Dixie Highway) and 41st Street. Pedestrian facilities are absent along Aviation Boulevard. All crosswalks are marked throughout the corridor, and most are in fair condition (as shown in **Figure 2-6** and **Figure 2-7**).

At the intersection of SR 5/US 1 and Aviation Boulevard, designated crosswalks are only provided on the south and east approaches. This intersection was under construction by Brightline at the time of this report. New pedestrian features were being installed.

Figure 2-6 SR 5/US 1 and 32nd Street (looking south)

Figure 2-7 SR 5/US 1 and 30th Street (looking north)

Existing designated bicycle facilities are absent along SR 5/US 1 and Aviation Boulevard. The 2015 IRC Bicycle and Pedestrian Master Plan has identified a need for both SR 5/US 1 and Aviation Boulevard corridors within the study area to have detailed corridor studies completed for bicycle facility recommendation.

The Build Alternatives for this PD&E Study evaluate shared use paths along both SR 5/US 1 and Aviation Boulevard.

2.9 Planned Pedestrian, Bicycle and Trail Accommodations

There are no existing trails or multi-use paths within the study area. The Central IRC Greenways Plan (2007) and this projects ETDM Summary Report identified potential future trail corridors that traverse the project area. See **Figure 2-8** for potential shared use trail improvements**.** These include the Central Indian River Greenway Corridor, All Aboard Florida Rail with Trail Corridor, Florida East Coast Railroad Corridor, Main Relief Canal Corridor and Airport Loop Trail. The corridors and trails have several names and have a common set of multi-use trail along either SR 5/US 1 and/or Aviation Boulevard. These were evaluated with a Section 4(f) Determination of Applicability review.

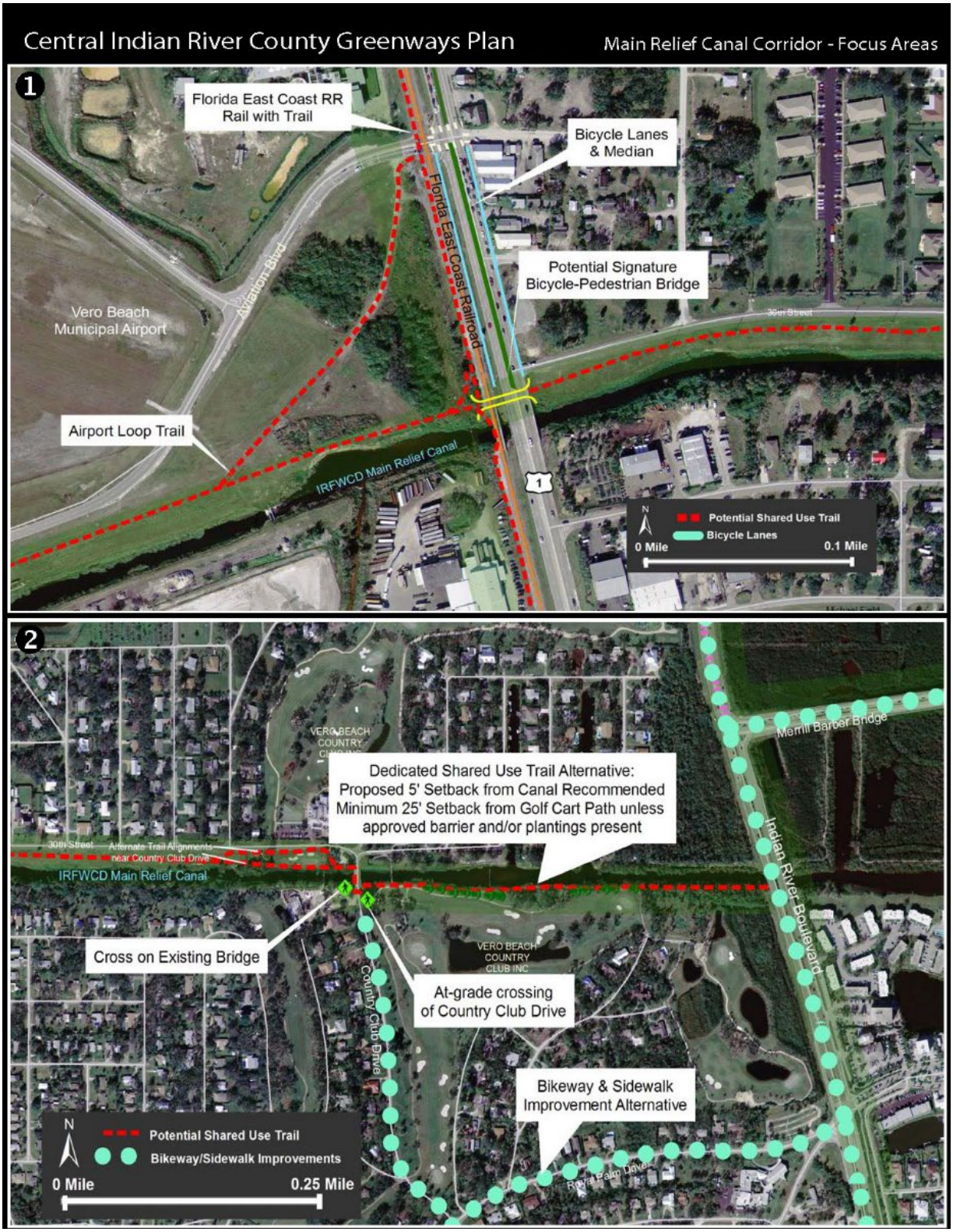


Figure 2-8 Central IRC Greenways Plan

2.10 Transit Facilities

The GoLine, the IRC public transportation system, services the study area with bus routes 3 and 8. GoLine route 3 runs along SR 5/US 1 from the beginning of the project to 37th Street and has bus stops at 28th Street and 30th Street. GoLine route 8 runs along Aviation Boulevard, turns north at the intersection with SR 5/US 1, and continues to the end of the project limits. Route 8 has one bus stop located within the study area at 38th Lane. Both transit bus routes typically stop twice an hour at each location and run from 6AM – 7PM, Monday through Friday, and 8AM – 5PM on Saturday. **Appendix B contains the transit map that** illustrates the full route and schedule for each GoLine bus route.

The *2023 GoLine Transit Development Plan: Vision for 2033 (TDP), Table 7-1 identifies IRC Transit Priority Needs FY 2024-2033,* as:

- FY 2030 Route 8, weekday frequency improvements
- FY 2033 Route 3, weekday frequency improvements

The FEC Railroad, which is parallel and abutting west of SR 5/US 1, is part of the FDOT Strategic Intermodal System (SIS) and is currently operating Brightline passenger service between Maimi and Orlando. There are currently no Brightline stations in IRC.

There are no existing park-and-ride lots and transfer centers within the study area.

2.11 Pavement Type and Condition

The most recent SR 5/SU 1 resurfacing project was FM 415291-1-52-01, in the year 2009. The latest Pavement Condition Survey reports for SR 5/US 1 were received from FDOT with test date 6/1/2023 and 6/5/2023. The current pavement conditions for SR 5/US 1 did not indicate any deficiencies (crack rating of 6.4 or less) and current conditions are summarized in **Table 2-6 and the condition survey is in** Appendix B.

Table 2-6 SR 5/US 1 Pavement Condition

Begin Milepost	End Milepost	Cracking Rate		Rut Rate		Ride Rate	
		NB	SB	NB	SB	NB	SB
5.845	7.268	8.5	8.5	9	9	7.0	7.4
7.268	7.930	8.0	8.5	8	8	7.2	7.4
7.930	13.625	8.5	8.5	9	9	8.1	8.1

Due to Aviation Boulevard being a city owned roadway, west of US 1, Pavement Condition Survey reports are not available from FDOT. Existing plans for Aviation Boulevard were obtained from City of Vero Beach and show a pavement design comprised of Type 'B'

Stabilization for 12 inches, optional base group 6, Type SP-12.5 structural course (Traffic C, 2 inches) and friction course FC-9.5 (Traffic C, 1 inch rubber).

Based on field reviews, the pavement on SR 5/US 1 and Aviation Boulevard appears to be in fair condition with some minor cracking and rutting (**Figure 2-9**). The pavement within the FEC railroad crossing on Aviation Boulevard, just west of SR 5/US 1, at the intersection appears to be new and in good condition due to the Brightline railroad crossing improvement project.

Figure 2-9 Existing Roadway Pavement on SR 5/US 1 (looking north)

2.12 Traffic Volumes and Operational Conditions

The FDOT planning office prepared a Traffic Forecasting Memorandum, dated 11/02/21. A Project Traffic Analysis Report (pre-draft PTAR 08/11/23) was prepared during the PD&E study.

The existing traffic data was collected in May 2021 on typical weekdays from 05/25/2021 to 05/27/2021 (Tuesday, Wednesday, and Thursday) at the intersections and roadways within the vicinity of the Aviation Boulevard Intersection. This data collection effort was performed during the peak hours for traffic.

The Average Daily Traffic (ADT) volume was then estimated as the average of the three-day counts. The Annual Average Daily Traffic (AADT) was computed by applying the seasonal factor (SF) and axle factor (AF). The existing year AADT volumes can be seen in **Figure 2-10** for the study area.

Six-hour vehicle turning movement counts (TMCs) (from 6:00 am to 9:00 am and from 4:00 pm to 7:00 pm), were obtained as part of the data collection effort for the following study intersections. The existing turning movement volumes for the AM and PM peak hours are summarized in **Figure 2-11** and **Figure 2-12.**

1. SR 5/US 1 & Aviation Blvd.
2. SR 5/US 1 & 26th Street
3. SR 5/US 1 & 37th Street
4. 27th Avenue & Aviation Blvd
5. County Admin Rd & Aviation Blvd

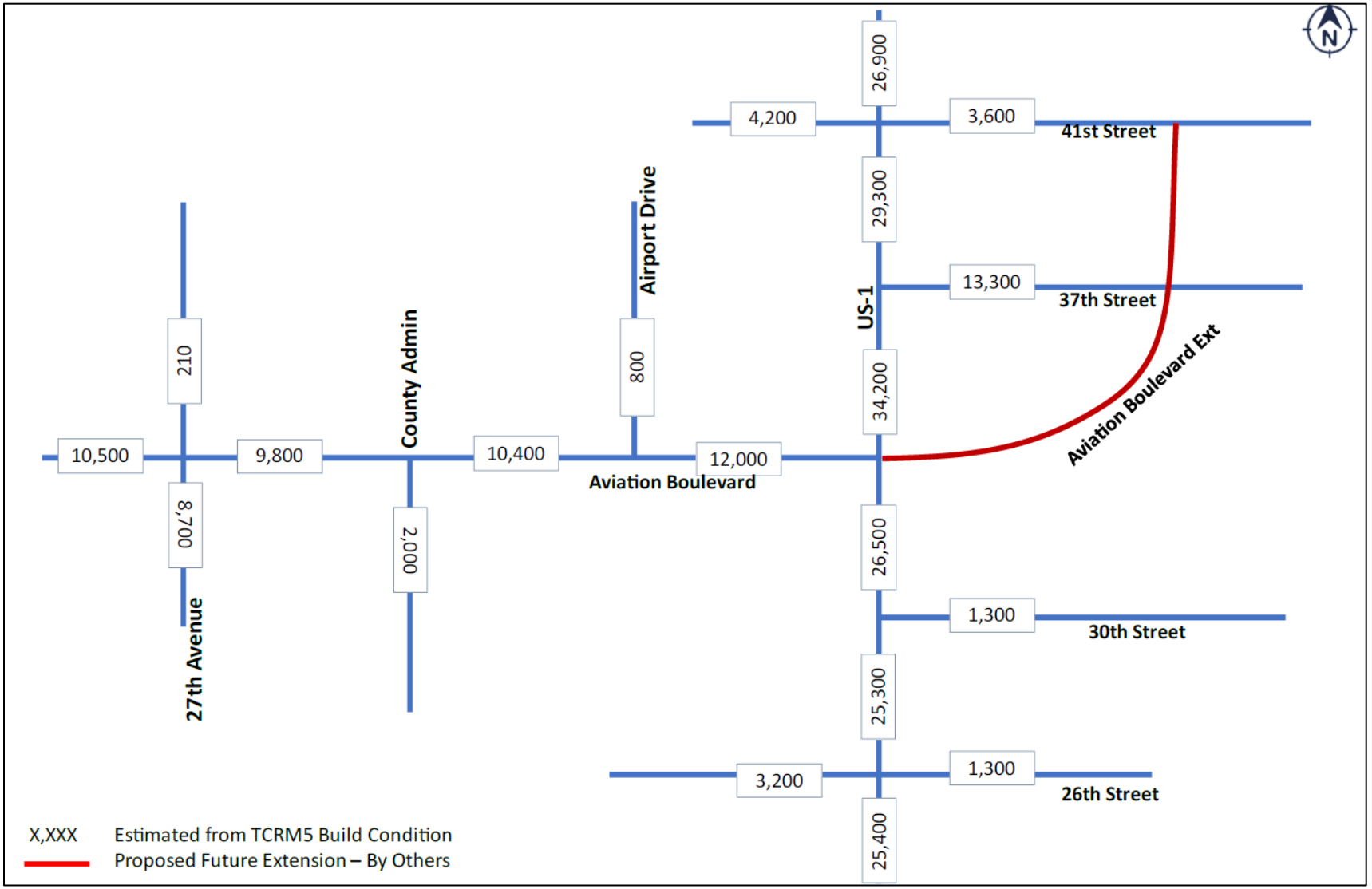


Figure 2-10 2021 Existing Annual Average Daily Traffic (AADT) Volumes

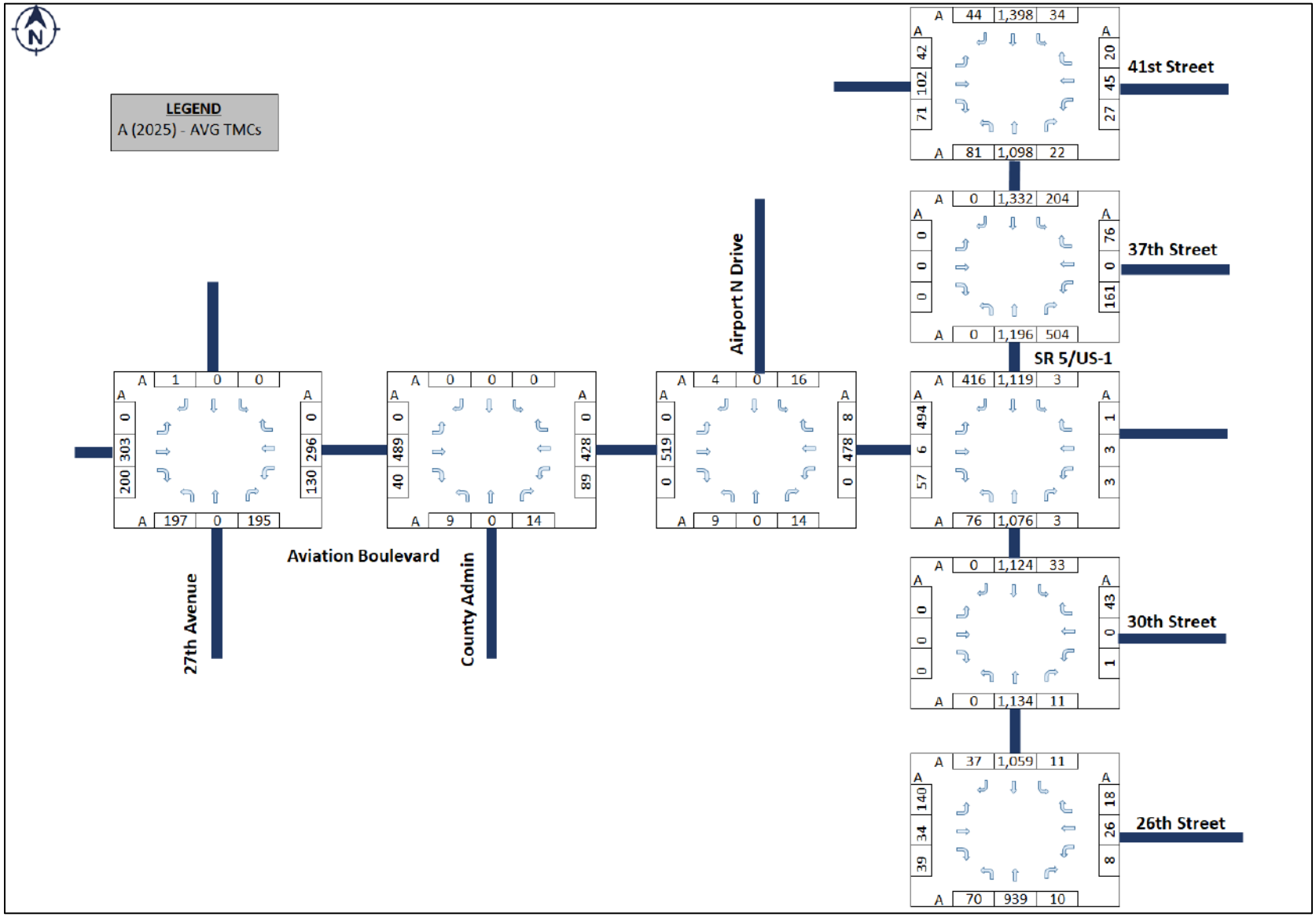


Figure 2-11 Existing Intersection Turning Movement Volumes – AM Peak Period

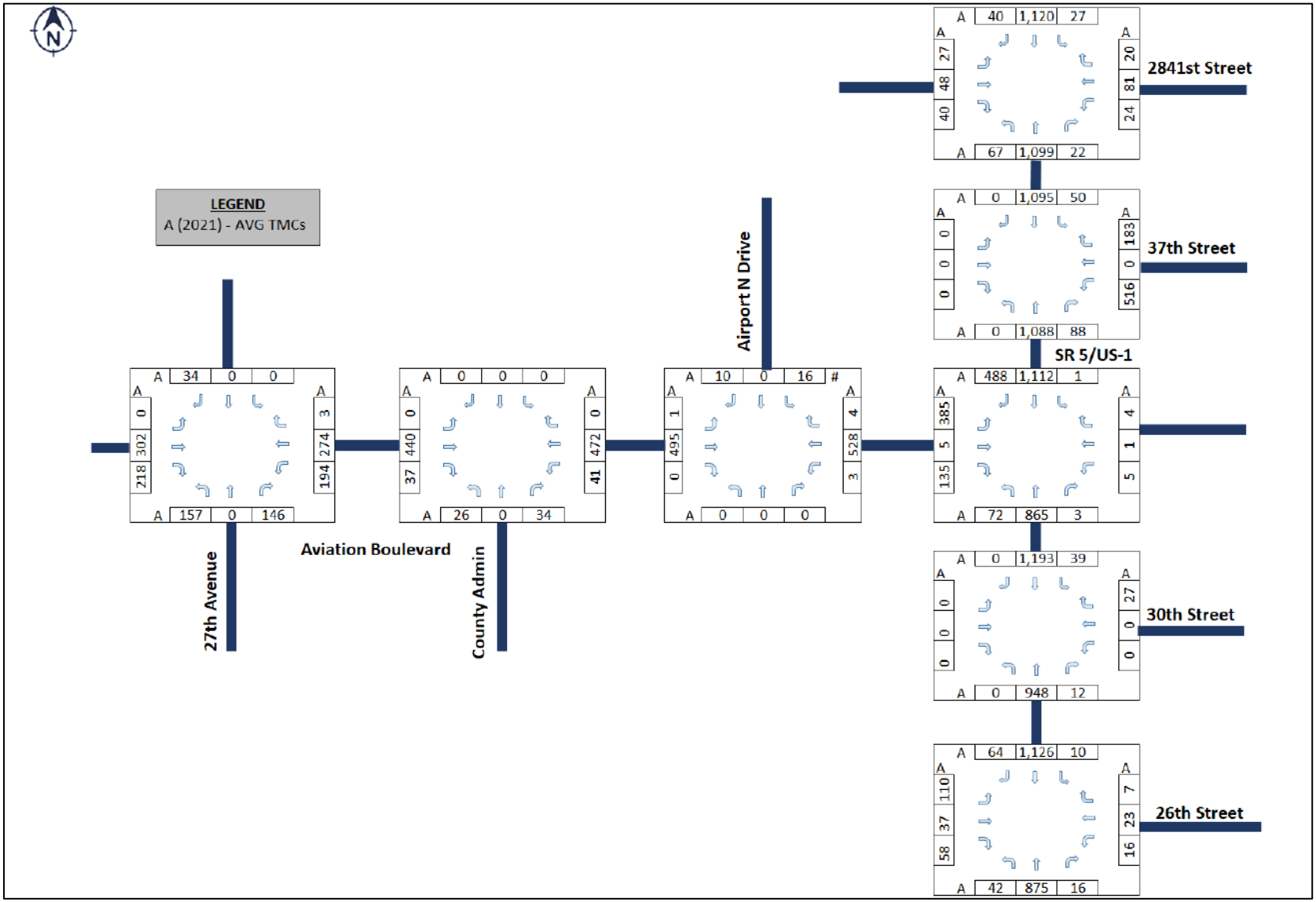


Figure 2-12 Existing Intersection Turning Movement Volumes – PM Peak Period

Existing traffic conditions for signalized intersections were analyzed using Highway Capacity Manual (HCM) 6 methodology. SYNCHRO 11 software was used to perform the analysis. The analysis was performed for AM and PM peak periods. **Table 2-7** and **Table 2-8** show the existing conditions LOS analysis results for the signalized intersections. The SYNCHRO reports for the existing intersection analysis are included in Appendix D of the *Project Traffic Analysis Report (PTAR)* **located in the project file**.

Table 2-7 2021 Existing Intersections Level of Service – AM Peak Period

No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US 1 & Aviation Blvd	61.5	E	107.4	F	14.0	B	29.8	C	29.7	C
2	SR 5/US 1 & 26th Street	67.8	E	71.4	E	9.2	A	48.8	D	34.4	C
3	SR 5/US 1 & 37th Street	-	-	69.1	E	13.6	B	9.0	A	15.4	B
4	27th Avenue & Aviation Blvd	12.1	B	6.9	A	-	-	66.8	E	15.5	B
5	County Admin & Aviation Blvd	13.1	B	5.4	A	18.6	B	-	-	9.5	A

Table 2-8 2021 Existing Intersections Level of Service – PM Peak Period

No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US 1 & Aviation Blvd	68.3	E	105.1	F	34.9	C	44.7	D	46.3	D
2	SR 5/US 1 & 26th Street	70.0	E	74.5	E	7.3	A	41.3	D	31.3	C
3	SR 5/US 1 & 37th Street	-	-	64.1	E	17.3	B	10.2	B	25.5	C
4	27th Avenue & Aviation Blvd	19.0	B	10.4	B	-	-	41.7	D	19.9	B
5	County Admin & Aviation Blvd	11.1	B	5.6	A	18.4	B	-	-	8.8	A

The analysis results show that all the existing signalized intersections are operating at an overall LOS D or better during the peak periods. The SR 5/US 1 at Aviation Blvd

intersection operates at an overall LOS C during the AM peak period and LOS D during the PM peak period. However, the eastbound approach operates at LOS E and the westbound approach operates at LOS F during both the AM and PM peak periods. The following intersection approaches are operating at LOS E or F.

AM and PM Peak Periods

- Eastbound and westbound approaches at SR 5/US-1 & Aviation Boulevard
- Eastbound and westbound approaches at SR 5/US-1 & 26th Street
- Westbound approach at SR 5/US-1 & 37th Street
- Southbound approach at 27th Avenue & Aviation Boulevard

2.13 Intersection Layout and Traffic Control

The PD&E Study intersection of SR 5/US 1 and Aviation Boulevard is a four (4) approach signalized intersection. Pedestrian crosswalks are provided on south and east approaches. The FEC railroad crosses the west approach of the intersection. Signal timing for the intersection includes split phases for the east and westbound approaches and includes pre-emption for the railroad. IRC Traffic Engineering maintains the signalized intersection. The existing lane layout for the study intersection is shown in **Figure 2-13**. Existing traffic operations for the intersection are provided in **Section 2.12**.

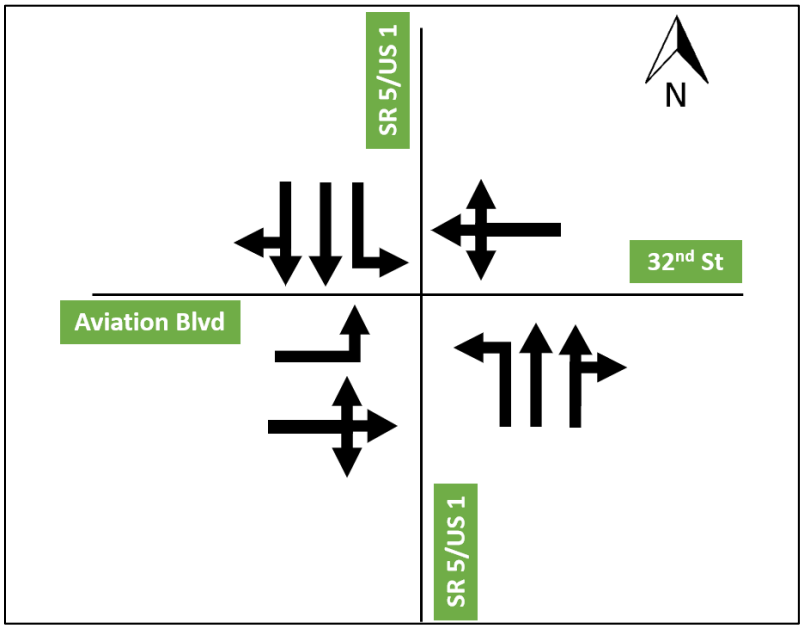


Figure 2-13 Existing Lane Geometry at SR 5/US 1 and Aviation Boulevard

2.14 Railroad Crossings

Aviation Boulevard intersects the FEC railroad at crossing number 273047Y. The railroad is directly adjacent to the SR 5/US 1 west right-of-way line throughout the study area. In 2021, FEC railroad/Brightline had a project that reconstructed the railroad crossing, added double tracks, and replaced the railroad bridge over the Main Canal.

Additional FEC railroad crossings located within the study limits are:

- 272192U at 21st Street
- 272191M at 23rd Street
- 272190F at 14th Avenue
- 272189L at 26th Street

All crossings are used for freight transportation and operate with crossbuck assemblies, advanced warning signs, “two quad” gate configurations, and mast mounted flashing lights for warning devices. Right-of-way for the railroad varies between 74 feet to 98 feet along the length of the project.

Brightline is a privately owned and operated intercity high-speed train and utilizes the FEC railroad tracks within the study area. The daily trains increased to 30 trains per day in October 2023.

2.15 Crash Data and Safety Analysis

Safety analysis was performed along SR 5/US 1 and Aviation Boulevard within the study area using the latest available five (5) years of crash data to identify crash patterns and contributing causes. Crash data from 2017 to 2021 for SR 5/US 1 (Roadway ID: 88010000) within the project limits were obtained from the FDOT Crash Analysis Reporting System (CARS) database. The crash data for the same analysis period for Aviation Boulevard (Roadway ID: 88000024) was obtained from the FDOT State Safety Office GIS (SSOGis) Query Tool on the Traffic Safety Web Portal. The crash data for both roadways data includes environmental and driver characteristics that were existent at the time of each crash and provides the basis for the crash data analysis.

Based on the crash analysis, a total of 102 crashes occurred on SR 5/US 1 and eight (8) crashes occurred along Aviation Boulevard within the study area from 2017 to 2021.

Rear-end crashes were the predominant crash type accounting for 49 (45%) of the total crashes; followed by 21 angle crashes (19%), 13 sideswipe object crashes (12%), 9 fixed object crashes (8%) and 5 left turn crashes (5%). There was one (1) pedestrian crash

and one (1) bicycle crash. Most of the crashes (89 crashes, 80.9%) occurred under daylight conditions, while 16 crashes (14.5%) occurred during nighttime. The number of nighttime crashes is lower than the statewide percentage of 33%. Poor surface conditions contributed only marginally to the number of crashes recorded over the five-year period as 88 (80%) of the crashes occurred during clear weather conditions and 99 (90%) occurred on dry pavement surface. Only 10% of crashes (10) occurred on wet pavement. This is lower than the statewide average of 15%.

One (1) fatal crash occurred within the study limits during the five-year period. Property Damage Only (PDO) crashes accounted for 65 (59.1%) of all crashes; 44 crashes (40.0%) resulted in Injury. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (27 crashes, 25%), resulted in the most crashes. Other contributing causes include 'failed to yield right-of-way' (20 crashes, 18%), 'followed too closely' (20 crashes, 18%), and 'ran red light' (4 crashes, 4%). **Table 2-9** and **Figure 2-14** show the crash summary for the study roadway segments.

Table 2-9 SR 5/US 1 and Aviation Boulevard Crash Summary Statistics

SR 5/US 1 and Aviation Boulevard		Number of Crashes					5 Year Total Crashes	Mean Crashes Per Yr	%
		Year							
		2017	2018	2019	2020	2021			
CRASH TYPE	Rear End	10	10	20	9	0	49	13	44.5%
	Head On	1	0	0	0	0	1	0	0.9%
	Angle	4	3	9	5	0	21	5	19.1%
	Left Turn	2	0	2	1	0	5	1	4.5%
	Right Turn	0	2	1	4	0	3	1	2.7%
	Sideswipe	3	3	3	0	0	13	3	11.8%
	Pedestrian	0	0	1	0	0	1	0	0.9%
	Bicycle	0	1	0	2	0	1	0	0.9%
	Fixed Object	***0***	***4***	***6***	***0***	***1***	***13***	***3***	***9.5%***
	Curb	0	1	1	1	0	2	1	1.8%
	Embankment	0	0	0	0	0	1	0	0.9%
	Guardrail Face	0	1	0	0	0	1	0	0.9%
	Other Traffic Barrier	0	1	0	0	0	1	0	0.9%
	Tree (Standing)	0	0	0	0	1	1	0	0.9%
	Other Post, Pole, or Support	0	0	1	0	0	1	0	0.9%
	Other Fixed Object	0	0	1	0	0	2	0	1.8%
	Others	**3**	**1**	**2**	**1**	**0**	**7**	**1**	**6.4%**
	Total Crashes	**23**	**23**	**41**	**22**	**2**	**110**	**22**	**100%**
SEVERITY	PDO Crashes	14	13	23	15	0	65	13	51.9%
	Fatal Crashes	0	0	1	0	0	1	0	0.9%
	Injury Crashes	9	10	17	7	1	44	9	40.0%
LIGHTING CONDITIONS	Daylight	19	18	30	21	1	89	18	80.9%
	Dusk	1	1	3	0	0	5	1	4.5%
	Dark	3	4	8	1	0	16	3	14.5%
SURFACE CONDITIONS	Dry	23	20	34	21	1	99	20	90.0%
	Wet	0	3	7	1	0	11	2	10.0%
MONTH OF YEAR	January	1	1	5	5	0	12	2	10.9%
	February	2	0	5	2	0	9	2	8.2%
	March	3	1	3	2	1	10	2	9.1%
	April	4	2	3	1	0	10	2	9.1%
	May	0	3	3	1	0	7	1	6.4%
	June	2	1	6	1	0	10	2	9.1%
	July	3	2	6	2	0	13	3	11.8%
	August	1	3	2	2	0	8	2	7.3%
	September	2	1	0	3	0	6	1	5.5%

SR 5/US 1 and Aviation Boulevard		Number of Crashes					5 Year Total Crashes	Mean Crashes Per Yr	%
		Year							
		2017	2018	2019	2020	2021			
	October	0	5	1	1	0	7	1	6.4%
	November	4	1	2	0	0	7	1	6.4%
	December	1	3	5	2	0	11	2	10.0%
DAY OF WEEK	Monday	4	3	8	0	0	15	3	13.6%
	Tuesday	3	6	7	4	0	20	4	18.2%
	Wednesday	4	6	6	4	1	21	42	19.1%
	Thursday	2	1	6	7	0	16	3	14.5%
	Friday	4	3	3	5	0	15	3	13.6%
	Saturday	5	2	4	2	0	13	3	11.8%
	Sunday	1	2	7	0	0	10	2	9.1%
HOUR OF DAY	00:00-06:00	1	0	1	0	0	2	0	1.8%
	06:00-09:00	1	1	6	2	0	10	2	9.1%
	09:00-11:00	2	4	3	2	1	12	2	10.9%
	11:00-13:00	5	3	7	5	0	20	4	18.2%
	13:00-15:00	2	4	6	4	0	16	3	14.5%
	15:00-18:00	9	7	7	8	0	31	6	28.2%
	18:00-24:00	3	4	11	1	0	19	4	17.3%
CONTRIBUTING CAUSES (VEHICLE ONLY)	No Contributing Action	4	2	2	1	0	9	2	8.2%
	Careless or Negligent Manner	8	8	8	3	0	27	5	24.5%
	Failed to Yield Right-of-Way	5	5	7	3	0	20	4	18.2%
	Improper Backing	0	0	0	1	0	1	0	0.9%
	Improper Turn	0	1	1	0	0	2	0	1.8%
	Followed too Closely	1	1	10	8	0	20	4	18.2%
	Ran Red Light	1	0	2	1	0	4	1	3.6%
	Drove too Fast	0	1	1	0	0	2	0	1.8%
	Improper Passing	0	0	1	1	0	2	0	1.8%
	Exceed Posted Speed	0	0	0	1	0	1	0	0.9%
	Failed to Keep in Proper Lane	0	1	0	1	0	2	0	1.8%
	Ran off Roadway	0	0	1	0	1	2	0	1.8%
	Other Contributing Action	4	4	8	2	0	18	4	16.4%
WEATHER CONDITIONS	Clear	20	20	29	18	1	88	18	80.0%
	Cloudy	3	1	9	3	0	16	3	14.5%
	Rain	0	2	3	1	0	6	1	5.5%

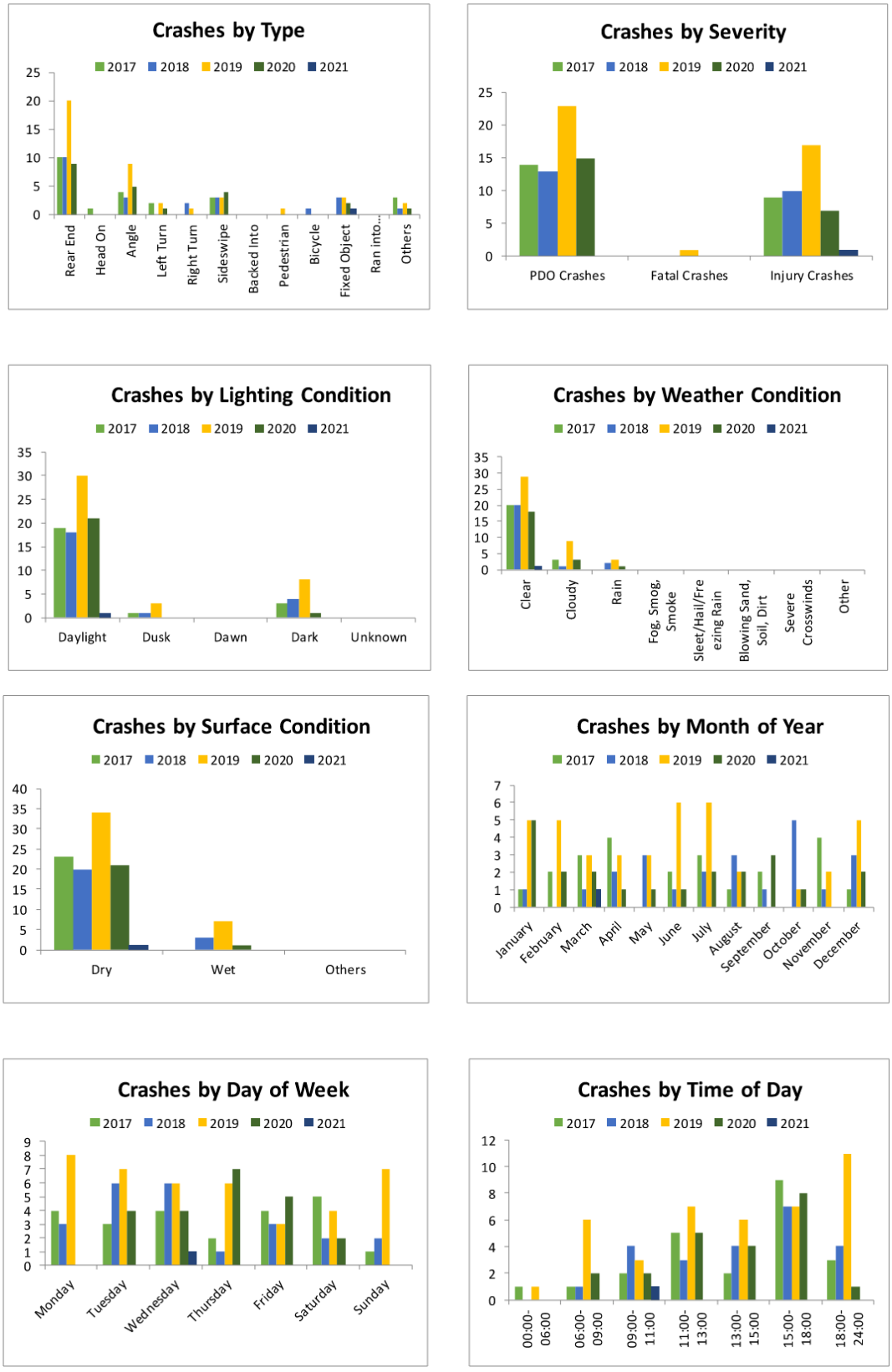


Figure 2-14 Crash Summary Statistics Histograms

2.15.1 Crash Hotspots

A crash accumulation analysis was conducted along SR 5/US 1 to identify specific segments or intersections with high crash frequencies and identify possible roadway deficiencies that can be improved. The crash accumulation analysis is graphically illustrated in **Figure 2-15**. Based on analysis, the following locations were identified as high crash frequency locations i.e., greater than 20 crashes for the five-year period.

1. SR 5/US 1 & 26th Street intersection (MP 6.7-6.9)
2. SR 5/US 1 & Aviation Boulevard intersection (MP 7.1-7.3)
3. SR 5/US 1 & 37th Street intersection (MP 7.7-7.9)

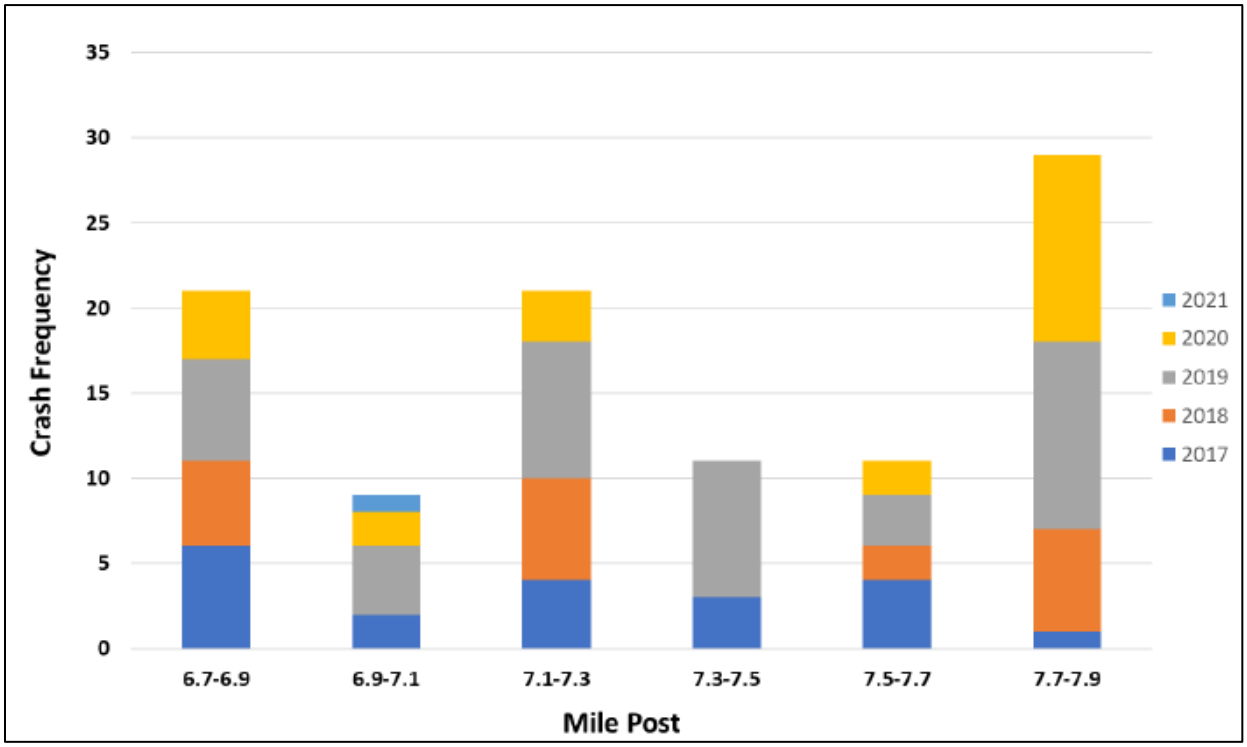


Figure 2-15 Safety Hotspots along SR 5/US 1

The Aviation Boulevard intersection with SR 5/US 1 provides access to the airport as well as the county administration offices. A total of 21 crashes occurred at this intersection from 2017 to 2021. Four (4) crashes occurred in 2017, 6 occurred in 2018, 9 occurred in 2019, 3 occurred in 2020, and none in 2021. Rear end crashes were the predominant crash type accounting for 41% of the total crashes, followed by angle and left turn crashes accounting for a combined 23% of the total crashes. There were no pedestrian or bicycle crashes at this location. No fatal crash occurred at this location; however, 32% of the crashes were injury crashes. Among the contributing causes documented in the crash data, 'carelessness or negligent manner' (10 crashes) resulted in the most crashes. Other

contributing causes included ‘failed to yield right of way’ (18%) and ‘followed too closely’ (18%). Most of the angle and left turn crashes occurring at this location were attributed to failure to yield right of way which may be due to inadequate signal timing and clearance time as well as poor signal visibility due to lack of retroreflective backplates.

The 26th Street intersection with SR 5/US 1 provides access to several adjacent businesses including the IRC Veterans Service Office. A total of 21 crashes occurred at this intersection from 2017 to 2021. Rear end crashes were the predominant crash type with accounting for 33% of the total crashes, followed by angle crashes accounting for 29% of the total crashes. There were no pedestrian, bicycle, or fatal crashes at this location. Among the contributing causes documented in the crash data, ‘carelessness or negligent manner’ (24%) resulted in the most crashes. Other contributing causes included ‘failed to yield right of way’ (14%), ‘followed too closely’ (14%) and ‘run red light’ (14%). Most of the angle crashes occurring at this location were attributed to failure to yield right of way and red light running. This intersection is operated in conjunction with the St Lucie Avenue and 26th Street intersection on the west side of the railroad. This may be contributing to inadequate signal timing and clearance time due to the railroad and not meeting driver expectancy. The mast arms at this location are also decorative with small signal heads resulting in poor signal visibility. In addition, the several adjacent driveway openings and the lack of a raised median increases the friction at this intersection.

The 37th Street intersection with SR 5/US 1 provides access to Cleveland Clinic and several medical offices. A total of 29 crashes occurred at this intersection from 2017 to 2021. Rear end crashes were the predominant crash type with accounting for 52% of the total crashes, followed by angle crashes accounting for 21% of the total crashes. There were no pedestrian crashes; however, one bicycle and one fatal crash occurred at this location. Among the contributing causes documented in the crash data, ‘followed too closely’ (31%) resulted in the most crashes. Other contributing causes included ‘failed to yield right of way’ (24%), ‘carelessness or negligent manner’ (21%). Most of the angle crashes occurring at this location were attributed to failure to yield right of way and red light running. This may be due to inadequate signal timing and clearance time as well as poor signal visibility due to lack of retroreflective backplates.

2.15.2 Fatal Crashes

Fatal crashes are a major concern in roadway safety analysis. Based on the crash data, one fatal crash occurred within the study area along SR 5/US-1. There were no fatal crashes along Aviation Boulevard. The police reports for these crashes were obtained from the FDOT and reviewed to identify specific contributing factors that may have caused or influenced this fatal crash. Fatal crash descriptions, as obtained from the crash reports, are presented below.

On 05/28/2019, a vehicle traveling northbound along SR5/US-1, failed to yield right of way at the intersection of SR5/US-1 and 37th Street (MP 7.853) which resulted in an angle collision. The driver of this vehicle died due to the impact. This crash occurred under dry surface conditions and during the daytime.

2.16 Drainage

The project improvements are located within the jurisdictional boundaries of the St. Johns River Water Management District (SJRWMD) and Indian River Farms Water Control District (IRFWCD) and is situated within the Indian River Lagoon Basin. The existing roadway drainage system along SR 5/US 1 is comprised of "closed conveyance systems" where stormwater runoff is collected and conveyed via curb and gutter to inlets and underground pipes, ultimately discharging into the IRFWCD Main Relief Canal. The existing roadway drainage system along Aviation Blvd. is comprised of "open conveyance systems" where stormwater runoff sheet flows from the roadway into roadside ditches and an existing dry detention pond, ultimately discharging into the Main Relief Canal. There are no formal SWFs for the local roadways located east of SR 5/US 1. Runoff sheet flows into shallow roadside ditches the discharges into the groundwater by soil percolation.

The project corridor, within the project limits, is divided into five (5) distinct sub-basins that correspond to the existing drainage patterns along the project corridor. The five (5) existing drainage basins are depicted in **Figure 2.16** and described below:

Basin 100 (550 feet west of Airport North Drive to SR 5/US 1 on Aviation Boulevard): The existing roadway consists of east, west through lanes and turn lanes at SR 5/US 1 and Airport North Drive. Runoff from the roadway sheet flows into roadside ditches and is conveyed to the Main Relief Canal. There is an existing dry detention pond located on the south side of Aviation Boulevard. This pond discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

Basin 200 (26th Street to Main Relief Canal on SR 5/US 1): The existing roadway consists of two through lanes in each direction and with a center flush paved median for left turns. Runoff from the roadway sheet flows to curb inlets on either side of SR 5/US 1 and is conveyed to the Main Relief Canal. There are no existing Stormwater Management Facilities (SMFs) on SR 5/US 1 and the roadway storm system directly discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

Basin 300 (Main Relief Canal to Aviation Boulevard on SR 5/US 1): The existing roadway consists of two through lanes in each direction and with a center flush paved median for left turns. Runoff from the roadway sheet flows to curb inlets on either side of SR 5/US 1 and is conveyed to the Main Relief Canal. There are no existing SMFs on SR 5/US 1 and

the roadway storm water directly discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

Basin 400 (Local roads; 30th Street, 31st Street, 32nd Street, 33rd Street and surrounding properties east of SR 5/US 1): The existing roadways consist of one through lane in each direction. Runoff sheet flows into shallow roadside ditches the discharges into the groundwater by soil percolation. This area will accumulate the proposed roadway improvements associated with the proposed design alternatives.

Basin 500 (Aviation Boulevard to approximately 1,500 feet west of Aviation Boulevard on SR 5/US 1): The existing roadway consists of two through lanes in each direction and with a center flush paved median for left turns. Runoff from the roadway sheet flows to curb inlets on either side of SR 5/US 1 and is conveyed to the Main Relief Canal. There are no existing SMFs on SR 5/US 1 and the roadway storm water directly discharges into the Main Relief Canal that ultimately flows into the Indian River Lagoon.

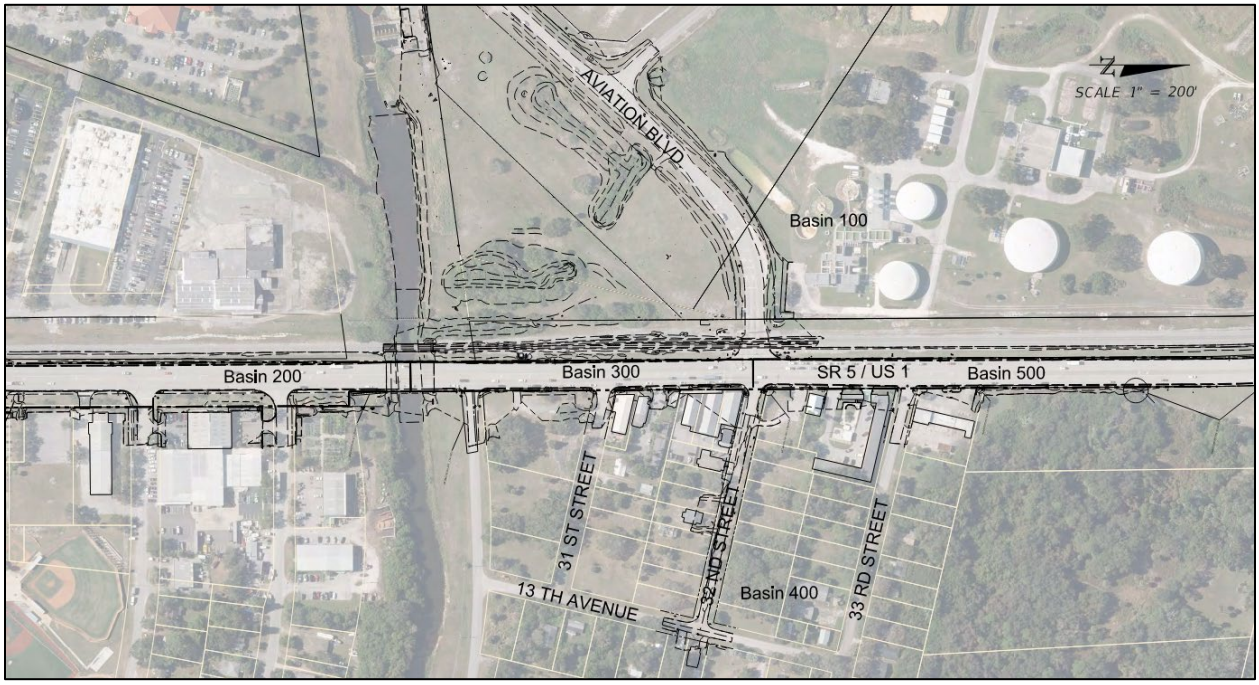


Figure 2-16 Drainage Basin Map

Most of the project limits are located within Floodplain Zone X, an area of minimal flood hazard, and poses no significant floodplain encroachment as shown in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRMette) 12061C0244J (effective 1/26/23). The Indian River Farms Main Relief Canal is located within Floodplain Zone AE, areas where base flood elevations are determined. The flood base elevations within Zone AE range from 16 to five (5) feet North American Vertical Datum (NAVD)'88. The FEMA FIRMette is shown in **Figure 2-17**.

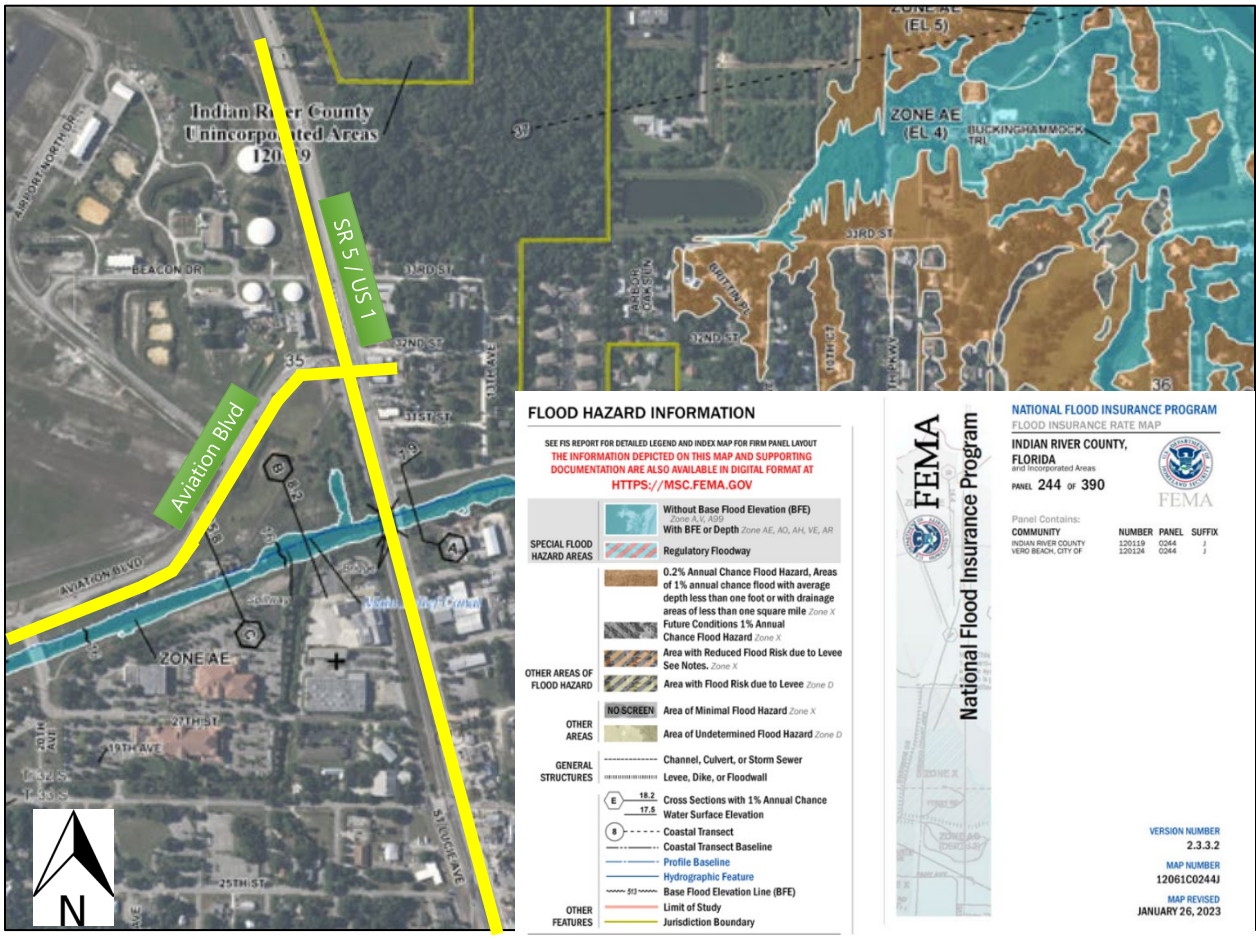


Figure 2-17 National Flood Hazard Layer FIRMette

Potential drainage challenges are present within the project limits. Vero Beach Regional Airport expressed not wanting to expand the existing pond located on the airport property due to the sensitive archeological zone and runway protection zone. New SMFs may not be within 100 feet of public wells. Due to the dense development along the corridor, detention ponds will have to be located north of the canal. The Indian River Farms Main Relief canal is classified as an impaired waterbody. Additionally, SMF detention ponds must have a maximum 48-hour detention period per the Federal Aviation Administration (FAA) Advisory Circular 150/5200-33C.

The permitting agency that will be the main point of contact in coordination between parties is the SJRWMD. The existing permits associated with the project location are::

- Indian River Memorial Hospital (1987) - Permit 40-061-0027
- Alcohope of the Treasure Coast (2003) - Permit 42-061-86755-3
- Aviation Boulevard Roadway Widening (2010) - Permit 40-061-123418-1

- All Aboard Florida - Fiber Optic Cable (2015) - Permit 144190-1

2.17 Soils and Geotechnical Data

Based on a review of the Geological Map of IRC from the United States Geological Survey (USGS), the soils within the study area are anticipate being in the Anastasia Formation (variably lithified coquina of shells and sands and unlithified fossiliferous sand) group. The Anastasia Formation is interbedded with coquinoid limestone and quartz sands. The base of the undifferentiated Quaternary sediments/Anastasia Formation is approximately 30 feet below land surface at the project area. Beneath these shallow sediments are undifferentiated Tertiary/Quaternary shelly sediments of fine-to-medium quartz sand with variable amounts of micrite, silt, marine mollusk shells, and clay.

A United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) IRC Soil Survey map is presented in **Figure 2-18**. Based on a review this map, Map Unit 22 Urban land (a miscellaneous area, with no soils information available) comprised the largest percent of soils within the study area with Map Unit 5 Myakka-Myakka wet, fine sands comprising the second largest percent of area. A summary of all the soils present within the study is provided in **Table 2-10**.

Table 2-10 USDA Soil Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in Study Area	Percent of Study Area
5	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	49.6	21.4%
8	Paola sand, 0 to 5 percent slopes	0.4	0.2%
11	St. Lucie sand, 0 to 8 percent slopes	11.4	4.9%
21	Pomello sand, 0 to 5 percent slopes	22.7	9.8%
22	Urban land, 0 to 2 percent slopes	72.7	31.4%
23	Arents, 0 to 5 percent slopes	48.9	21.1%
28	EauGallie-Urban land complex	11.3	4.9%
29	Immokalee-Urban land complex	7.7	3.3%
32	Jonathan sand, 0 to 5 percent slopes	0.4	0.2%
49	Pompano fine sand, 0 to 2 percent slopes	0.6	0.3%
100	Waters of the Atlantic Ocean	6.2	2.7%
Totals for Area of Interest		**232.0**	**100.0%**

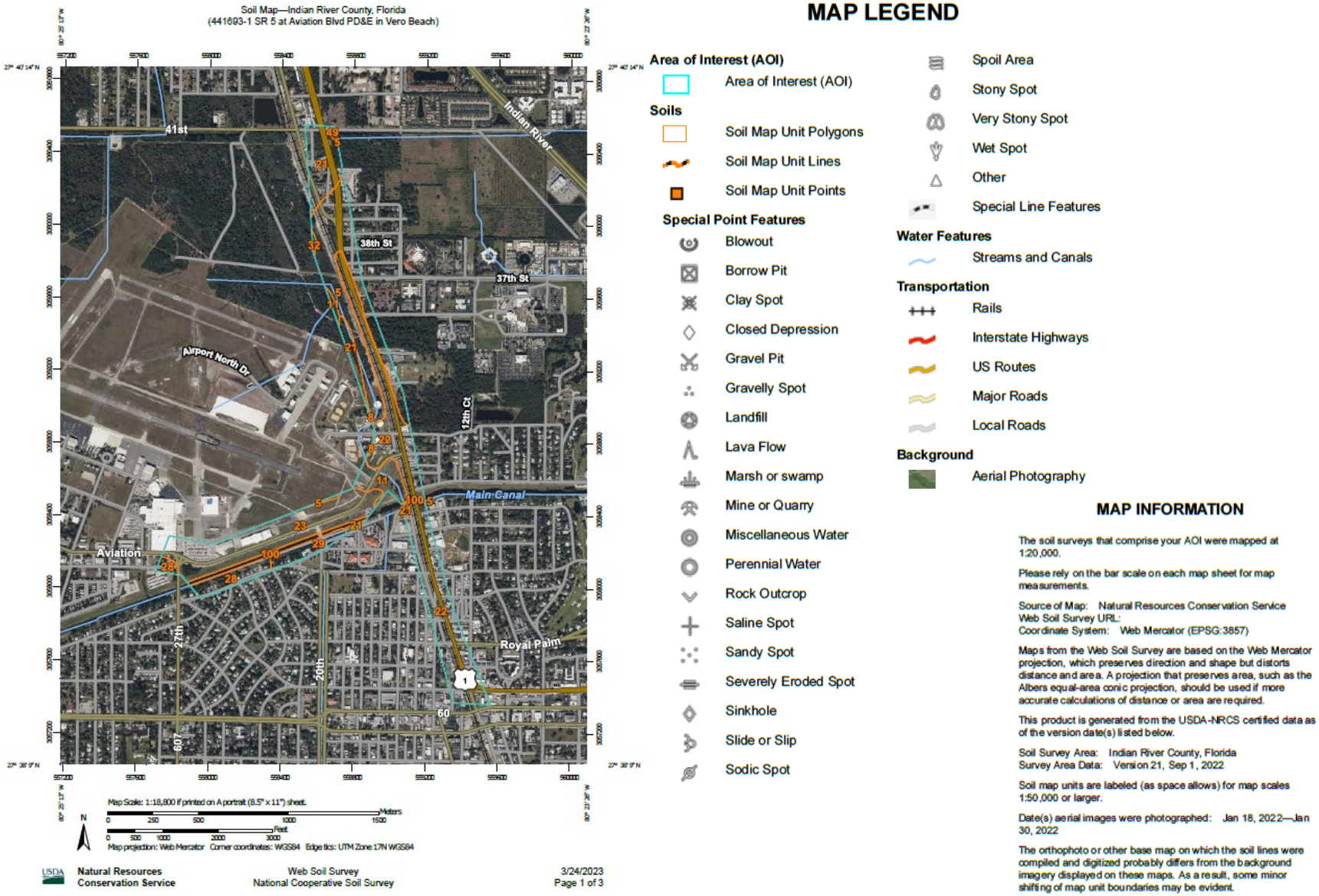


Figure 2-18 Soils Map

2.18 Utilities

There are numerous utilities throughout the study area. Based on review of existing plans, field reconnaissance and a Florida Sunshine 811 design ticket, a total of 13 utility agency owners (UAO) were identified within the study area. **Table 2-11** lists the utility agency owners identified within the study area which are further defined in the Utility Assessment Report.

Table 2-11 Existing Utilities in the Study Area

Utility Agency Owner	Contact	Utility Type
AT&T Florida 7747 Ellis Rd W Melbourne, FL 32904	Luke Folkerts 407-496-6041 lf2490@att.com	Telephone
AT&T Transmission 6000 Metro West Blvd Ste 201 Orlando, FL. 32835-7631	Kenneth Wagner 407-578-8000 swagner@pea-inc.com	Communication Lines, Fiber
Lumen (CenturyLink) National 7003 Presidents Dr. Suite 100, Orlando, FL 32809	Michael Hunt 716-480-2073 michael.hunt@lumen.com	Fiber
City of Vero Beach 17-17th Street PO Box 1389 Vero Beach, FL 32961-1389	Todd Young 772-978-5209 TYoung@covb.org	Water, Wastewater
Comcast 1401 Northpoint Pkwy, West Palm Beach, FL 33407	Timothy Henes 561-325-2963 Timothy_Henes@comcast.com	CATV
Crown Castle 1601 NW 136 Avenue, Suite A-200 Sunrise, FL 33323	Danny Haskett 786-246-7827 danny.haskett@crowncastle.com	Fiber
Florida City Gas/NextEra 4045 NW 97th Ave. Doral, FL. 33178	Tristan Simoes-Ponce 305-607-2038 Tristan.Simoes-ponce@nexteraenergy.com	Gas
FP&L Distribution 4406 SW Cargo Way Palm City, FL 34990	Rob Morris 772-223-4215 rob.morris@fpl.com	Electric
FP&L Transmission 15430 Endeavor Dr Jupiter, FL 33478	Thomas Colucci 315-219-7458 Thomas.Colucci@fpl.com	Electric
Indian River County Utilities 1801 27th Street – Bldg A, Vero Beach, FL 32960	Harrison Youngblood 772-226-4343 hyoungblood@ircgov.com	Sewer, Water

Utility Agency Owner	Contact	Utility Type
Resurgence Infrastructure Group 608 Huck Finn Dr. Crestview, FL 32536	Laura Glass 850-826-0846 laura.glass@glass811.com	Fiber
Sprint 360 S. Lake Destiny Dr., Ste. A Orlando, FL 32810	Jon Baker 352-409-5095 jabaker@cogentco.com	Fiber
Verizon 4700 Exchange Ct. Boca Raton, FL 33431	Donovan Carr 954-213-1959 donovan.carr@verizon.com	Communication Lines, Fiber

AT&T Florida – AT&T Florida provided marked up utility plan sheets that showed existing buried conduit facilities that run parallel along the west side of the FECRR from south of the SR 5/US 1 at Aviation Boulevard intersection up to 41st Street. South of the intersection, the buried conduit turns southwest across the Main Canal. The markups show "other" facilities running parallel along Aviation Boulevard on the south side of the roadway.

AT&T Transmission – Based on utility plan markups, AT&T transmission maintains a high-capacity fiber optic cable (in a joint duct bank) that runs parallel on the west side of SR 5/US 1 within the study area.

Lumen / CenturyLink – Based on utility plan markups, CenturyLink has existing facilities that run parallel along the west side of the FECRR throughout the study area.

City of Vero Beach (Water & Sewer) – The City of Vero Beach provided utility markup plans that show an existing eight (8)-inch water main (12 inch under the Main Canal) that runs on the east side of SR 5/US 1 from Royal Palm Boulevard to 37th Street with meters spaced throughout. On Aviation Boulevard, the City has three (3) abandoned and one (1) active 24-inch water lines that cross the roadway west of the FECRR crossing. Running to the east along 30th Street there is a 16-inch water main, eight (8)-inch sanitary sewer with service laterals and 12-inch force main. Running along 31st Street is an eight (8)-inch sanitary sewer, (16) inch reuse (non-potable) water main and a 2.5-inch water main with meters. Running along 32nd Street is an eight (8)-inch sanitary sewer with service laterals and 2.5-inch water main with meters. Lastly, within the study limits running along 33rd Street is a (24) inch effluent transmission main, eight (8)-inch sanitary sewer with service laterals and six (6)- inch water main with meters.

Comcast – Based on utility plan markups, Comcast has existing aerial facilities that run parallel along the west side of the FECRR from 21st Street to 29th Street. At 29th Street the facilities are relocated underground and run due west. There are no Comcast facilities

along SR 5/US 1 near the Main Canal. Existing aerial facilities resume north of Aviation Boulevard/32nd Street, on the east side of SR 5/US 1 and run parallel to north of 36th Street. No existing Comcast facilities are located along Aviation Boulevard.

Crown Castle – Based on utility plan markups, Crown Castle has existing facilities that run parallel along the east side of SR 5/US 1. There are no facilities present along Aviation Boulevard.

Florida City Gas/NextEra – Based on utility plan markups, Florida City Gas/NextEra has several existing facilities within the study area. There is an existing four (4) inch gas main that crosses SR 5/US 1 on the north side of the 26th Street intersection. An existing six (6) inch gas main crosses SR 5/US 1 on the north side of the intersection and connects to an existing valve on the northeast corner of the intersection. An existing six (6) inch gas main runs parallel along the east side of SR 5/US 1 from Aviation Boulevard to the end project limit.

FPL Distribution – Based on utility plan markups, FPL Distribution has an existing 120V line that crosses SR 5/US 1 north of the 30th Street intersection and then runs parallel on the pole line in addition to a two (2) phase 13kv distribution line along SR 5/US 1 on the east side to 37th Street. Overhead lines also run along the west side of SR 5/US 1 and the FECRR from 26th Street, across Aviation Boulevard and continue to run parallel to FECRR beyond project limits.

On Aviation Boulevard, FPL Distribution has existing overhead lines that run along both sides of the roadway from the begin project limit to approximately 1,500 feet to the east. The overhead distribution line then continues along the east side of Aviation Boulevard to just north of the County Administration Road intersection where the roadway curves to the north.

FPL Transmission – Based on utility plan markups, FPL Transmission has existing overhead facilities along SR 5/US 1 from the beginning project limit to 26th Street. On Aviation Boulevard, there are existing FPL Transmission facilities from 27th Avenue to just south of the intersection of County Administration Road.

IRC Utilities – Based on utility plan markups, IRC has a 12-inch existing water transmission main that runs parallel along the west side of FECRR from north of 33rd Street to the end project limit. There is also an existing eight (8)-inch water transmission line on the east side of SR 5/US 1 from 28th Street to the end project limit.

Resurgence Infrastructure Group – Based on utility plan markups, Resurgence Infrastructure Group has an existing underground fiber cable that is located in a shared FECRR Duct Bank within the FECRR right-of-way. The underground cable runs parallel

to FECRR on the west side from the begin project limit to 29th Street where it crosses the track to the east side of FECRR right-of-way.

Sprint – Based on utility plan markups, Sprint's only existing facilities, two (2) inch underground conduit, are located within FEC right-of-way.

Verizon – Based on utility plan markups, Verizon has existing underground facilities located in PVC duct in FECRR right-of-way throughout the study area. There are no facilities present along Aviation Boulevard.

2.19 Lighting

Conventional lighting along SR 5/US 1 runs along the east side of the corridor from the beginning of the project limits to just after the bridge over main canal. At this point the lighting infrastructure crosses SR 5/US 1 and continues along the west side of the corridor until 37th Street. After 37th Street lighting is present on either side of SR 5 until the end of the project limits. All lighting consists of high-pressure sodium.

Lighting is absent along Aviation Boulevard but is provided at the signalized intersections (on mast arms) of 27th Avenue and County Administration Road/27th Street.

2.20 Signs

Existing conventional roadside regulatory traffic signs and information signs exist throughout the intersection including required railroad crossing signs. No Variable Message Signs (VMS) or overhead signs are present within the limits of the project.

2.21 Aesthetics Features

The existing SR 5/US 1 right of way is completely impervious asphalt and concrete sidewalk with no opportunity for landscape. There are large trees locate beyond the right of way. One outdoor advertising sign is located on the east roadside of SR 5/US 1 north of 33rd Street. impact. Aviation Boulevard within the airport does not have landscape due to aviation safety requirements.

2.22 Bridges and Structures

The study limits include one existing bridge structure along SR 5/US 1 over the IRFWCD Main Canal (Bridge No. 880085) located at Mile Post (MP) 7.053 approximately 866 feet south of the intersection of SR 5/US 1 with Aviation Boulevard (MP 7.217) within IRC, Florida. The existing conditions at the bridge were analyzed during field reviews and reviews of the as-built construction plans (Project No. 88010-3510) and corresponding bridge inspection reports. A Bridge Load Rating Summary report (**Appendix B**) was

completed in June 2023 for Bridge No. 880085 and found all ratings for the legal loads on the bridge to be adequate.

The existing bridge structure was designed in the late 1970's and constructed in 1980. The bridge width is 70 feet and accommodates two (2) vehicular lanes per direction and one (1) two-way left turn lane in the center (see **Figure 2-19** Existing Bridge Plan View). The bridge spans over the IRFWCD Main Canal with four (4) simply supported spans of 26, 32, 31, and 26 feet, respectively, for a total bridge length of 114 feet (See Bridge Elevation View in **Figure 2-20**). The bridge horizontal alignment has a zero-degree skew-angle and the existing substructure consists of cast-in-place end and intermediate bents supported on 18-inch square precast prestressed concrete piling.

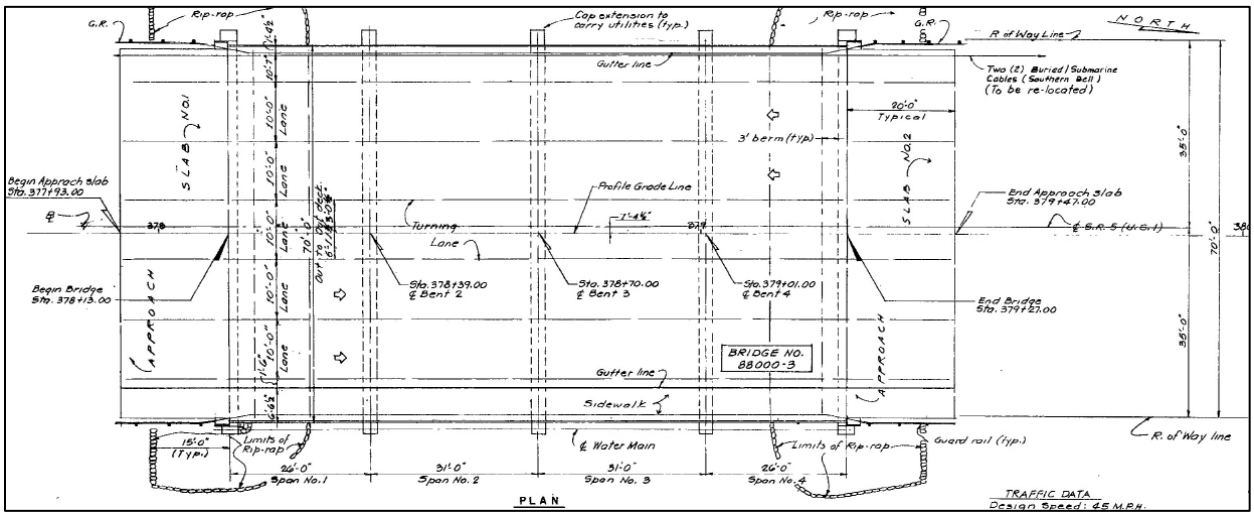


Figure 2-19 Existing Bridge Plan View

The vertical clearance shown in the original construction plans is zero (0) feet and eight (8) inches above the High Water Elevation of 11.35 feet (National Geodetic Vertical Datum (NGVD)) [9.89-ft NAVD] and the low member elevation is 12.33 feet NGVD [10.87-ft NAVD]. The Bridge Hydraulic Design Data Table in the existing plans call for a minimum 3'-0" vertical Drift Clearance above the Design High Water (50-yr) Elevation of 8.20 feet (NGVD) [6.74-ft NAVD]. The vertical drift clearance provided is 4.33 feet. The Normal Flow Elevation is listed as 1.58 feet (NGVD) [0.12-ft NAVD]. As seen in **Figure 2-20,** the existing canal bank armoring consists of sandbags with an embankment slope of 1.5:1 (horizontal to vertical).

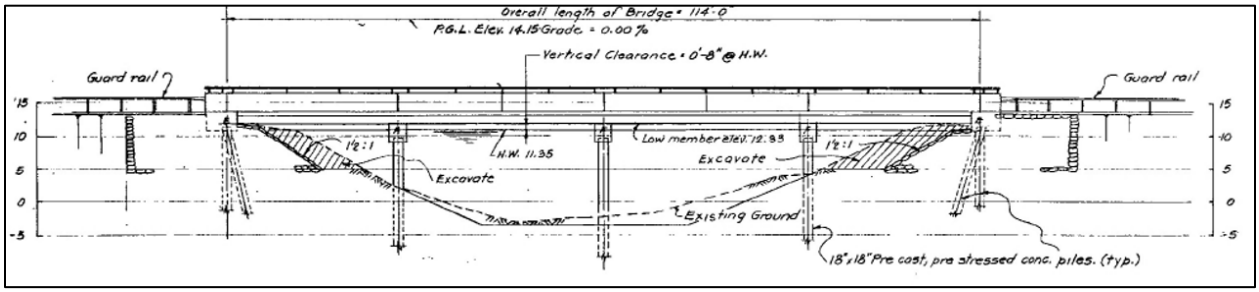


Figure 2-20 Existing Bridge Elevation View over the IRFWCD Main Canal
(Note: Canal Elevations Shown are in NGVD)

The existing five (5) lane bridge typical section consists of four (4) 10-ft lanes with a center 10-ft two-way left turn lane a 10-ft 7-inch southbound outside shoulder and 5-ft 2-inch sidewalk with curb and gutter in the northbound direction (see **Figure 2-21**). The deck cross-slope is 0.02 ft/ft with the deck crowned and sloped to either side. The superstructure consists of a flat slab system with 7-ft-wide precast prestressed slab units with a cast-in-place concrete toping for a total superstructure depth of 1-ft 1-inch.

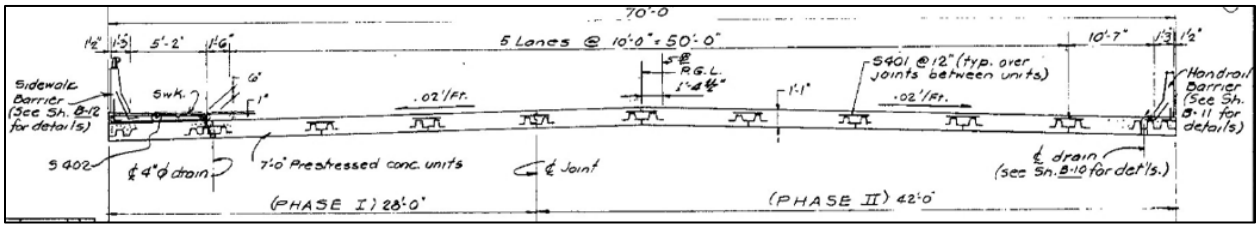


Figure 2-21 Existing Bridge Typical Section Looking South

The latest bridge inspection report on file with the Department indicated that above and underwater bridge inspections were completed on May 5, 2021, and May 24, 2021, respectively. Minor cracking in various bridge super structure elements and some scaling (loss of concrete matrix) to substructure piling was noted but deemed minor in nature. These reports reflected a Sufficiency Rating of 96.5 and a Health Index of 97.35. Some minor scouring and/or silting was noted in the canal bottom cross sections compared with the original canal sections.

A survey for asbestos-containing materials (ACM) was completed on December 21, 2007, at the SR 5/US 1 and Main Canal Bridge (No. 880085) and published their findings in their report dated February 21, 2007, on file with the department. The findings of this asbestos survey indicated that asbestos-containing graphite material was present in the bridge bearing pads associated with the intermediate bents. These bearing pads consist of 45% to 60% asbestos material and are classified by the Environmental Protection Agency (EPA) as a Category II non-friable material. The demolition work associated with

this project will require this material to be properly removed and disposed of by a state of Florida licensed asbestos abatement.

The existing plans identified the existing bridge site as Non-Coastal as it relates to environmental classification.

There are five (5) known utilities near the bridge location. Resurgence Infrastructure Group and AT&T Transmission each run a Fiber Optic Cable within a Joint Use Duct Bank just east of the FEC Railroad tracks between the existing bridge and the railroad tracks within FEC right-of-way. Florida Power and Light (FPL) has overhead distribution lines far enough north of the bridge that proposed bridge construction should not impact the lines, but they could be impacted due to roadway improvements. Crown Castel Fiber has facilities adjacent to the bridge that appear on the northbound side of the bridge structure which will be impacted by the proposed bridge construction. These will need to be relocated. The City of Vero Beach has a number of water mains running parallel and crossing the existing bridge structure as seen in **Figure 2-22**. There is a 12-inch Cast-Iron-Pipe watermain attached to the existing bridge barrier on the east side of the bridge (northbound direction). This facility will need to be relocated if the bridge is replaced. The city also has a 16-inch Ductile Iron Pipe watermain crossing beneath the end span on the north side of the bridge. This main crosses diagonally north of the east side of the bridge at a 45-degree angle and continues east along 30th Street. It will be necessary to obtain more accurate utility locations with level “A” locates (soft-dig) on the watermain during the final design phase. This will allow for the development of a potential pile spacing for the proposed bridge north end bent to avoid the need to relocate this facility.

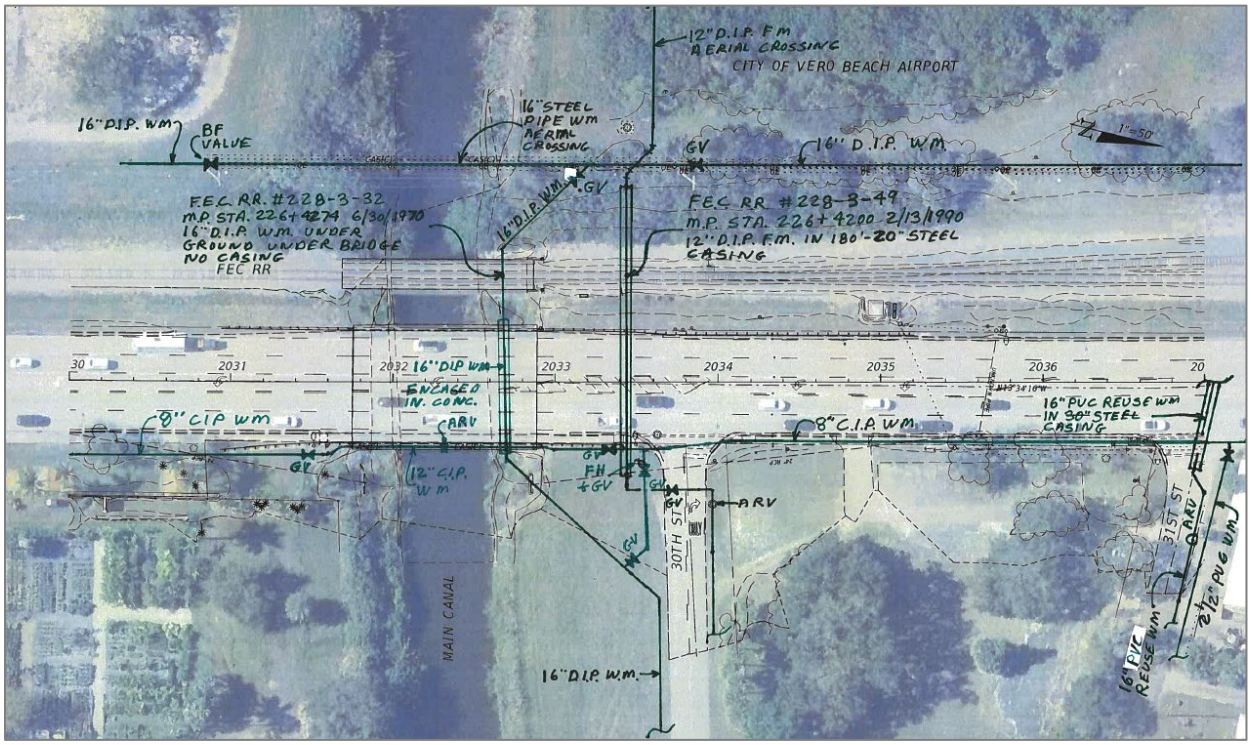


Figure 2-22 Existing City of Vero Beach Water and Sewer Utilities

Canal structure No. D40F88000-01760 is located on the Main Canal approximately 750 feet west (upstream) of the Main Canal bridge. The proposed improvements for this study are not anticipated to impact this existing control structure.

2.23 Existing Environmental Features

The following subsections provide a summary of key existing environmental characteristics found within the study area that may be affected by the proposed improvements. This project was evaluated through the FDOT's ETDM process (ETDM Project No. 14475). The purpose of the ETDM process is to incorporate environmental considerations into transportation planning to inform project delivery. An ETDM Programming Screen Summary Report was published on January 21, 2022, containing comments from the ETAT on the project's effects on various natural, physical, and social resources. Supporting environmental documents are provided in **Appendix C**.

A complete evaluation of environmental characteristics is documented in the following reports prepared for this PD&E Study and provided in SWEPT:

- SocioCultural Effects (SCE)
- Contamination Screening Evaluation Report (CSER)
- Conceptual Stage Relocation Plan (CSRP)

- Cultural Resource Assessment Survey (CRAS)
- Natural Resources Evaluation Report (NRE)
- Noise Study Report (NSR)
- Type 2 Categorical Exclusion (Type 2 CE)

2.23.1 Social and Economic

This project is within the City of Vero Beach and the unincorporated community of Gifford, two census designated areas within IRC, Florida. The population of residents in the corridor study area is 19.66% racial/ethnic minority, compared to the county's 26.07% racial/ethnic minority population.

The project intersection is in an area with a mix of commercial and light industrial land uses, the FEC railroad, abandoned homes and vacant lands. The immediate project area lacks any defined public or sense of community space. Sidewalks exist only along the east side of SR 5/US 1 and the local streets are both paved and unpaved without pedestrian walkways.

Camp Haven Men's Rehabilitation Center is a shelter that works to rebuild the lives of homeless men in IRC by providing temporary residency along with employment, psychological and personal counseling. It operates on private donations. Based on conversations with the center's board members, the center is zoned as Motel and is inspected by the County as a motel.

The area between SR 5/US 1 and 13th Avenue, and between 30th Street and 33rd Street was previously a tourist fishing retreat called Camp Gordon with many wooden cabins. Over the years the business closed, cabins were abandoned and/or demolished.

A few occupied wooden homes with residents are located 500 feet east of SR 5/US 1 along 13th Avenue. Further east of 13th Avenue and away from the project, are single and multi-family residential units and the Vero Beach Golf and Country Club.

Community focal points include:

- Community and Fraternal Centers
    - Vero Beach Community Center, 2266 14TH AVE 32960
    - Visitors Bureau for IRC, 1216 21ST ST 32960
    - Camp Haven, 3256 US 1 32960
    - Chamber Of Commerce - IRC, 1216 21ST ST 32960
    - Elks Lodge 1774, 1350 26TH ST 32960
    - Italian American Civic Associates, Inc, 1600 25TH ST 32960

  - Masonic Lodge - Vero 250 F & Am 1959 14TH AVE 32960
  - Florida Irish American Society Inc 1314 20TH ST 32960
  - Boys & Girls Club - IRC 2926 PIPER DR 32960
  - Garden Club of IRC 2526 17TH AVE 32960

- Cultural Centers
  - Indian River Citrus Museum/Heritage Center 2140 14TH AVE 32960 (at Pocahontas Park)
  - The Railroad Museum 2336 14TH AVE 32960
  - IRC Law Library 2000 16TH AVE 32960
  - IRC Library 1600 21ST ST 32960
- Parks and Recreational
  - Michael Field Complex
  - Pocahontas Park
  - Hosie Schumann Park
  - Central IRC Greenways Plan
- Historic and Archaeological
  - Vero Man Ice Age Archeological Zone

2.23.2 Section 4(f) Potential

There are four (4) potential Section 4(f) resources identified within the project study area:

- Michael Field Complex
- Hosie Schumann Park
- Pocahontas Park
- Central IRC Greenways Plan

2.23.3 Cultural Resources

A Cultural Resource Assessment Repot (CRAS) was prepared for this study. Two previously recorded archaeological sites were identified within or adjacent to the study area during a search of the Florida Master Site File (FMSF): Site 8IR1 Vero Man and Site 8IR9 Vero Locality. These archaeological sites are 8IR1 and 8IR9, are now considered one and the same site, and will be referred to henceforth as 8IR1/8IR9. Site 8IR1/8IR9 is associated with Pre-Columbian burials and is considered eligible for listing in the National

Register by the State Historic Preservation Officer (SHPO). The site is located between the southwest corner of the study intersection and the Main Canal.

A total of 24 previously recorded historic structures were identified within the historic resources study area during the search of the Florida Master Site File (FMSF) and background information. Of the previously recorded 24 historic structures, 13 are extant and 11 have been demolished. The previously recorded buildings were recorded in 1990 as a result of the *Historic Properties Survey of the City of Vero Beach,* Florida. Although not evaluated by the SHPO for National Register eligibility, the initial recorder considered all of the buildings ineligible for listing in the National Register, both individually and as part of a district (Historic Property Associates 1990; FMSF Manuscript No. 2670).

The 13 extant previously recorded buildings are affiliated with the c. 1931-1955 tourist camp, Camp Gordon, also known as Beattyville. It was founded in 1931. Most of the structures associated with Camp Gordon have been demolished so that the group no longer retains integrity of design or setting. None of the original Camp Gordon commercial buildings are extant. The remaining Camp Gordon structures within the study area are in poor to ruinous condition. The resources do not have enough integrity to be considered National Register eligible.

Three (3) previously recorded resource groups were identified within the study area during the search of the FMSF. The Indian River Farms Main Canal (8IR1148) within the current area of potential effect (APE) was determined ineligible for listing on the National Register by the SHPO on January 1, 2014. The FEC Railway (8IR1497) has been determined eligible countywide but has not been evaluated within the current APE. Dixie Highway (8IR1519) has been determined eligible for the National Register by the SHPO outside of the current APE but has not been evaluated within the current APE.

2.23.4 Natural Resources

A Natural Resource Evaluation (NRE) report was prepared for this study to document the natural resources analysis performed to support decisions related to the evaluation of project alternatives and to summarize potential impacts to wetlands, federal and state protected species, protected habitats, and Essential Fish Habitat (EFH).

In order to determine the approximate locations and boundaries of existing upland and wetland communities within the project study area, available site-specific data was collected and reviewed. The project boundary includes all of the limits of the intersection of SR 5/US 1 and Aviation Boulevard/32nd Street. The north-south limits extend beyond the intersection along US 1 between 21st Street and 41st Street (approximately 2 miles). The west limits extend along Aviation Boulevard between 27th Avenue and SR 5/US 1 (approximately 1 mile). The east limits include the area east of SR 5/US 1 to 13th Avenue.

The project study area encompasses the project boundary plus an approximate 300-foot buffer. The following information was collected and analyzed:

- USDA, NRCS, Web Soil Survey (http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx);
- NRCS Soil Survey of Indian River County (2023);
- USFWS, NWI Wetlands Mapper (https://www.fws.gov/wetlands/data/mapper.html);
- SJRWMD FLUCFCS (2014);
- FDOT, FLUCFCS, 3rd edition, 1999;
- USFWS, Classification of Wetlands and Deepwater Habitats of the United States, (Cowardin, et. al. 1979);
- FNAI 2010. Guide to the Natural Communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, Florida; and
- 2019 aerial photographs of the project study area.

This project was evaluated for impacts to wildlife and habitat resources, including protected species, in accordance with 50 CFR Part 402 of the ESA of 1973, as amended, the Florida Endangered and Threatened Species Act, Section 379.2291, FS, and the FDOT PD&E Manual chapter titled Protected Species and Habitat.

The project area falls within USFWS-designated CH for West Indian manatee (*Trichechus manatus*). The project falls entirely within the USFWS CAs of the Florida scrub-jay (*Aphelocoma coerulescens*), Audubon's crested caracara (*Caracara plancus audubonii*), and Atlantic salt marsh snake (*Nerodia clarkii taeniata*). The project falls within the Core Foraging Area (CFA) of one wood stork colony, Pelican Island, located approximately nine miles north of the project limits.

A review of USFWS, FWC, Florida Department of Agriculture and Consumer Services (FDACS), and Florida Natural Areas Inventory (FNAI) data indicates thirty-two (32) protected plant and wildlife species known to occur in Indian River County. Twenty (20) of the species are federally listed endangered or threatened. Eleven (11) listed species are state listed endangered or threatened. The bald eagle (*Haliaeetus leucocephalus*) was delisted from protection under the Endangered Species Act in 2007. However, the bald eagle is still protected under the Bald and Golden Eagle Protection Act (BGEPA), Migratory Bird Treaty Act (MBTA), and State law (FAC 68A-16.002). Multiple species of bats are state protected by FAC 68A-4.001 General Prohibitions and 68A-9.010 Taking Nuisance Wildlife.

To further summarize the results of desktop and field data collection efforts, each potential occurring species was assigned a likelihood for occurrence of “none”, “low”, “moderate”, or “high” within habitats found on the project corridor and an indicator of suitable habitat proximity to the project area of “distant”, “near”, or “contiguous”. Definitions of probability of species presence/habitat proximity are provided below.

Likelihood of Species Presence

None – Species has been documented in Indian River County, but due to complete absence of suitable habitat, could not be naturally present within the project corridor.

Low – Species with a low likelihood of occurrence within the project area are defined as those species that are known to occur in Indian River County or the bio-region, but preferred habitat is limited in the project area, or the species is rare.

Moderate – Species with a moderate likelihood for occurrence are those species known to occur in Indian River or nearby counties, and for which suitable habitat is well represented in the project area, but no observations or positive indications exist to verify presence.

High – Species with a high likelihood for occurrence are suspected within the project area based on known ranges and existence of sufficient preferred habitat in the area; are known to occur adjacent to the project; or have been previously observed or documented in the vicinity.

Habitat Proximity

Distant – Appropriate habitat is distant from the project footprint when accounting for the species’ home range size and level of mobility.

Near – Appropriate habitat is near the project footprint when accounting for the species’ home range size and level of mobility.

Contiguous – Appropriate habitat occurs within or immediately adjacent to the project footprint.

Figure 2-23 depicts field observations as well as historic species occurrences from the database searches. **Table 2-12** lists the federally and state listed wildlife species known to occur within Indian River County that could potentially occur near the project area based on availability of suitable habitat and known ranges.

Figure 2-23 Species Occurrence Map

Table 2-12 Potentially Occurring and Observed Listed Species

Scientific Name	Common Name	State	Federal	Habitat	Habitat Occurrence in Relation to Project Footprint	Probability of Species Presence or Occurrence
Plants						
Harrisia fragrans	Fragrant prickly-apple	FE	E	Scrubby flatwoods and xeric hammocks on the Atlantic Coastal Ridge	Distant	None
Dicerandra immaculata	Lakela's mint	FE	E	Coastal sand-pine scrub vegetation on dunes	Distant	None
Insects						
Cyclargus thomasi bethunebakeri	Miami blue butterfly	FE	E	Tropical hardwood hammocks, tropical pine rocklands, and beachside scrub	Distant	None
Reptiles						
Drymarchon couperi	Eastern indigo snake	FT	T	Hydric hammock, palustrine, sandhill scrub, upland pine forest, mangrove swamp	Contiguous	Low
Eretmochelys imbricata	Hawksbill sea turtle	FE	E	Oceans, Bays, Inlets and beaches	Distant	None
Dermochelys coriacea	Leatherback sea turtle	FE	E	Oceans, Bays, Inlets and beaches	Distant	None
Caretta caretta	Loggerhead sea turtle	FT	T	Oceans, Bays, Inlets and beaches	Distant	None
Chelonia mydas	Green sea turtle	FT	T	Oceans, Bays, Inlets and beaches	Distant	None
Nerodia clarkii taeniata	Atlantic salt marsh snake	FT	T	Salt marsh tidal flats that contain grasses	Distant	None
Gopherus polyphemus	Gopher tortoise	T	NL	Old fields, sandhill, scrub, xeric hammock, ruderal, dry prairie, pine flatwood	Contiguous	Moderate
Birds						
Antigone canadensis pratensis	Florida sandhill crane	T	NL	Basin marsh, depression marsh, dry prairies, marl prairie, pastures, human-altered suburban landscapes	Contiguous	Low
Aphelocoma coerulescens	Florida scrub-jay	FT	T	Relict dune ecosystems or scrub on well drained to excessively well drained sandy soils	Distant	Low
Athene cunicularia floridana	Florida burrowing owl	T	NL	Native prairies and cleared areas with short groundcover	Near	Low
Calidris canatus rufa	Rufa red knot	FT	T	Coastal marine and estuarine habitats with large areas of exposed intertidal sediments.	Distant	None
Caracara plancus audubonii	Audubon's crested caracara	FT	T	Improved pastures and prairie with cabbage palm	Distant	Low
Charadrius melodus	Piping plover	FT	T	Sandy upper beaches, sparsely vegetated shores of shallow lakes, ponds, rivers, and impoundments	Distant	None
Charadrius nivosus	Snowy plover	T	NL	Beaches, dry mud or salt flats, sandy shores of rivers, lakes, and ponds	Distant	None
Egretta caerulea	Little blue heron	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Egretta rufescens	Reddish egret	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Egretta tricolor	Tricolored heron	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Falco sparverius paulus	Southeastern American kestrel	T	NL	Sandhill, mesic flatwoods, ruderal, dry prairie	Near	Low
Haliaeetus leucocephalus	Bald eagle	BGEPA[1]	BGEPA[1]	Forests, estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Laterallus jamaicensis ssp.	Eastern black rail	FT	T	Tidal marshes, coastal marsh and wet meadows	Distant	None

Scientific Name	Common Name	State	Federal	Habitat	Habitat Occurrence in Relation to Project Footprint	Probability of Species Presence or Occurrence
Jamaicensis						
Mycteria americana	Wood stork	FT	T	Estuarine tidal swamps/marshes, lacustrine, seepage stream, ditches	Contiguous	Moderate
Platalea ajaja	Roseate spoonbill	T	NL	Estuarine, lacustrine, riverine, tidal marsh, tidal swamp	Contiguous	Moderate
Rynchops niger	Black skimmer	T	NL	Open sand on beaches, sandbars, and dredge material islands	Distant	None
Sterna dougallii	Roseate tern	FT	T	Nest sites include bare limestone, shell-sand beaches, newly deposited rock and marl fill, dredge material, rooftops. Forages in open water over sandbars, reefs, tidal channels.	Distant	None
Sternula antillarum	Least tern	T	NL	Coastal areas throughout Florida, including beaches, lagoons, bays, and estuaries. Increasingly use artificial nesting sites, including gravel rooftops, dredge spoil islands or other dredged material deposits, construction sites, causeways, and mining lands. Nesting areas have a substrate of well-drained sand or gravel and usually have little vegetation.	Distant	None
Mammals						
Peromyscus polionotus niveiventris	Southeastern beach mouse	FT	T	Coastal dunes with sea oats	Distant	None
Puma concolor coryi	Florida panther	FE	E	Extensive blocks of forests, large wetlands, can use human-altered landscapes	Distant	None
Trichechus manatus	West Indian manatee	FT	T	Coastal waters, bays, rivers, estuaries, sometimes lakes and canals	Contiguous	Low
Eumops floridanus	Florida bonneted bat	FE	E	Roosting habitat: Forest and other areas with tall, mature trees or other areas with suitable roost structures. Artificial roosting structure includes buildings, bridges, and bat houses. Foraging habitat: open fresh water, permanent or seasonal freshwater wetlands, wetland and upland forests, and wetland and upland shrub.	Near	Low
	Bats (multiple species)	-	*	Forested areas, manmade structures	Near	Moderate

The extent and types of wetlands in the project study limits were documented in accordance with Executive Order 11990, Protection of Wetlands, and the FDOT PD&E Manual. Surface waters were identified through the review of available literature, GIS data, and field verification.

Following the review of all available materials, field assessments were conducted on June 22, 2023, to identify the presence of wetland vegetation, evidence of hydrology, and hydric soil indicators. The jurisdictional limits of the surface waters were estimated using the criteria stated in the *USACE Final Regional Supplement to the Corps of Engineers Wetland Delineations Manual: Atlantic and Gulf Coastal Plain Region* (October 2010), and Florida statewide unified wetland delineation methodology as adopted by the FDEP and the Water Management Districts per Chapter 62-340 of the FAC and described in *The Florida Wetlands Delineation Manual*. Project scientists evaluated wetland and surface water systems using the UMAM.

The project area contains one surface water (SW) (SW-1 [Main Canal]) and four Other Surface Waters (OSWs) (OSW-1, OSW-2, OSW-3, and OSW-4). The SW is classified as FLUCFCS 5100: streams and waterways (USFWS: PEM1Hx [Palustrine, Emergent, Persistent, Permanently Flooded, Excavated]) and is a man-made canal which drains to the Indian River Lagoon. The OSWs are classified as FLUCFCS 5300: reservoirs (USFWS: PSS1Cx [Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Excavated]), which are man-made, open water ponds with mowed edges. A surface water map is included as **Figure 2-24**.

No wetlands were identified within the project study area.

Figure 2-24 Surfaces Waters (Preferred Alternative)

2.23.5 Physical Resources Contamination

A Contamination Screening Evaluation Report (CSER) was prepared for this study. The preliminary (Level I) evaluation was conducted to determine potential contamination issues within the proposed project limits from properties or operations located within the vicinity of the project. The contamination study area encompasses the right-of-way and properties within 500 feet of the corridor, non-landfill solid waste sites within 1000 feet, landfills, and Superfund sites within a ½ mile of the project. Sites found to have a history of contamination, or to house hazardous substances, were evaluated for potential contamination involvement within the proposed Build Alternative and a degree of risk was assigned for each site.

A total of 13 potential contamination sites were identified within the project study area (**Figure 2-25**). No sites are assigned a High Risk rating. Four (4) sites are assigned a Medium Risk rating for potential contamination concerns:

- FEC Railroad (Map ID #1)
    - This railroad bed has a long history of use (the railroad was constructed in 1894) and may contain arsenic and other contaminants from treated railroad ties and spraying. The railroad is within the likely construction zone of each alternative.
- Vero Beach Water Treatment Plant (Map ID #2)
    - There was “sewage disposal” circa 1970s-1980s north of Aviation Boulevard, and there have been multiple ponds or ditches along both sides of Aviation Blvd that, based on historical aerials, appear to have received effluent.
- Sullivan Site (Map ID #3)
    - Two Underground Storage Tanks (USTs) were removed or abandoned circa 1998 but there is no record of confirmatory soil or groundwater sampling.
- W C Graves Jr. / Indian River Associates (Map ID #4)
    - Two USTs were removed before 1990 but there is no record of confirmatory soil or groundwater sampling. One heating oil UST was present but there is no record that it was removed or properly abandoned.

The remaining sites are categorized as Low Risk or No Risk.

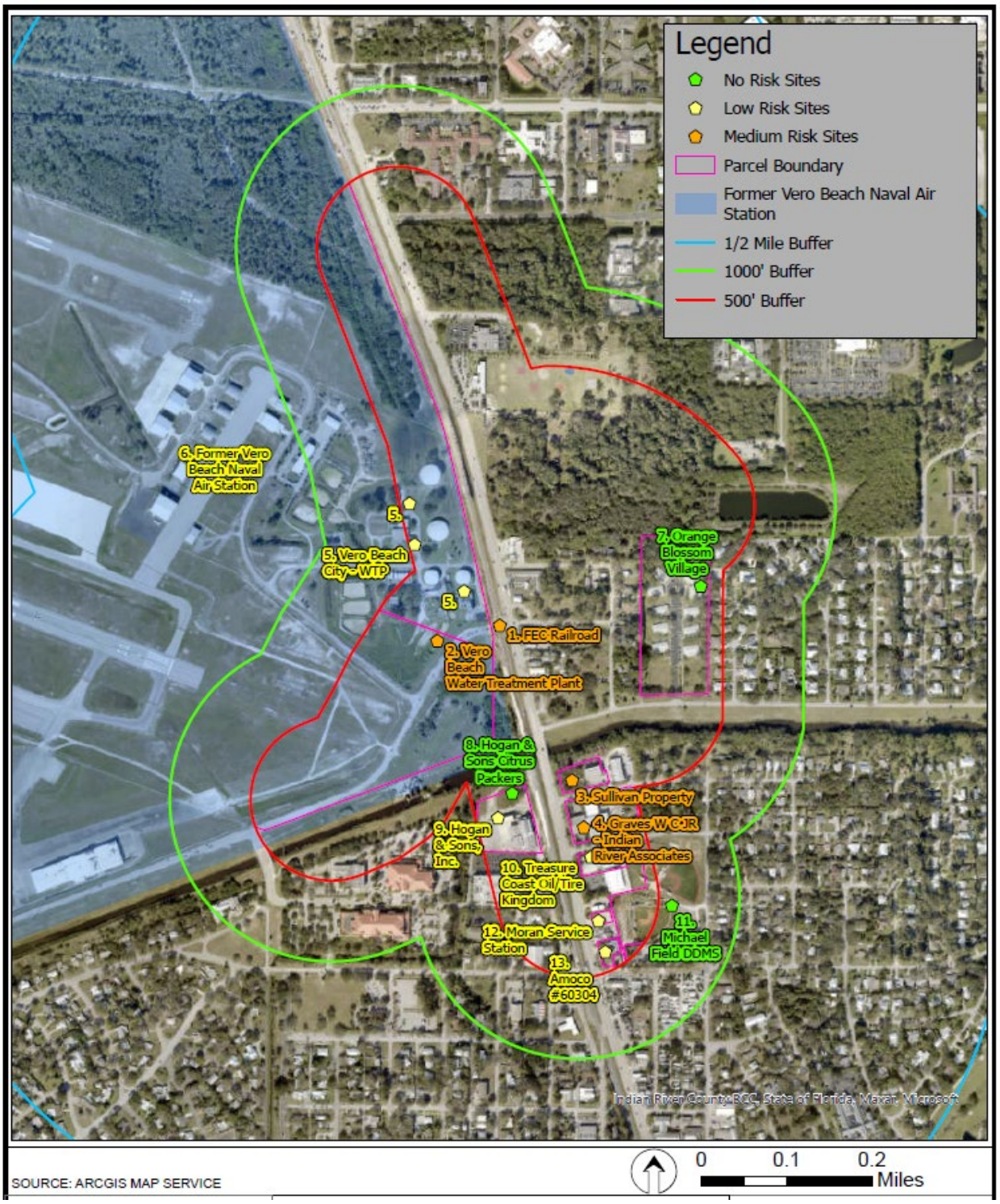


Figure 2-25 Potential Contamination Map

The project study area includes one bridge: FDOT Structure No. 880085 (SR 5/US-1 & Main Relief Canal Bridge). The Asbestos Survey Report, *State Road 5/US-1 & Main Relief Canal bridge No. 880085 (MP 7.053) Indian River County, Florida* dated February

2007, was obtained for this study. The bridge's graphite bearing pads were previously determined in 2007 to have 45-60% asbestos. Bridge plans indicate there may be asbestos-containing materials (ACM) that were inaccessible for testing so there may be additional asbestos. No metal components with suspect metals-based coatings were identified by the survey.

There are numerous old houses and commercial buildings in the project area; these may contain ACM and lead-based paint (LBP). After the preferred alternative is selected, ACM and LBP surveys will need to be conducted on any of these structures that would require demolition.

3.0 FUTURE CONDITIONS

3.1 Future Conditions Considerations

Future land use for the study area is planned to change slightly with some commercial parcels becoming mixed use in the future. Projected future travel demand and future year AADT forecasts for this study were developed under a separate study, *Traffic Forecasting Memorandum - SR 5/US 1 at Aviation Boulevard PD&E Support*, dated November 2, 2021. The PTAR, dated August 2023, was prepared for this study. These reports are summarized below.

3.1.1 County Extension of Aviation Boulevard

IRC public works project will extend Aviation Boulevard to the Cleveland Clinic Hospital and medical region. This project was in the design phase during the PD&E study and was considered in the study's traffic forecasting. Aviation Boulevard will be extended east of SR 5/US 1 to 36th Street. The initial concept route is shown in **Figure 3-1**. PD&E Alternatives were developed to be compatible with IRC's project to extend Aviation Boulevard. The county extension of Aviation Boulevard is accounted for in the No-Build and Build Alternatives.

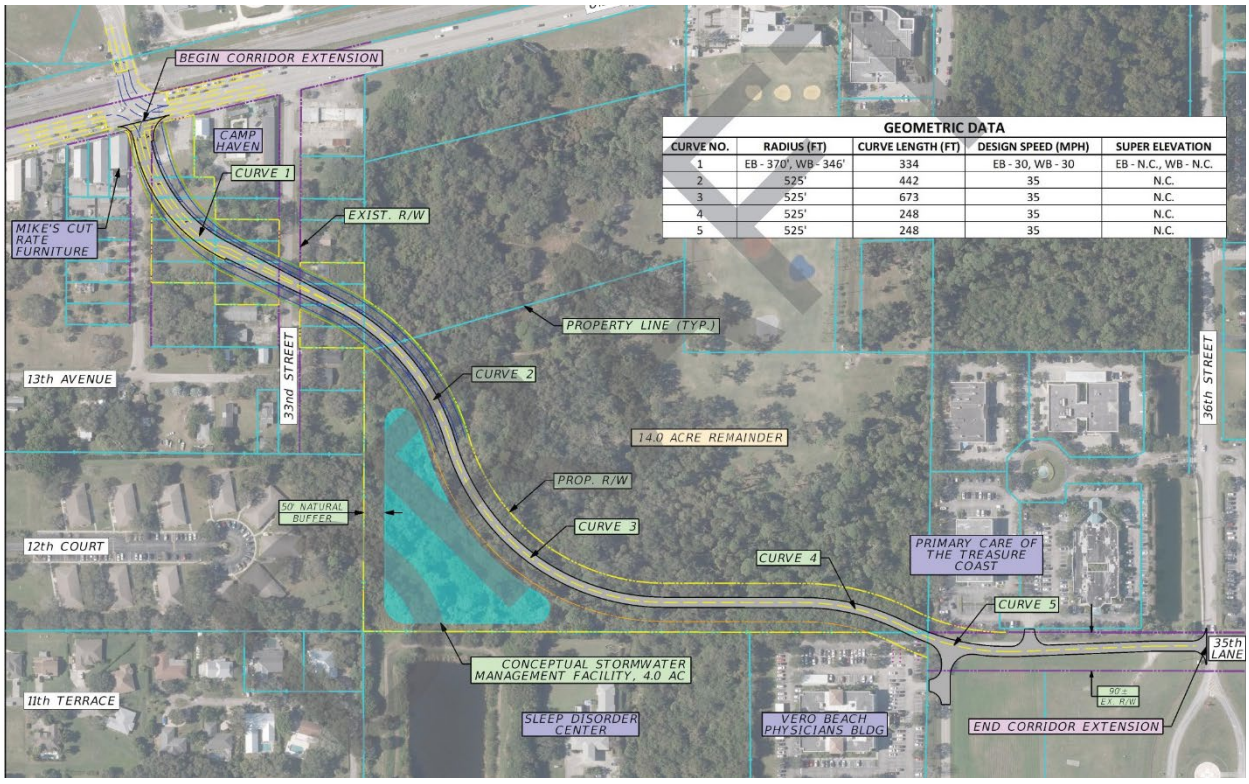


Figure 3-1 IRC Aviation Boulevard Extension Concept

3.1.2 Project Traffic Development

The Treasure Coast Regional Planning Model Version 5.0 (TCRPM5) with base year 2015 and horizon year 2045 was used to estimate the future years daily forecasts for the study area. The 2045 model is based on the adopted year 2045 Regional Long-Range Transportation Plan (RLRTP) for Indian River, St. Lucie, and Martin Counties.

The traffic forecasting methodology used for this PD&E Study included an evaluation of the following forecast methodologies:

1. Regression analysis of 10 years of the most recent historical AADTs from FDOT count sites.

2. Regression analysis of 10 years of the most recent historical AADTs from FDOT combined with the adopted TCRPM5 Model.

3. Growth between the base year (2015) and the validation (2045) year of the adopted TCRPM5 Model roadway volumes.

4. Zonal analysis of adjacent TAZ employment and population data from the validation year and the adopted TCRPM5 Model.

Based on a comparison of the growth rates on the study segment resulting from each of the evaluated forecasting methodologies, an areawide compound rate of 2.0% was recommended. This growth rate was calculated by averaging each of the rates obtained from each of the forecasting methods.

The developed AADT forecast volumes and future year turning movement volumes (TMV) for the study intersections are provided in the *Project Traffic Analysis Report (PTAR)* prepared as part of this PD&E Study. The 2025 opening year and 2045 design year future AADT volumes are summarized in **Figure 3-2** and **Figure 3-3**, respectively. The 2025 opening year and 2045 design year future TMVs for the AM and PM peak hours are summarized in **Figure 3-4** and **Figure 3-5**, respectively. The complete *PTAR* is included as part of the project folder and can be found in SWEPT.

Operational and LOS analysis results for the No-Build and Build Alternatives are provided in **Section 5.0**.

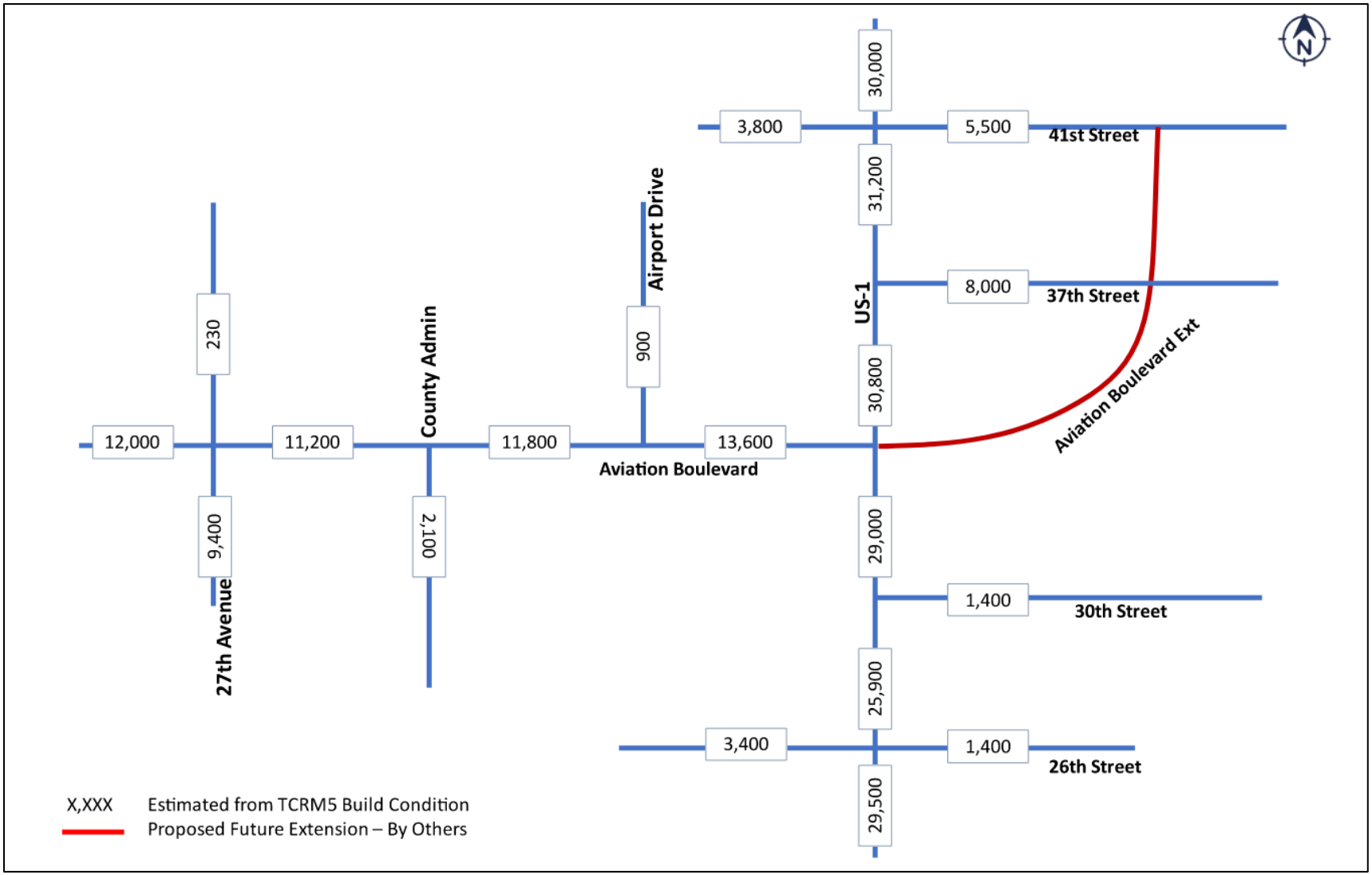


Figure 3-2 2025 Future Annual Average Daily Traffic (AADT) Volumes

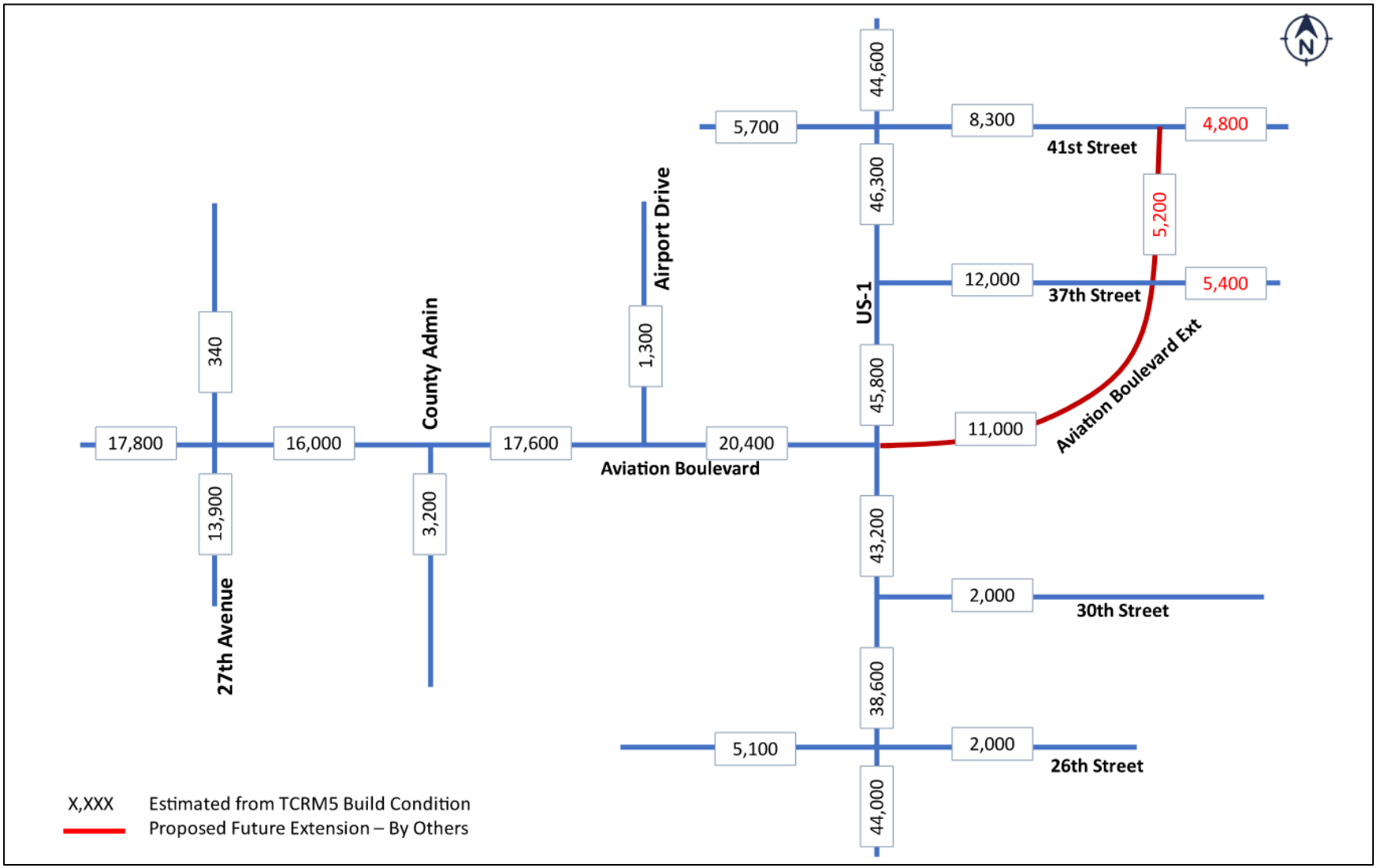


Figure 3-3 2045 Future Annual Average Daily Traffic (AADT) Volumes

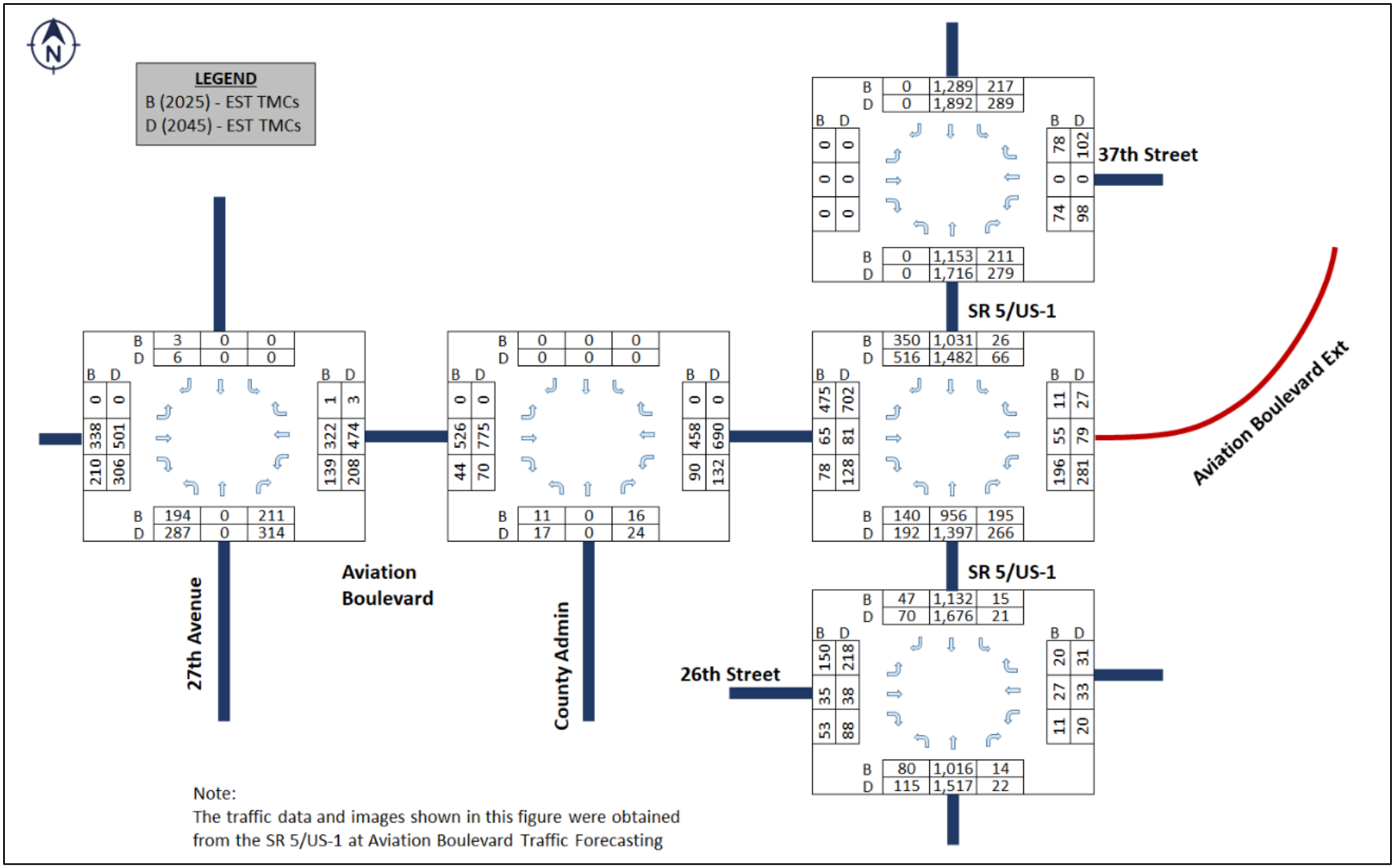


Figure 3-4 2025 and 2045 Turning Movement Volumes– AM Peak Period

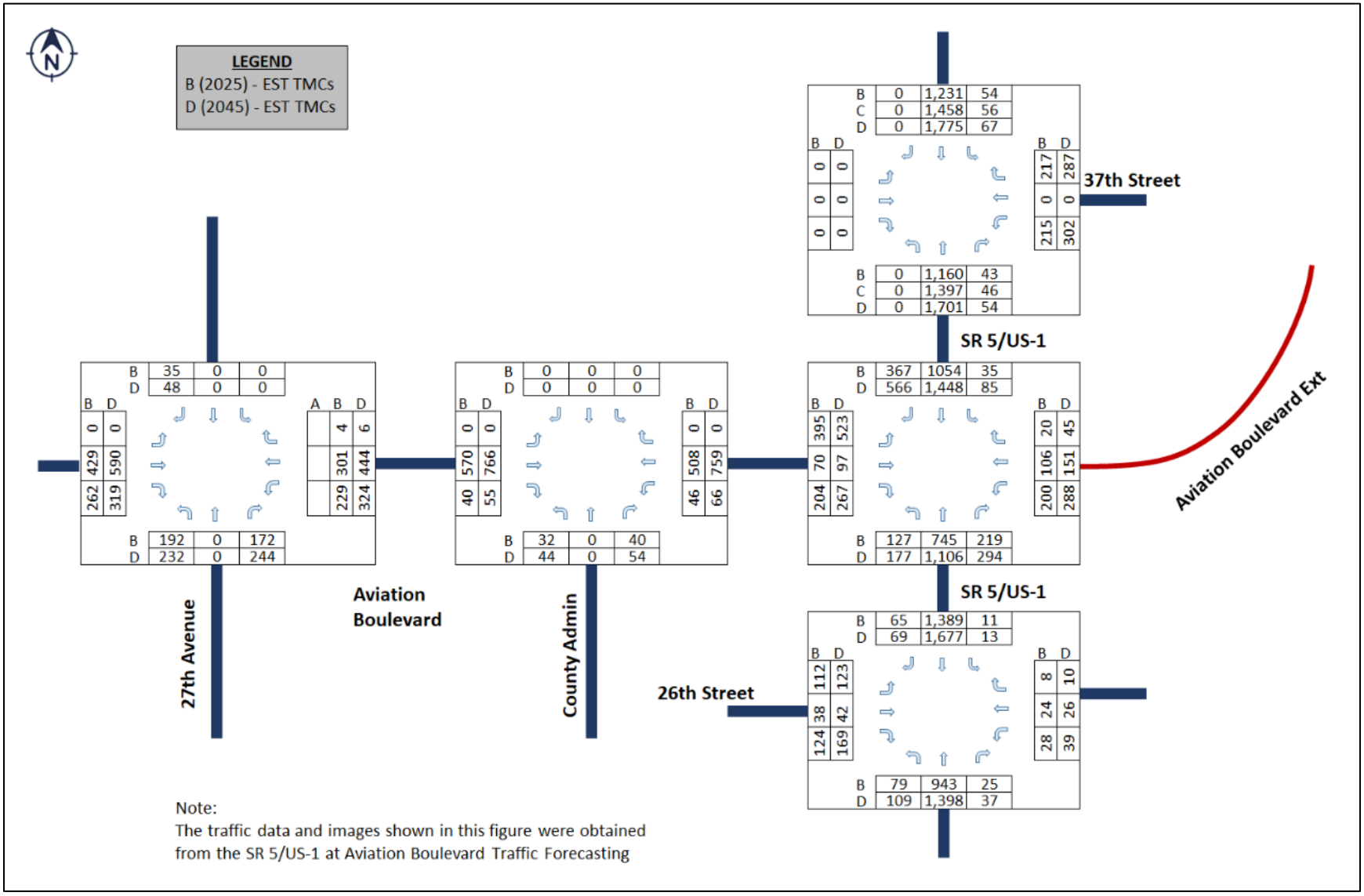


Figure 3-5 2025 and 2045 Turning Movement Volumes – PM Peak Period

4.0 DESIGN CONTROLS & CRITERIA

Build alternatives for this PD&E Study were developed and analyzed based on current FDOT and AASHTO design standards and criteria as set in the current Florida Design Manual (FDM) and PD&E Manual.

The latest available approved versions of manuals and handbooks were utilized in the development of study alternatives. The following FDOT Manuals and Guidelines were used in conducting the PD&E study:

- *Florida Statues*
- *Florida Administrative Codes*
- *Applicable Federal Regulations, U.S. Codes, and Technical Advisories*
- *FDOT PD&E Manual*
- *FDOT ETDM Manual*
- *FDOT Design Manual (FDM), January*
- *SocioCultural Effects Evaluation Handbook,*
- *Public Involvement Handbook*
- *Highway Capacity Manual (HCM)*
- *Manual on Uniform Traffic Studies (MUTS)*
- *Manual of Uniform Traffic Control Devices (MUTCD)*
- *Minimum Standards for Design, Construction, and Maintenance Streets and Highways (Florida Greenbook)*
- *A Policy on Geometric Design of Highways and Streets*
- *AASHTO Guide for the Development of Bicycle Facilities*
- *AASHTO Guide for the Development of Pedestrian Facilities*
- *Highway Safety Manual (HSM)*
- *Right of Way Mapping Handbook*
- *Right of Way Procedures Manual*
- *Survey and Mapping Handbook*
- *Soils and Foundation Handbook*
- *Electronic Field Book (EFB) User Handbook*
- *Structures Manual*
- *FDOT Drainage Manual & Drainage Design Guide*
- *SJRWMD Permit Information Manual*
- *Indian River Farms Water Control District (IRFWCD) Permit Criteria*
- *Federal Aviation Administration (FAA) Advisory Circular 150/5200-33C*
- *FDEP and Department of Management Services (DMS) Florida State Owned Land and Record Information System (FL-SOLARIS) and Land Inventory Tracking System (LITS)*

- *U.S. Department of Agriculture, Soil Conservation Service (SCS)*
- *U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) SSURGO Database of Clay County, Florida*
- *United States Geological Survey (USGS) 7.5-Minute Quadrangle Map*
- *U.S. Fish and Wildlife Service National Wetland Inventory (NWI)*
- *Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map (FIRM)*
- *CADD Manual*
- *FDOT Multimodal Quality / Level of Service Handbook*
- *Manual On Intersection Control Evaluation (ICE)*
- *Project Traffic Forecasting Handbook & Project Traffic Forecasting Procedure No. 525-030-120*
- *Traffic Analysis Handbook*
- *FDOT Traffic Engineering Manual*
- *Access Management Guidebook*
- *Florida Highway Landscape Guide*
- *Basis of Estimates Manual*
- *Federal Transit Administration (FTA) and Federal Rail Administration (FRA) Program Guidance*
- *Project Management Handbook*
- *Aerial Surveying Standards for Transportation*
- *CADD production Criteria Handbook*

4.1 Roadway Context Classification

Project Level Context Classification was obtained from the FDOT Complete Streets Team via an email dated April 21, 2021. The context classification for SR 5/US 1 is C4 Urban General and C3C for Aviation Boulevard west of SR 5/US 1, and was considered C4 Urban east of SR 5/US 1.

4.2 Airport/Runway

The Vero Beach Regional Airport is located to the west of the SR 5/US 1 and Aviation Boulevard intersection. Runway 30L and the land within the airport property is controlled by the Federal Aviation Administration (FAA) and Vero Beach Airport regulations. An Airport RPZ analysis was conducted due to the proximity of the study intersection to the airport (**Figure 4-1**). The *Flight Surface* controls the airspace to keep the aircraft flight space clear. The FAA concurred with the Runway Protection Zone analysis that concluded the at-grade roadway alternative was the best solution for improvements within the Vero Beach Airport (VRB) Runway 30L RPZ.

Figure 4-1 Vero Beach Airport Runway Protection Zone

4.3 Railroad

The FEC railroad crosses Aviation Boulevard on the west side of SR 5/US 1. Refer to *FDM Chapter 220* and *FDOT Standard Plans Index 509-070* regarding the railroad crossing.

4.4 Design Control and Criteria

The design standards used to govern the development of proposed improvements for the SR 5/US 1 at Aviation Boulevard PD&E study area are summarized in **Table 4-1**.

The build alternative alignments were developed with the two main controlling factors consisting of the FEC railroad right of way and the north right of way line along Aviation Boulevard. The alignment of Aviation Boulevard was kept perpendicular to the railroad

for safety considerations and the curvature of Aviation Boulevard through the airport property held clos e to the existing curvature to minimize impact to the Vero Ice Age Man archeological zone located just south of Aviation Boulevard.

The vertical alignment is a best fit between the railroad tracks, existing ground along the west side of SR 5 /US 1 and the bridge over Main Canal.

Table 4-1 Roadway Design Criteria

Design Criteria	Criteria		Reference Document	Notes
General				
Functional Classification	SR 5/US 1 – Urban Principal Arterial Other Aviation Blvd – Urban Minor Arterial		Straight Line Diagram	
Context Classification	SR 5/US 1 – from 21st St to 38th Ln C4 (Urban General) Aviation Blvd – C3C (Suburban Commercial) west of SR 5/US 1 C4 (Urban General) east of SR 5/US 1		ETDM Screening Report 01/21/2022 Target Speed Recommendation Report FDOT Preliminary Context Classification GIS Viewer	
Truck %	4.3%		FDOT Traffic Report	
Design Speed	SR 5/US 1 – 45 mph Aviation Blvd – 30 mph Shared Use Path – 18 mph		FDM Table 201.5.1 Target Speed Recommendation Report	
Posted Speed	SR 5/US 1 – 35 mph from 21st St to 26th St, 45 mph from 26th St to 41st St Aviation Blvd – 40 mph from 27th Ave to County Admin Rd, 25 mph advisory speed west of Airport N. Drive		Target Speed Recommendation Report	
Design Vehicle	WB-62 FL			
Access Management				
	Existing	**Proposed**		
Access Class	6	5	FDM Table 201.4.2 Rule 14-97 - Arterial Access Classifications & Standards	SR 5/US 1: - Access Class 6 from 21st St to south of 39th St - Access Class 5 from south of 39th St to
Median Type	Non-Restrictive	Restrictive		
Connection Spacing (Feet)	440 ft > 45 mph 245 ft ≤ 45 mph	245 ft ≤ 45 mph		
Directional Median Opening Spacing (Feet)	N/A	660 ft		

Design Criteria	Criteria		Reference Document	Notes
Full Median Opening Spacing (Feet)	N/A	1320 ft		41st St
Signal Spacing (Feet)	1320 ft	1320 ft		
Lane and Median Widths				
Minimum Travel Lanes (Feet)	10’ for 25-35 mph 11’ for 40-45 mph		FDM Table 210.2.1	C3 Suburban / C4 Urban General
Minimum Auxiliary Lanes (Feet)	10’ for 25-35 mph 11’ for 40-45 mph		FDM Table 210.2.1	C3 Suburban / C4 Urban General
Two-way Left Turn	11’ for 25-35 mph 12’ for 40-45 mph		FDM Table 210.2.1	TWLT lanes typically 1 ft wider than travel lane
Bike Lane Width (Feet)	7’ buffered bike lane		FDM 223.2.1.1	
Bike Keyhole Lane (Feet)	7’		FDM 223.2.1.3	
Shared Use Path	8’ to 14’		FDM 224.4	10 ft where R/W is limited, 8 ft in constrained conditions
Median Width (Feet)	C3C – 22’ C4 with 25-35 mph design speed– 15.5’		FDM Table 210.3.1	
Border Width				
Min. Border Width for C4 Urban General	12 feet at 25-40 mph 14 feet at 45 mph		FDM Table 210.7.1	
Horizontal Alignment				
Allowable Deflection	2 degrees (≤40, curbed) 1 degree (≥45, curbed)		FDM Section 210.8.1	
Length of Horizontal Curve (Feet)	450’ = 30 mph 525' = 35 mph 600' = 40 mph 675' = 45 mph		FDM Table 210.8.1	
Maximum Deflection Angle Through Intersection	6 degrees = 35 mph 5 degrees = 40 mph 3 degrees= 45 mph		FDM Table 212.7.1	
Minimum Radius for emax=0.05	refer to table		FDM Table 210.9.2	
Superelevation	e_{max}=0.05		FDM Table 210.9.2	
Vertical Alignment				
Maximum Grade	8% for 25 to 30 mph 7% for 35 to 40 mph		FDM Table 210.10.1	

Design Criteria	Criteria	Reference Document	Notes
	6% for 45 mph		
Max. Change in Grade Without Vertical Curve	1.00 for 25-30 mph 0.90 for 35 mph 0.70 for 45 mph	FDM Table 210.10.2	
Min. distance between VPIs on curbed roadways	250 ft	FDM Section 210.10.1.1	
Min. grade on curbed roadway	0.30%	FDM Section 210.10.1.1	
Vertical Curve			
Min. K Value for Sag Curve	37 for 30 mph 49 for 35 mph 64 for 40 mph 79 for 45 mph	FDM Table 210.10.3	
Min. K Value for Crest Curve	31 for 30 mph 47 for 35 mph 70 for 40 mph 98 for 45 mph	FDM Table 210.10.3	
Min. Vertical Curve Length for Sag Curve (Feet)	90 for 30 mph 105 for 35 mph 120 for 40 mph 135 for 45 mph	FDM Table 210.10.4	
Min. Vertical Curve Length for Crest Curve (Feet)	90 for 30 mph 105 for 35 mph 120 for 40 mph 135 for 45 mph	FDM Table 210.10.4	
Vertical Clearance			
Min. Vertical Clearance for Bridges (feet)	16.5’ over roadway 2.0’ above design flood stage	FDM 260.6	
Min. Vertical Clearance over railroad (feet)	23.5’ over railroad 24.25’ over electrified railroad	FDM 260.6	
Min. Vertical Clearance (feet)	17.5’ Overhead signs 19.5’ Dynamic Message signs 17.5’ Traffic signals	FDM 210.10.3	

5.0 ALTERNATIVES ANALYSIS

5.1 Previous Planning Studies

No previous planning studies were completed for the SR 5/US 1 and Aviation Boulevard intersection. In 1999 a county-wide study of potential railroad crossing grade separations was conducted that identified 41st Street as a potential grade separation location.

5.2 No-Build (No-Action) Alternative

The No-Build Alternative assumes no proposed improvements and serves as a baseline for comparison against the other alternatives throughout the entire PD&E process. The No-Build Alternative maintains the existing configuration along SR 5/US 1 and Aviation Boulevard. In the No-Build Alternative, SR 5/US 1 includes two through lanes and a dedicated left turn lane in both the southbound and northbound directions. Aviation Boulevard consists of one through-left-right shared lane and one exclusive left turn lane in the eastbound direction and one shared through-left-right turn lane in the westbound direction.

The No-Build Alternative also includes on-going construction projects and all funded or programmed improvements scheduled to be opened to traffic in the analysis year being considered. These improvements must be part of the Department's adopted Five-Year Work Program, IRC MPO Cost Feasible LRTP, and any developer-funded transportation improvements specified in approved Development Orders.

IRC has programmed improvements to extend Aviation Boulevard east from SR 5/US 1 to the Cleveland Clinic Hospital, which would realign/reconstruct the existing connection at 32nd Street. The proposed extension would connect the intersection of SR 5/US 1 at Aviation Boulevard directly to 37th Street. This county road extension will serve as an alternative route to improve existing and future access to the Cleveland Clinic Indian River Hospital and provide relief to 37th Street, which is nearing vehicular capacity. In the No-Build Alternative, the Aviation Boulevard Extension consists of two 12-ft lanes, 7-ft bike lanes, and intersection improvements at SR 5/US 1.

Future traffic operational analysis was completed for the No-Build Alternative and included five (5) study intersections. The existing signal timings were optimized for the No-Build analysis to account for traffic growth and demand. For the 2045 design year, the SR 5/US 1 and Aviation Boulevard intersection is forecasted to operate at LOS F during both the AM and PM peak period. All the other intersections are expected to operate at LOS D or better. In addition, four (4) intersection approaches will operate at LOS F and three (3) intersection approaches will operate at LOS E during the AM while three (3) intersection approaches will operate at LOS F and four (4) intersection approaches will

operate at LOS E during the PM peak periods. **Table 5-1** and **Table 5-2** show the Future No-Build conditions LOS analysis results for the signalized intersection within the traffic study area.

Table 5-1 2045 Future No-Build Intersection LOS – AM Peak Period

No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US 1 & Aviation Blvd	287.8	F	217.2	F	113.0	F	281.0	F	219.0	F
2	SR 5/US 1 & 26th Street	71.2	E	78.3	E	13.5	B	32.5	C	28.7	C
3	SR 5/US 1 & 37th Street	-	-	58.6	E	23.2	C	15.5	B	21.0	C
4	27th Avenue & Aviation Blvd	24.3	C	12.8	B	-	-	44.2	D	24.4	C
5	County Admin & Aviation Blvd	13.6	B	6.0	A	25.7	C	-	-	10.2	B

Table 5-2 2045 Future No-Build Intersection LOS – PM Peak Period

No	Intersection	Approach Delay (s/veh)/LOS								Intersection Control Delay (s/veh)/LOS	
		EB		WB		NB		SB			
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1	SR 5/US 1 & Aviation Blvd	236.9	F	272.7	F	151.1	F	378.3	F	272.1	F
2	SR 5/US 1 & 26th Street	67.9	E	79.6	E	16.3	B	23.7	C	25.9	C
3	SR 5/US 1 & 37th Street	-	-	63.3	E	20.0	C	15.2	B	24.0	C
4	27th Avenue & Aviation Blvd	31.7	C	19.8	B	-	-	60.5	E	31.5	C
5	County Admin & Aviation Blvd	13.2	B	6.0	A	25.3	C	-		10.5	B

The No-Build Alternative requires no acquisition of additional right-of-way, has no environmental impacts and requires no additional funding. However, the No-Build Alternative has numerous disadvantages including not meeting the purpose and need of the study and fails to meet the goals of the IRC MPO's LRTP. In the 2045 design year, the No-Build Alternative results in failing level of service for the SR 5/US 1 and Aviation

Boulevard intersection in both the AM and PM peak period. Furthermore, the No-Build Alternative does not provide any additional safety improvements.

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

The Transportation System Management and Operations (TSM&O) Alternative is included in the PD&E process and evaluates strategies that reduce existing traffic congestion, preserve the existing capacity, improve the security, safety, and reliability of the transportation system, while minimizing environmental impacts. TSM&O options generally include traffic management strategies, traffic signal and intersection improvements, access management, and transit improvements.

TSM&O measures that could reduce congestion within the study area that do not include additional capacity improvements include: transit, traffic operations improvements, and pedestrian/bicycle facilities. Indian River Transit, GoLine runs two (2) bus routes within the study area. Ridership could be increased with increased frequency of buses, additional bus stops, and new transit amenities.

Signal timing improvements at the SR 5/US 1 and Aviation Boulevard intersection would provide limited operational benefits at that isolated location. For this proposed project, it was determined that the traffic demand and capacity and safety improvement needs cannot be provided solely through the implementation of TSM&O improvements.

5.4 Alternatives Considered

The alternatives development process included conventional intersection alternatives, grade separation alternatives that address the MPO planning goal to conduct a grade separation feasibility analysis, and alternatives that evolved from the Intersection Control Evaluation (ICE) component.

The ICE is a process used to consider multiple context-sensitive intersection control strategies when planning a new or modified intersection. The goal of ICE is to provide a quantitative decision-making process to identify and select a control strategy that fits the location's context, provides safe travel facilities for all road users, and offers the best overall value. As part of the PD&E Study, an ICE stage 1 analysis was performed for the intersection of SR 5/US 1 and Aviation Boulevard.

The ICE Stage 1 involves two analysis components: 1) A planning level volume-to-capacity (V/C) ratio assessment using the Capacity Analysis at Junctions (CAP-X) tool; and 2) a planning level safety assessment using Safety Performance for Intersection Control Evaluation (SPICE). The CAP-X tool is based on the operational analysis using the critical lane method to evaluate selected types of innovative intersection designs. Each control type was compared operationally using a planning level V/C ratio based on

the 2045 design year traffic volumes. The FDOT expanded version of FHWA's SPICE tool was used to rank the control strategies selected for the CAP-X tool. It should be noted that the SPICE Tool does not include the Partial Displaced Left Turn, Partial Median U-Turn, Quadrant Roadway, and Single Point Grade Separation control strategies. As such, they were not evaluated in the SPICE analysis.

Based on the preliminary safety and capacity analysis evaluation as well as the multimodal accommodation, the following intersection control strategies were recommended to be evaluated during the PD&E study:

1. Single Point Grade Separation (SR 5/US 1 over Aviation Boulevard)
2. Single Point Grade Separation (Aviation Boulevard over SR 5/US 1)
3. Quadrant Roadway (S-E quadrant)
4. Quadrant Roadway (N-E quadrant)
5. Partial Displaced Left Turn
6. Median U-Turn
7. Traffic Signal

Both grade separation of SR 5/US 1 over Aviation Boulevard and Aviation Boulevard over SR 5/US 1 were recommended to be further evaluated from the ICE process. Currently there are no grade separated crossings over the FEC railroad within a 2-mile radius from the study area. The proposed Brightline service along the FEC corridor will increase the number of trains resulting in additional delays and safety concerns at grade crossings. Although grade separation of the minor roadway (Aviation Boulevard over SR 5/US 1) does not result in significant operational improvements, it can enhance safety and emergency response across the railroad tracks to the nearby Cleveland Clinic Indian River Hospital. The combination of these control strategies was evaluated in this PD&E Study to determine the optimal configuration for this intersection. The complete ICE Report for this PD&E Study with the corresponding justifications for the various control strategies are included in Appendix F of the *PTAR*.

Throughout the course of the PD&E study and ICE, the PD&E team created and investigated eight (8) different alternatives for consideration. The IRC extension project for Aviation Boulevard, eastward of SR 5/US 1, was being designed during the PD&E study and was considered to be built before the PD&E project was completed.

The eight (8) alternatives considered are:

- Alternative 1 – Conventional Intersection
- Alternative 2 – One-Way Pair
- Alternative 3 – US 1/SR 5 Overpass
- Alternative 4 – Aviation Boulevard Overpass without railroad crossing
- Alternative 5 – Aviation Boulevard Underpass without railroad crossing
- Alternative 6 – Aviation Boulevard Overpass with railroad crossing
- Alternative 7 – Displaced Left Turn
- Alternative 8 – Median U-Turn Roundabout

5.5 Screening Evaluation Matrix for the Alternatives Considered

5.5.1 Evaluation of Alternatives Considered

Given the amount and variety of alternatives, the design team created a screening evaluation matrix to narrow down the range of viable alternatives. The matrix evaluates the alternatives in a comprehensive range of engineering and environmental categories and scores them on a one (1) to four (4) scale with one (1) being the least desirable and four (4) being the most desirable. The screening evaluation matrix is shown in **Table 5-3**. The categories investigated include the following:

- PD&E Purpose and Need
  - Improve Safety
  - Address Forecasted Traffic Demain
  - Enhance Multimodal Functions
- Support from local constituents / stakeholders
  - Local Government entities and public
  - FAA and Vero Beach Regional Airport
  - FEC Railroad
- Compatible with surrounding roadway network and future Aviation Boulevard extension
- Impacts
  - Severity and number of business and residential parcels
  - Cultural
  - Environmental
  - Noise
  - Contamination
- Constructability and Cost

Alternative 1 (Conventional Intersection) consists of a conventional, at-grade intersection with a LOS D rating and a shared used path to enhance multimodal access; the shared use path is included in each alternative. This alternative is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the crossing expands from three (3) lanes to six (6) lanes. The at-grade intersection allows for a future connection to the planned Aviation Boulevard extension and maintains access to the local corridor network. However, the expanded pavement footprint impacts the businesses and residents east of SR-5/US-1 along with minor social, cultural, environmental, and physical impacts. The constructability of this alternative poses minimal challenges with a new bridge over the main canal and a relatively low cost compared to the other alternatives. A concept layout of Alternative 1 can be seen in **Figure 5-1**.

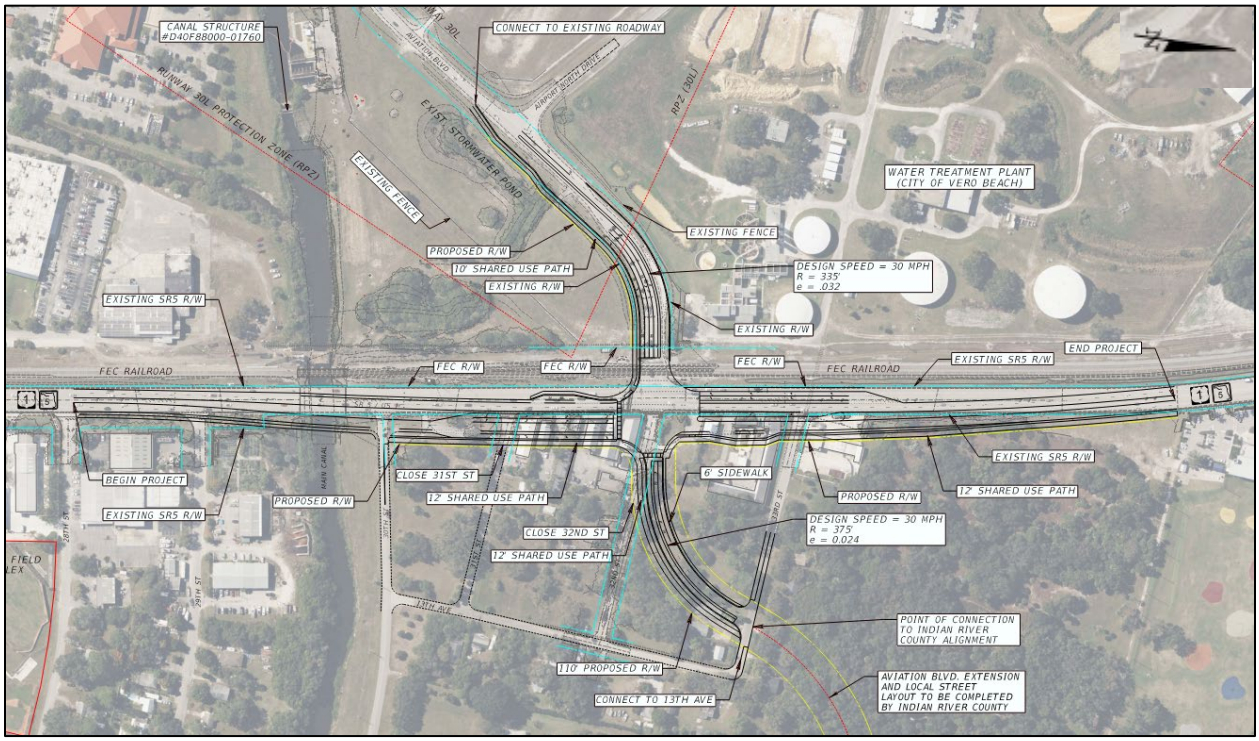


Figure 5-1 Alternative 1 Concept Layout

Alternative 2 (One-Way Pair) introduces a bifurcated path for SR 5/US 1 with the southbound direction remaining in the original pavement footprint and a new northbound alignment splitting and shifting east to form a second intersection with Aviation Boulevard. This alternative was developed to evaluate options to minimize impacts to the businesses and non-profit organization on SR 5/US-1 The one-way pair results in a LOS C and LOS D for southbound and northbound SR 5/US 1, respectively. Like Alternative 1, Alternative 2 is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the railroad crossing expands from three lanes to six lanes. The twin intersections allow for a future connection to the planned Aviation Boulevard extension but changes access to the local corridor network. By splitting the northbound and southbound directions, the businesses along SR 5/US 1 have minimal impacts. However, residential impacts are more prominent, specifically the residents along 13th Avenue. This design has a minor impact on cultural resources and a moderate impact on the surrounding environment. Due to the curvature of the alignment leading into the bifurcation, the main canal bridge will have to be reconstructed into two bridges which is a moderate cost and constructability challenge when compared to the other alternatives. A concept layout of Alternative 2 can be seen in **Figure 5-2**.

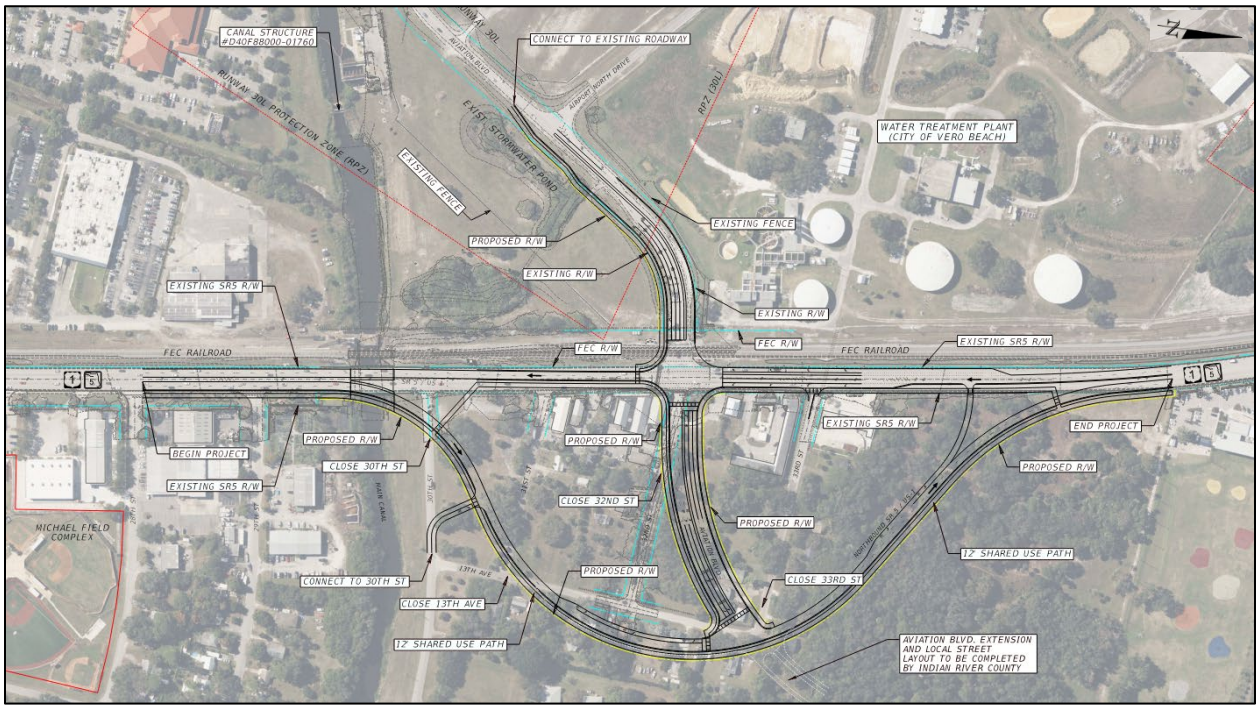


Figure 5-2 Alternative 2 Concept Layout

The bridge construction would require a temporary roadway and bridge which will also require temporary or permanent right of way acquisition. A concept layout of the temporary roadway and bridge for construction of the Main Canal bridge can be seen in **Figure 5-3**.

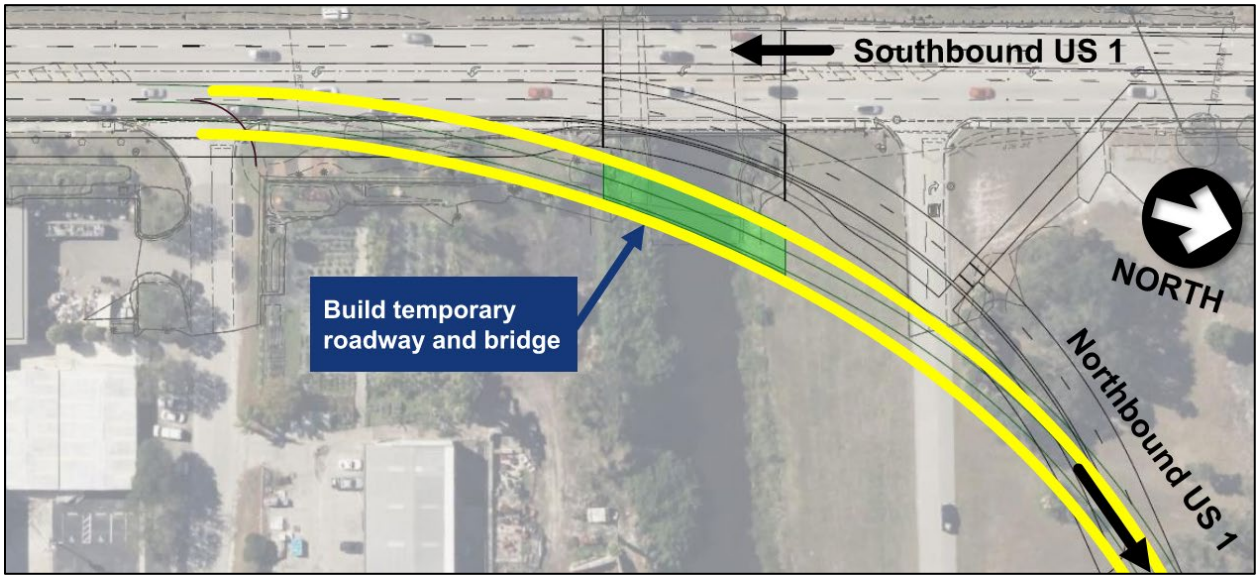


Figure 5-3 Alternative 2 Temporary Bridge

Alternative 3 (US 1 Overpass) is the first of four alternatives with a grade separation. The SR 5/US 1 through movements are elevated over the intersection with an overpass which reduces conflict points and results in a LOS C. Elevating SR 5/US 1 is not preferred by the MPO which wanted Aviation Blvd over SR 5/US 1. The City of Vero Beach was against all grade separation alternatives. Like the other alternatives, the layout increases the number of lanes crossing the railroad from three to six. The at-grade portion of the layout is compatible with the future extension of Aviation Boulevard; however, the large footprint of the bridge and necessary ramps eliminate access to several local side streets and results in major impacts to businesses and residents. The new intersection layout is shifted east to minimize impacts to cultural and environmental resources. The inclusion of three bridges over the Main Canal makes this alternative one of the highest construction costs and difficult to construct. A concept layout of Alternative 3 can be seen in **Figure 5-4**.

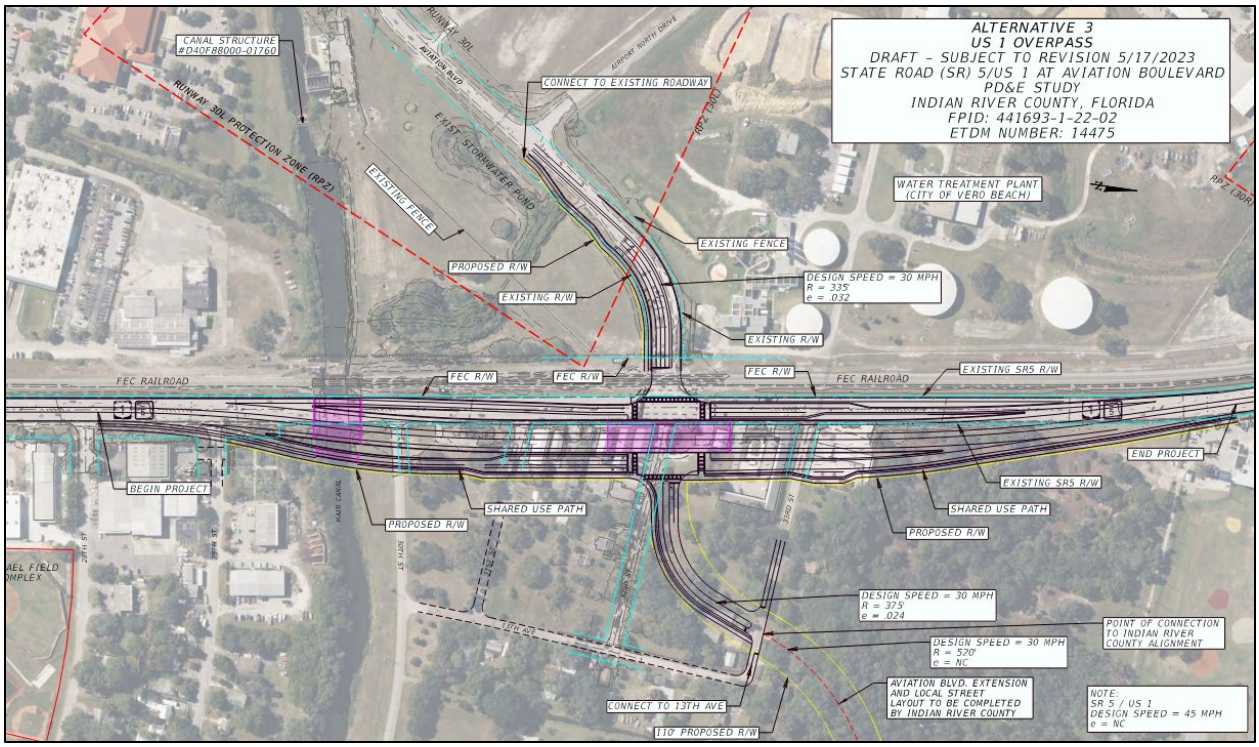


Figure 5-4 Alternative 3 Concept Layout

Alternative 4 (Aviation Boulevard Overpass without railroad crossing) is the second grade separated layout and transforms Aviation Boulevard into a four-lane bridge (two lanes in each direction). The removal of the at-grade crossing enhances safety for the project even though the design adds two new intersections by allowing vehicles, pedestrians, and bicyclists to use the elevated structure avoiding at-grade rail conflict points. The US 1/Aviation Boulevard intersection becomes a LOS B, and the two intersections forming the new "Quadrant Road" are both LOS C. To meet the required vertical clearance over the railroad and tie-down within reasonable limits, steep profile grades of 7% are required for the overpass. However, the elevated roadway inside the RPZ is not preferred by the FAA and Vero Airport even though the free-flowing traffic will reduce traffic queuing within the RPZ. The City of Vero Beach was against Alternative 4. The total removal of the at-grade railroad crossing gives this design the highest preference for the FEC. The high elevation of the overpass expands past the typical tie-in points of the other alternatives in relation to the future Aviation Boulevard extension and limits the connectivity to the existing local street network. The large footprint of the design has major implications for the surrounding businesses and residents as well as property owners further north along SR 5/US 1. The impacts to cultural and environmental resources are minor and moderate, respectively. As with Alternative 3, Alternative 4 has a high cost and degree of difficulty to construct due to the reconstruction of the main canal bridge and new overpass. A concept layout of Alternative 4 can be seen in **Figure 5-5**.

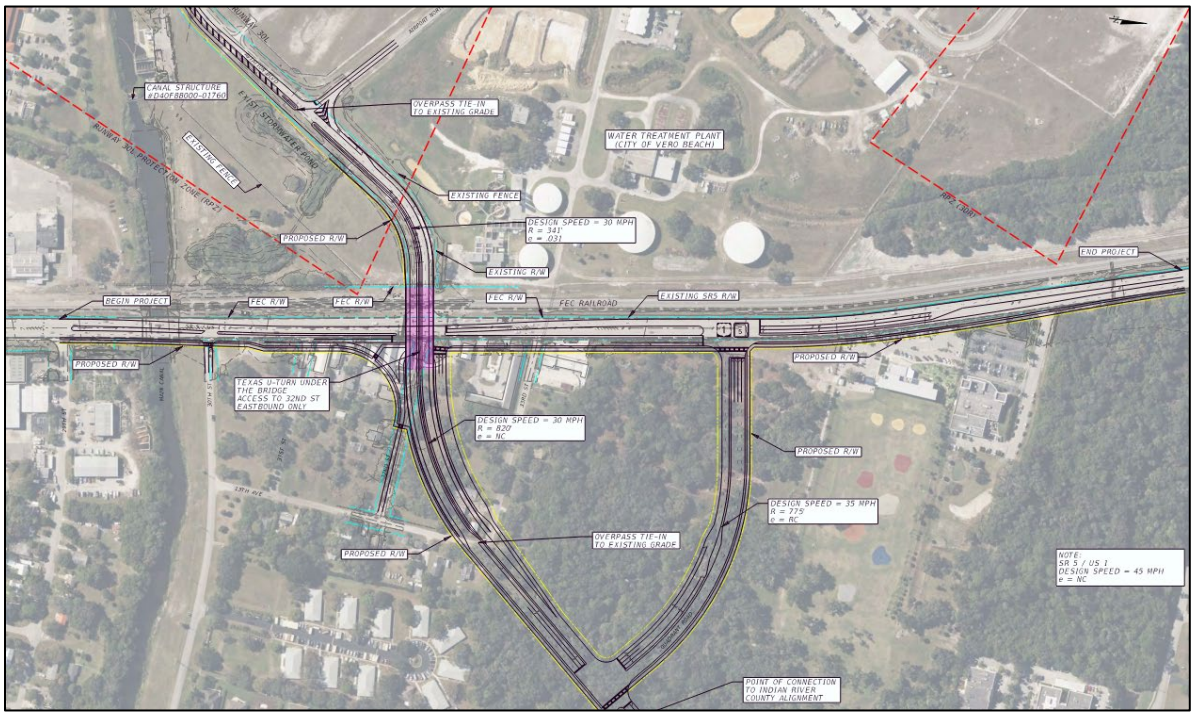


Figure 5-5 Alternative 4 Concept Layout

Alternative 5 (Aviation Boulevard Underpass without railroad crossing) mimics the previous alternative except it features an underpass to bypass the railroad crossing in lieu of an overpass. The removal of the at-grade crossing enhances safety for the project even though the design adds two intersections. The US 1/Aviation Boulevard intersection is removed, and the two intersections forming the new "Quadrant Road" are LOS C and D at SR 5/US 1 and Aviation Boulevard, respectively. To meet the required vertical clearance under the railroad and tie-in within reasonable limits, steep profile grades of 7% are required for the underpass. The FEC RR, SR 5/US1 and Airport Drive would bridge over the "open trench" underpass. However, the open trench, depressed roadway inside the RPZ is not preferred by the FAA and Vero Airport even though the free-flowing traffic will reduce traffic queuing within that zone. The FAA would require a full tunnel section through the RPZ. The underpass restricts connectivity to the existing local street network. The large footprint of the design has major implications for the surrounding businesses and residents as well as property owners further north along SR 5/US 1. Due to the deep excavation required to construct the underpass, additional archaeological findings could be discovered given the adjacent proximity to the Vero Man site. The impacts to cultural and environmental resources are substantial and moderate, respectively. This alternative has the highest cost and degree of difficulty to construct due to the underpass and new bridges for the railroad and SR 5/US 1. A concept layout of Alternative 5 can be seen in **Figure 5-6**.

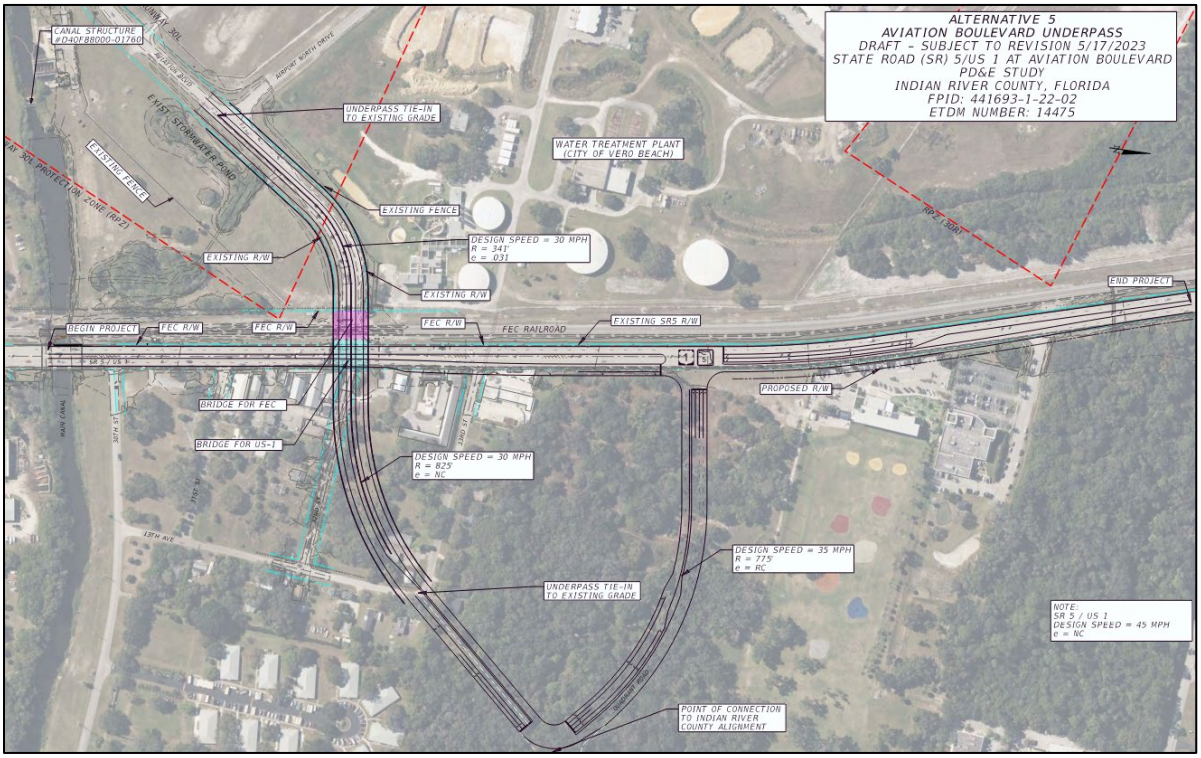


Figure 5-6 Alternative 5 Concept Layout

Alternative 6 (Aviation Boulevard Overpass with railroad crossing) combines Alternatives 1 and 4 by transforming Aviation Boulevard into a two-lane bridge (one lane in each direction) while keeping the at-grade railroad crossing and removing the "Quadrant Road" portion. The at-grade railroad crossing remains at three lanes but adds the overpass between the eastbound and westbound lanes. The US 1/Aviation Boulevard intersection becomes LOS C. To meet the required vertical clearance over the railroad and tie-down within reasonable limits, steep profile grades of 7% are required for the overpass. However, the elevated roadway inside the RPZ is not preferred by the FAA and Vero Airport even though the free-flowing traffic will reduce traffic queuing within that zone. The high elevation of the overpass expands past the typical tie-in points of the other alternatives in relation to the future Aviation Boulevard extension and limits the connectivity to the existing local street network. Due to the converging movements of the overpass and at-grade connections, this alternative does not have independent utility and would require the Aviation Boulevard extension to be completed. The large footprint of the design has major implications for the surrounding businesses and residents. The impacts to cultural and environmental resources are minor and moderate, respectively. Similar to the other grade separated alternatives, Alternative 6 has a high cost and degree of difficulty to construct due to the new overpass over the railroad. A concept layout of Alternative 6 can be seen in **Figure 5-7**.

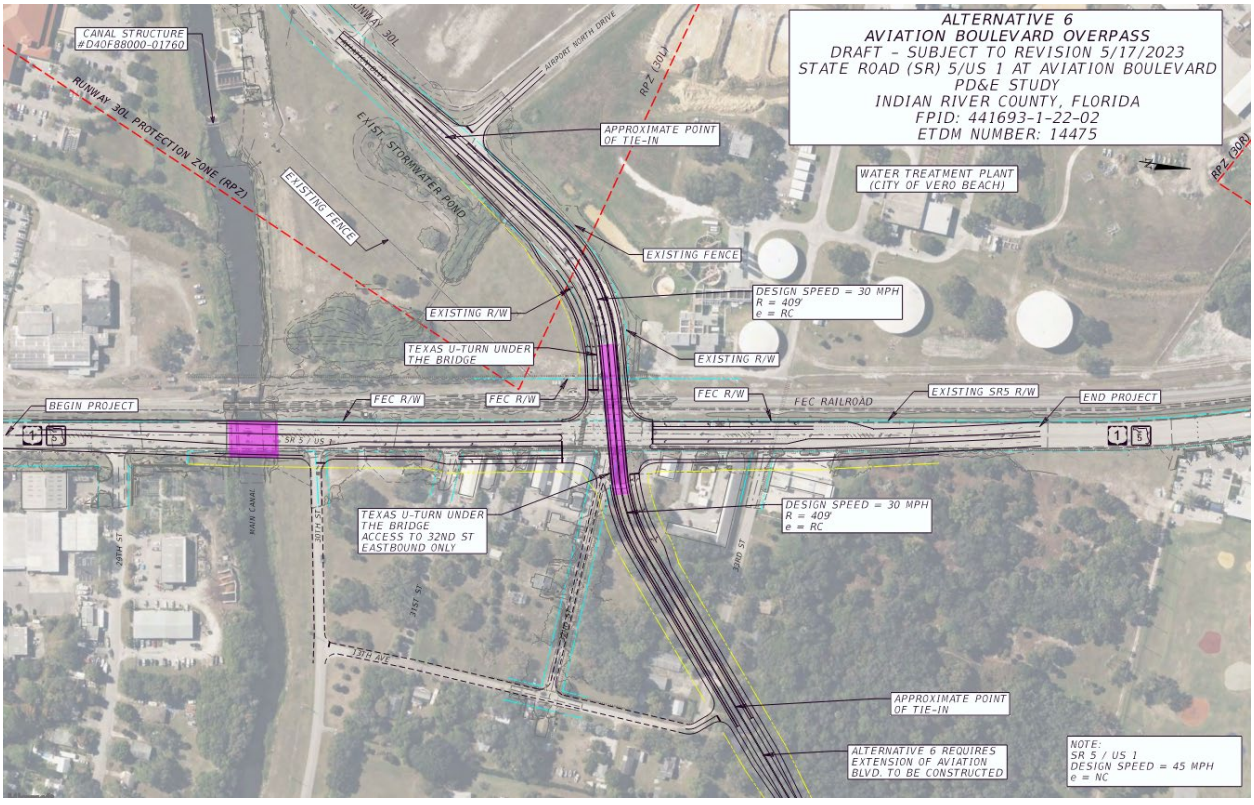


Figure 5-7 Alternative 6 Concept Layout

Alternative 7 (Displaced Left Turn) consists of a conventional, at-grade intersection with an added displaced left turn lane for the northbound SR 5/US 1 movement. The main US 1/Aviation Boulevard intersection has a LOS D and the northbound left turn signal operates at LOS A. This alternative is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the crossing expands from three (3) lanes to six (6) lanes. However, the deflected left turn movement at the railroad is an added safety concern for signal/gate timing. The at-grade intersection allows for a future connection to the planned Aviation Boulevard extension and maintains access to the local corridor network. However, the expanded pavement footprint impacts the businesses and residents east of SR 5/US 1 along with minor cultural, environmental, and physical impacts. The displaced left turn reduces the opportunity for southbound transit stops and increases the complexity for pedestrians crossing SR 5/US 1. The constructability of this alternative poses few challenges besides a new bridge over the main canal and a relatively low cost compared to the other alternatives. A concept layout of Alternative 7 can be seen in **Figure 5-8**.

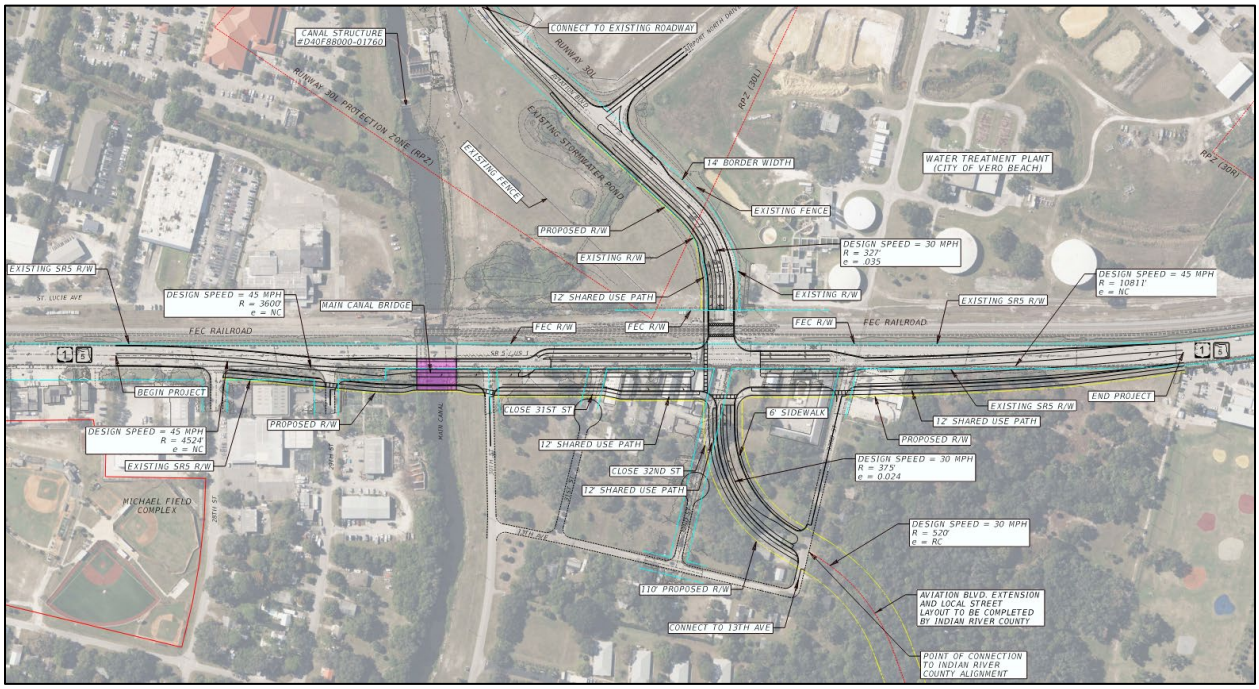


Figure 5-8 Alternative 7 Concept Layout

Alternative 8 (Median U-Turn with Roundabout) consists of a conventional, at-grade intersection and an additional roundabout intersection with a new "Quadrant Road". The left-turn movements are removed from the intersection (except for westbound Aviation Boulevard) and motorists are directed to enter a roundabout to make their desired turn. The main intersection has LOS C, the roundabout has LOS B, and the "Quadrant Road" has LOS C. This alternative is compatible with FAA and Vero Beach Regional Airport requirements as well as FEC Railroad even though the crossing expands from three (3) lanes to five (5) lanes. The at-grade intersection allows for a future connection to the planned Aviation Boulevard extension and maintains access to the local corridor network. The expanded pavement footprint impacts the businesses and residents east of SR 5/US 1 along with minor cultural impacts but moderate environmental and physical impacts. The constructability of this alternative poses few challenges besides a new bridge over the main canal and a moderate cost compared to the other alternatives. A concept layout of Alternative 8 can be seen in **Figure 5-8**.

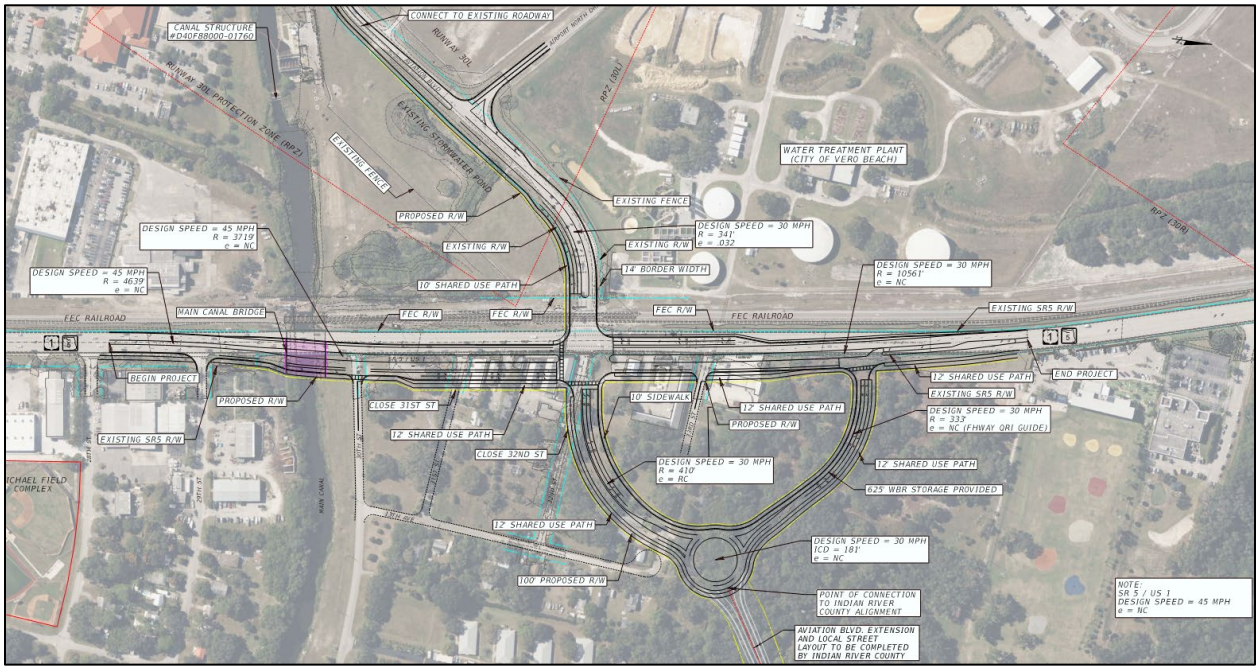


Figure 5-9 Alternative 8 Concept Layout

5.5.2 Screening Evaluation Matrix

Based on the screening evaluation for the alternatives considered, the four (4) alternatives that were dropped from further investigation were:

- **Alternative 3 US-1 Overpass** had substantial effects to future property access along SR 5/US 1 and is not desirable by either the county or city.
- **Alternative 4 Aviation Boulevard Overpass (without railroad crossing)** had the highest number of property impacts and potential business and residential relocations; and was opposed by the city.
- **Alternative 5 Aviation Boulevard Underpass (without railroad crossing)** has very complex construction, railroad track detour and bridge work that found this alternative not viable due to constructability.
- **Alternative 6 Aviation Boulevard Overpass (with railroad crossing)** was dropped from further consideration based on right-of-way impacts, being opposed by the city, plus it does not have independent utility without the extension of Aviation Boulevard being constructed first.

The result of the screening evaluation analysis is illustrated in the matrix shown in **Table 5-3**.

Table 5-3 Screening Evaluation Matrix

CRITERIA	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 3 US 1 OVERPASS	ALTERNATIVE 4 AVIATION BLVD OVERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 5 AVIATION BLVD UNDERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 6 AVIATION BLVD OVERPASS (WITH RAILROAD CROSSING)	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
PD&E PURPOSE AND NEED **IMPROVES SAFETY**	Yes (3)	Yes: Reduced speeds and conflict points. Short crosswalks. Adds 1 intersection. NB US-1 curvature potential sight distance challenges. (2)	Yes: Reduced conflict points. (3)	Yes: Eliminates railroad crossing. Adds 1 full intersection. (4)	Yes: Eliminates railroad crossing. Adds 1 full intersection. (4)	Yes: Keeps at-grade railroad crossing and adds an overpass over railroad. (3)	Yes. Reduced conflict points. Adds 1 DLT intersection. (3)	Yes: Reduced speeds and conflict points with roundabout. Adds 1 directional intersection. (3)
PD&E PURPOSE AND NEED **ADDRESSES TRAFFIC DEMAND**	LOS D (3)	US-1 SB LOS C US-1 NB LOS D (3)	LOS C (4)	US-1 LOS B New Quadrant Rd US-1 @ QR LOS C Aviation @ QR LOS C (4)	New Quadrant Rd US-1 @ QR LOS C Aviation @ QR LOS D (3)	US-1 @ QR LOS C required. (4)	US-1 LOS D US-1 DLT LOS A (3)	US-1 LOS C, New Quadrant Road (QR) US-1 @ QR LOS B Aviation @ QR LOS C (4)
PD&E PURPOSE AND NEED **ENHANCES MULTIMODAL**	Shared Use Path (4)	Shared Use Path (4)	Shared Use Path (4)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Roadway 7% profile grade. (3)	Shared Use Path. Crosswalk at DLT Signal. (3)	Shared Use Path (4)
LOCAL GOVERNMENT AND PUBLIC SUPPORT	City supported. Public supported. County supported. (4)	City opposed. County neutral. (1)	City opposed. Public opposed. County wants Aviation Blvd. overpass (1)	City opposed. Public opposed. County supported. (2)	City opposed. Public opposed. County supported. (2)	City opposed. Public opposed. County supported. (2)	City neutral. County supported. (4)	City neutral. County supported. (4)
COMPATIBLE WITH FAA AND AIRPORT NEEDS	Yes (4)	Yes (4)	Elevated roadway outside RPZ. (1)	Elevated roadway inside RPZ. Reduces traffic queue in RPZ. (1)	Depressed roadway inside RPZ. (1)	Elevated roadway inside RPZ. (1)	Yes (4)	Yes (4)
COMPATIBLE WITH FEC RAILROAD NEEDS	Yes: 6 lanes at rail crossing (2)	Yes: 6 lanes at rail crossing. (2)	Yes: 6 lanes at rail crossing. (2)	Yes: Removes at-grade rail crossing. (4)	Yes: Removes at-grade rail crossing. (4)	Yes: 3 lanes at rail crossing. (3)	Yes: 6 lanes at rail crossing. Adds separated NB deflected left turn lane at RR crossing. (2)	Yes: 5 lanes at rail crossing. (3)
COMPATIBLE WITH AVIATION BLVD EXTENSION	Yes (3)	Yes (3)	Yes (3)	Yes: Extension would connect at quadrant road intersection. (3)	Yes: Extension would connect at quadrant road intersection. (3)	PD&E Alt 6 does not have independent utility. Needs Aviation Blvd extension built to have logical termini. (1)	Yes. (3)	Yes: Extension would connect at quadrant road roundabout. (3)
ACCESS MANAGEMENT COMPATIBILITY WITH LOCAL STREET NETWORK	Maintains existing access. (4)	Changes circulation on 30th, 31st,32nd, 33rd Streets and 13th Ave. (2)	Close access to 30th and 33rd Streets. Reduces property access along US-1 ramps. (1)	Closes 31st Street. Disconnects 13th Ave and 33rd St from local network. Increased access with quadrant road. (1)	Closes 32nd Streets. Maintains access to 30th and 31st Streets. Eliminates access to Aviation Blvd east of US-1. Increased access with quadrant road. (1)	Maintains access to 30th, 31st and 33rd Streets. Eliminates access to Aviation Blvd east of US-1. (2)	Closes access to 31st and 32nd Streets. Adds new directional signalized median. (3)	Close access to 31st and 32nd Streets. Roundabout provides local traffic circulation. Increased access with quadrant road. (4)

LEGEND:

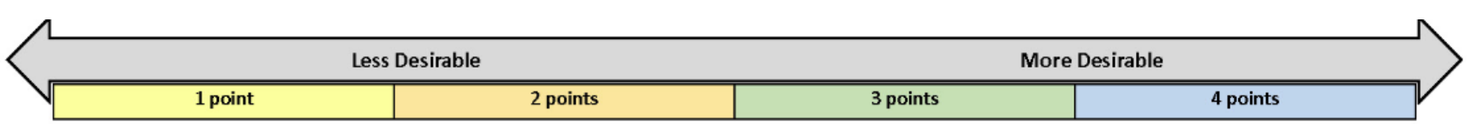
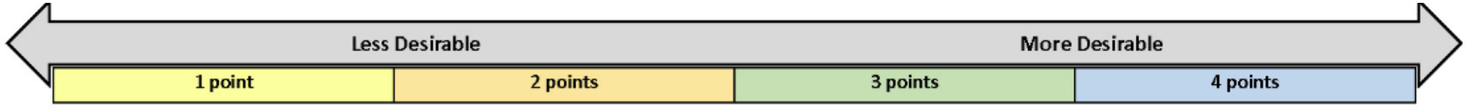


Table 5-3 Screening Evaluation Matrix, continued

CRITERIA	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 3 US 1 OVERPASS	ALTERNATIVE 4 AVIATION BLVD OVERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 5 AVIATION BLVD UNDERPASS (WITHOUT RAILROAD CROSSING)	ALTERNATIVE 6 AVIATION BLVD OVERPASS (WITH RAILROAD CROSSING)	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
PROPERTY IMPACT TYPES	Business and residential impacts. (2)	Reduced business impacts on US-1. Impacts homes on 13th Ave. US-1 NB lanes split parcels into 2 parts. (1)	Business and residential impacts. (2)	Business and residential impacts. Physical separation of land north/south of overpass. Modifies entrance and eliminates first row of parking at Big Shots. (1)	Business and residential impacts. Physical separation of land north/south of underpass. Modifies entrance and eliminates first row of parking at Big Shots. (1)	Business and residential impacts. Physical separation of land north/south of overpass. (1)	Business and residential impacts. (2)	Business and residential impacts. (2)
PARCELS EFFECTED AND POTENTIAL DISPLACEMENTS	21 Parcels. Potential 9 business and 2 residential displacements. (2)	35 Parcels. Potential 2 business displacements. Potential 10 residential displacements along 13 Ave. (1)	23 Parcels. Potential 9 business and 2 residential displacements. (2)	35 parcels. Potential 9 business and 6 residential displacements. Quadrant Road (3.7acres) (1)	35 Parcels. Potential 9 business and 6 residential displacements. Quadrant Road (3.7 acres) (1)	27 Parcels. Potential 9 business and 6 residential and 2 residential displacements. Quadrant Road (3.7acres) (1)	22 Parcels. Potential 9 business and 2 residential displacements. (2)	25 Parcels. Potential 9 business and 6 residential displacements. Quadrant Road (2 acres) (1)
CULTURAL: HISTORIC AND ARCHEOLOGICAL POTENTIAL	Minor (2)	Minor (2)	Minor (2)	Minor (2)	Substantial excavation required adjacent to Vero Man site, increased potential for archeological findings. (1)	Minor (2)	Minor (2)	Minor (2)
NATURAL ENVIRONMENT	Minor (3)	Moderate. Effects forested area. (2)	Minor (3)	Moderate. Effects forested area. (2)	Moderate. Effects forested area. (2)	Moderate. Effects forested area. (2)	Minor (3)	Moderate. Effects forested area. (2)
PHYSICAL: NOISE	Low (3)	Shifts US-1 NB lanes eastward 500 feet towards homes. (1)	Elevated US-1 structure. (1)	Elevated Aviation Blvd structure. (1)	Depressed Aviation Blvd structure. (1)	Elevated Aviation Blvd structure. (1)	Low (3)	Road closer to residential. (2)
PHYSICAL: CONTAMINATION	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)	Moderate risk (2)
CONSTRUCTABILITY	Typical construction. One Main Canal Bridge. (4)	Requires 2 bridges over Main Canal. (3)	Requires 1 Main Canal bridge and 1 overpass. (2)	Requires 1 Main Canal bridge and 1 overpass. (2)	Requires Aviation Blvd underpass, high speed railroad track detour, railroad bridge, US 1 bridge at underpass, Main Canal Bridge. (1)	Requires Aviation Blvd Overpass. 1 Main Canal bridge. (2)	Requires two US-1 medians and 1 Main Canal bridge. (3)	Typical Construction. 1 Main Canal bridge. (4)
COST: CONSTRUCTION	Low (4)	Moderate (3)	High (2)	High (2)	Very High (1)	High (2)	Low (4)	Moderate (3)
TOTAL POINTS: (HIGHER IS DESIRABLE)	49	36	35	35	31	32	46	47
RANKING	1	4	5	6	8	7	3	2
SELECTED TO MOVE TO DETAILED PD&E PHASE	**YES**	**Yes**	Eliminate: Opposed by City. Aviation Blvd not raised.	Eliminate: Opposed by City.	Eliminate: Not viable due to constructability.	Eliminate: Not viable due to logical termini.	**YES**	**YES**

LEGEND:



A mulit-discipline review meeting was held on May 23, 2023, The Alternatives Screening Evaluation Matrix meeting ranked Alternatives 1, 2, 7, and 8 the highest which are the Conventional Intersection, One-Way Pair, Displaced Left Turn, and Median U-Turn Roundabout, respectively. Alternatives 3, 4, 5, and 6, were grade separated intersections that were not supported by the FAA, Airport and City of Vero Beach, and proved to be expensive and/or intrusive for the project site. Therefore, based on the FAA findings, screening evaluation, public input, and coordination with the city, county, airport, and agencies, the four (4) overpass or underpass alternatives were eliminated from further consideration.

5.6 Build Alternatives

After the initial screening of alternatives and stakeholder engagement discussed in **Section 5.5**, the four (4) at grade Build Alternatives that were further developed and evaluated in this PD&E Study included:

- Alternative 1 – Conventional Intersection
- Alternative 2 – One-Way Pair
- Alternative 7 – Displaced Left Turn Intersection
- Alternative 8 – Median U-turn with Roundabout

These four alternatives were evaluated through a comprehensive multi-discipline engineering and environmental analysis which is documented in several reports contained in the project file. This section will provide additional detail on the evaluated Build Alternatives and how the alternatives address the project's purpose and need.

5.6.1 Alternative 1 Conventional Intersection

Alternative 1 proposes a conventional at grade signalized intersection that is similar to the existing intersection geometry but includes additional turn lanes and safety improvements. The horizontal alignment of SR 5/US 1 is shifted slightly to the east, requiring right-of-way acquisition of the adjacent parcels east of SR 5/US 1 throughout the study intersection area. The flush paved median is replaced with a raised curbed median. The intersection lane layout is modified to include the following improvements:

- South approach: an additional dedicated left turn lane
- East approach: an additional dedicated left turn lane
- North approach: two (2) additional dedicated right turn lanes
- West approach: an additional dedicated left and right turn lane
- All approaches include a raised median and median traffic separator

The west approach of the intersection is proposed to be widened to the south to accommodate the additional turn lanes at the intersection and a twelve (12)-ft wide shared use path. The proposed improvements to the west approach of the intersection will also cross the existing FEC railroad right-of-way and will need to be coordinated with the agency. The proposed improvements to the east approach of the intersection will also require additional right-of-way (total width of 110 feet) to accommodate the turn lane improvements, 12-ft shared use path and re-alignment to connect to the IRC Aviation Boulevard extension project. The design speed for the east and west approaches (along Aviation Boulevard) is 30 mph.

Access management changes in this alternative include implementing a raised median, closure of 31st Street at SR 5/US 1 and the closure of 32nd Street at the new extension of Aviation Boulevard.

The bridge over the Main Canal will need to be replaced. Multimodal improvements for this alternative include bus bays on SR 5/US 1 north and south of Aviation Boulevard, shared use paths along SR 5/US 1 and Aviation Boulevard and bicycle key holes on the north and south approach of the signalized intersection.

In the design year 2045, the SR 5/US 1 and Aviation Boulevard intersection is forecasted to operate at LOS D for both the AM and PM peak periods for Alternative 1. All intersection approaches will also operate at LOS E or better for both peak periods.

This alternative meets the purpose and need of the study by improving the traffic operations of the intersection, improving safety, supporting economic growth and enhancing modal interrelationships with rail, bicycle, and pedestrian modes.

5.6.2 Alternative 2 One-Way Pair

Alternative 2 shifts northbound SR 5/US 1 alignment to the east starting at Main Canal, creating two (2) one-way roadways through the connection with Aviation Boulevard. Northbound SR 5/US 1 reconnects with southbound SR 5/US 1 approximately 1,200 feet north of the Aviation Boulevard intersection. The typical section of bifurcated SR 5/US 1 proposes two (2) lanes in each direction with curb and gutter. A new signalized intersection on Aviation Boulevard with northbound SR 5/US 1 is proposed approximately 700 feet east of the existing signalized intersection with southbound SR 5/US 1. Due to the curvature of the alignment leading into the bifurcation, the main canal bridge will have to be reconstructed into two (2) bridges.

The lane layout for the Aviation Boulevard intersection with southbound SR 5/US 1 is:

- South approach: n/a

- East approach: one (1) left turn lane, one (1) through lane, one (1) shared through/right lane.
- North approach: one (1) left turn lane, two (2) through lanes, one (1) right turn lane.
- West approach: one (1) left turn lane, two (2) through lanes, one (1) right turn lane.

The lane layout for the Aviation Boulevard intersection with northbound SR 5/US 1 is:

- South approach: one (1) left turn lane, two (2) through lanes.
- East approach: County project
- North approach: n/a
- West approach: Two (2) left turn lanes, one (1) through lane.

The creation of a one-way pair roadway through this area reduces the need for additional right-of-way acquisition along SR 5/US 1 but does require additional right-of-way east of 13th Avenue. Additional right-of-way on the south side of Aviation Boulevard, west of SR 5/US 1, is still required in this alternative for additional eastbound turn lanes and proposed shared use path. A 12-ft shared use path is proposed along the east side of both northbound and southbound SR 5/US 1.

Access changes associated with this alternative include SR 5/US 1 being split into two one-way roadways, 30th Street being connected with the proposed northbound SR 5/US 1 roadway, the elimination of 13th Avenue, 32nd Street and 33rd Street. Vehicles traveling eastbound wanting to make a left turn to travel north on SR 5/US 1 will need to head east through the existing Aviation Boulevard intersection and make a left turn at the new intersection with northbound SR 5/US 1.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year and LOS D during the 2045 design year for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound right turn movement at the southbound intersection and the eastbound left turn movement at the northbound intersection which operates at LOS E during the 2045 PM peak period.

Reconstructing the bridge over Main Canal in this alternative has significant issues from a construction standpoint. Given the proposed horizontal geometry, superelevation and required vertical geometry of the northbound travel lanes on the bridge there is inadequate area to adequately maintain four (4) lanes of traffic and pedestrian/bicycle facilities during construction. Other issues associated with Alternative 8 include the following:

1. No southbound bicycle facilities are provided along SR 5/US 1.
2. Due to curvature of the bridge two (2) separate bridges would be required over the Main Canal. Given the curvature of the northbound structure and the need to

develop a three-span structure to accommodate the canal operations an AASHTO or FIB bridge with an 8-inch cast in place concrete deck would be required. This would necessitate a significant increase in vertical profile for this bridge.

3. Phased construction of the bridge will likely necessitate the use of a temporary bridge for the northbound movement placed directly east of the proposed bridge with corresponding diversion. This would necessitate significant additional right-of-way implications to build the structure.
4. A temporary pedestrian bridge will be required as well.
5. Phased construction is complicated by the proposed alignment.

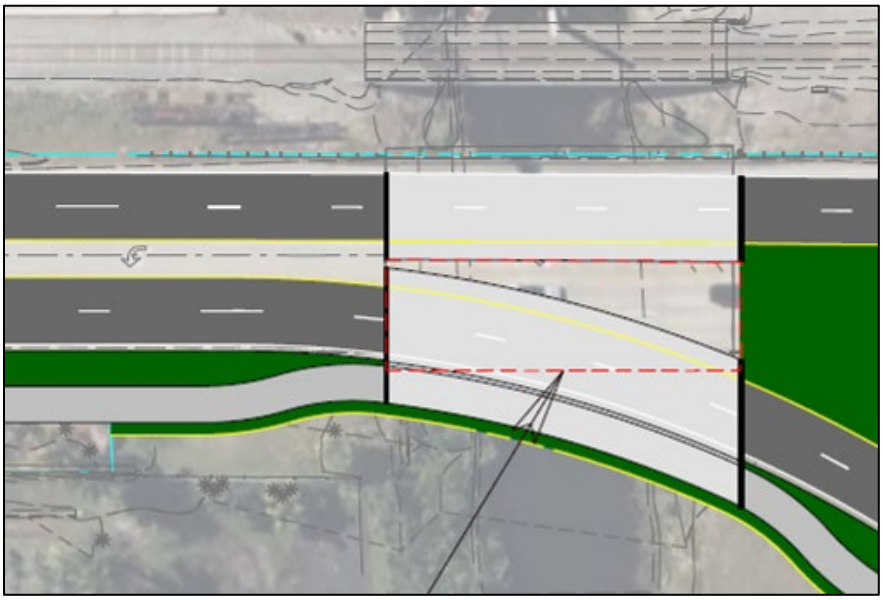


Figure 5-10 Alternative 2 – Proposed Bridge over the Main Canal

5.6.3 Alternative 7 Displaced Left Turn Intersection

Alternative 7 consists of a conventional, at grade intersection with an added deflected left turn for the northbound SR 5/US 1 movement to the west side of the SR 5/US 1 right-of-way via a signalized directional median and a two-lane, two-way parallel roadway that is separated from SR5/US 1 by a concrete separator. This two (2)-lane parallel roadway also allows the eastbound to southbound right turn to utilize the Displaced Left Turn signalized intersection. This alternative is similar to Alternative 1 as it expands Aviation Boulevard and the railroad grade crossing to provide four (4) eastbound lanes (one right, one through, two lefts), a median separator and two (2) westbound through lanes. Access to Airport North Drive is provided at grade. A shared use path would be along the south side of Aviation Boulevard.

In Build Alternative 7, the DLT movement was developed for the northbound SR 5/US 1 movement only. The PD&E team considered a southbound DLT and concluded not to

advance the concept since that traffic movement was a very low volume and the second DLT signalized intersection pushes impacts into the golf driving range business and further constrains available queue storage between SR 5/US 1 and 30th Street along Aviation Boulevard. Adding the southbound DLT would increase the number of lanes across SR 5/US 1, increasing pedestrian crossing times and right of way needs. This could potentially push the 33rd Street connection further northeast and require a new quadrant road to be developed to relocated turns, provide storage and provide logical termini. It was concurred upon that the southbound DLT would not be advanced unless the DLT alternative was selected to move forward after the public alternatives workshop.

Alternative 7 requires pedestrians to cross an additional traffic separator due to the displaced left turn lanes on the south approach and precludes a busbay or bus stop in the southbound direction.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year for both the AM and PM peak periods. For the 2045 design year, the intersection will also operate at LOS C for both the AM and PM peak periods. Most of the intersection approaches and movements will also operate at LOS D or better except for the westbound approach, left turn and shared thru-right movements as well as the right turn movement at the displaced left turn cross over which operates at LOS E during the 2025 opening year and 2045 design year for both AM and PM peak periods.

5.6.4 Alternative 8 Median U-turn with Roundabout

Alternative 8 combines a proposed quadrant roadway and new roundabout intersection to address future traffic demands. The alternative proposes improvements within the FEC railroad right-of-way to accommodate a new dedicated eastbound right turn lane. This alternative improves safety by removing several left turn movements, traffic calming with the proposed roundabout and shared use paths on both SR 5/US 1 and Aviation Boulevard.

Access changes with this alternative include raised median, and the eastbound, northbound and southbound left turns removed from the SR 5/US 1 and Aviation Boulevard intersection. The connection of the two local streets, 30th and 32nd are eliminated at SR 5/US 1. Eastbound left turns would travel through the intersection and make a left turn at the proposed roundabout, continue northeast along the new quadrant roadway and then continue north on SR 5/US 1. Northbound left turns will need to make a right turn at Aviation Boulevard and utilize the roundabout to then travel westbound through the intersection. Southbound left turning traffic is moved to the directional signalized intersection at the new quadrant roadway, north of Aviation Boulevard intersection.

The project intersection at SR 5/US-1 and Aviation Blvd will operate at LOS C during the 2025 opening year for both the AM and PM peak periods. For the 2045 design year, the intersection will operate at LOS D and LOS C for the AM and PM peak periods respectively. Most of the intersection approaches and movements will also operate at LOS D or better except for the eastbound and westbound approaches as well as the eastbound thru and westbound left turn movements during the AM peak period and the eastbound approach, thru and right turn movements as well as the westbound left turn movement which operates at LOS E during the PM peak period for both 2025 and 2045.

5.7 Comparative Build Alternatives Evaluation

An evaluation matrix was completed to evaluate the four (4) at-grade Build Alternatives and the No-Build Alternative. The evaluation matrix used specific criteria to weigh the alternatives on a scale from one (1) to four (4). In the ranking scale, a low score or score of one (1) denoted less desirable effects and a score of four (4) reflected a higher desired effect or good alternative. The evaluation matrix is shown in **Table 5-2**. This evaluation matrix was utilized in the Public Alternatives Workshop held on October 11th, 2023.

Level of Service – Traffic operational analysis found Alternatives 7 and 8 to have the least amount of vehicular delay in the design year despite both alternatives having two (2) signalized intersections. Alternatives 1 and 2 are both expected to operate within target level of service. The No-Build Alternatives is expected to have failing level of service in the design year. The Project Traffic Analysis Report (PTAR) documents the detailed traffic analysis.

Safety - Build Alternative 8 results in the lowest number of expected total crashes with an overall crash reduction of 80% compared to the No-Build Alternative. Build Alternative 1 and Build Alternative 2 provide similar overall crash reduction of 72% compared to the No-Build Alternative. Build Alternative 7 provides the least crash reduction of 64% compared to the No-Build Alternative. Detailed crash prediction analyses are provided in the PTAR as part of the project file.

Mobility (Transit, Bicycle, Pedestrian) – Alternatives 1 and 8 ranked the highest in this category due to shared use path and bus bay improvements. Alternatives 2 and 7 do not include proposed bus bays on SR 5/US 1 due to geometric constraints but do propose shared use paths. The No-Build Alternative does not include any proposed mobility improvements such as bus bays, shared use path or bike lanes. The shared use path supports the county planning goals of providing trails and pathways through this intersection.

Roadway Alignment – Alternative 1 proposes a straight alignment for SR 5/US 1 that shifts slightly to the east starting south of Main Canal and ties back into the existing roadway near Big Shots Golf of Vero Beach. Alternative 2 proposed two (2) separate alignments for SR 5/US 1 that separates the roadway into one-way pairs. Southbound SR 5/US 1 will remain on the existing roadway alignment and retain the five (5) ft border width to the FEC R/W. Northbound SR 5/US 1 has an alignment that curves to the east and requires a superelevated bridge over the Main Canal and sweeps east through the existing residential homes. The roadway alignment in Alternative 7 shifts to the east approximately 40 feet more than Alternative 1 to provide space for the northbound to westbound displaced left turn and eastbound to southbound right turn. These displaced lanes are separated from SR 5/US 1 with a six (6) ft concrete separator. Alternative 8 shifts the SR 5/US 1 alignment to the east, creating a larger buffer with the FEC railroad. This alternative also removes left turns from the SR 5/US 1 and Aviation Boulevard intersection and has higher traffic volumes on Aviation Boulevard between the two one-way pairs that will utilize the proposed roundabout and quadrant roadway.

Drainage – All four (4) Build Alternatives would include new drainage features to improve drainage throughout the study area. The No-Build Alternative has no associated drainage improvements and existing drainage inlet grates are within the sidewalk. Pond options for Alternative 1 were sized to accommodate a required water quality/quantity of 2.72 ac-ft and within existing Basins 300, 400, and 500. Alternative 2 were sized to accommodate a required water quality/quantity of 3.44 ac-ft and within existing Basins 300, 400, and 500. Pond options for Alternative 7 were sized to accommodate a required water quality/quantity of 1.48 ac-ft and within existing Basins 300, 400, and 500. Alternative 8 were sized to accommodate a required water quality/quantity of 3.50 ac-ft and within existing Basins 300, 400, and 500. The pond options for Alternative 1 and Alternative 7 were similar and received the same score in the evaluation. Alternative 2 and 8 received better scores in the evaluation matrix due to their potential pond locations. The pond siting analysis is documented in the *Pond Siting Report*.

Bridge and Canal – Alternative 1, 7 and 8 improve the canal and bridge maintenance by shifting SR 5/US 1 to the east and providing additional space within the roadway right of way for maintenance vehicles and personnel to stay out of the railroad right of way. Alternative 2 proposes for the southbound SR 5/US 1 lanes to remain the same over the bridge and does not provide the maintenance area, a new bridge is proposed for the northbound lanes. The No-Build alternative proposes no changes to the existing aging bridge.

Railroad –Alternative 8 scored the highest out of the Build Alternatives due to the proposed large buffer along US 1 and the railroad, elimination of left turns across the railroad tracks, and proposing five (5) roadway lanes at the crossing. Alternative 1 scored

a point lower than Alternative 8 due to the same proposed features but included six (6) roadway lanes at the railroad crossing. Alternative 2 proposes a minimal buffer along US 1 and railroad and six (6) roadway lanes crossing the rail tracks. Alternative 7 proposes to shift northbound left turn lanes to the west of the southbound lanes, closer to the railroad tracks and scored lowest in this category.

Right of Way Properties Impacted – Alternatives 1 and 7 impact the least number of parcels and received the higher score for this evaluation category. Alternative 2 is expected to impact the highest number of impacted parcels and residential home impacts, while Alternative 8 is expected to impact the largest land area of the properties impacted. The right of way impacts are documented in the *Conceptual Stage Relocation Plan*.

Environmental – The project location is an urban area and environmental impacts are expected to be minimal to the natural environment. All four (4) Build Alternatives are expected to improve stormwater quality with drainage improvements. There are minimal impacts to cultural resources. Alternatives 1 and 7 ranked the highest in this category due to the minimal impacts expected from the proposed improvements. A *Natural Resource Evaluation* and *Cultural Resource Assessment Report* were prepared for the study.

Noise Impacts – Alternative 2 was ranked the lowest for Noise in the evaluation matrix due to the alternative proposing to shift SR 5/US 1 travel lanes eastward 500 feet towards homes. Alternative 8 was also ranked less desirable due to the proposed roundabout having a higher traffic level and being located closer to residential land use. Alternative 1 and 3 were ranked the same with a score of 3. A *Noise Study Report* was prepared for the alternatives.

Maintenance – Alternative 1 ranked the highest for maintenance since the alternative proposes only one signalized intersection at the current location and provides a bridge maintenance area. Alternative 2 does not provide a bridge maintenance area and has two separate roadways to maintain. Alternatives 7 and 8 proposed two (2) signalized intersections which would require more maintenance in the future. The No-Build Alternative would require additional maintenance as well since the roadway would be older.

Constructability – Alternative 1 and 8 ranked the highest for constructability due to the proposed roadway and bridge work being able to be completed in phases. Alternative 7 would require additional construction phases for the displaced left turn geometry and was ranked less desirable. Alternative 2 would require a temporary bridge and detour and was ranked the lowest.

Total Cost – Construction cost estimates were completed for all four (4) Build Alternatives. Alternative 8 had the highest estimated construction cost and was ranked

the lowest. Alternative 1 had the lowest estimated construction cost and was ranked the most desirable.

Public Comment - During the public involvement outreach, the City of Vero Beach was in favor of Alternative 1. Some members of the public had concerns with the operations of Alternative 7 and 8. A detailed discussion is included in **Section 6.0** below and in the *Comments and Coordination Report*.

Table 5-4 Alternative Evaluation Matrix

CRITERIA	NO BUILD	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
LEVEL OF SERVICE	US 1 & Aviation Blvd LOS F (AM/PM) (1)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D (AM) US 1 & Aviation Blvd – LOS C (PM) (4)	US 1 & Aviation Boulevard – LOS D (AM) US 1 & Access Rd– LOS C (AM) US 1 & Aviation Boulevard – LOS C (PM) US 1 & Access Rd– LOS B (PM) (4)
SAFETY	Paved median remains. No crash reduction measures. (1)	Adds a raised median. 72% crash reduction (3)	Adds a raised median. 72% crash reduction (3)	Complicated pedestrian crossing and left turns at railroad crossing. 64% crash reduction (2)	Adds a raised median. 80% crash reduction (4)
MOBILITY (TRANSIT, BICYCLE, PEDESTRIAN)	No bicycle facilities and cracked sidewalks (1)	Shared use path for bicyclists and pedestrians. Bus bay provided for transit (4)	Shared use path for bicyclists and pedestrians. Transit stops provided. (3)	Does not provide for transit southbound. Displaced left adds second pedestrian crossing maneuver. (1)	Shared use path for bicyclists and pedestrians. Bus bay provided for transit. (4)
ROADWAY ALIGNMENT	Bridge and curb remain adjacent to railroad right of way. (1)	Straight alignment. Roadway is buffered from railroad right of way. (4)	One way pair. Superelevated curved bridge. (1)	Additional deflection and bridge widening for displaced left turn. (2)	Redirection of left turns and higher traffic volumes east of SR 5/US-1 (3)
DRAINAGE	Sidewalk drainage problems (1)	Pond 1-C Score 221 (2)	Pond 2A Score 214 (3)	Pond 7C Score 225 (2)	Pond 8-A Score 219 (3)
BRIDGE AND CANAL	Aging bridge. No canal access upstream of the bridge. (1)	Canal-Bridge maintenance access provided on all sides. (4)	Canal-Bridge maintenance access provided on one side. (1)	Canal-Bridge maintenance access provided on all sides. (4)	Canal-Bridge maintenance access provided on all sides. (4)
RAILROAD	Bridge and roadway remain adjacent to railroad right of way (1)	Raised median on Aviation Blvd. Large US 1 rail-roadway buffer. 6 lanes at railroad crossing (3)	Raised median on Aviation Blvd. Minimal US 1 rail-roadway buffer. 6 lanes at railroad crossing. (2)	Raised median on Aviation Blvd. Moderate US 1 rail-roadway buffer. 6 lanes at railroad crossing. Displaced left turn at rail crossing. (1)	Raised median on Aviation Blvd. Large US 1 rail-roadway buffer. 5 lanes at railroad crossing (4)
RIGHT OF WAY PROPERTIES IMPACTED	N/A	27 Parcels, 7.68 Acres, Relocations: 4 business, (0) residential (4)	42 Parcels, 7.61 Acres, Relocations: 2 business, 10 residential (1)	29 Parcels, 6.03 Acres, Relocations: 5 business, 2 residential (3)	35 Parcels, 8.89 Acres Relocations: 5 business, 6 residential (1)
ENVIRONMENTAL	Does not improve water quality. (1)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)
NOISE IMPACTS	N/A	Low (3)	Shifts US-1 travel lanes eastward 500 feet towards homes (1)	Low (3)	Higher traffic levels around roundabout. Road closer to residential. (2)
MAINTENANCE	Increased maintenance (1)	1 Signal (4)	2 Signals. Additional access road maintenance. (2)	2 Signals (3)	2 Signals. Additional access road maintenance. (2)
CONSTRUCTABILITY	N/A	Construct roadway and bridge in phases. (3)	Requires temporary bridge detour. (1)	Construct roadway and bridge in phases. Adds phase for displaced left turn. (2)	Construct roadway and bridge in phases. (3)
TOTAL COST	Maintenance cost	**$37,569,000 (4)**	**$39,832,000 (2)**	**$39,810,000 (3)**	**$45,776,000 (1)**
SCORE / RANK	**N/A**	**44 points**	**25 points**	**33 points**	**37 points**

LEGEND:

Less Desirable ← → **More Desirable**

1 point	2 points	3 points	4 points

5.8 Selection of the Preferred Alternative

Based on the comprehensive evaluation of the four build alternatives, Alternative 1 was chosen as the Preferred Alternative. Alternative 1 meets the purpose and need of the study, reconstructs the existing conventional intersection geometry, and results in the least impacts and costs.

5.9 Value Engineering

The purpose of the Value Engineering Study is to evaluate the preferred alternative to identify cost savings or added value measures that can improve the overall benefit of the alternatives and has the most efficient design.

A Value Engineering (VE) Study was held on December 4th-8th, 2023 and generated 13 recommendations. The VE Team evaluated the Preferred Alternative and an additional concept (RD-4) that was similar to Alternative 2. This additional concept was developed as an effort to mitigate impacts to the Camp Haven property east of SR 5/US 1. Due to numerous impacts associated with the additional concept, the concept was dropped.

After review of the engineering and environmental effects four (4) recommendations were accepted and two (2) were partially accepted as noted in **Table 5-5**. The VE Resolution Memorandum is included in **Appendix D** and the Value Engineering Study Report is provided in SWEPT as part of the project file.

5.10 Preferred Alternative

The Preferred Alternative (Alternative 1) was updated with the accepted VE recommendations, additional comments from the City and County and is summarized in **Section 1.5** and detailed in **Section 7.0.** The Preferred Alternative concept plans are provided in **Appendix A**.

The Preferred Alternative is a conventional intersection with through lanes, left and right turn lanes, bike lanes, and a shared use path. The main canal bridge is replaced with wide shoulders and a shared use path on the east side. Bus bays are provided on SR 5/US 1 along the northbound and southbound departure sides of the Aviation Boulevard intersection. A dry pond is provided along the east side of SR 5/US 1, north of 30th Street.

Table 5-5 Value Engineering Recommendations and Decisions

Item	Value Engineering Recommendation	Functional Score	VE Cost Avoidance (Addition)	Decision
RD-1	One right turn lane with longer storage SB US-1 to WB Aviation Blvd	2	$768,000	Not Accepted
RD-2	One left turn lane with longer storage NB US-1 to WB Aviation Blvd	2	$698,000	Not Accepted
RD-3	Continuation of bike lanes north of Aviation Blvd	4	($18,000)	Accepted
RD-4	Reconfigure US-1 and Aviation Blvd intersection per Alternative 9	-17	($2,525,000)	Dropped
RD-5	One left turn lane NB US-1 and one right turn lane SB US-1 to WB Aviation Blvd	2	$1,535,000	Not Accepted
RD-6	Reconstruct 13th Ave between 30th & 33rd St	5	($117,000)	Not Accepted
RD-7	Reconfigure 13th Ave and 33rd St to create a right-angle intersection with Aviation Blvd	9	($710,000)	Not Accepted
RD-8	Tie Aviation Boulevard into 32nd St	7	$3,628,000	Not Accepted
RD-9	Provide two through lanes and one right turn lane at the intersection Airport N. Drive	6	($85,000)	Accepted
RD-10	Provide left turn lane SB US-1 to EB 28th St	2	Negligible	Accepted
RD-11	Incorporate shared use path around pond	1	($99,000)	Partially Accepted
RD-12	Add bike lane NB US-1 on bridge	9	($271,000)	Accepted
RD-13	Add pedestrian lighting for the shared use path on the east side of US-1	2	($159,000)	Partially Accepted

6.0 PROJECT COORDINATION & PUBLIC INVOLVEMENT

A *Public Involvement Plan* was prepared to outline the public outreach efforts. A *Comments and Coordination Report* was prepared to capture the relevant public and agency comments obtained throughout the study. Both documents are provided as part of the project file on SWEPT.

Throughout the PD&E Study process, a project website was developed and maintained (https://www.fdot.gov/projects/sr5aviationblvdpde). The project website was utilized to share project information, documents, photos, public notices, and schedules with the public and agencies. The website also included a page where the public could be included in the mailing list and submit comments.

6.1 Agency Coordination

An initial agency screening was conducted through the FDOT's Efficient Transportation Decision Making (ETDM) Environmental Screening Tool (EST) (ETDM #14475).

6.1.1 Local, State and Federal Agencies Meeting Dates

A project kick-off meeting with FDOT, IRC, City of Vero Beach and the IRC MPO staff occurred on April 21, 2022, to initiate the project study, present an overview of the project, and begin coordination efforts.

A local coordination meeting occurred on October 25, 2022 with IRC, the City of Vero Beach, and IRC MPO staff to coordinate the PD&E Study with the County Aviation Boulevard extension project. The group was informed about the ongoing Public Kick-off Meeting activities and encouraged to attend the public kick-off meeting on October 26, 2022.

A project briefing to the IRC MPO occurred on December 2, 2023 to present the traffic analysis and status of the alternatives development.

A local coordination meeting with IRC MPO staff, IRC and City of Vero Beach Public Works, and Vero Beach Regional Airport occurred on January 19, 2023, to review the study alternatives and gain input from stakeholders.

The City of Vero Beach organized and conducted a Public Information Meeting on February 8, 2023, with affected property owners and invited FDOT to present the alternatives being developed. The city and several members of the public supported the at-grade intersection improvements and opposed the grade separated alternatives.

On February 9, 2023 FEC Railroad was contacted by District 4 Railroad Office, who transmitted a coordination memorandum to FEC that contained project alternatives.

On March 8, 2023 the project team attended a joint FEC, Brightline, and FDOT District 4 Railroad Coordination Workshop. The workshop was held to identify a potential set of requirements for developing a checklist to support FEC railroad coordination in District 4. Representatives from FEC, Brightline, and FDOT were in attendance. The representatives shared characteristics and requirements of their services in the project area.

A local coordination meeting with Vero Beach Regional Airport and FAA was held on March 28, 2023, to clarify the action items related to the FDOT PD&E build alternatives presented to the Vero Beach Regional Airport at a prior coordination meeting. The FAA and airport officials requested a RPZ analysis be conducted and that FDOT would be the party responsible to conduct the study.

On May 16, 2023 the City Council proposed a resolution regarding the study alternatives but that resolution was tabled until more information was available.

A local coordination meeting with IRC MPO staff, IRC and City of Vero Beach Public Works, and Vero Beach Regional Airport occurred on June 16, 2023, to review build alternatives, the screening evaluation matrix, results from the RPZ analysis and gain input. The airport and FAA concurred with the RPZ analysis and findings that the PD&E at-grade alternatives represented the best solution for aviation operations and safety.

On June 30, 2023 a FEC RR coordination memorandum was transmitted to FEC with the four at-grade build alternatives 1, 2, 7, and 8 to obtain input from FEC.

A coordination meeting with IRFWCD was held on August 4, 2023, via teleconference to discuss the SR 5/US 1 at Aviation Boulevard PS&E Study alternatives, preliminary pond sites and bridge replacement concepts. IRFWCD desired access to each quadrant of the bridge for maintenance and a maintenance access width of 15 feet is desired.

On August 18, 2023, the project team attended a FEC Railroad Coordination Meeting. At the meeting funding, bicycle and pedestrian crossings, railroad closures and future reviews of the PD&E documents were discussed.

On February 29, 2024, a local coordination meeting with IRC MPO staff, IRC and City of Vero Beach Public Works, and Vero Beach Regional Airport was held to discuss the preferred alternative and VE study refinements that will be presented at the public hearing.

6.1.2 MPO Meeting Dates

Coordination with MPO occurred throughout the entire PD&E Study. The MPO planning staff were invited and attended the local coordination meetings held with the city and county public works departments.

The PD&E project team made a presentation at the MPO Technical Advisory Committee (TAC) Meeting on Friday, December 2, 2022. The City of Vero Beach stated that they have significant issues with any overpass being located near the airport that could impact the runway protection zone.

The PD&E project team made a presentation at the MPO Citizens Advisory Committee (CAC) Meeting on Tuesday, December 6, 2022. The members had some concerns as to the status of when Brightline will be coming through and the impact on this intersection.

The PD&E project team made a presentation at the MPO Board Meeting on Wednesday, December 14, 2022. After the presentation the floor was opened for comments and concerns. Concerns raised included movement of emergency vehicles, impacts an overpass would have to the airport, inclusion of bike lanes and coordination with Brightline.

The PD&E project team presented the build alternatives to the MPO TAC meeting on January 27, 2023. Comments regarding the City of Vero Beach having significant issues with any overpass being located near the airport that could impact the runway protection zone and/or archeological area were discussed. The City had been contacted by property owners along the corridor who oppose the overpass due to their future development plans.

The PD&E project team presented the build alternatives to the MPO Citizens Advisory Committee (CAC) Meeting on February 7, 2023. Discussion included questions about the status of Brightline and whether train traffic would interact with the proposed project.

The PD&E project team gave an update presentation to the IRC MPO TAC on August 25, 2023, and the Governing Board on September 13, 2023. The update included recent findings from FAA and FEC Railroad coordination, the Build Alternatives that were eliminated, and the Build Alternatives that were identified for further study.

6.2 Public Involvement

Public Involvement activities occurred throughout the study and are documented in the *Comments and Coordination Report.* This technical document is included in the PD&E Study project files and uploaded to SWEPT.

Public Kickoff Meeting was held on October 20th, 2022 (virtual), and October 26h, 2022 (in-person). Registration links and information were provided in advance and included a QR code for easy access. Project information was posted on the project website. Questions and comments could be submitted prior to the meeting through the project website or by emailing the project manager.

The virtual Public Kickoff meeting began at 5:35 p.m. A project presentation video was played. After the project presentation the project team members addressed comments and questions from meeting attendees. Attendees had the option to submit comments and questions using the raise hand feature to be unmuted or typing their comment or question into the question panel of the GoToMeeting panel. The presentation and a recording of the meeting are available on the project website. There were 23 attendees (excluding the 11 team members). Laurence Reisman, TC Palm Reporter, attended. No elected officials attended.

The in-person Public Kickoff meeting was an open house format and began at 5:30 p.m. A project presentation played on a loop. The following project boards were displayed for attendees: Welcome, Title VI, Schedule, Traffic, Typical Sections, Aviation Typical Sections, and Existing Conditions.

Two elected officials attended the in-person Public Kickoff meeting:

- City of Vero Beach, Vice Mayor Rey Neville
- City of Vero Beach, Council Member Honey Minuse

Five agency representatives attended the in-person Public Kickoff meeting:

- City of Vero Beach, Planning and Development Director, Jason Jeffries
- IRC MPO, Staff Director Brian Freeman
- IRC MPO CAC member Joan Edwards
- Indian River Historical Society President Mark Holt
- Old Vero Ice Age Sites Committee Chair Randy Old

One reporter attended the in-person Public Kickoff meeting:

- TC Palm, Thomas Weber

The **Alternatives Public Workshop** was held on October 10th, 2023 (virtual), and October 11th, 2023 (in-person).

At the virtual Alternatives Public Workshop there were 16 public attendees with six comments and/or questions received. The comments/questions were general comments not related to any specific issue or alternative. Responses were addressed live on the virtual meeting. A recording of the meeting was posted on the website.

At the in-person Alternatives Public Workshop there were 44 public attendees, a presentation on a video loop was available and questions were answered one-on-one by FDOT and consultant staff. Public comments obtained at the workshop included three (3) comments in favor of Alternative 1, 27 comments in favored Alternative 2 and one (1) comment in favored Alternative 8.

Four elected officials attended the in-person Alternatives Public workshop:

- City of Vero Beach, Councilmember Tracey Zudans
- City of Vero Beach, Councilmember Rey Neville
- City of Vero Beach, Councilmember John Carroll
- Commissioner Indian River County

One reporter attended the in-person Alternatives Public workshop:

- TC Palm, Nick Slater

6.3 Public Hearing

A public hearing is tentatively scheduled for June 5th and 6th, 2024.

SECTION 6.3 TO BE COMPLETED AFTER PUBLIC HEARING

A *Public Hearing Transcript* will be included with this PD&E Study and uploaded to SWEPT separately.

7.0 PREFERRED ALTERNATIVE DESIGN FEATURES

7.1 Engineering Details of the Preferred Alternative

The Preferred Alternative was selected based on the results of the alternatives evaluation, public involvement, and coordination with agencies and officials at the local, state and federal levels. Conceptual plans of the Preferred Alternative are provided in Appendix A.

The preferred alternative reconstructs SR 5/US 1 and Aviation Boulevard as follows:

- Project Limits:
    - SR 5/US 1 limits begin at 28th Street and end 1300 ft north of Aviation Boulevard, for a total length of 2700 ft.
    - Aviation Boulevard limits begin 750 ft west of Airport N. Drive and end 670 ft east of SR 5/US 1, for a total length of 2200 ft.
- The existing SR5 5/US 1 bridge (no. 880085) over the IRFWCD Main Canal will be replaced. The new bridge includes shoulders, a 12-ft shared use path on the east side, and a 15-ft canal maintenance area on the east and west sides.
- A 2.52-acre dry retention pond is proposed and located adjacent to the project between 30th Street and 31st Street.
- SR 5/US 1 at Aviation Boulevard intersection configuration:
    - Northbound approach: two left turns, two travel lanes, and one right turn lane,
    - Southbound approach: one left turn, two travel lanes, and two right turn lanes,
    - Westbound approach: one left turn lanes, one travel lane, one right turn lane,
    - Eastbound approach: two left turn lane, one travel lane, one right turn lane,
    - Bicycle lanes are provided on SR 5/US 1 from 29th Street to approximately 350 ft north of 33rd Street.
    - Bicycle lanes are provided on Aviation Boulevard from SR 5/US 1 to 33rd Street in the eastbound and westbound direction; and from SR 5/US 1 to Airport N. Drive in the westbound direction only. The bicyclist will use the shared use path in the eastbound direction within the airport property.

- The alignment east of SR 5/US 1 curves to the north and connects with 33rd Street to be compatible with the proposed alignment of the Aviation Boulevard Extension project being conducted by IRC. At the Main Canal Bridge, SR 5/US 1 is shifted 15 feet to the east for additional maintenance access between the bridge and FEC Railroad right-of-way.

- Two bus bays are provided on SR 5/US 1, north and south of the Aviation Boulevard intersection, on the departure side of the intersection.

- A 12-ft shared use path is provided along the east side of SR 5/US 1 and on the south side of Aviation Boulevard west of SR 5/US 1.

- High emphasis crosswalks are provided on the south and east approaches of the intersection.

- Access to Airport N. Drive is provided with one westbound right turn lane and one eastbound left turn lane.

Engineering details of the Preferred Alternative are summarized in the following sub sections.

7.1.1 Typical Sections

The project is primarily an intersection reconstruction with a raised median that tapers in width to match the existing travel lanes at each end of the project.

The SR 5/US 1 typical section is a four-lane divided, urban section with a raised 28-ft median, 7-ft bicycle lanes, and a 12-ft shared use path on the east side. The context classification for SR 5/US 1 is C4 Urban General and has a design target speed of 45 mph. The proposed typical section for SR 5/US 1 is shown in **Figure 7-1.**

The context classification for Aviation Boulevard is C3C with a design target speed of 30 mph. The typical section for Aviation Boulevard, west of SR 5/US 1, is a four (4) lane, urban section with a 12-ft shared use path on the south side and a westbound seven (7)-ft buffered bicycle lane. The proposed typical section for Aviation Boulevard, west of SR 5/US 1 is shown in **Figure 7-2**. The typical section for Aviation Boulevard, east of SR 5/US 1, is a two lane, urban section with seven (7)-ft buffered bicycle lanes and six (6)-ft concrete sidewalks on both sides.

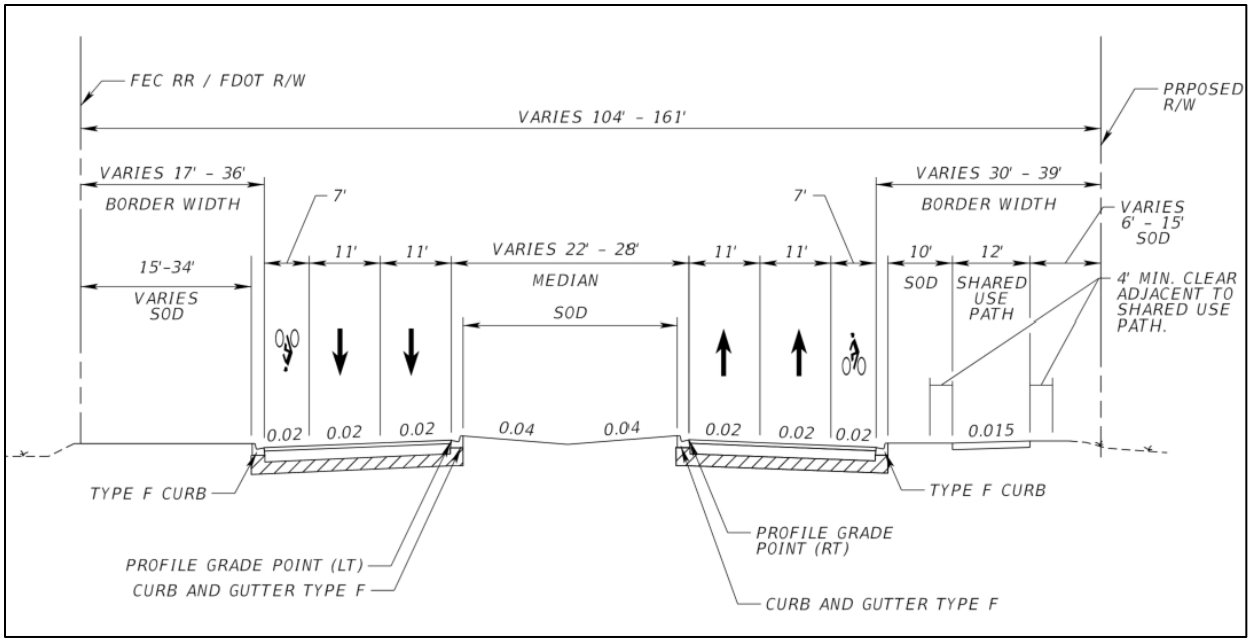


Figure 7-1 Preferred Alternative Typical Section - SR 5/US 1

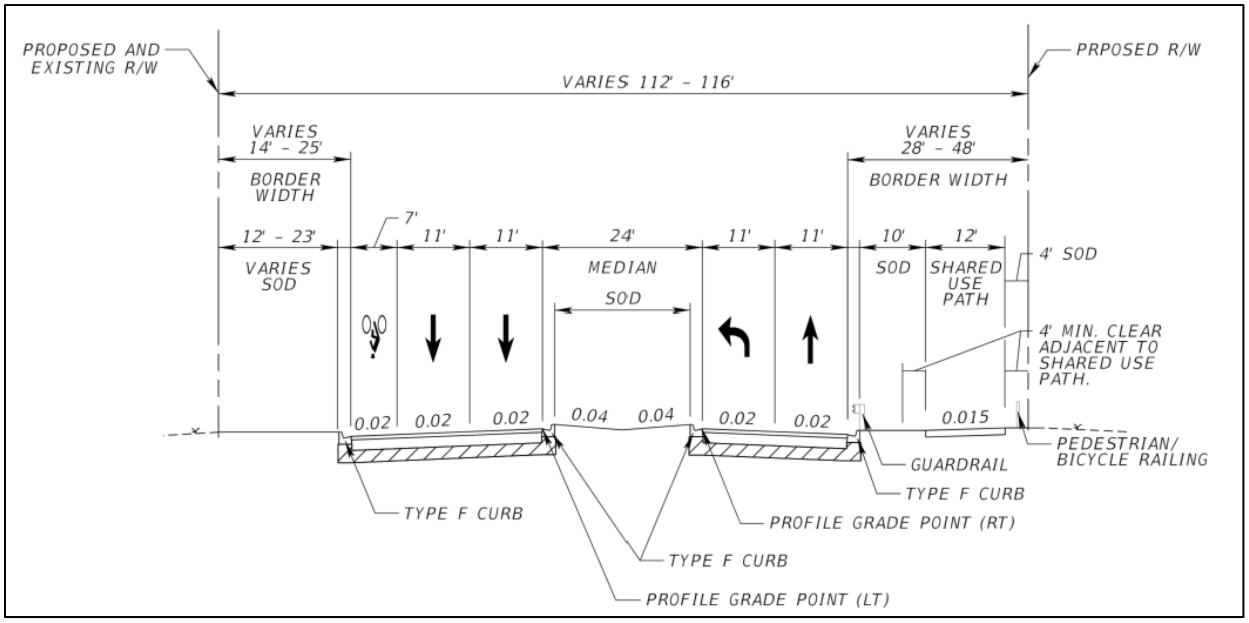


Figure 7-2 Preferred Alternative Typical Section – Aviation Blvd West Approach

The proposed bridge structure provides four (4) travel lanes, outside shoulders, a raised median, and a shared use path on the east side. A proposed bridge typical section for the replacement bridge structure (bridge No.880085) over the Main Canal is shown in **Section 7.1.8 Bridges and Structures** and shown in **Figure 7-3**. It should be noted that a 25 ft 4-inch median was needed on the bridge typical section to meet horizontal curve criteria on SR 5/US 1 while holding the FEC ROW line on the west side of the roadway. Barrier wall is also not provided between the shared-use path and travel through lanes due to sight distance issues at 30th Street.

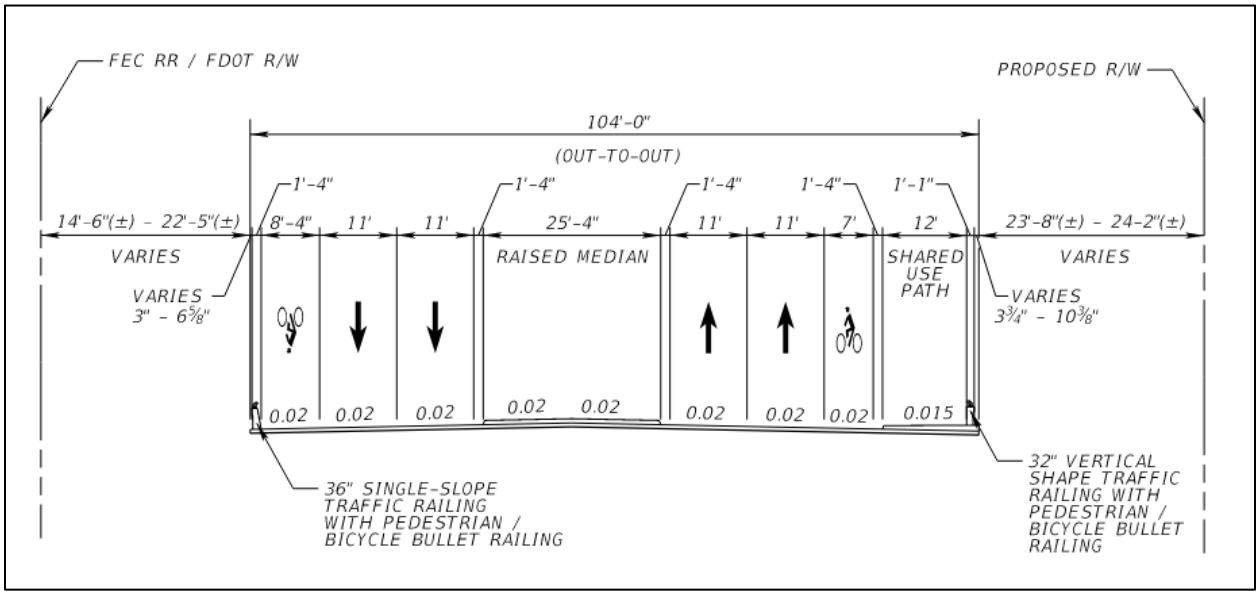


Figure 7-3 Preferred Alternative Typical Section - Bridge Over Main Relief Canal

The approved Typical Section Package will be provided in SWEPT as part of the project file after the public hearing.

7.1.2 Right-of-Way and Relocations

Additional right-of-way is required to construct the Preferred Alternative. Due to the FEC railroad on the west side of SR 5/US 1, the alignment must be widened to the right or east side of SR 5/US 1. The Vero Beach Regional Airport owns the land west of the FEC right of way and additional right-of-way is required on the south side of Aviation Boulevard. The existing alignment of Aviation Boulevard within the airport property is designated by easement agreement through the airport and FAA. This agreement would require modification to incorporate the addition right of way needed for Aviation Boulevard.

During the PD&E study, Indian River County purchased and cleared the property known as Mike's Furniture located at the SR 5/US 1 and Aviation Boulevard/32nd Street.

In order to meet current design standards for clear zone, border width, maintenance access for the bridge approaches, roadway, shared use path improvements, and stormwater management approximately 7.64 acres of additional right-of-way is needed from 27 parcels and would require four (4) business relocations. A Conceptual Stage Relocation Plan was prepared and included the SWEPT file. The preferred alternative Right of Way exhibit is provided in **Appendix A**.

7.1.3 Horizontal and Vertical Geometry

The horizontal alignment on SR 5/US 1 curves east to match the alignment required for the dual southbound right turns, bicycle lane, two through lanes, a left turn lane and median separator. This shift provides a 15 ft maintenance access area between the Main Canal Bridge and the FEC railroad bridge. The SR 5/US 1 horizontal alignment curves back into the existing alignment north of 33rd Street to match existing curvature and pavement. The horizontal alignment proposed for Aviation Boulevard follows the existing alignment, maintains a near perpendicular railroad crossing and minimizes intrusion in the archeological zone to the south. Horizontal alignment curve data for SR 5/US 1 and Aviation Boulevard is provided in **Table 7-1**.

Table 7-1 Horizontal Curve Data

Roadway	Curve No	Radius (ft)	Curve Length (ft)	Superelevation (e)	Design Speed (MPH)
SR 5/US 1 (PGL LT)	1L	17,016.14	1098.80	Normal Crown	45
SR 5/US 1 (PGL LT)	2L	7,706.25	800.97	Normal Crown	45
SR 5/US 1 (PGL RT)	1R	17,044.14	1135.56	Normal Crown	45
SR 5/US 1(PGL RT)	2R	8689.68	712.34	Normal Crown	45
Aviation Blvd (PGL LT)	A1L	654.42	440.76	Reverse Crown	30
Aviation Blvd (PGL LT)	A2L	470.92	404.51	Reverse Crown	30
Aviation Blvd (PGL LT)	A3L	371.00	247.06	e= 0.025	30
Aviation Blvd (PGL RT)	A1R	701.92	459.15	Reverse Crown	30
Aviation Blvd (PGL RT)	A2R	446.87	400.00	Reverse Crown	30
Aviation Blvd (PGL RT)	A3R	396.00	471.20	e = 0.021	30

The vertical alignment for SR 5/US 1 was developed through coordination with the IRFWCD high water elevations, bridge superstructure depth and FEC Railroad track elevations. The SR 5/US 1 roadway elevation is raised approximately two (2) feet to provide the required vertical curvature across the railroad along Aviation Boulevard. A saw-tooth grade was also applied to assist in drainage. Vertical curve data is summarized in **Table 7-2**.

Table 7-2 Vertical Curve Data

Roadway	Vertical Curve No	Vertical Curve Length (ft)	K_{value}	Entrance Grade %	Exit Grade %
SR 5/US 1 (PGL)	1	500	714.28	0.350	-0.350
Aviation Blvd (PGL RT)	1	145	205.00	-0.400	0.300

7.1.4 Bicycle and Pedestrian Accommodations

A 12-ft shared use path is proposed on the east side of SR 5/US 1 and south side of Aviation Boulevard west of SR 5/US 1. A six (6)-ft sidewalk is proposed on both sides of Aviation Boulevard from SR 5/US 1 to 33rd Street. West of SR 5/US 1 sidewalk is not provided on the north side of Aviation Boulevard to minimize ROW needs, minimize impacts to the existing dry detention pond, minimize archaeological site impacts, to restrict pedestrian activity at the railroad tracks to use the shared use path, to restrict pedestrians from the aviation side of the corridor. High emphasis crosswalks are proposed on the south and east approach of the intersection.

Bicycle lanes are provided on SR 5/US 1 in both directions from 29th Street to approximately 350 ft north of 33rd Street and the new bridge has wide shoulders to accommodate bicycles. Bicycle lanes on Aviation Boulevard are proposed in the east/west bound direction from SR 5/US 1 to 33rd Street; and in the westbound direction from SR 5/US 1 to Airport N. Drive with eastbound bicycle traffic served by the shared use path.

The shared use path crosses the FEC railroad tracks on the west approach of the intersection. Pedestrian and bicycle safety features should be provided on both sides of the track. An example from the Manual on Uniform Traffic Control Devices (MUTCD) 11th edition of signing and markings for a pathway crossing railroad tracks is shown in **Figure 7.4**.

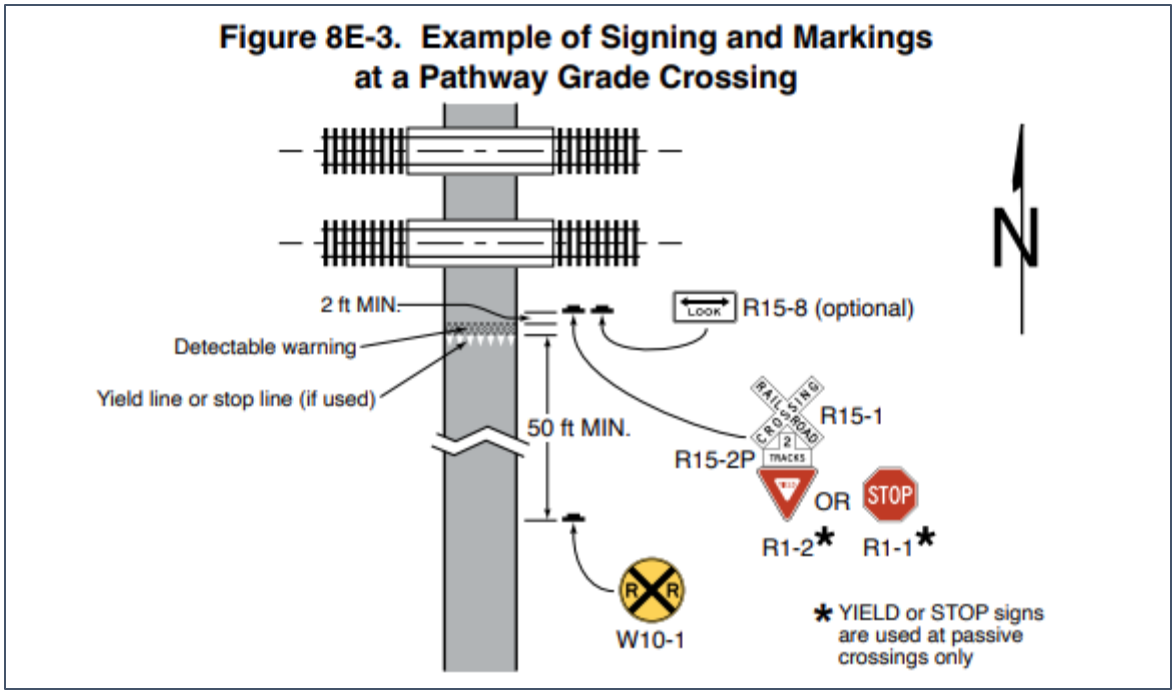


Figure 7-4 Example of Signing and Markings at a Pathway Railroad Crossing

7.1.5 Multi-Modal Accommodations

Two (2) new bus bays are proposed on SR 5/US 1. One (1) bus bay is located south of the intersection and one (1) bus bay is located north of the intersection. The 70-ft bus bays will support an articulated bus. Bus shelters, if required at these locations, should be coordinated with GoLine, the IRC maintaining and operating transit agency.

A 12-ft shared use path is proposed on the east side of SR 5/US 1 from 28th Street to the end project limit and on the south side of Aviation Boulevard from the west project limit to the bus bay on SR 5/US 1. The shared use path will provide long term continuity with the proposed shared use paths identified in the IRC Bicycle Pedestrian Master Plan.

On Aviation Boulevard, east of SR 5/US 1 six (6)-ft concrete sidewalks are proposed on both sides of the roadway.

Seven (7)-ft buffered bike lanes are proposed on SR 5/US 1 from 29th Street to the north project limit where a bike ramp is provided to provide access to bicyclists to the shared use path. On Aviation Boulevard, seven (7)-ft bicycle lanes are provided in the westbound direction from SR 5/US 1 to Airport N Drive and seven (7)-ft bicycle lanes are provided in both directions from SR 5/US 1 to 33rd Street.

These multimodal features were coordinated with and requested by the MPO staff, IRC public works and City of Vero Beach public works.

7.1.6 Access Management

The Preferred Alternative proposes improvements along SR 5/US 1 for approximately a half mile and ties back into existing flush paved median at each end. Through coordination with the District Access Management Manager, it was determined that a median opening table was not required for this project. Email correspondence is provided in **Appendix E**.

The existing access management classification of SR 5/US 1 is Class 6 and the proposed access class for the Preferred Alternative is Class 5. Criteria for both access classes are provided in **Table 7-3**. The target, design and posted speed is 45 mph on SR 5/US 1.

Table 7-3 Access Class Criteria

SR 5/US 1 Access Class	Median Type	Connection Spacing ≤ 45 mph (ft)	Median Opening Directional ≤ 45 mph (ft)	Median Opening Full ≤ 45 mph (ft)	Signal Spacing ≤ 45 mph (ft)
Proposed Class 5	Restrictive	245	660	1320	1320
Existing Class 6	Non-Restrictive	245	--	--	1320

The Preferred Alternative focuses on improvements at the SR 5/US 1 at Aviation Boulevard intersection and modifies the median access with a proposed raised median. Access to 29th Street, 30th Street, and 33rd Street from SR 5/US 1 is reduced to right in/right out in the Preferred Alternative. The existing connection of 31st Street from SR 5/US 1 is removed in the Preferred Alternative due to the right turn lane and taper location. There is one median opening at Aviation Boulevard, which is a full signalized intersection, spaced 1470 ft and 1300 ft from the begin and end project limit, respectively.

Aviation Boulevard is a county roadway, and the proposed typical section implements a raised median from Airport N. Drive to SR 5/US 1 to 33rd Street. West of the airport property the only existing access is to Airport N. Drive, which will remain a full median opening. West of SR 5/US 1 the realignment of Aviation Boulevard and turn lane approaches to SR 5/US 1 require implementation of a raised median. This 600 ft segment has a traffic separator between the westbound left turn and eastbound travel lane which prohibits any median opening.

7.1.7 Intersection Concepts

The Preferred Alternative includes the one (1) signalized intersection at SR 5/US 1 and Aviation Boulevard with additional turn lanes on all four (4) approaches at the intersection. The SR 5/US 1 alignment shifts east, further away from the FEC railroad tracks. High emphasis crosswalks are proposed on the south and east approach of the intersection. SR 5/US 1 left turn lanes (northbound dual lanes and southbound single lane) were evaluated using auto-turn to ensure opposing left turns meet eight (8) feet spacing requirement and four (4) feet minimum separation for the dual turn lanes.

On SR 5/US 1, several of the existing unsignalized side street connections are proposed to have access changes due to the proposed raised median. The intersections of 29th Street, 30th Street and 33rd Street are proposed to become right in/right out intersections. The intersection of SR 5/US 1 and 31st Street is eliminated.

Aviation Boulevard is widened to four (4) lanes at the non-signalized T-intersection at Airport North Drive. A dedicated southbound right turn lane and northbound left turn lane is provided.

Aviation Boulevard at 33rd Street intersection will be the connection to the IRC project to extend Aviation Boulevard to hospital region. The local streets 31st, 32nd, and 33rd are owned and maintained by the City of Vero Beach. These streets may be modified by future private development. City and County coordination during the design and right of way phase is required for the connection to 33rd Street and the extension project.

Concept plans showing the intersections for the Preferred Alternatives are included in **Appendix A**. Right-of-way corner clips at the SR 5/US 1 and Aviation Boulevard intersection should be re-evaluated during the design phase when mast arm locations are determined.

7.1.8 Bridges and Structures

Bridge Typical Section

The proposed bridge typical section will consist of a four (4)-lane divided roadway with a 28-ft 0-inch-wide raised median and 11-ft wide travel lanes. An 8-ft 4-inch buffered bicycle lane adjacent to the exterior 1-ft 4-inch traffic railing (36-inch Single Sloped, with bullet rail) completes the southbound feature of the bridge typical section. In the northbound direction a 7-ft 0-inch bicycle lane is provided adjacent to a raised sidewalk allowing for the 12-ft shared-use-path. A 1-ft 1-inch concrete traffic railing (32-inch Vertical Shape, with bullet rail completes the section. **Figure 7-5** depicts the relationship between the existing bridge deck slab and the proposed deck superstructure for the Preferred Alternative.

Due to sight distance issues from 30th Street, north of the bridge, barrier wall is not provided to separate the shared-use-path from the travel lanes.

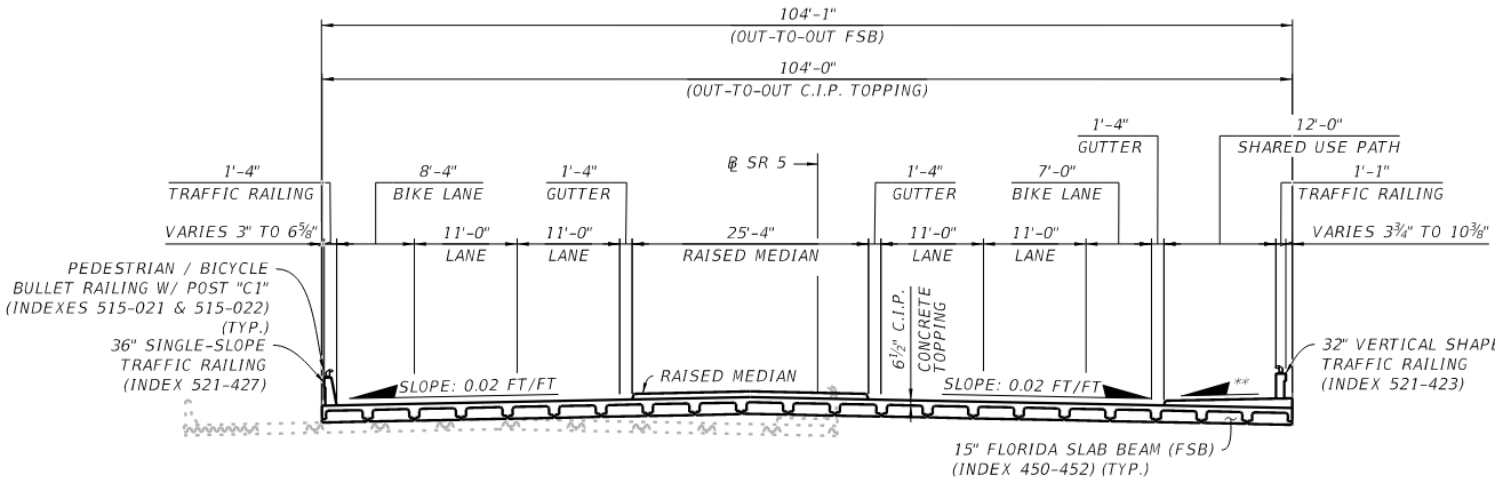


Figure 7-5 Proposed Bridge Typical Section Looking North

Bridge Span Arrangement

The proposed bridge span arrangement will consist of a 126-ft 0-inch three-span symmetrical structure with a 52-ft center span and 37-ft approach spans. The Begin and End Bridge points are located an additional 9-inches from the center of the new piles (solid lines below) at the end bents. This arrangement was selected to accommodate adequate spacing between existing and proposed piling. As seen in **Figure 7-6**, the proposed line of new piles are placed 5-ft from the centerline of the existing piles. Piles would consist of 18-inch precast prestressed concrete piles supporting cast in place end and intermediate pile bent caps. The pile bents will be placed approximately parallel to the Main Canal and existing pile bents.

The proposed superstructure will consist of a series of 15-inch-deep precast prestressed Florida Flat Slab Beams (per Standard Index 450-452) connected using a 6.5-inch reinforced composite cast-in-place (C.I.P.) concrete topping and a reinforced C.I.P. concrete keyway or pockets between adjacent beams. The travel lanes are on a horizontal curve as the roadway crosses the canal. To accommodate this shifting horizontal geometry, the bridge deck width is approximately 9-inches wider and will have a 2.5° skew with respect to the pile bents. The total bridge width is 104'-0" measured perpendicular to the skew.

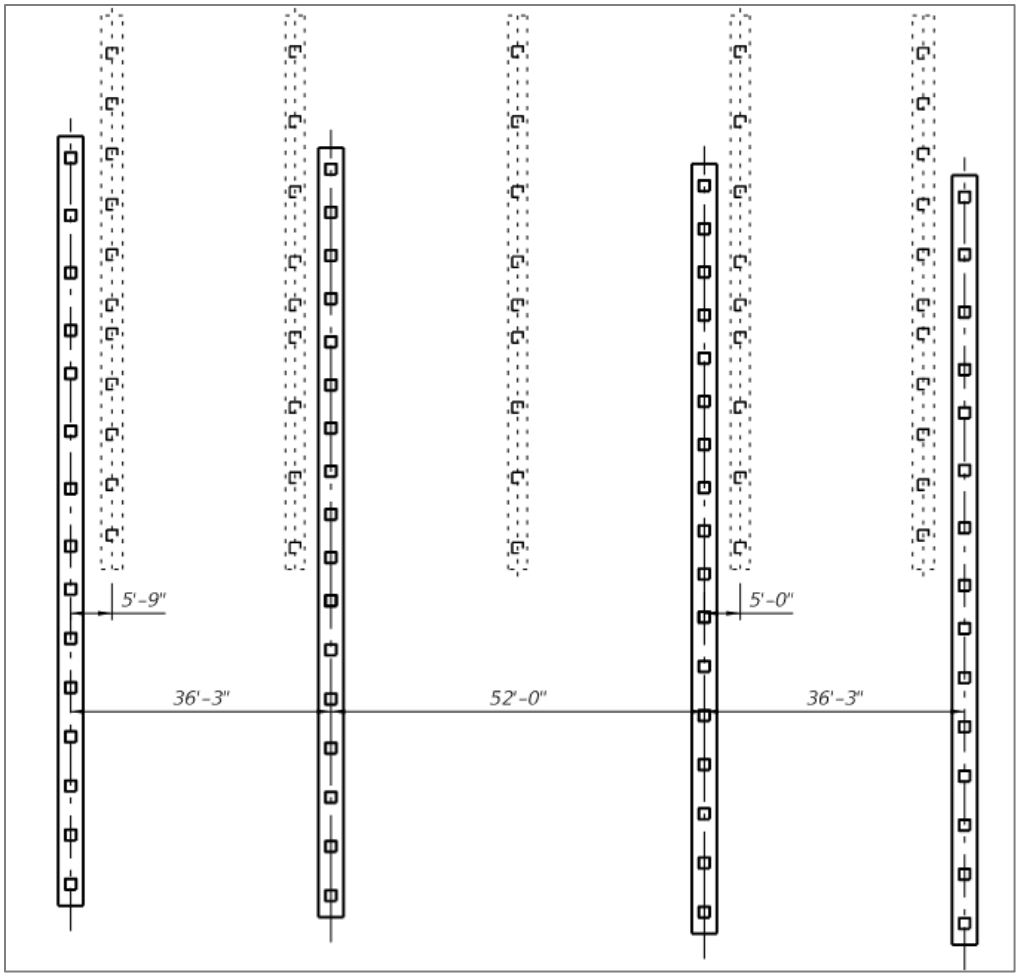


Figure 7-6 Proposed Span Arrangement and Bent Layout

The integral topping is an FDOT requirement to mitigate past historical reflective cracking problems and poor performance of precast flat slab systems constructed side-by-side without a reinforced C.I.P. concrete keyway or pocket (Sonovoids and Prestressed Slab Units). The total depth of the new slab structure is 24-inches when considering camber and construction tolerances versus the existing 13-inch slab units and toping.

The bridge vertical profile was established to meet the vertical clearance required by both FDOT and IRFWCD for both drainage and navigation (maintenance). A hydraulic analysis was performed by IRFWCD consultant, Carter and Associates, and is included in **Appendix E**. Vertical clearance requirements set for the Main Canal Bridge are shown in **Table 7-4.**

Table 7-4 Vertical Clearance Requirements

Agency	Design Criteria	Water EL (NGVD-29)	Water EL (NAVD-88)	Min Low Mem. EL (NVGD-88)
FDOT	6-ft clearance above Control Elevation - Navigation	1.58	0.12	6.12
FDOT	2-ft drift clearance above DHW (50-yr event) - Drainage	8.20	6.74	8.74
IRFWCD	1-ft drift clearance above DHW (100-yr event) - Drainage	11.35	9.89	10.89

This system slightly increases the bridge superstructure depth requiring an increase in the roadway vertical profile; but has the advantage of achieving longer spans. This system reduces the number of spans (from four to three) and substructure units in the main canal from three to two. This provides larger spacing between intermediate pile bents for ease of canal maintenance and will facilitate construction of the bridge. In coordination meetings with IRFWCD it was indicated that they did not want to reduce the existing low member elevation of 12.33-ft NGVD [10.87-ft NAVD] for the proposed bridge. They also indicated that they would like to see a sacrificial pile placed upstream of the center span pile bents and the bank armoring for the bridge abutments to be in substantial conformance with IRFWCD Rubble Riprap detail along IRFWCD Canals (see **Figure 7.6**). Therefore, the proposed profile takes this into consideration. The roadway approaches would also require 30-ft reinforced concrete approach slabs on either end to transition to the roadway.

Based on corrosion test results obtained from FDOT Statewide Environmental Data and project site location, Tierra South Florida recommend the following environmental classifications: Steel Substructure – Extremely Aggressive (Resistivity 820 ohm-cm); Concrete Substructure – Moderately Aggressive (Resistivity 820 ohm-cm); and Superstructure – Slightly Aggressive. This is consistent with the existing plans that identified the existing bridge site as Non-Coastal.

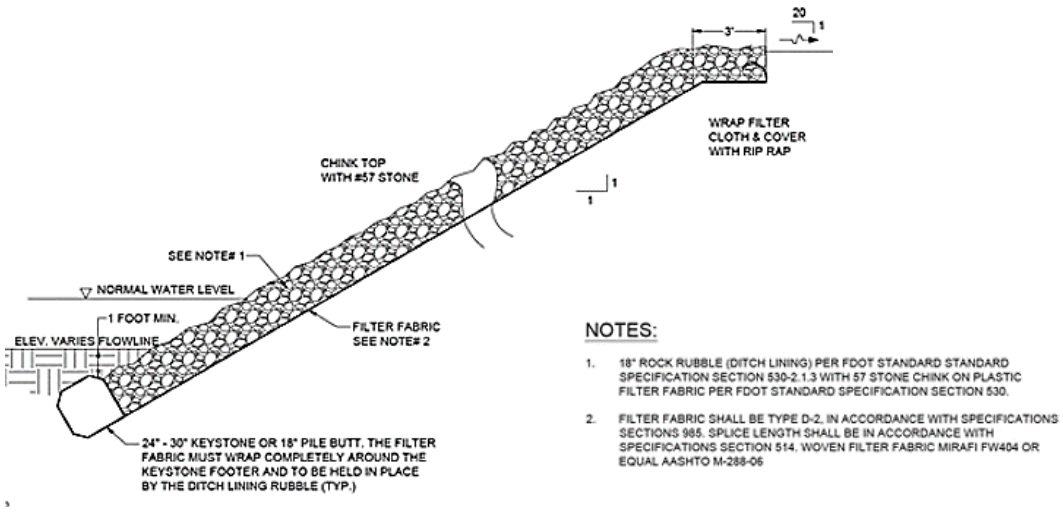


Figure 7-7 Rubble Riprap along IRFWCD Canal – Standard Detail

The probable estimated construction cost for this bridge widening is based on using $280 per square foot of deck area (new bridge costs include a 25% increase in unit prices due to required phase construction and construction over water). For temporary retaining walls near the existing bridge, a preliminary estimated cost of $35 per square foot was used for four walls with a length of approximately 20 feet and a height of 25 feet; the preliminary estimated cost is $17,500. This cost is included in the square foot cost of the bridge. Based on a deck area of 13,230 square feet, the estimated cost is $3,704,400. Additional costs include Bridge demolition and removal which is estimated at $52 per square foot of deck area. Based on an existing deck area of 7,980 square feet (70-ft x 114-feet), the estimated cost for removal is $414,960. The cost of roadway approach slabs is $230,404. The total estimated construction cost for replacement of the bridge is estimated at $4,353,000. Note that the total costs do not include the cost of rubble rip-rap in the canal.

As stated in **Section 2.22**, there were findings of asbestos-containing graphite material in the bridge bearing pads associated with the intermediate bents. These bearing pads consist of 45% to 60% asbestos material and are classified by the Environmental Protection Agency (EPA) as a Category II non-friable material. The demolition work associated with this project will require this material to be properly removed and disposed of by a state of Florida licensed asbestos abatement.

7.1.9 Intelligent Transportation System and TSMO Strategies

During the design phase, coordination with IRC public works, emergency services and the FEC railroad is required to identify any special ITS or TSMO equipment required at the railroad crossing.

7.1.10 Utilities

The estimated impacts to utility facilities resulting from the recommended Preferred Alternative are itemized in the *Utility Assessment Package* prepared for the PD&E Study. Impacts are estimated to occur to buried and overhead telephone, water main, force main, sanitary sewer main, sewer laterals, water meter, fire hydrants, gas main, overhead electric, and overhead fiber optic cable.

The City of Vero Beach has an existing water plant on the northwest corner of SR 5/US 1 and Aviation Boulevard. The City also has plans to relocate the city's wastewater plant to this location. Several buried pipes run underneath SR 5/US 1 to service the city's residents from the existing plant. Impacts to these utilities are anticipated due to the preferred alternative.

Due to the SR 5/US 1 alignment being shifted to the east to accommodate the maintenance access easement for the bridge over Main Canal, several utilities on the east side of SR 5/US 1 will be impacted. Notably, the overhead electric lines that run from 30th Street to 33rd Street will need to be relocated due to roadway improvements.

As stated in **Section 2.22**, Crown Castel Fiber has facilities adjacent to the bridge that appear on the northbound side of the bridge structure which will need to be relocated. There is a 12-inch Cast-Iron-Pipe watermain attached to the existing bridge (Bridge No. 880085) barrier on the east side of the bridge (northbound direction) which will require relocation. The city also has a 16-inch Ductile Iron Pipe watermain crossing beneath the end span on the north side of the bridge. This main crosses diagonally north of the east side of the bridge at a 45-degree angle and continues east along 30th Street. It will be necessary to obtain more accurate utility locations with level "A" locates (soft-dig) on the watermain during the final design phase. This will allow for the development of a potential pile spacing for the proposed bridge north end bent to avoid the need to relocate this facility.

Contact information for the impacted utilities is provided in **Section 2.18.**

7.1.11 Railroad Crossings at Aviation Boulevard and 14th Avenue

Aviation Boulevard intersects the FEC railroad at crossing number 273047Y. The proposed concept considers FRA safety features for railroad quiet zones. The proposed crossing will be expanded to four eastbound lanes (one right lane, one through lane, dual left turn lanes) and two westbound through lanes with a 12.5-ft wide median to accommodate a railroad exit gate arm. On-street bicycle lanes are provided on westbound Aviation Boulevard and start just west of the railroad tracks. A 12-ft shared use path will cross the tracks on the south side of Aviation Boulevard and safety features detailed in **Section 7.1.4** should be considered. A sidewalk is not provided on the north side to reduce the number of bike/pedestrian crossing locations. The horizontal alignment of Aviation Boulevard will maintain a near perpendicular crossing with the railroad, as in the existing condition, and the posted speed is 30 mph. Continued coordination with the FEC Railroad during design is required.

During the design phase, it is recommended that the following items are considered:

- Pedestrian one way exit gates,
- Second train warning signs,
- Traffic signal uninterrupted power supply,
- Activated blank-out signs for southbound right and northbound left turn lanes,
- Advanced railroad preemption for pedestrians,
- Providing a supervised railroad preemption circuit instead of the existing single break system.

FDOT Standard Index 509-070 details median criteria needed for signal gates at the railroad crossing. Due to the northbound dual left turn lanes the 50-ft length needed for the median on the west approach is not achievable.

During the PD&E study, the potential to close the one-lane, one-way 14th Avenue railroad crossing was discussed as a rail/roadway risk countermeasure to improve safety. The closure of the 14th Avenue crossing (272190F) and the evaluation of the southbound traffic being relocated upstream to the nearby 26th Street crossing (272189L) was evaluated in a separate study.

The potential closure of 14th Avenue was presented at the October 10th and 11th, 2023 Alternatives Public Workshop.

If the closure of 14th Avenue is determined to be acceptable, the FDOT Railroad Closure Application process would commence as a separate project outside of this PD&E study.

7.1.12 Permits

The USACE and SJRWMD regulate impacts to wetlands within the project area. Other agencies, including the USFWS, EPA, and the FWC, review and comment on wetland permit applications. The project is located adjacent to the Vero Beach Airport and contains FEC railroad tracks within the project limits. Coordination with these agencies was conducted during the PD&E study and anticipated permits were identified.

Due to the Preferred Alternative proposing an additional travel lane, it is currently anticipated that the project will qualify for a SJRWMD Individual Permit under FAC Chapter 62-330.054. Due to the section of new alignment, it is anticipated that the project will qualify for a USACE Nationwide Permit #14 for Linear Transportation Projects. This permit allows for the construction of transportation facilities; however, impacts cannot exceed 0.5 acre for non-tidal systems.

The anticipated needed permits for this project are listed in **Table 7.5**.

Table 7-5 Anticipated Permits

Permit	Issuing Agency
Section 404 Dredge and Fill NWP 14	USACE
Environmental Resource Permit (ERP)	SJRWMD
National Pollutant Discharge Elimination System (NPDES) Permit	FDEP
Railroad Permit	FEC
FAA Permit with the airport	FAA

It is anticipated that a permit be required from the USACE. Surface water impacts are related to proposed modifications to abutments and bridge approaches and pilings. Due to the section of new alignment, it is anticipated that the project will qualify for a USACE NWP 14 - Linear Transportation Projects. This permit allows for the construction of transportation facilities; however, impacts cannot exceed 0.5 acre for non-tidal systems.

SJRWMD requires an ERP when construction of any project results in the creation or modification of a surface water management system or results in impacts to jurisdictional wetlands. The ERP permitting process depends on the size of the project and/or the extent of wetland impacts. This project is anticipated to require an individual permit.

40 CFR Part 122 prohibits point source discharges of stormwater to waters of the U.S. without an NPDES permit. Under the State of Florida's delegated authority to administer the NPDES program, construction sites that will result in greater than one acre of disturbance must file for and obtain either coverage under an appropriate generic permit contained in Chapter 62-621, FAC, or an individual permit issued pursuant to Chapter 62-620, FAC.

7.1.13 Drainage and Stormwater Management Facilities

The pond siting selection process for SR 5/US-1 at Aviation Boulevard adhered to the FDOT District 4 Pond Siting Procedures. A Pond Siting Team consisted of members from FDOT District 4 Planning and Environment Management, Roadway Design, Drainage, Survey, Right-of-Way, Maintenance, Construction, and Legal advisor. Three multi-disciplinary team meetings were conducted to evaluate the impacts and compare the pond sites to determine the preferred pond site. Refer to the *Pond Siting Report* for additional information.

The Preferred Alternative will have a "closed conveyance system" and a new dry detention pond attenuating the stormwater runoff. Three (3) pond options (Pond 1A, Pond 1B, and Pond 1C) were sized to treat and attenuate the proposed road right-of-way within Basins 300, 400, and 500. The ponds will meet the water quality/quantity (treatment and attenuation) criteria set forth by SJRWMD and IRFWCD.

The preferred pond configuration is Pond 1A. IRFWCD has a specific discharge criterion that limits the outfall flow into their canal system. Therefore, the pond volume capacity was increased to meet the discharge requirement. The provided water quality/quantity volume of 2.72 ac-ft. plus attenuation storage in Pond 1A is 4.04 ac-ft, and the right-of-way requirement is 2.52 acres. The pond will include a 20-foot maintenance berm to allow access to maintenance crews.

This project improves the water quality as the existing SR 5/US 1 system does not have an existing stormwater treatment system. The project has no adverse impact to the area's water quality. Stormwater treatment of the additional impervious areas will be treated as required by the SJRWMD Permit Information Manual.

The modifications to the existing drainage system within the project limits will result in an insignificant change in the capacity to carry floodwater. These changes will cause little to no increase in flood heights, flood risks or damage. There will not be a change in the potential for interruption or termination of emergency service or emergency evacuation routes.

7.1.14 Floodplain Analysis

Most of the project limits are located within Floodplain Zone X, an area of minimal flood hazard, and poses no significant floodplain encroachment as shown in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 12061C0244J (effective 1/26/23). The Indian River Farms Main Relief Canal is located within Floodplain Zone AE, areas where base flood elevations are determined. The flood base elevations within Zone AE range from 16 to 5 feet NAVD'88. In addition, there are no regulated floodway(s) within the project limits. However, the only floodplain involvement with federally defined floodplains will be the proposed bridge widening. The new bridge has one less bridge span and pile bent within the canal which improves flow. Therefore, it has been determined that there is no change in flood "Risk" or floodplain impacts associated with this project.

7.1.15 Transportation Management Plan

During construction of the project, proper traffic control will be needed to minimize impacts to the community, local businesses, vehicular and pedestrian traffic, and transit. As part of the PD&E Study, a preliminary traffic control plan for the construction of the proposed improvements was developed and consists of four (4) separate phases. The preliminary traffic control plan does not require a full closure on SR 5/US 1 or Aviation Boulevard and detours are not needed. Pedestrian detours will be provided as needed to safely guide pedestrians around construction zones.

Phase 1 – On SR 5/US 1, existing northbound and southbound traffic is maintained, and the work zone is located on the east side of the roadway. On Aviation Boulevard, traffic is maintained on the existing lanes and the work zone for future eastbound traffic is located to the south of the existing lanes.

Phase 2 – On SR 5/US 1, northbound traffic is shifted to the newly constructed northbound roadway and southbound traffic is maintained on the existing lanes. The median and adjacent center lanes, including the bridge, are constructed between the flow of SR 5/US 1 traffic. On Aviation Boulevard, traffic is shifted to the newly constructed future eastbound lanes and the work zone is concentrated on the existing lanes for future westbound traffic.

Phase 3 – On SR 5/US 1 northbound traffic will remain on the newly constructed northbound lanes consistent with Phase 2, but southbound traffic will be shifted to the newly constructed median and adjacent center lanes. The SR 5/US 1 work zone will be

concentrated on the existing lane to construct the new southbound roadway, including the bridge. On Aviation Boulevard, friction course, signing and pavement markings and landscaping would be constructed.

Phase 4 – This phase would only be needed for SR 5/US 1 to construct friction course, signing and pavement markings and landscaping.

Typical sections detailing the temporary traffic control plans are included in the conceptual design plans in **Appendix A**.

7.1.16 Constructability and Construction Impacts

One of the critical aspects of developing roadway improvements along SR 5/US 1 is determining how those improvements will be constructed.

The existing roadway section and traffic volumes will require that four lanes of traffic be maintained during peak-hour periods during the day. Based on this requirement, the bridge would need to be constructed in three (3) phases. A conceptual temporary traffic control scheme was developed for the bridge is provided in the preliminary plans for the preferred Alternative in **Appendix A**. Approximately 45-feet of the proposed bridge can be constructed in Phase 1 without impact to the existing bridge travel lanes and sidewalk. Phase 2 and 3, with its median construction is the most critical phase and is depicted in **Figure 7-8** below.

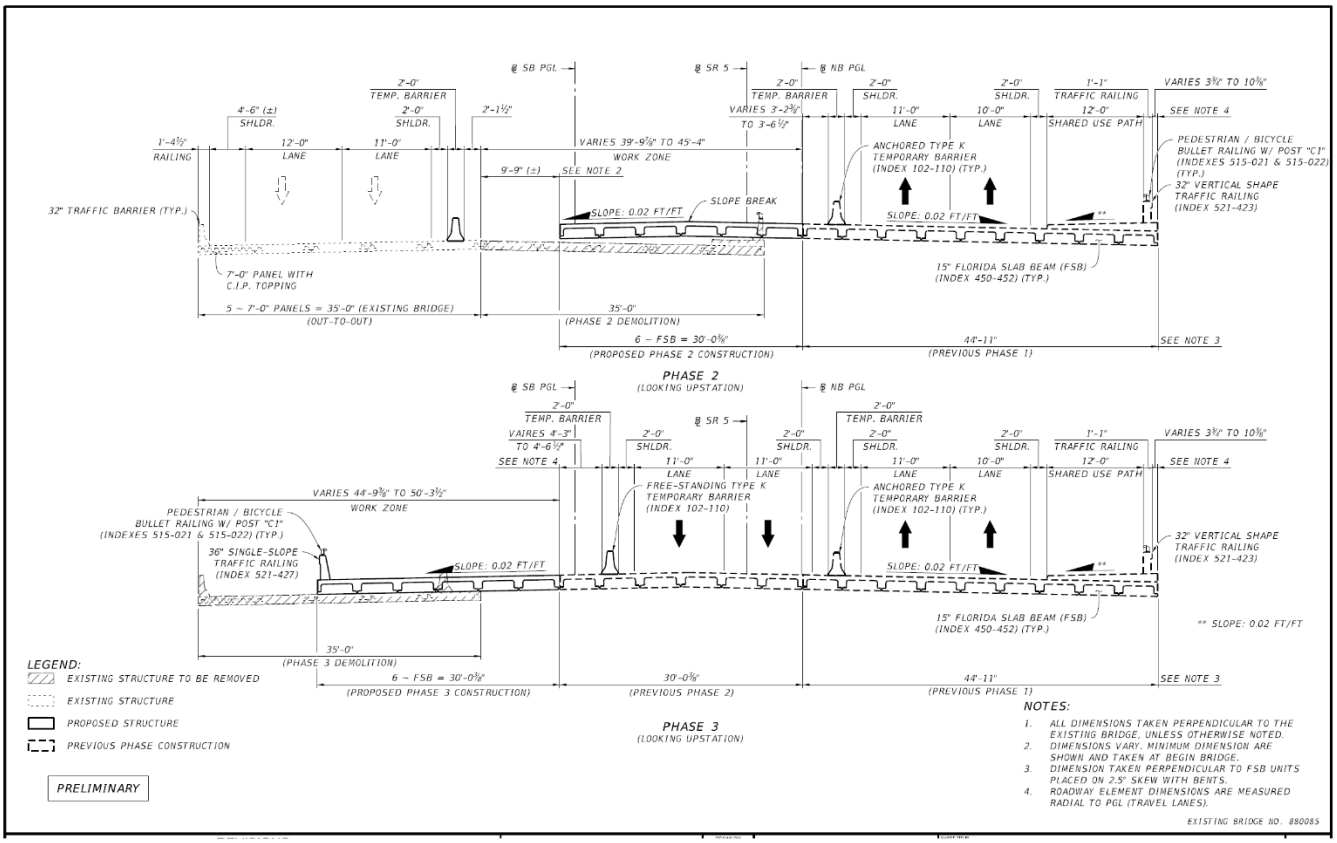


Figure 7-8 Bridge Traffic Control Phase 2 and 3

In Phase 2, pedestrian traffic and the two (2) northbound lanes can be shifted to the structure built in Phase 1 and the two (2) southbound lanes can remain on the existing structure. The barrier protected shared use path will be utilized for pedestrian and bicycle traffic for this phase and all future phases. During Phase 2, 35-feet of the existing structure will be removed, and an additional 30-feet of the proposed structure will be constructed

to be used in Phase 3. In Phase 3, the two (2) southbound lanes will be shifted to the proposed bridge. This will allow room for the last 35 feet of the existing bridge to be removed and the final 30 feet of the proposed bridge to be constructed.

In all cases the existing City of Vero Beach 12-inch watermain attached to the bridge on the east side must be relocated. The relocation will have to be done away from the bridge in additional right of way or an easement and installed via horizontal directional drilling (HDD) utilizing High Density Polyethylene (HDPE) watermain grade pipes.

Temporary impacts to businesses will be minor as most of the businesses located north of the canal will require acquisition of the entire parcel or large portions of the parcels and building structures. Access can be maintained to 28th and 29th Streets south of the canal.

Temporary detours and access to 30th Street and 13th Avenue may be required during construction until the new access to 33rd Street is constructed. There is a potential for IRC to have constructed the extension of Aviation Boulevard from US 1 to the medial region which would improve access to 30th Street and 13th Avenue during construction.

The existing residential area is east of 13th Avenue which is more than 500 feet from SR 5/US 1 which lessens the construction noise impacts. There is an medical eye surgery facility located at the north end project limit.

The bridge pile driving, drilling, and crane operations require coordination with the Vero Beach Airport and FAA as the bridge is under the flight path. Potential pile driving activities near the FEC railroad bridge should be coordinated with FEC Railroad.

Construction activities may cause short-term air quality impacts in the form of dust from earthwork and unpaved roads. These impacts will be minimized by adherence to applicable state regulations and to applicable FDOT Standard Specifications for Road and Bridge Construction.

It is anticipated that the application of the FDOT Standard Specifications for Road and Bridge Construction will minimize or eliminate most of the potential construction noise and vibration impacts. However, should unanticipated noise or vibration issues arise during the construction process, the Project Manager, in concert with the District Noise Specialist and the Contractor, will investigate additional methods of controlling these impacts.

Minimization measures and best management practices to control erosion and stormwater impacts during construction will be documented in a Stormwater Runoff Control Concept (SRCC) to be prepared in the design phase.

Contractor requirements related to interaction with protected species will be refined in the design and permitting phase. During construction, best management practices,

adherence to FDOT's Standard Specification for Road and Bridge Construction and use of preconstruction surveys are strategies that will be considered, as needed, for protection of listed species.

Although no evidence for archeological site 8IR1/8IR9 was identified, archaeological monitoring by a professional archaeologist within the vicinity of the site is recommended during project construction. Specifically, monitoring is recommended during earth-disturbing activities in the following locations:

- Along Aviation Boulevard
- SR 5/US 1 between Aviation Boulevard and 28th Street
- Pond 1A

Should construction activities uncover archaeological remains, it is recommended that activity in the immediate area of the remains be stopped while a professional archaeologist evaluates the remains. In the event that human remains are found during construction or maintenance activities, the provisions of Chapter 872.05, F.S. will apply.

7.1.17 Special Features

The Preferred Alternative has several special features incorporated in the design.

- A 15-ft wide canal maintenance area on the upstream and downstream side of the Main Canal bridge. The Indian River Farms Water Control District (IRFWCD) requested this feature to allow bridge maintenance access without encroaching on the FEC right of way and to access the downstream bridge area from the south side. Access and guardrail connections will need to be coordinated during design for both approaches on the bridge. A special IRFWCD riprap detail for under the bridge is anticipated.

- Guardrail is needed on Aviation Boulevard, at the west end of the project, where the roadway is being widened to the south into an existing dry stormwater pond. This area will require slope protection or retaining wall for approximately 600 ft stretch with a pedestrian/bicycle railing.

- Bicycle lane connection to the shared use path was recommended by the VE Study and is located on the northbound side just north of 33rd Street.

- Traffic signal and railroad signal timing control interface is required.

- Bus bays are provided on SR 5/US 1, north and south of Aviation Boulevard.

- The Value Engineering Study recommended adding pedestrian lighting on the SR 5/US 1 shared use path and an additional pathway around the proposed pond if the path would be part of a trail system and if the city wanted a path around the pond.

7.1.18 Design Variations and Design Exceptions

No design variation and/or design exceptions are anticipated for the Preferred Alternative. The 10 foot buffer between the shared use path and edge of pavement avoides a design variation by providing the placement of signs outside of the lateral clear zone for the vehicles on the roadway and bicycles on the shared use path.

7.1.19 Cost Estimates

A construction cost estimate for the Preferred Alternative was obtained using the Long-Range Estimate (LRE) cost estimating tool.

Table 7-6 Cost Estimate for Preferred Alternative

Item	Cost Estimate	Comments
Right-of-Way	$19,602,500	R/W estimate 8/21/23. R/W update in progress.
Construction	$16,277,971	Update 3/16/2024
Design **@ 12% of construction cost**	$1,953,357	Phase 32
Construction Inspection and Engineering (@ 13% of Construction Cost)	$2,278,916	Phase 62
Total Cost	$40,110,244	

7.2 Summary of Environmental Impacts of the Preferred Alternative

7.2.1 Future Land Use

The future land use obtained from the City of Vero Beach Department of Public Works/GIS Division and is shown in **Figure 7-9**. Existing commercial land use on the east side of SR 5/US 1 at the Aviation Boulevard intersection is planned to become Mixed Use in the future. The Preferred Alternative proposes a conventional intersection geometry which is compatible with future land use.

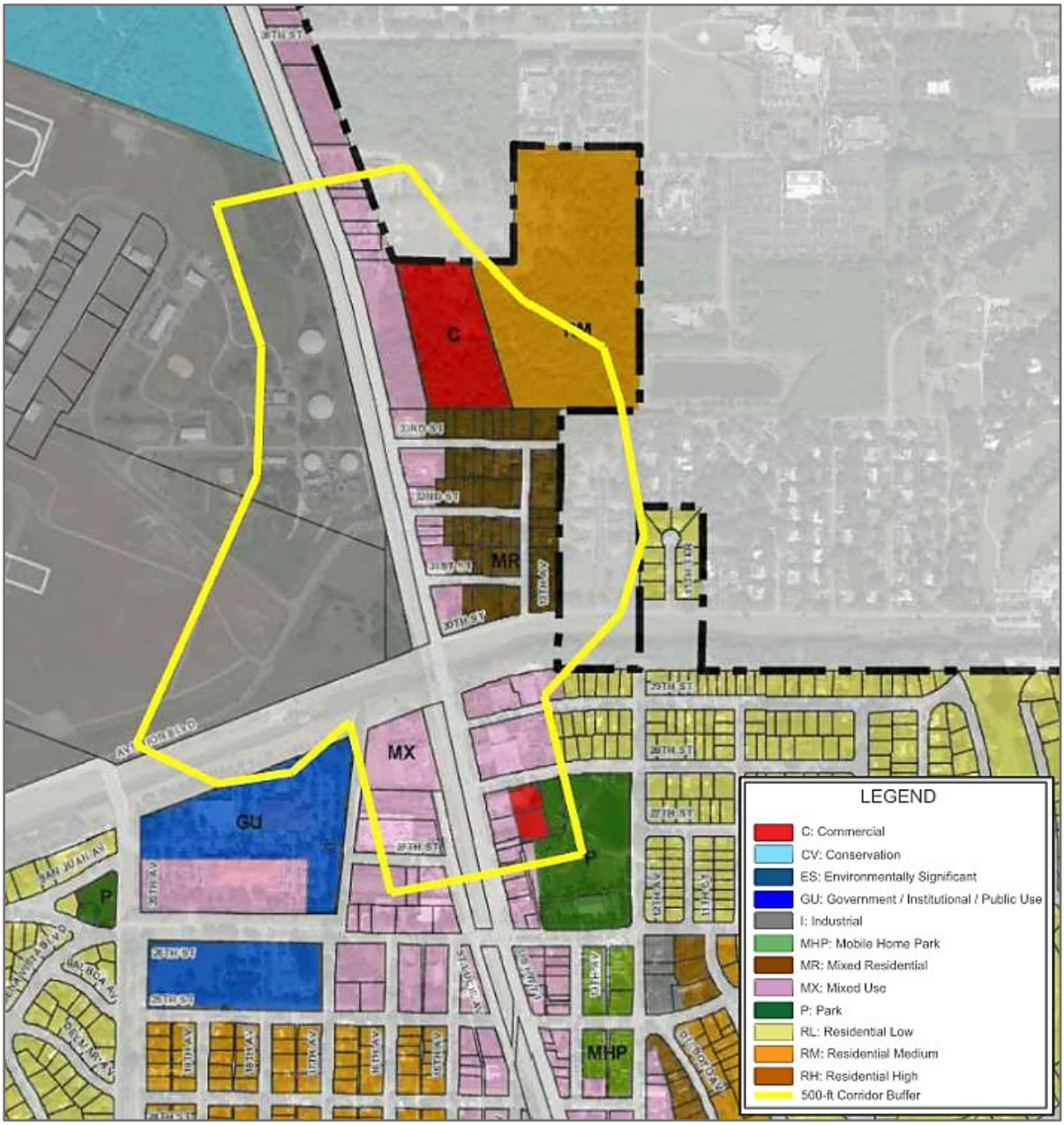


Figure 7-9 Future Land Use Map

7.2.2 Sociocultural

Expansion of SR 5/US 1 and Aviation Boulevard requires right of way acquisition throughout the project limits. The Conceptual State Relocation Plan (CSRP) was prepared and included in the SWEPT project file.

Additional right of way is required within the Vero Beach Airport property along the realignment of Aviation Boulevard to 33rd Street. Twenty (27) parcels are anticipated to be impacted including several business impacts.

Along Aviation Boulevard west of the railroad tracks, an airport agreement is required to modify the description of the land required for Aviation Boulevard. This agreement requires coordination with the FAA and FDOT Aviation Offices.

One outdoor advertising sign is located on the east roadside north of 33rd Street and is within the right of way acquisition area.

With regards to aesthetic effects, the existing SR5/US 1 right of way is 100% impervious asphalt or concrete with no opportunity for landscape. The project will enhance the area with shared use paths, new sidewalks, grassed medians and potential areas for landscape in areas of the new right of way. A landscaping plan has not been developed as part of the PD&E Study. Retention pond design should evaluate opportunities to retain the large mature oak trees that are located within the general pond area. A landscaping concept opportunity plan and/or design would be developed during the design phase. Future proposed landscaping plan for the corridor will be coordinated with the City of Vero Beach and IRC.

However, due to the existing commercial and residential development, the proposed project is anticipated to have a Degree of Effect (DOE) of *Minimal*, as identified in the ETDM Summary Report.

7.2.3 Section 4(f)

There are two Section 4(f) resources within the project limits, the Micheal Field Baseball Complex located 135 ft east of SR 5/ US 1 and just south of 28th Street. Another resource are planned trails which were identified in the Central IRC Greenway Plan and have planned routes through the project corridor. The shared use path provided in the preferred alternative supports the future implementation of these trails. These resources were evaluated through a Section 4(f) Determination of Applicability which is included in the SWEPT and the Type 2 Categorical Exclusion and found to have either No Use of the resource or Section 4(f) is Not Applicable. The SWEPT resource outcome is shown in **Table 7-7.**

Table 7-7 Section 4(f) Determination

Resource Name	Facility Type	Property Classification	Owner or Official with Jurisdiction	Recommended Outcome	OEM SME Action
Michael Field Complex	A city owned baseball field complex.	Park/Rec Area	City of Vero Beach	No Use	Determination 07-18-2023
Central Indian River County Greenways Plan	Multiple planned shared use paths or trails	Park/Rec Area	Indian River County	Not Applicable	Determination 07-19-2023

7.2.4 Cultural Resources

A total of 53 shovel tests were excavated within the archaeological APE in areas devoid of hardscape, underground utilities, and deep layers of fill or spoil. There was no evidence of the previously recorded archaeological site, 8IR1/8IR9, nor were new archaeological sites or occurrences identified in the archaeological APE as a result of the background research, the pedestrian survey, or the subsurface testing. No shovel tests were dug within the City of Vero Beach Vero Man Local Historic Site/Archaeological Zone on the west side of SR 5/US 1 due to the presence of buried utilities, hardscape, gas lines, and fill. However, on the east side of SR 5/US 1 within the purported location of site 8IR1/8IR9, 22 shovel tests were excavated.

Although no evidence for site 8IR1/8IR9 was identified, archaeological monitoring by a professional archaeologist within the vicinity of the site is recommended during project construction. Specifically, monitoring is recommended during earth-disturbing activities in the following locations:

- Along Aviation Boulevard
- SR 5/US 1 between Aviation Boulevard and 28th Street
- Pond 1A

The historic resources survey identified 36 historic resources, including 16 extant previously recorded resources and 20 newly identified resources. The 16 previously recorded resources consist of three linear resources and 13 buildings. The 20 newly

identified resources consist of 18 buildings (8IR1883-8IR1890; 8IR1893-8IR1903) and two resource groups (8IR1904-8IR1905). The resource groups include the Vero's Motel Complex (8IR1904) and the Vero Beach Regional Airport (8IR1905). Florida Master Site File (FMSF) forms were prepared for the newly recorded resources. FMSF forms were updated for four buildings (8IR744; 8IR745; 8IR755; 8IR766) and the two linear resources which had not been recorded or evaluated within the current APE, the Florida East Coast (FEC) Railway (8IR1497) and Dixie Highway (8IR1519). An updated FMSF form was not prepared for the Indian River Farms Main Canal (8IR1148), which has been determined ineligible within the APE by the SHPO, as it does not exhibit physical changes nor changes in eligibility since it was last recorded.

The segment of the FEC Railway (8IR1497) within the APE has been determined eligible under Criterion A for Community Planning and Development and Transportation for its role in the development of the east coast of Florida including Vero Beach and Indian River County.

This segment of SR 5/US 1 (8IR1519) within the APE exhibits modern improvements such as widening, signalization, and signage. Therefore, this segment is considered National Register–ineligible, because other segments of SR 5/US 1 have been determined eligible within Indian River County, the entire resource maintains National Register-eligibility per the Historic Linear Resource Guide (FDHR 2022).

Vero's Motel (8IR1904) does not embody a distinctive type or style of high architectural value and exhibits modifications. The Vero Beach Regional Airport (8IR1905) lacks historic integrity as its terminals and runways have been altered. Due to a loss of historic structures and the construction of non-historic structures, the airport does not convey its associations with its early 20th-century or World War II military history. Therefore, both resource groups are considered ineligible for the National Register.

Twenty-four of the buildings are affiliated with the c. 1931-1955 tourist camp, Camp Gordon. The vernacular cottages and commercial buildings that constituted Camp Gordon were an associated collection of resources. The loss of most of the structures and deterioration of the remaining structures does not lend itself to a district, and individually, the resources do not have enough integrity or importance to be considered eligible for the National Register. The additional newly recorded buildings not associated with Camp Gordon are also considered ineligible because they exhibit common architectural styles, modifications, and lack historical associations.

7.2.5 Wetlands

No wetlands were identified within the project study area, so no impacts to wetlands are proposed due to the Preferred Alternative.

Surface water impacts (SW-1) for the Preferred Alternative total 0.11 acres, which equates to a total functional loss of 0.06 palustrine herbaceous units. Direct fill impacts to SW-1 result from construction of bridge pilings and widening activities. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. Other surface water (OSW-1) impacts for the Preferred Alternative total 0.06 acres. Mitigation is not required for impacts to OSW since these reservoirs have been permitted through an existing permitted stormwater system and are thus non-jurisdictional.

Impacts to SW and OSW within the Preferred Alternative are summarized in **Table 7-8**. UMAM scores and functional loss analysis for surface waters for the Preferred Alternative are also summarized in **Table 7-8**. For impacts to surface waters, it is anticipated that mitigation would be required by both the SJRWMD and USACE. Permanent impacts to surface waters associated with pilings and bridge widening activities resulted in 0.06 units of functional loss. Shade impacts are not considered since this area for surface waters consists of non-vegetated bottom. No impacts to OSWs are proposed to be mitigated.

Table 7-8 Potential Surface Water Impacts

FLUCFCS / ID	USFWS Classification	Preferred Alternative			
		Impact Type	Impact Acreage	UMAM Score	Functional Loss
Surface Waters					
5100 / SW-1	PEM1Hx	Fill	0.11	0.50	0.06
Other Surface Waters					
5300 / OSW-1	PSS1Cx	Fill	0.06	-	-
Preferred Alternative Total			**0.17**		**0.06**

7.2.6 Protected Species and Habitat

The project may affect but is not likely to adversely affect federally and state listed wildlife species. The species key for the indigo snake, wood stork and manatee were utilized and are contained in the Natural Resource Evaluation in the project file.

The project is anticipated to have **no effect** on the following federally listed species:

- Fragrant prickly-apple
- Lakela's mint
- Miami blue butterfly
- Loggerhead sea turtle
- Green sea turtle
- Leatherback sea turtle
- Hawksbill sea turtle
- Atlantic salt marsh snake
- Florida scrub-jay
- Red knot
- Audubon's crested caracara
- Piping plover
- Eastern black rail
- Roseate tern
- Florida bonneted bat
- Southern beach mouse
- Florida panther

Federally listed species assigned an effect determination of **may affect, not likely to adversely affect** include:

- Eastern indigo snake
- Wood stork
- West Indian manatee

There is **no effect anticipated** on the following state listed species:

- Snowy plover
- Black skimmer
- Least tern

There is **no adverse effect anticipated** on the following state listed species:

- Gopher tortoise
- Florida sandhill crane
- Florida burrowing owl

- Little blue heron
- Reddish egret
- Tricolored heron
- Southeastern American kestrel
- Roseate spoonbill

There are species which may occur in the project vicinity that are not listed as threatened or endangered but receive other legal protection. The project is not expected to negatively impact the bald eagle which is protected under the BGEPA, the MBTA, and State law (FAC 68A-16.002).

No roosting bats were observed within the project study area during field reviews. The tricolored bat is not likely to roost or forage within the project study area. FDOT will continue coordination with USFWS to determine the potential effect to the tricolored bat once a final listing decision has been made. No impacts are anticipated to state or federally protected bats due to the proposed project.

Multiple avenues of protection will be employed to negate and minimize any potential effects to these species. Some of the measures employed may include detailed surveys and agency coordination during the project design phase, including providing appropriate mitigation to offset impacts. During construction, best management practices, adherence to *FDOT's Standard Specification for Road and Bridge Construction* and use of preconstruction surveys are strategies that will be considered, as needed, for protection of listed species.

The study area occurs within areas of critical habitat for the West Indian manatee. No impacts to manatee critical habitat are anticipated as a result of this project. For these reasons, it was determined that the Build Alternatives will result in **no destruction or adverse modification** of critical habitat for the West Indian manatee.

7.2.7 Essential Fish Habitat

No EFH exists within the project study area, therefore the proposed project will have no involvement with EFH, and an EFH analysis was not required.

7.2.8 Highway Traffic Noise

The existing land use in the noise study area consist of 22 residences, a baseball field, preschool gym, rehabilitation center, motel and a restaurant.

Design year (2045) exterior traffic noise levels with the project (future build with Preferred Alternative 1) are predicted to range from 52.0 to 66.0 dB(A) at the residences, with traffic

noise levels predicted to approach, meet, or exceed the NAC for Activity Category B at one residence. Noise barriers were not evaluated for the single impacted residential receptor. Consistent with FDOT's traffic noise policy, a noise barrier must benefit a minimum of two impacted receptors to be considered feasible.

A traffic noise level of 53.6 dB(A) was predicted for the baseball field, a level that does not approach, meet, or exceed the NAC for Activity Category C.

Traffic noise levels are not predicted to approach, meet, or exceed the NAC for any of the Activity Category E uses evaluated, ranging from 62.3 to 69.2 dB(A). Finally, an interior traffic noise level of 47.0 dB(A) at the Small Wonders Preschool Gym does not approach, meet, or exceed the NAC for Activity Category D. When compared to existing traffic noise levels, the largest increase with the proposed project is predicted to be 11.1 dB(A). None of the evaluated noise sensitive land uses are predicted to experience a substantial increase (greater than 15 dB(A)) in traffic noise resulting from the proposed project.

Noise abatement measures are not recommended for construction as part of this project. If changes occur to the current conceptual design, additional analysis may be warranted.

7.2.9 Contamination

A total of 13 potential contamination sites were identified within the contamination study area and are shown in **Figure 2-25**. Of the 13 sites, none have a High Risk rating and 4 sites have a Medium Risk rating. The following have a Medium Risk rating:

- FEC Railroad (Map ID #1)
  - This railroad bed has a long history of use and may contain arsenic (from chromated copper arsenate), petroleum products (from creosote oil), and other contaminants from treated railroad ties. All project alternatives include modifications to the railroad crossing at Aviation Boulevard.
- Vero Beach Water Treatment Plant (Map ID #2)
  - There have been one or more ponds or ditches along Aviation Boulevard that have received effluent including spent lime sludge from the City's water treatment plant.
- Sullivan Property (Map ID #3)
  - Two USTs were removed circa 1998 but no tank closure report with confirmatory soil or groundwater sampling was found.
- W C Graves Jr. / Indian River Associates (Map ID #4)

- Two USTs were removed before 1990 but there is no record of confirmatory soil or groundwater sampling. One heating oil UST was also present but there is no record that it was removed or properly abandoned.

The remaining sites were categorized as Low Risk or No Risk. This determination was made because these sites either do not possess an active industrial waste permit or storage tank, the permit files do not indicate any current or prior contamination issues, and/or they are not situated near the proposed project improvements.

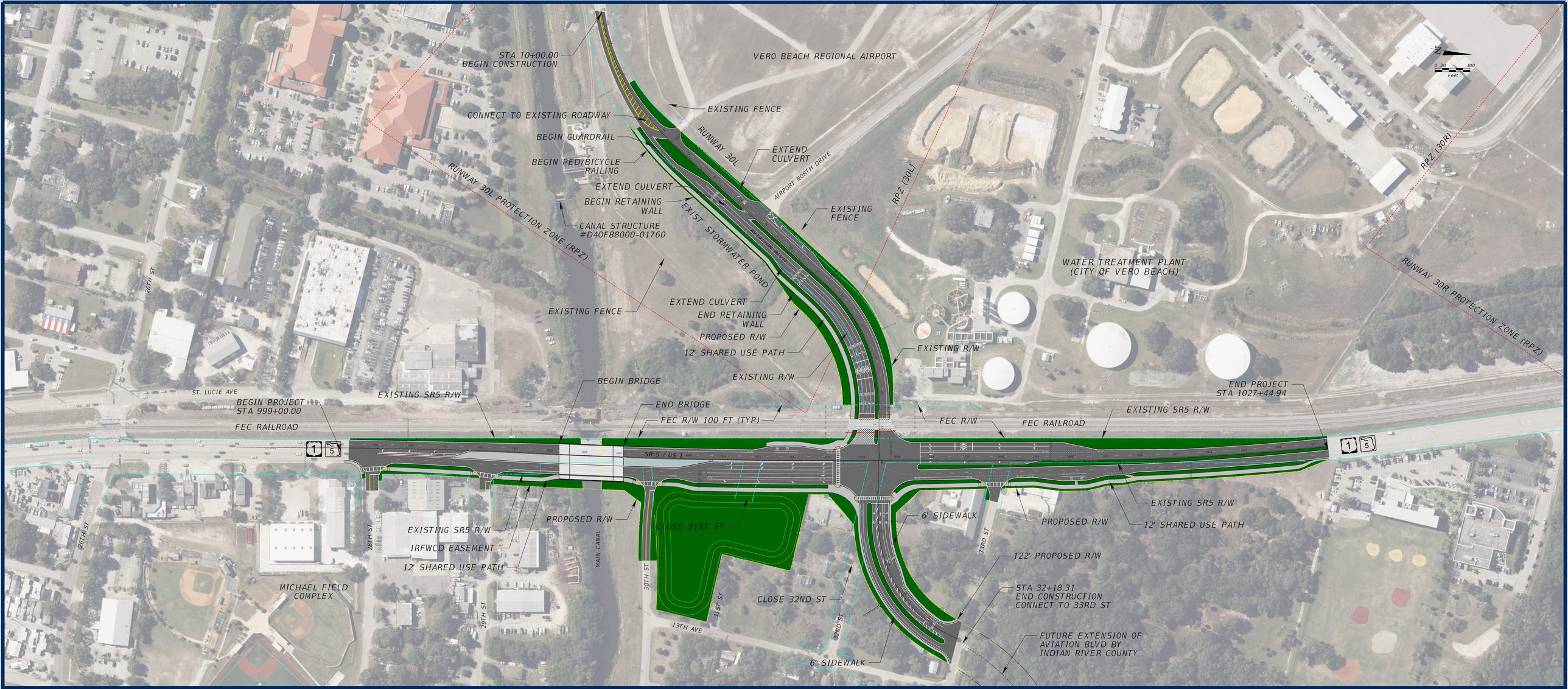
It is recommended that the project be re-evaluated during design to determine if any new contamination-related risks are present, to determine if remediation by others reduces or eliminates risk, and to evaluate potential dewatering concerns. Level II contamination assessment investigations may be appropriate for some areas that have proposed subsurface work activities (e.g., pole foundations or drainage features) or where excess soils are expected to be produced.

If dewatering is needed during construction, an SFWMD Water Use Permit will be required. Dewatering operations in the vicinity of potentially contaminated areas may be limited to low-flow and short-term to avoid potential contamination plume exacerbation. Dewatering near contaminated sites may also require the installation of groundwater barriers and/or an effluent treatment plan. The contractor should be held responsible for compliance with any necessary dewatering permits.

There are numerous old houses and commercial buildings in the contamination study area; these may contain Asbestos Containing Materials (ACM) and/or Lead-Based Paint (LBP). ACM and LBP surveys will need to be conducted by a licensed asbestos consultant on buildings and structures if demolition or renovation is proposed.

APPENDICES

Appendix A – Preferred Alternative



Preferred Alternative

(Alternative 1)

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

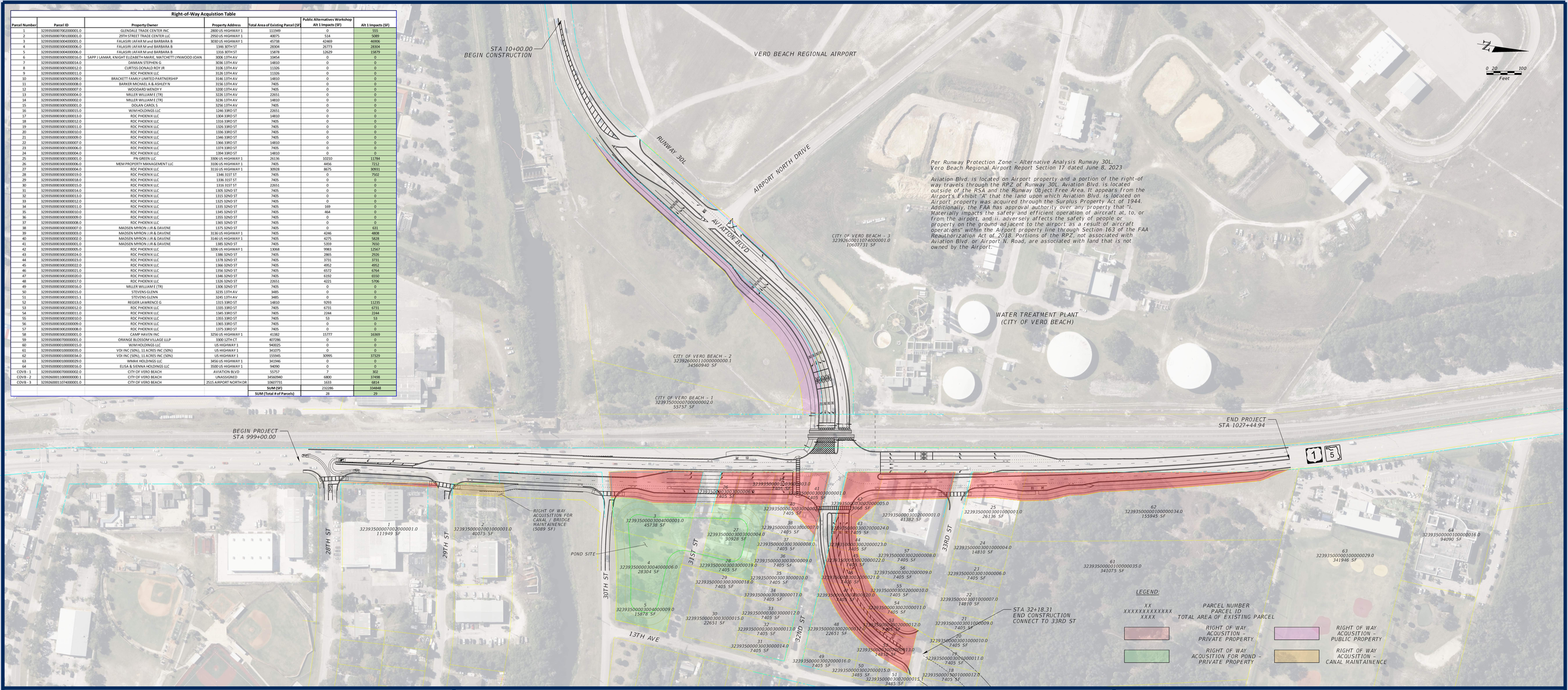
1

Draft Alternative

April 2nd, 2024

Right-of-Way Acquistion Table

Parcel Number	Parcel ID	Property Owner	Property Address	Total Area of Existing Parcel (SF)	Public Alternatives Workshop Alt 1 Impacts (SF)	Alt 1 Impacts (SF)
1	3239350000700200001.0	GLENDALE TRADE CENTER INC	2800 US HIGHWAY 1	111949	0	555
2	3239350000700100001.0	29TH STREET TRADE CENTER LLC	2950 US HIGHWAY 1	40075	514	5089
3	3239350000300400001.0	FALASIRI JAFAR M and BARBARA B	3030 US HIGHWAY 1	45738	42469	46906
4	3239350000300440006.0	FALASIRI JAFAR M and BARBARA B	1346 30TH ST	28304	26773	28304
5	3239350000300440006.0	FALASIRI JAFAR M and BARBARA B	1316 30TH ST	15878	12629	15879
6	3239350000300500016.0	SAPP J LAMAR, KNIGHT ELIZABETH MARIE, MATCHETT LYNWOOD JOAN	3006 13TH AV	10454	0	0
7	3239350000300500014.0	DAMIAN STEPHEN G	3036 13TH AV	14810	0	0
8	3239350000300500012.0	CURTISS DONALD ROY JR	3106 13TH AV	11326	0	0
9	3239350000300500011.0	RDC PHOENIX LLC	3126 13TH AV	11326	0	0
10	3239350000300500009.0	BRACKETT FAMILY LIMITED PARTNERSHIP	3146 13TH AV	14810	0	0
11	3239350000300500008.0	BARKER MICHAEL A & ASHLEY N	3156 13TH AV	7405	0	0
12	3239350000300500007.0	WOODARD WENDY Y	3200 13TH AV	7405	0	0
13	3239350000300500004.0	MILLER WILLIAM E (TR)	3226 13TH AV	22651	0	0
14	3239350000300500002.0	MILLER WILLIAM E (TR)	3236 13TH AV	14810	0	0
15	3239350000300500001.0	DOLAN CAROL S	3256 13TH AV	7405	0	0
16	3239350000300300015.0	WJM HOLDINGS LLC	1246 33RD ST	22651	0	0
17	3239350000300100013.0	RDC PHOENIX LLC	1304 33RD ST	14810	0	0
18	3239350000300100012.0	RDC PHOENIX LLC	1316 33RD ST	7405	0	0
19	3239350000300100011.0	RDC PHOENIX LLC	1326 33RD ST	7405	0	0
20	3239350000300100010.0	RDC PHOENIX LLC	1336 33RD ST	7405	0	0
21	3239350000300100009.0	RDC PHOENIX LLC	1346 33RD ST	7405	0	0
22	3239350000300100007.0	RDC PHOENIX LLC	1360 33RD ST	14810	0	0
23	3239350000300100006.0	RDC PHOENIX LLC	1374 33RD ST	7405	0	0
24	3239350000300100004.0	RDC PHOENIX LLC	1394 33RD ST	14810	0	0
25	3239350000300100001.0	PN GREEN LLC	3306 US HIGHWAY 1	26136	10210	11784
26	3239350000300300006.0	MEM PROPERTY MANAGEMENT LLC	3106 US HIGHWAY 1	7405	4456	7212
27	3239350000300300004.0	RDC PHOENIX LLC	3116 US HIGHWAY 1	30928	8675	30931
28	3239350000300300019.0	RDC PHOENIX LLC	1346 31ST ST	7405	0	7502
29	3239350000300300018.0	RDC PHOENIX LLC	1336 31ST ST	7405	0	0
30	3239350000300300015.0	RDC PHOENIX LLC	1316 31ST ST	22651	0	0
31	3239350000300300014.0	RDC PHOENIX LLC	1305 32ND ST	7405	0	0
32	3239350000300300013.0	RDC PHOENIX LLC	1315 32ND ST	7405	0	0
33	3239350000300300012.0	RDC PHOENIX LLC	1325 32ND ST	7405	0	0
34	3239350000300300011.0	RDC PHOENIX LLC	1335 32ND ST	7405	169	0
35	3239350000300300010.0	RDC PHOENIX LLC	1345 32ND ST	7405	464	0
36	3239350000300300009.0	RDC PHOENIX LLC	1355 32ND ST	7405	0	0
37	3239350000300300008.0	RDC PHOENIX LLC	1365 32ND ST	7405	0	0
38	3239350000300300007.0	MADSEN MYRON J JR & DAVENE	1375 32ND ST	7405	0	631
39	3239350000300300003.0	MADSEN MYRON J JR & DAVENE	3136 US HIGHWAY 1	7405	4246	4808
40	3239350000300300002.0	MADSEN MYRON J JR & DAVENE	3146 US HIGHWAY 1	7405	4275	5828
41	3239350000300300001.0	MADSEN MYRON J JR & DAVENE	1385 32ND ST	7405	5359	7650
42	3239350000300200005.0	RDC PHOENIX LLC	3206 US HIGHWAY 1	13068	9983	12567
43	3239350000300200024.0	RDC PHOENIX LLC	1386 32ND ST	7405	2865	2926
44	3239350000300200023.0	RDC PHOENIX LLC	1378 32ND ST	7405	3731	3731
45	3239350000300200022.0	RDC PHOENIX LLC	1366 32ND ST	7405	4952	4952
46	3239350000300200021.0	RDC PHOENIX LLC	1356 32ND ST	7405	6572	6764
47	3239350000300200020.0	RDC PHOENIX LLC	1346 32ND ST	7405	6192	6550
48	3239350000300200017.0	RDC PHOENIX LLC	1326 32ND ST	22651	4221	5706
49	3239350000700400016.0	MILLER WILLIAM E (TR)	1306 32ND ST	7405	0	0
50	3239350000300200015.0	STEVENS GLENN	3235 13TH AV	3485	0	0
51	3239350000300200015.1	STEVENS GLENN	3245 13TH AV	3485	0	0
52	3239350000300200013.0	REGIER LAWRENCE G	1315 33RD ST	14810	9293	11235
53	3239350000300200012.0	RDC PHOENIX LLC	1335 33RD ST	7405	6731	6731
54	3239350000300200011.0	RDC PHOENIX LLC	1345 33RD ST	7405	2244	2244
55	3239350000300200010.0	RDC PHOENIX LLC	1355 33RD ST	7405	53	53
56	3239350000300200009.0	RDC PHOENIX LLC	1365 33RD ST	7405	0	0
57	3239350000300200008.0	RDC PHOENIX LLC	1375 33RD ST	7405	0	0
58	3239350000300200001.0	CAMP HAVEN INC	3256 US HIGHWAY 1	41382	15777	16369
59	3239350000700400001.0	ORANGE BLOSSOM VILLAGE LLLP	3300 12TH CT	4077286	0	0
60	3239350000100000015.0	WJM HOLDINGS LLC	US HIGHWAY 1	940025	0	0
61	3239350000100000035.0	VDI INC (50%), 11 ACRES INC (50%)	US HIGHWAY 1	341075	0	0
62	3239350000100000034.0	VDI INC (50%), 11 ACRES INC (50%)	US HIGHWAY 1	1559345	30995	37329
63	3239350000100000029.0	WMAK HOLDINGS LLC	3456 US HIGHWAY 1	341946	0	0
64	3239350000100000016.0	ELISA & SIENNA HOLDINGS LLC	3500 US HIGHWAY 1	94090	0	0
COVB - 1	3239350000700400002.0	CITY OF VERO BEACH	AVIATION BLVD	55757	7	302
COVB - 2	3239260001100000000.1	CITY OF VERO BEACH	UNASSIGNED	34560940	6800	37498
COVB - 3	3239260001107400001.0	CITY OF VERO BEACH	2515 AIRPORT NORTH DR	10607731	1633	6814
				SUM (SF)	232286	334848
				SUM (Total # of Parcels)	28	29



Preferred Alternative

FDOT

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

1

Right of Way Acquisition

April 2nd, 2024

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

TYPICAL SECTION PACKAGE

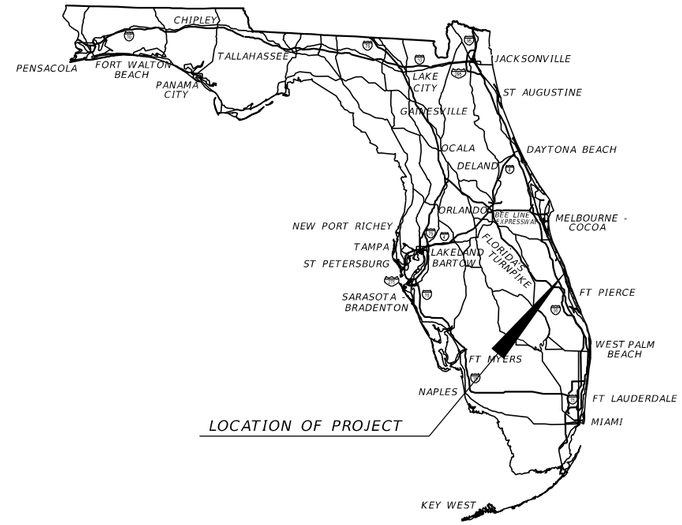
FINANCIAL PROJECT ID 441693-1-22-02

INDIAN RIVER COUNTY (88010000)

STATE ROAD NO. 5

SR-5/US-1 AT AVIATION BOULEVARD

PROJECT LOCATION URL:	http://tinyurl.com/44169312202
PROJECT LIMITS:	BEGIN MP 6.944 - END MP 7.690
EXCEPTIONS:	NONE
BRIDGE LIMITS:	BR#880085 MP 7.051 - MP 7.073
RAILROAD CROSSING:	273047Y



FDOT DISTRICT DESIGN ENGINEER

FDOT DISTRICT TRAFFIC OPERATIONS ENGINEER

JOHN OLSON, P.E.
CONCURRING WITH:
TYPICAL SECTION ELEMENTS
TARGET SPEED
DESIGN & POSTED SPEEDS

JONATHAN M. OVERTON, P.E.
CONCURRING WITH:
TARGET SPEED
DESIGN & POSTED SPEEDS

FDOT DISTRICT INTERMODAL SYSTEMS DEVELOPMENT MANAGER

FDOT DISTRICT STRUCTURES DESIGN ENGINEER

CESAR J. MARTINEZ, P.E.
CONCURRING WITH:
CONTEXT CLASSIFICATION
TARGET SPEED

RAMON A. OTERO, P.E.
CONCURRING WITH:
TYPICAL SECTION ELEMENTS

CITY OF VERO BEACH
DIRECTOR OF PUBLIC WORKS

INDIAN RIVER COUNTY
ACTING PUBLIC WORKS DIRECTOR

MATTHEW T. MITTS, P.E.
CONCURRING WITH:
TYPICAL SECTION ELEMENTS

KIRSTIN LEINDECKER, P.E.
CONCURRING WITH:
TYPICAL SECTION ELEMENTS

APPROVED BY:

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ON THE DATE ADJACENT TO THE SEAL

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WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411
CERTIFICATE OF AUTHORIZATION:
WILLIAM EVANS, P.E. NO.: 45207
VENDOR NO.: F650271367

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

INDEX OF SHEETS

SHEET NO	SHEET DESCRIPTION
1	COVER SHEET
2	TYPICAL SECTION NO. 1
3	TYPICAL SECTION NO. 2
4	TYPICAL SECTION NO. 3
5	TYPICAL SECTION NO. 4

SHEET NO.
1

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

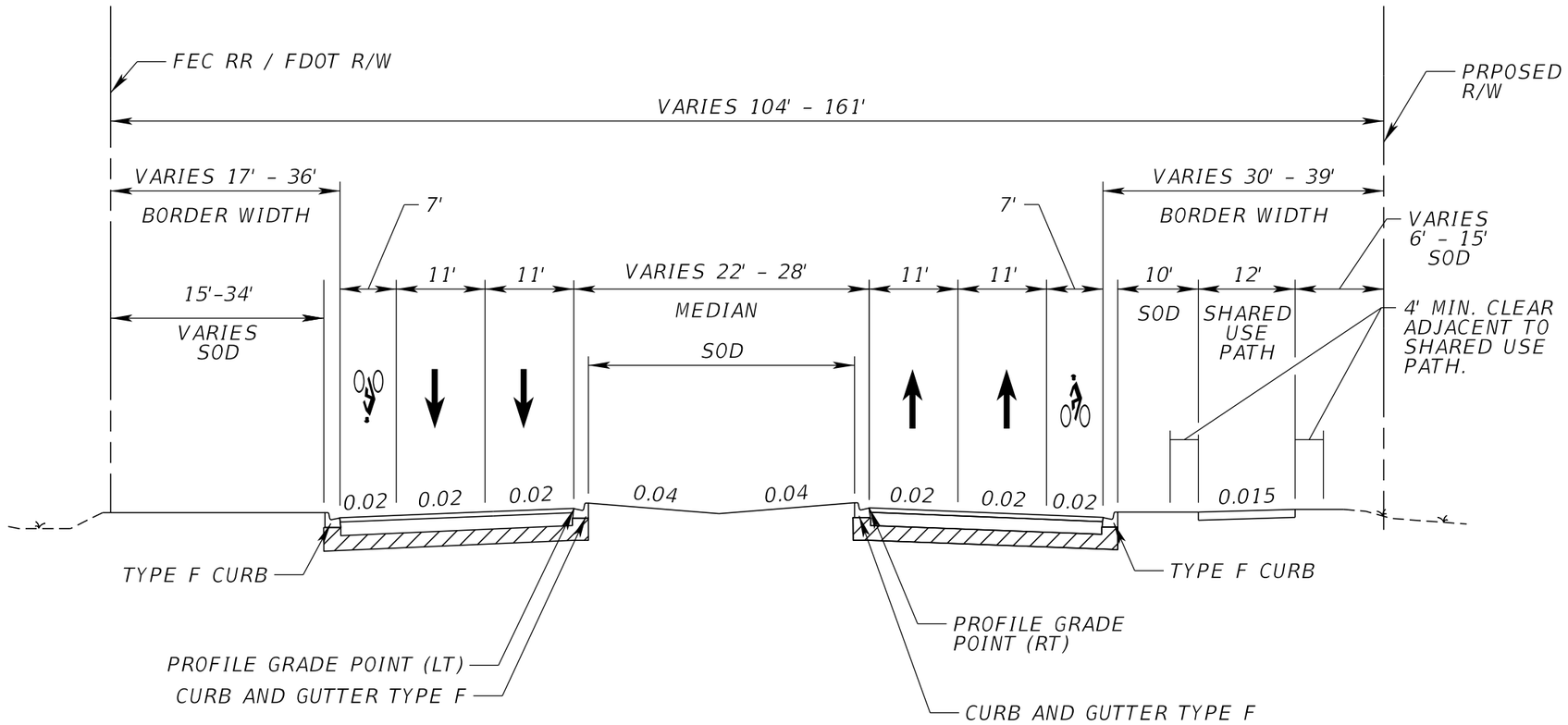
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
(X) 5 - RESTRICTIVE w/245 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 1



TYPICAL SECTION
SR 5 / US 1
MP 7.016 TO MP 7.044
MP 7.079 TO MP 7.287

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 34200
ESTIMATED OPENING YEAR = 2025 AADT = 30800
ESTIMATED DESIGN YEAR = 2045 AADT = 45800
K = 9% D = 52.3% T = 4.3% (24 HOUR)
DESIGN HOUR T = 2.2%
TARGET SPEED = 45 MPH
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
EXISTING SPEED = 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
441693-1-22-02	2

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

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

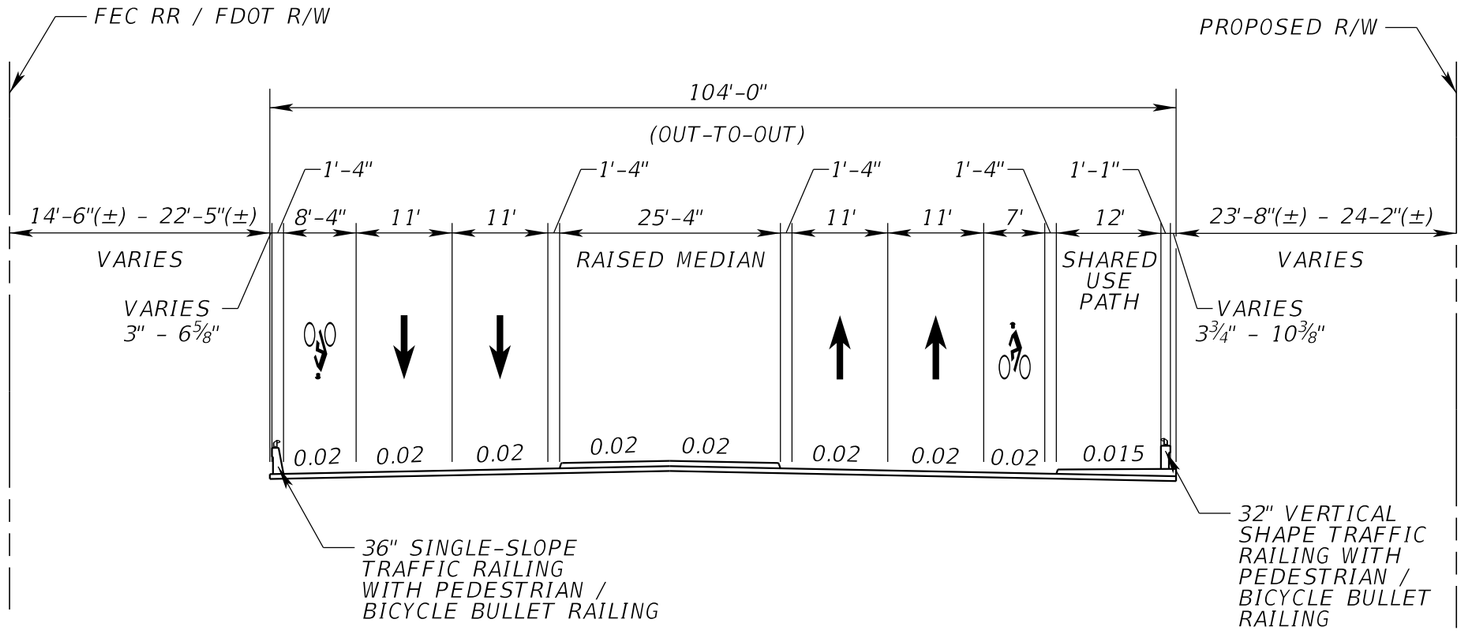
( )	1 - FREEWAY
( )	2 - RESTRICTIVE w/Service Roads
( )	3 - RESTRICTIVE w/660 ft. Connection Spacing
( )	4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
(X)	5 - RESTRICTIVE w/245 ft. Connection Spacing
( )	6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( )	7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 2



TYPICAL SECTION
SR 5 / US 1
MP 7.044 TO MP 7.079

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 34200
ESTIMATED OPENING YEAR = 2025 AADT = 30800
ESTIMATED DESIGN YEAR = 2045 AADT = 45800
K = 9% D = 52.3% T = 4.3% (24 HOUR)
DESIGN HOUR T = 2.2%
TARGET SPEED = 45 MPH
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH
EXISTING SPEED = 45 MPH

FINANCIAL PROJECT ID	SHEET NO.
441693-1-22-02	3

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

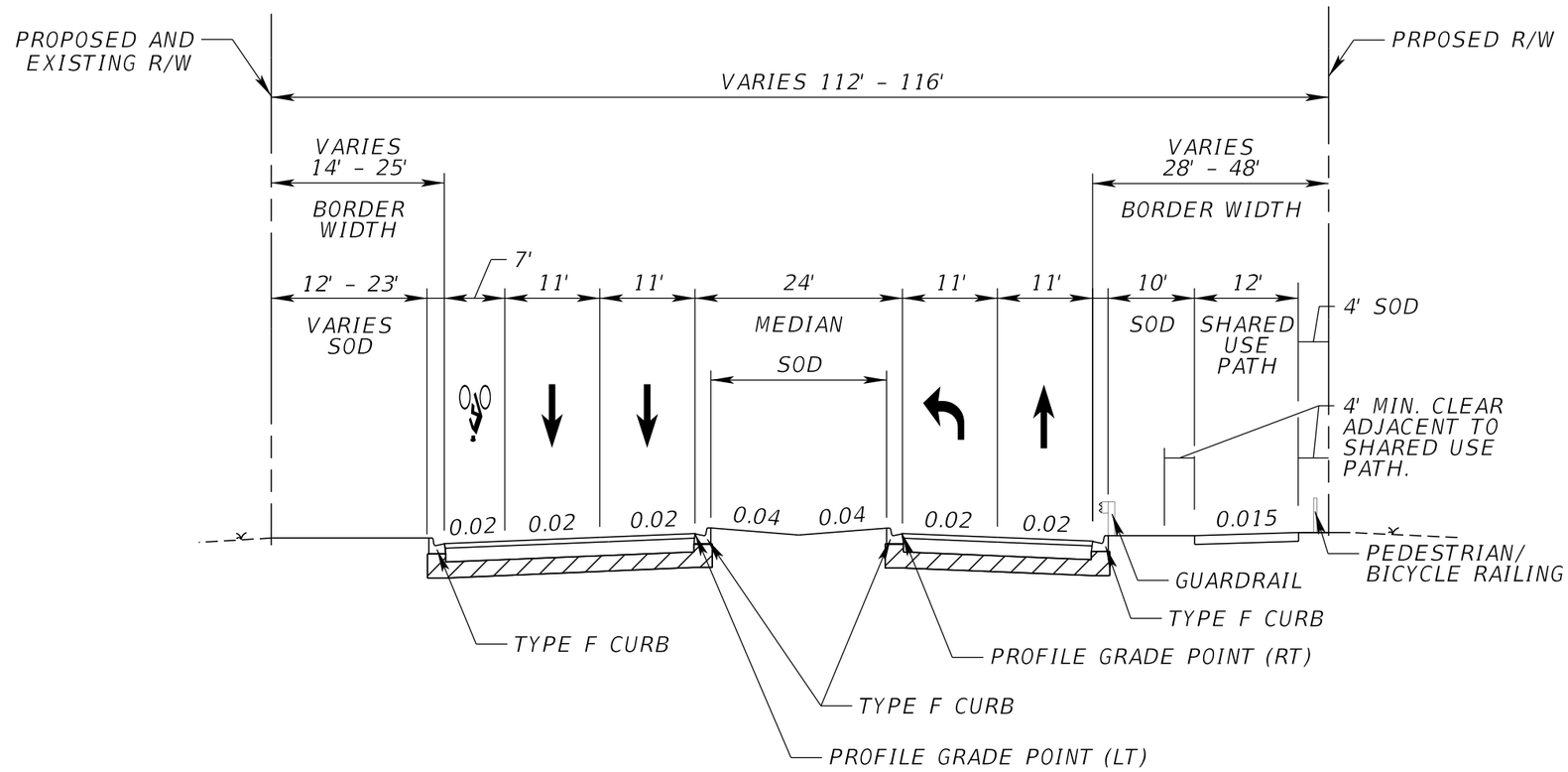
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 3



TYPICAL SECTION
AVIATION BLVD
MP 2.736 TO MP 3.202

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 12000
ESTIMATED OPENING YEAR = 2025 AADT = 13600
ESTIMATED DESIGN YEAR = 2045 AADT = 20400
K = 9% D = 51.9% T = 7.9% (24 HOUR)
DESIGN HOUR T = 3.9%
TARGET SPEED = 30 MPH
DESIGN SPEED = 30 MPH
POSTED SPEED = 30 MPH
EXISTING SPEED = 30 MPH

FINANCIAL PROJECT ID	SHEET NO.
441693-1-22-02	4

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PROJECT CONTROLS

CONTEXT CLASSIFICATION

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

FUNCTIONAL CLASSIFICATION

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

HIGHWAY SYSTEM

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

ACCESS CLASSIFICATION

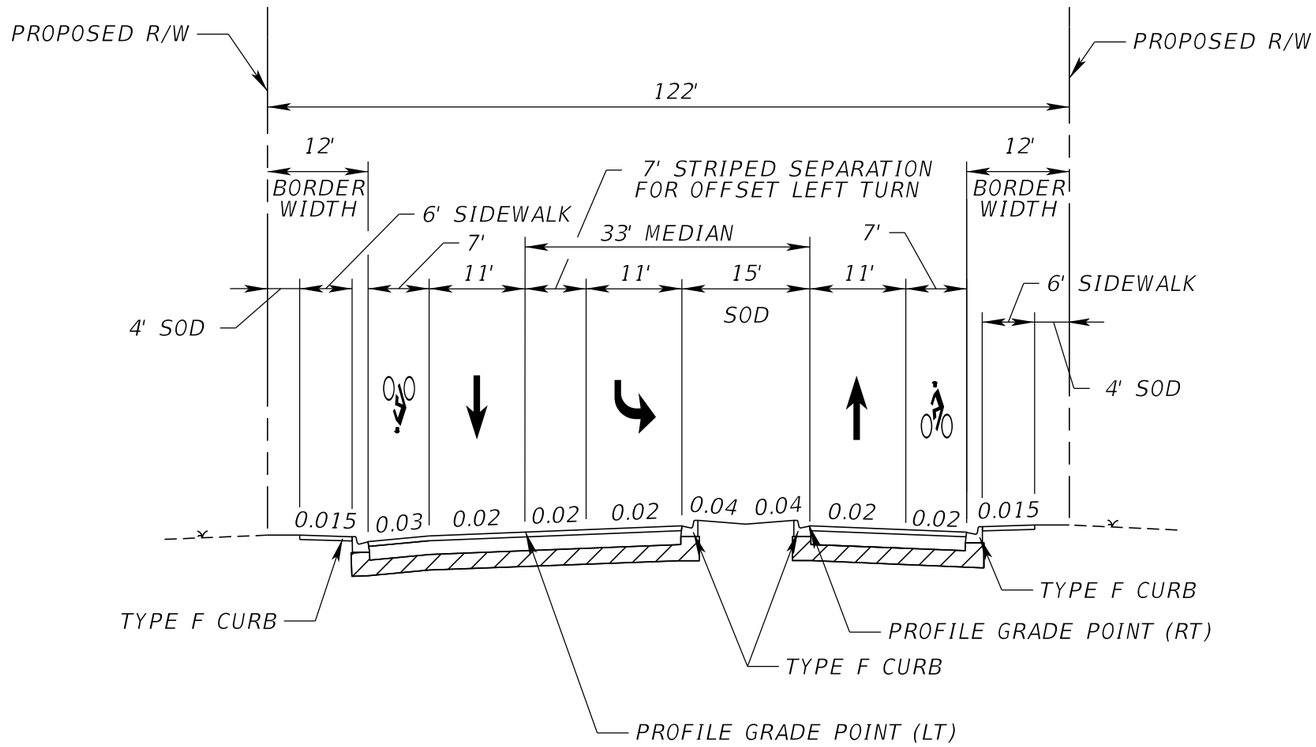
( ) 1 - FREEWAY
( ) 2 - RESTRICTIVE w/Service Roads
( ) 3 - RESTRICTIVE w/660 ft. Connection Spacing
( ) 4 - NON-RESTRICTIVE w/2640 ft. Signal Spacing
( ) 5 - RESTRICTIVE w/440 ft. Connection Spacing
( ) 6 - NON-RESTRICTIVE w/1320 ft. Signal Spacing
( ) 7 - BOTH MEDIAN TYPES

CRITERIA

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

POTENTIAL EXCEPTIONS AND VARIATIONS RELATED TO TYPICAL SECTION:

TYPICAL SECTION No. 4



TYPICAL SECTION
AVIATION BLVD
MP 3.244 TO MP 3.346

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = N/A
ESTIMATED OPENING YEAR = 2025 AADT = N/A
ESTIMATED DESIGN YEAR = 2045 AADT = 11,000
K = 9% D = 51.9% T = 7.9% (24 HOUR)
DESIGN HOUR T = 3.9%
TARGET SPEED = 30 MPH
DESIGN SPEED = 30 MPH
POSTED SPEED = 30 MPH
EXISTING SPEED = 30 MPH

FINANCIAL PROJECT ID	SHEET NO.
441693-1-22-02	5

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PD&E PREFERRED ALTERNATIVE PLANS

ROADWAY PLANS
STRUCTURE PLANS

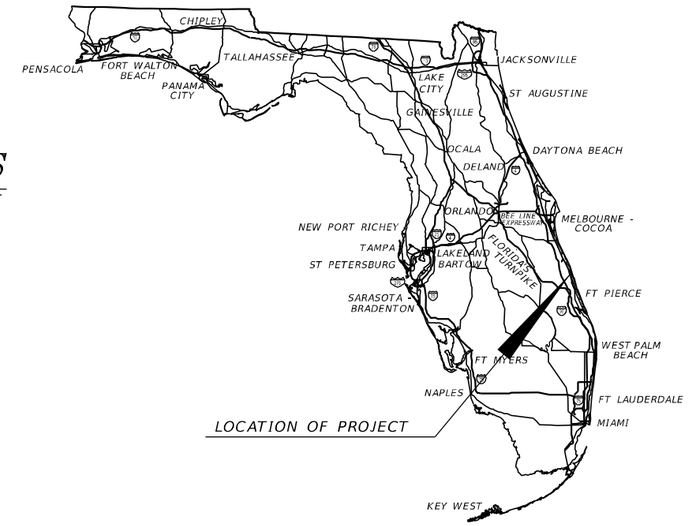
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

PD&E PREFERRED ALTERNATIVE PLANS

FINANCIAL PROJECT ID 441693-1-22-02,

(FEDERAL FUNDS)

INDIAN RIVER COUNTY (88010000)
STATE ROAD NO. 5
US-1 AT AVIATION BOULEVARD



INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2 - 5	TYPICAL SECTIONS
6 - 14	ROADWAY PLANS
15 - 23	ROADWAY PROFILES
24 - 27	TEMPORARY TRAFFIC CONTROL PLANS

PROJECT LOCATION URL:	http://tinyurl.com/44169312202
PROJECT LIMITS:	BEGIN MP 6.944 - END MP 7.690
EXCEPTIONS:	NONE
BRIDGE LIMITS:	BR#880085 MP 7.051 - MP 7.073
RAILROAD CROSSING:	273047Y

GOVERNING STANDARD PLANS:

Florida Department of Transportation, FY2023-24 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, FY 2023-24 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

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ROADWAY PLANS
ENGINEER OF RECORD:

WILLIAM EVANS, P.E. NO.: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411
(561) 687-2220
CONTRACT NO.: CAI28
VENDOR NO.: 65-0271367

FDOT PROJECT MANAGER:

VANDANA NAGOLE, P.E.

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
-	-	1

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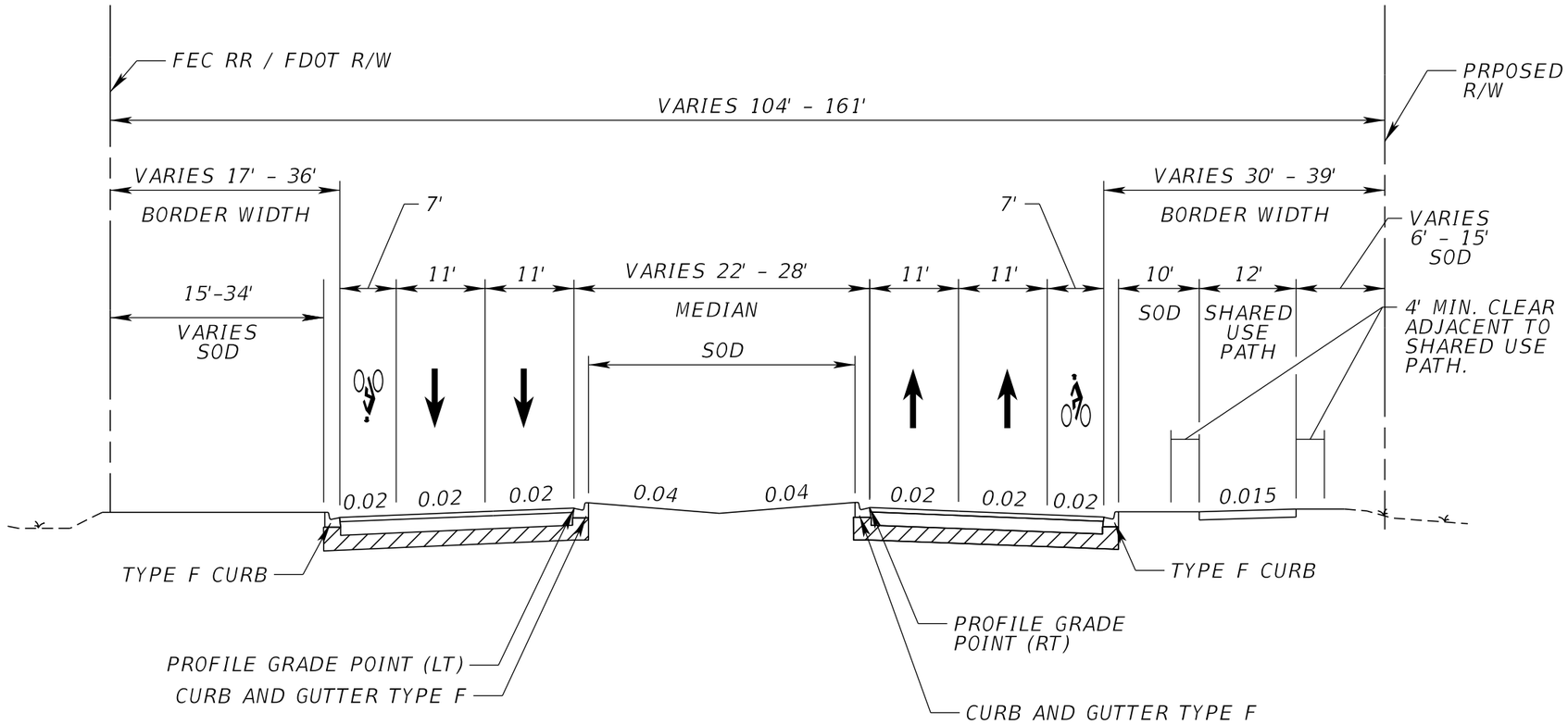

SR 5 / US 1
STA. 1000+00.00 TO STA. 1005+57.00
STA. 1006+84.00 TO STA. 1013+40.00

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 34200
ESTIMATED OPENING YEAR = 2025 AADT = 30800
ESTIMATED DESIGN YEAR = 2045 AADT = 45800
K = 9% D = 52.3% T = 4.3% (24 HOUR)
DESIGN HOUR T = 2.2%
DESIGN SPEED = 45 MPH
CONTEXT CLASSIFICATION = C4

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TYPICAL SECTIONS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		2
					SR 5	INDIAN RIVER	441693-1-22-02		

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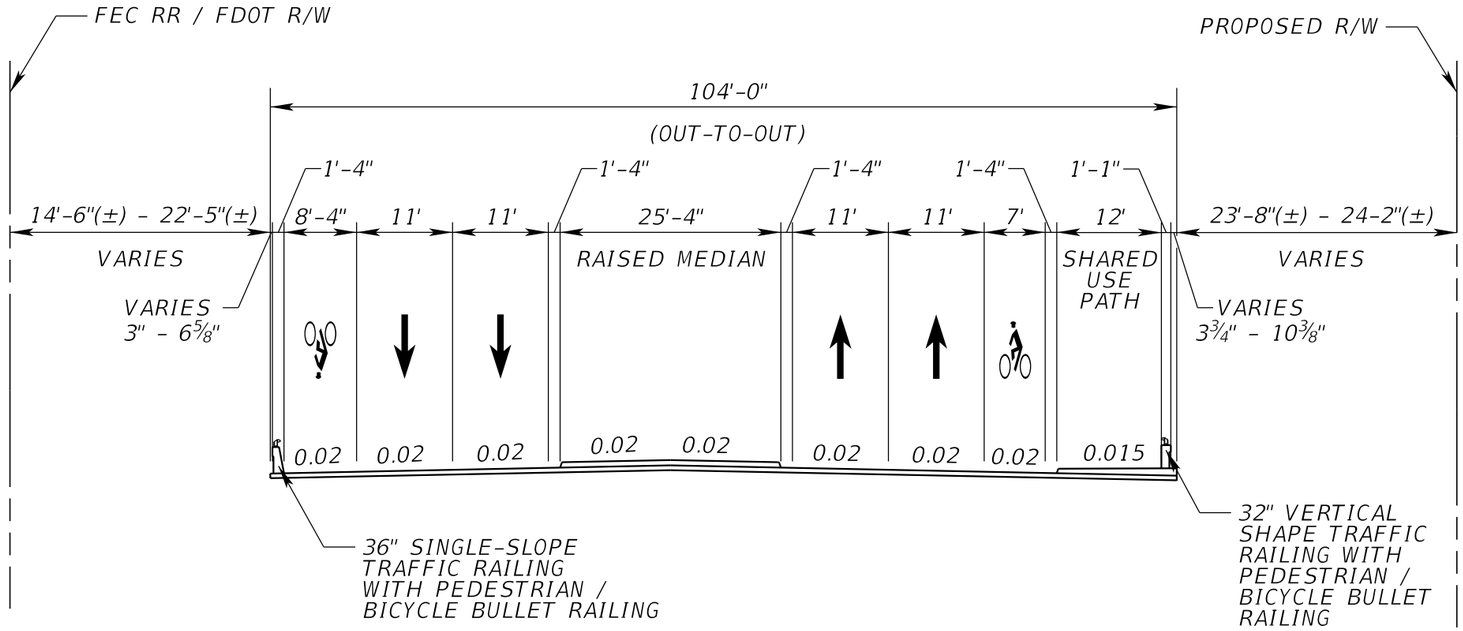

SR 5 / US 1

STA. 1005+57.00 TO STA. 1006+84.00

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 34200
ESTIMATED OPENING YEAR = 2025 AADT = 30800
ESTIMATED DESIGN YEAR = 2045 AADT = 45800
K = 9% D = 52.3% T = 4.3% (24 HOUR)
DESIGN HOUR T = 2.2%
DESIGN SPEED = 45 MPH
CONTEXT CLASSIFICATION = C4

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TYPICAL SECTIONS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		3
					SR 5	INDIAN RIVER	441693-1-22-02		

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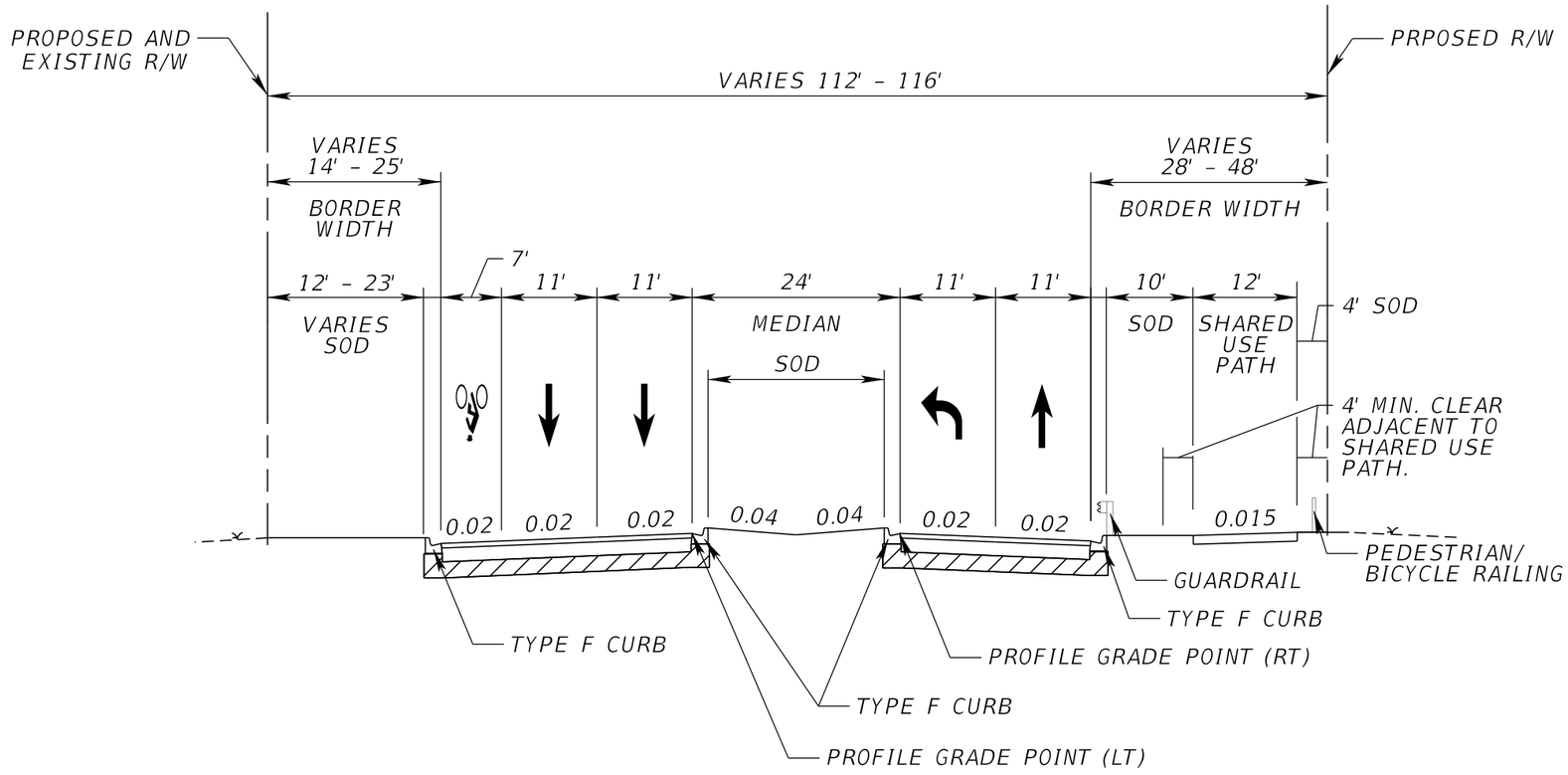

AVIATION BLVD

STA. 16+60.00 TO STA. 24+60.00

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 12000
ESTIMATED OPENING YEAR = 2025 AADT = 13600
ESTIMATED DESIGN YEAR = 2045 AADT = 20400
K = 9% D = 51.9% T = 7.9% (24 HOUR)
DESIGN HOUR T = 3.9%
DESIGN SPEED = 30 MPH
CONTEXT CLASSIFICATION = C3C

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

TYPICAL SECTIONS

SHEET NO. 4

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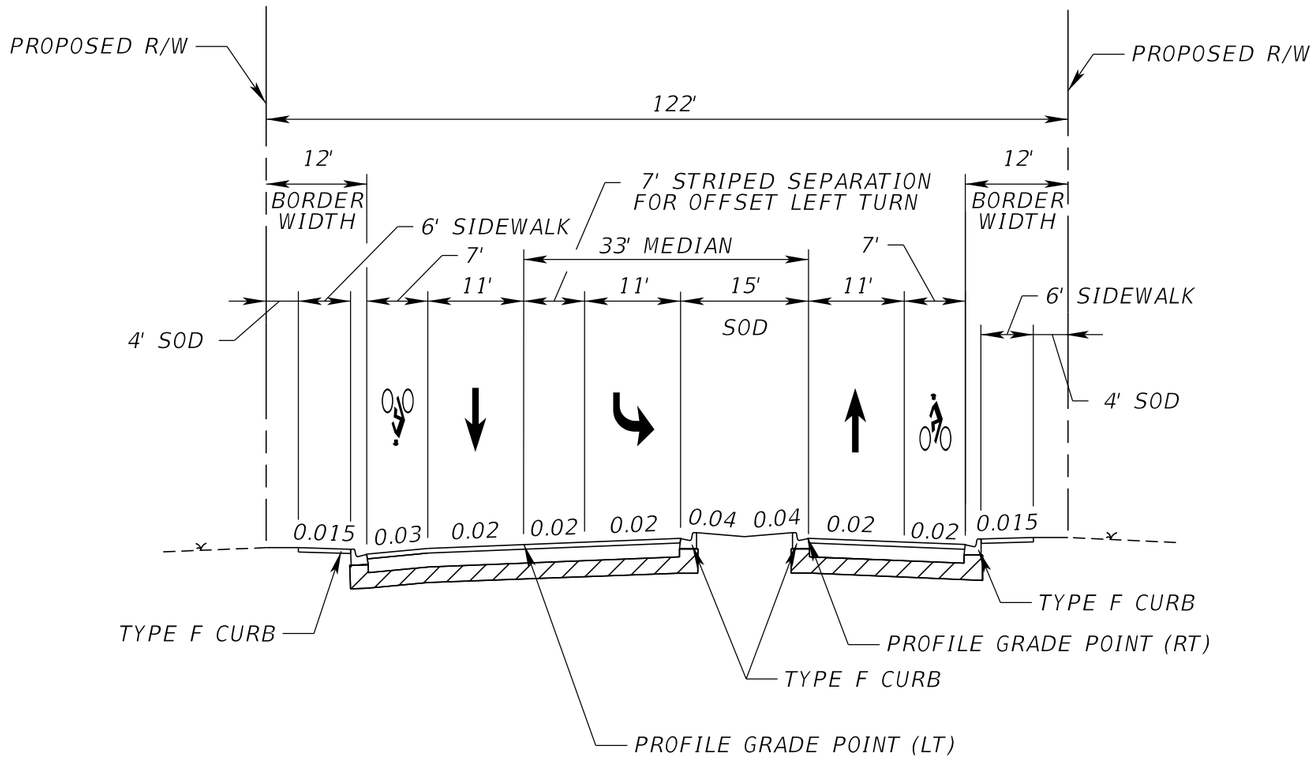

AVIATION BLVD

STA. 27+20.00 TO STA. 32+00.00

NOT TO SCALE

TRAFFIC DATA

CURRENT YEAR = 2021 AADT = 12000
ESTIMATED OPENING YEAR = 2025 AADT = N/A
ESTIMATED DESIGN YEAR = 2045 AADT = 11000
K = 9% D = 51.9% T = 7.9% (24 HOUR)
DESIGN HOUR T = 3.9%
DESIGN SPEED = 30 MPH
CONTEXT CLASSIFICATION = C4

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TYPICAL SECTIONS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		5
					SR 5	INDIAN RIVER	441693-1-22-02		

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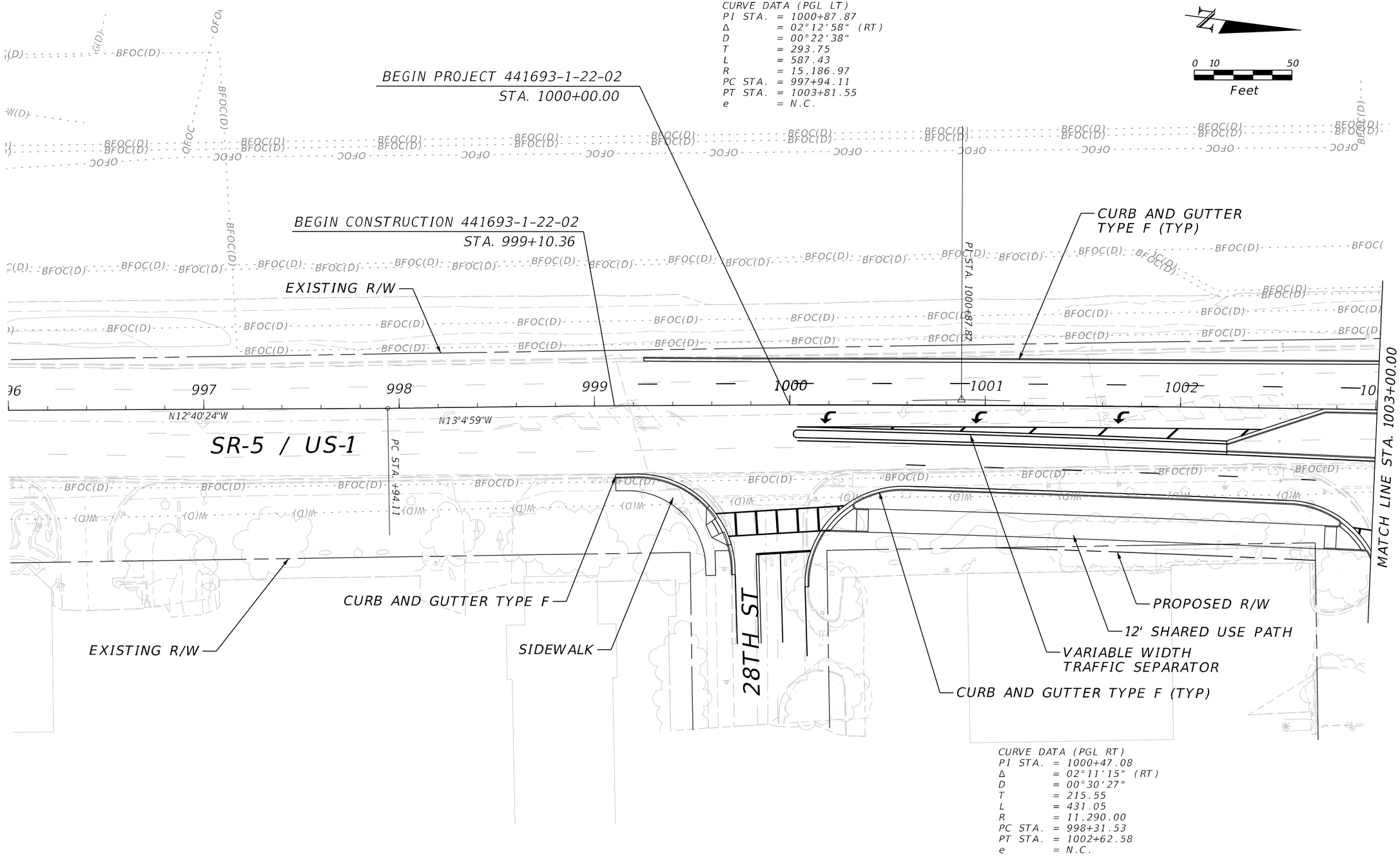

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		6
					SR 5	INDIAN RIVER	441693-1-22-02		

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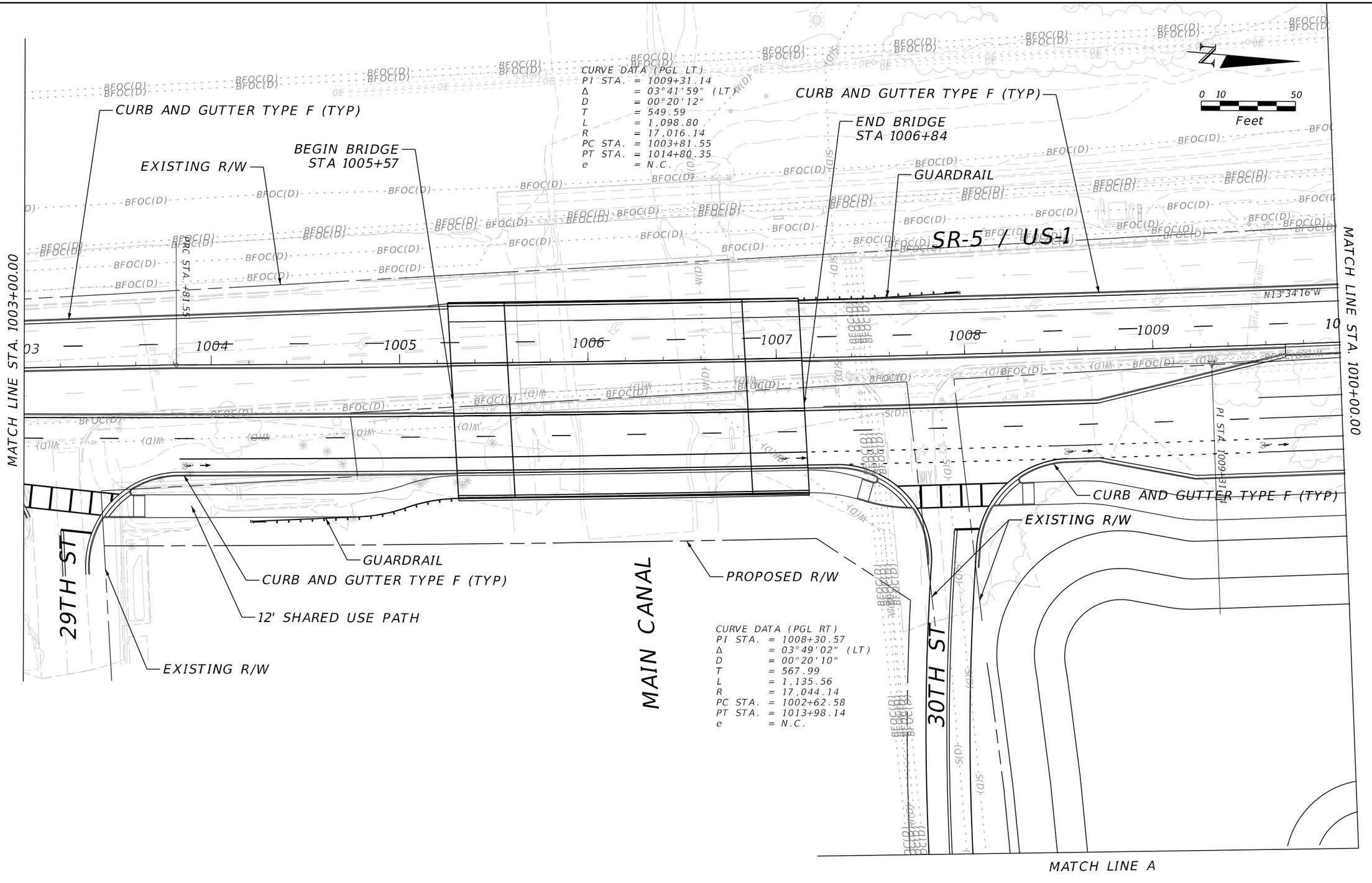

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		7
					SR 5	INDIAN RIVER	441693-1-22-02		

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REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		8
					SR 5	INDIAN RIVER	441693-1-22-02		

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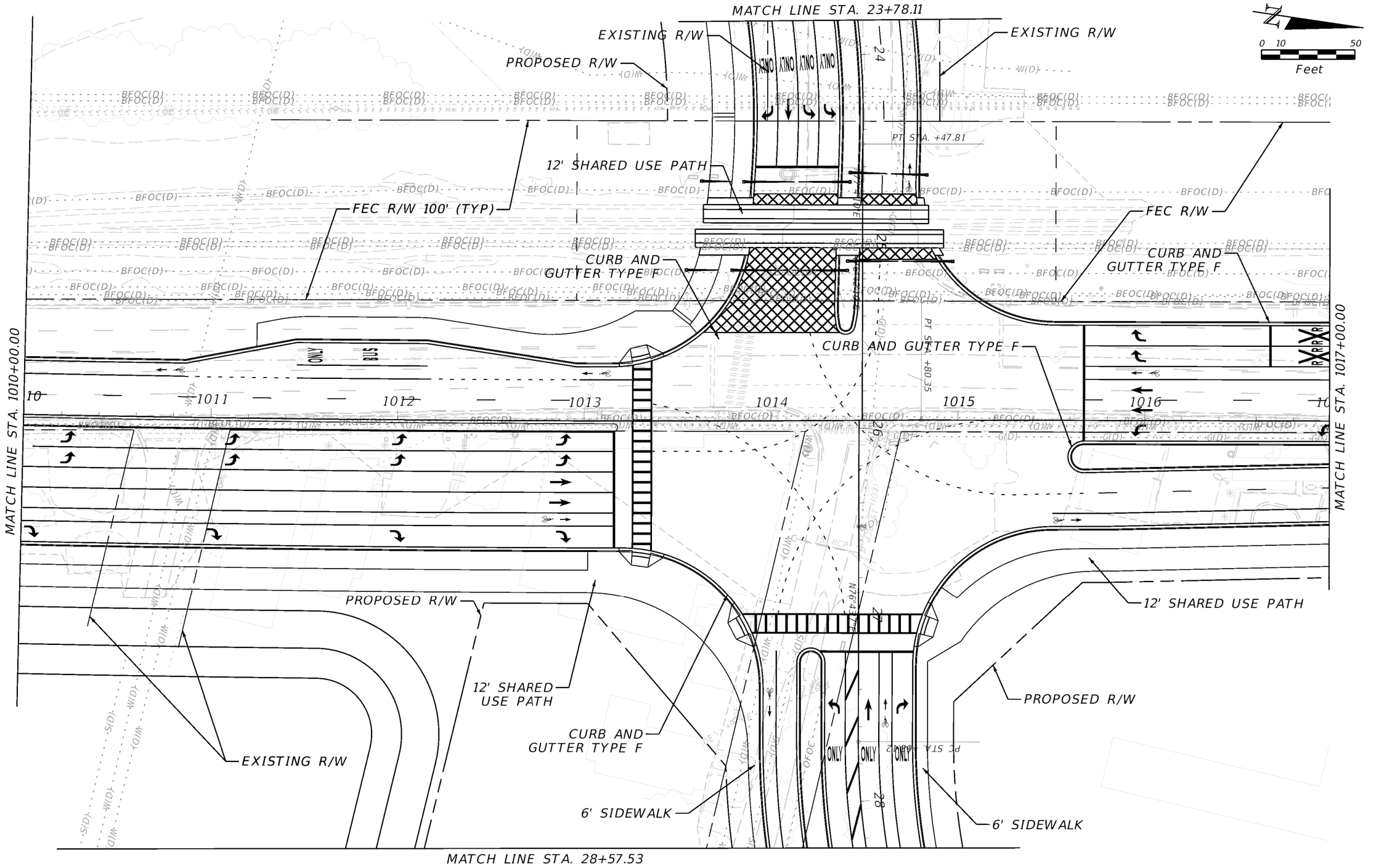

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 5	INDIAN RIVER	441693-1-22-02		5

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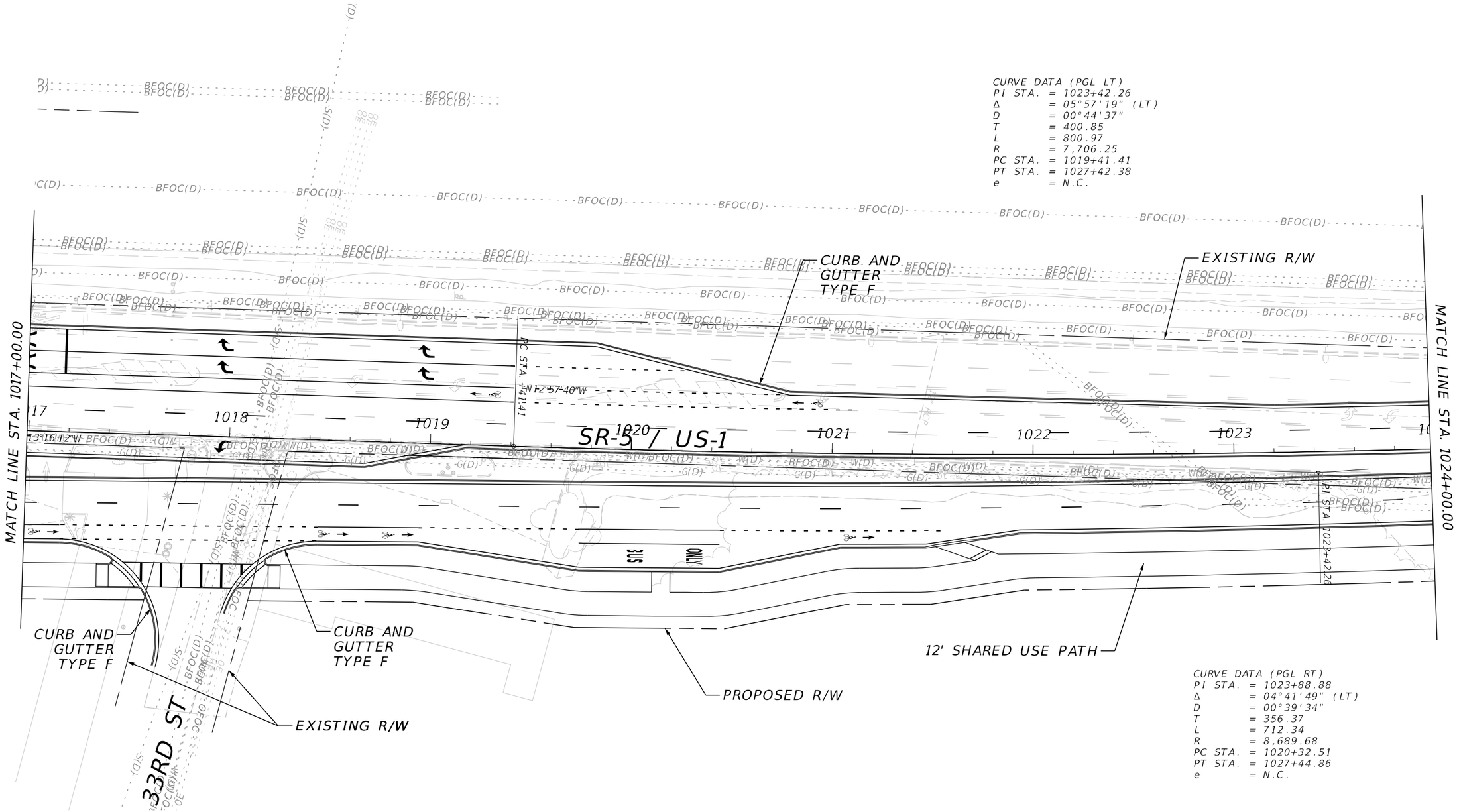

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	ROADWAY PLANS	10
					SR 5	INDIAN RIVER	441693-1-22-02		

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0 10 50
Feet

END PROJECT 441693-1-22-02
END CONSTRUCTION
STA. 1027+44.94

CURB AND GUTTER TYPE F

EXISTING R/W

MATCH LINE STA. 1024+00.00

SR-5 / US-1

1024 1025 1026 1027

CURB AND GUTTER TYPE F

12' SHARED USE PATH

PROPOSED R/W

EXISTING R/W

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		11
					SR 5	INDIAN RIVER	441693-1-22-02		

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END CONSTRUCTION 441693-1-22-02
STA. 10+00.00

CURVE DATA (PGL LT)
PI STA. = 12+29.11
Δ = 38°35'21" (LT)
D = 08°45'19"
T = 229.11
L = 440.76
R = 654.42
PC STA. = 10+00.00
PT STA. = 14+40.76
e = R.C.

CURB AND GUTTER TYPE F (TYP)

EXISTING R/W

PT STA. 14+40.76

PI STA. 12+29.11

AVIATION BLVD

ONLY

GUARDRAIL

PROPOSED R/W

PEDESTRIAN RAIL

12' SHARED USE PATH

EXISTING R/W

CURVE DATA
PI STA. = 12+92.61
Δ = 37°06'56" (LT)
D = 07°14'23"
T = 265.69
L = 512.66
R = 791.40
PC STA. = 10+26.92
PT STA. = 15+39.58
e = R.C.

0 10 50
Feet

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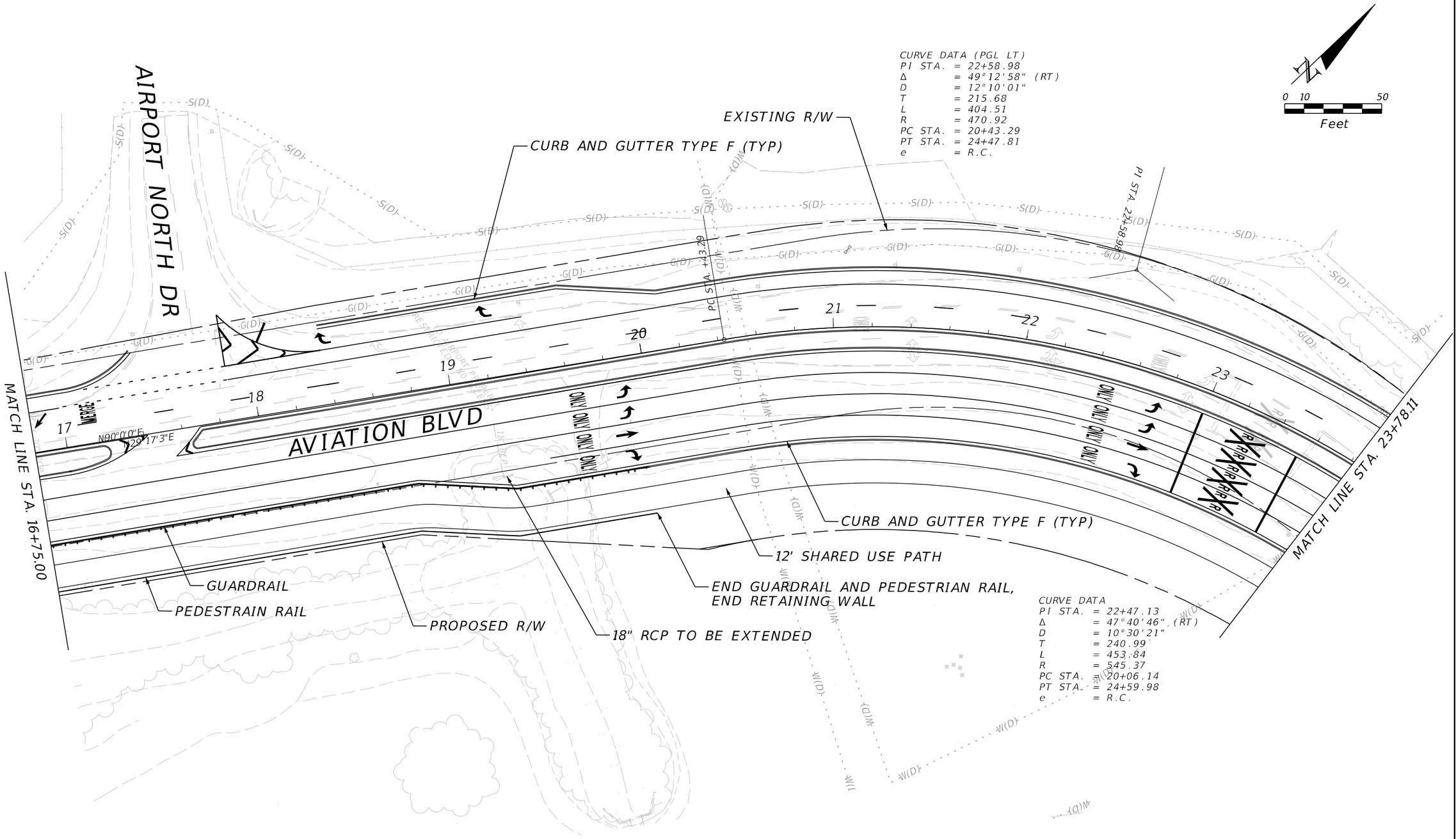
REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		12
					SR 5	INDIAN RIVER	441693-1-22-02		



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

ROADWAY PLANS

SHEET NO. 13

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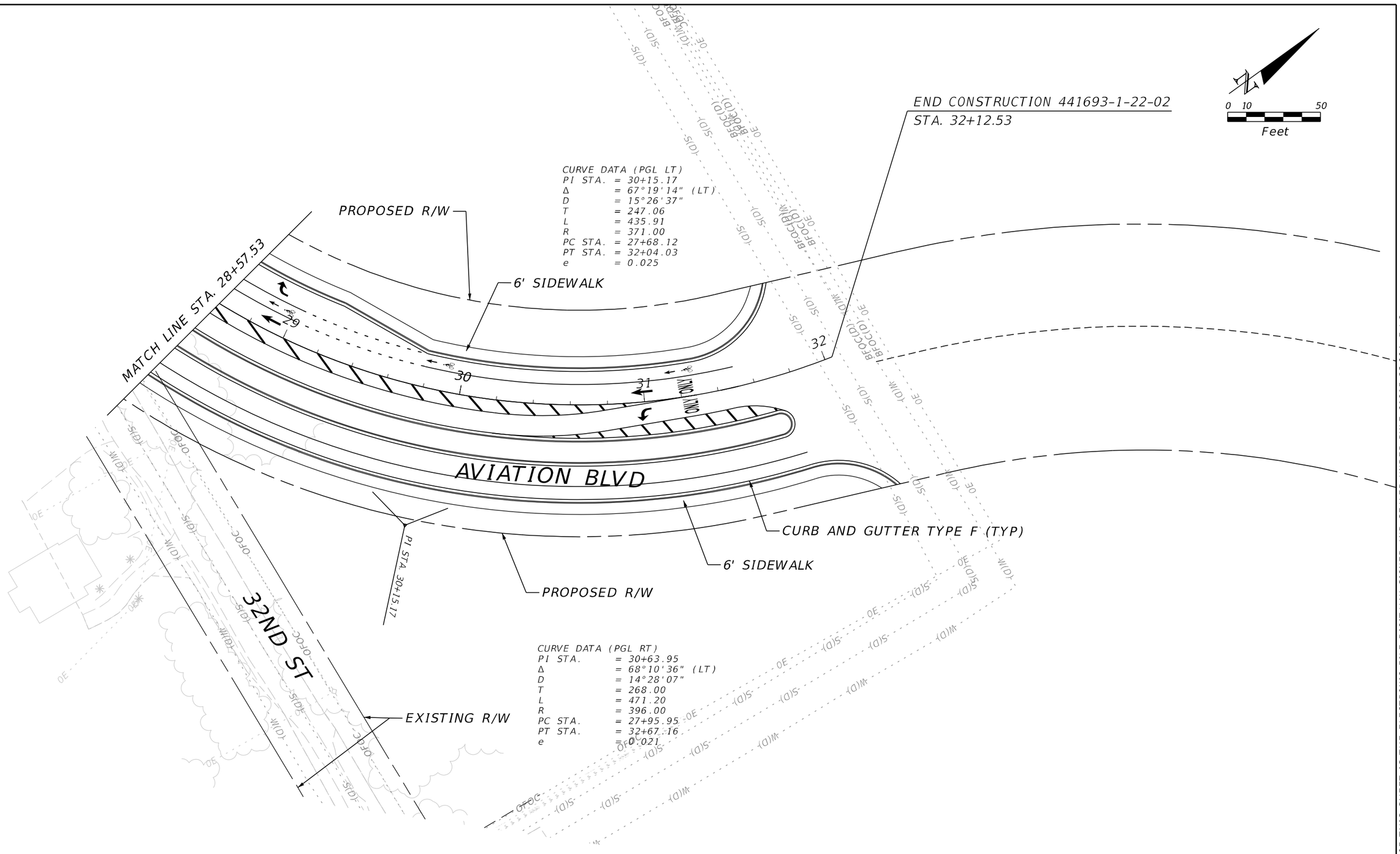

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	ROADWAY PLANS	14
					SR 5	INDIAN RIVER	441693-1-22-02		

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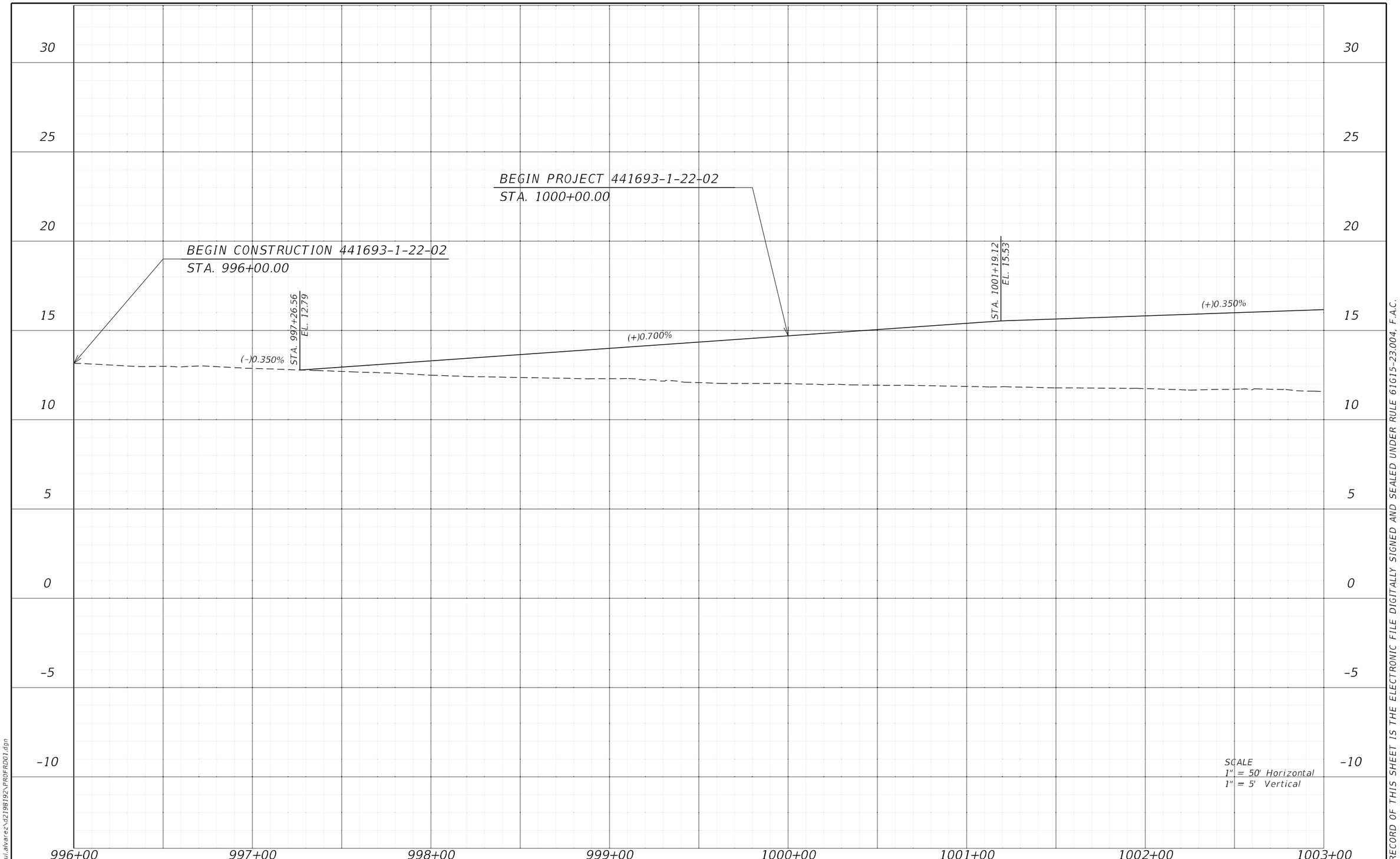

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	ROADWAY PROFILES US-1	15
					SR 5	INDIAN RIVER	441693-1-22-02		

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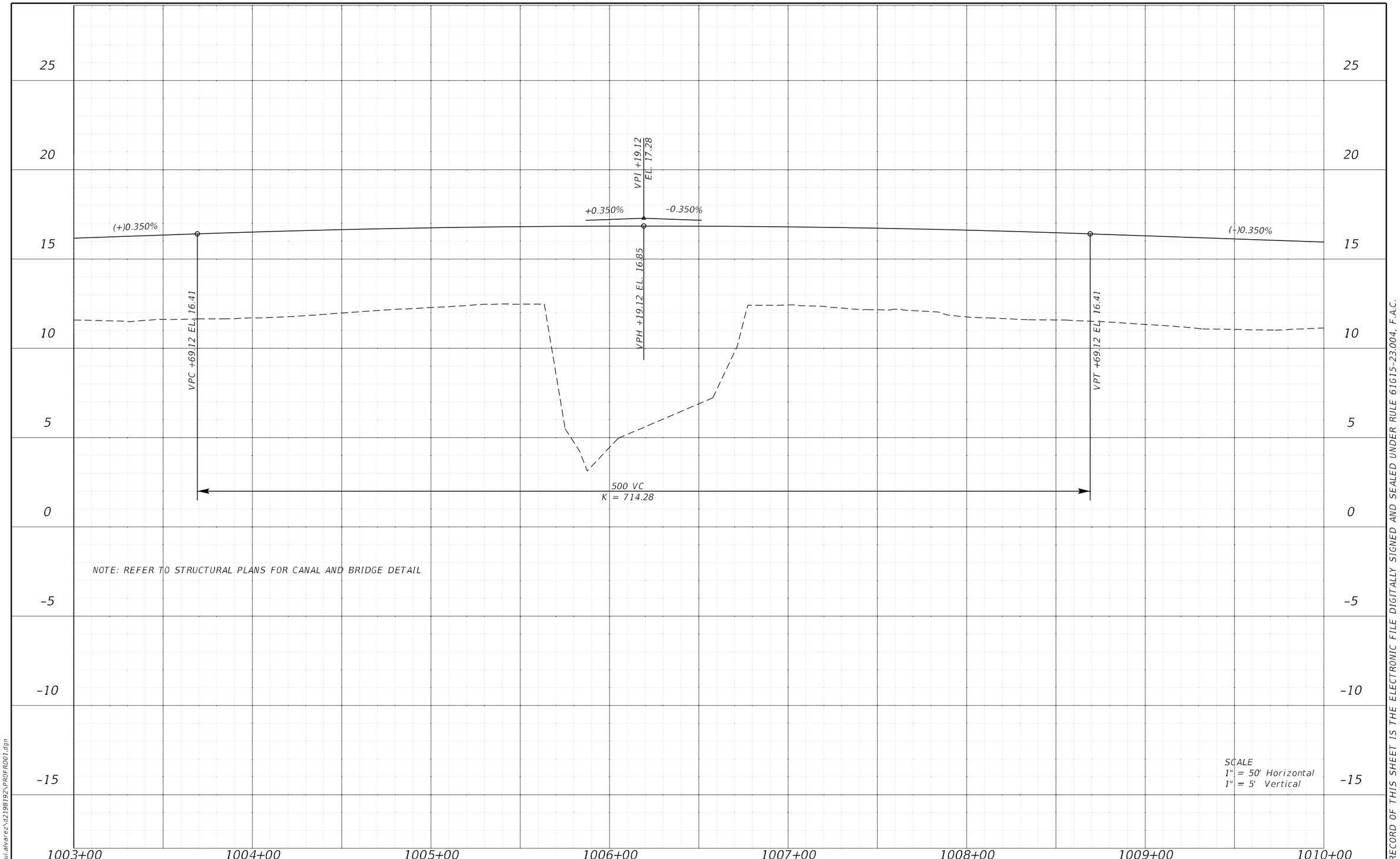

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	ROADWAY PROFILES US-1	16
					SR 5	INDIAN RIVER	441693-1-22-02		

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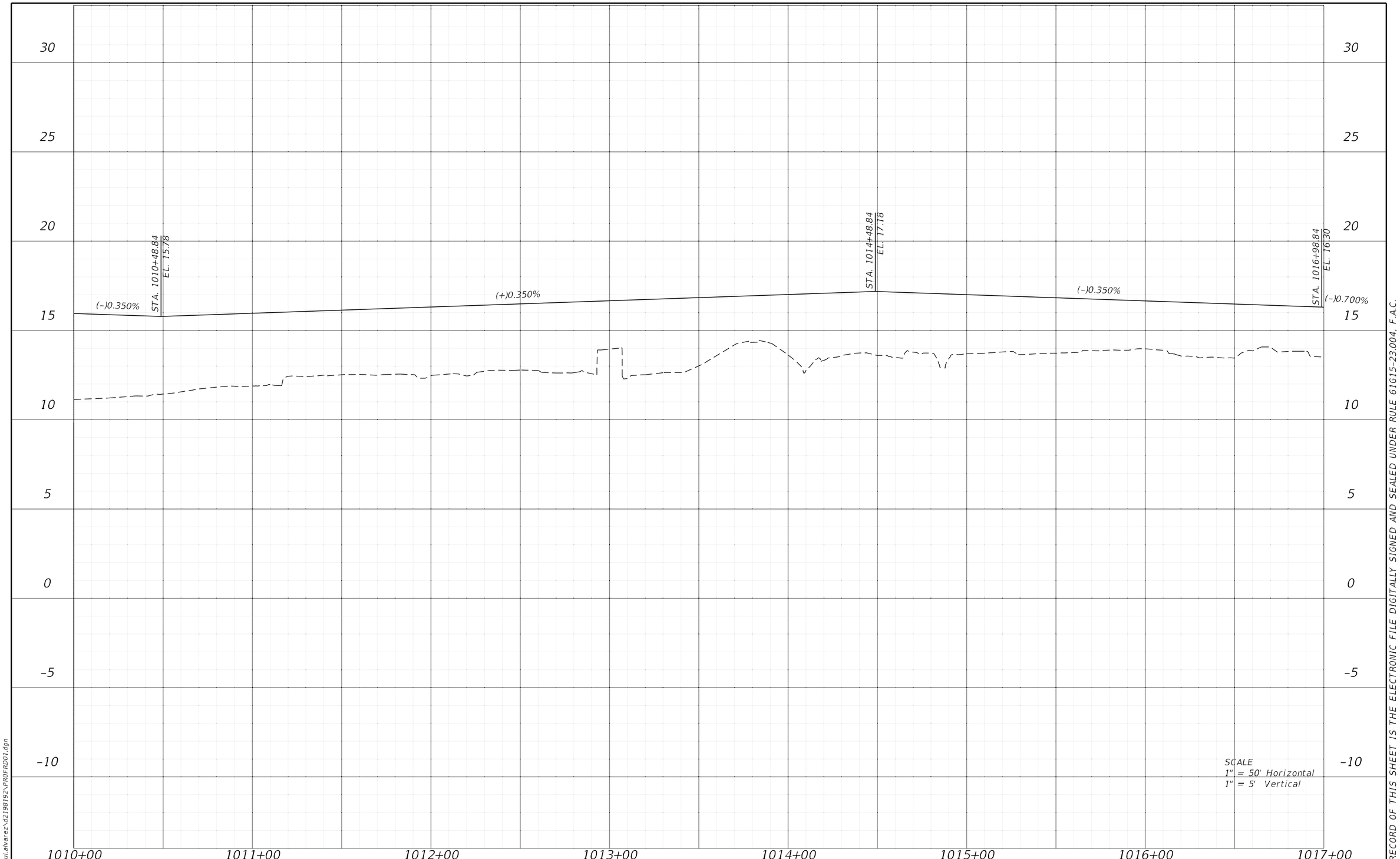

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			ROADWAY PROFILES US-1	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		17
					SR 5	INDIAN RIVER	441693-1-22-02		

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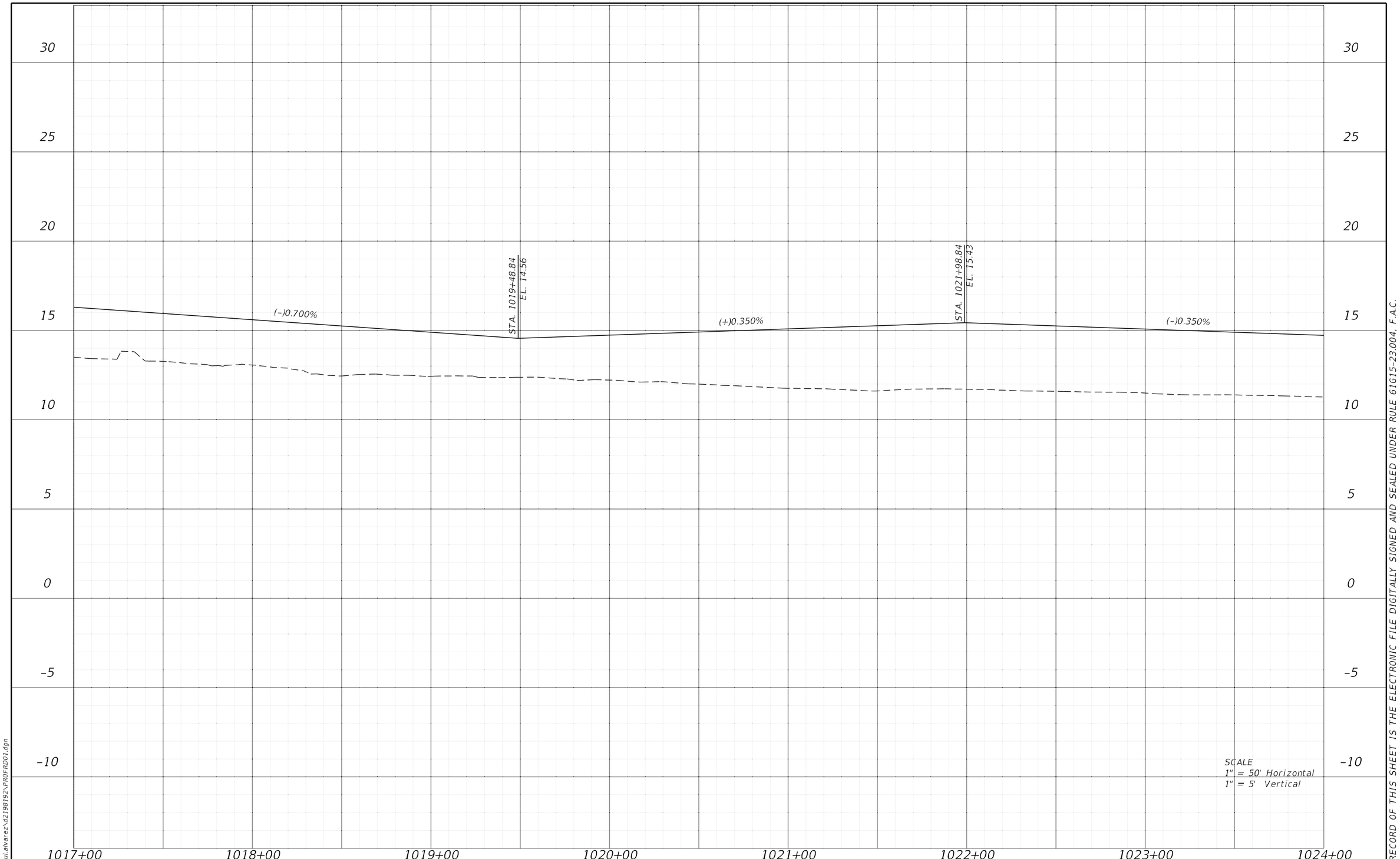

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

ROADWAY PROFILES
US-1

SHEET NO. 18

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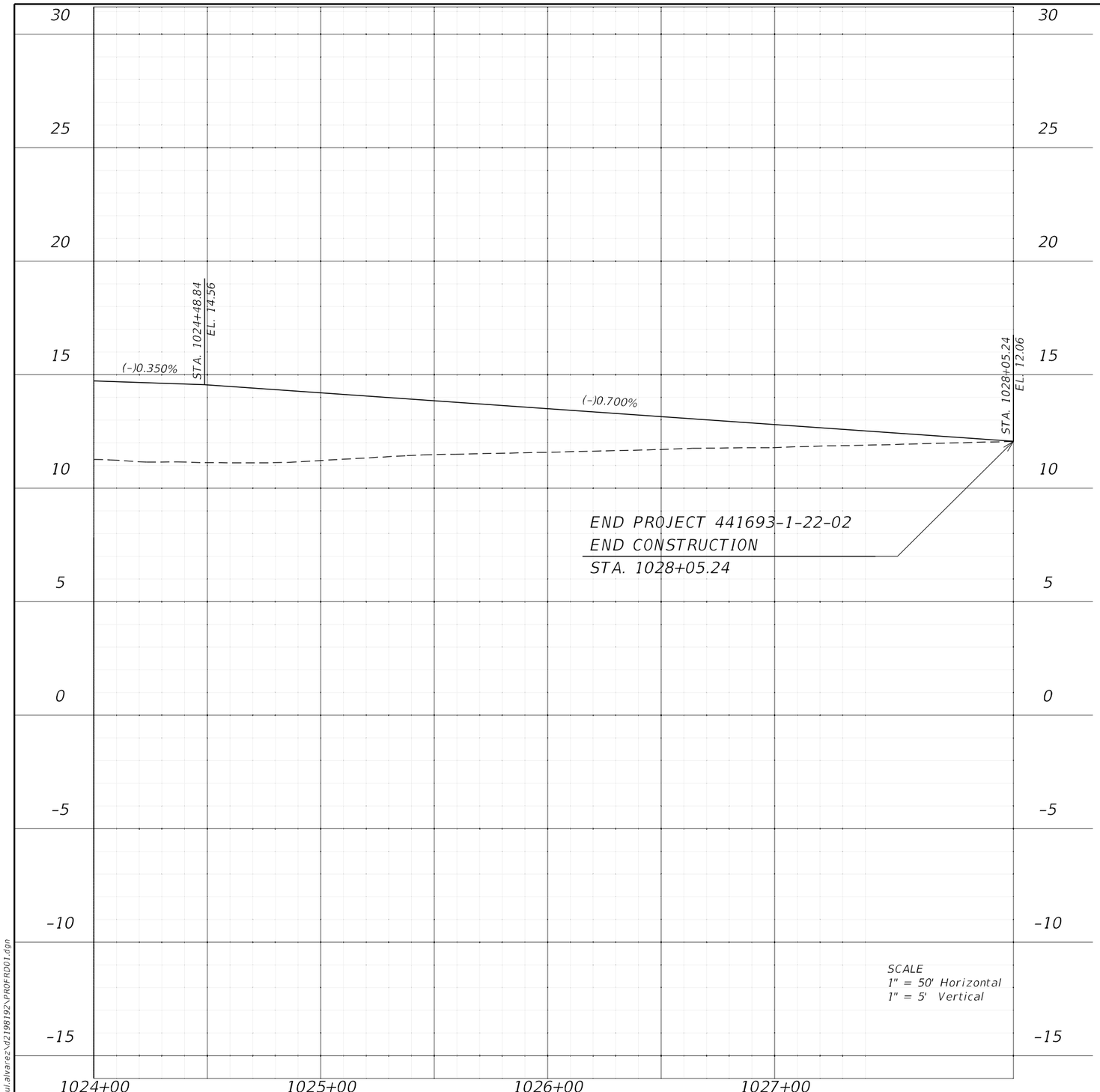

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

ROADWAY PROFILES
US-1

SHEET NO. 19

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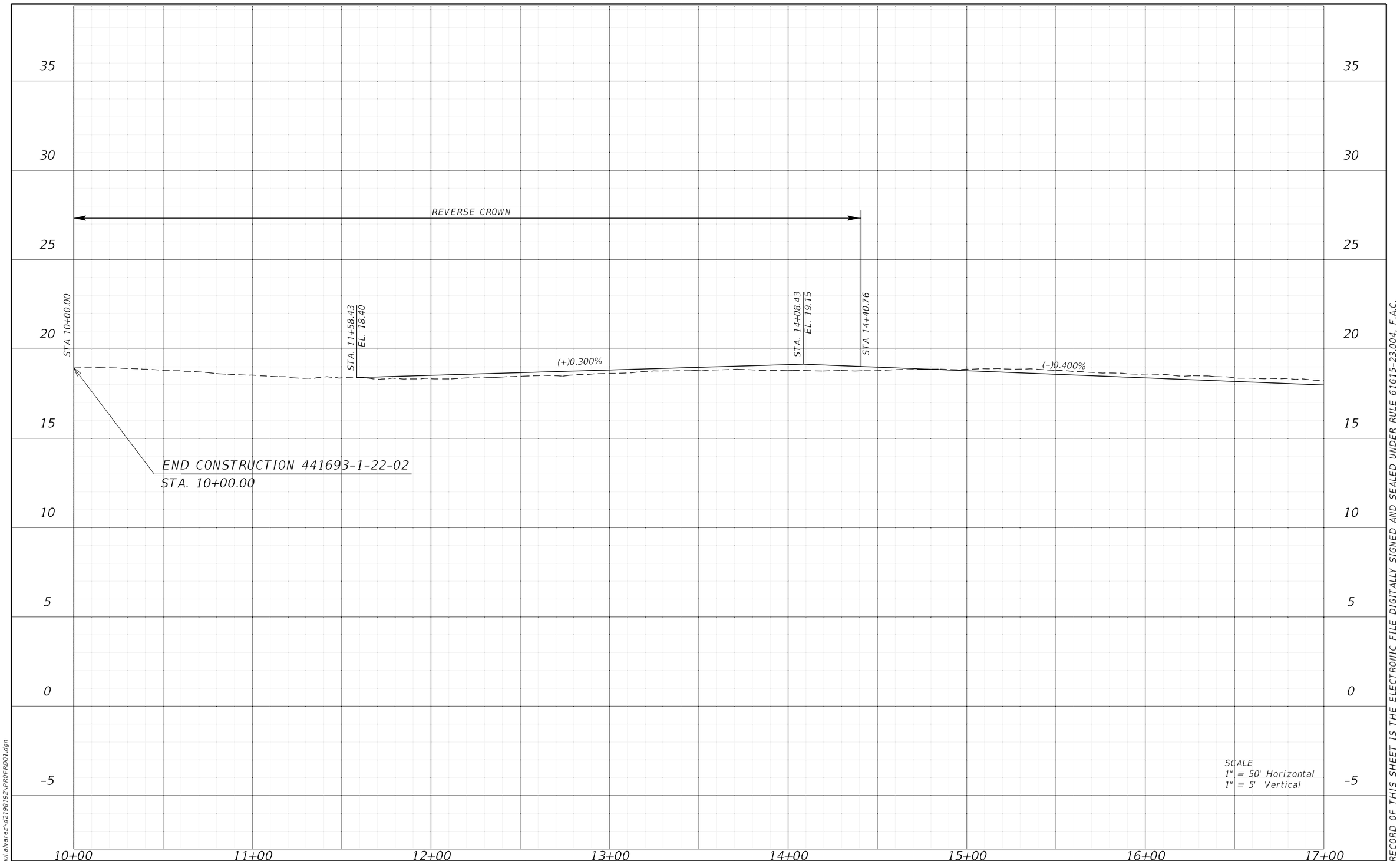

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

ROADWAY PROFILES
AVIATION BLVD

SHEET NO. 20

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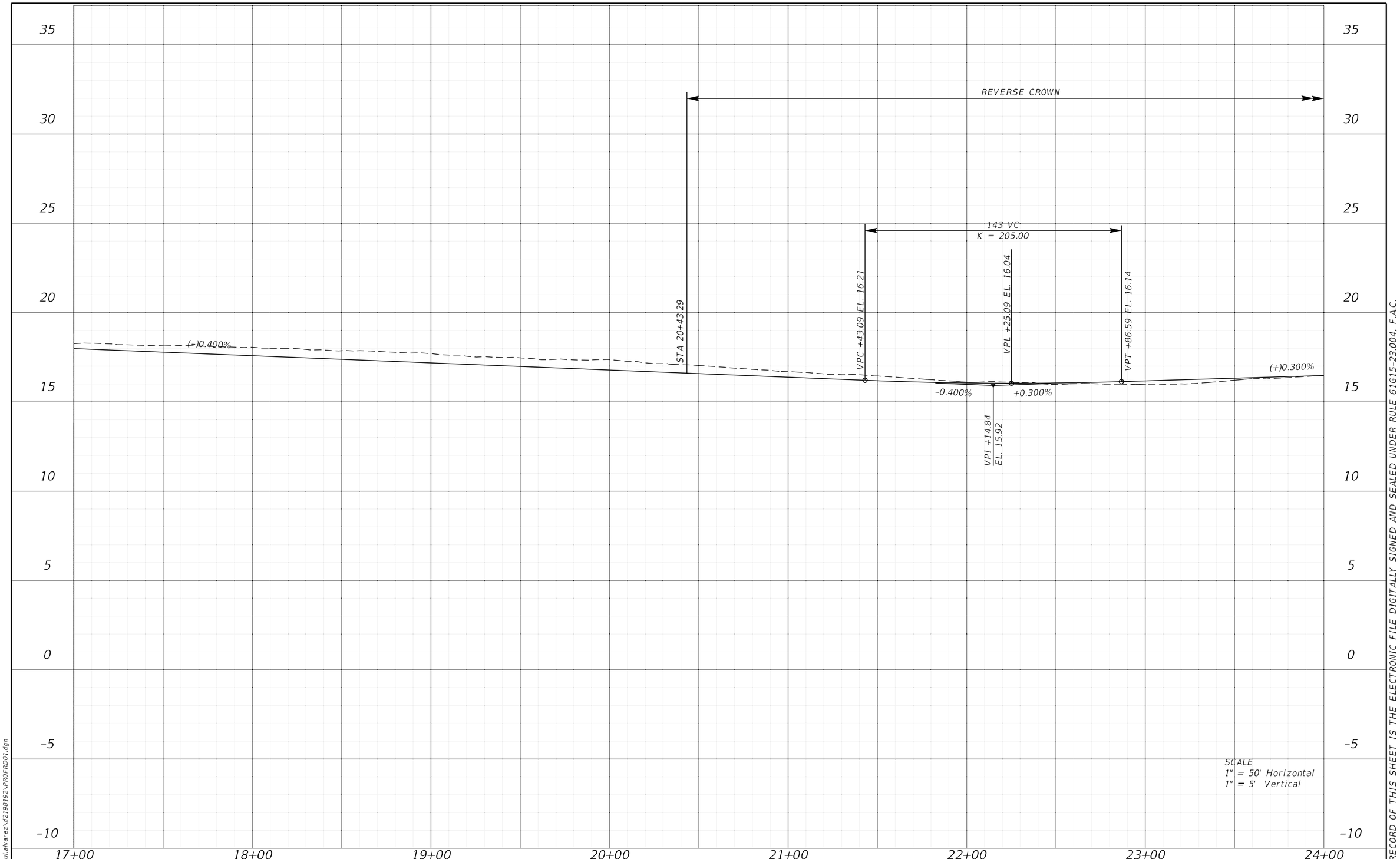

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION				SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER: 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	ROADWAY PROFILES AVIATION BLVD	21
					SR 5	INDIAN RIVER	441693-1-22-02		

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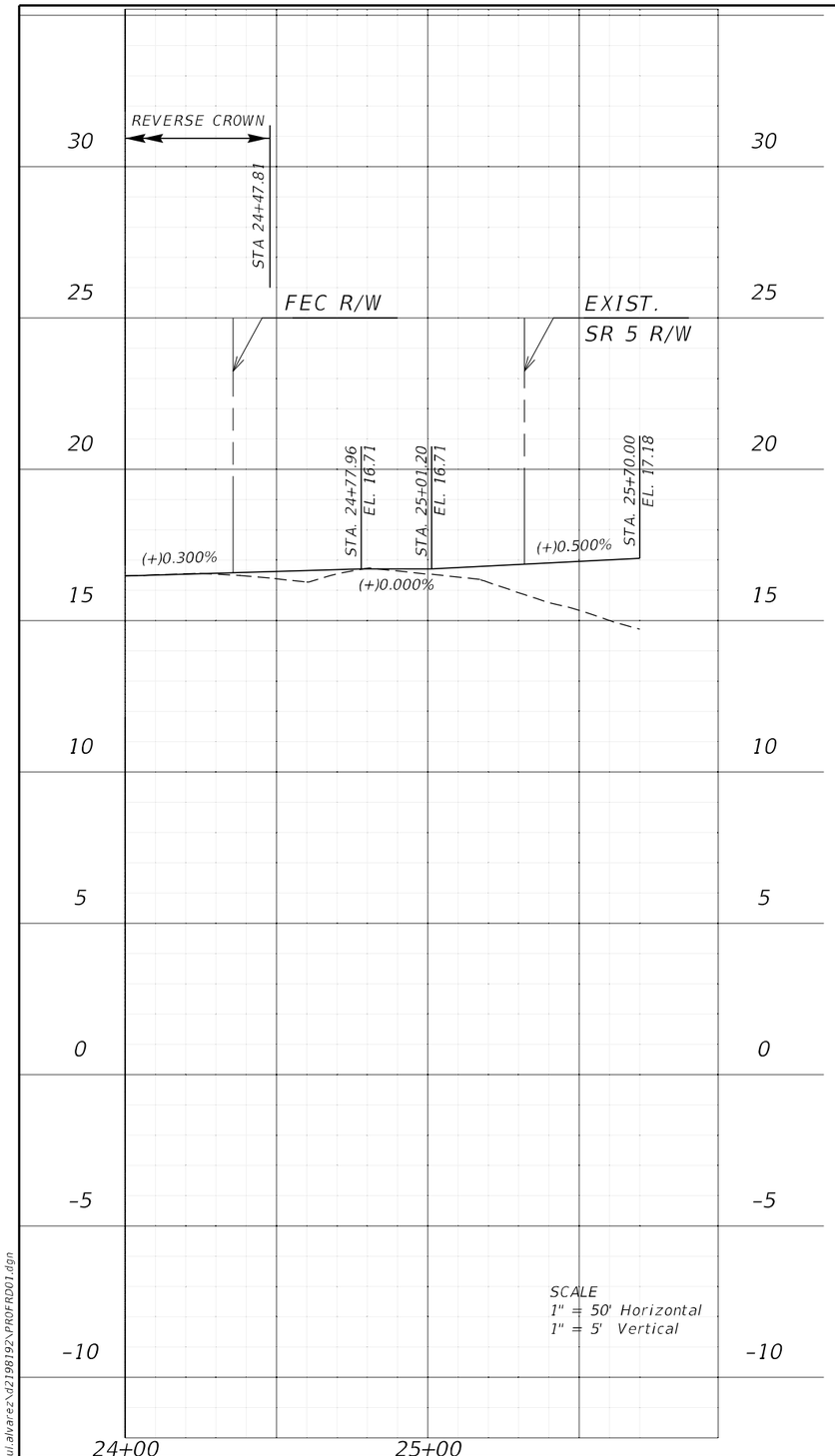

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

ROADWAY PROFILES
AVIATION BLVD

SHEET NO. 22

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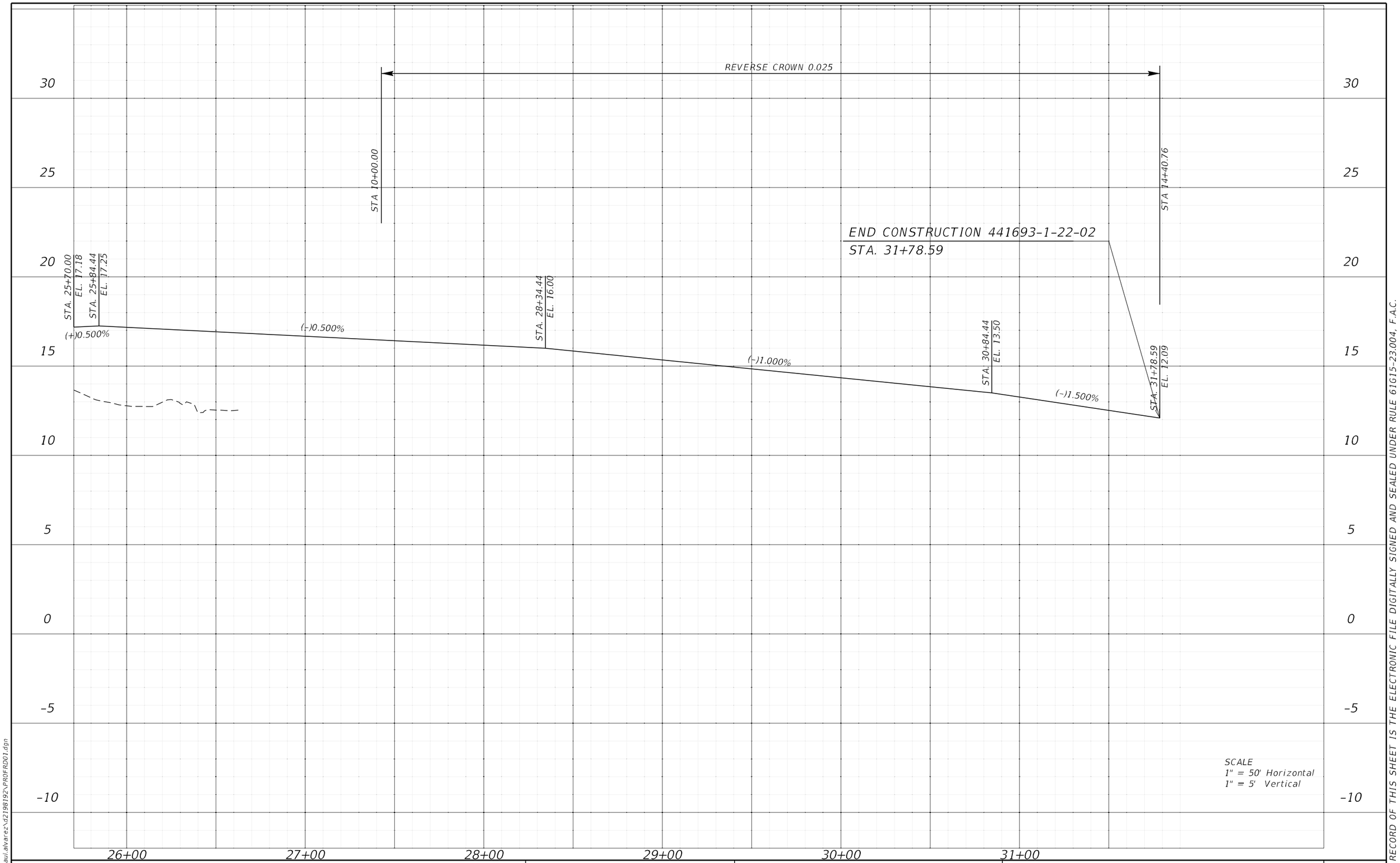

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

ENGINEER OF RECORD

WILLIAM EVANS, P.E.
LICENSE NUMBER: 45207
WGI, INC.
2035 VISTA PARKWAY
WEST PALM BEACH, FL 33411

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

ROADWAY PROFILES
AVIATION BLVD

SHEET NO. 23

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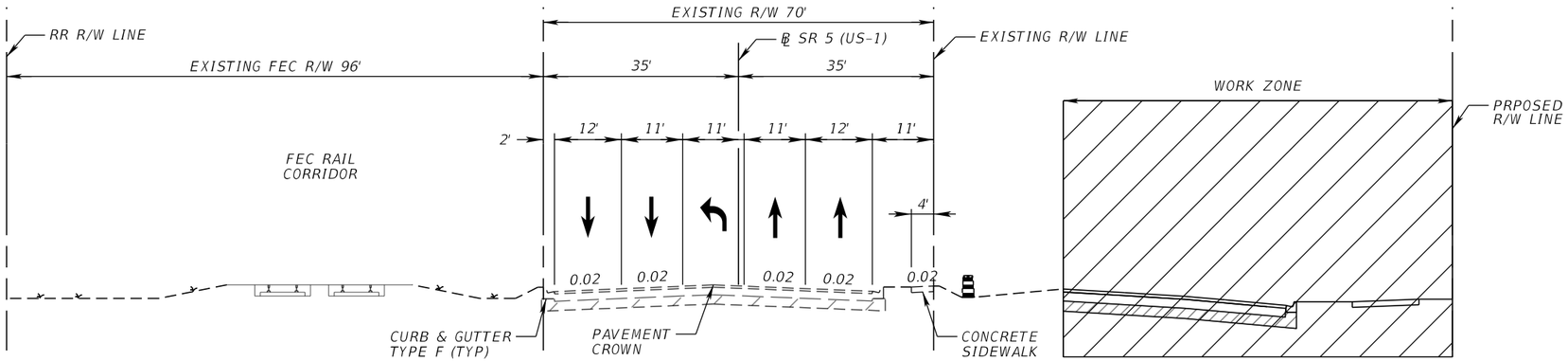
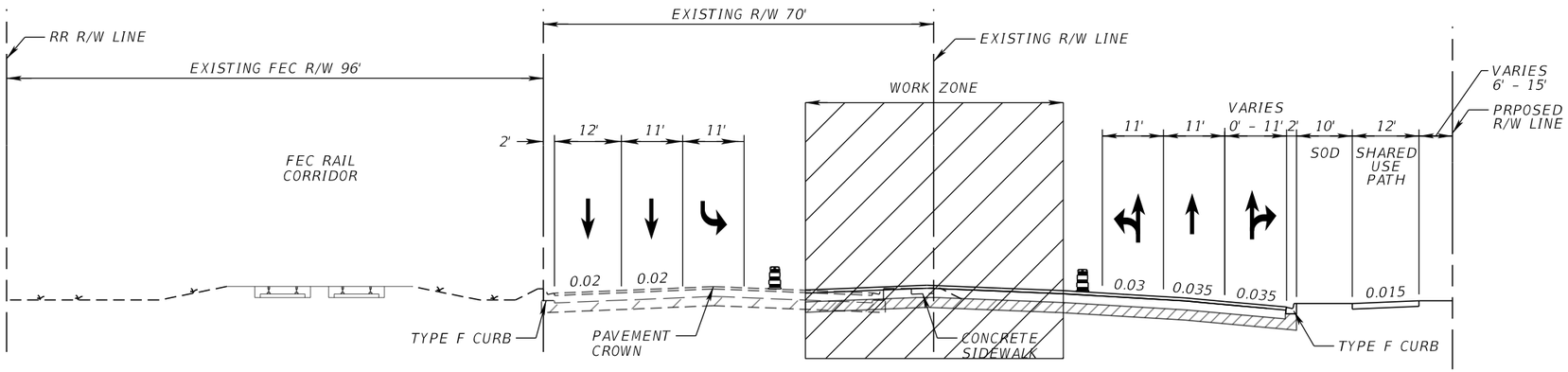


PHASE 1 - SR 5 / US-1

1. MAINTAIN EXISTING NORTHBOUND AND SOUTHBOUND TRAFFIC.
2. CONSTRUCT THE NORTHBOUND ROADWAY, INCLUDING THE BRDIGE.



PHASE 2 - SR 5 / US-1

1. SHIFT NORTHBOUND TRAFFIC TO THE NEWLY CONSTRUCTRED NORTHBOUND ROADWAY.
2. CONSTRUCT CENTER LANES, INCLUDING THE BRDIGE.

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TEMPORARY TRAFFIC CONTROL PLAN	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		24
					SR 5	INDIAN RIVER COUNTY	441693-1-22-02		

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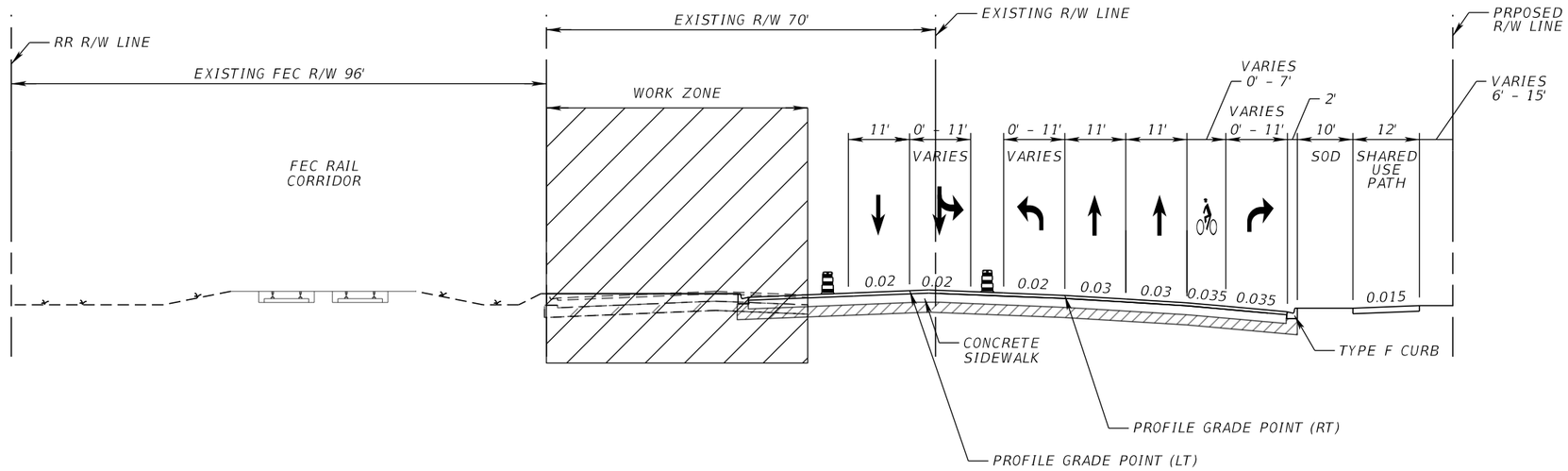
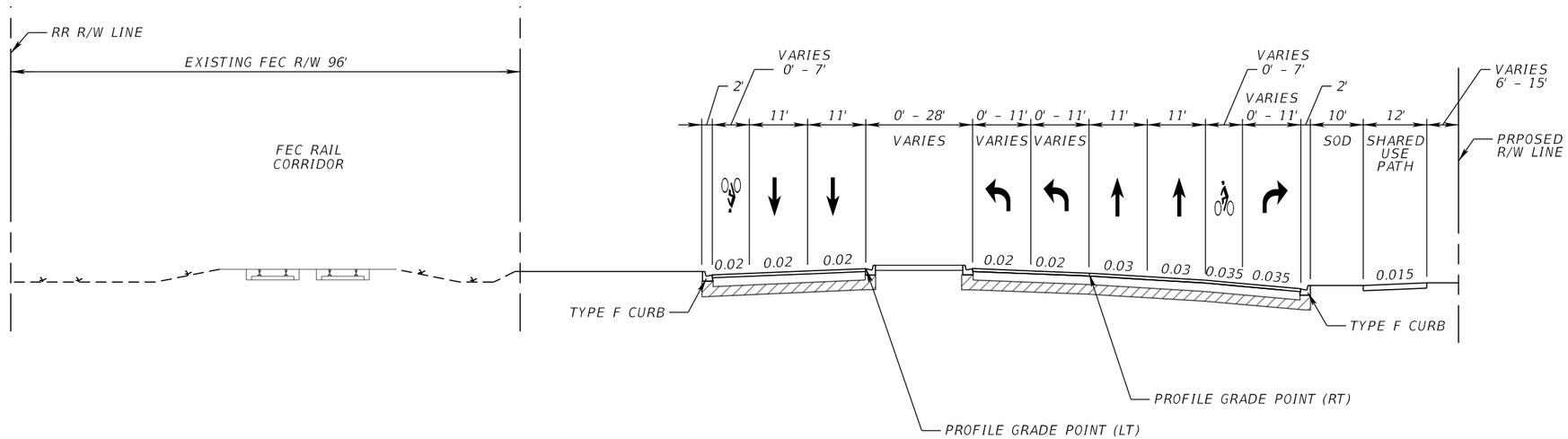


PHASE 3 - SR 5 / US-1

1. SHIFT SOUTHBOUND TRAFFIC TO NEWLY CONSTRUCTED CENTER LANES.
2. CONSTRUCT THE SOUTHBOUND ROADWAY, INCLUDING THE BRDIGE.



PHASE 4 - SR 5 / US-1

1. CONSTRUCT FRICTION COURSE, MEDIAN, SIGNING AND PAVEMENT MARKINGS AND LANDSCAPE.

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TEMPORARY TRAFFIC CONTROL PLAN	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		25
					SR 5	INDIAN RIVER COUNTY	441693-1-22-02		

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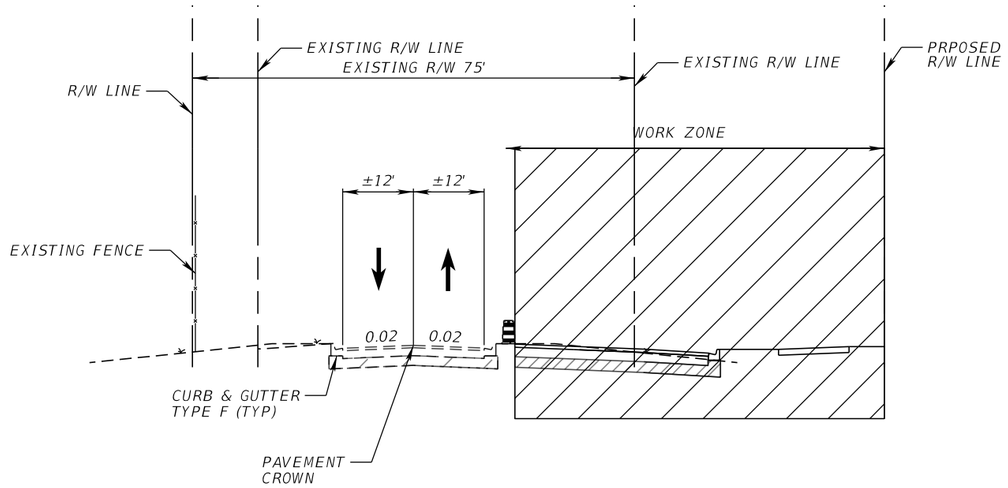
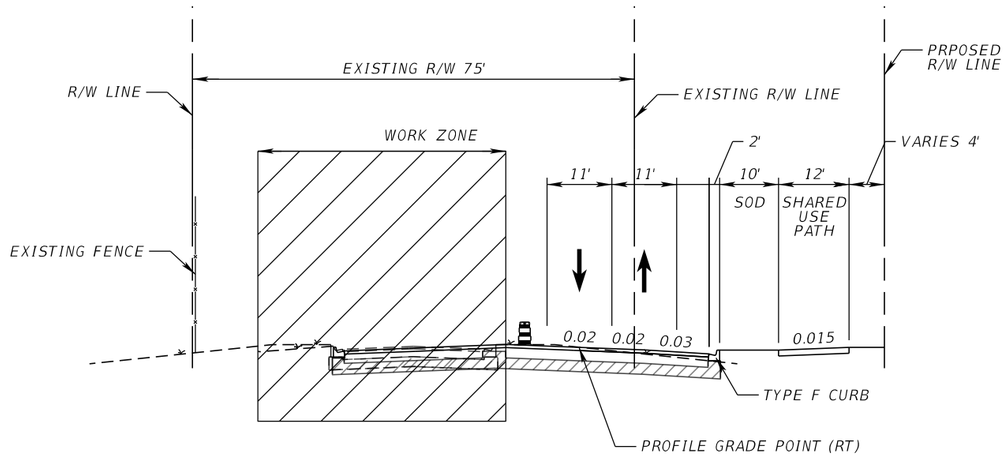


PHASE 1 - AVIATION BLVD

1. MAINTAIN EXISTING EASTBOUND AND WESTBOUND TRAFFIC.
2. CONSTRUCT THE EASTBOUND ROADWAY.



PHASE 2 - AVIATION BLVD

1. SHIFT TRAFFIC TO THE NEWLY CONSTRUCTED EASTBOUND ROADWAY.
2. CONSTRUCT THE WESTBOUND ROADWAY.

REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TEMPORARY TRAFFIC CONTROL PLAN	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
					SR 5	INDIAN RIVER COUNTY	441693-1-22-02		26

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

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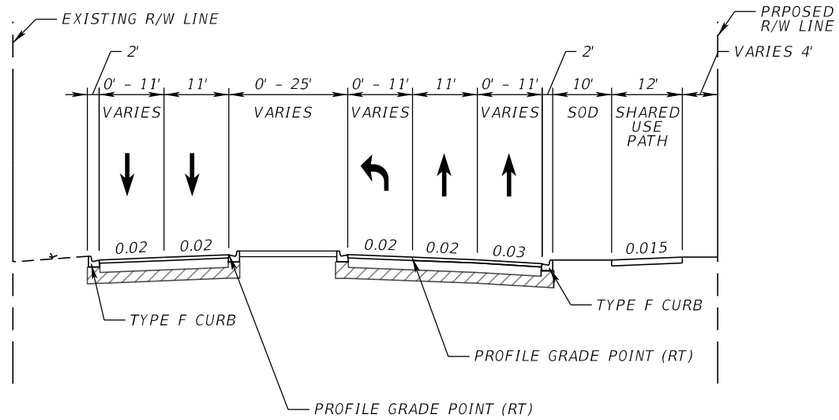

PHASE 3 - AVIATION BLVD

1. CONSTRUCT FRICTION COURSE, SIGNING AND PAVEMENT MARKINGS AND LANDSCAPE.

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

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REVISIONS				ENGINEER OF RECORD	STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			TEMPORARY TRAFFIC CONTROL PLAN	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	WILLIAM EVANS, P.E. LICENSE NUMBER 45207 WGI, INC. 2035 VISTA PARKWAY WEST PALM BEACH, FL 33411	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		27
					SR 5	INDIAN RIVER COUNTY	441693-1-22-02		

PD&E PREFERRED ALTERNATIVE PLANS

STATE OF FLORIDA

DEPARTMENT OF TRANSPORTATION

PD&E PREFERRED ALTERNATIVE PLANS

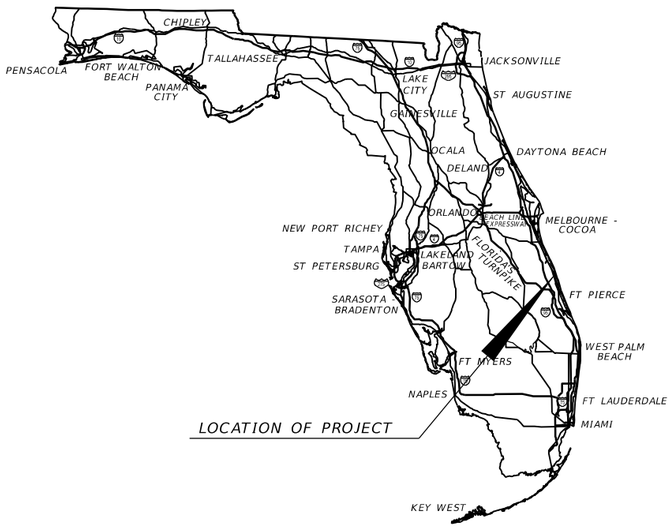
FINANCIAL PROJECT ID 441693-1-22-02

(FEDERAL FUNDS)

INDIAN RIVER COUNTY (88010000)

STATE ROAD NO. 5 OVER MAIN RELIEF CANAL

STRUCTURE PLANS



INDEX OF STRUCTURE PLANS

SHEET NO.	SHEET DESCRIPTION
B-1	KEY SHEET
B-2	PLAN AND ELEVATION - ALTERNATIVE #1
B-3	TYPICAL SECTION - ALTERNATIVE #1
B-4	CONSTRUCTION SEQUENCE (1 OF 2) - ALTERNATIVE #1
B-5	CONSTRUCTION SEQUENCE (2 OF 2) - ALTERNATIVE #1

GOVERNING DESIGN STANDARDS:

Florida Department of Transportation, FY 2023-24 Standard Plans for Road and Bridge Construction and applicable Interim Revisions (IRs).

Standard Plans for Road Construction and associated IRs are available at the following website: http://www.fdot.gov/design/standardplans

Standard Plans for Bridge Construction are included in the Structures Plans Component

GOVERNING STANDARD SPECIFICATIONS:

Florida Department of Transportation, FY 2023-24 Standard Specifications for Road and Bridge Construction at the following website: http://www.fdot.gov/programmanagement/Implemented/SpecBooks

THIS ITEM HAS BEEN DIGITALLY SIGNED AND SEALED BY

ON THE DATE ADJACENT TO THE SEAL

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

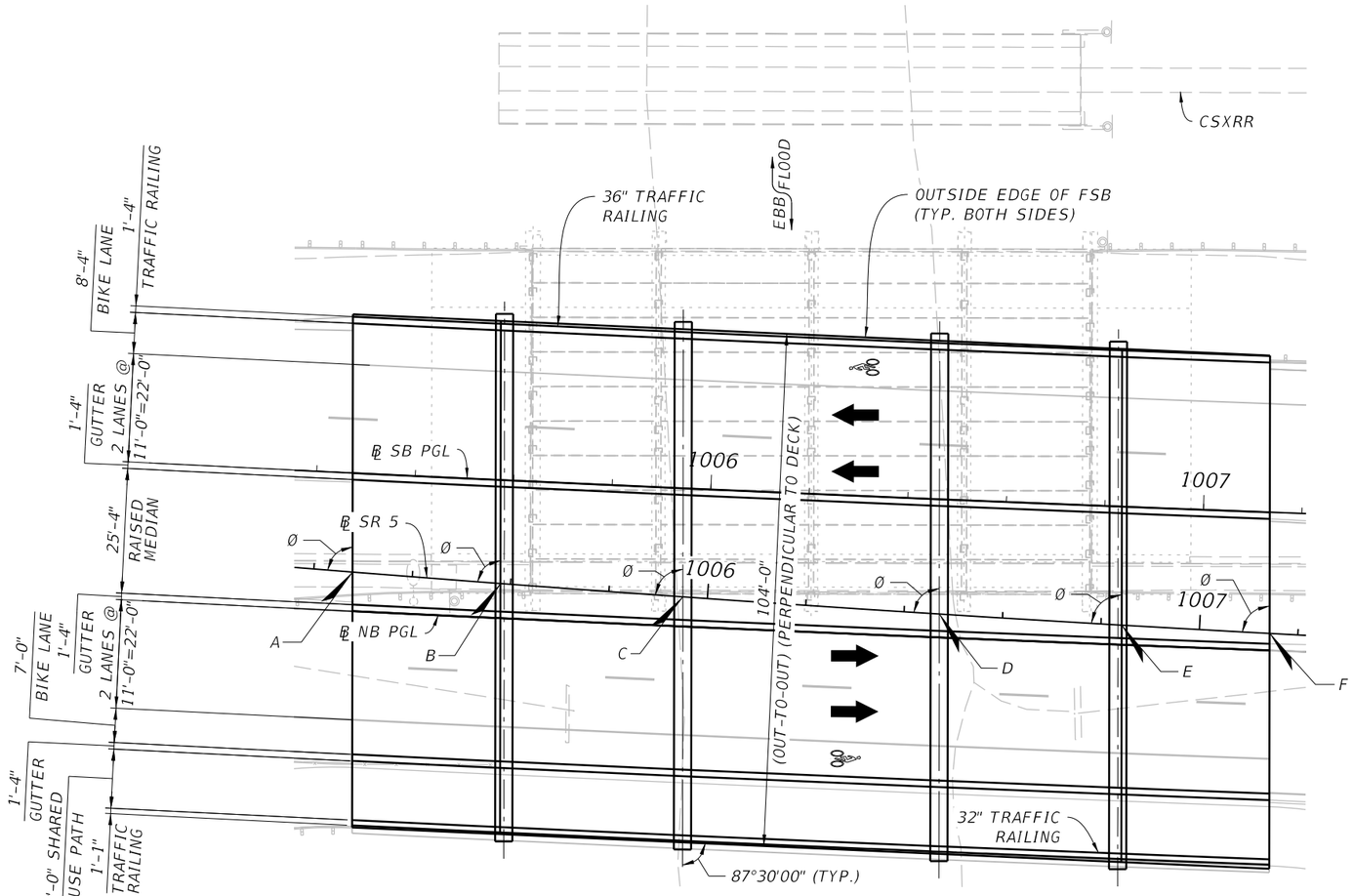
STRUCTURE PLANS ENGINEER OF RECORD:

STEVEN T. STARNES, P.E. NO.: 58183
WGI, INC.
4371 US HWY. 17 S. SUITE 203
FELMING ISLAND, FL 32003
(904) 470-4503
CONTRACT NO.: CAI28
VENDOR NO.: 65-0271367

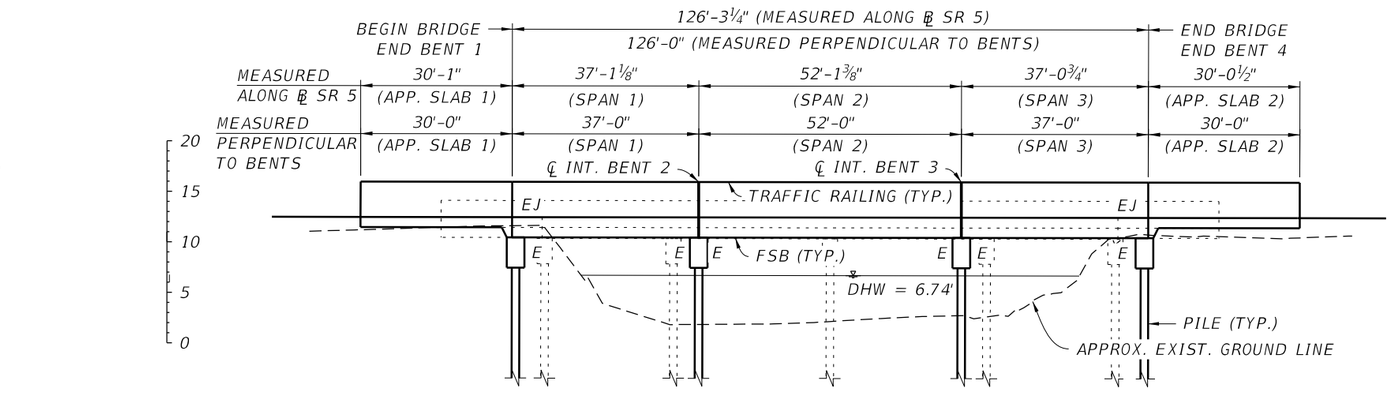
FDOT PROJECT MANAGER:

VANDANA NAGOLE, P.E.

CONSTRUCTION CONTRACT NO.	FISCAL YEAR	SHEET NO.
		B-1



PLAN



ELEVATION
(ALONG RIGHT COPING)

CALLOUT	LOCATION	STATION	Ø (T.C.)
A	BEGIN APP. SLAB	1005+27.86	85°31'28"
B	BEGIN BRIDGE	1005+57.95	85°45'37"
C	℄ INT. BENT 2	1005+95.05	86°03'04"
D	℄ INT. BENT 3	1006+47.16	86°27'35"
E	END BRIDGE	1006+84.22	86°45'01"
F	END APP. SLAB	1007+14.27	86°59'09"

LEGEND:

EXISTING BRIDGE TO BE REMOVED

PROPOSED BRIDGE

PRELIMINARY

NOTES:

1. SEE ROADWAY PLAN FOR HORIZONTAL GEOMETRY.
2. ALL PILE BENTS ARE PARALLEL TO EXISTING BENTS.
3. BRIDGE DECK AND FSB DIMENSIONS ARE MEASURED PERPENDICULAR TO DECK SKEW (2.5°) WITH PILE BENTS.
4. BRIDGE DECK IS OVERBUILT TO ACCOMMODATE HORIZONTAL CURVATURE OF ROADWAY.
5. ROADWAY ELEMENT DIMENSIONS ARE MEASURED PERPENDICULAR TO PGL (TRAVEL LANES).

EXISTING BRIDGE NO. 880085

REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STEVEN T. STARNES
LICENSE NUMBER: 58183
WGI, INC.
4371 US HWY. 17 S. SUITE 203
FLEMING ISLAND, FL 32003

DRAWN BY: KLS
CHECKED BY: STS
DESIGNED BY: KLS
CHECKED BY: STS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

SHEET TITLE: PLAN AND ELEVATION - ALTERNATIVE #1

REF. DWG. NO.

PROJECT NAME: SR 5 (US 1) AT AVIATION BLVD. - PD&E
SR 5 OVER MAIN RELIEF CANAL

SHEET NO. B-2

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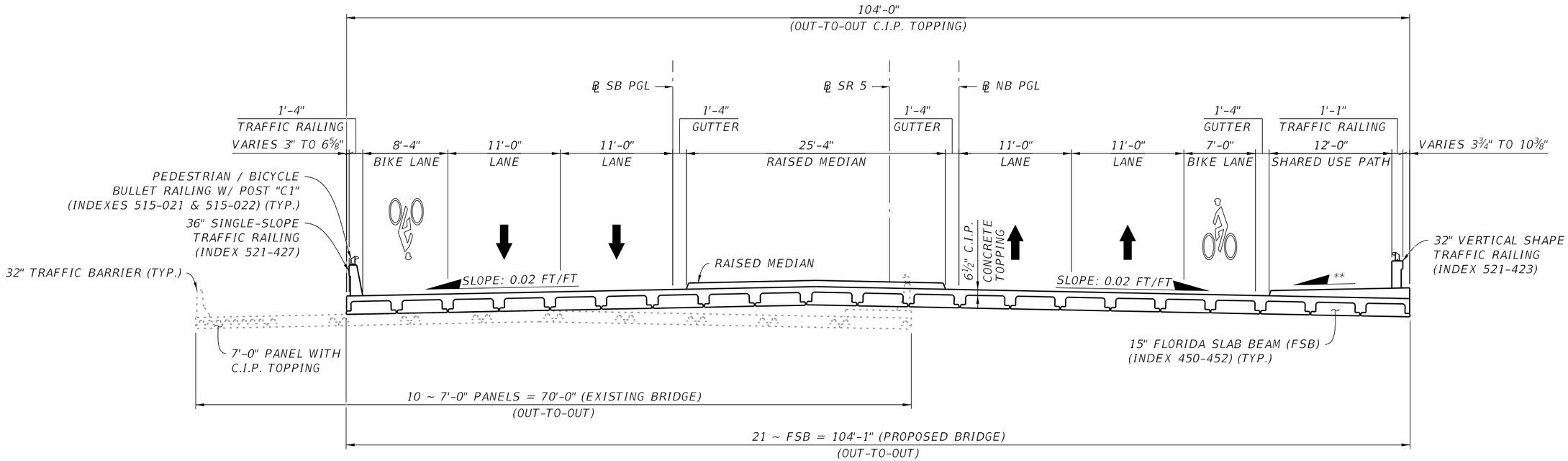

TYPICAL SECTION - ALTERNATIVE #1

(SPAN 1 SHOWN, SPAN 2-3 SIMILAR)
(LOOKING UPSTATION)

** SLOPE: 0.015 FT/FT

LEGEND:

EXISTING BRIDGE TO BE REMOVED

PROPOSED BRIDGE

PRELIMINARY

NOTES:

1. SEE ROADWAY PLAN FOR HORIZONTAL GEOMETRY.
2. BRIDGE DECK IS OVERBUILT TO ACCOMMODATE HORIZONTAL CURVATURE OF ROADWAY.
3. ROADWAY ELEMENT DIMENSIONS ARE MEASURED RADIAL TO PGL (TRAVEL LANES).
4. BRIDGE DECK AND FSB DIMENSIONS ARE MEASURED PERPENDICULAR TO DECK SKEW (2.5°) WITH PILE BENTS.
5. FSB WIDTH = 4'-11" & 4'-10". TYPICAL GAP = 1" & ¾". GAP BETWEEN PHASES = 1 5/8". MEASURED ALONG CROSS-SLOPE.

EXISTING BRIDGE NO. 880085

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STEVEN T. STARNES
LICENSE NUMBER: 58183
WGI, INC.
4371 US HWY. 17 S. SUITE 203
FLEMING ISLAND, FL 32003

DRAWN BY:	CHECKED BY:	DESIGNED BY:	CHECKED BY:
KLS	STS	KLS	STS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

SHEET TITLE: TYPICAL SECTION - ALTERNATIVE #1

REF. DWG. NO.:

PROJECT NAME: SR 5 (US 1) AT AVIATION BLVD. - PD&E
SR 5 OVER MAIN RELIEF CANAL

SHEET NO.: B-3

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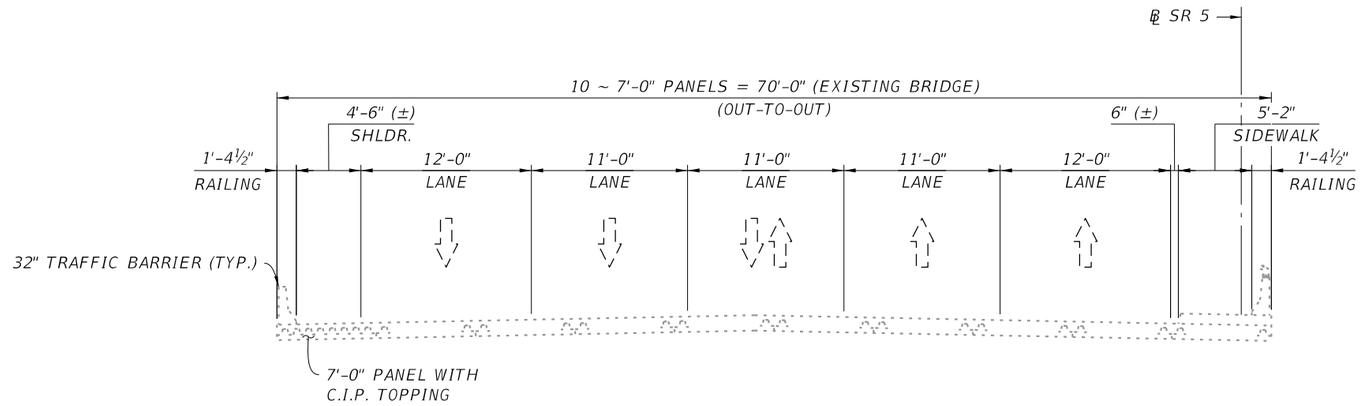
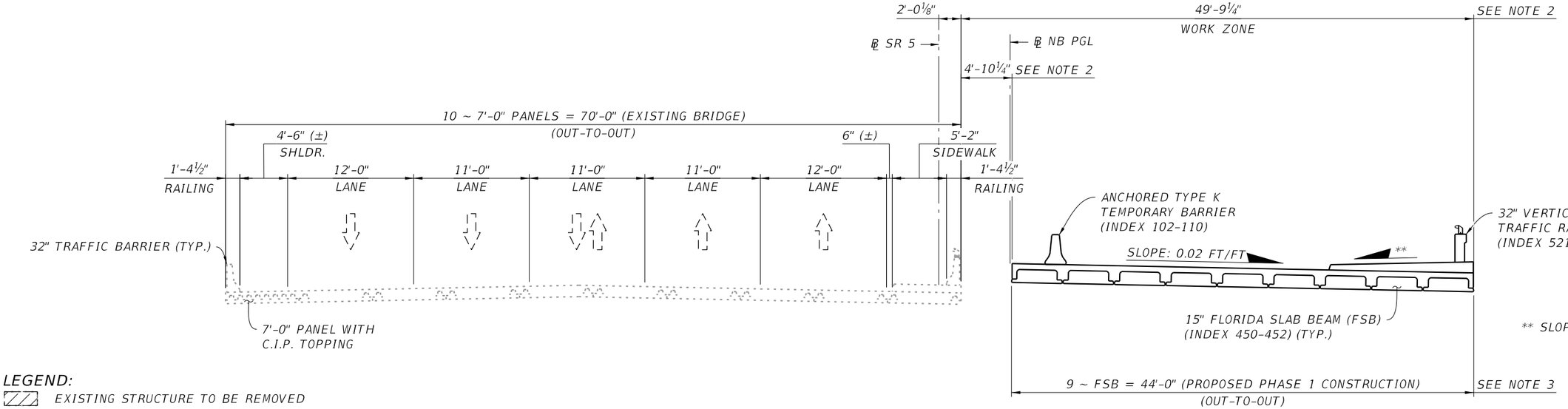


EXISTING TYPICAL SECTION
(LOOKING UPSTATION)



PHASE 1
(LOOKING UPSTATION)

LEGEND:
- EXISTING STRUCTURE TO BE REMOVED
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PREVIOUS PHASE CONSTRUCTION

PRELIMINARY

NOTES:
1. ALL DIMENSIONS TAKEN PERPENDICULAR TO THE EXISTING BRIDGE, UNLESS OTHERWISE NOTED.
2. DIMENSIONS VARY. MINIMUM DIMENSION ARE SHOWN AND TAKEN AT BEGIN BRIDGE.
3. DIMENSION TAKEN PERPENDICULAR TO FSB UNITS PLACED ON 2.5° SKEW WITH BENTS.
4. ROADWAY ELEMENT DIMENSIONS ARE MEASURED RADIAL TO PGL (TRAVEL LANES).

EXISTING BRIDGE NO. 880085

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STEVEN T. STARNES
LICENSE NUMBER: 58183
WGI, INC.
4371 US HWY. 17 S. SUITE 203
FLEMING ISLAND, FL 32003

DRAWN BY: KLS
CHECKED BY: STS
DESIGNED BY: KLS
CHECKED BY: STS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

SHEET TITLE: CONSTRUCTION SEQUENCE (1 OF 2) - ALTERNATIVE #1

REF. DWG. NO.

PROJECT NAME: SR 5 (US 1) AT AVIATION BLVD. - PD&E
SR 5 OVER MAIN RELIEF CANAL

SHEET NO. B-4

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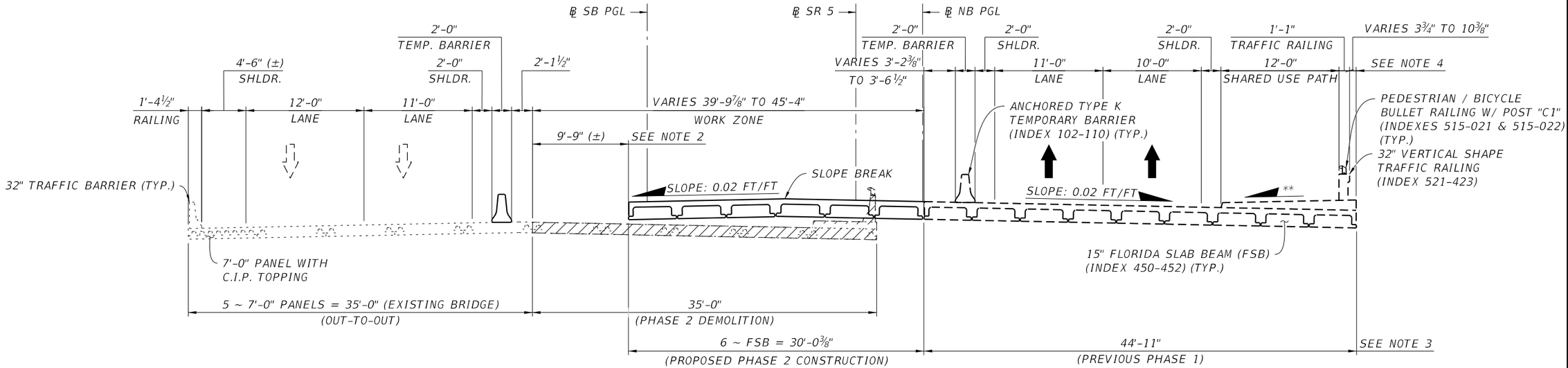
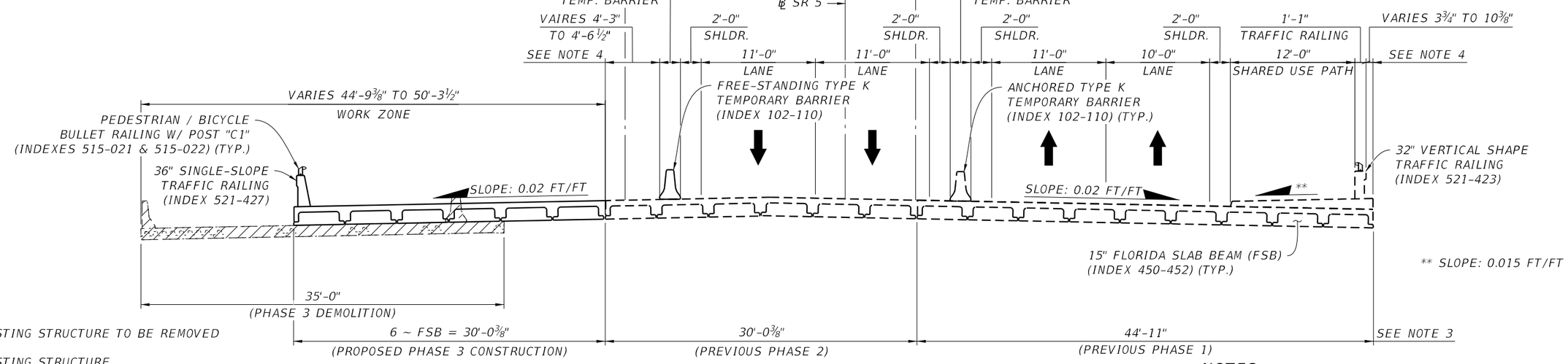


PHASE 2
(LOOKING UPSTATION)



PHASE 3
(LOOKING UPSTATION)

LEGEND:

- EXISTING STRUCTURE TO BE REMOVED
- EXISTING STRUCTURE
- PROPOSED STRUCTURE
- PREVIOUS PHASE CONSTRUCTION

PRELIMINARY

NOTES:

1. ALL DIMENSIONS TAKEN PERPENDICULAR TO THE EXISTING BRIDGE, UNLESS OTHERWISE NOTED.
2. DIMENSIONS VARY. MINIMUM DIMENSION ARE SHOWN AND TAKEN AT BEGIN BRIDGE.
3. DIMENSION TAKEN PERPENDICULAR TO FSB UNITS PLACED ON 2.5° SKEW WITH BENTS.
4. ROADWAY ELEMENT DIMENSIONS ARE MEASURED RADIAL TO PGL (TRAVEL LANES).

EXISTING BRIDGE NO. 880085

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STEVEN T. STARNES
LICENSE NUMBER: 58183
WGI, INC.
4371 US HWY. 17 S. SUITE 203
FLEMING ISLAND, FL 32003

DRAWN BY:	KLS
CHECKED BY:	STS
DESIGNED BY:	KLS
CHECKED BY:	STS

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
SR 5	INDIAN RIVER	441693-1-22-02

SHEET TITLE: CONSTRUCTION SEQUENCE (2 OF 2) - ALTERNATIVE #1

REF. DWG. NO.:

PROJECT NAME: SR 5 (US 1) AT AVIATION BLVD. - PD&E
SR 5 OVER MAIN RELIEF CANAL

SHEET NO.: B-5

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Date: 3/13/2024 11:43:47 AM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 441693-1-52-01 **Letting Date:** 01/2099

Description: SR-5/US-1 AT AVIATION BOULEVARD

District: 04 **County:** 88 INDIAN RIVER **Market Area:** 11 **Units:** English
Contract Class: 7 **Lump Sum Project:** N **Design/Build:** N **Project Length:** 1.237 MI

Project Manager: NAGOLE

Version 17 Project Grand Total **$16,277,971.35**
Description: 2024 WPUC SR-5/US-1 AT AVIATION BOULEVARD - PREFERRED ALTERNATIVE

Sequence: 1 NDU - New Construction, Divided, Urban **Net Length:** 0.549 MI 2,899 LF

Description: SR-5/US-1 Corridor including bridge with shared-use path on east side.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	80.00 / 80.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.549
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	104.00
Horizontal Elevation For End Section	104.00
Front Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	0.00 % / 0.00 %
Outside Shoulder Cross Slope L/R	3.00 % / 3.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	10.65	AC	$49,392.09	$526,025.76
120-6	EMBANKMENT	6,248.35	CY	$29.58	$184,826.19

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.61	AC	$49,392.09	$128,913.35
	Comment: Proposed Pond				
120-1	REGULAR EXCAVATION	21,058.20	CY	$22.27	$468,966.11
	Comment: Proposed Pond				
	Earthwork Component Total				$1,308,731.41

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4

Roadway Pavement Width L/R	22.00 / 22.00
Structural Spread Rate	165
Friction Course Spread Rate	80

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	17,495.39	SY	$16.19	$283,250.36
285-709	OPTIONAL BASE,BASE GROUP 09	14,171.52	SY	$18.98	$268,975.45
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,169.15	TN	$148.38	$173,478.48
337-7-82	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22	566.86	TN	$207.81	$117,799.18

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	10.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	Y

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,749.54	SY	$16.19	$28,325.05
285-709	OPTIONAL BASE,BASE GROUP 09	1,417.15	SY	$18.98	$26,897.51
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	116.92	TN	$148.38	$17,348.59
337-7-82	ASPH CONC FC,TRAFFIC C,FC-9.5,PG 76-22	56.69	TN	$207.81	$11,780.75

Pavement Marking Subcomponent

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

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	222.00	EA	$4.02	$892.44
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	4.39	GM	$1,171.40	$5,142.45
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	2.20	GM	$449.94	$989.87
	Roadway Component Total				$934,880.13

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	8.25 / 19.25
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 5.00
Sidewalk Width L/R	6.00 / 12.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,898.72	LF	$27.01	$78,294.43
520-1-10	CONCRETE CURB & GUTTER, TYPE F	2,898.72	LF	$27.01	$78,294.43
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	5,797.44	SY	$56.89	$329,816.36
570-1-1	PERFORMANCE TURF	1,610.40	SY	$3.12	$5,024.45

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	5,797.44	LF	$1.84	$10,667.29
104-11	FLOATING TURBIDITY BARRIER	137.25	LF	$13.89	$1,906.40
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	137.25	LF	$13.00	$1,784.25
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$4,039.69	$4,039.69
104-18	INLET PROTECTION SYSTEM	28.00	EA	$155.49	$4,353.72
107-1	LITTER REMOVAL	13.97	AC	$20.47	$285.97
107-2	MOWING	13.97	AC	$65.97	$921.60
	Shoulder Component Total				$515,388.59

MEDIAN COMPONENT

User Input Data

Description	Value
Total Median Width	20.00
Performance Turf Width	19.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	5,797.44	LF	$27.01	$156,588.85
520-5-12	TRAF SEP CONC-TYPE I, 6' WIDE	870.00	LF	$96.27	$83,754.90
570-1-1	PERFORMANCE TURF	6,119.52	SY	$3.12	$19,092.90
	Median Component Total				$259,436.65

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	20.00	EA	$7,013.89	$140,277.80
425-1-451	INLETS, CURB, TYPE J-5, <10'	6.00	EA	$11,481.26	$68,887.56
425-1-521	INLETS, DT BOT, TYPE C, <10'	3.00	EA	$6,099.36	$18,298.08
425-2-41	MANHOLES, P-7, <10'	3.00	EA	$6,729.69	$20,189.07
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	1,456.00	LF	$179.47	$261,308.32
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	440.00	LF	$267.91	$117,880.40
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	2,752.00	LF	$426.25	$1,173,040.00
570-1-1	PERFORMANCE TURF	166.90	SY	$3.12	$520.73

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-1	CONC CLASS II, CULVERTS	11.30	CY	$1,869.81	$21,128.85
	Comment: 2x 36" Straight End Wall and 1x 24" Straight End Wall. 2 x 4.53 CY + 1 x 2.24 CY = 11.3 CY				
425-1-542	INLETS, DT BOT, TYPE D, >10'	1.00	EA	$10,218.67	$10,218.67
	Comment: Control Structure for Proposed Pond				
570-1-2	PERFORMANCE TURF, SOD	12,632.00	SY	$5.34	$67,454.88
	Comment: Proposed Pond				
	Drainage Component Total				$1,899,204.36

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	20.00	AS	$471.57	$9,431.40
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	5.00	AS	$1,500.79	$7,503.95
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	2.00	AS	$8,253.40	$16,506.80
700-2-16	MULTI- POST SIGN, F&I GM, 101-200 SF	2.00	AS	$13,724.53	$27,449.06
	Signing Component Total				$60,891.21

SIGNALIZATIONS COMPONENT

Signalization 1

Description	Value
Type	4 Lane Mast Arm
Multiplier	1
Description	Standard 4 MA intersection

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	750.00	LF	$13.87	$10,402.50
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	250.00	LF	$30.56	$7,640.00
632-7-1	SIGNAL CABLE- NEW OR RECO, FUR & INSTALL	1.00	PI	$6,269.35	$6,269.35
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	16.00	EA	$1,210.12	$19,361.92
639-1-112	ELECTRICAL POWER SRV,F&I,OH,M,PUR BY CON	1.00	AS	$4,103.18	$4,103.18
639-2-1	ELECTRICAL SERVICE WIRE, F&I	60.00	LF	$5.95	$357.00
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	4.00	EA	$1,510.67	$6,042.68
649-21-10	STEEL MAST ARM ASSEMBLY, F&I, 60'	3.00	EA	$74,945.13	$224,835.39
649-21-21	STEEL MAST ARM ASSEMBLY, F&I, 78'	1.00	EA	$89,526.96	$89,526.96
650-1-14	VEH TRAF SIGNAL,F&I ALUMINUM, 3 S 1 W	14.00	AS	$1,175.52	$16,457.28
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	4.00	AS	$723.59	$2,894.36
665-1-11	PEDESTRIAN DETECTOR, F&I,	4.00	EA	$192.56	$770.24

	STANDARD				
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00	AS	$32,025.59	$32,025.59
700-3-101	SIGN PANEL, F&I GM, UP TO 12 SF	4.00	EA	$148.19	$592.76
700-5-21	INTERNAL ILLUM SIGN, F&I OM, UP TO 12 SF	2.00	EA	$3,107.28	$6,214.56
700-5-22	INTERNAL ILLUM SIGN, F&I OM, 12-18 SF	2.00	EA	$3,190.30	$6,380.60

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
660-4-11	VEHICLE DETECTION SYSTEM-VIDEO, CABINET	1.00	EA	$4,555.07	$4,555.07
	Comment: Indian River County preferred detection system: Video Detection				
660-4-12	VEHICLE DETECTION SYSTEM-VIDEO, ABOVE G	4.00	EA	$6,801.42	$27,205.68
	Comment: Indian River County preferred detection system: Video Detection				
	Signalizations Component Total				$465,635.12

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MAX

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	2,898.72	LF	$13.87	$40,205.25
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	378.26	LF	$30.56	$11,559.63
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	$1,210.12	$14,521.44
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	9,830.94	LF	$3.70	$36,374.48
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	12.00	EA	$9,544.29	$114,531.48
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	12.00	EA	$999.15	$11,989.80
	Subcomponent Total				$229,182.07
	Lighting Component Total				$229,182.08

BRIDGES COMPONENT

Bridge 880085

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Length (LF)	126.00
Width (LF)	105.00
Type	Low Level
Cost Factor	1.00
Structure No.	880003
Removal of Existing Structures area	8,050.00
Default Cost per SF	$120.00
Factored Cost per SF	$120.00

Final Cost per SF	**$297.62**
Basic Bridge Cost	**$1,587,600.00**
Description	LOW LEVEL BRIDGE WITH 4 LANES. ELEVATED 8-FT SIDEWALK ON THE WEST SIDE OF BRIDGE AND 12-FT SHARED-USE PATH ON THE EAST SIDE OF BRIDGE.

Bridge Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	8,050.00	SF	$51.67	$415,943.50
400-2-10	CONC CLASS II, APPROACH SLABS	233.33	CY	$735.46	$171,604.88
415-1-9	REINF STEEL- APPROACH SLABS	40,832.75	LB	$1.44	$58,799.16

Bridge X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-47	CONC CLASS II, CIP TOP W/ SR ADMIX	440.00	CY	$2,327.50	$1,024,100.00
400-4-5	CONC CLASS IV, SUBSTRUCTURE	144.00	CY	$1,468.71	$211,494.24
415-1-5	REINF STEEL- SUBSTRUCTURE	111,080.00	LB	$1.62	$179,949.60
455-34-3	PRESTRESSED CONCRETE PILING, 18" SQ	4,680.00	LF	$145.83	$682,484.40
515-2-311	PED/BICYCLE RAILING, ALUM,42" TYPE 1	187.00	LF	$114.63	$21,435.81
	Bridge 880085 Total				$4,353,411.59
	Bridges Component Total				$4,353,411.59

RETAINING WALLS COMPONENT

Retaining Wall 1

Description	Value
Length	100.00
Begin height	5.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00	SF	$37.03	$46,287.50

Retaining Wall 2

Description	Value
Length	100.00
Begin height	5.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00	SF	$37.03	$46,287.50

Retaining Wall 3

Description	Value
Length	100.00
Begin height	5.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00	SF	$37.03	$46,287.50

Retaining Wall 4

Description	Value
Length	100.00
Begin height	5.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,250.00	SF	$37.03	$46,287.50

Retaining Wall 5

Description	Value
Length	50.00
Begin height	20.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,000.00	SF	$37.03	$37,030.00

Retaining Wall 6

Description	Value
Length	50.00
Begin height	20.00
End Height	20.00
Multiplier	1

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
548-12	RET WALL SYSTEM, PERM, EX BARRIER	1,000.00	SF	$37.03	$37,030.00
	Retaining Walls Component Total				$259,210.00

Sequence 1 Total $10,285,971.14

Sequence: 2 NUU - New Construction, Undivided, Urban **Net Length:** 0.284 MI 1,500 LF

Description: Aviation Blvd West of SR 5/US 1 with shared-use path on south side, 7' bike lane on north side, and Median. Special light fixtures needed for Airport property approval.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	44.00 / 113.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.284
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	104.00
Horizontal Elevation For End Section	104.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	5.40	AC	$49,392.09	$266,717.29
	Earthwork Component Total				$266,717.29

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	29.00 / 22.00
Structural Spread Rate	165
Friction Course Spread Rate	80

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	9,360.30	SY	$16.19	$151,543.26
285-709	OPTIONAL BASE,BASE GROUP 09	8,500.27	SY	$18.98	$161,335.12
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	701.27	TN	$148.38	$104,054.44
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	340.01	TN	$197.89	$67,284.58

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
570-1-2	PERFORMANCE TURF, SOD	1,334.00	SY	$5.34	$7,123.56
	Comment: Median Sod. (1500 ft)x(8 ft)/(9 ft2/yd2)=1334 yd2				

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	20.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	Y

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	1,872.06	SY	$16.19	$30,308.65
285-709	OPTIONAL BASE,BASE GROUP 09	1,700.05	SY	$18.98	$32,266.95
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	140.25	TN	$148.38	$20,810.29
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	68.00	TN	$197.89	$13,456.52

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	3

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	192.00	EA	$4.02	$771.84
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	2.27	GM	$1,171.40	$2,659.08
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	1.70	GM	$449.94	$764.90

Peripherals Subcomponent

Description	Value
Off Road Bike Path(s)	0
Off Road Bike Path Width L/R	0.00 / 12.00
Bike Path Structural Spread Rate	200
Noise Barrier Wall Length	0.00
Noise Barrier Wall Begin Height	0.00
Noise Barrier Wall End Height	0.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,666.75	SY	$16.19	$43,174.68
285-701	OPTIONAL BASE,BASE GROUP 01	2,000.06	SY	$14.76	$29,520.89
334-1-12	SUPERPAVE ASPHALTIC CONC, TRAFFIC B	200.01	TN	$158.98	$31,797.59
339-1	MISCELLANEOUS ASPHALT PAVEMENT	24.33	TN	$281.07	$6,838.43
536-1-1	GUARDRAIL- ROADWAY, GEN TL-3	720.00	LF	$27.75	$19,980.00
536-85-26	GUARDRAIL END TREATMENT-TYPE CRT	1.00	EA	$4,619.10	$4,619.10
544-3-2	CRASH CUSHION, TL-3, WIDE	1.00	EA	$34,793.88	$34,793.88
	Roadway Component Total				$763,103.77

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	0.00 / 0.00
Total Outside Shoulder Perf. Turf Width L/R	0.00 / 0.00

Sidewalk Width L/R	0.00 / 0.00

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	6,000.00	LF	$27.01	$162,060.00
	Comment: Median C&G and outside edge of pavt. both sides. (1500 ft)x(4 sides)=6000 ft				

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	3,000.10	LF	$1.84	$5,520.18
104-11	FLOATING TURBIDITY BARRIER	71.03	LF	$13.89	$986.61
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	71.03	LF	$13.00	$923.39
104-15	SOIL TRACKING PREVENTION DEVICE	1.00	EA	$4,039.69	$4,039.69
104-18	INLET PROTECTION SYSTEM	15.00	EA	$155.49	$2,332.35
107-1	LITTER REMOVAL	3.44	AC	$20.47	$70.42
107-2	MOWING	3.44	AC	$65.97	$226.94
	Shoulder Component Total				$176,159.58

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	11.00	EA	$7,013.89	$77,152.79
425-1-451	INLETS, CURB, TYPE J-5, <10'	3.00	EA	$11,481.26	$34,443.78
425-1-521	INLETS, DT BOT, TYPE C, <10'	2.00	EA	$6,099.36	$12,198.72
425-2-41	MANHOLES, P-7, <10'	2.00	EA	$6,729.69	$13,459.38
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	664.00	LF	$179.47	$119,168.08
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	64.00	LF	$267.91	$17,146.24
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	1,424.00	LF	$426.25	$606,980.00
570-1-1	PERFORMANCE TURF	86.37	SY	$3.12	$269.47
	Drainage Component Total				$880,818.46

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	6.00	AS	$471.57	$2,829.42
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	$1,500.79	$3,001.58
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	$8,253.40	$8,253.40
	Signing Component Total				$14,084.40

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MAX

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,500.05	LF	$13.87	$20,805.69
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	195.74	LF	$30.56	$5,981.81
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	6.00	EA	$1,210.12	$7,260.72
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	5,087.38	LF	$3.70	$18,823.31
715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	6.00	EA	$9,544.29	$57,265.74
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	6.00	EA	$999.15	$5,994.90
	Subcomponent Total				$116,132.17

Lighting Component Total $116,132.17

Sequence 2 Total $2,217,015.67

Sequence: 3 NUU - New Construction, Undivided, Urban **Net Length:** 0.085 MI 450 LF

Description: Aviation Blvd East of SR-5/US-1 with 7' bike lanes on both sides and median.

EARTHWORK COMPONENT

User Input Data

Description	Value
Standard Clearing and Grubbing Limits L/R	50.00 / 60.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.085
Top of Structural Course For Begin Section	105.00
Top of Structural Course For End Section	105.00
Horizontal Elevation For Begin Section	103.00
Horizontal Elevation For End Section	103.00
Front Slope L/R	6 to 1 / 6 to 1
Outside Shoulder Cross Slope L/R	2.00 % / 2.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	1.13	AC	$49,392.09	$55,813.06
120-6	EMBANKMENT	1,964.91	CY	$29.58	$58,122.04
	Earthwork Component Total				$113,935.10

ROADWAY COMPONENT

User Input Data

Description	Value
Number of Lanes	3
Roadway Pavement Width L/R	17.00 / 18.00
Structural Spread Rate	165
Friction Course Spread Rate	80

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	2,007.36	SY	$16.19	$32,499.16
285-709	OPTIONAL BASE,BASE GROUP 09	1,749.44	SY	$18.98	$33,204.37
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	144.33	TN	$148.38	$21,415.69
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	69.98	TN	$197.89	$13,848.34

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
570-1-2	PERFORMANCE TURF, SOD	550.00	SY	$5.34	$2,937.00
	Comment: Median Sod. (450 ft)x(11 ft)/ (9 ft2/yd2)=550 yd2				

Turnouts/Crossovers Subcomponent

Description	Value
Asphalt Adjustment	15.00
Stabilization Code	Y
Base Code	Y
Friction Course Code	Y

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	301.10	SY	$16.19	$4,874.81
285-709	OPTIONAL BASE,BASE GROUP 09	262.42	SY	$18.98	$4,980.73
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	21.65	TN	$148.38	$3,212.43
337-7-83	ASPH CONC FC,TRAFFIC C,FC-12.5,PG 76-22	10.50	TN	$197.89	$2,077.85

Pavement Marking Subcomponent

Description	Value
Include Thermo/Tape/Other	N
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	2
Solid Stripe No. of Stripes	3
Skip Stripe No. of Paint Applications	2
Skip Stripe No. of Stripes	2

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-1-3	RAISED PAVMT MARK, TYPE B	46.00	EA	$4.02	$184.92
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.51	GM	$1,171.40	$597.41
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	0.34	GM	$449.94	$152.98
	Roadway Component Total				$119,985.69

SHOULDER COMPONENT

User Input Data

Description	Value
Total Outside Shoulder Width L/R	13.25 / 13.25
Total Outside Shoulder Perf. Turf Width L/R	5.00 / 5.00
Sidewalk Width L/R	6.00 / 6.00

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	449.86	LF	$27.01	$12,150.72
520-1-10	CONCRETE CURB & GUTTER, TYPE F	449.86	LF	$27.01	$12,150.72
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	599.81	SY	$56.89	$34,123.19
570-1-1	PERFORMANCE TURF	499.84	SY	$3.12	$1,559.50

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
520-1-10	CONCRETE CURB & GUTTER, TYPE F	900.00	LF	$27.01	$24,309.00
	Comment: Median C&G both sides. (450 ft)x(2 sides)= 900 ft				

Erosion Control

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount

104-10-3	SEDIMENT BARRIER	899.71 LF	$1.84	$1,655.47
104-11	FLOATING TURBIDITY BARRIER	21.30 LF	$13.89	$295.86
104-12	STAKED TURBIDITY BARRIER-NYL REINF PVC	21.30 LF	$13.00	$276.90
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	$4,039.69	$4,039.69
104-18	INLET PROTECTION SYSTEM	5.00 EA	$155.49	$777.45
107-1	LITTER REMOVAL	1.03 AC	$20.47	$21.08
107-2	MOWING	1.03 AC	$65.97	$67.95
	Shoulder Component Total			$91,427.53

DRAINAGE COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
425-1-351	INLETS, CURB, TYPE P-5, <10'	4.00	EA	$7,013.89	$28,055.56
425-1-451	INLETS, CURB, TYPE J-5, <10'	1.00	EA	$11,481.26	$11,481.26
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00	EA	$6,099.36	$6,099.36
425-2-41	MANHOLES, P-7, <10'	1.00	EA	$6,729.69	$6,729.69
430-175-124	PIPE CULV, OPT MATL, ROUND, 24"S/CD	200.00	LF	$179.47	$35,894.00
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	24.00	LF	$267.91	$6,429.84
430-175-148	PIPE CULV, OPT MATL, ROUND, 48"S/CD	432.00	LF	$426.25	$184,140.00
570-1-1	PERFORMANCE TURF	25.90	SY	$3.12	$80.81
	Drainage Component Total				$278,910.52

SIGNING COMPONENT

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	5.00	AS	$471.57	$2,357.85
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	1.00	AS	$1,500.79	$1,500.79
700-2-15	MULTI- POST SIGN, F&I GM, 51-100 SF	1.00	AS	$8,253.40	$8,253.40
	Signing Component Total				$12,112.04

LIGHTING COMPONENT

Conventional Lighting Subcomponent

Description	Value
Spacing	MAX

Pay Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	449.86	LF	$13.87	$6,239.56
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	58.70	LF	$30.56	$1,793.87
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00	EA	$1,210.12	$2,420.24
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	1,525.68	LF	$3.70	$5,645.02

715-61-342	LIGHT POLE CMPLT,STD,F&I, 40'MH,12'ARM L	2.00 EA	$9,544.29	$19,088.58
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	2.00 EA	$999.15	$1,998.30
	Subcomponent Total			$37,185.57
	Lighting Component Total			$37,185.57
Sequence 3 Total				$653,556.45

Sequence: 4 MIS - Miscellaneous Construction **Net Length:** 0.000 MI 1 LF

Description: Disputes Review Board Pay Items

ROADWAY COMPONENT

X-Items

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-20-1	DISPUTES REVIEW BD, MEETING-DO NOT BID	36.00	DA	$3,900.00	$140,400.00
	Comment: Assume 36 month construction				
999-20-2	DISPUTES REVIEW BD, HEARING-DO NOT BID	6.00	EA	$4,500.00	$27,000.00
	Comment: Assume 1 hearing every 6 months.				
	Roadway Component Total				$167,400.00

Sequence 4 Total $167,400.00

Date: 3/13/2024 11:43:48 AM

FDOT Long Range Estimating System - Production

R3: Project Details by Sequence Report

Project: 441693-1-52-01 **Letting Date:** 01/2099

Description: SR-5/US-1 AT AVIATION BOULEVARD

District: 04 **County:** 88 INDIAN RIVER **Market Area:** 11 **Units:** English

Contract Class: 7 **Lump Sum Project:** N **Design/Build:** N **Project Length:** 1.237 MI

Project Manager: NAGOLE

Version 17 Project Grand Total **$16,277,971.35**

Description: 2024 WPUC SR-5/US-1 AT AVIATION BOULEVARD - PREFERRED ALTERNATIVE

Project Sequences Subtotal			**$13,323,943.26**
102-1	Maintenance of Traffic	10.00 %	$1,332,394.33
101-1	Mobilization	10.00 %	$1,465,633.76
Project Sequences Total			**$16,121,971.35**
Project Unknowns		0.00 %	$0.00
Design/Build		0.00 %	$0.00

Non-Bid Components:

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-16	PARTNERING (DO NOT BID)	2.00	LS	$3,000.00	$6,000.00
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	$150,000.00	$150,000.00
Project Non-Bid Subtotal					**$156,000.00**
Version 17 Project Grand Total					**$16,277,971.35**

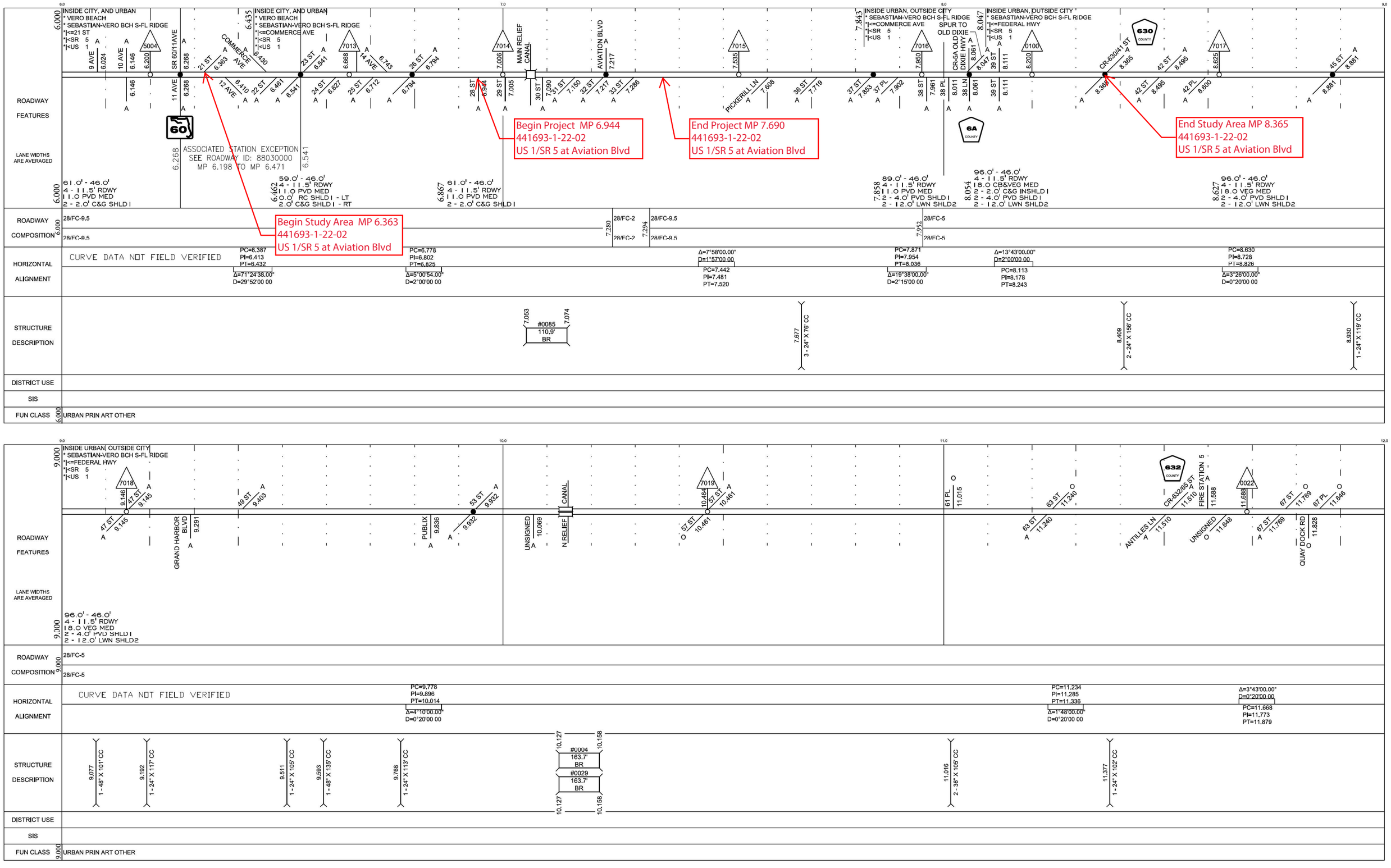
Appendix B – Existing Conditions

	5 YR INV	SLD REV	BMP	EMP	INV	SLD REV
DATE	04/19/2016	05/05/2016				
BY	CALTRAN	CALTRAN				

FLORIDA DEPARTMENT OF TRANSPORTATION

STRAIGHT LINE DIAGRAM OF ROAD INVENTORY

SECTION STATUS	INT. or US ROUTE NO.	STATE ROAD NO.	COUNTY	DISTRICT	ROADWAY ID	SHEET NO:
02	US 1	SR 5	INDIAN RIVER	04	88010000	2 OF 4



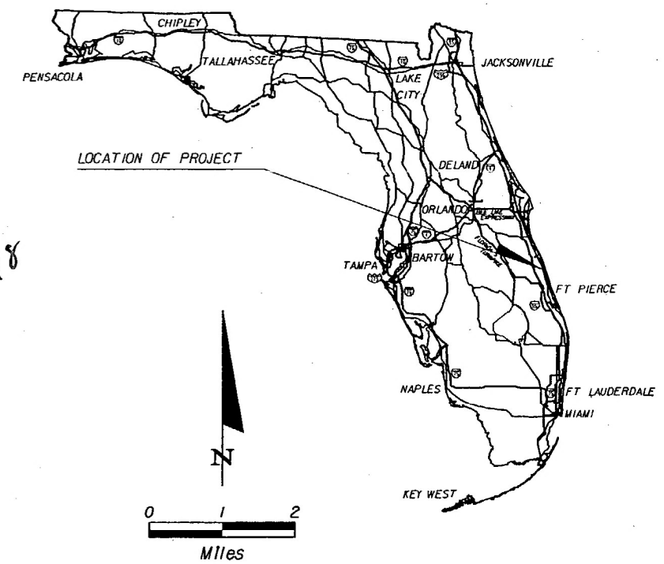
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

FINAL "AS-BUILT" PLANS

~~CONTRACT PLANS~~

FINANCIAL PROJECT ID 415291-1-52-01
INDIAN RIVER COUNTY (88010)
STATE ROAD NO. 5
FROM 20TH PLACE TO SOUTH OF 33RD STREET

148



COMPONENTS OF CONTRACT PLANS SET

ROADWAY PLANS
SIGNING AND PAVEMENT MARKING PLANS
SIGNALIZATION PLANS
LANDSCAPE PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2-3	SUMMARY OF PAY ITEMS
4-7	TYPICAL SECTION
8	TYPICAL SECTION DETAILS
9	SUMMARY OF QUANTITIES
10	SUMMARY OF DRAINAGE STRUCTURES
11	GENERAL NOTES
12-25	ROADWAY PLANS
26-28	TRAFFIC CONTROL PLAN
CTL-1 THRU CTL-3	PROJECT NETWORK CONTROL
UTV-1	VERIFIED UTILITY LOCATIONS

INDEX OF FINAL PLANS

1. ROADWAY PLANS
2. SIGNING AND PAVEMENT MARKINGS
3. SIGNALIZATION PLANS
4. LANDSCAPING PLANS

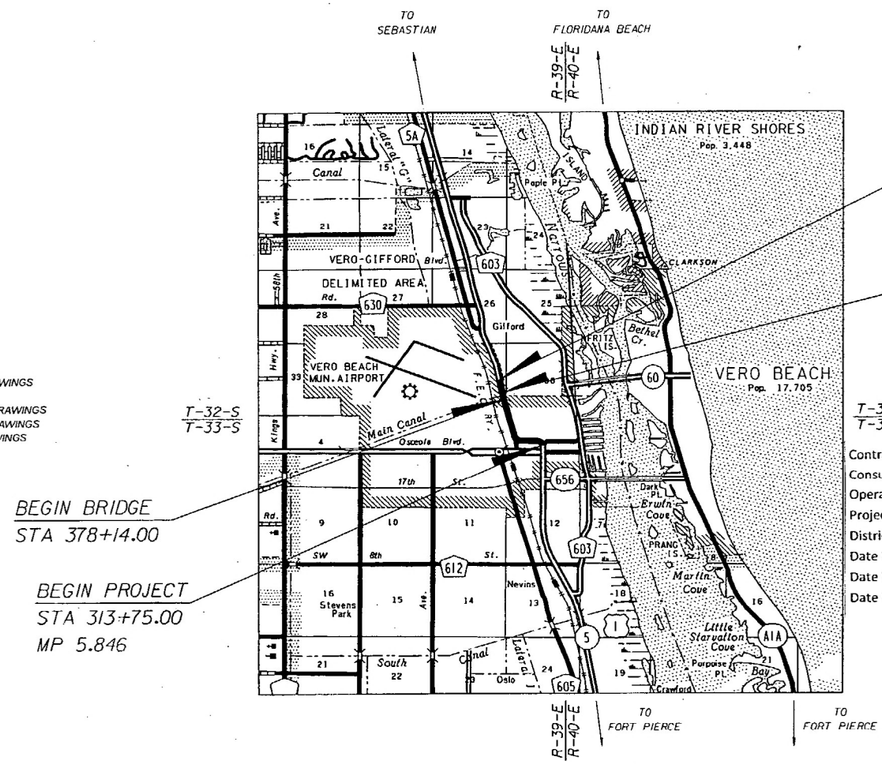
INDEX OF FINAL PLANS

COMPUTATION BOOK -- 1/1
SIGNALIZATION SHOP DRAWINGS
CANTILEVER SIGN SHOP DRAWINGS
SIGNALIZATION EQUIPMENT SHOP DRAWINGS
FIBER OPTIC SHOP DRAWINGS
PULL BOXES, CONDUIT & MISC SHOP DRAWINGS
WIRE, BREAKERS & CONDUIT SHOP DRAWINGS
IRRIGATION & LANDSCAPE SHOP DRAWINGS

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
DESIGN STANDARDS DATED 2008,
AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 2007,
AS AMENDED BY CONTRACT DOCUMENTS.

APPLICABLE DESIGN STANDARDS MODIFICATION: 7-1-08

For Design Standards Modifications click on "Design Standards" at the following website:
http://www.dot.state.fl.us/rddesign/



PROJECT LENGTH IS BASED ON ℄ OF SURVEY

LENGTH OF PROJECT	LINEAR FEET	MILES
ROADWAY	7,533.00	1.426
BRIDGES	114.00	0.022
NET LENGTH OF PROJECT	7,647.00	1.448
EXCEPTIONS	0.00	0.00
GROSS LENGTH OF PROJECT	7,647.00	1.448

FDOT PROJECT MANAGER: JULIO DELGADO, P.E.

Contractor:	Community Asphalt
Consultants:	CIMA Engineering
Operations Engineer:	Carolyn Gish, PE
Project Administrator:	Kristopher Kehres, EI
District Secretary:	Jim Wolfe, PE
Date Work Started:	04/06/2009
Date Work Conditionally Accepted:	N/A
Date Work Final Accepted or Completed:	10/7/2009

ROADWAY SHOP DRAWINGS TO BE SUBMITTED TO:

MICHAEL PRIORY, P.E.
PBS&J
3230 W. COMMERCIAL BLVD., SUITE 100
FORT LAUDERDALE, FLORIDA 33309
PHONE: (954) 733-7233
VENDOR NO. 59-0896138

PLANS PREPARED BY:

PBS&J
3230 W. COMMERCIAL BLVD., SUITE 100
FORT LAUDERDALE, FLORIDA 33309
PHONE: (954) 733-7233
VENDOR NO. 59-0896138
CONTRACT NO. C-8H96
CERTIFICATE OF AUTHORIZATION NO. 24

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THESE PLANS AS PROVIDED BY THE ENGINEER OF RECORD. IF CHANGES WERE MADE, THOSE CHANGES ARE INDICATED BY BLACK INK REVISION AND BEAR THE SEAL AND SIGNATURE OF THE RESPONSIBLE PROFESSIONAL ENGINEER.

Carolyn Gish 10/30/09
OPERATIONS ENGINEER DATE
53845

ROADWAY PLANS
ENGINEER OF RECORD: MICHAEL PRIORY, P.E.

P.E. NO.: 60614

REVISIONS

REVISIONS
SHEET S-28 (Revised 3/26/2009)

KEY SHEET REVISIONS		
DATE	BY	DESCRIPTION

FISCAL YEAR	SHEET NO.
09	1

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 1 A0001
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE . WANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000

0001 SUMMARY OF ROADWAY — PAY ITEMS

SPC	ALT	ITEM NUMBER	ITEM DESCRIPTION	UNIT	41529115201	QUANTITY TOTAL
		0101- 1-	MOBILIZATION	LS	1.000 N	1.000
		0102- 1-	MAINTENANCE OF TRAFFIC	LS	1.000 N	1.000
T		0102- 14-	TRAFFIC CONTROL OFFICER	WH	8.000 N	8.000
		0102- 60-	WORK ZONE SIGN	ED	8602.000 N	8602.000
		0102- 74- 1	BARRICADE, TEMPORARY, TYPES I, II, DI, VP & DRUM	ED	22258.000 N	22258.000
		0102- 74- 2	BARRICADE, TEMPORARY, TYPE III, 6'	ED	999.000 N	999.000
		0102- 76-	ADVANCE WARNING ARROW PANEL	ED	764.000 N	764.000
		0102- 77-	HIGH INTENSITY FLASHING LIGHTS, TEMP, TYPE B	EQ	2873.000 N	2873.000
		0102- 99-	CHANGEABLE-VARIABLE MESSAGE SIGN, TEMPORARY	ED	328.000 N	328.000
		0102-911- 1	PAVEMENT MARKING REMOVABLE, WHITE-BLACK, SKIP	LF	23691.000 N	23691.000
		0102-911- 2	PAVEMENT MARKING REMOVABLE, WHITE-BLACK, SOLID	LF	42222.000 N	42222.000
		0102-911- 3	PAVEMENT MARKING REMOVABLE, WHITE-BLACK, OTHER	SF	2938.000 N	2938.000
		0102-912- 1	PAVT MARKING REMOVABLE, YELLOW, SKIP	LF	2482.000 N	2482.000
		0102-912- 2	PAVEMENT MARKING REMOVABLE, YELLOW, SOLID	LF	31221.000 N	31221.000
		0104- 16-	ROCK BAG	EA	900.000 N	900.000
		0110- 1- 1	CLEARING & GRUBBING	LS	1.000 N	1.000
		0110- 4-	REMOVAL OF EXISTING CONCRETE PAVEMENT	SY	920.000 N	920.000
		0120- 2- 2	BORROW EXCAVATION, TRUCK MEASURE	CY	20.000 N	20.000
		0120- 71-	REGULAR EXCAVATION (3-R PROJECTS ONLY)	LS	1.000 N	1.000
		0285-713-	OPTIONAL BASE, BASE GROUP 13	SY	111.000 N	111.000
		0327- 70- 8	MILLING EXIST ASPH PAVT, 2 1/2" AVG DEPTH	SY	54302.000 N	54302.000
		0334- 1- 13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TN	4941.400 N	4941.400
		0337- 7- 30	ASPHALT CONCRETE FRICTION COURSE,TRAFFIC B, FC-9.5, RUBBER	TN	3142.400 N	3142.400
		0339- 1-	MISCELLANEOUS ASPHALT PAVEMENT	TN	17.900 N	17.900
		0400- 1- 11	CONCRETE CLASS I, RETAINING WALLS	CY	8.000 N	8.000
		0425- 6-	VALVE BOXES, ADJUST	EA	16.000 N	16.000
		0425- 10-	YARD DRAIN	EA	1.000 N	1.000
		0460- 70- 2	ALUMINUM BULLET RAILINGS, DOUBLE RAIL	LF	106.000 N	106.000
		0515- 1- 2	PIPE HANDRAIL - GUIDERAIL, ALUMINUM	LF	60.000 N	60.000
		0520- 1- 10	CONCRETE CURB & GUTTER, TYPE F	LF	1439.000 N	1439.000
		0520- 2- 2	CONCRETE CURB, TYPE B	LF	97.000 N	97.000
		0520- 2- 4	CONCRETE CURB, TYPE D	LF	144.000 N	144.000
		0522- 1-	SIDEWALK CONCRETE, 4" THICK	SY	907.000 N	907.000
		0522- 2-	SIDEWALK CONCRETE, 6" THICK	SY	63.000 N	63.000
		0527- 1-	DETECTABLE WARNING ON WALKING SURFACE, RETROFIT	EA	7.000 N	7.000
		0536- 1- 1	GUARDRAIL -ROADWAY	LF	288.000 N	288.000
		0536- 1- 6	GUARDRAIL- BRIDGE, THRIE BEAM	LF	176.000 N	176.000
		0536- 8-	GUARDRAIL- BRIDGE ANCHORAGE ASSEMBLY (FURNISH & INSTALL)	EA	4.000 N	4.000
		0536- 73-	GUARDRAIL REMOVAL	LF	267.000 N	267.000
		0536- 85- 24	GUARDRAIL END ANCHORAGE ASSEMBLY- PARALLEL	EA	2.000 N	2.000
		0536- 85- 25	GUARDRAIL END ANCHORAGE ASSEMBLY- TYPE II	EA	2.000 N	2.000
		0706- 3-	RETRO-REFLECTIVE PAVEMENT MARKERS	EA	1283.000 N	1283.000

FLORIDA DEPARTMENT OF TRANSPORTATION

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 2 A0001
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE . WANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000

0001 SUMMARY OF ROADWAY — PAY ITEMS CONTINUED

SPC	ALT	ITEM NUMBER	ITEM DESCRIPTION	UNIT	41529115201	QUANTITY TOTAL
		0710- 11-111	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 6"	NM	4.027 N	4.027
		0710- 11-122	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 8"	LF	1085.000 N	1085.000
		0710- 11-123	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 12"	LF	3231.000 N	3231.000
		0710- 11-124	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 18"	LF	502.000 N	502.000
		0710- 11-125	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 24"	LF	934.000 N	934.000
		0710- 11-131	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SKIP 16"	GM	2.382 N	2.382
		0710- 11-160	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, MESSAGE	EA	19.000 N	19.000
		0710- 11-170	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, ARROWS	EA	86.000 N	86.000
		0710- 11-211	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 6"	NM	3.022 N	3.022
		0710- 11-222	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 8"	LF	1790.000 N	1790.000
		0710- 11-224	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 18"	LF	1126.000 N	1126.000
		0710- 11-231	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SKIP, 6"	GM	0.243 N	0.243
		0710- 11-290	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, ISLAND NOSE	SF	109.000 N	109.000
		0715- 14- 12	LIGHTING - PULL BOX, F&I, SIDEWALK	EA	1.000 N	1.000
		0999- 16-	PARTNERING, DO NOT BID	LS	1.000 N	1.000
		0999- 25-	INITIAL CONTINGENCY AMOUNT, DO NOT BID	LS	1.000 N	1.000

FLORIDA DEPARTMENT OF TRANSPORTATION

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 3 A0002
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE . WANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000

0002 SUMMARY OF SIGNING — PAY ITEMS

SPC	ALT	ITEM NUMBER	ITEM DESCRIPTION	UNIT	41529115201	QUANTITY TOTAL
		0700- 20- 11	SINGLE POST SIGN, F&I, LESS THAN 12 SF	AS	64.000 N	64.000
		0700- 20- 12	SINGLE POST SIGN, F&I, 12-20 SF	AS	19.000 N	19.000
		0700- 20- 31	SINGLE POST SIGN, INSTALL, LESS THAN 12 SF	AS	1.000 N	1.000
		0700- 20- 40	SINGLE POST SIGN, RELOCATE	AS	3.000 N	3.000
		0700- 20- 60	SINGLE POST SIGN, REMOVE	AS	24.000 N	24.000
		0700- 21- 11	MULTI- POST SIGN, F&I, 50 SF OR LESS	AS	5.000 N	5.000
		0700- 23-142	OVERHEAD TRUSS CANTILEVER SIGN,FURNISH & INSTALL TRUSS LENGTH > 50, SIGN AREA 101-200 SF	AS	1.000 N	1.000
		0700- 48- 28	SIGN PANELS, INSTALL, 15 OR LESS	EA	1.000 N	1.000
		0700- 48- 48	SIGN PANELS RELOCATE, 15 OR <	EA	1.000 N	1.000
		0700- 48- 60	SIGN PANELS, REMOVE	EA	7.000 N	7.000
		0705- 10- 1	OBJECT MARKER, TYPE I	EA	17.000 N	17.000
		0710- 90-	PAINTED PAVEMENT MARKINGS, FINAL SURFACE	LS	1.000 N	1.000
		0711- 17-	THERMOPLASTIC, REMOVE	SF	342.000 N	342.000
		0713-101-170	PREFORMED TAPE, STANDARD, WHITE, ARROWS	EA	1.000 N	1.000
		0713-101-225	PREFORMED TAPE, STANDARD, YELLOW, SOLID, 18"	LF	5.000 N	5.000
		0713-102-111	PREFORMED TAPE, HIGH PERFORMANCE, WHITE, SOLID, 6"	NM	0.057 N	0.057
		0713-102-131	PREFORMED TAPE, HIGH PERFORMANCE, WHITE, SKIP, 6"	GM	0.052 N	0.052
		0713-102-211	PREFORMED TAPE, HIGH PERFORMANCE, YELLOW, SOLID, 16"	NM	0.051 N	0.051

FLORIDA DEPARTMENT OF TRANSPORTATION

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

PBS&J
Certificate of Authorization No. 24
Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J

Michael Priory, P.E.
P.E. No.: 60614
3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale, FL 33309
(954) 733-7233

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	41529-1-52-01

SUMMARY OF PAY ITEMS

SHEET NO. 2

COMPONENTS OF CONTRACT PLANS SET

ROADWAY PLANS
SIGNING AND PAVEMENT MARKING PLANS
SIGNALIZATION PLANS
LANDSCAPE PLANS

A DETAILED INDEX APPEARS ON THE KEY SHEET OF EACH COMPONENT

INDEX OF ROADWAY PLANS

SHEET NO.	SHEET DESCRIPTION
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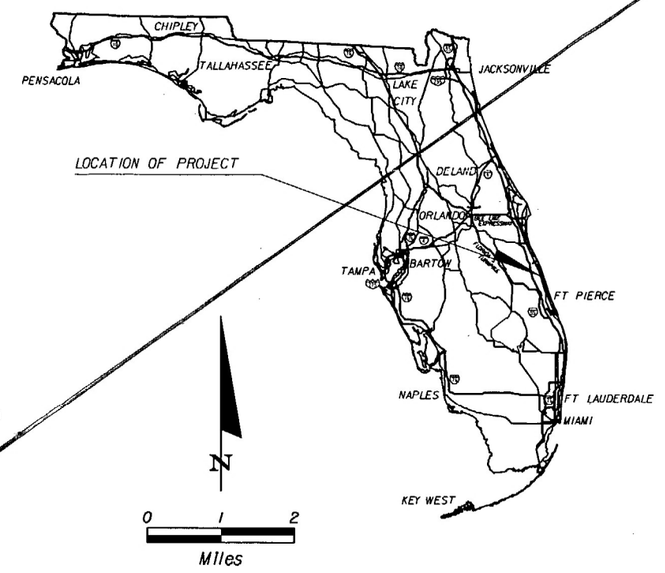
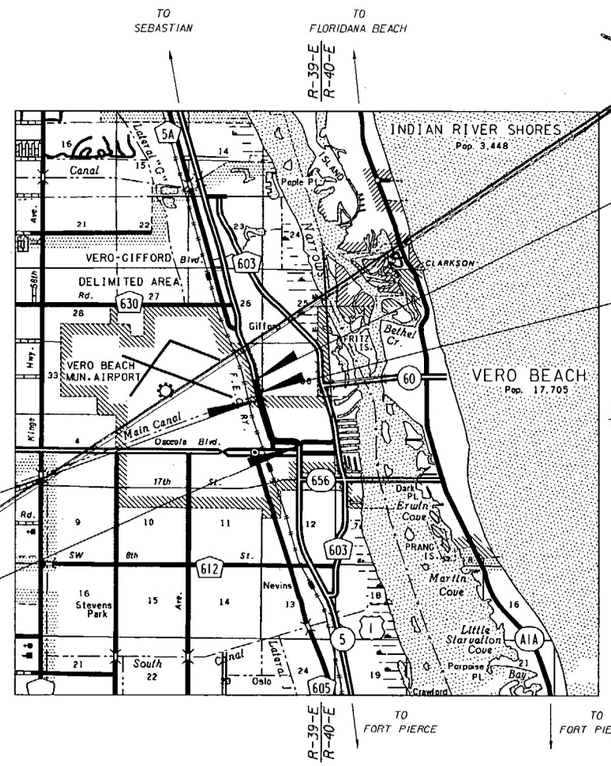
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

~~CONTRACT PLANS~~

VOID

FINANCIAL PROJECT ID 415291-1-52-01
INDIAN RIVER COUNTY (88010)
STATE ROAD NO. 5
FROM 20TH PLACE TO SOUTH OF 33RD STREET





T-32-S
T-33-S

T-32-S
T-33-S

BEGIN BRIDGE
STA 378+14.00

BEGIN PROJECT
STA 373+75.00
MP 5.846

END PROJECT
STA 390+22.00

END BRIDGE
STA 379+28.00

GOVERNING STANDARDS AND SPECIFICATIONS:
FLORIDA DEPARTMENT OF TRANSPORTATION,
DESIGN STANDARDS DATED 2008,
AND STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION DATED 2007,
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APPLICABLE DESIGN STANDARDS MODIFICATION: 7-1-08

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REVISIONS

VOID

PROJECT LENGTH IS BASED ON ℄ OF SURVEY

LENGTH OF PROJECT	LINEAR FEET	MILES
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NET LENGTH OF PROJECT	7,647.00	1.448
EXCEPTIONS	0.00	0.00
GROSS LENGTH OF PROJECT	7,647.00	1.448

FDOT PROJECT MANAGER: JULIO DELGADO, P.E.

KEY SHEET REVISIONS		
DATE	BY	DESCRIPTION

ROADWAY SHOP DRAWINGS TO BE SUBMITTED TO:

MICHAEL PRIORY, P.E.
PBS&J
3230 W. COMMERCIAL BLVD., SUITE 100
FORT LAUDERDALE, FLORIDA 33309
PHONE: (954) 733-7233
VENDOR NO. 59-0896138

PLANS PREPARED BY:

PBS&J
3230 W. COMMERCIAL BLVD., SUITE 100
FORT LAUDERDALE, FLORIDA 33309
PHONE: (954) 733-7233
VENDOR NO. 59-0896138
CONTRACT NO. C-8H96
CERTIFICATE OF AUTHORIZATION NO. 24

NOTE: THE SCALE OF THESE PLANS MAY HAVE CHANGED DUE TO REPRODUCTION.

ROADWAY PLANS
ENGINEER OF RECORD: MICHAEL PRIORY, P.E.

P.E. NO.: 60614

FISCAL YEAR	SHEET NO.
09	1

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DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 1 A0001
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE , MANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000 ,

0001 SUMMARY OF ROADWAY — PAY ITEMS

S P C	ALT	ITEM NUMBER	ITEM DESCRIPTION	UN IT	41529115201	QUANTITY TOTAL
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		0102- 1-	MAINTENANCE OF TRAFFIC	LS	1.000 N	1.000
T		0102- 14-	TRAFFIC CONTROL OFFICER	WH	8.000 N	8.000
		0102- 60-	WORK ZONE SIGN	ED	8602.000 N	8602.000
		0102- 74- 1	BARRICADE, TEMPORARY, TYPES I, II, DI, VI & DRUM	ED	22258.000 N	22258.000
		0102- 74- 2	BARRICADE, TEMPORARY, TYPE III, 6'	ED	999.000 N	999.000
		0102- 76-	ADVANCE WARNING ARROW PANEL	ED	764.000 N	764.000
		0102- 77-	HIGH INTENSITY FLASHING LIGHTS, TEMP, TYPE B	ED	2873.000 N	2873.000
		0102- 99-	CHANGEABLE-VARIABLE MESSAGE SIGN, TEMPORARY	ED	328.000 N	328.000
		0102-911- 1	PAVEMENT MARKING REMOVABLE, WHITE-BLACK, SKIP	LF	23691.000 N	23691.000
		0102-911- 2	PAVEMENT MARKING REMOVABLE, WHITE-BLACK, SOLID	LF	42222.000 N	42222.000
		0102-911- 3	PAVEMENT MARKING REMOVABLE, WHITE-BLACK, OTHER	SF	2938.000 N	2938.000
		0102-912- 1	PAVT MARKING REMOVABLE, YELLOW, SKIP	LF	2482.000 N	2482.000
		0102-912- 2	PAVEMENT MARKING REMOVABLE, YELLOW, SOLID	LF	31221.000 N	31221.000
		0104- 16-	ROCK BAG	EA	900.000 N	900.000
		0110- 1- 1	CLEARING & GRUBBING	LS	1.000 N	1.000
		0110- 4-	REMOVAL OF EXISTING CONCRETE PAVEMENT	SY	920.000 N	920.000
		0120- 2- 2	BORROW EXCAVATION, TRUCK MEASURE	CY	20.000 N	20.000
		0120- 71-	REGULAR EXCAVATION (3-R PROJECTS ONLY)	LS	1.000 N	1.000
		0285-713-	OPTIONAL BASE, BASE GROUP 13	SY	111.000 N	111.000
		0327- 70- 8	MILLING EXIST ASPH PAVT, 2 1/2" AVG DEPTH	SY	54302.000 N	54302.000
		0334- 1- 13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	TN	4941.400 N	4941.400
		0337- 7- 30	ASPHALT CONCRETE FRICTION COURSE, TRAFFIC B, FC-9.5, RUBBER	TN	3142.400 N	3142.400
		0339- 1-	MISCELLANEOUS ASPHALT PAVEMENT	TN	17.900 N	17.900
		0400- 1- 11	CONCRETE CLASS I, RETAINING WALLS	CY	8.000 N	8.000
		0425- 6-	VALVE BOXES, ADJUST	EA	16.000 N	16.000
		0425- 10-	YARD DRAIN	EA	1.000 N	1.000
		0460- 70- 2	ALUMINUM BULLET RAILINGS, DOUBLE RAIL	LF	106.000 N	106.000
		0515- 1- 2	PIPE HANDRAIL - GUIDERAIL, ALUMINUM	LF	60.000 N	60.000
		0520- 1- 10	CONCRETE CURB & GUTTER, TYPE F	LF	1439.000 N	1439.000
		0520- 2- 2	CONCRETE CURB, TYPE B	LF	97.000 N	97.000
		0520- 2- 4	CONCRETE CURB, TYPE D	LF	144.000 N	144.000
		0522- 1-	SIDEWALK CONCRETE, 4" THICK	SY	907.000 N	907.000
		0522- 2-	SIDEWALK CONCRETE, 6" THICK	SY	63.000 N	63.000
		0527- 1-	DETECTABLE WARNING ON WALKING SURFACE, RETROFIT	EA	7.000 N	7.000
		0536- 1- 1	GUARDRAIL -ROADWAY	LF	288.000 N	288.000
		0536- 1- 6	GUARDRAIL- BRIDGE, THRIE BEAM	LF	176.000 N	176.000
		0536- 8-	GUARDRAIL- BRIDGE ANCHORAGE ASSEMBLY (FURNISH & INSTALL)	EA	4.000 N	4.000
		0536- 73-	GUARDRAIL REMOVAL	LF	267.000 N	267.000
		0536- 85- 24	GUARDRAIL END ANCHORAGE ASSEMBLY- PARALLEL	EA	2.000 N	2.000
		0536- 85- 25	GUARDRAIL END ANCHORAGE ASSEMBLY- TYPE II	EA	2.000 N	2.000
		0706- 3-	RETRO-REFLECTIVE PAVEMENT MARKERS	EA	1283.000 N	1283.000

FLORIDA DEPARTMENT OF TRANSPORTATION

VOID

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 2 A0001
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE , MANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000 ,

0001 SUMMARY OF ROADWAY — PAY ITEMS CONTINUED

S P C	ALT	ITEM NUMBER	ITEM DESCRIPTION	UN IT	41529115201	QUANTITY TOTAL
		0710- 11-111	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 6"	NM	4.027 N	4.027
		0710- 11-122	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 8"	LF	1085.000 N	1085.000
		0710- 11-123	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 12"	LF	3231.000 N	3231.000
		0710- 11-124	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 18"	LF	502.000 N	502.000
		0710- 11-125	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SOLID, 24"	LF	934.000 N	934.000
		0710- 11-131	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, SKIP 16"	GM	2.382 N	2.382
		0710- 11-160	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, MESSAGE	EA	19.000 N	19.000
		0710- 11-170	PAINTED PAVEMENT MARKINGS, STANDARD, WHITE, ARROWS	EA	86.000 N	86.000
		0710- 11-211	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 6"	NM	3.022 N	3.022
		0710- 11-222	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 8"	LF	1790.000 N	1790.000
		0710- 11-224	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SOLID, 18"	LF	1126.000 N	1126.000
		0710- 11-231	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, SKIP, 6"	GM	0.243 N	0.243
		0710- 11-290	PAINTED PAVEMENT MARKINGS, STANDARD, YELLOW, ISLAND NOSE	SF	109.000 N	109.000
		0715- 14- 12	LIGHTING - PULL BOX, F&I, SIDEWALK	EA	1.000 N	1.000
		0999- 16-	PARTNERING, DO NOT BID	LS	1.000 N	1.000
		0999- 25-	INITIAL CONTINGENCY AMOUNT, DO NOT BID	LS	1.000 N	1.000

FLORIDA DEPARTMENT OF TRANSPORTATION

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 3 A0002
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE , MANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000 ,

0002 SUMMARY OF SIGNING — PAY ITEMS

S P C	ALT	ITEM NUMBER	ITEM DESCRIPTION	UN IT	41529115201	QUANTITY TOTAL
		0700- 20- 11	SINGLE POST SIGN, F&I, LESS THAN 12 SF	AS	64.000 N	64.000
		0700- 20- 12	SINGLE POST SIGN, F&I, 12-20 SF	AS	19.000 N	19.000
		0700- 20- 31	SINGLE POST SIGN, INSTALL, LESS THAN 12 SF	AS	1.000 N	1.000
		0700- 20- 40	SINGLE POST SIGN, RELOCATE	AS	3.000 N	3.000
		0700- 20- 60	SINGLE POST SIGN, REMOVE	AS	24.000 N	24.000
		0700- 21- 11	MULTI- POST SIGN, F&I, 50 SF OR LESS	AS	5.000 N	5.000
		0700- 23-142	OVERHEAD TRUSS CANTILEVER SIGN, FURNISH & INSTALL TRUSS LENGTH > 50, SIGN AREA 101-200 SF	AS	1.000 N	1.000
		0700- 48- 28	SIGN PANELS, INSTALL, 15 OR LESS	EA	1.000 N	1.000
		0700- 48- 48	SIGN PANELS RELOCATE, 15 OR <	EA	1.000 N	1.000
		0700- 48- 60	SIGN PANELS, REMOVE	EA	7.000 N	7.000
		0705- 10- 1	OBJECT MARKER, TYPE I	EA	17.000 N	17.000
		0710- 90-	PAINTED PAVEMENT MARKINGS, FINAL SURFACE	LS	1.000 N	1.000
		0711- 17-	THERMOPLASTIC, REMOVE	SF	342.000 N	342.000
		0713-101-170	PREFORMED TAPE, STANDARD, WHITE, ARROWS	EA	1.000 N	1.000
		0713-101-225	PREFORMED TAPE, STANDARD, YELLOW, SOLID, 18"	LF	5.000 N	5.000
		0713-102-111	PREFORMED TAPE, HIGH PERFORMANCE, WHITE, SOLID, 6	NM	0.057 N	0.057
		0713-102-131	PREFORMED TAPE, HIGH PERFORMANCE, WHITE, SKIP, 6'	GM	0.052 N	0.052
		0713-102-211	PREFORMED TAPE, HIGH PERFORMANCE, YELLOW, SOLID, 6"	NM	0.051 N	0.051

FLORIDA DEPARTMENT OF TRANSPORTATION

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	41529I-1-52-01

SUMMARY OF PAY ITEMS

SHEET NO. 2

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 4 A0003
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE , MANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000

0003 SUMMARY OF SIGNALIZATION — PAY ITEMS

S P C	ALT	ITEM NUMBER	ITEM DESCRIPTION	UN IT	41529115201		QUANTITY TOTAL
		10555- 1- 1	DIRECTIONAL BORE, LESS THAN 6"	LF	1021.000 N		1021.000
		10630- 1- 12	CONDUIT - SIGNALS, FURNISH & INSTALL, UNDERGROUND	LF	139.000 N		139.000
		10630- 1- 13	CONDUIT - SIGNALS, FURNISH & INSTALL, UNDER EXISTING PAVEMENT	LF	800.000 N		800.000
		10630- 1- 22	CONDUIT - SIGNALS, FURNISH, UNDERGROUND	LF	506.000 N		506.000
		10632- 7- 1	CABLE, SIGNAL, FURNISH & INSTALL	LP	2.000 N		2.000
T		10633-121- 1	CABLE - FIBER OPTIC, F&I, UNDERGROUND, SGL MODE, 11- 25 PR	LF	160.000 N		160.000
T		10633-121- 3	CABLE - FIBER OPTIC, F&I, UNDERGROUND, SGL MODE, 151-100 PR	LF	400.000 N		400.000
		10635- 1- 11	PULL & JUNCTION BOXES, F&I, PULL BOX	EA	33.000 N		33.000
T		10635- 1- 15	PULL & JUNCTION BOXES, F&I, FIBER OPTICS	EA	2.000 N		2.000
		10639- 1- 23	SIGNALS, ELECTRICAL POWER SERVICE,UNDERGROUND	AS	2.000 N		2.000
		10639- 2- 1	SIGNALS, ELECTRICAL SERVICE WIRE	LF	325.000 N		325.000
		10649- 31-108	MAST ARM,F&I, WIND SPEED-150,SINGLE ARM,WITH LUMINAIRE-60	EA	2.000 N		2.000
		10649- 31-112	MAST ARM,F&I, WIND SPEED-150,DOUBLE ARM,W/O LUMINAIRE, 36-60	EA	1.000 N		1.000
		10649- 31-116	MAST ARM,F&I, WIND SPEED-150,DOUBLE ARM,W/O LUMINAIRE, 46-70.5	EA	1.000 N		1.000
		10649- 31-206	MAST ARM,F&I, WIND SPEED-130,SINGLE ARM,W/O LUMINAIRE, ARM LENGTH 36'	EA	2.000 N		2.000
		10650- 51-311	TRAFFIC SIGNAL, F&I, 3 SECTION, 1 WAY, STANDARD	AS	15.000 N		15.000
		10650- 51-511	TRAFFIC SIGNAL, F&I, 5 SECTIONS, 1 WAY, STANDARD	AS	2.000 N		2.000
T		10650- 51-513	TRAFFIC SIGNAL, F&I, 5 SECTIONS, 1 WAY, SPECIAL	AS	1.000 N		1.000
		10653-191-	PEDESTRIAN SIGNAL, F&I, LED - COUNT DOWN, 1 DIRECTION	AS	6.000 N		6.000
		10653-192-	PEDESTRIAN SIGNAL, F&I, LED - COUNT DOWN, 2 DIRECTIONS	AS	5.000 N		5.000
		10659-106-	SIGNAL HEAD AUXILIARIES, F&I, TUNNEL VISOR	EA	66.000 N		66.000
		10659-107-	SIGNAL HEAD AUXILIARIES, F&I, ALUMINUM PEDESTAL	EA	6.000 N		6.000
		10660- 2-106	LOOP ASSEMBLY, F&I, TYPE F	AS	1.000 N		1.000
T		10663- 74- 11	VEHICLE DETECTOR ASSEM, F&I, OPTICAL TYPE	EA	16.000 N		16.000
		10665- 11-	PEDESTRIAN DETECTOR, F&I, DETECTOR STATION, POLE OR CONTROLLER CABINET MOUNTED	EA	16.000 N		16.000
T		10670- 5-130	TRAFFIC CONTROLLER ASSEMBLY, F&I, SPECIAL	AS	1.000 N		1.000
T		10670- 5-131	TRAFFIC CONTROLLER ASSEMBLY, F&I, SPECIAL ONE PREEMPTION PLAN	AS	1.000 N		1.000
T		10685-106-	SYSTEM AUXILIARIES, F&I, UNINTERRUPTIBLE POWER SOURCE	EA	2.000 N		2.000
T		10685-120-	SYSTEM AUXILIARIES, F&I, TELEMETRY TRANSCEIVER	EA	2.000 N		2.000
T		10685-128-	SYSTEM AUXILIARIES, FURNISH & INSTALL, INTERFACE PANEL	EA	2.000 N		2.000
T		10686-101-	CLOSED CIRCUIT TV EQUIPMENT, F&I, CAMERA ASSEMBLY	EA	1.000 N		1.000

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 5 A0003
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE , MANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000

0003 SUMMARY OF SIGNALIZATION — PAY ITEMS CONTINUED

S P C	ALT	ITEM NUMBER	ITEM DESCRIPTION	UN IT	41529115201		QUANTITY TOTAL
		10690- 10-	SIGNAL HEAD TRAFFIC ASSEMBLY REMOVAL	EA	9.000 N		9.000
		10690- 20-	SIGNAL PEDESTRIAN ASSEMBLY REMOVAL	EA	8.000 N		8.000
		10690- 33- 1	POLE REMOVAL, DEEP DIRECT BURIAL	LF	192.000 N		192.000
		10690- 50-	CONTROLLER ASSEMBLY, REMOVE, COMPLETE ASSEMBLY	EA	1.000 N		1.000
		10690- 60-	DETECTOR VEHICLE ASSEMBLY REMOVE	EA	29.000 N		29.000
		10690- 70-	DETECTOR PEDESTRIAN ASSEMBLY REMOVE	EA	10.000 N		10.000
		10690- 80-	SPAN WIRE ASSEMBLY, REMOVE	EA	1.000 N		1.000
		10690- 90-	CONDUIT & CABLING REMOVE	PI	1.000 N		1.000
		10690- 91-	SIGNAL INTERCONNECT CABLE REMOVE	LF	400.000 N		400.000
		10690-100-	SIGNAL EQUIPMENT MISCELLANOUS REMOVE	PI	1.000 N		1.000
		10699- 1- 1	INTERNAL ILLUM SIGN, ST NAME	EA	8.000 N		8.000
		10700- 89- 2	SIGN, ELECTRIC POWERED, BLANK OUT	EA	2.000 N		2.000
		10715- 5- 11	LUMINAIRE & BRACKET ARM, F&I, ALUMINUM	EA	4.000 N		4.000

DATE: 07/03/08 PROPOSAL SUMMARY OF PAY ITEMS PAGE: 6 A0004
PROPOSAL : T4212 LEAD PROJECT : 41529115201 COUNTY : INDIAN RIVE , MANDIST: 04
PROJECT(S): 41529115201 COUNTY/SECTION: 88010000

0004 SUMMARY OF LANDSCAPE / PERIPHERAL — PAY ITEMS

S P C	ALT	ITEM NUMBER	ITEM DESCRIPTION	UN IT	41529115201		QUANTITY TOTAL
		10570- 1- 2	PERFORMANCE TURF, SOD	SY	2226.000 N		2226.000
		10580- 1- 1	LANDSCAPE COMPLETE- SMALL PLANTS	LS	1.000 N		1.000
		10580- 1- 2	LANDSCAPE COMPLETE- LARGE PLANTS	LS	1.000 N		1.000
T		10590- 70-	IRRIGATION SYSTEM	LS	1.000 N		1.000

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

PBS&J
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Michael Priory, P.E.
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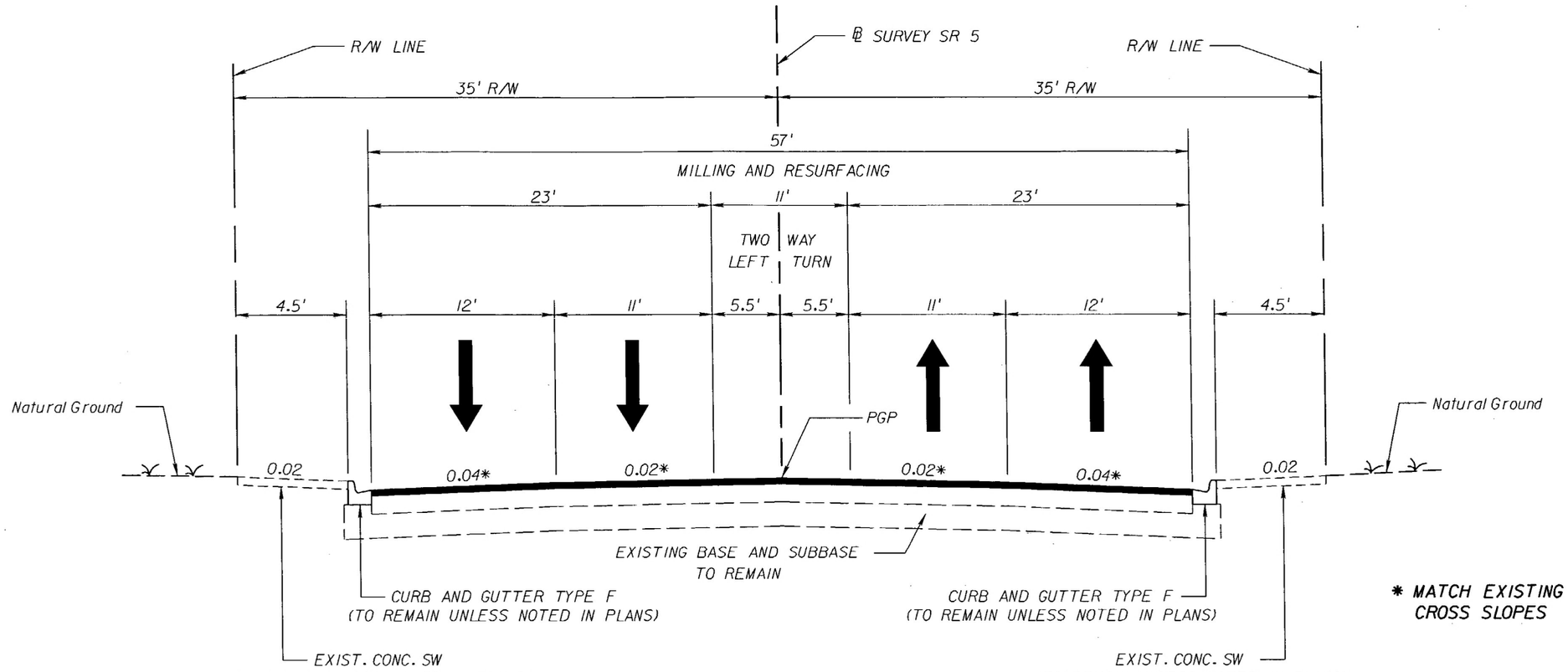
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	41529I-1-52-01

SUMMARY OF PAY ITEMS

SHEET NO. 3



* MATCH EXISTING CROSS SLOPES

TYPICAL SECTION

SR 5 (US-1)

STA. 313+75.00 TO STA. 342+43.17

TRAFFIC DATA
STA. 313+75.00 TO STA. 390+22.00

CURRENT YEAR = 2005 AADT = 39200
ESTIMATED OPENING YEAR = 2010 AADT = 45400
ESTIMATED DESIGN YEAR = 2030 AADT = 70300
K = 9.8% D = 51.2% T = 3.7% (24 HOUR)
DESIGN HOUR T = 1.9%
DESIGN SPEED = 35 MPH
POSTED SPEED = 35 MPH

MILLING

MILL EXISTING ASPHALT PAVEMENT (2.5 In AVG. DEPTH)

RESURFACING

SP STRUCTURAL COURSE (TRAFFIC C) (1.5")
FRICTION COURSE (FC-9.5) (TRAFFIC C) (1.0") (RUBBER)

WIDENING

OPTIONAL BASE GROUP 13 (TYPE B-12.5) ONLY (8.0")
WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2.0")
FRICTION COURSE (FC-9.5) (TRAFFIC C) (1.0") (RUBBER)

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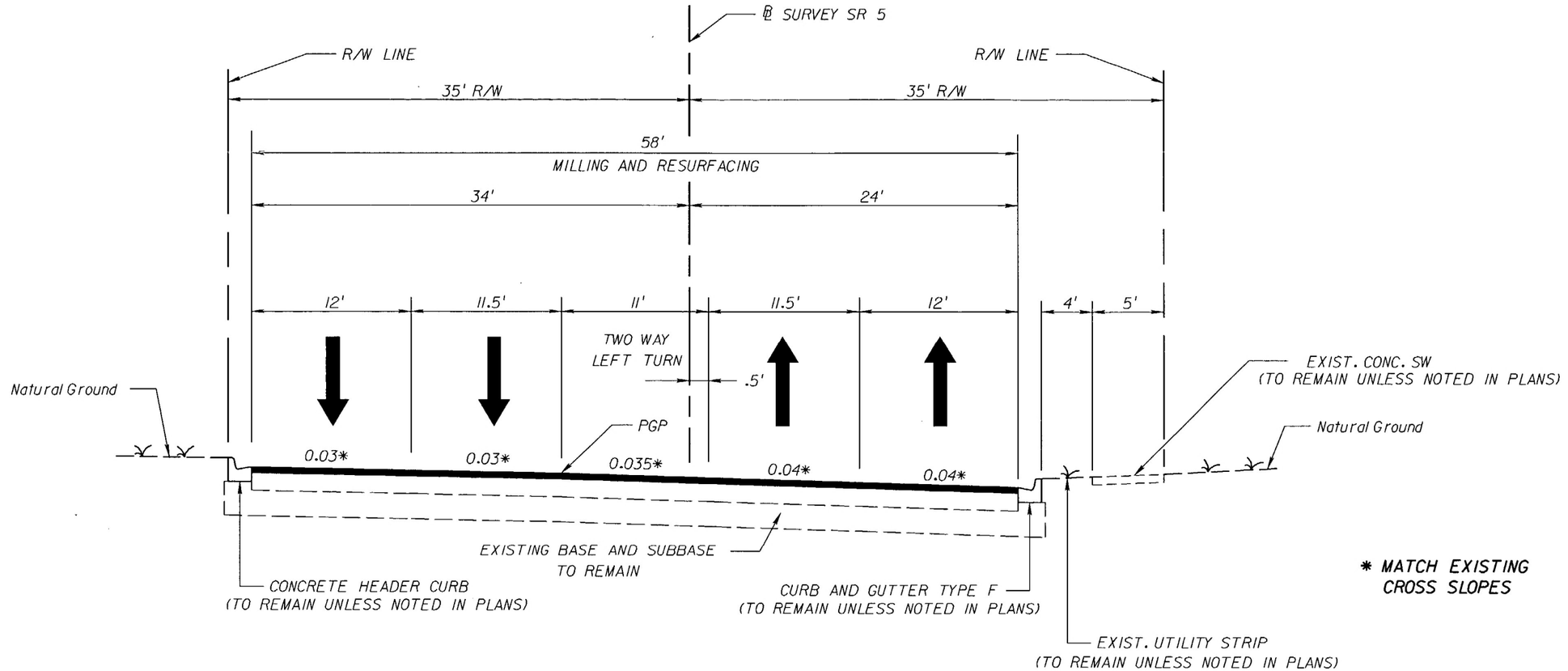
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TYPICAL SECTION

SHEET NO. 4



* MATCH EXISTING CROSS SLOPES

TYPICAL SECTION

SR 5 (US-1)

STA. 342+43.17 TO STA. 365+07.00

STA. 382+80.00 TO STA. 390+22.00

NOTE: 45 MPH BEGINS AT STA 368+23.53

TRAFFIC DATA

STA. 313+75.00 TO STA. 390+22.00

CURRENT YEAR = 2005 AADT = 39200
ESTIMATED OPENING YEAR = 2010 AADT = 45400
ESTIMATED DESIGN YEAR = 2030 AADT = 70300
K = 9.8% D = 51.2% T = 3.7% (24 HOUR)
DESIGN HOUR T = 1.9%
DESIGN SPEED = 35/45 MPH
POSTED SPEED = 35/45 MPH

MILLING

MILL EXISTING ASPHALT PAVEMENT (2.5 In AVG. DEPTH)

RESURFACING

SP STRUCTURAL COURSE (TRAFFIC C) (1.5")
FRICTION COURSE (FC-9.5) (TRAFFIC C) (1.0") (RUBBER)

WIDENING

OPTIONAL BASE GROUP 13 (TYPE B-12.5) ONLY (8.0")
WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2.0")
FRICTION COURSE (FC-9.5) (TRAFFIC C) (1.0") (RUBBER)

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TYPICAL SECTION

SHEET NO. 5

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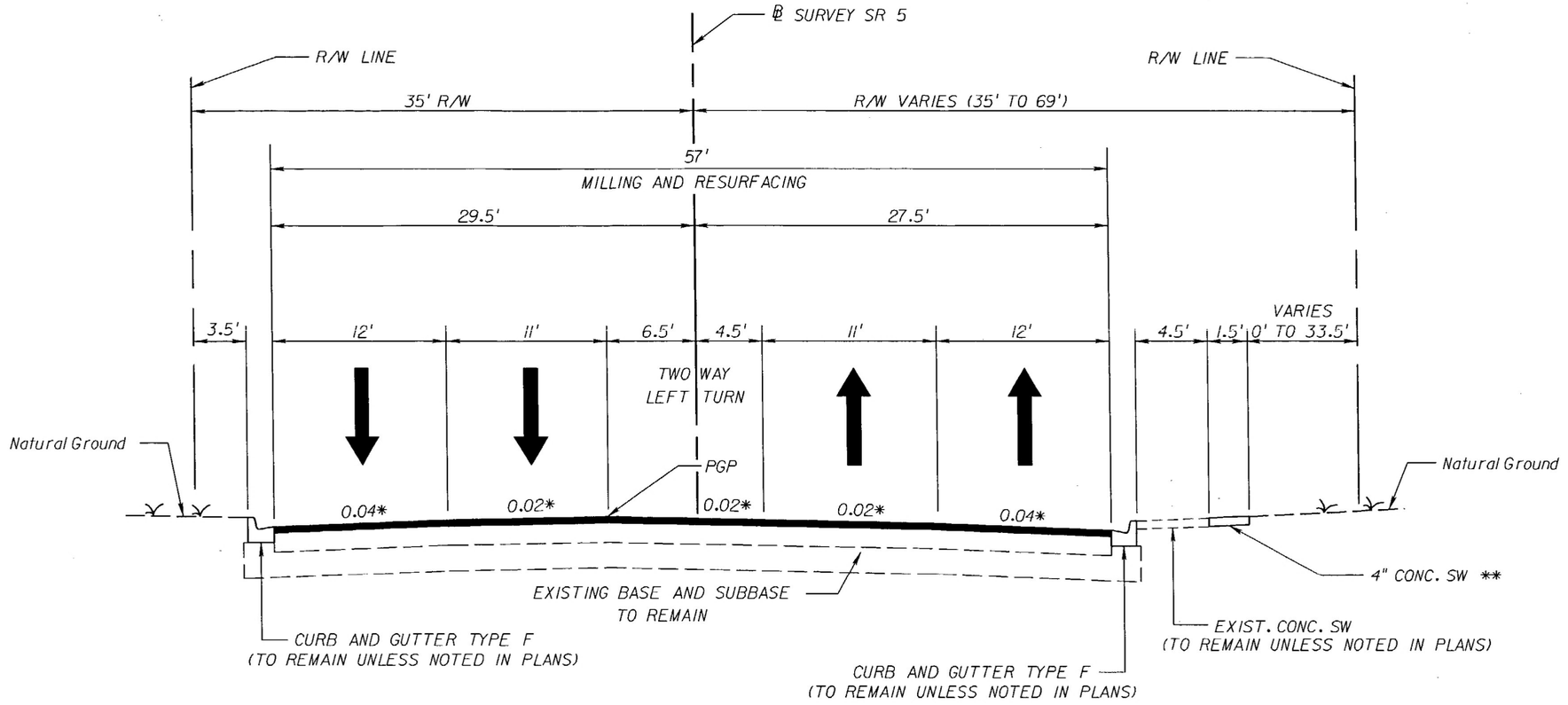

TYPICAL SECTION

SR 5 (US-1)

STA. 365+07.00 TO STA. 378+14.00

STA. 379+28.00 TO STA. 382+80.00

TRAFFIC DATA
STA. 313+75.00 TO STA. 390+22.00

CURRENT YEAR = 2005 AADT = 39200
ESTIMATED OPENING YEAR = 2010 AADT = 45400
ESTIMATED DESIGN YEAR = 2030 AADT = 70300
K = 9.8% D = 51.2% T = 3.7% (24 HOUR)
DESIGN HOUR T = 1.9%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

MILLING

MILL EXISTING ASPHALT PAVEMENT (2.5 in AVG. DEPTH)

RESURFACING

SP STRUCTURAL COURSE (TRAFFIC C) (1.5")
FRICTION COURSE (FC-9.5) (TRAFFIC C) (1.0") (RUBBER)

WIDENING

OPTIONAL BASE GROUP 13 (TYPE B-12.5) ONLY (8.0")
WITH TYPE SP STRUCTURAL COURSE (TRAFFIC C) (2.0")
FRICTION COURSE (FC-9.5) (TRAFFIC C) (1.0") (RUBBER)

* MATCH EXISTING CROSS SLOPES

** WHERE R/W PERMITS (LOCATIONS NOTED IN PLANS)

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TYPICAL SECTION

SHEET NO. 6

205/9 7/5/2008 11:36:31 PM H:\Transportation\415291\520\roadway\typsrd03.dgn

State Of Florida Department Of Transportation

6A

700-050-12
CONSTRUCTION
02/09

Roadway - As-Built Pavement Data (LIMS)

Date Page No. of LIMS ID 090012814

Project ID.: 415291-1-52-01 Pay Item No.: 101-1 Material ID.: PROABS

Sample Level: V Manfr or Prod: Community Asphalt Date Sampled: 10/1/09

Dest. LabID: D04011 Sample No.: P0001V Sampled By: Marie Kinne

Sta. From: 313+96.90 Sta. To: 390+22

Lane Information

LANE	L1	L2	R1	R2				

Pavement Information
(Enter Only New Pavement Layers - Start With First Pavement Layer Placed)

	Layer Number	Subgrade (if new)	Base (if new)	1	2
Milling Depth	Layer Code			SP125C	FC95
	Approx. Thickness in.			1.5"	1"

Layer Number	3	4	5	6	7
Layer Code					
Approx. Thickness in./mm					

Remarks: Sample P0001V is for Typical Section 1 of 3. Structural Mix Design is 07-5748D. Friction Mix Designs are 08-6059A & 08-6059D.

State Of Florida Department Of Transportation

6B

700-050-12
CONSTRUCTION
02/09

Roadway - As-Built Pavement Data (LIMS)

Date Page No. of LIMS ID 0900128620

Project ID.: 415291-1-52-01 Pay Item No.: 101-1 Material ID.: PROABS

Sample Level: V Manfr or Prod: Community Asphalt Date Sampled:

Dest. LabID: D04011 Sample No.: P0002V Sampled By: Marie Kinne

Sta. From: 313+96.90 Sta. To: 390+22

Lane Information

LANE: L1 | L2 | R1 | R2 | | | | |

Pavement Information
(Enter Only New Pavement Layers - Start With First Pavement Layer Placed)

	Layer Number	Subgrade (if new)	Base (if new)	1	2
Milling Depth	Layer Code			SP12.5C	FC95
	Approx. Thickness in.			1.5"	1"

Layer Number	3	4	5	6	7
Layer Code					
Approx. Thickness in./mm					

Remarks: Sample P0002V is for Typical Section 2 of 3. Structural Mix Design is 07-5748D. Friction Mix Designs are 08-6059A & 08-6059D.

State Of Florida Department Of Transportation

6C

700-050-12
CONSTRUCTION
02/09

Roadway - As-Built Pavement Data (LIMS)

Date Page No. of LIMS ID 0900128624

Project ID.: 415291-1-52-01 Pay Item No.: 101-1 Material ID.: PROABS

Sample Level: V Manfr or Prod: Community Asphalt Date Sampled: 10/1/09

Dest. LabID: D04011 Sample No.: P0003V Sampled By: Marie Kinne

Sta. From: 313+96.90 Sta. To: 390+22

Lane Information

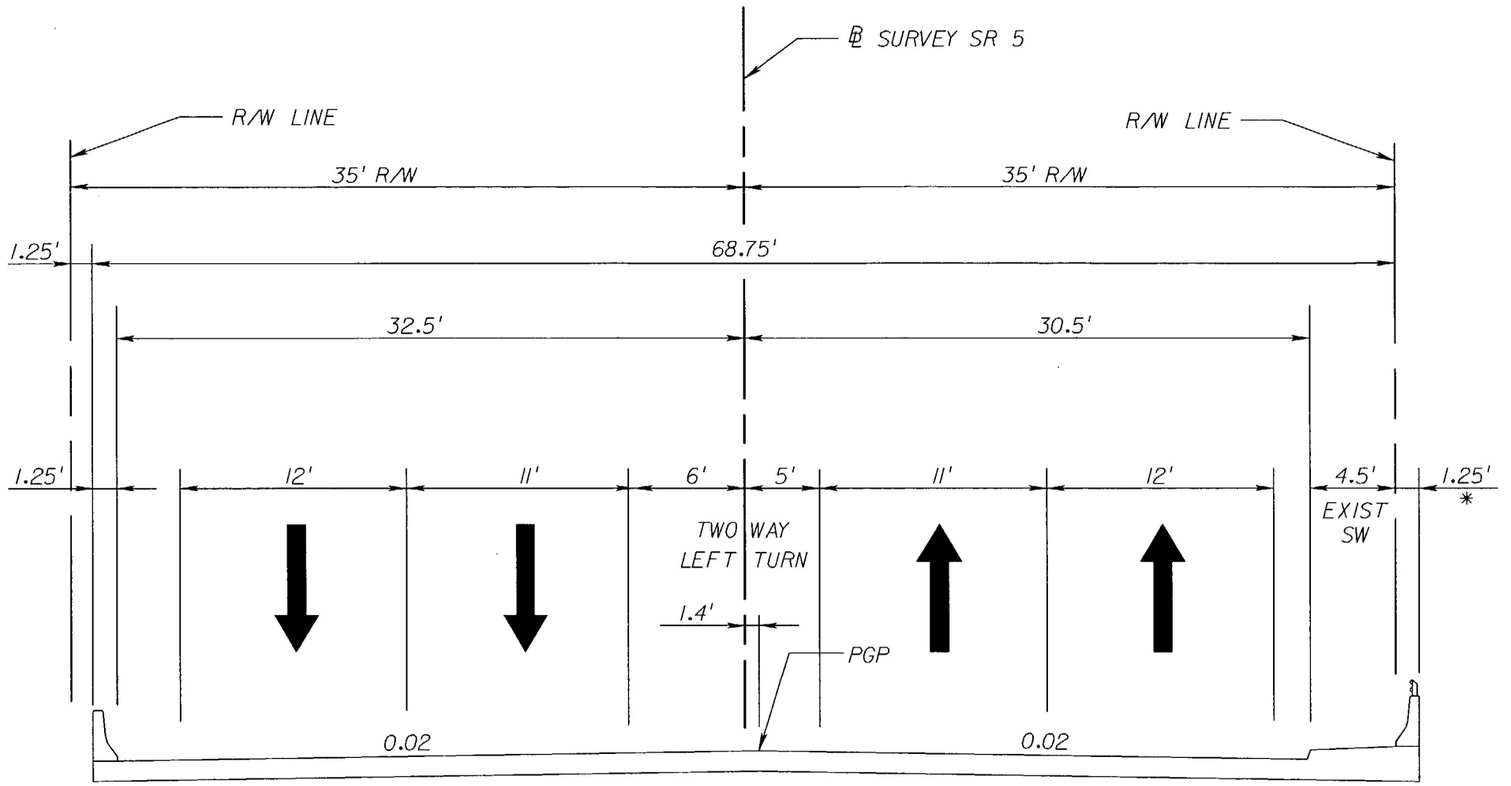
LANE	L1	L2	R1	R2				

Pavement Information
(Enter Only New Pavement Layers - Start With First Pavement Layer Placed)

	Layer Number	Subgrade (if new)	Base (if new)	1	2
Milling Depth	Layer Code			SP125C	FC95
	Approx. Thickness in.			1.5"	1"

Layer Number	3	4	5	6	7
Layer Code					
Approx. Thickness in./mm					

Remarks: Sample P0003V is for Typical Section 3 of 3. Structural Mix Design is 07-5748D. Friction Mix Designs are 08-6059A ; 08-6059D.



* EXISTING TRAFFIC RAILING BARRIER. REPLACE EXISTING SINGLE RAIL POST C WITH DOUBLE RAIL PER INDEX 822 POST B.

TRAFFIC DATA
STA. 313+75.00 TO STA. 390+22.00

CURRENT YEAR = 2005 AADT = 39200
ESTIMATED OPENING YEAR = 2010 AADT = 45400
ESTIMATED DESIGN YEAR = 2030 AADT = 70300
K = 9.8% D = 51.2% T = 3.7% (24 HOUR)
DESIGN HOUR T = 1.9%
DESIGN SPEED = 45 MPH
POSTED SPEED = 45 MPH

DESIGN SPEED = 45 MPH

BRIDGE NUMBER 880085

SR-5 (US-1) OVER MAIN RELIEF CANAL

STA. 378+14.00 TO STA. 379+28.00

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

PBS&J
Certificate of Authorization No. 24
Post Buckley Schuh & Jernigan, Inc.. d/b/a/ PBS&J
Michael Priory. P.E.
P.E. No.: 60614
3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale. FL 33309
(954) 733-7233

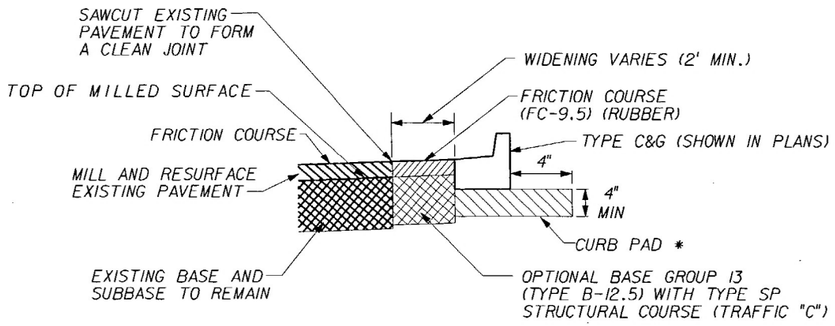
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	41529I-1-52-01

TYPICAL SECTION

SHEET NO. 7

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.



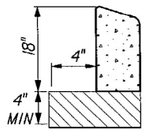
WIDENING DETAIL

NTS

* 1. CURB PAD TO BE GRANULAR SUBBASE (LBR 100) OR BASE TYPE B-12.5. AT THE CONTRACTORS OPTION.

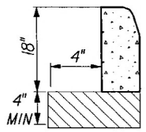
2. COST OF CURB PAD TO BE INCLUDED IN PRICE OF CURB AND GUTTER (TYPE F), CURB (TYPE B), OR CURB (TYPE D).

3. ACTUAL WIDTH OF BASE MAY VARY DUE TO ACTUAL EXISTING PAVEMENT WIDTH. CONTRACTOR MAY ELECT TO PLACE UNIFORM WIDTH BASE WIDENING STRIP AT NO ADDITIONAL COST TO THE DEPARTMENT.



TYPE B

INCLUDE COST OF ASPHALT BASE CURB PAD

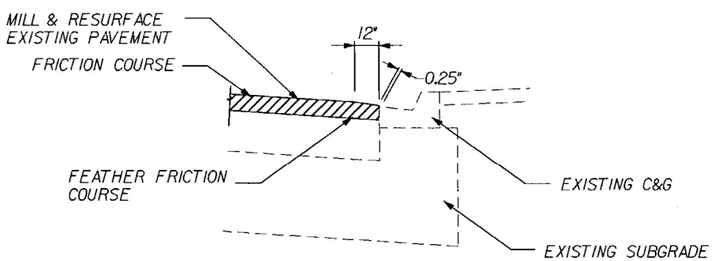


TYPE D

INCLUDE COST OF ASPHALT BASE CURB PAD

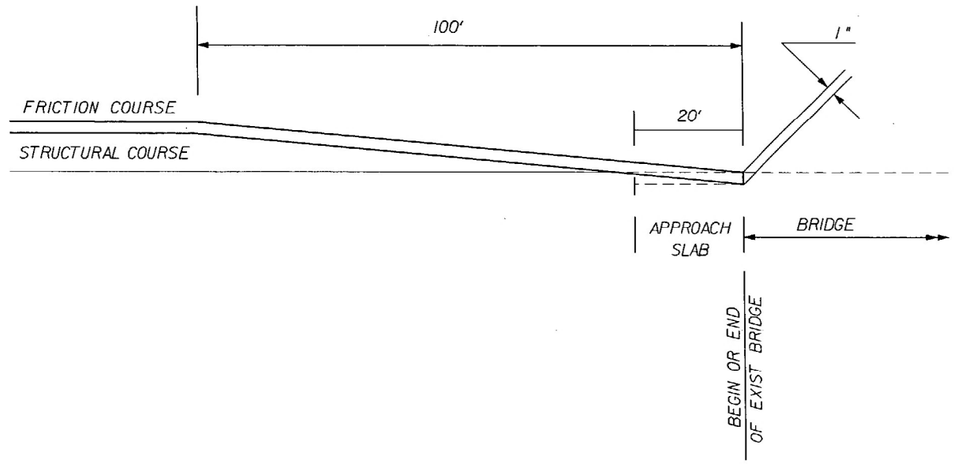
CURB PAD DETAIL

NTS



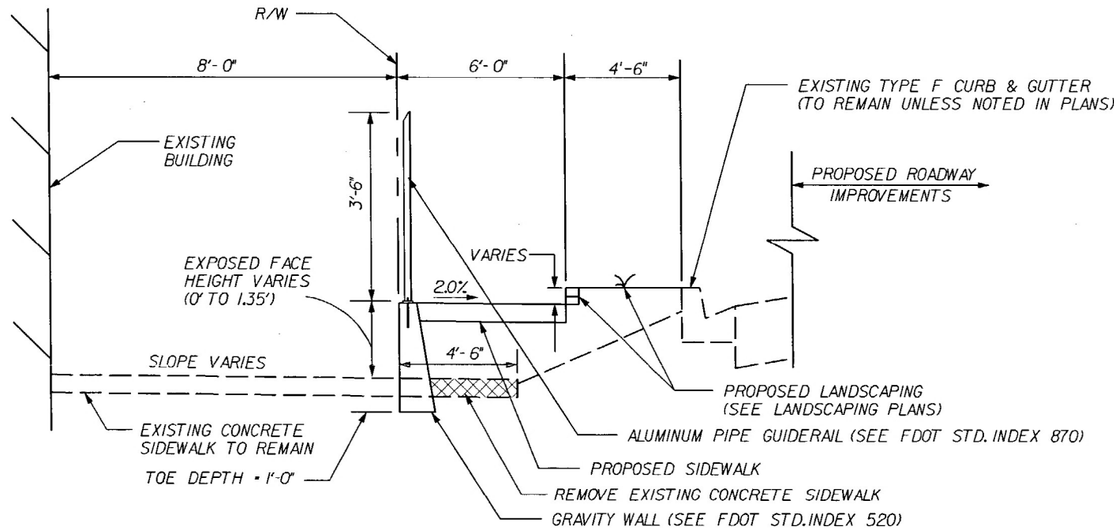
FEATHERING DETAIL

NTS



TRANSITION PROFILE AT BRIDGE APPROACHES

NTS (BRIDGE No. 880085)



GRAVITY WALL TYPICAL SECTION WITH GUIDERAIL

NTS STA. 385+99.62 TO STA. 386+59.12

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

PBS&J
Certificate of Authorization No. 24
Michael Priory, P.E.
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Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TYPICAL SECTION DETAILS

SHEET NO. 8

SUMMARY OF GUARDRAIL

LOCATION STATION	SIDE	GUARDRAIL (LF) ROADWAY P	ROADWAY F	~~PEDESTRIAN SAFETY TREATMENT~~ P	~~PEDESTRIAN SAFETY TREATMENT~~ F	END ANCHORAGE ASSEMBLIES (EA) FLARED P	FLARED F	BRIDGE P	BRIDGE F	TYPE II P	TYPE II F	PARALLEL P	PARALLEL F	STANDARD INDEX	REMARKS	FIELD BOOK REFERENCE
FROM 377+42.61	RT	37.5'	50	FROM								1	1	400	SE CORNER OF BRIDGE	
~~TO 377+80.11~~				TO	377+92.45											
FROM 377+42.71	LT	37.5'	50	FROM						1	1			400	SW CORNER OF BRIDGE	
~~TO 377+80.21~~				TO	377+92.71											
~~FROM 379+61.81~~	RT	25'	21	FROM	379+49.31									400	NE CORNER OF BRIDGE	
~~TO 379+86.81~~				TO	379+70.31					1	1					
~~FROM 379+63.06~~	LT	187.5'	200	FROM	379+56.56									400	NW CORNER OF BRIDGE	
TO 381+50.56				TO								1	1			
NEW GUARDRAIL TOTAL		288'	321'							2	2	2	2			
~~FROM 377+80.11~~	RT	44'	31.5	FROM	377+92.45									402	BRIDGE THRIE BEAM TRANS.	
TO 378+23.95				TO				1	1							
~~FROM 377+80.21~~	LT	44'	31.5	FROM	377+92.71									402	BRIDGE THRIE BEAM TRANS.	
TO 378+24.21				TO				1	1							
FROM 379+17.81	RT	44'	31.5	FROM				1	1					402	BRIDGE THRIE BEAM TRANS.	
~~TO 379+61.81~~				TO	379+49.31											
FROM 379+19.06	LT	44'	31.5	FROM				1	1					402	BRIDGE THRIE BEAM TRANS.	
TO 379+63.06				TO	379+50.56											
THRIE BEAM TOTAL		176'	126'					4	4							
FROM 351+40.93	LT	25'	25	FROM											GUARDRAIL REMOVAL	
TO 351+43.70				TO												
FROM 377+48.63	LT	64'	64	FROM											GUARDRAIL REMOVAL	
TO 378+11.71				TO												
FROM 377+48.66	RT	64'	64	FROM											GUARDRAIL REMOVAL	
TO 378+11.43				TO												
FROM 379+30.24	LT	63'	63	FROM											GUARDRAIL REMOVAL	
TO 379+92.96				TO												
FROM 379+30.33	RT	51'	51	FROM											GUARDRAIL REMOVAL	
TO 379+80.80				TO												
GUARDRAIL REMOVAL TOTAL		267'	267	[redacted]												

SUMMARY OF EARTHWORK

DESCRIPTION	CY P	CY F
FILL	13	
FILL ADJUSTMENT (18%)	3	
FILL	16	
TRUCK ADJUSTMENT (25%)	4	
TOTAL BORROW EXCAVATION	20	22.0
REGULAR EXCAVATION	31	31.0

EARTHWORK HAS BEEN CALCULATED USING BASE GROUP 13 (TYPE B-12.5) ONLY BASE OPTION. IF ANOTHER OPTION IS CONSTRUCTED, THERE SHALL BE NO REVISION TO THE EARTHWORK QUANTITES FOR WHICH PAYMENT IS MADE BY PLAN QUANTITY.

SUMMARY OF GRAVITY WALL & ALUMINUM HANDRAIL

LOCATION STA. TO STA.	SIDE	CLASS I CONCRETE CY P	CLASS I CONCRETE CY F	ALUMINUM HANDRAIL LF P	ALUMINUM HANDRAIL LF F	REMARKS	FIELD BOOK REFERENCE
385+99.62 TO 386+59.12	RT	8	8.0	60	60.0	ELEVATED SWK	n/a

SCHEDULE OF WATER VALVE ADJUSTMENTS

STATION	VALVE BOX ADJUSTMENT (P)	(F)
328+80 ±	5	5
329+45 ±	1	1
379+75 ±	1	0
383+10 ±	1	0
383+60 ±	1	0
390+60 ±	1	0
390+80 ±	1	0
TOTAL	11	06

SOME VALVES MAY BE BURIED UNDER PAVEMENT. CONTACT CITY OF VERO BEACH WATER DEPARTMENT, TODD YOUNG, AT (772)978-5209 FOR EXACT LOCATIONS.

PAY ITEM NOTES

101-1 INCLUDES ALL ITEMS OF MOBILIZATION NOT INCLUDED FOR PAYMENT UNDER SEPARATE PAY ITEMS.

102-1 INCLUDES ALL ITEMS OF MAINTENANCE OF TRAFFIC NOT INCLUDED FOR PAYMENT UNDER SEPARATE PAY ITEMS. THIS INCLUDES BUT IS NOT LIMITED TO THE REMOVAL OF STORM WATER FROM THE ROADWAY DURING CONSTRUCTION, THE RELOCATION OF EXISTING STREET SIGNS, TEMPORARY ACTUATION, AND ALL RELOCATION AND REALIGNMENT OF SIGNAL HEADS TOGETHER WITH REQUIRED CABLE QUANTITIES, TO THE PROPER LANE CONFIGURATION AS REQUIRED DURING CONSTRUCTION. ALSO INCLUDES THE COST OF MAINTAINING COMMUNICATIONS, INCLUDING TEMPORARY LINES AND CONNECTIONS.

102-14 INCLUDES CONTROLLING AND DIRECTING TRAFFIC IN THE WORK ZONE ONLY WHEN SIGNALS ARE NOT IN USED AT A SIGNALIZED INTERSECTION.

110-1-1 INCLUDES COST OF REMOVING TREES AND SHRUBS AS NOTED IN THE LANDSCAPE PLANS.

110-4 INCLUDES COST OF REMOVING BRICKS AND DECORATIVE PAVERS

285-713 BASE IS LIMITED TO B-12.5 TO EXPEDITE CONSTRUCTION AND TO MINIMIZE DROP OFF.

327-70-8 INCLUDES TRANSITION AREAS.

334-1-13 INCLUDES SAWCUTTING ASPHALT SURFACE AS REQUIRED.

425-6 INCLUDES CONTIGENCY OF 5 VALVE ADJUSTMENTS IF NEEDED AT OTHER LOCATIONS.

425-10 INCLUDES COST OF PLUG AND COLLAR OF TEE.

460-70-2 INCLUDES COST OF REMOVAL AND DISPOSAL OF EXISTING HANDRAIL.

520-1-10 INCLUDES COST OF CURB PAD, PAVEMENT SAWCUT, AND PAVEMENT RESTORATION ADJACENT TO NEW CURB AND GUTTER.

520-2-2 INCLUDES COST OF CURB PAD, PAVEMENT SAWCUT, AND PAVEMENT RESTORATION ADJACENT TO NEW CURB. ALSO INCLUDES COST OF SUBSURFACE MATERIAL AND CONCRETE ISLANDS.

522-1 INCLUDES ALL COSTS ASSOCIATED WITH RECONSTRUCTION OF THE EXISTING DECORATIVE PAVER CURB RAMP AT NE CORNER OF 8TH AVENUE AND 21ST STREET.

520-2-4 INCLUDES COST OF CURB PAD, PAVEMENT SAWCUT, AND PAVEMENT RESTORATION ADJACENT TO NEW CURB.

710 THE TOTALS SHOWN ON THE SUMMARY OF ROADWAY PAY ITEMS ARE FOR PAINTED PAVEMENT MARKINGS USED FOR MAINTENANCE OF TRAFFIC.

715-14-12 ITEM HAS BEEN INCLUDED AS A CONTENGENCY IF NEEDED DUE TO CURB RAMP CONSTRUCTION AT THE SE CORNER OF 9TH AVENUE. Qty = 0 EA

PLAN QUANTY ANALYSIS

SUMMARY OF GUARDRAIL

LOCATION STATION		SIDE	PLAN	DIFFERENCE	FINAL
FROM	377 + 42.61	RT	37.5	12.5	50.0
TO	377 + 92.45				
FROM	377 + 42.71	LT	37.5	12.5	50.0
TO	377 + 92.71				
FROM	379 + 49.31	RT	25	-4.0	21.0
TO	379 + 70.31				
FROM	379 + 50.56	LT	187.5	12.5	200.0
TO	381 + 50.56				
NEW GUARDRAIL TOTAL			288	34	321.0
FROM	377 + 92.45	RT	44	31.5	-12.5
TO	378 + 23.95				
FROM	377 + 92.71	LT	44	31.5	-12.5
TO	378 + 24.21				
FROM	379 + 17.81	RT	44	31.5	-12.5
TO	379 + 49.31				
FROM	379 + 19.06	LT	44	31.5	-12.5
TO	379 + 50.56				
THRIE BEAM TOTAL			176	126	-50.0

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

Carolyn Grist 52845

REVISIONS DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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STATE OF FLORIDA 10/28/09
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

SUMMARY OF QUANTITIES

SHEET NO. 9

QUANTITY	STR. NO.	STATION	SIDE	DESCRIPTION	BARRELS	PVC PIPE				MANHOLE		CURB INLETS				DITCH BOTTOM INLETS		YARD DRAIN	COMMENTS	REMARKS
						12"	15"	18"	24"	P-7 <10'	P-7 >10'	P-5 PART	P-6 PART	J-5 PART	J-6 PART	C <10'	E <10'	EA		
P	S-1	386+58.12	RT	YARD DRAIN	1													1	CONNECT TO 24" RCP	STANDARD INDEX 282
F																		1 ✓		
P																				
F																	

GENERAL NOTES

1. BENCHMARK DATA IS NORTH AMERICAN VERTICAL DATUM OF 1988 (N.A.V.D.- '88).

2. ALL PUBLIC LAND CORNERS AND MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION ARE TO BE PROTECTED BY CONTRACTOR AS FOLLOWS: CORNERS AND MONUMENTS IN CONFLICT WITH THE WORK AND IN DANGER OF BEING DAMAGED, DESTROYED OR COVERED HAVE TO BE PROPERLY REFERENCED BY A REGISTERED LAND SURVEYOR IN ACCORDANCE WITH THE MINIMUM TECHNICAL STANDARDS OF THE FLORIDA BOARD OF PROFESSIONAL LAND SURVEYORS PRIOR TO BEGINNING WORK AT THAT SITE. THE CONTRACTOR SHALL RETAIN THE LAND SURVEYOR TO REFERENCE, AND RESTORE UPON COMPLETION OF THE WORK, ALL SUCH CORNERS AND MONUMENTS AND WILL FURNISH TO THE DISTRICT LOCATION ENGINEER A SIGNED AND SEALED COPY OF THE LAND SURVEYOR'S REFERENCED DRAWING. THE CONTRACTOR SHALL INCLUDE ALL COSTS OF REFERENCING, RESTORING AND PRESERVING, AS DEFINED ABOVE IN THE BID PRICE FOR ITEM 101-1, MOBILIZATION. IF A CORNER MONUMENT IS IN DANGER OF BEING DESTROYED AND HAS NOT BEEN PROPERLYREFERENCED, THE PROJECT ENGINEER SHOULD NOTIFY THE DISTRICT LOCATION SURVEYOR, WITHOUT DELAY, ROBERT HUGHAN AT (954)777-4556.

3. ALL N.A.V.D. BENCH MARK MONUMENTS WITHIN THE LIMITS OF CONSTRUCTION WILL BE PROTECTED AND REFERENCED BY THE CONTRACTOR IN THE SAME WAY AS PUBLIC LAND CORNERS EXCEPT THAT THE LAND SURVEYOR WILL NOT BE REQUIRED TO RESTORE THE N.A.V.D. BENCH MARK UPON COMPLETION OF THE WORK. THE CONTRACTOR WILL PROMPTLY TRANSMIT ALL DISPLACED OR DAMAGED N.A.V.D. BENCH DISCS TO THE DISTRICT LOCATION SURVEYOR AT (954)777-4556, WHO WILL NOTIFY THE GEODETIC INFORMATION CENTER. THE CONTRACTOR SHALL INCLUDE ALL COSTS OF REFERENCING, RESTORING AND PRESERVING, AS DEFINED ABOVE IN THE BID PRICE FOR ITEM 101-1, MOBILIZATION.

4. ALL STATIONS AND OFFSETS ARE FROM BASELINE OF SURVEY UNLESS OTHERWISE NOTED IN THE PLANS.

5. ALL EXCESS MATERIAL IS TO BE DISPOSED OFF BY THE CONTRACTOR IN APPROVED AREAS PROVIDED BY THE CONTRACTOR WITHIN THREE (3) FULL WORKING DAYS OF BEING DEPOSITED IN THE CONSTRUCTION AREA AND AT THE CONTRACTOR'S EXPENSE. DO NOT DEPOSIT MATERIALS ONTO ADJACENT PROPERTIES.

6. EXISTING DRAINAGE STRUCTURES WITHIN CONSTRUCTION LIMITS SHALL REMAIN, UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO PREVENT MILLED MATERIAL FROM ENTERING THE DRAINAGE SYSTEM. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING INLETS CLEAN OF PAVING MATERIAL, SILT, LIMEROCK, AND DEBRIS DURING THE CONSTRUCTION AT NO ADDITIONAL COST.

7. MILLED SURFACE MUST BE RESURFACED THE SAME DAY. RESURFACING MUST TAKE PLACE PRIOR TO TRAFFIC USE.

8. THE CONTRACTOR IS TO MAINTAIN AND KEEP STREET NAME IDENTIFICATION VISIBLE DURING CONSTRUCTION OPERATIONS, IN ORDER TO FACILITATE EMERGENCY VEHICLE TRAFFIC.

9. EROSION CONTROL ITEMS ARE ESTIMATED FOR PREVENTION, CONTROL, ABATEMENT OF EROSION, SEDIMENTATION, AND WATER POLLUTION. THESE ITEMS ARE TO BE USED AT THE LOCATIONS DESCRIBED IN THE CONTRACTOR'S APPROVED EROSION CONTROL PLAN OR AS DIRECTED BY THE PROJECT ENGINEER TO COMPLY WITH ALL FEDERAL, STATE AND LOCAL REGULATIONS.

10. CONTRACTOR SHALL GIVE WRITTEN NOTIFICATION TO PROPERTY OWNERS, ADJACENT TO THE PROJECT, 14 DAYS IN ADVANCE OF CLEARING AND GRUBBING.

11. CONTRACTOR SHALL SAW CUT: EXISTING ASPHALT PAVEMENT AT THE LIMITS OF MILLING AND RESURFACING AND AT ALL AREAS OF EXISTING ASPHALT. IF ADJACENT TO/PARALLEL TO NEW CONCRETE AND OR WIDENING; EXISTING CURB OR CURB AND GUTTER AND SIDEWALK ADJACENT TO NEW CURB OR CURB AND GUTTER AND SIDEWALK.

12. ALL LANES OF SR-5/US-1 MUST BE OPENED FOR TRAFFIC DURING AN EVACUATION NOTICE OF A HURRICANE OR OTHER CATASTROPHIC EVENT AND SHALL REMAIN OPENED FOR THE DURATION OF THE EMERGENCY OR EVENT AS DIRECTED BY THE PROJECT ENGINEER.

13. ALL ROADWAY CONDUIT TRENCHING SHALL BE COMPLETED PRIOR TO MILLING AND RESURFACING OPERATIONS.

14. MILLING AND RESURFACING DEPTHS SHALL BE ADJUSTED FOR THE ASPHALT OVERLAY ON THE APPROACH SLABS SO AS TO NOT DAMAGE THE APPROACH SLABS.

15. THE BRIDGE ON THE PROJECT WAS INSPECTED AND TESTED FOR ASBESTOS CONTAINING MATERIAL (ACM) AS DEFINED IN FDOT PROCEDURES. THE BRIDGE BEARING PADS WERE FOUND TO BE ASBESTOS CHRYSOTILE. THE CONTRACTOR IS TO CONTACT THE DISTRICT CONTAMINATION IMPACT COORDINATOR (DCIC) AT (954)777-4286 THIRTY DAYS PRIOR TO CUTTING THE TRAFFIC RAILAND/OR BARRIER AND COORDINATE THAT ACTIVITY WITH THE DEPARTMENT'S CONTAMINATION AND REMEDIATION (CAR) CONTRACTOR. THE CAR CONTRACTOR WILL PROVIDE OVER SIGHT OF THE RAIL CUTTING ACTIVITY AND HANDLE AND DISPOSE OF ANY ACM EXPOSED.

16. IF SUSPECTED CONTAMINATED OR HAZARDOUS MATERIAL IS FOUND ON THE PROJECT, OR ENCOUNTERED DURING CONSTRUCTION, NOTIFY THE DISTRICT CONTAMINATION IMPACT COORDINATOR (DCIC) AT 954-777-4286.

17. DUE TO THE PROXIMITY TO THE VERO BEACH MUNICIPAL AIRPORT, THE CONTRACTOR SHALL SUBMIT A FORM 7460-1 TO FAA FOR HEIGHTS REVIEW OF ANY CRANES EXPECTED TO BE USED DURING CONSTRUCTION.

18. THERE SHALL BE NO DEWATERING BETWEEN STA. 327+77 TO 330+35, AND BETWEEN STA. 350+74 TO 352+74, IN ORDER TO AVOID IMPACTING AREAS OF KNOWN GROUNDWATER CONTAMINATION.

19. CONTRACTOR IS TO CONTACT THE DISTRICT CONTAMINATION IMPACT COORDINATOR AT (954)777-4286 THIRTY DAYS PRIOR TO INSTALLING MAST ARM FOOTERS AT THE FOLLOWING LOCATIONS WHICH HAVE BEEN IDENTIFIED AS HAVING CONTAMINATED SOIL AND/OR GROUNDWATER:

    A. NE CORNER OF SR 5 AND 10TH AVENUE (STA. 383+77 N)
    B. SW CORNER OF SR 5 AND 10TH AVENUE (STA. 329+34 S)
    C. NE CORNER OF SR 5 AND 23RD STREET (STA. 351+74 E)

    THE DISTRICT CONTAMINATION IMPACT COORDINATOR WILL ARRANGE FOR THE REMOVAL AND DISPOSAL OF CONTAMINATED SOIL, GROUNDWATER, DRILLING MUD OR ANY OTHER CONTAMINATED MATERIAL RESULTING FROM THE CONTRACTOR'S CONSTRUCTION OF THE FOOTERS AT THESE LOCATIONS. NO ADDITIONAL TIME OR PAYMENT WILL BE MADE TO THE ROADWAY CONTRACTOR FOR THE COORDINATION OF THIS WORK.

20. COORDINATE THE SELECTION AND REVIEW OF PROPOSED STAGING AREAS ASSOCIATED WITH THE PROJECT WITH THE DISTRICT CONSTRUCTION ENVIRONMENTAL COORDINATOR (954)777-4665.

21. TREE PROTECTION BARRIERS SHALL BE INSTALLED PRIOR TO SITE WORK. THERE SHALL BE NO CONSTRUCTION ACTIVITY WITHIN THE TREE PROTECTION BARRIER ZONE. REFER TO FDOT STANDARD INDEX 544 FOR TREE PROTECTION BARRICADE DETAIL AND NOTES.

22. EXISTING BRICK PAVERS AT THE SOUTHWEST CORNER OF SR-5 AND 11TH AV THAT ARE REMOVED TO CONSTRUCT THE PROPOSED CURB RAMP AND SIDEWALK ARE TO BE PROVIDED TO THE PATIO RESTAURANT, 1103 21ST ST, CONTRACTOR SHALL COORDINATE WITH THE MAINTENANCE PERSON AT THE RESTAURANT.

UTILITIES:

1. ALL EXISTING UTILITIES ARE TO REMAIN UNLESS OTHERWISE NOTED.

2. THE LOCATION OF EXISTING UTILITIES SHALL BE DETERMINED BY THE CONTRACTOR AND THE UTILITY OWNER, WHEN NECESSARY DURING CONSTRUCTION. UTILITY LOCATIONS AND ADJUSTMENTS SHALL BE REQUESTED BY THE CONTRACTOR.

3. THE CONTRACTOR IS ADVISED THAT PROPERTIES ADJACENT TO THE PROJECT MAY HAVE ELECTRIC, TELEPHONE, GAS, WATER AND/OR SEWER SERVICE LATERALS WHICH MAY NOT BE SHOWN IN THE PLANS. THE CONTRACTOR MUST REQUEST THE LOCATION OF THESE LATERAL SERVICES FROM UTILITY COMPANIES. THE ADDITIONAL COST OF EXCAVATING, INSTALLING, BACKFILLING AND COMPACTING AROUND THESE LATERALS SERVICING SAID PROPERTIES MUST BE INCLUDED IN THE BID RELATED ITEM FOR THE WORK BEING DONE.

4. THE CONTRACTOR SHALL HAND DIG PRIOR TO EXCAVATING NEAR KNOWN UTILITIES. EXTREME CAUTION SHALL BE EXERCISED BY THE CONTRACTOR WHILE EXCAVATING, INSTALLING, BACKFILLING OR COMPACTING AROUND THE UTILITIES. THE COST IS TO BE INCLUDED IN RELATED ITEM FOR WORK BEING DONE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO ANY UTILITY THAT HAS BEEN PROPERLY LOCATED.

5. THE CONTRACTOR IS TO USE EXTREME CAUTION WHEN WORKING IN OR AROUND AREAS OF OVERHEAD UTILITIES.

6. THE APPROPRIATE UTILITY COMPANY SHALL BE NOTIFIED BY THE CONTRACTOR AT LEAST TWO (2) FULL WORKING DAYS IN ADVANCE OF ANY EXCAVATION SO THAT A UTILITY COMPANY REPRESENTATIVE CAN BE PRESENT. IN THE EVENT THAT A UTILITY CONTACT INFORMATION HAS CHANGED SINCE THESE PLANS WERE PRODUCED, THE CONTRACTOR SHALL CONTACTSUNSHINE ONE CALL AT THE NUMBER SHOWN BELOW TO GET THE LATEST UTILITY CONTACT INFORMATION.

7. THE LOCATION(S) OF THE UTILITIES SHOWN IN THE PLANS INCLUDING THOSE DESIGNATED VVH ARE BASED ON LIMITED INVESTIGATION TECHNIQUES AND SHOULD BE CONSIDERED APPROXIMATE ONLY. THE VERIFIED LOCATIONS/ELEVATIONS APPLY ONLY AT THE POINTS SHOWN. INTERPOLATIONS BETWEEN THESE POINTS HAVE NOT BEEN VERIFIED.

8. UTILITY OWNERS:

COMPANIES	TELEPHONE NUMBERS	CONTACT
BELLSOUTH	(772) 460-4431	MR. MIKE KOENIG
CITY GAS	(305) 694-6870	MR. CHRISTOPHER J. STEMER
CITY OF VERO BEACH ELECTRIC	(772) 978-5460	MR. JOE DEMARZO
CITY OF VERO BEACH WATER & SEWER DEPT.	(772) 978-4800	MR. ROB BOLTON
COMCAST	(954) 444-5113	MR. LEONARD MAXWELL
INDIAN RIVER COUNTY TRAFFIC ENGINEERING	(772) 226-1563	MR. JOHN ANKENY
PLANNING AND ENVIRONMENTAL MANAGEMENT	(954)777-4364 / 4664	MS. KARA SCHWARTZ / MR. CARLTON CARD
SUNSHINE ONE CALL	(800) 432-4770	

GENERAL RAILROAD NOTES:

1. PRIOR TO THE PRE-CONSTRUCTION MEETING CONTACT THE DEPARTMENT OF TRANSPORTATION:

    HECTOR HARTMANN, OFFICE OF MODAL DEVELOPMENT, 3400 W COMMERCIAL BLVD FORT LAUDERDALE, FL 33309-3421
    TELEPHONE NO. (954)777-4401 FAX NO. (954)677-7892

2. THE CONTRACTOR WILL BE REQUIRED TO HAVE A RAILROAD FLAGMAN AT ANY TIME WORK IS BEING DONE:
    A. ON OR ABOVE THE RAILROAD RIGHT-OF-WAY,
    B. WITHIN 25' FROM THE CENTERLINE OF THE TRACKS,
    C. IF THERE IS A RISK OF FOULING THE TRACKS (CRANES),
    D. MAINTENANCE OF TRAFFIC IMPACTS A CROSSING,
    E. AS REQUIRED BY THE RAILROAD.

    BEFORE STARTING ANY WORK NEAR THE RAILROAD RIGHT-OF-WAY. THE CONTACT PERSON FOR THE FLORIDA EAST COAST RAILWAY L.L.C. WILL BE:

    MR. CHARLES STONE / TELEPHONE: 1-800-342-1131 EXT. 6057 OR 904-538-6057
    MS. SISSY BUICE / TELEPHONE: 1-904-538-6052

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DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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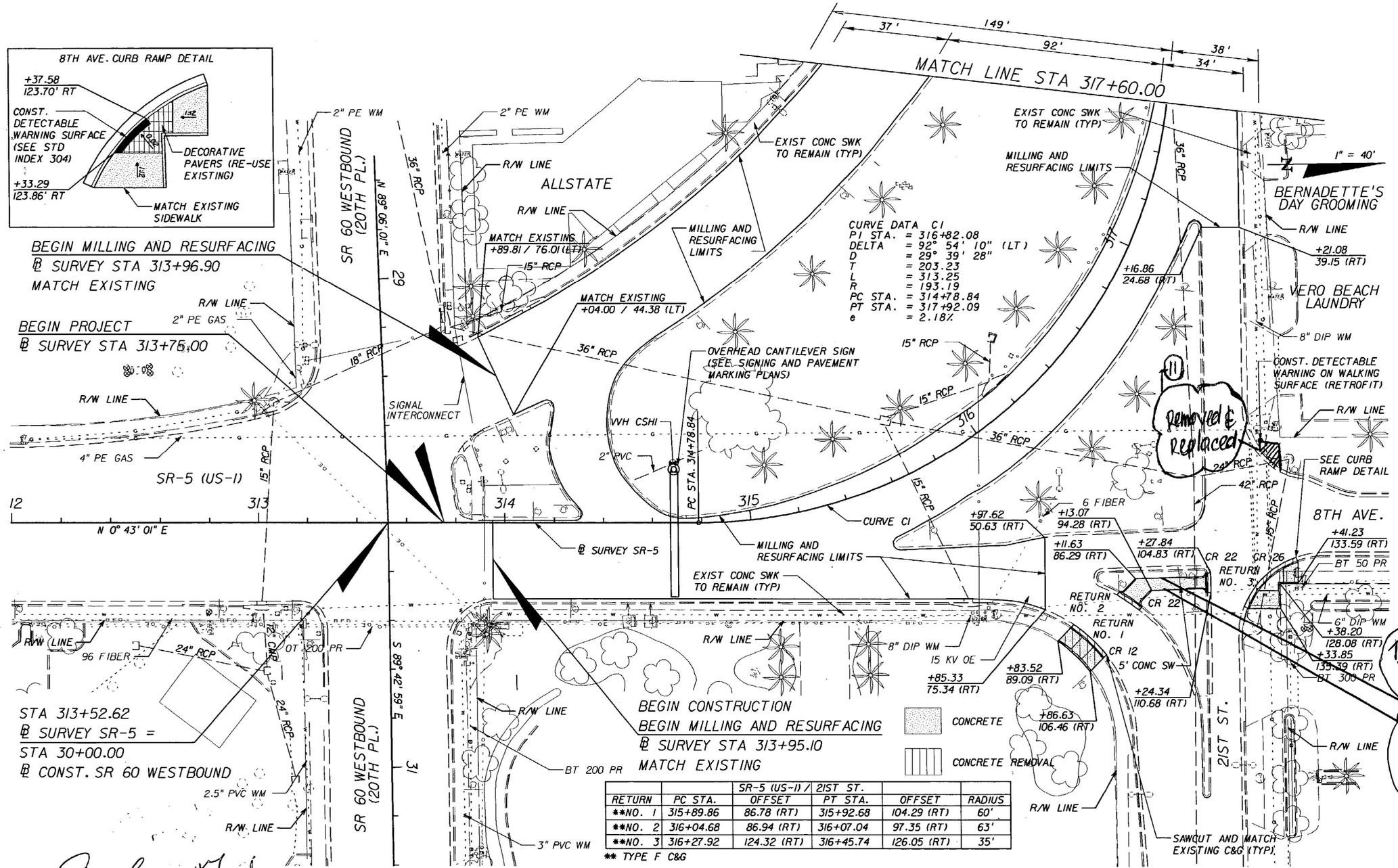
Michael Priory, P.E.
P.E. No.: 60614
3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale, FL 33309
(954) 733-7233

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

GENERAL NOTES

SHEET NO. 11



		SR-5 (US-1) /	21ST ST.		
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	315+89.86	86.78 (RT)	315+92.68	104.29 (RT)	60'
**NO. 2	316+04.68	86.94 (RT)	316+07.04	97.35 (RT)	63'
**NO. 3	316+27.92	124.32 (RT)	316+45.74	126.05 (RT)	35'

** TYPE F C&G

Carolyn Hust
#53815
10/28/09

REVISIONS					
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 12

205/9 7/5/2008 1:35:01 PM H:\Transportation\415291\5201\roadway\planrd01.dgn

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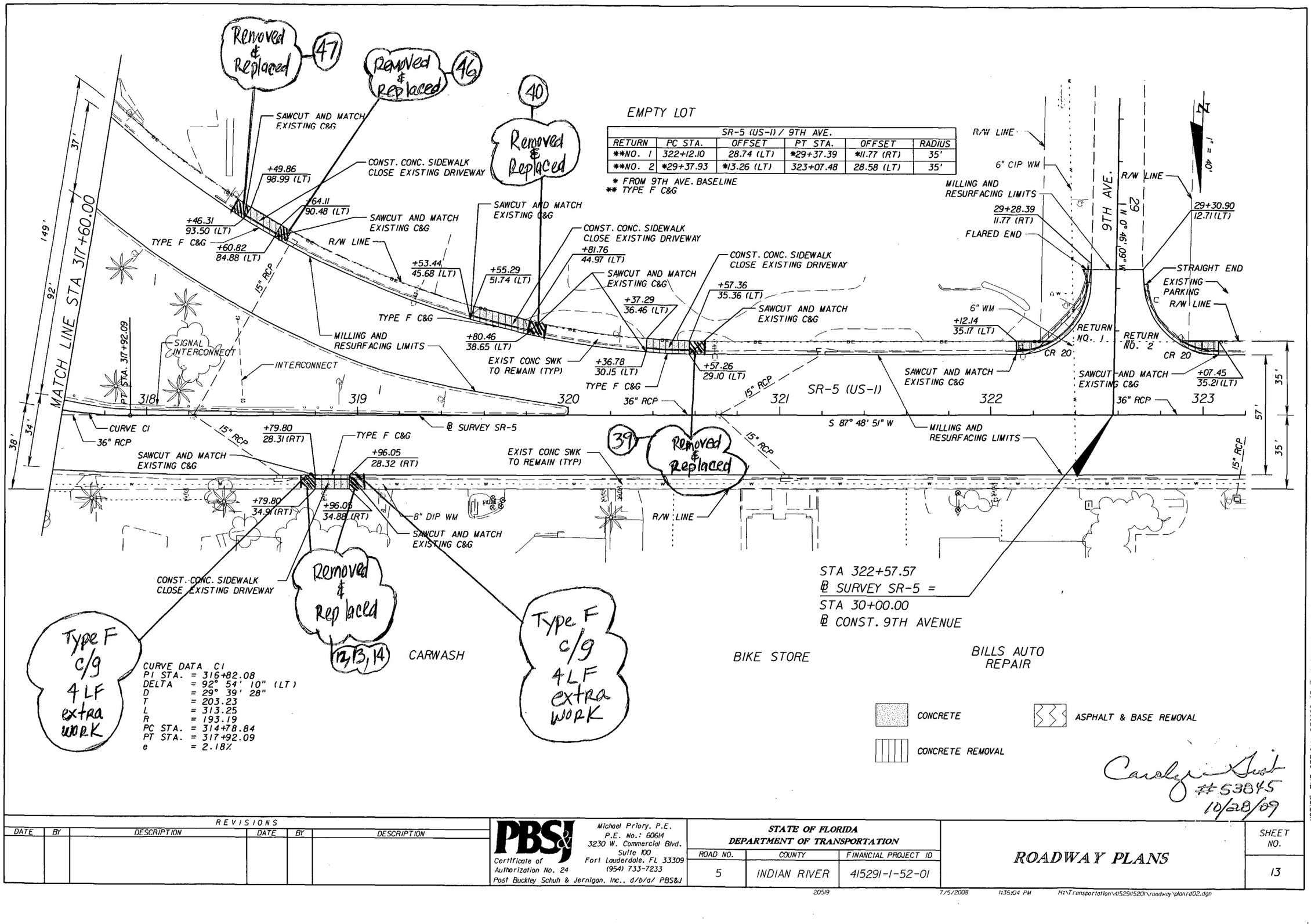

CURVE DATA C1
PI STA. = 316+82.08
DELTA = 92° 54' 10" (LT)
D = 29° 39' 28"
T = 203.23
L = 313.25
R = 193.19
PC STA. = 314+78.84
PT STA. = 317+92.09
e = 2.18%

Carolyn Gust #53845 10/28/09

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 13

20519 7/5/2008 1:35:04 PM H:\Transportation\415291\5201\roadway\plonrd02.dgn

CITY TAVERN

INDIAN RIVER NATIONAL BANK

N

1" = 40'

R/W LINE

PROPOSED MAST ARM FOUNDATION (SEE SIGNALIZATION PLANS)

+79.25
55.86 (LT)

+67.00
35.25 (LT)

CR 10

R/W LINE

SR-5 (US-1)

EXIST CONC SWK TO REMAIN (TYP)

SAWCUT C&G AND MATCH INLET

+66.72
28.67 (LT)

27' R

15" RCP

35'

57'

15" RCP

MILLING AND RESURFACING LIMITS

324

325

36" RCP

326

327

30" RCP

328

15" RCP

S 87° 48' 51" W

℄ SURVEY SR-5

15" RCP

15" RCP

EXIST CONC SWK TO REMAIN (TYP)

SAWCUT C&G AND MATCH INLET

1/2" PVC BE

31' R

+69.93
29.88 (RT)

SIDEWALK EASEMENT

+69.57
37.64 (RT)

TYPE F C&G

ADJUST VALVES

VVH CSHT

+73.96
44.80 (RT)

R/W LINE

8" DIP WM

PROPOSED MAST ARM FOUNDATION (SEE SIGNALIZATION PLANS)

VVH CSH6

R/W LINE

6" PVC WM

THORPE/SOTHEBY'S INTERNATIONAL REALTY

KANE'S APPLIANCE

CITGO GAS STATION

CONCRETE

ASPHALT & BASE REMOVAL

CONCRETE REMOVAL

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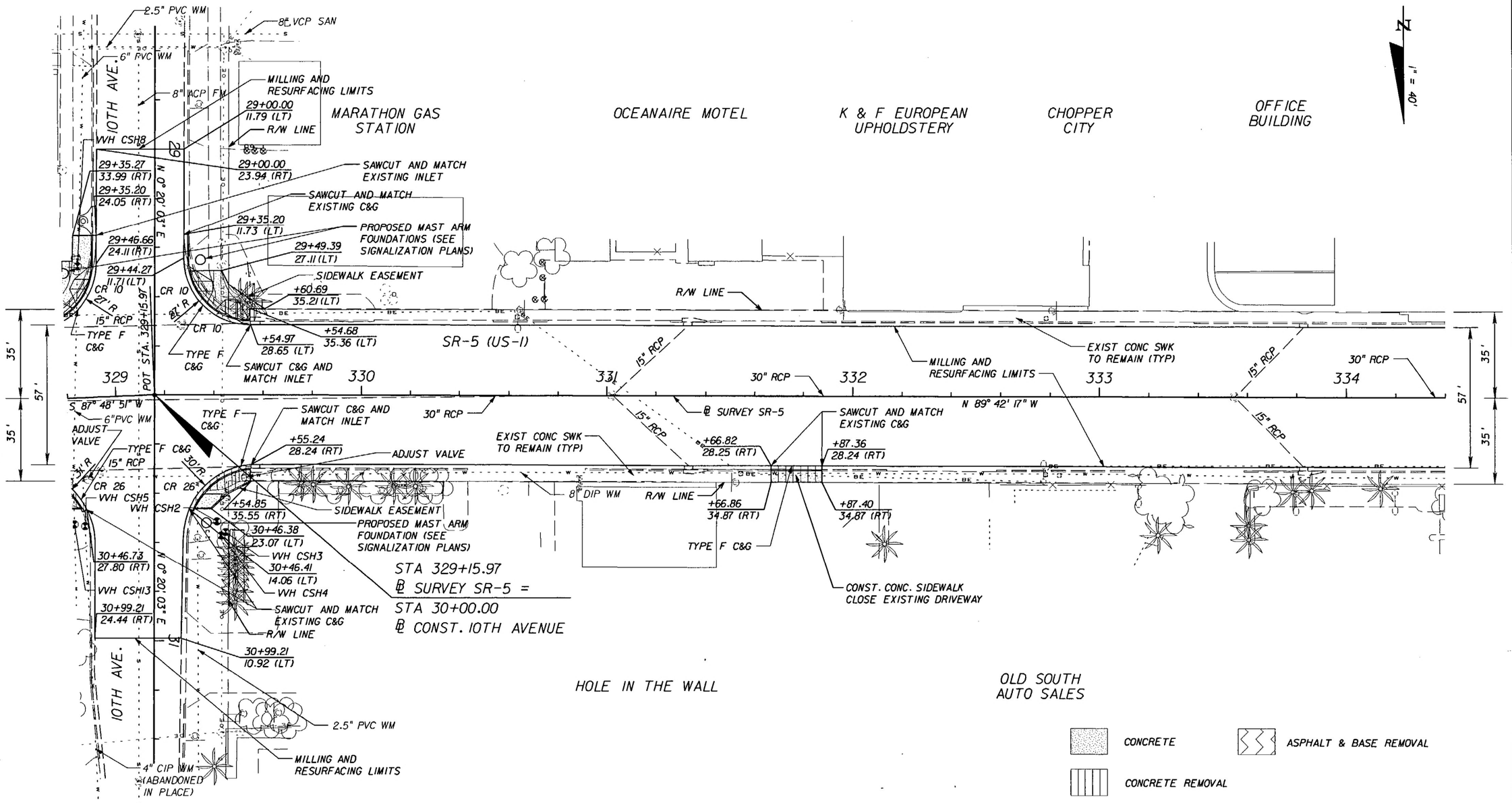
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 14



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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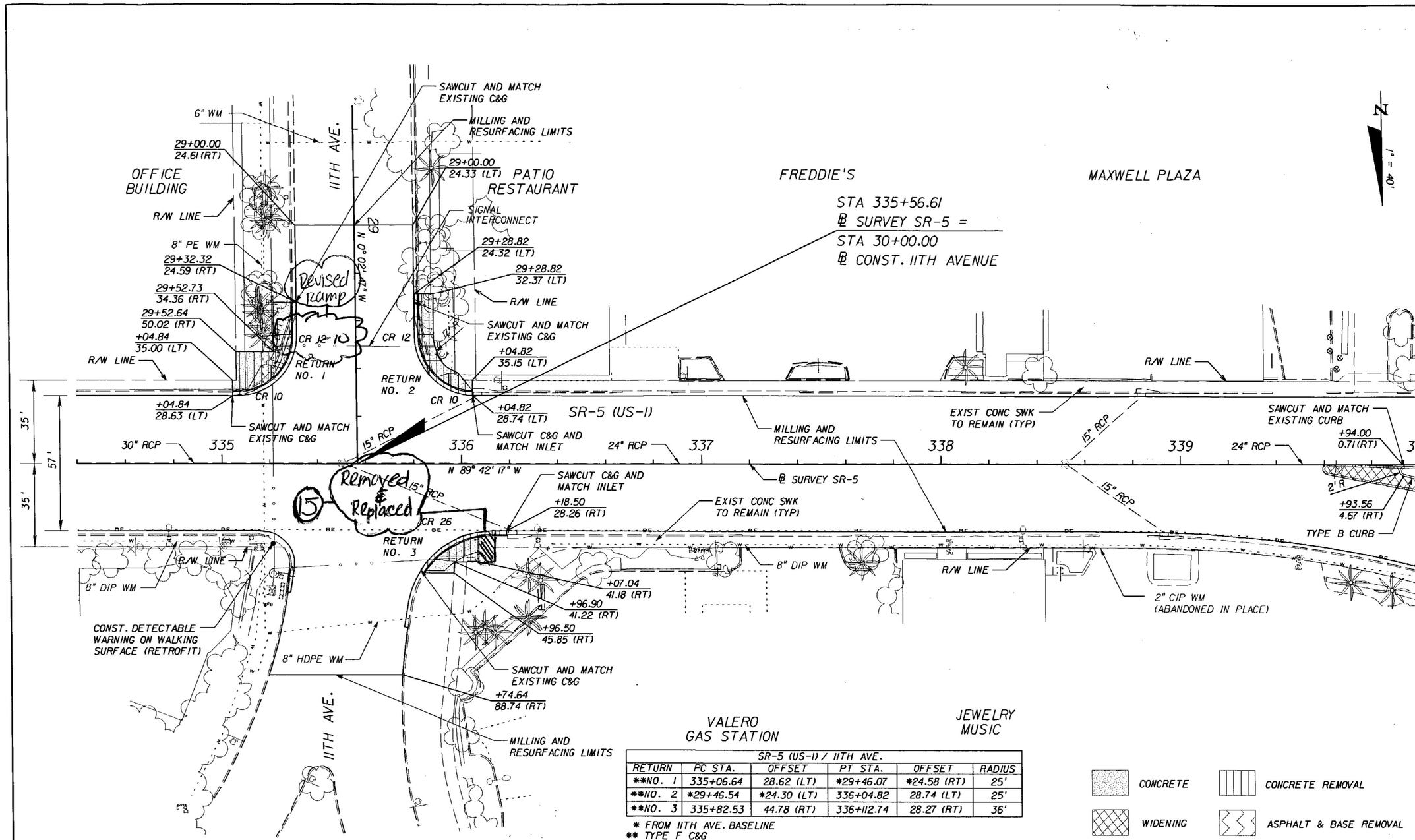
ROADWAY PLANS

SHEET NO. 15



SR-5 (US-1) / 11TH AVE.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	335+06.64	28.62 (LT)	*29+46.07	*24.58 (RT)	25'
**NO. 2	*29+46.54	*24.30 (LT)	336+04.82	28.74 (LT)	25'
**NO. 3	335+82.53	44.78 (RT)	336+112.74	28.27 (RT)	36'

* FROM 11TH AVE. BASELINE
** TYPE F C&G

CONCRETE
CONCRETE REMOVAL
WIDENING
ASPHALT & BASE REMOVAL

Carolyn Grubb #53845 10/28/09

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 16

Removed & Replaced (38)

Extra ADA mat retro fit

21ST ST.

CONST. DETECTABLE WARNING ON WALKING SURFACE (RETROFIT)

+43.17
54.40 (LT)

MILLING AND RESURFACING LIMITS

FEC RAILROAD TRACKS

1" = 40'

MILLING AND RESURFACING LIMITS

SAWCUT AND MATCH EXISTING C&G

STRAIGHT END

+10.19
138.54 (LT)

+33.64
94.04 (LT)

+31.58
75.08 (LT)

+42.12
68.80 (LT)

R/W LINE

RETURN NO. 1

SAWCUT AND MATCH EXISTING C&G

R/W LINE

+23.67
98.65 (LT)

SAWCUT C&G AND MATCH INLET

EXIST CONC SWK TO REMAIN (TYP)

MILLING AND RESURFACING LIMITS

SR-5 (US-1)

CR 23

15" RCP

POT STA 342+43 LT

343

344

345

346

MATCH LINE STA 346+40.00

58'

35'

35'

COMMERCE AVE.

SAWCUT AND MATCH EXISTING C&G

℄ SURVEY SR-5

Removed & Replaced

N 18° 17' 39" W

+23.83
23.73 (RT)

15" RCP

25' R

EXIST CONC SWK TO REMAIN (TYP)

34

SAWCUT C&G AND MATCH INLET

+84.43
130.00 (LT)

+97.90
89.85 (LT)

+88.22
86.59 (LT)

+94.75
67.45 (LT)

CR 12

R/W LINE

SAWCUT AND MATCH EXISTING CURB

+98.68
36.55 (RT)

+86.33
53.50 (RT)

RETURN NO. 1

CR 12

10' R

CR 20

R/W LINE

+23.83
34.76 (RT)

32+60.45
10.76 (LT)

STRAIGHT END

30+45.39
38.15 (LT)

STA 342+31.85
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 12TH AVENUE

342

N 89° 42' 17" W

31

2" PE WM

32

N 0° 04' 43" W

12TH AVE.

33

PATIO PAWN

F CURB
10 LF-Deleted

R/W LINE

15" RCP

15" RCP

15" RCP

MILLING AND RESURFACING LIMITS

8" DIP WM

32+60.45
10.95 (RT)

MILLING AND RESURFACING LIMITS

TIRE KINGDOM

R/W LINE

EXIST CONC SWK TO REMAIN (TYP)

341

SAWCUT AND MATCH EXISTING CURB

R/W LINE

8" DIP WM

+82.00
26.50 (RT)

509' R

MAXWELL PLAZA

24" RCP

+49.85
19.27 (RT)

TYPE B CURB

2" CIP WM (ABANDONED IN PLACE)

MATCH LINE STA 340+00.00

30'

36'

39'

53'

INDIAN RIVER COUNTY CHAMBER OF COMMERCE

SR-5 (US-1) / 21ST ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	342+96.07	54.28 (LT)	343+20.85	33.28 (LT)	25'

** TYPE F C&G

SR-5 (US-1) / 12TH AVE.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	*32+57.42	*10.78 (LT)	344+89.52	38.67 (RT)	22'

* FROM 12TH AVE. BASELINE
** TYPE F C&G

CONCRETE

WIDENING

CONCRETE REMOVAL

Carolyn Grist #53845 10/28/09

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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 17

DETAIL A

351+15.56
43.07 (LT)
EL 14.64

351+18.32
37.75 (LT)
B/C EL 14.55

351+00.00
35.04 (LT)
B/C EL 14.16

6' CONC SWK

1" = 40'

STA 346+90.26
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 22ND STREET

STA 351+34.64
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 23RD STREET

18" RCP

FEC RAILROAD TRACKS

6 FIBER

PROPOSED MAST ARM FOUNDATION (SEE SIGNALIZATION PLANS)

15 KV OE

8' DIP WM

SAWCUT AND MATCH EXISTING CURB

+48.33
118.36 (LT)

END GUARDRAIL REMOVAL
+43.70 / 117.11 (LT)

REMOVE GUARDRAIL

+43.23
115.93 (LT)

+36.55
97.07 (LT)

BEGIN GUARDRAIL REMOVAL
+40.93 / 92.27 (LT)

+38.99
91.97 (LT)

INTERCONNECT

MILLING AND RESURFACING LIMITS

+30.81
53.22 (LT)
MATCH RR EXT.

VVH CSH9

+96.99
121.49 (LT)

+54.25
118.39 (LT)

+46.89
97.62 (LT)

RAIL ROAD PREEMPTION

23RD ST.

A-1

M-1

TYPE D CURB

+39.67
77.22 (LT)

+86.10
91.40 (LT)

+78.27
41.02 (LT)

+76.76
60.36 (LT)

SAWCUT AND MATCH EXISTING CURB

+78.27
34.50 (LT)

CR 23

RETURN NO. 1

CONST. DETECTABLE WARNING SURFACE (SEE STD INDEX 304)

INSTALL TYPE III PEDESTRIAN GATE (BY OTHERS)

SEE DETAIL A

R/W LINE

MILLING AND RESURFACING LIMITS

SR-5 (US-1)

℄ SURVEY SR-5

N 18° 17' 39" W

EXIST CONC SWK TO REMAIN (TYP)

18" RCP

2" WM

R/W LINE

SAWCUT C&G AND MATCH INLET

8" CIP WM (GROUTED)

15" RCP

RETURN NO. 2

CR 26

8" PVC WM

VVH CSH14

VVH CSH15

VVH CSH16

VVH CSH17

+67.83
34.95 (RT)

30+63.91
33.61 (RT)

SAWCUT AND MATCH EXISTING C&G

MILLING AND RESURFACING LIMITS

8" PE WM

30+60.63
24.69 (RT)

30+60.63
25.77 (LT)

PROPOSED MAST ARM FOUNDATION (SEE SIGNALIZATION PLANS)

23RD ST.
S 21° 27' 39" E
121.68'

42 - 4" DUCT BANK

K & B FOREIGN CAR SERVICE

CITGO GAS STATION

FINE CABINETRY

REAL ESTATE INC.

MATCH LINE STA 346+40.00

35'

58'

35'

30+48.07
32.13 (RT)

30+66.74
13.01 (RT)

+12.78
23.48 (RT)

+24.10
23.60 (RT)

+24.10
34.83 (RT)

30+25.25
33.71 (LT)

30+30.03
28.28 (LT)

FLARED END

30+38.77
11.89 (LT)

30+66.74
12.13 (LT)

CR 20

25' R

22ND ST.
S 88° 42' 39" E
121.68'

R/W LINE

MILLING AND RESURFACING LIMITS

OT 25 PR

5" RCP

18" RCP

31

Removed & Replaced
16

Removed & Replaced
31

Removed & Replaced
32,33

Type F c/g 16 LF extra work

SR-5 (US-1) / 23RD ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
***NO. 1	351+06.93	34.51 (LT)	351+30.56	51.05 (LT)	25'
**NO. 2	350+67.84	23.81 (RT)	*30+60.63	24.69 (RT)	27'

* FROM 23RD ST. BASELINE
** TYPE F C&G
*** TYPE D CURB

MISC. ASPHALT (4")

PROPOSED RAILROAD CROSSING EXTENSION AND PEDESTRIAN GATE (BY OTHERS)

CONCRETE

WIDENING

CONCRETE REMOVAL

ASPHALT & BASE REMOVAL

Carolyn Grant
#53845
10/28/09

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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 18

1" = 40'

STA 355+79.02
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 24TH STREET

FEC RAILROAD TRACKS

R/W LINE

SR-5 (US-1)

MILLING AND RESURFACING LIMITS

352 353 354 355 356 357

35'
58'
35'

℄ SURVEY SR-5

EXIST CONC SWK TO REMAIN (TYP)

R/W LINE

8" PVC WM

6" CIP WM (ABANDONED IN PLACE)

MILLING AND RESURFACING LIMITS

1" PE

R/W LINE

30+58.80
14.50 (RT)

30+58.80
14.18 (LT)

S 89° 12' 39" E

24TH ST.

31

BT 100 PR

BT 50 PR

SAWCUT AND MATCH EXISTING C&G

+18.03
23.81 (RT)

TYPE F C&G
+48.28
23.83 (RT)

N 18° 17' 39" W

TYPE F C&G
+58.65
23.83 (RT)

SAWCUT AND MATCH EXISTING C&G

18" RCP

+01.05
23.79 (RT)

+18.03
34.80 (RT)

+48.28
34.88 (RT)

+01.05
35.16 (RT)

+58.65
34.88 (RT)

R/W LINE

8" PVC WM

2.5 PVC WM

EXIST CONC SWK TO REMAIN (TYP)

R/W LINE

CONST. CONC. SIDEWALK CLOSE EXISTING DRIVEWAY

CONST. CONC. SIDEWALK CLOSE EXISTING DRIVEWAY

ALOHA AUTO

PINNACLE ROOFING

ORIENTAL RUG GALLERY

JENKINS AUTO

CONCRETE

CONCRETE REMOVAL

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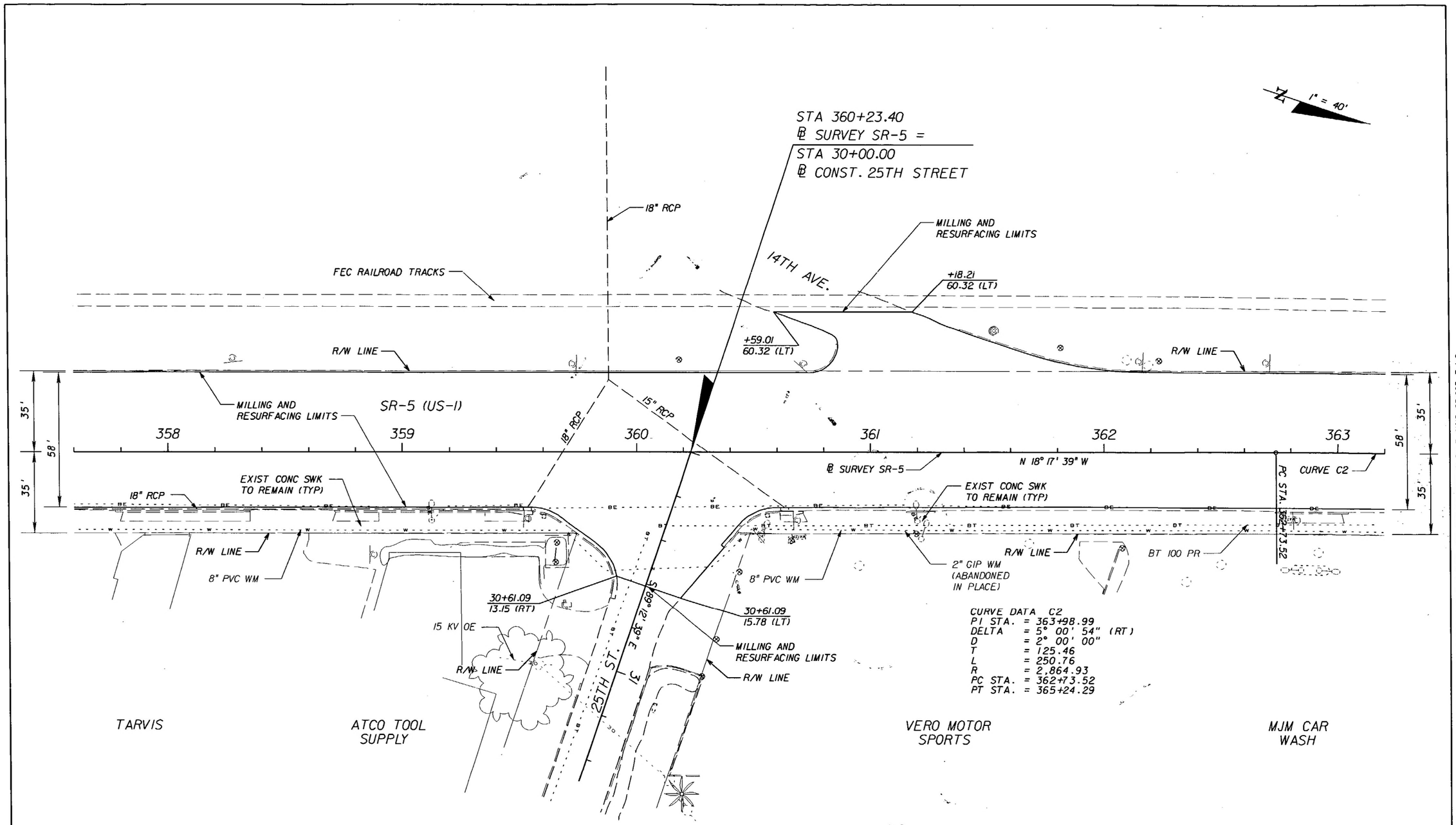
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 19



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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 20

1" = 40'

STA 355+79.02
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 24TH STREET

FEC RAILROAD TRACKS

R/W LINE

SR-5 (US-1)

MILLING AND RESURFACING LIMITS

352 353 354 355 356 357

℄ SURVEY SR-5

EXIST CONC SWK TO REMAIN (TYP)

35'
58'
35'

SAWCUT AND MATCH EXISTING C&G

TYPE F C&G
+48.28
23.83 (RT)

+18.03
23.81 (RT)

N 18° 17' 39" W

TYPE F C&G
+58.65
23.83 (RT)

18" RCP

+01.05
23.79 (RT)

30+58.80
14.18 (LT)

+18.03
34.80 (RT)

+48.28
34.88 (RT)

+01.05
35.16 (RT)

+58.65
34.88 (RT)

R/W LINE

8" PVC WM

6" CIP WM (ABANDONED IN PLACE)

30+58.80
14.50 (RT)

MILLING AND RESURFACING LIMITS

1" PE

2" PVC WM

EXIST CONC SWK TO REMAIN (TYP)

~~CONST. CONC. SIDEWALK CLOSE EXISTING DRIVEWAY~~

DELETED LEFT OPEN

CONST. CONC. SIDEWALK CLOSE EXISTING DRIVEWAY

S 88° 12' 39" W

24TH ST.

BT 100 PR

BT 50 PR

ALOHA AUTO

PINNACLE ROOFING

ORIENTAL RUG GALLERY

JENKINS AUTO

CONCRETE

CONCRETE REMOVAL

Carolyn Hurst #53845
11/12/09

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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 19

1" = 40'

STA 360+23.40
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 25TH STREET

18" RCP

MILLING AND RESURFACING LIMITS

14TH AVE.

FEC RAILROAD TRACKS

+18.21
60.32 (LT)

+59.01
60.32 (LT)

R/W LINE

R/W LINE

MILLING AND RESURFACING LIMITS

SR-5 (US-1)

15" RCP

18" RCP

358 359 360 361 362 363

35' 58' 35'

℄ SURVEY SR-5

N 18° 17' 39" W

CURVE C2

PC STA. 362+73.52

35' 58' 35'

EXIST CONC SWK TO REMAIN (TYP)

EXIST CONC SWK TO REMAIN (TYP)

18" RCP

R/W LINE

8" PVC WM

8" PVC WM

2" GIP WM (ABANDONED IN PLACE)

R/W LINE

BT 100 PR

30+61.09
13.15 (RT)

30+61.09
15.78 (LT)

15 KV OE

MILLING AND RESURFACING LIMITS

R/W LINE

R/W LINE

25TH ST.

S 89° 12' 39" E 689.31'

CURVE DATA C2
PI STA. = 363+98.99
DELTA = 5° 00' 54" (RT)
D = 2° 00' 00"
T = 125.46
L = 250.76
R = 2,864.93
PC STA. = 362+73.52
PT STA. = 365+24.29

TARVIS

ATCO TOOL SUPPLY

VERO MOTOR SPORTS

MJM CAR WASH

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J

Michael Priory, P.E.
P.E. No.: 60614
3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale, FL 33309
(954) 733-7233

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 20

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extra ADA mat retro fit

SR-5 (US-1) / 26TH ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	365+18.08	51.80 (LT)	365+42.16	32.85 (LT)	25'
**NO. 2	*30+46.29	*22.46 (LT)	365+10.86	23.80 (RT)	36'

* FROM 26TH ST. BASELINE
** TYPE F C&G

1" = 40'

STA 364+65.44
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 26TH STREET

26TH ST.

12" CIP WM

MILLING AND RESURFACING LIMITS

SAWCUT AND MATCH EXISTING C&G

CONST. DETECTABLE WARNING ON WALKING SURFACE (RETROFIT)

+25.60 / 54.24 (LT)
+26.83 / 50.64 (LT)
+27.34 / 46.38 (LT)
+28.62 / 45.12 (LT)
+17.67 / 53.48 (LT)
+40.98 / 59.60 (LT)
+75.50 / 34.28 (LT)

FEC RAILROAD TRACKS

SAWCUT AND MATCH EXISTING CURB

R/W LINE

CR 23

SIGNAL INTERCONNECT

RETURN NO. 1

TYPE D CURB

SR-5 (US-1)

Removed & Replaced 35,36

35'
58'

364 365 366 367 368

MILLING AND RESURFACING LIMITS

CURVE C2

EXIST CONC SWK TO REMAIN (TYP)

SAWCUT AND MATCH EXISTING C&G

+23.75 / 23.91 (RT) CR 19

PT STA. 365+24.29

CONST. DETECTABLE WARNING ON WALKING SURFACE (RETROFIT)

UTILITY EASEMENT

RETURN NO. 2

CR 20

N 13° 16' 45" W

℄ SURVEY SR-5

+52.64 / 24.92 (RT)

18" RCP

22' R

CR 20

8" PVC WM

2" GIP WM (ABANDONED IN PLACE)

30+89.00 / 13.41 (RT)

R/W LINE

BT 100 PR

R/W LINE

S 89° 12' 39" E

30+25.77 / 41.36 (LT)

+22.50 / 34.96 (RT)

+10.60 / 34.89 (RT)

30+31.90 / 41.28 (LT)

+95.77 / 68.66 (RT)

+20.86 / 68.66 (RT)

8" CIP WM

SAWCUT C&G AND MATCH INLET

+52.53 / 36.04 (RT)

+71.68 / 37.20 (RT)

EXIST CONC SWK TO REMAIN (TYP)

R/W LINE

SAWCUT AND MATCH EXISTING C&G

EXIST CONC & BRICK PAVER DRIVEWAY (TO REMAIN)

R/W LINE

30+89.00 / 22.31 (LT)

15 KV OE

MILLING AND RESURFACING LIMITS

MILLING AND RESURFACING LIMITS

VERO BEACH IMPORT AUTO SERVICE

26TH ST.

CHEVRON

KAYAKS

PEST CONTROL

PERFECT PAVERS

69'

CURVE DATA C2
PI STA. = 363+98.99
DELTA = 5° 00' 54" (RT)
D = 2° 00' 00"
T = 125.46
L = 250.76
R = 2,864.93
PC STA. = 362+73.52
PT STA. = 365+24.29

CONCRETE
CONCRETE REMOVAL
ASPHALT
ASPHALT & BASE REMOVAL

Carolyn Irish #53845 10/28/09

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STATE OF FLORIDA
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5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 21

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1" = 40'

STA 372+33.54
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 28TH STREET

FEC RAILROAD TRACKS

R/W LINE

SR-5 (US-1)

MILLING AND RESURFACING LIMITS

MILLING AND RESURFACING LIMITS

SAWCUT AND MATCH EXISTING C&G

Removed & Replaced (37)

18" RCP

18" RCP

35'

58'

69'

35'

58'

69'

369 370 371 372 373 374

+30.60
27.70 (RT)

SAWCUT AND MATCH EXISTING C&G

+30.51
35.22 (RT)

25' R

EXIST CONC SWK TO REMAIN (TYP)

18" RCP

+72.44
28.08 (RT)

+67.33
28.12 (RT)

+23.50
28.27 (RT)

(M-1)

SAWCUT C&G AND MATCH INLET

+80.35
35.11 (RT)

℄ SURVEY SR-5

RETURN NO. 1 18" RCP

N 13° 16' 45" W

RETURN NO. 2

SAWCUT AND MATCH EXISTING C&G

+83.30
28.13 (RT)

18" RCP

CR 20

CR 20

CR 20

+10.83
35.96 (RT)

+29.22
36.65 (RT)

+09.82
37.07 (RT)

SAWCUT AND MATCH EXISTING C&G

+75.65
36.65 (RT)

+78.42
39.42 (RT)

+82.42
52.80 (RT)

+14.05
36.65 (RT)

+11.28
39.42 (RT)

+07.28
52.80 (RT)

+83.68
36.65 (RT)

STRAIGHT END

+83.30
34.79 (RT)

+82.78
36.71 (RT)

EXIST CONC SWK TO REMAIN (TYP)

8" CIP WM

R/W LINE

SAWCUT AND MATCH EXISTING DRIVEWAY

SAWCUT AND MATCH EXISTING DRIVEWAY

EXIST CONC & BRICK PAVER DRIVEWAY (TO REMAIN)

30+69.00
13.23 (RT)

MILLING AND RESURFACING LIMITS

N 76° 43' 15" E

28TH ST.

31

R/W LINE

SAWCUT AND MATCH EXISTING C&G

30+69.00
23.42 (LT)

R/W LINE

6" PVC WM

R/W LINE

BOAT RENTAL

SR-5 (US-1) / 28TH ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	371+80.33	28.26 (RT)	*30+39.22	*24.83 (RT)	39'
**NO. 2	*30+53.43	*23.22 (LT)	372+81.85	28.13 (RT)	25'

* FROM 28TH ST. BASELINE
** TYPE F C&G

CONCRETE
CONCRETE REMOVAL
WIDENING
ASPHALT & BASE REMOVAL

Carolyn Hurst #53845 10/28/09

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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

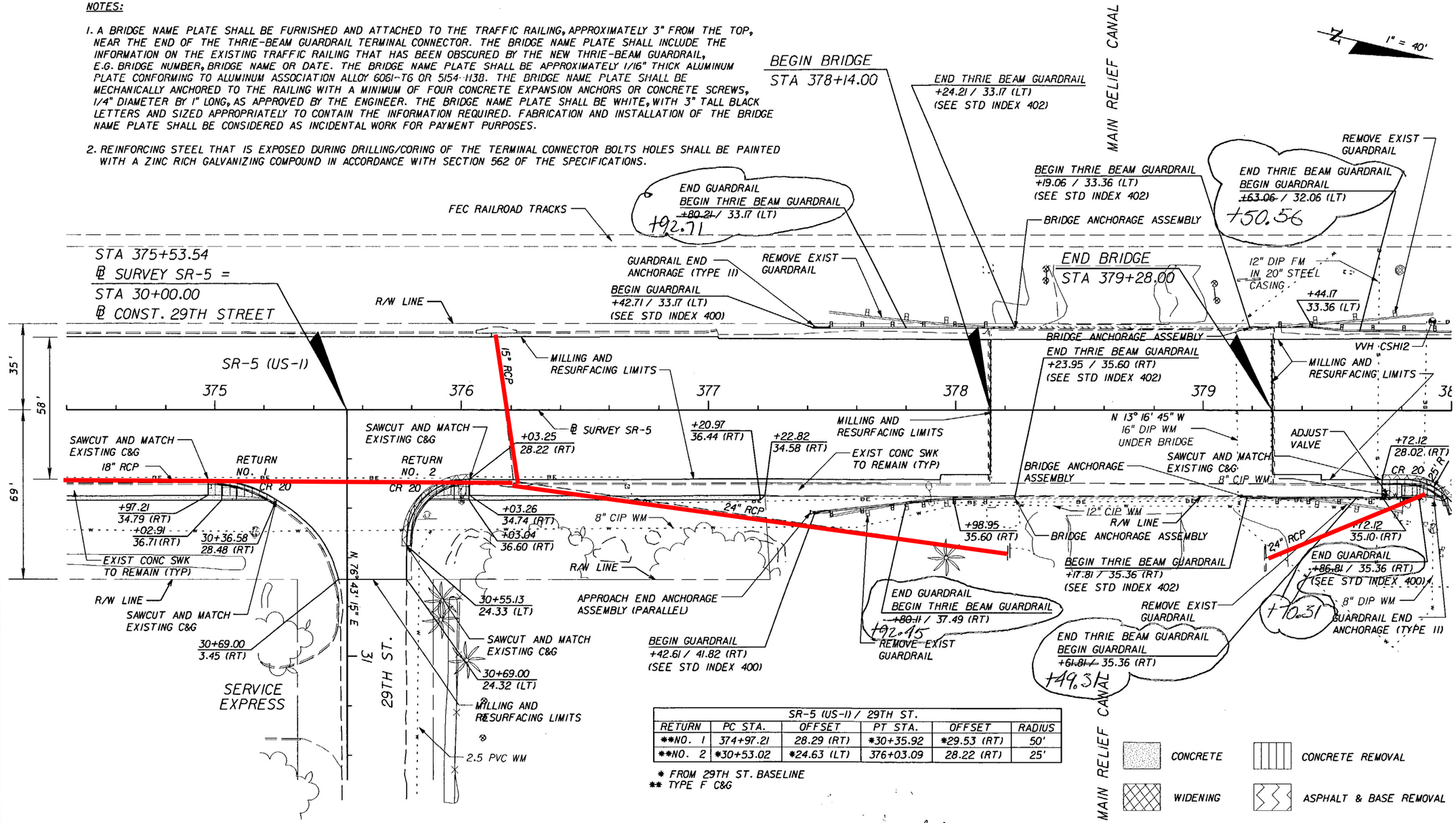
ROADWAY PLANS

SHEET NO. 22

NOTES:

1. A BRIDGE NAME PLATE SHALL BE FURNISHED AND ATTACHED TO THE TRAFFIC RAILING, APPROXIMATELY 3" FROM THE TOP, NEAR THE END OF THE THRIE-BEAM GUARDRAIL TERMINAL CONNECTOR. THE BRIDGE NAME PLATE SHALL INCLUDE THE INFORMATION ON THE EXISTING TRAFFIC RAILING THAT HAS BEEN OBSCURED BY THE NEW THRIE-BEAM GUARDRAIL, E.G. BRIDGE NUMBER, BRIDGE NAME OR DATE. THE BRIDGE NAME PLATE SHALL BE APPROXIMATELY 1/16" THICK ALUMINUM PLATE CONFORMING TO ALUMINUM ASSOCIATION ALLOY 6061-T6 OR 5154-H38. THE BRIDGE NAME PLATE SHALL BE MECHANICALLY ANCHORED TO THE RAILING WITH A MINIMUM OF FOUR CONCRETE EXPANSION ANCHORS OR CONCRETE SCREWS, 1/4" DIAMETER BY 1" LONG, AS APPROVED BY THE ENGINEER. THE BRIDGE NAME PLATE SHALL BE WHITE, WITH 3" TALL BLACK LETTERS AND SIZED APPROPRIATELY TO CONTAIN THE INFORMATION REQUIRED. FABRICATION AND INSTALLATION OF THE BRIDGE NAME PLATE SHALL BE CONSIDERED AS INCIDENTAL WORK FOR PAYMENT PURPOSES.

2. REINFORCING STEEL THAT IS EXPOSED DURING DRILLING/CORING OF THE TERMINAL CONNECTOR BOLTS HOLES SHALL BE PAINTED WITH A ZINC RICH GALVANIZING COMPOUND IN ACCORDANCE WITH SECTION 562 OF THE SPECIFICATIONS.



SR-5 (US-1) / 29TH ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	374+97.21	28.29 (RT)	*30+35.92	*29.53 (RT)	50'
**NO. 2	*30+53.02	*24.63 (LT)	376+03.09	28.22 (RT)	25'

* FROM 29TH ST. BASELINE
** TYPE F C&G

Candy Justice #53015 10/29/09

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5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 23

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N

1" = 40'

STA 380+28.86
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 30TH STREET

STA 383+42.84
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 31ST STREET

FEC RAILROAD TRACKS

BT 600 PR

16" CONCENTRATE WM IN 30" STEEL CASING

BT 400 PR

R/W LINE

VVH CSH10

VVH CSH11

15 KV OE

END GUARDRAIL
+50.56 / 32.06 (LT)
(SEE STD INDEX 400)

APPROACH END ANCHORAGE ASSEMBLY (PARALLEL)

SR-5 (US-1)

MILLING AND RESURFACING LIMITS

380 381 382 383 384 385

N 13° 16' 45" W

35'
57'
35'

55'
35'

℄ SURVEY SR-5

15" RCP

SAWCUT AND MATCH EXISTING C&G

ADJUST VALVE RETURN NO. 1

ADJUST VALVE RETURN NO. 2

+58.74
28.00 (RT)

+02.32
40.33 (RT)

25' R

24" RCP

EXIST CONC SWK TO REMAIN (TYP)

+91.71
28.16 (RT)

+73.27
26.73 (RT)

EXIST CONC SWK TO REMAIN (TYP)

24" RCP

CR 20

CR 20

CR 20

30+50.53
26.42 (RT)

+58.74
34.79 (RT)

8" CIP WM

SAWCUT AND MATCH EXISTING C&G

FLARED END

+40.45
3.33 (RT)

30+55.41
1.12 (RT)

FLARED END

30+56.95
26.56 (RT)

MILLING AND RESURFACING LIMITS

30+90.57
2.96 (RT)

30+90.57
27.47 (RT)

12" PVC FM

30TH ST.

31

N 73° 14' 15" E

R/W LINE

BT 50 PR

+91.71
34.76 (RT)

FLARED END

30+46.12
16.94 (RT)

30+56.11
13.08 (RT)

BT 200 PR

R/W LINE

31ST ST.

N 89° 53' 45" E

37

SAWCUT AND MATCH EXISTING C&G

FLARED END

BT 400 PR

+73.26
34.70 (RT)

30+56.11
11.99 (LT)

2.5 PVC WM

MILLING AND RESURFACING LIMITS

16" CONCENTRATE WM

R/W LINE

R/W LINE

SR-5 (US-1) / 31ST ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	382+96.48	28.16 (RT)	*30+46.12	*16.94 (RT)	21'
**NO. 2	*30+37.74	*13.14 (LT)	383+69.41	26.83 (RT)	27'

* FROM 31ST ST. BASELINE
** TYPE F C&G

CONCRETE

CONCRETE REMOVAL

WIDENING

ASPHALT & BASE REMOVAL

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STATE OF FLORIDA
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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 24

SR-5 (US-1) / 32ND ST.					
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	*30+39.84	*11.87 (RT)	387+29.92	22.18 (LT)	25'

* FROM 32ND ST. BASELINE
** TYPE F C&G

1" = 40'

AVIATION BLVD.

MILLING AND RESURFACING LIMITS

FEC RAILROAD TRACKS

END PROJECT
END MILLING AND RESURFACING
℄ SURVEY STA 390+22.00
MATCH EXISTING

END CONSTRUCTION
℄ SURVEY STA 390+85.59

R/W LINE

extra work
4" Sidewalk
9.1 SY

SR-5 (US-1)

MILLING AND RESURFACING LIMITS

35'
55'
35'

386 387 388 389 390 391

EXIST CONC SWK TO REMAIN (TYP)

CONST. DETECTABLE WARNING ON WALKING SURFACE (RETROFIT)

CONNECT TO 24" RCP

+25.81 22.18 (RT)
+61.70 28.79 (RT) 24" RCP
CR 15
S-1
TYPE F C&G
BEGIN SIDEWALK WITH GUIDERAIL MATCH EXISTING +99.62 / 34.81 (RT) (SEE SHEET 8)
+28.12 34.82 (RT) EL 14.23
R/W LINE
END SIDEWALK WITH GUIDERAIL MATCH EXISTING +59.12 / 34.84 (RT) (SEE SHEET 8)
+28.12 34.84 (RT) EL 14.23
STA 387+02.29
℄ SURVEY SR-5 =
STA 30+00.00
℄ CONST. 32ND STREET
R/W LINE

+59.12 28.84 (RT)
30+51.97 12.96 (RT)
32ND ST.
N 89° 53' 15" E
15" RCP
15" RCP
R/W LINE

SAWCUT AND MATCH EXISTING C&G
+29.92 22.18 (RT)
RETURN NO. 1
+21.15 35.24 (RT)
30+45.84 11.87 (LT)
30+51.97 11.87 (LT)
18" RCP
R/W LINE
MILLING AND RESURFACING LIMITS
CR. 21

EXIST CONC SWK TO REMAIN (TYP)
24" RCP
R/W LINE

℄ SURVEY SR-5
N 13° 16' 45" W

SAWCUT AND MATCH EXISTING C&G
24" RCP
+26.43 34.85 (RT)
SAWCUT AND MATCH EXISTING C&G
TYPE D CURB
R/W LINE
33RD ST.
N 89° 53' 15" E
CR 20

SAWCUT AND MATCH EXISTING C&G
24" RCP
+85.59 28.15 (RT)
RETURN NO. 1
RETURN NO. 2
+85.59 34.84 (RT)
R/W LINE
30+41.96 25.11 (LT)
SAWCUT AND MATCH EXISTING CURB
R/W LINE
CR 20

Type D Curb 13 LF extra work

Removed & Replaced

48

		SR-5 (US-1) /	33RD ST.		
RETURN	PC STA.	OFFSET	PT STA.	OFFSET	RADIUS
**NO. 1	390+26.54	27.99 (RT)	*30+40.37	*11.95 (RT)	12'
**NO. 2	*30+37.50	*14.00 (LT)	390+81.49	28.15 (RT)	15'

* FROM 33RD ST. BASELINE
** TYPE F C&G

CITRUS MOTEL

CONCRETE

ASPHALT & BASE REMOVAL

CONCRETE REMOVAL

Carolyn Grubb
53845
10/28/09

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STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

ROADWAY PLANS

SHEET NO. 25

TRAFFIC CONTROL GENERAL NOTES

1. ARROWS DENOTE DIRECTION OF TRAFFIC ONLY AND DO NOT REFLECT PAVEMENT MARKINGS.

2. ALL TRAFFIC CONTROLS SHALL BE IN ACCORDANCE WITH PROJECT PLANS AND THE 2003 MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES WITH REVISION 1 AND 2 INCORPORATED, DATED DECEMBER 2007, AS A MINIMUM CRITERIA.

3. ALL TRAFFIC CONTROL LAYOUTS SHOULD FOLLOW STANDARD INDEX NUMBERS: 600, 611-613, 615-617, 619, 630, AND 660.

4. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ALL POTHOLES WHICH DEVELOP WITHIN THE PROJECT LIMITS AND SHALL MAINTAIN A SUPPLY OF COLD MIX ON THE PROJECT SITE TO EXPEDITE THOSE REPAIRS. COST INCLUDED IN ITEM 102-1 MAINTENANCE OF TRAFFIC.

5. LANE CLOSURES SHALL NOT BE PERMITTED DURING PEAK HOURS FROM 7:00 AM TO 9:00 AM AND FROM 4:00 PM TO 6:00 PM , IN ADDITION TO THOSE HOURS WHICH MAY BE DESIGNATED BY THE ENGINEER DUE TO EXCESSIVE TRAFFIC AND/OR HAZARDOUS CONDITIONS. SHOULD ANY LANE CLOSURE CAUSE AN UNACCEPTABLE LEVEL OF TRAFFIC CONGESTION, THE CONTRACTOR WILL BE DIRECTED BY THE ENGINEER TO OPEN THE LANE UNTIL SUCH TIME THAT THE TRAFFIC IS RETURNED TO AN ACCEPTABLE FLOW. ALL LANES SHALL BE RE-OPENED DURING INACTIVE WORK PERIODS. THE CITY OF VERO BEACH NOISE ORDINANCE PROHIBITS CONSTRUCTION NOISE BETWEEN 7:00 PM AND 7:00 AM, UNLESS A SPECIAL PERMIT HAS BEEN OBTAINED FROM THE CITY MANAGER. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMIT. COST INCLUDED IN ITEM 102-1 MAINTENANCE OF TRAFFIC.

6. PRIOR TO ANY LANE CLOSURE THE CONTRACTOR SHALL NOTIFY THE FDOT CONSTRUCTION PROJECT ENGINEER OR RESIDENT CONSTRUCTION ENGINEER AT LEAST FOURTEEN (14) DAYS PRIOR TO CLOSURE FOR APPROVAL. THE NOTIFICATION WILL INCLUDE SKETCHES, CALCULATIONS, AND OTHER DATA REQUIRED BY THE ENGINEER.

   NOTIFY: FLORIDA DEPARTMENT OF TRANSPORTATION
   KATHERINE KEHRES, RESIDENT ENGINEER
   3601 OLEANDER AVENUE
   FORT PIERCE, FL 33450
   (772) 465-7396

7. THE CONTRACTOR SHALL CONTACT THE FDOT DISTRICT 4 PUBLIC INFORMATION OFFICER, BARBARA KELLEHER AT (954) 777-4090 AT LEAST 10 BUSINESS DAYS PRIOR TO LANE CLOSURE.

8. THE CONTRACTOR SHALL ONLY BE ALLOWED TO WORK WITHIN A DESIGNATED SEGMENT OF ROADWAY LIMITED TO A MAXIMUM LENGTH OF 1000 FEET AT ANY TIME DURING CONSTRUCTION ACTIVITIES INVOLVING REMOVAL AND REPLACEMENT OF CONCRETE AND CONDUIT INSTALLATION. THE DESIGNATED CONSTRUCTION AREA IS TO BE APPROVED BY THE PROJECT ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES, AND SHALL CONSIST OF ONLY ONE SIDE OF THE ROADWAY. THE CONTRACTOR SHALL NOT PROCEED TO THE NEXT PRE-APPROVED 1000 FOOT CONSTRUCTION AREA UNTIL ALL WORK IS COMPLETED IN THE PREVIOUS 1000 FOOT SECTION. UNLESS APPROVED BY THE PROJECT ENGINEER. IF THE CONTRACTOR WOULD LIKE TO WORK OUTSIDE OF THIS DESIGNATED AREA. THEY MUST OBTAIN WRITTEN APPROVAL 14 DAYS IN ADVANCE OF THE WORK BEING PERFORMED, AND THE SPECIFIC WORK ACTIVITIES MUST BE DOCUMENTED IN THE REQUEST.

9. CHANNELIZING DEVICES SHALL BE OFFSET 2 FEET FROM LANE LINES.

10. THE EXISTING POSTED REGULATORY SPEED SHALL BE MAINTAINED THROUGH THE WORK ZONE.

11. CONTRACTOR SHALL REMOVE, RELOCATE OR COVER ANY SIGNS AND/OR PAVEMENT MARKINGS THAT CONFLICT WITH THE TRAFFIC CONTROL PLANS. WHEN THE CONFLICT NO LONGER EXISTS, THE CONTRACTOR SHALL REPLACE THOSE SIGNS AND/OR MARKINGS IN THEIR ORIGINAL POSITION. THE CONTRACTOR SHALL COVER WORK ZONE SIGNS WHEN CONDITIONS NO LONGER WARRANT THEIR USE.

12. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMMEDIATE REMOVAL OF STORM WATER FROM ROADWAYS UTILIZED FOR MAINTAINING TRAFFIC IN A MANNER APPROVED BY THE ENGINEER.

13. THE LENGTH OF AN OPEN TRENCH SHALL NOT EXCEED 500 FEET. THE CONTRACTOR WILL NOT BE ALLOWED TO OPEN ANY TRENCHES THAT CANNOT BE BACK-FILLED DURING THE SAME WORKING PERIOD WITHOUT THE APPROVAL OF THE ENGINEER.

14. AT THE END OF EACH WORK DAY OR WHENEVER THE WORK ZONE BECOMES INACTIVE, ANY DROP OFF ADJACENT TO THE PEDESTRIAN, BICYCLE, WHEELCHAIR TRAVEL PATHS, AND TRAVEL WAY SHALL BE TREATED.

15. THE CONTRACTOR SHALL MAINTAIN THE EXISTING LEVEL OF ILLUMINATION THROUGHOUT CONSTRUCTION.

16. CONTRACTOR TO MAINTAIN BLUE RPM'S DURING CONSTRUCTION PHASES. PERMANENT RPM'S, AS REQUIRED FOR LANE LINES, SHALL BE PLACED WITHIN 72 HOURS OF COMPLETION OF THE MAIN LINE FRICTION COURSE. OTHER LOCATIONS FOR RPM PLACEMENT MAY BE DESIGNATED BY THE ENGINEER.

17. THE CONTRACTOR SHALL INSTALL CONSTRUCTION SIGNING PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES AND MAINTAIN SIGNING DURING ALL PHASES OF CONSTRUCTION.

18. THE ALTERATION OF TRAVEL WAYS TO CREATE A WORK ZONE SHALL NOT COMMENCE UNTIL ALL LABOR AND MATERIAL ARE READY FOR THE CONSTRUCTION IN THAT ZONE.

19. THE CONTRACTOR SHALL NOTIFY INDIAN RIVER COUNTY TRAFFIC ENGINEERING DIVISION TWO (2) WORKING DAYS PRIOR TO ANY MODIFICATION AND/OR CHANGES TO AN EXISTING TRAFFIC SIGNAL.

   INDIAN RIVER COUNTY TRAFFIC ENGINEERING DIVISION
   JOHN ANKENY
   1840 25TH STREET
   VERO BEACH, FL 32960
   (772) 226-1563

20. SIGNALIZED INTERSECTIONS SHALL BE MAINTAINED AT ALL TIMES BY UTILIZING THE EXISTING SYSTEMS OR BY THE USE OF TEMPORARY SYSTEMS. COST IS TO BE INCLUDED UNDER PAY ITEM 102-1 MAINTENANCE OF TRAFFIC.

21. THE CONTRACTOR SHALL MAINTAIN VEHICLE AND PEDESTRIAN DETECTION THROUGHOUT CONSTRUCTION. RESPONSE TIME TO ALL REPORTED MALFUNCTIONS OF TRAFFIC SIGNALS AND RELATED EQUIPMENT SHALL BE WITHIN TWO (2) HOURS OF NOTIFICATION. THE CONTRACTOR SHALL RESTORE ALL MALFUNCTIONING TRAFFIC SIGNAL EQUIPMENT TO ITS LEVEL OF OPERATION PRIOR TO THE MALFUNCTION WITHIN TWENTY-FOUR (24) HOURS OF NOTIFICATION.

22. SIGNAL HEADS SHALL BE REALIGNED AS NECESSARY.

23. WHEN A CONTRACTOR IS PERFORMING SIGNAL WORK IN AN INTERSECTION (REMOVING EXISTING SIGNAL CONTROLLER AND SIGNAL HEADS, OR INSTALLING NEW ONES), A TRAFFIC CONTROL OFFICER SHALL DIRECT TRAFFIC.

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REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

PBS&J
Certificate of Authorization No. 24
Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J
Michael Priory, P.E.
P.E. No.: 60614
3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale, FL 33309
(954) 733-7233

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TRAFFIC CONTROL PLAN

SHEET NO. 26

TRAFFIC CONTROL GENERAL NOTES

24. THE CONTRACTOR SHALL INSTALL ANY NECESSARY PAVEMENT, ROAD ROCK, PAVEMENT MARKING SIGNAGE AND/OR ANY PEDESTRIAN SIGNALIZATION AND/OR SIGNAL MODIFICATION TO ACCOMMODATE AN EXISTING OR ALTERNATE WALK ROUTE.

25. IN THE CASE THAT A DESIGNATED CROSSING OR ANY PORTION OF THE DESIGNATED WALK ROUTE CAN NOT BE MAINTAINED, THEN THE CONTRACTOR SHALL NOTIFY THE SPECIAL PROJECTS COORDINATOR AT INDIAN RIVER COUNTY TRAFFIC ENGINEERING DIVISION, (772) 567-8000 EXT. 1234, A MINIMUN OF TEN (10) WORKING DAYS PRIOR TO CLOSING THAT ROUTE IN ORDER THAT AN AN ALTERNATE CROSSING/ROUTE CAN BE ESTABLISHED.

26. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND ADEQUATE WALKING SURFACE APPLICABLE TO THE AMERICANS WITH DISABILITIES ACT (ADA) FOR PEDESTRIANS. SAFE WALK ROUTES FOR ALL PEDESTRIANS AND TRANSIT USERS WITHIN THE VICINITY OF THE CONSTRUCTION ZONE SHALL BE MAINTAINED THROUGHOUT CONSTRUCTION. THIS INCLUDES SAFE WALK ROUTES/ACCESS TO AND FROM EXISTING BUS STOPS AND TRANSIT VEHICLES. IF THE CURRENT WALKING SURFACE AND ACCESS TO AND FROM TRANSIT VEHICLES AT BUS STOPS CANNOT BE MAINTAINED, THEN A TEMPORARY ROAD-ROCK 4' WALK WAY SHALL BE CREATED. THE SAFE WALK ROUTE SHALL BE SEPARATED FROM THE CONSTRUCTION ACTIVITY BY THE 4' HIGH ORANGE CONSTRUCTION FENCE FOR THE ENTIRE LENGTH OF THE PROJECT OR THE LENGTH OF THE WALK ROUTE. WHICHEVER IS LESS.

27. PEDESTRIAN WALKWAYS, BUS STOPS AND PEDESTRIAN ACCESS TO TRANSIT VEHICLES SHOULD BE MAINTAINED FREE OF ANY OBSTRUCTIONS AND HAZARDS SUCH AS HOLES, DEBRIS, MUD, CONSTRUCTION EQUIPMENT, STORED MATERIALS, ETC. ANY HAZARDS NEAR OR ADJACENT TO WALKWAYS, BUS STOPS AND ACCESS TO TRANSIT VEHICLES SHOULD BE CLEARLY DELINEATED.

28. WHERE SAFE PEDESTRIAN ACCESS/WALKWAYS CANNOT BE PROVIDED, PEDESTRIANS SHOULD BE DIRECTED TO ALTERNATIVE ROUTES BY APPROPRIATE TRAFFIC CONTROL DEVICES. PEDESTRIAN, BICYCLE, AND WHEELCHAIR TRAFFIC SHALL BE GUIDED AND MAINTAINED (SPECIAL ATTENTION IS DIRECTED TO THE EXISTING BUS STOP LOCATION ACCESS) USING APPROVED WARNING LIGHTS, SIGNING, AND CHANNELIZATION DEVICES. SUCH CONTROL DEVICES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MUTCD SECTIONS ON WORK ZONE TRAFFIC CONTROL FOR PEDESTRIANS AND CHAPTER 6D, PEDESTRIAN AND WORKER SAFETY.

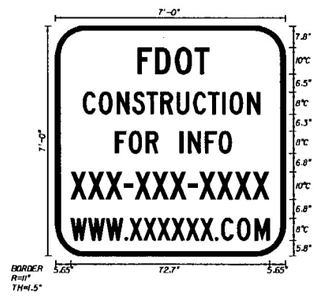
29. THE EXISTING BUS STOPS WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED DURING CONSTRUCTION. ANY ADJUSTMENTS OR RELOCATION OF EXISTING SIGNS SHALL BE COORDINATED WITH THE APPROPRIATE LOCAL TRANSIT AUTHORITY. COST TO BE INCLUDED IN ITEM 102-1 MAINTENANCE OF TRAFFIC. THE CONTRACTOR SHALL CONTACT BEFORE CONSTRUCTION:

INDIAN RIVER TRANSIT
COUNTY PLANNING OFFICE
1840 25TH STREET, VERO BEACH, FL 32960
ATTENTION: PHILL MANSON
(772) 567-8000 EXT. 1455

TO COORDINATE COLLECTION OF THE REMOVED BUS STOP SIGNS, BENCHES AND ACCESS TO THE BUS STOPS DURING CONSTRUCTION.

30. ALL ROADWAY CONDUIT TRENCHING SHALL BE COMPLETED PRIOR TO MILLING AND RESURFACING OPERATIONS.

PROJECT INFORMATION SIGN DETAIL

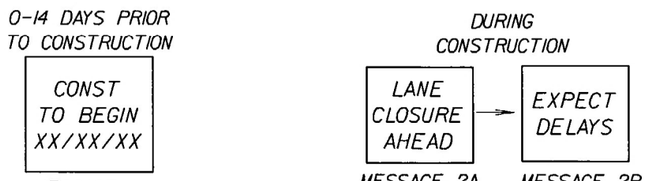


NOTE:

A PUBLIC INFORMATIONAL SIGN IS TO BE PLACED AT THE BEGINNING AND AT THE END OF THE PROJECT. SIGN REQUIRES A SINGLE POST INSTALLATION. THE INFORMATION SIGN PHONE NUMBER AND/OR WEBSITE CAN BE OBTAINED FROM THE TREASURE COAST OPERATIONS OFFICE. COST OF THE SIGNS IS INCLUDED UNDER PAY ITEM 102-1 MAINTENANCE OF TRAFFIC.

PORTABLE CHANGEABLE (VARIABLE) MESSAGE SIGN MESSAGES

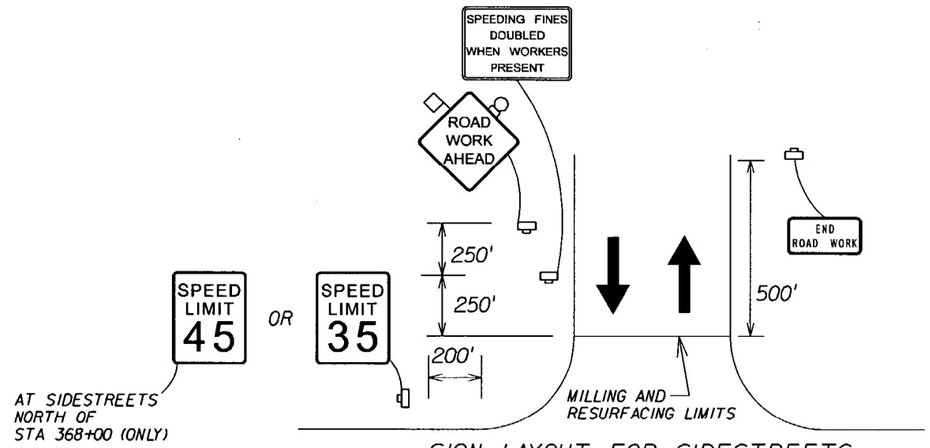
PCMS TO BE PLACED ON SR-5:



PCMS

ADVANCE CONSTRUCTION NOTICE:

THE CONTRACTOR SHALL FURNISH AND MAINTAIN CHANGEABLE VARIABLE MESSAGE SIGN AT LOCATION SHOWN ON THIS PLAN. MESSAGES FOR THE CVMS SHALL BE AS INDICATED ON THIS PLAN OR AS APPROVED BY THE ENGINEER.THE CVMS SHALL BE IN PLACE TWO (2) WEEKS BEFORE START OF ANY WORK ITEMS AFFECTING THE EXISTING VEHICULAR AND PEDESTRIAN TRAFFIC. CVMS INSTALLATION, OPERATION AND REMOVAL BEFORE CONSTRUCTION BEGINS AND DURING CONSTRUCTION SHALL BE PAID UNDER PAY ITEM 102-99, PORTABLE CHANGEABLE-VARIABLE MESSAGE SIGN.



SIGN LAYOUT FOR SIDESTREETS

ALL PHASES

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PBS&J
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3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale, FL 33309
(954) 733-7233
Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TRAFFIC CONTROL PLAN

SHEET NO. 27

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CONSTRUCTION PHASING

PHASE I (A) & (B)

1. SHIFT ALL LANES AS REQUIRED BY WORK ZONES (OUTSIDE LANE CLOSURE CAN BE PERFORMED ON ONE SIDE AT A TIME DURING PERMITTED LANE CLOSURES), IN ACCORDANCE WITH FDOT STANDARD INDEX NO. 600, AND 611-613.
2. INSTALL MAST ARM FOUNDATIONS.
3. CONSTRUCT CURB RETURNS.
4. INSTALL SIDEWALKS AND INSTALL CURB CUT RAMPS. REPLACE CURB & GUTTER AND DRIVEWAY TURNOUTS, AS REQUIRED.
5. INSTALL TRAFFIC SIGNAL MAST ARM AND PEDESTRIAN POLE FOUNDATIONS.

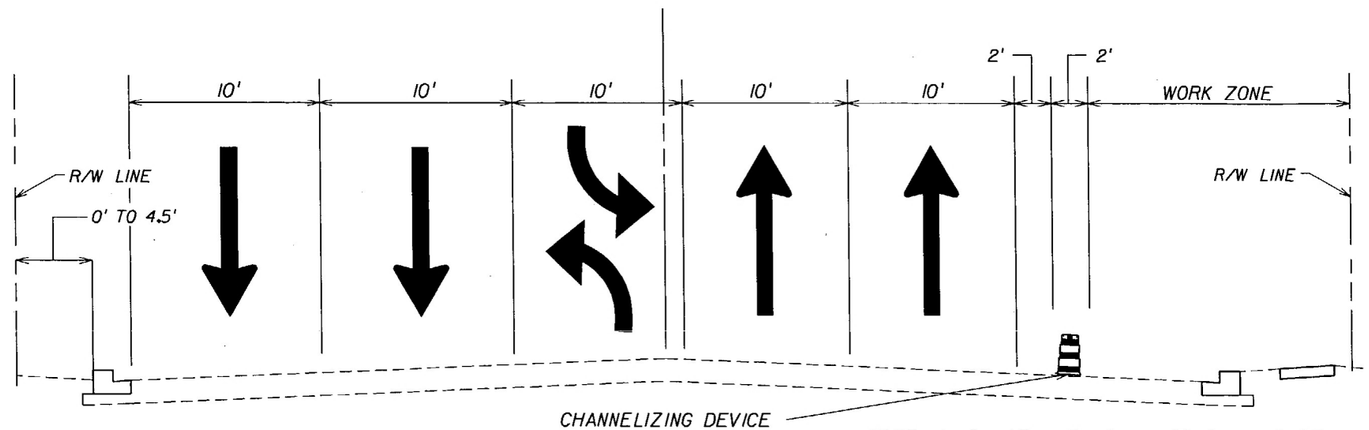
PHASE II

1. CLOSE THE INSIDE LANES TO THROUGH TRAFFIC, DURING PERMITTED LANE CLOSURES, IN ACCORDANCE WITH FDOT STANDARD INDEX NO. 600, 611-613, AND 615-617.
2. INSTALL TEMPORARY SIGNING AND PAVEMENT MARKINGS. ADJUST SIGNAL HEADS AS NEEDED TO MAINTAIN LEFT TURN MOVEMENTS.
3. REMOVE EXISTING MEDIAN CURB & GUTTER, AS REQUIRED.
4. PERFORM INSTALLATION OF NEW MEDIAN CURB/CURB & GUTTER AND PAVEMENT WIDENING EXCLUDING FRICTION COURSE.
5. INSTALL CANTILEVER TRUSS FOUNDATION.
6. PERFORM LANDSCAPING ACTIVITIES.

PHASE III

1. PERFORM MILLING AND RESURFACING CONSTRUCTION ACTIVITIES. MAINTAIN TRAFFIC IN ACCORDANCE WITH INDEX NO. 613, 615, AND 628.
2. PLACE PAVEMENT MARKINGS IN FINAL LOCATION. MAINTAIN TRAFFIC IN ACCORDANCE WITH INDEX NO. 619
3. INSTALL TRAFFIC SIGNAL MAST ARMS, PEDESTRIAN POLES, AND CANTILEVER TRUSS.
4. PERFORM LANDSCAPING ACTIVITIES.

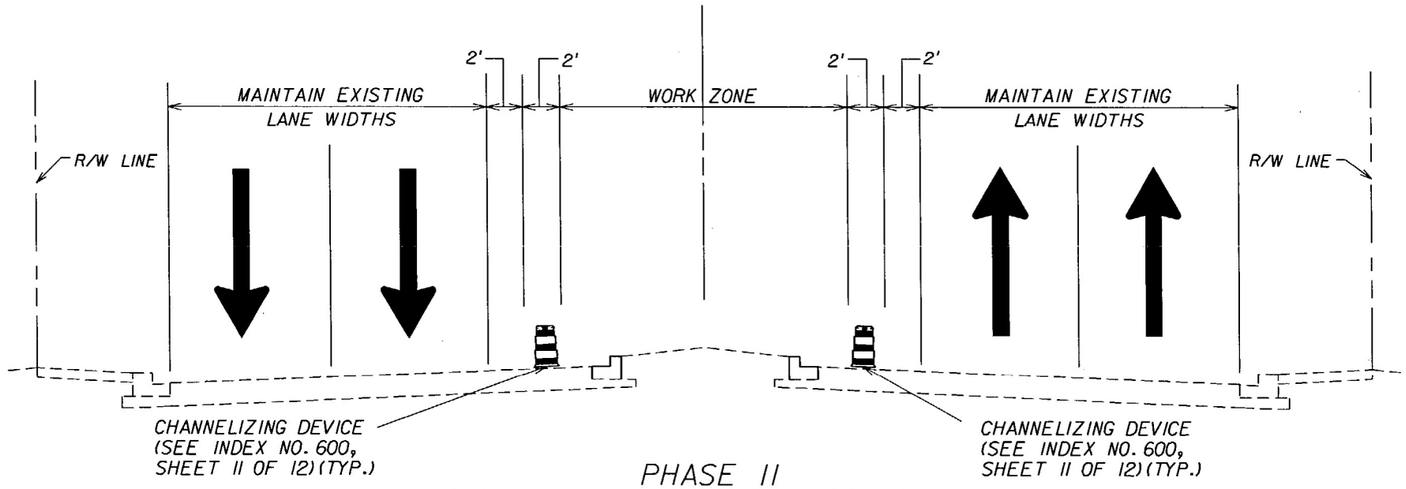
℄ SURVEY - SR 5



PHASE I (A)
STA. 313+75.00 TO STA. 390+22.00

NOTE: 1. PHASE I (B) IS A MIRROR IMAGE OF PHASE I (A)
2. ONLY ONE SIDE OF ROADWAY SHALL BE UNDER CONSTRUCTION AT ANY GIVEN TIME. PHASE III OF THIS TCP PLAN SHALL BE DIVIDED INTO STAGES 1 AND 2, TO ACCOMODATE THIS REQUIREMENT. THE CONTRACTOR MAY CHOOSE WHICH SIDE HE WOULD LIKE TO OPERATE ON FIRST.

℄ SURVEY - SR 5



PHASE II
STA. 313+75.00 TO STA. 320+02.00
STA. 339+59.00 TO STA. 345+34.00

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

TRAFFIC CONTROL PLAN

SHEET NO. 28

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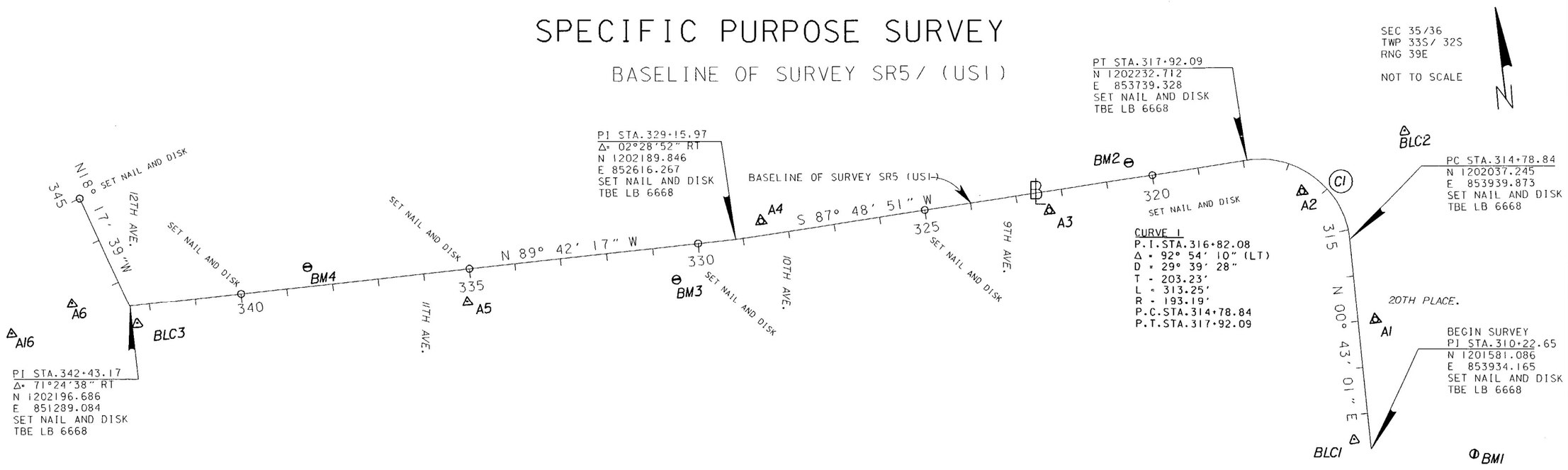
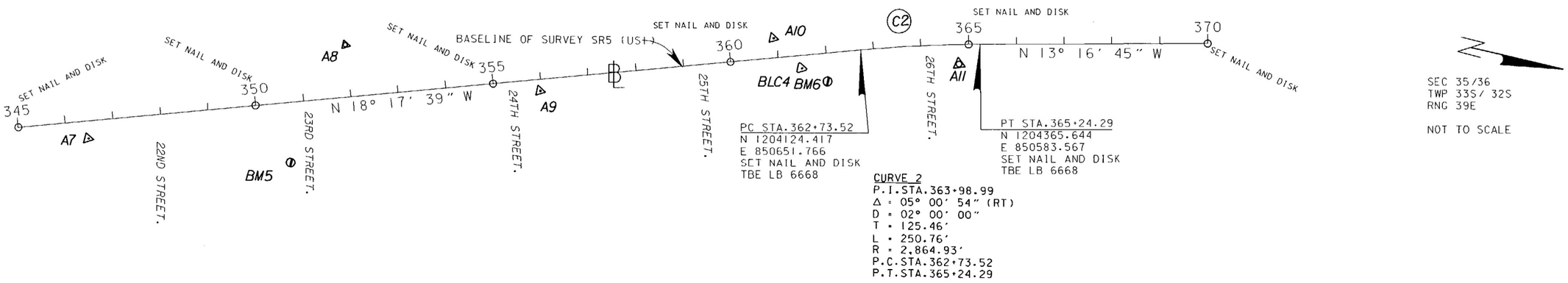
SPECIFIC PURPOSE SURVEY

BASELINE OF SURVEY SR5 / (US1)





SURVEYOR'S NOTE:

PROJECT FM NO: 415291-1-52-01
BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (1983) / 1999 ADJUSTMENT
A BEARING OF N 36° 05' 17" W HAS BEEN ESTABLISHED BETWEEN MONUMENTS
BLC1 STAMPED TO 5-88-06-C1 TO
BLC6 STAMPED 5-88-06-C6
VERTICAL DATUM: NAVD88
PROJECT UNITS: US SURVEY FEET
FIELD BOOK REFERENCES 4319107

LIMITS: SR5 US1 FROM 20TH PLACE TO 33RD STREET

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 61G 17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS CTL-1 THROUGH CTL-3 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON 08-08-06.

SURVEYOR: MARK R. SOWERS PLS NUMBER 5266

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

MARK R. SOWERS, PLS
SURVEYOR LICENSE NUMBER 5266
TBE GROUP, INC.
3427 NW 55TH STREET
FORT LAUDERDALE, FL 33309
CERTIFICATE OF AUTHORIZATION G75525

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

PROJECT NETWORK CONTROL

SHEET NO. CTL-1

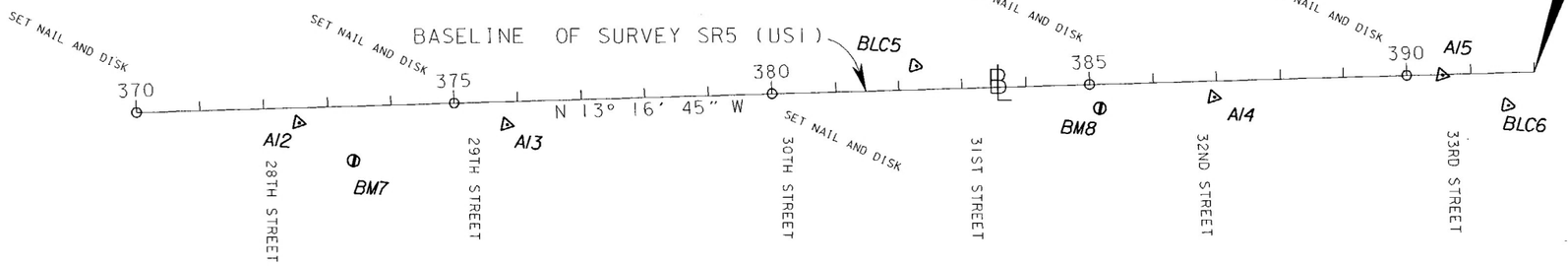
NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G17-7.0025, F.A.C.

SPECIFIC PURPOSE SURVEY

BASELINE OF SURVEY SR5 (US1)

SEC 35/36
TWP 33S/ 32S
RNG 39E

NOT TO SCALE



END OF SURVEY
POT STA.392+00.00
N 1206969.815
E 849968.967
SET TBE NAIL AND DISK
STAMPED LB 6668

SURVEYOR'S NOTE:

PROJECT FM NO: 415291-1-52-01
BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (1983) OF 1999, ADJUSTMENT
A BEARING OF N 36° 05' 17" W HAS BEEN ESTABLISHED BETWEEN MONUMENTS
BLC1 STAMPED 5-88-06-C1 TO
BLC6 STAMPED 5-88-06-C6
VERTICAL DATUM: NAVD88
PROJECT UNITS: US SURVEY FEET
FIELD BOOK REFERENCES 4319107

LIMITS: SR5 US1 FROM 20TH PLACE TO 33RD STREET

SURVEYOR'S CERTIFICATION
I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 61G 17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS CTL-1 THROUGH CTL-3 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON 08-08-06.

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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

PROJECT NETWORK CONTROL

SHEET NO. CTL-2

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SPECIFIC PURPOSE SURVEY

POINT NAME	(X) EASTING	(Y) NORTHING	SCALE FACTOR	LATITUDE	LONGITUDE	BASELINE STATION	OFFSET	(Z) ELEVATION	DESCRIPTION
BLC1	853891.822	1201612.896	0.99998599	27°38'17.0465	80°23'21.4603	310+53.93	-42.74	7.52	SET FDOT BRASS DISK STAMPED "5-88-06-C1"
BLC2	853971.155	1202273.723	0.99998603	27°38'23.5862	80°23'20.5419	316+37.10	131.10	5.86	SET FDOT BRASS DISK STAMPED "5-88-06-C2"
BLC3	851306.007	1202159.136	0.99998483	27°38'22.5812	80°23'50.1815	342+26.06	-37.46	13.20	SET FDOT BRASS DISK STAMPED "5-88-06-C3"
BLC4	850716.359	1204019.099	0.99998456	27°38'41.0272	80°23'56.6370	361+53.25	28.27	12.52	SET FDOT BRASS DISK STAMPED "5-88-06-C4"
BLC5	850155.118	1206009.486	0.99998431	27°39'00.7631	80°24'02.7703	382+22.59	-39.41	11.33	SET FDOT BRASS DISK STAMPED "5-88-06-C5"
BLC6	850019.815	1206925.044	0.99998425	27°39'09.8356	80°24'04.2254	391+44.75	39.21	13.50	SET FDOT BRASS DISK STAMPED "5-88-06-C6"
A1	853983.3386	1201860.163	0.99998603	27°38'19.4905	80°23'20.4292	313+02.32	45.68	6.65	SET 5/8" FDOT IRON ROD AND CAP
A2	853844.1997	1202152.013	0.99998597	27°38'22.3872	80°23'21.9602	316+46.64	-44.43	7.60	SET 5/8" FDOT IRON ROD AND CAP
A3	853314.245	1202174.869	0.99998573	27°38'22.6395	80°23'27.8514	322+19.08	-41.59	9.09	SET 5/8" FDOT IRON ROD AND CAP
A4	852667.065	1202227.726	0.99998544	27°38'23.1944	80°23'35.0444	328+63.77	35.92	8.89	SET 5/8" FDOT IRON ROD AND CAP
A5	852010.225	1202160.783	0.99998514	27°38'22.5634	80°23'42.3513	335+21.86	-32.19	10.39	SET NAIL AND DISK STAMPED LB 6668
A6	851161.792	1202222.77	0.99998476	27°38'23.2183	80°23'51.7815	343+07.90	-112.67	14.41	SET NAIL AND DISK STAMPED LB 6668
A7	851194.305	1202588.169	0.99998478	27°38'26.8349	80°23'51.4002	346+44.62	32.90	12.23	SET NAIL AND DISK STAMPED LB 6668
A8	850880.699	1203068.381	0.99998464	27°38'31.6052	80°23'54.8612	351+99.00	-114.12	14.29	SET 5/8" IRON ROD AND CAP
A9	850886.962	1203494.382	0.99998464	27°38'35.8232	80°23'54.7685	356+01.51	25.54	12.65	SET NAIL AND DISK STAMPED LB 6668
A10	850664.904	1203953.755	0.99998454	27°38'40.3826	80°23'57.2127	361+07.36	-41.10	14.47	SET NAIL AND DISK STAMPED LB 6668
A11	850628.435	1204338.248	0.99998452	27°38'44.1916	80°23'57.5974	364+86.83	37.13	13.23	SET 5/8" FDOT IRON ROD AND CAP
A12	850439.279	1205100.74	0.99998444	27°38'51.7510	80°23'59.6595	372+72.87	28.42	11.32	SET NAIL AND DISK STAMPED LB 6668
A13	850364.621	1205414.958	0.99998441	27°38'54.8660	80°24'00.4727	375+95.84	27.93	10.65	SET NAIL AND DISK STAMPED LB 6668
A14	850105.534	1206502.268	0.99998429	27°39'05.6451	80°24'03.2950	387+13.59	25.52	13.76	SET NAIL AND DISK STAMPED LB 6668
A15	849998.827	1206833.55	0.99998424	27°39'08.9306	80°24'04.4638	390+60.52	-2.24	13.85	SET NAIL AND DISK STAMPED LB 6668
A16	850800.925	1202200.961	0.9999846	27°38'23.0198	80°23'55.7951	344+00.46	-462.15	14.02	SET NAIL AND DISK STAMPED LB 6668
BM1	N/A	N/A	N/A	27°38'16.3917	80°23'19.4665	N/A	N/A	7.25	SET FDOT BRASS DISK STAMPED "5-88-06-B1"
BM2	N/A	N/A	N/A	27°38'23.6183	80°23'25.9739	320+47.0	51.6	8.11	SET FDOT BRASS DISK STAMPED "5-88-06-B2"
BM3	N/A	N/A	N/A	27°38'22.1182	80°23'37.1962	330+57.8	-72.5	9.86	SET FDOT BRASS DISK STAMPED "5-88-06-B3"
BM4	N/A	N/A	N/A	27°38'23.3693	80°23'45.9457	338+45.9	46.0	11.75	SET FDOT BRASS DISK STAMPED "5-88-06-B4"
BM5	N/A	N/A	N/A	27°38'30.9958	80°23'51.8069	350+55.5	128.1	12.67	SET FDOT BRASS DISK STAMPED "5-88-06-B5"
BM6	N/A	N/A	N/A	27°38'41.5483	80°23'56.4615	361+98.4	59.6	13.30	SET FDOT BRASS DISK STAMPED "5-88-06-B6"
BM7	N/A	N/A	N/A	27°38'52.5383	80°23'59.2196	373+41.4	84.9	13.82	SET FDOT BRASS DISK STAMPED "5-88-06-B7"
BM8	N/A	N/A	N/A	27°39'03.8758	80°24'02.6254	385+25.9	44.0	12.93	SET FDOT BRASS DISK STAMPED "5-88-06-B8"

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REVISIONS

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3427 NW 55TH STREET
FORT LAUDERDALE FL, 33309
CERTIFICATE OF AUTHORIZATION G75525

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

PROJECT NETWORK CONTROL

SHEET NO. CTL-3

VERIFIED UTILITY LOCATIONS

VVH	UTILITY, SIZE AND DESCRIPTION	STATION	OFFSET (FT)	TOP OF UTILITY ELEVATION	UTILITY DIRECTION	GROUND ELEVATION (FT)	DEPTH (FT)	NOTE
CSH1	2" PVC UNKNOWN UTILITY	314+68.63	24.28 LT	4.60	N/S	7.11	2.51	
CSH7	1/2" PVC BURIED ELECTRIC	328+73.33	49.30 RT	8.16	NW/SE	8.97	0.81	
CSH6	EXPLORATORY DEPTH; NO UTILITY FOUND	328+78.47	52.69 RT	N/A	N/A	8.77	8.24	
CSH13	6" PVC WATER LINE	328+80.71	51.29 RT	5.63	N/S	8.85	3.22	
CSH5	4" CI UNKNOWN UTILITY	328+85.11	52.19 RT	6.53	N/S	8.79	2.26	
CSH8	6" PVC WATER LINE	328+86.42	53.60 LT	5.85	N/S	9.16	3.31	
CSH2	EXPLORATORY DEPTH; NO UTILITY FOUND	329+41.37	51.41 RT	N/A	N/A	8.60	8.1	
CSH4	2" CI UNKNOWN UTILITY	329+43.12	57.16 RT	8.05	NW/SE	8.69	0.64	
CSH3	1/2" CI UNKNOWN UTILITY	329+44.87	55.72 RT	8.00	SW/NE	8.79	0.79	
CSH9	EXPLORATORY DEPTH; NO UTILITY FOUND	350+98.30	50.67 LT	N/A	N/A	15.36	8.27	
CSH16	2 X 2" PVC	351+63.85	24.20 RT	10.81	E/W	12.22	1.41	
CSH17	18" RCP STORM SEWER	351+66.72	24.48 RT	10.27	NW/SE	12.01	1.74	
CSH15	8" CI WATER LINE	351+70.37	34.67 RT	10.77	N/S	12.30	1.53	
CSH14	8" DIP WATER LINE	351+70.74	33.34 RT	9.02	N/S	12.21	3.19	
CSH12	2" PVC STREET LIGHT	379+92.38	35.99 LT	9.04	N/S	11.90	2.86	
CSH11	2" PVC STREET LIGHT	380+52.80	34.40 LT	10.06	N/S	12.10	2.04	
CSH10	2" PVC STREET LIGHT	381+08.39	34.97 LT	9.38	N/S	11.96	2.58	

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G15-23.003, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

PBS&J
Certificate of Authorization No. 24
Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J
Michael Priory, P.E.
P.E. No.: 60614
3230 W. Commercial Blvd.
Suite 100
Fort Lauderdale, FL 33309
(954) 733-7233

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

VERIFIED UTILITY LOCATIONS

SHEET NO. UTV-1

Removal of existing concrete pavement, pay item 110-4

Plan Ref. #	Stations	L	W		AREA SF		AREA SY		RUNNING TOTAL
11	316+55 to 316+70	15.00	4.80		72.0000		8.00		8.00
12	318+75 to 318+79	4.00	1.98		7.9200		0.88		8.88
13	318+96 to 319+00	4.00	1.98		7.9200		0.88		9.76
14	318+96 to 319+01	5.00	4.41		22.0500		2.45		12.21
15	NW corner 11th Av	8.50	7.50		63.7500		7.10		19.31
16	NE corner 22nd st	3.50	6.00		21.0000		2.30		21.61
31	SE corner 23rd st	3.00	5.00		15.0000		1.66		23.27
32	NE corner 23rd st	2.00	16.00		32.0000		3.55		26.82
33	NE corner 23rd st	7.00	5.00		35.0000		3.90		30.72
34	NE corner 12 Av	9.00	7.50		67.5000		7.50		38.22
35	NE corner 26 st	5.00	20.00		100.0000		11.10		49.32
36	NE corner 26 st	5.00	5.00		25.0000		2.70		52.02
37	SE corner 28 st	5.00	10.00		50.0000		5.50		57.52
38	342+42 to 342+53	5.00	11.00		55.0000		6.10		63.62
39	320+57 to 320+63	6.00	6.24		37.4400		4.16		67.78
40	319+81 to 319+86	5.00	6.39		31.9500		3.55		71.33
46	318+60 to 318+70	6.51	10.00		65.1000		7.23		78.56
47	318+46 to 318+36	6.51	10.00		65.1000		7.23		85.79
48	390+85 to 390+95	10.00	3.96		39.6000		4.40		90.19
									90.19

PAY ITEM TOTAL QUANITY 90.19

NOTICE: THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE SIGNED AND SEALED UNDER RULE 61G10-11.011, F.A.C.

REVISIONS					
DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

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Post Buckley Schuh & Jernigan, Inc., d/b/a/ PBS&J
Harry L. Beton, L.A.
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	415291-1-52-01

SIDEWALK EXTRA WORK
ASBUILTS

SHEET NO. UTV-2

78 | 1

THIS CONTRACT PLAN SET INCLUDES
SUMMARY OF PAY ITEMS (3 SHEETS)
ROADWAY AND PAVEMENT MARKING PLANS
STRUCTURE PLANS

FOR INDEX OF STRUCTURE PLANS
SEE STRUCTURE PLANS

INDEX OF ROADWAY & PAVEMENT MARKING PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
3	DETAIL SHEET - WARNING DEVICES
4-5	PLAN AND PROFILES
6	CHANNEL CROSS SECTIONS
7	PAVEMENT MARKINGS
8	CONC. APPROACH SLAB - INDEX NO. 12522

ROAD DESIGN STANDARDS (BOOKLET DATED JANUARY 1978)

BGR-01-1	GUARDRAIL CONSTRUCTION (5 SHEETS)
GEC-04	EROSION CONTROL DEVICES, SILT BARRIERS
GSA-01	STANDARD ABBREVIATIONS
GSS-01	STANDARD SYMBOLS FOR KEY MAPS AND PLAN SHEETS (3 SHEETS)
PCG-01	CURB, CURB AND GUTTER

TRAFFIC OPERATIONS STANDARDS (BOOKLET DATED JANUARY 1978)

17346-A	SPECIAL MARKING AREAS (6 SHEETS)
17352	TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKINGS

NOTE: UTILITY ADJUSTMENTS ARE SHOWN ON ROADWAY PLAN AND PROFILE SHEETS.

eld Books—
ber

Description
Misc. pay item rdwy. book
Align & Ref.
BM's, X-sec, Canal Exc. X-sec
Pile Data

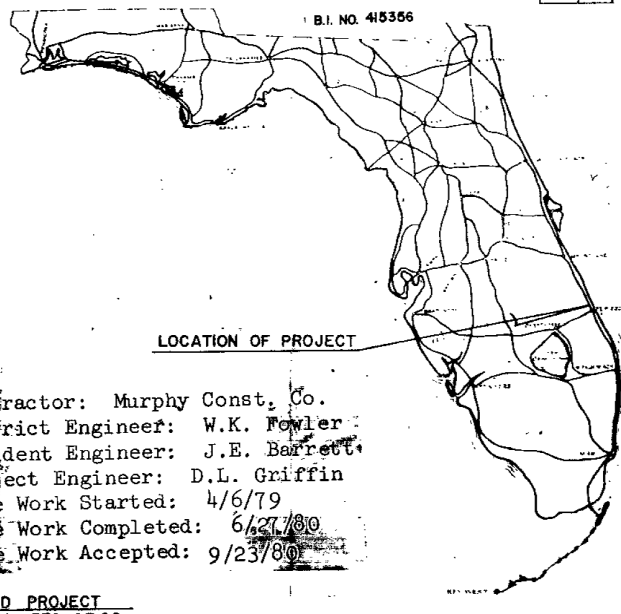
IF ANY
DIRECTLY BEHIND
KEY SHEET

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
AS BUILT PLANS
OF

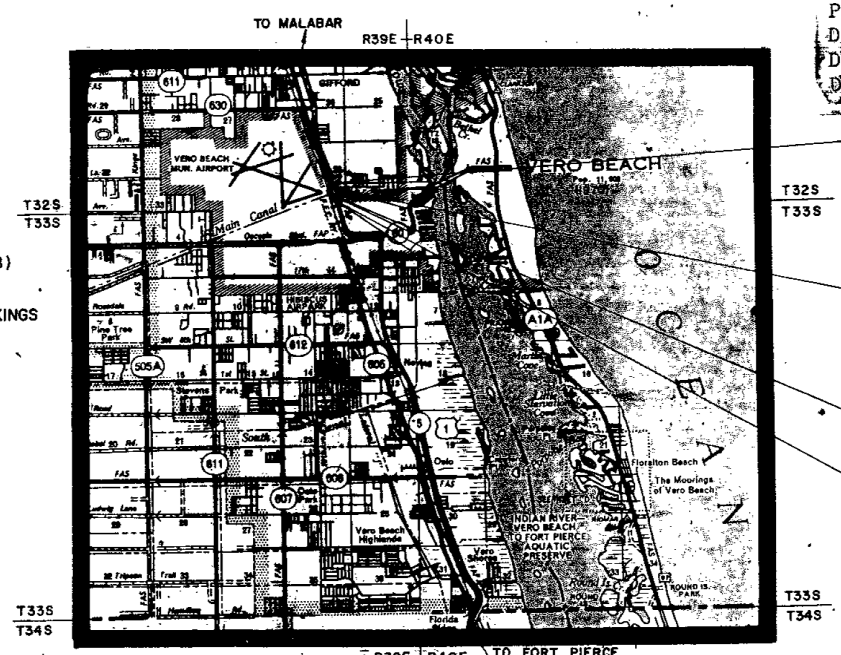
STATE HIGHWAY

STATE PROJECT NO. 88010-3510
INDIAN RIVER COUNTY

STATE ROAD NO. 5 (US 1)



Contractor: Murphy Const. Co.
District Engineer: W.K. Fowler
Resident Engineer: J.E. Barrett
Project Engineer: D.L. Griffin
Date Work Started: 4/6/79
Date Work Completed: 6/27/80
Date Work Accepted: 9/23/80



END PROJECT
STA. 379+97.00

END BRIDGE 880003
STA 379 + 27.00

BEGIN BRIDGE 880003
STA 378 + 13.00

BEGIN PROJECT
STA. 377 + 13.00

1-MILE

LENGTH OF PROJECT		
	LINEAR FEET	MILES
ROADWAY	170.00	0.032
BRIDGES	114.00	0.021
NET LENGTH OF PROJECT	284.00	0.053
EXCEPTIONS	0.00	0.000
GROSS LENGTH OF PROJECT	284.00	0.053

PROJECT MANAGER: J.L. LOWRY

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA

GOVERNING SPECIFICATIONS: STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1977 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL PROVISIONS FOR THIS PROJECT.

SUBMITTED BY

DIRECTOR OF ROAD OPERATIONS

APPROVED DATE

DIVISION ENGINEER
FEDERAL HIGHWAY ADMINISTRATION

88010-3510

SUMMARY OF ROADWAY PAY ITEMS

ALT	ITEM NUMBER	ITEM		UNIT	88010-3510 FA NON PART				QUANTITY TOTAL
	101- 1-	MOBILIZATION		LS	1.000	✓			1.00
	102- 1-	MAINT OF TRAFFIC		LS	1.000	✓			1.00
	104- 11-	FLOATING SILT BARRIER		LF	110.000	✓			110.00
	110- 1-	CLEARING & GRUBBING		LS	1.000	✓			1.00
	120- 1-	REGULAR EXCAV		CY	465.000	✓			465.00
	120- 5-	CHANNEL EXCAVATION		CY	847.000	✓			847.00
	200- 1- 2	LIMEROCK BASE	(8") (D-CSE)	SY	1112.000	✓			1112.00
	300- 1- 1	BIT MATL	(PRIME COAT)	GA	167.000	✓			167.00
	300- 1- 3	BIT MATL	(TACK COAT)	GA	270.000	✓			270.00
	300- 1- 13	BIT MATL (PLANT MIX)	(ASPH CEM 20)	GA	4647.000	✓			4647.00
	331- 2-	TYPE S-I ASPH CONC		TN	240.000	✓			240.00
	333- 2- 9	TYPE 111 ASPH CONC	(1000 LB STAB)	TN	55.000	✓			55.00
	339- 1-	MISC ASPHALT PAVEMENT		TN	7.000	✓			7.00
	360- 1-	CONC APPRH SLABS		EA	2.000	✓			2.00
	425- 5-	ADJ MANHOLES		EA	1.000	✓			1.00
	520- 1- 10	CONC CURB & GUTTER	(TYPE F)	LF	130.000	✓			130.00
	522- 1-	CONC SIDEWALK,	4" THICK	SY	82.000	✓			82.00
	530- 1- 1	RIPRAP (SAND-CEMENT)	(ROADWAY)	CY	7.000	✓			7.00
	536- 1- 1	GUARDRAIL	(RDWY)	LF	237.500	✓			237.50
	536- 6-	END ANCHORAGE ASSEM TYPE II		EA	4.000	✓			4.00
	536- 7-	SPECIAL GUARDRAIL POST		EA	8.000	✓			8.00
	536- 73-	REM OF EXIST GUARDRAIL		LF	125.000	✓			125.00
	570- 2-	SEED & MULCH		SY	62.000				62.00

88010-3510

SUMMARY OF SIGNING PAY ITEMS

A T	ITEM NUMBER	ITEM	UNIT	88010-3510	QUANT
				FA NON PART	TOTAL
	706- 2-	REFLECTIVE PAVEMENT MARKER	EA	77.000	77.
	710- 4- 41	SOLID TRAFFIC STRIPE (4")	LF	505.000	505.
	710- 4-181	SOLID TRAFFIC STRIPE ()8")	LF	240.000	240.
	711- 2-	SKIP TRAFFIC STRIPE, THERMOPLASTIC (4")	LF	1186.000	1186.
	711- 4-	DIRECTIONAL ARROWS,THERMOPLASTIC	EA	5.000	5.
	711- 6- 41	SOLID TRAFFIC STRIPE, THERMOPLASTIC (4")	LF	1977.000	1977.

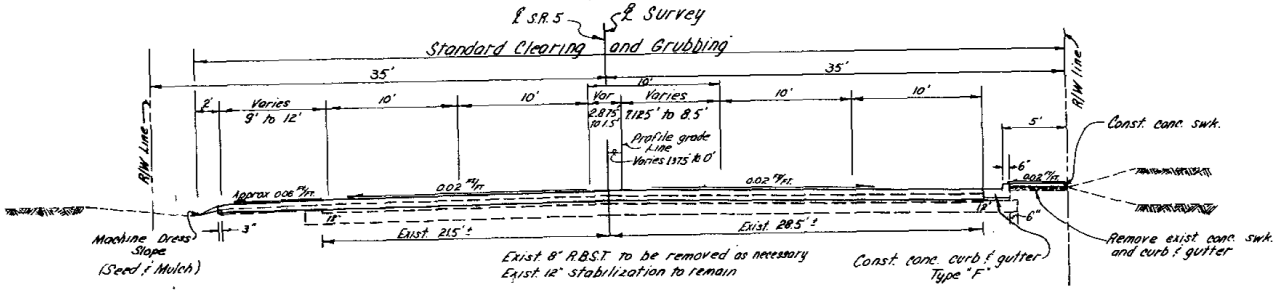
88010-3510

SUMMARY OF BRIDGE PAY ITEMS

ALT	ITEM NUMBER	ITEM		UN IT	88010-3510 BR # 880003 FA NON PART	QUANTITY TOTAL
	110- 3-	REM OF EXIST STRUCTURES		LS	1.000	1.0
	400- 2- 4	CLASS II CONC	(SUPERSTRUCTURE)	CY	178.000	178.0
	400- 2- 5	CLASS II CONC	(SUBSTRUCTURE)	CY	111.000	111.0
	400- 5- 4	CONC HANDRAIL	(BARRIER)	LF	114.000	114.0
	400- 5- 5	CONC HANDRAIL	(SIDEWALK BARRIER TYPE)	LF	114.000	114.0
	415- 1- 4	REINF STEEL	(SUPERSTRUCT)	LB	45158.000	45158.0
	415- 1- 5	REINF STEEL	(SUBSTRUCT)	LB	17225.000	17225.0
	450- 71-	RESETTING PREST SLAB UNITS		LF	1100.000	1100.0
	455- 3- 2	PREST CONC PILING FURN	(18" SQ)	LF	1624.000	1624.0
	455- 4- 2	PREST CONC PILING DRIV	(18" SQ)	LF	1624.000	1624.0
	455- 9- 12	UNL TEST PILES	(PREST CONC) (18" SQ)	LF	140.000	140.0
	455- 10- 90	TEST LOADS	(90 TN)	EA	1.000	1.0
	455- 10-110	TEST LOADS	(110 TN)	EA	1.000	1.0
	455- 15-	PREFORMED PILE HOLES		EA	22.000	22.0
	455- 17- 2	PILE SPLICES	(18")	EA	1.000	1.0
	460- 91- 2	EXPANSION JOINT SEAL	(COMPRESSION ELAST)	LF	137.000	137.0
	530- 1- 2	RIPRAP (SAND-CEMENT)	(BRIDGE)	CY	100.000	100.0

TYPICAL SECTIONS AND SUMMARY OF QUANTITIES

STATE PROJ.
88010-3510



TYPICAL SECTION

Sta. 377+13 to Sta. 377+93
Sta. 379+47 to Sta. 379+97

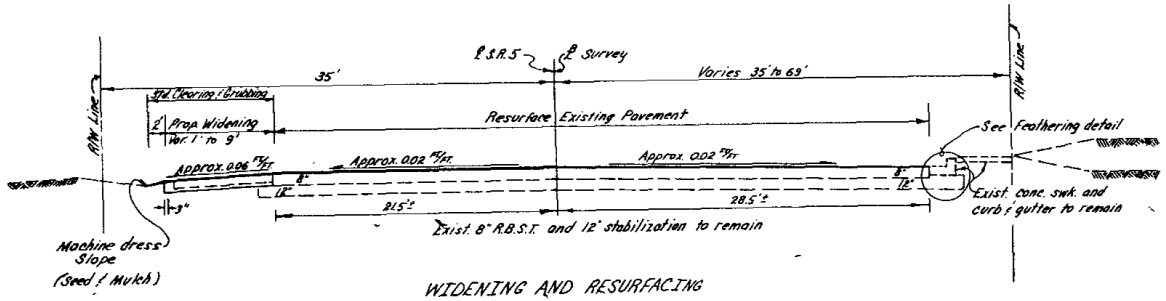
Construct limerock base course (8" thick, double course) primed, with type S-I aspholtic concrete surface course (200 #/SY, double course).

For additional information see Index Nos. BGR-01 & PGG-01

DESIGN SPEED 45 M.P.H.

TRAFFIC DATA

1979 ADT	=	15,000
1987 ADT	=	16,463
1999 ADT	=	18,801
K	=	10%
D	=	55%
24 HR T	=	8%
Design H.T.		4%



WIDENING AND RESURFACING

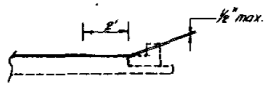
Sta. 375+00 to Sta. 377+13
Sta. 379+97 to Sta. 381+67

LEVELING
Level existing pavement with type III asphaltic concrete (1000 LB STAB)(50 #/Sy Avg.)

RESURFACE
Type S-I asphaltic concrete surface course (100 #/S.Y.)

WIDENING
Limerock base course (8" thick, double course) primed, with type S-I asphaltic concrete surface course (200 #/SY, double course)

DESIGN SPEED 45 M.P.H.



FEATHERING DETAIL

NOTES:
1) None of the existing limerock base that is removed is to be used in the construction of new limerock base.
2) For information on Maintenance of Traffic see Bridge Plans.
3) New construction and widening shall be constructed with Type S-I asphaltic concrete surface course (200 #/SY - Double Course), 1st layer to be (100 #/S.Y.) and the 2nd layer to be constructed along with roadway resurface (100 #/S.Y.)

SUMMARY OF GUARDRAIL

STATION TO STATION		SIDE	LENGTH	END ANCHORAGE	REMARKS
Sta. 377+46.5	Sta. 378+09	Lt.	62.5	1	Guardrail - Bridge
Sta. 377+46.5	Sta. 378+09	Rt.	62.5	1	Guardrail - Bridge
Sta. 379+31	Sta. 379+93.5	Lt.	62.5	1	Guardrail - Bridge
Sta. 379+31	Sta. 379+81	Rt.	50	1	Guardrail - Bridge
Sta. 377+55.5	Sta. 378+18	Lt.	62.5		Remove Guardrail
Sta. 379+23	Sta. 379+85.5	Lt.	62.5		Remove Guardrail
GRAND TOTALS			237.5 L.F.	4	Const. Guardrail
			125 L.F.		Remove Guardrail

Stationing shown above is approximate. Exact stations to be determined by the Engineer during construction.
Connection of Guardrail to proposed bridge shall be in accordance with Index No. BGR-01
Existing guardrail that is removed shall be delivered by the Contractor to: 5025 - 41st Street (S. Gifford Rd.) Vero Beach, Florida.

SUMMARY OF EARTHWORK

CHANNEL EXCAVATION	847 C.Y.
REGULAR EXCAVATION	465 C.Y.

PAY ITEM FOOTNOTES:

ITEM NO. 104-11 Included for prevention, control, and abatement of erosion and water pollution and are to be used at locations as directed by the Engineer. Limits shown on plans are approximate only.

ITEM NO. 110-1 Includes the removal of approx. 175 L.F. of conc. curb and gutter and approx. 90 S.Y. of conc swk.

ITEM NO. 120-1 The pay quantity for this item shall be the plan quantity.

ITEM NO. 331-2 Includes estimated 6 tons for sidestreets.

ITEM NO. 339-1 Included for pavement under guardrail.

ITEM NO. 425-5 Included for the adjustment of the storm sewer manhole at Sta. 380+02

ITEM NO. 530-1-1 Included for the spillway as shown on plans. This is an estimated quantity and is to be increased or decreased as directed by the Engineer.

ITEM NO. 536-7 Included for post placement on approach slabs.

ITEM NO. 570-2 Included in the cost for this item will be approximately 1.3 lbs. grass seed, .05 tons mulch material, .006 tons fertilizer, and 0.13 MG water. Also includes any final dressing that may be needed.

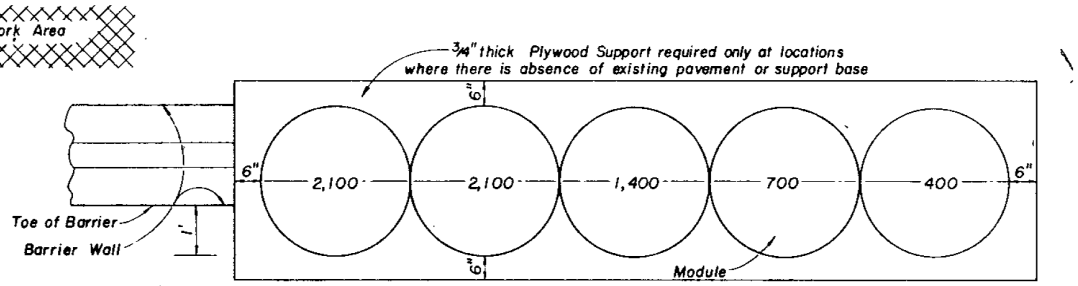
ITEM NO. 706-2 Includes 47 ea. red and colorless and 30 ea. amber & amber (reflective pavement markers).

ITEM NO. 711-6-41 Includes 317 L.F. white and 1080 L.F. yellow.

TRAFFIC CONTROL AND SAFE PRACTICES
FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS
FLORIDA DEPARTMENT OF TRANSPORTATION

WARNING DEVIC

PROJ. NO.	SHE
88010-3510	



NOTES:
1) Inertial Attenuator to be installed where taper offset from lane line is not obtainable.
2) Number shown inside module indicates the weight in pounds of sand. All modules are approximately 36" inches in height and in diameter.
3) Inertial Attenuator to be installed in accordance with manufacturers specifications and recommendations
4) Module color and marking shall be in accordance with Index No. 17353.
5) Cost of inertial attenuator to be included in the unit cost for Maintenance of Traffic.

Approaching Traffic

TEMPORARY INERTIAL ATTENUATOR

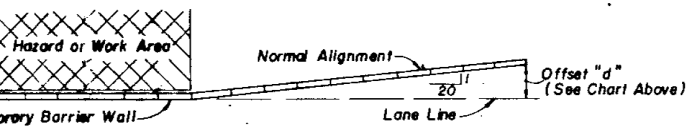
SUMMARY OF MODULES	
WEIGHT	QUANTITY
400 lbs.	1
700 lbs.	1
1,400 lbs.	1
2,100 lbs.	2

Design Vehicle Wt. 4,500 lbs.
Design Speed 45 m.p.h.
Max. Deceleration 5.96 g's
Avg. Deceleration 4.15 g's

Design Vehicle Wt. 2,000 lbs.
Design Speed 45 m.p.h.
Max. Deceleration 7.06 g's
Avg. Deceleration 4.47 g's

OFFSET

"d"	Conditions
6'	Municipal Construction - Low Speed - ADT > 1600
6'	Undivided Highway - Low Speed - ADT < 1600
6'	Undivided Highway - High Speed - ADT < 1600
10'	Undivided Highway - High Speed - ADT > 1600
10'	Divided Highway of Four or More Lanes
10'	Interstate and Other Limited Access Facilities

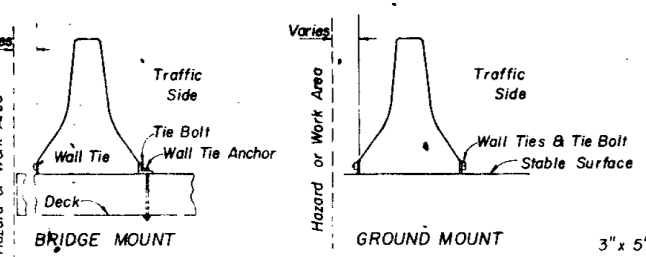


Approaching Traffic

PLAN

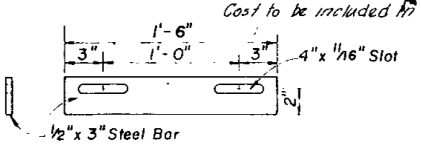
WALL ALIGNMENT

OTES.
1) For optional wall alignment see detail of Temporary Inertial Attenuator.
2) Temporary barrier to be placed as shown in the plans or as directed by the Engineer.
3) For additional information refer to charts I, II and III in the manual of Traffic Control and Safe Practices.
4) Sections of temporary barrier wall shall be set end-to-end as close together as feasible to form a continuous barrier.
5) Temporary barrier wall shall be delineated by steady burn type "C" lights on 50' centers.
6) For additional information on barrier wall placement see construction sequence on Bridge Plans.

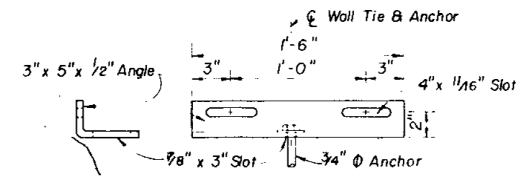


WALL CONNECTION & ANCHORAGE

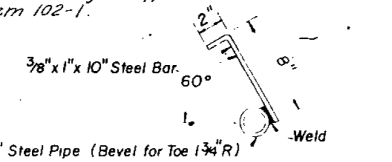
nchor shall have a pullout and shear capacity of 14,000 lbs. After onstruction is complete anchor shall be removed to 1" min. below slab urface and hole filled with grout.



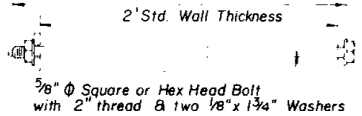
WALL TIE



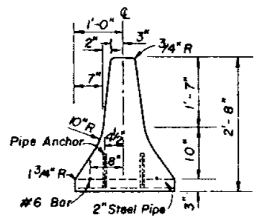
WALL TIE & ANCHOR

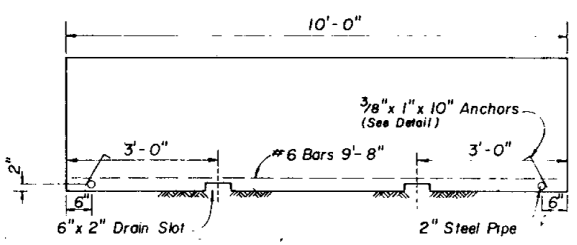


WALL LIFT PIPE & ANCHOR



WALL TIE BOLT

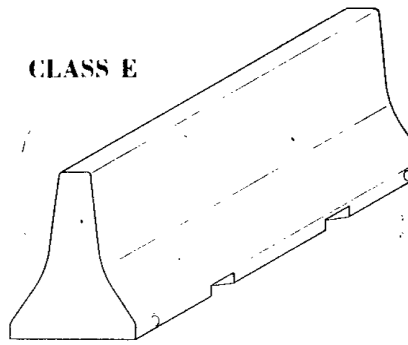




PRECAST WALL UNIT

The contractor shall pick up wall units (furnished by D.O.T.) at the D.O.T. Fort Pierce maintenance yard, 3601 Oleander Ave., Fort Pierce. The contractor shall also return the wall units to the Fort Pierce maintenance yard. (Approx. 45 units will be available.) Cost to be included in Pay Item 102-1.

CLASS E

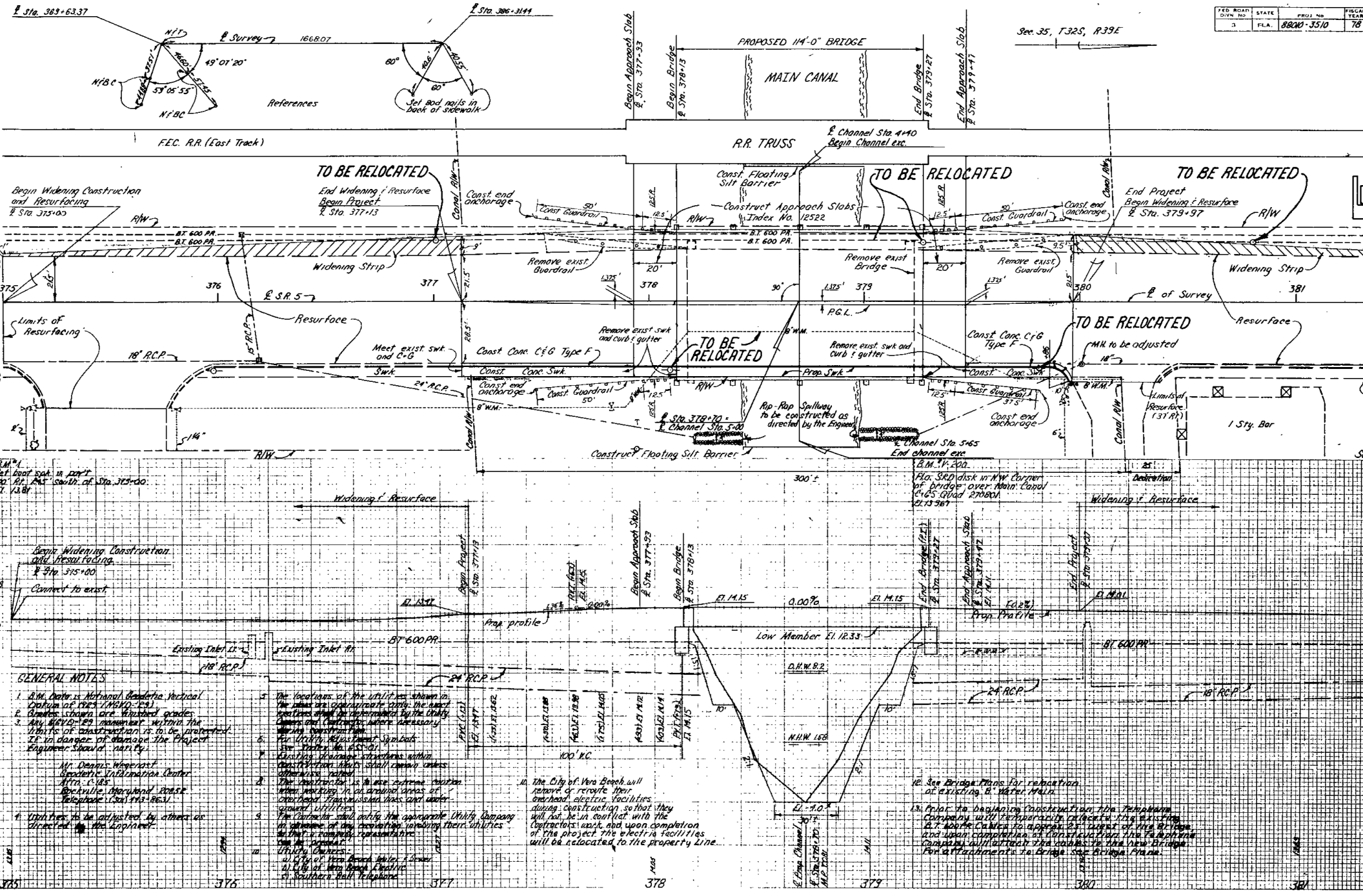


TEMPORARY BARRIER WALL

Wall ties, wall tie, anchors and wall tie bolts, are to be furnished by the Contractor and shall become the property of D.O.T. at the completion of the project, and shall be stockpiled as directed by the Engineer.

Approved

Revised Date 10-1-77



GENERAL NOTES

1. B.M. Datum is National Geodetic Vertical Datum of 1929 (NGVD-29).
2. Symbols shown are standard grades.
3. Any disturbance to the Limits of Construction is to be protected. If in danger of damage the Project Engineer should notify:

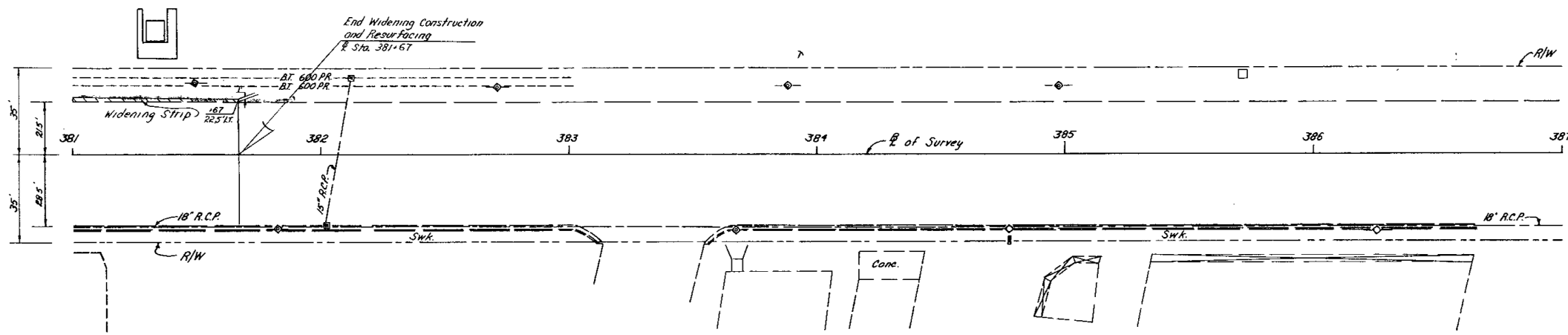
   Mr. Dennis Wagerose
   Geodetic Information Center
   Attn: C185
   Rockville, Maryland 20852
   Telephone (301) 443-8631

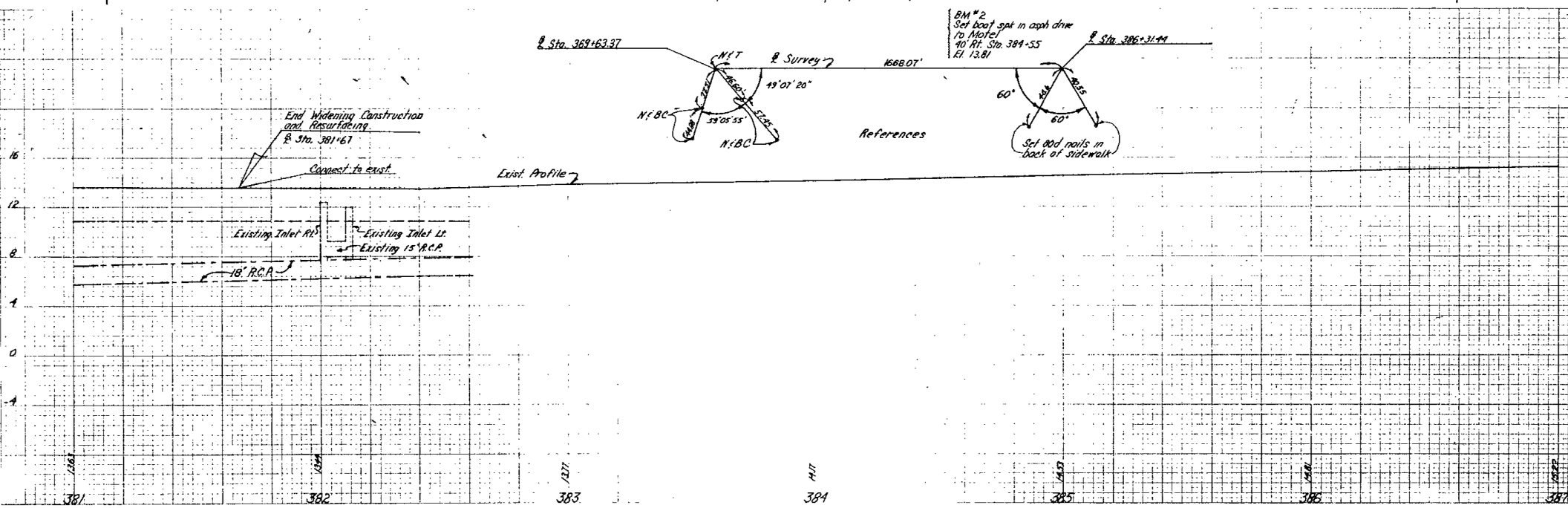
4. Manhole to be adjusted by others as directed by the Engineer.
5. The locations of the utilities shown on the plans are approximate only. the exact locations shall be determined by the Utility Owners and Contractor where necessary during construction.
6. For Utility Adjustment Schedule See Index No. 625-01.
7. Existing drainage structures within construction limits shall remain unless otherwise noted.
8. The contractor is to use extreme caution when working in or around areas of overhead, fixed and/or underground utilities.
9. The Contractor shall notify the appropriate Utility Company in advance of any excavation involving their utilities so that a company representative may be present.
10. Utility Owners:
    a) City of Vero Beach Water & Sewer
    b) City of Vero Beach Electric
    c) Southern Bell Telephone
10. The City of Vero Beach will remove or reroute their overhead electric facilities during construction so that they will not be in conflict with the Contractors work, and upon completion of the project the electric facilities will be relocated to the property line.
12. See Bridge Plans for relocation of existing 8" Water Main.
13. Prior to beginning construction the Telephone Company will temporarily relocate the existing B.T. Work Cables to approx. 25' west of the Bridge, and upon completion of construction the Telephone Company will attach the cables to the new Bridge. For attachments to Bridge see Bridge Plans.

F.A. ROAD	STATE	PROJ. No.
3	FLA.	8810-3510

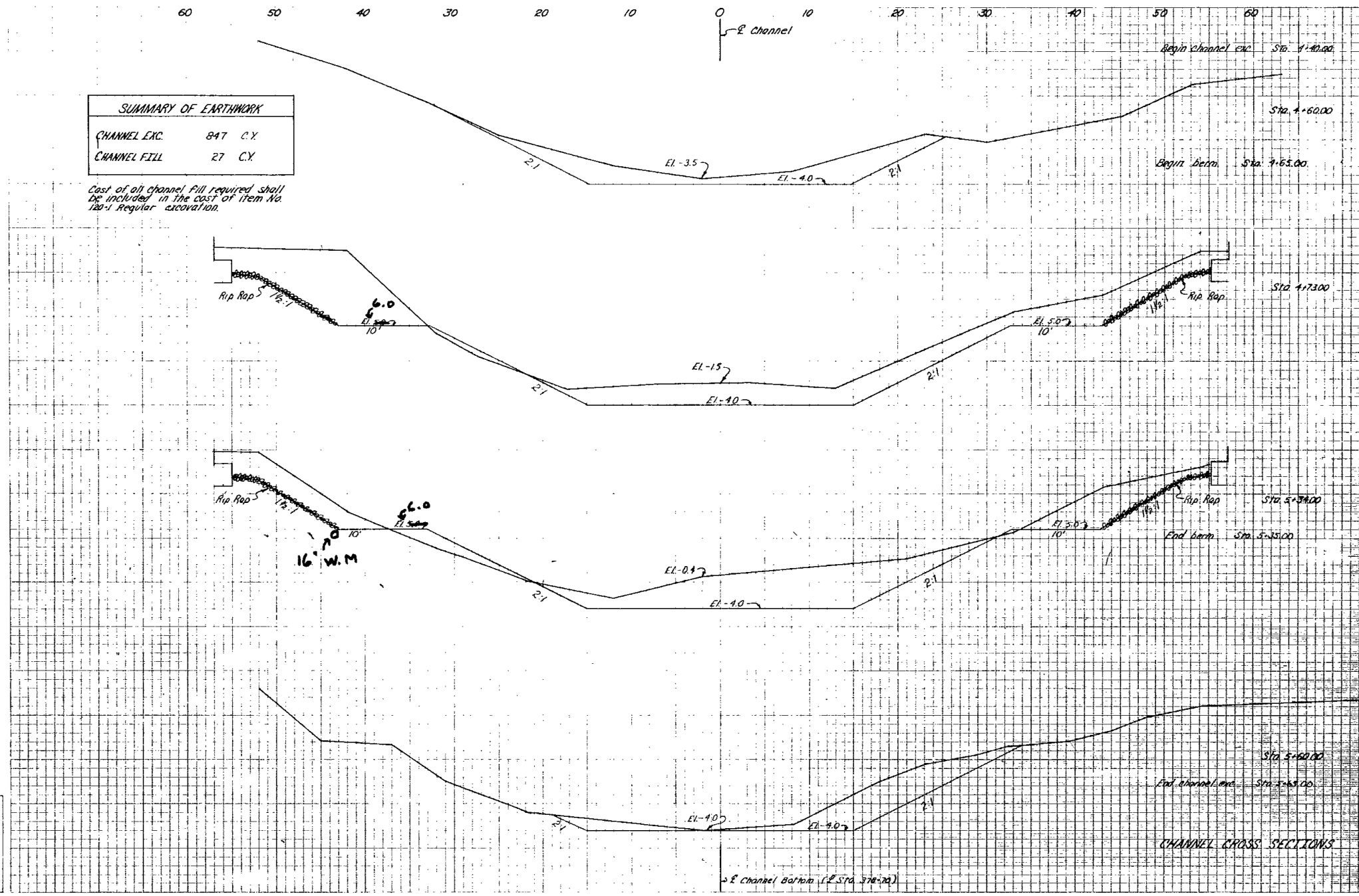
Sec 35, T32S, R39E

F.E.C. R.R. (East Track)





Fed. Road Dist. No.	State	County	Sheets	Proj.
3	Fla.	Indian River	5	8801K

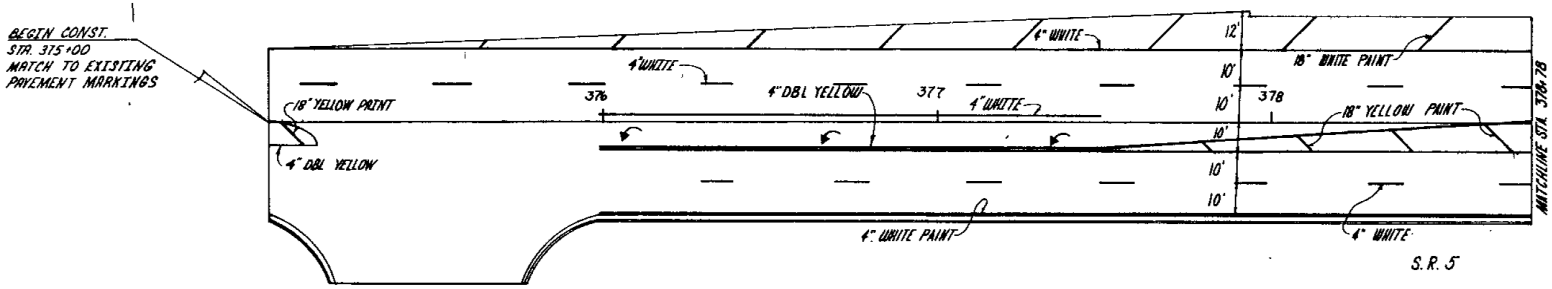


SUMMARY OF EARTHWORK

CHANNEL EXC.	847	C.Y.
CHANNEL FILL	27	C.Y.

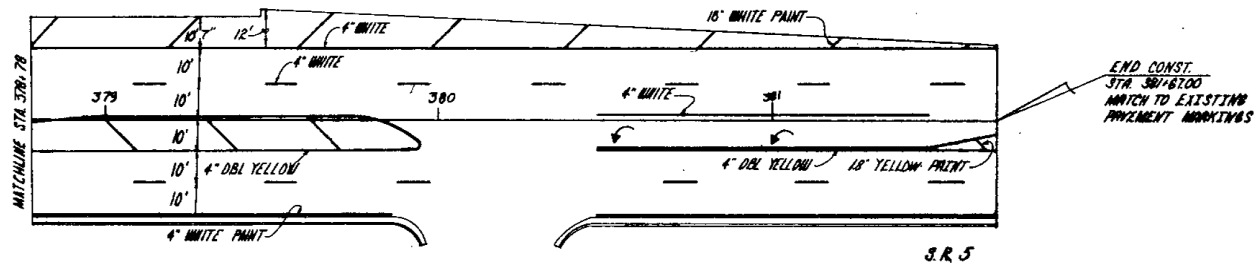
Cost of all channel Fill required shall be included in the cost of Item No. 120-1 Regular excavation.

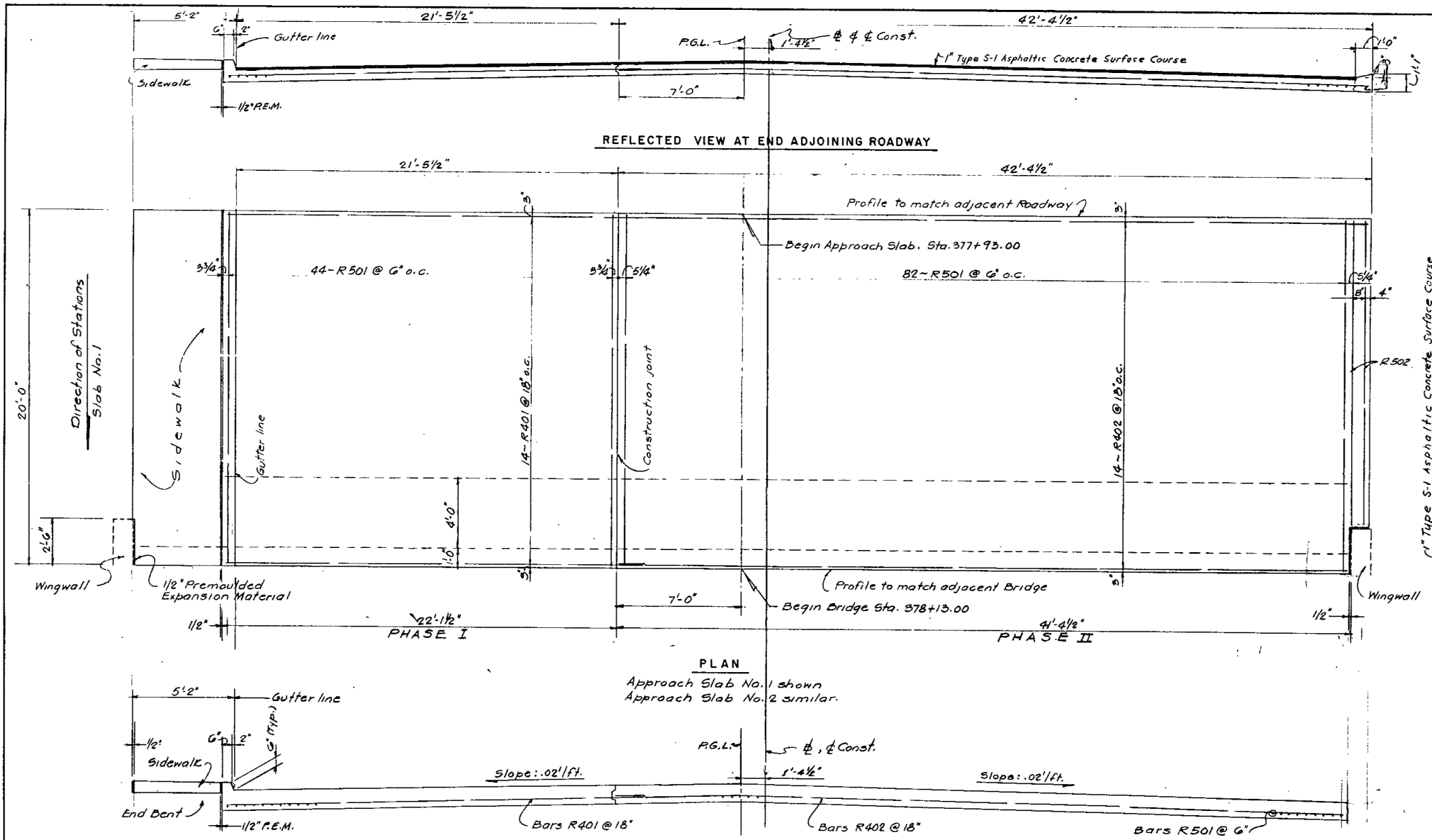
CHANNEL CROSS SECTIONS



SCALE: 1" = 4

NOTE: ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC UNLESS OTHERWISE SPECIFIED





BILL OF REINFORCING STEEL*				
MARK	SIZE	LENGTH	NO. REQD.	TYPE
R401	4	25'-5"	14	Str.
R402	4	41'-9"	14	"
R501	5	19'-6"	126	"
R502	5	17'-0"	2	"

ESTIMATED QUANTITIES *		
ITEM	UNIT	QUANTITY
Class II Concrete	C.Y.	38.41
Reinforcing Steel	Lbs.	3208

* Bill of Reinforcing Steel and Estimated Quantities are for one Approach Slab only. 2 Required. Sidewalk Quantities are not included.

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

REVISIONS	
Date	Description

APPROACH SLAB

STATE OF FLORIDA DEPARTME
STRUCTU

STATE ROAD 5
MAIN

ROAD NO.	COUNTY
SR-5	INDIAN RIVER

	Names	Dates
Designed by	NCR	11/77
Checked by	RPJr	1/78
Quantities by	NCR	11/77
Checked by	RPJr	1/78
Supervised by	NCR	

FED. ROAD DIV. NO.	STATE	PROJECT
3	FLA.	88010

ESTIMATED BRIDGE QUANTITIES *

ITEM NO.	ITEM	UNITS	QUANTITIES
110-3 ▲	Removal of Existing Structure	L.S.	1
400-2-5	Class II Concrete (Substructure)	C.Y.	111
400-2-4	Class II Concrete (Superstructure)	C.Y.	178
400-5-4	Concrete Handrail (Barrier)	L.F.	114
400-5-5	Concrete Handrail (Sidewalk Barrier Type)	L.F.	114
415-1-4	Reinforcing Steel (Superstructure)	Lb.	45,158
415-1-5	Reinforcing Steel (Substructure)	Lb.	17,225
450-71 ***	Resetting Pre stressed Slab Units	L.F.	1,100
455-3-2	Pre stressed Concrete Piling Furnished (18"ø)	L.F.	1,624
455-4-2	Pre stressed Concrete Piling Driven (18"ø)	L.F.	1,624
455-9-12	Unloaded Test Piles (Pre-stressed Conc)(18"ø)	L.F.	140
455-10-90	Test Load (90 Tons)	Ea.	1 **
455-10-110	Test Load (110 Tons)	Ea.	1 **
455-15	Pre formed Pile Holes	Ea.	22
455-17-2	Pile Splices (18")	Ea.	1
460-91-2	Expansion Joint Seal (Compression Elast.)	L.F.	137
530-1-2	Rip Rap (Sand-Cement)(Bridge)	C.Y.	100

▲ Approx. 7,015 S.F. of Cast in Place Slab Bridge.
* Does not include Quantities for Approach Slab
** The number of test loads may be increased or omitted as directed by the Engineer.

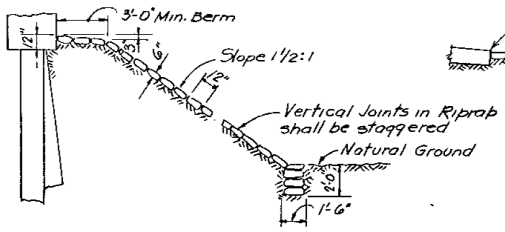
INDEX OF BRIDGE SHEETS

B-1 Summary of Quantities, Index of Drawings, General Notes and Rip-Rap details.
B-2 General Plan and Elevation.
B-3 Bridge Design Data Sheet.
B-4 Soils Data.
B-5 Pile Layout and Finish Grade Elevations.
B-6 End Bents 1 and 5. Plan and Elevation.
B-7 End Bents 1 and 5. Sections and Details.
B-8 Interior Bents 2, 3 and 4.
B-9 Superstructure. Spans 1 thru 4.
B-10 Superstructure Details.
B-11 Concrete Handrail Barrier. (Index 11,407)
B-12 Sidewalk Barrier. (Index 11,460)
B-13 12", 14" and 18" Prestressed Concrete Piles. (Index 3400)
B-14 Construction Sequence.

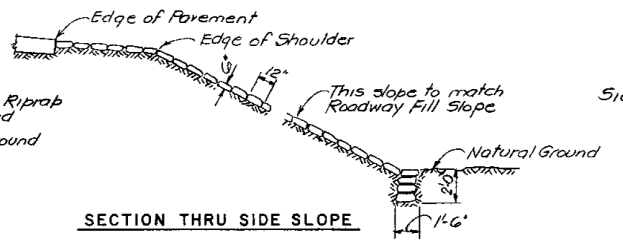
*** The Prestressed Slab Units shall be furnished by the Department of Transportation and shall be picked up by the Contractor at the Ft. Myers Maintenance Yard, 702 Pine Island Road (S.R. 78), Ft. Myers, Florida and transported to the job site.
The Contractor shall notify Mr. D.M. Heflin, Post Office Box "M", Ft. Myers, Florida, 33902, Phone No. (813) 995-5403 two (2) weeks in advance of the intended date for picking up the Prestressed Slab Units. The cost of picking up the Prestressed Slab Units, transporting them to the job site, and the cost of any necessary cleaning and repairs so that the Units may be used in the proposed structure shall be included in the Contract Unit Price for "Resetting Pre stressed Slab Units."

GENERAL NOTES

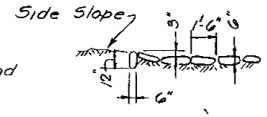
GENERAL SPECIFICATIONS: Florida Department of Transportation Standard Specifications for Road and Bridge Construction (1977) & 1978 Supplement.
DESIGN SPECIFICATIONS: Designed in accordance with the 1973 edition of A.A.S.H.O. Standard Specifications for Highway Bridges and approved revisions.
DESIGN LOADING: HS 20-44 Roadway.
60 P.S.F. Sidewalk.
MATERIAL STRESSES: All allowable stresses are in accordance with the 1973 edition of the A.A.S.H.O. Standard Specifications for all the materials shown on plans.
Maximum working stresses for Concrete: Class II 1360 p.s.i. Class III 2000 p.s.i. Class IV 2200 p.s.i.
REINFORCING STEEL: Grade 60, except pre-stressed concrete piles may be Grade 40.
CONCRETE STRENGTH: (28 days): Class II 3400 p.s.i., Class III 5000 p.s.i. and Class IV 5500 p.s.i.
SURFACE FINISH: All surfaces shown in detail below, including top and inside face of End Bent wingwalls, shall receive a Class 5 applied finish coating.
ENVIRONMENT: Non-Coastal.



SECTION THRU FORWARD SLOPE

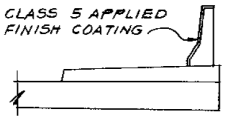


SECTION THRU SIDE SLOPE



SECTION THRU ENDS

RIP-RAP DETAILS



DETAIL SHOWING LOCATION OF APPLIED FINISH COATING

BUDGET ITEM 415356
BRIDGE NO. 88000-3

SUMMARY OF QUANTITIES, IND
DRAWINGS, GEN. NOTES & RIP-RA

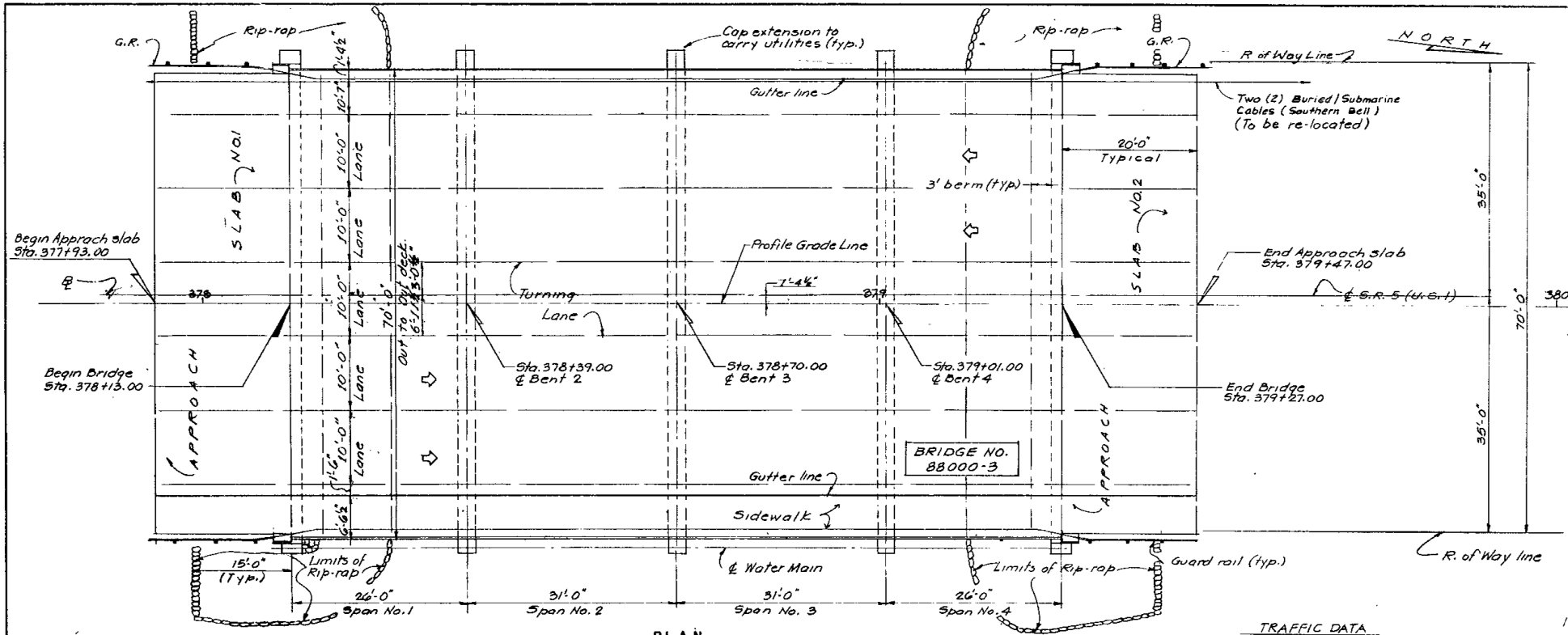
STATE OF FLORIDA DEPARTMENT OF TRAN
STRUCTURES

STATE ROAD 5 (U.S.1) C
MAIN CANAL

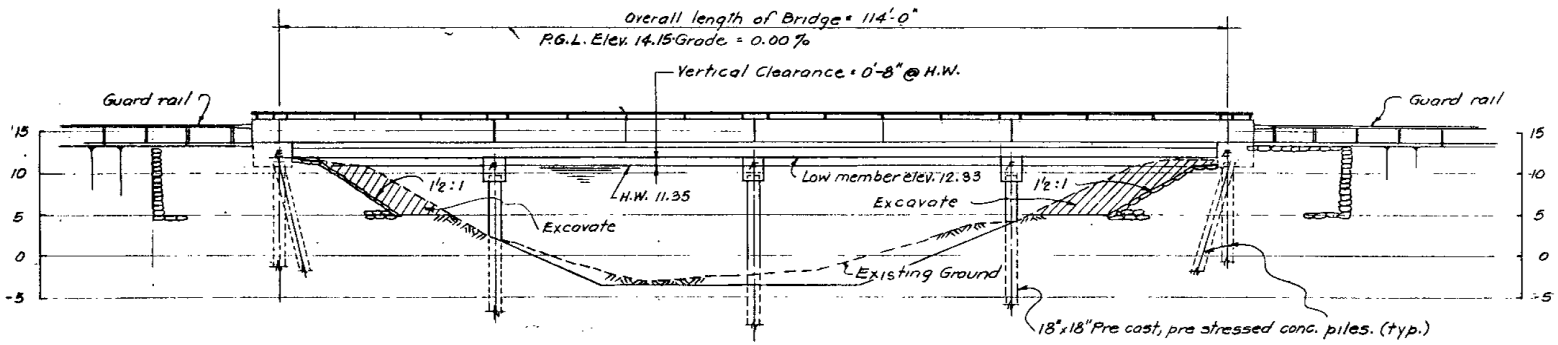
REVISIONS		ROAD NO.	COUNTY	
Dates	Descriptions	SR-5	INDIAN RIVER	88010

	Names	Dates	APPROVED BY
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.Jr.	JAN-78	T all
Quantities by	N.C.R.	NOV-77	District Design E
Checked by	R.P.Jr.	JAN-	Drawing No.
Supervised by	N.C.R.		1 of 11

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA-FLORIDA



PLAN



ELEVATION

NOTE: Drive one unloaded test pile 45 ft. long (18"ø) in each Bent 1 and 5, and one unloaded test pile 50 ft. long (18"ø) in Bent No. 3, in the position of a permanent plumb pile located as directed by the Engineer.

TRAFFIC DATA
Design Speed: 45 M.P.H.

1. See Sh. B-1 for
Details of Rip-ra
of Quantities.
2. See Sh. B-4 for
3. Existing cast in
bridge to be rem
4. See Sh. B-14 for Co
Sequence.
5. Exact location unc
Cable Location Bure
1-800-432-4770

BUDGET ITEM 415356
BRIDGE NO. 88000 3
GENERAL PLAN AND ELEV

STATE OF FLORIDA DEPARTMENT
STRUCTURE

STATE ROAD 5 (
MAIN C

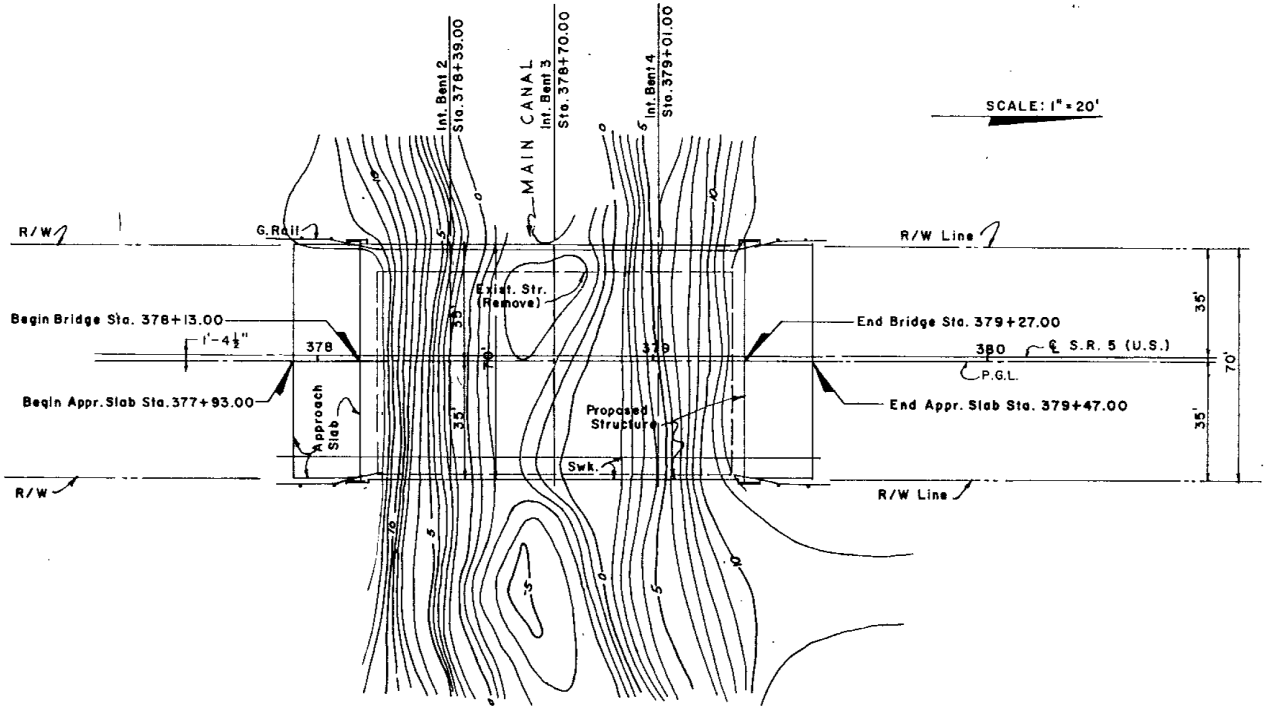
ROAD NO.	COUNTY
SR-5	INDIAN RIVER

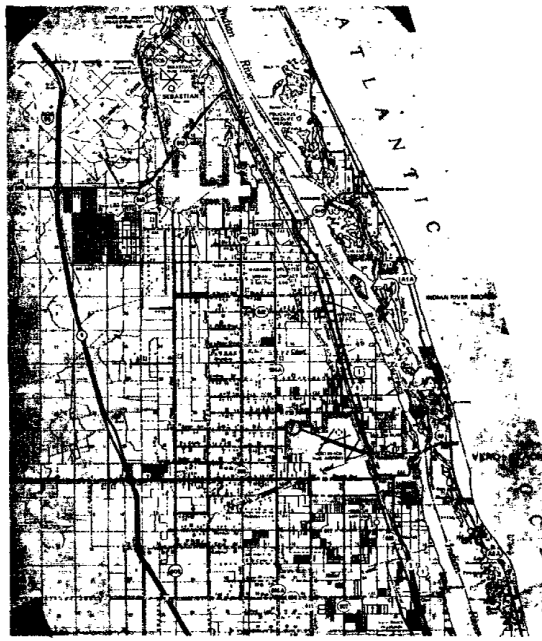
	Names	Dates	APPROVED
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.	JAN-78	T.
Quantities by	A.	NOV. 77	
Checked by		JAN 78	
	R.		2

REVISIONS	
Date	Description

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

FED. ROAD DIV. No	STATE	PROJECT No.
3	FLA.	88010- 35

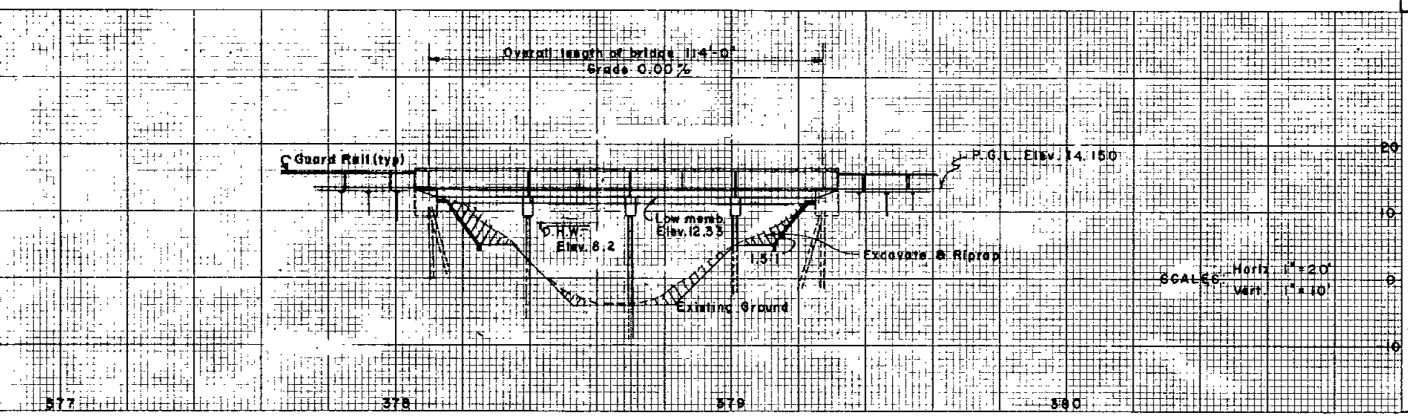




DRAINAGE AREA & LOCATION

EXISTING STRUCTURES

(REFERENCE)	(1)	(2)	(3)	(4)	(5)
FOUNDATION	Conc. Piles				
OVERALL LENGTH	105' 6"				
SPAN LENGTH	5@15' 2@15'3"				
TYPE CONSTRUCTION	Conc.				
SIDEWALKS					
ROADWAY WIDTH	54'				
ELEV LOW MEMBER	12.33				



DESIGN DATA

STRUCTURE RECOMMENDATIONS
1. LOADING HS-20-44
2. BRIDGE ROADWAY WIDTH 62
3. SIDEWALKS 5'-0" Rt.

DRAINAGE RECOMMENDATIONS
1. BEGIN BRIDGE STATION 378+13.00 END BRIDGE STATION 379+27.00
2. CENTERLINE GRADE ELEVATION 14.15
3. BRIDGE SKEW ANGLE NONE
4. CHANNEL BOTTOM, WIDTH 30'± ELEVATION -4.0 SIDE SLOPES 2:1
   CENTERLINE CHANNEL BOTTOM, STATION 378+70
   LIMITS OF CHANNEL EXCAVATION RT. R/W LT. R/W
5. CLEARANCE: NAVIGATION: HORIZ. N.A. DRIFT: HORIZ. 15' Min.
   VERT. N.A. ABOVE EL. N.A. VERT. 3.0 ABOVE EL. 8.2
6. DRAINAGE AREA 25 Sq. Miles *
7. WATER STAGE DATA:

	MAX. STAGE OF RECORD	DESIGN H.W.	NORMAL FLOW ELEV.
ELEVATION	7.5-8	8.2	1.58
DATE OF OCCURRENCE	unknown	"	
RECURRENCE INTERVAL	"	50 Years	

8. DESIGN DISCHARGE 2264 CFS SOURCE Indian River Farms Drainage District & Corps. Ft. Drum Study.
   RECURRENCE INTERVAL 50 YEARS
9. DESIGN VELOCITY 3.8 FPS

REMARKS: Construct Berm at El. 5.0

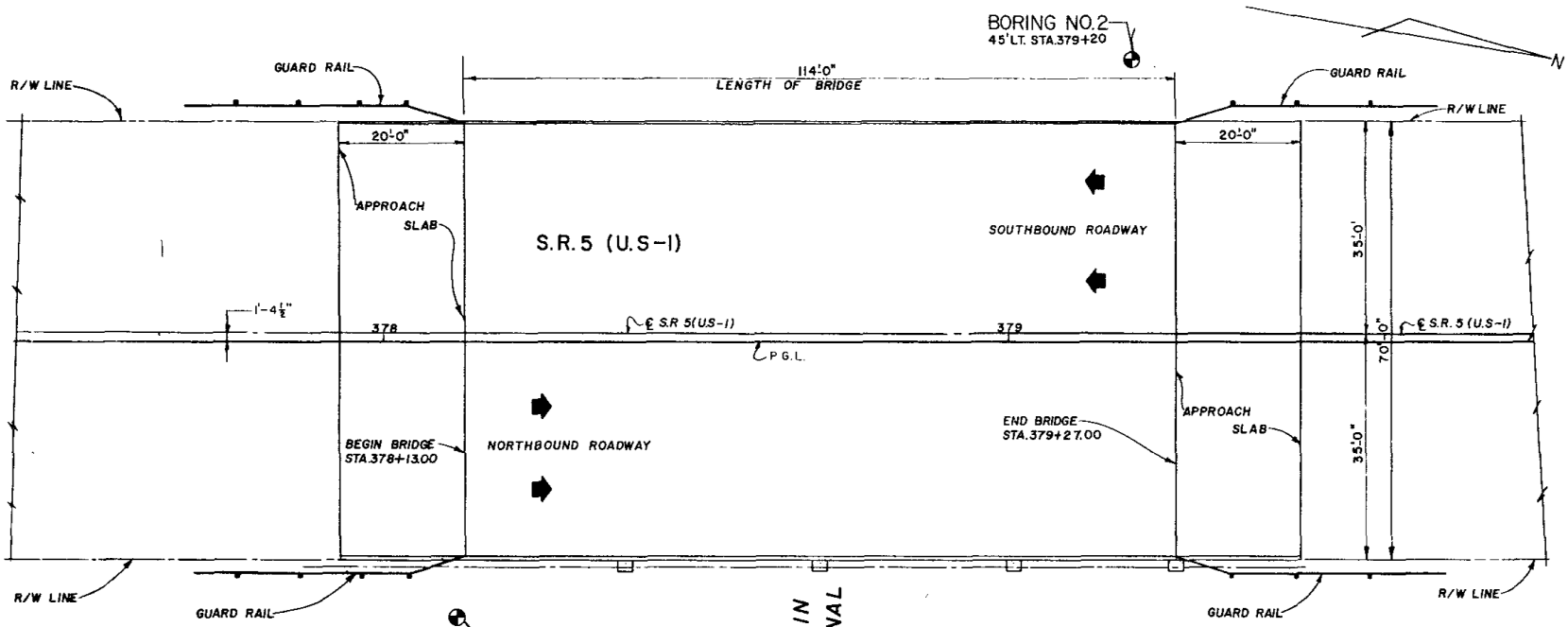
* U.S.G.S. report indicates drainage area is indeterminate. D.A. determined by I.R.F.D.D. (Approx.)
There is a saltwater intrusion barrier 4650 ft. east of bridge Elev. 1.2 ± m.s.l.

BASIC FLOOD (100 YR) DATA:
Q100 = 2504 Cfs
EHW = + 8.6' MSL

RECOMMENDED DISTRICT DR. ENGR.
APPROVED ENGINEER OF DRAINAGE

BRIDGE DESIGN DATA SHEET DRAWING NO. 3 of 11 12521 DD IB

STATE	PROJECT NO.
FLA.	88010-3510



BORING LOCATION PLAN

SCALE 1"=10 FT.

NOTES

DUE TO CORE BORING LOCATIONS AND PROCED
STRATA MAY DIFFER WITH SOIL PROFILE.

DEPTHS GIVEN IN DISTANCE BELOW EXISTING

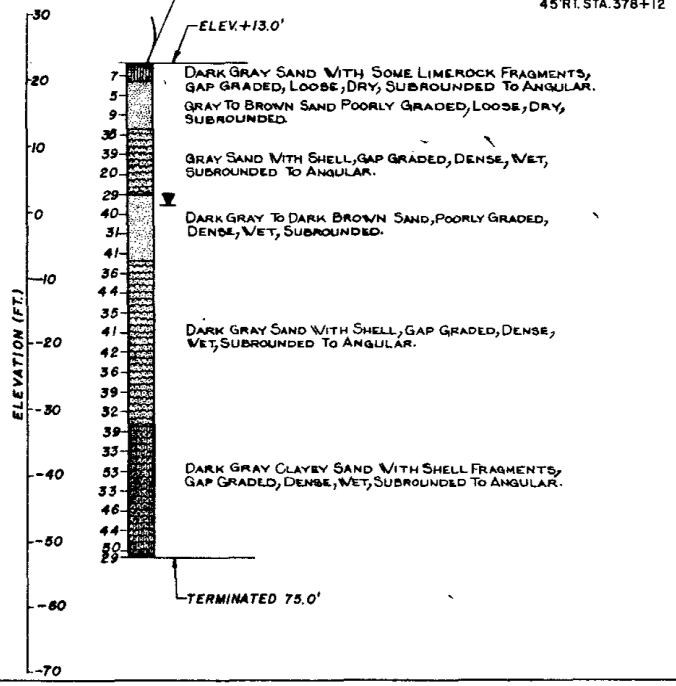
NUMBERS TO LEFT OF BORING INDICATE BL
SPOON FOR 12" PENETRATION.

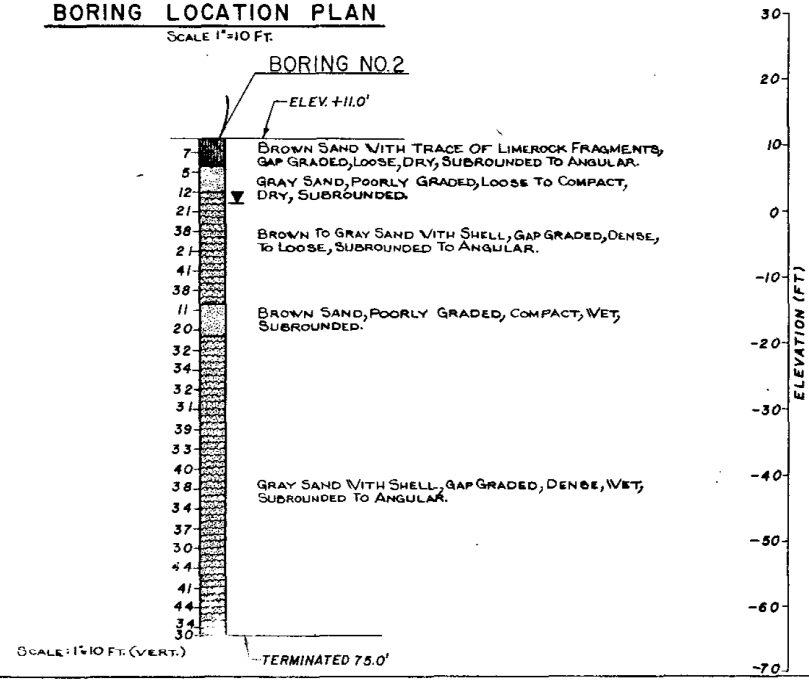
SPOON: INSIDE DIAME
OUTSIDE DIAM

HAMMER: WEIGHT 140
DROP 30"

LEGEND

- WATER LEVEL
- FINE SILICA SAND WITH LIMEROCK FRAGMENTS
- FINE SILICA SAND
- FINE SILICA SAND WITH SHELL
- CLAYEY SAND WITH SHELL FRAGMENTS





STATE OF FLORIDA DEPARTMENT OF TRANSPOR
REPORT OF CORE BORINGS FOR STRUCTU

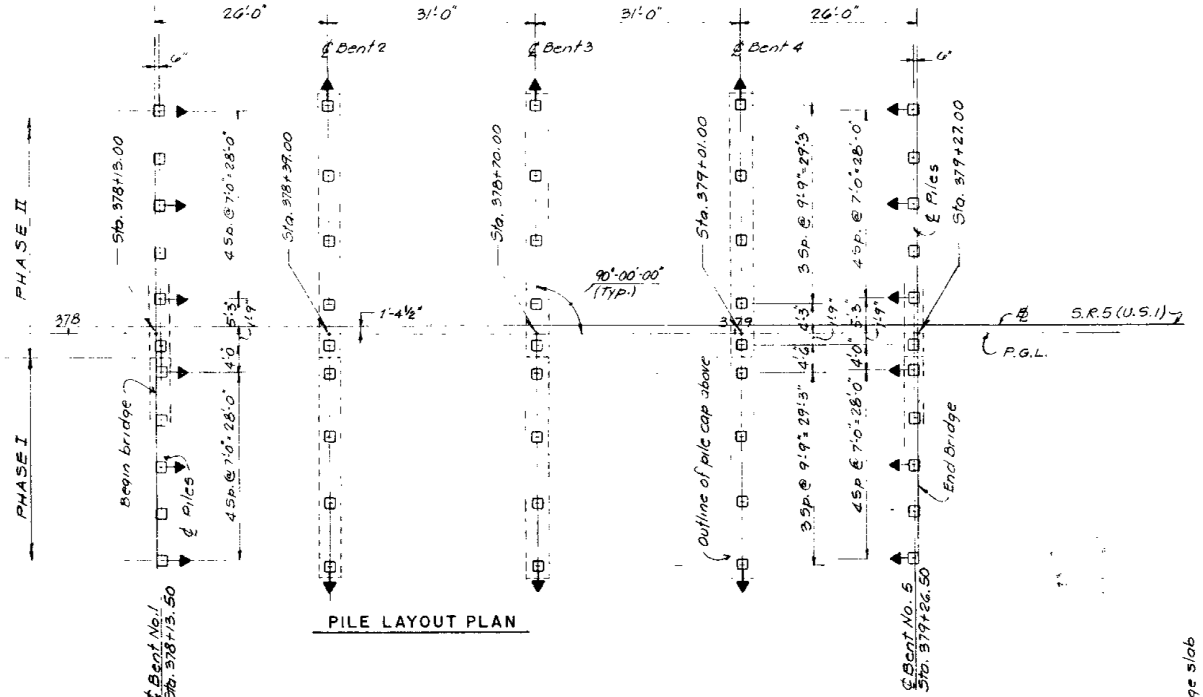
S R 5 (U.S.1) OVER MAIN CANAL (BRIDGE NO.

PROJ. NO. 99004-3511
BRIDGE NO. 88000 3
COUNTY: INDIAN RIVER

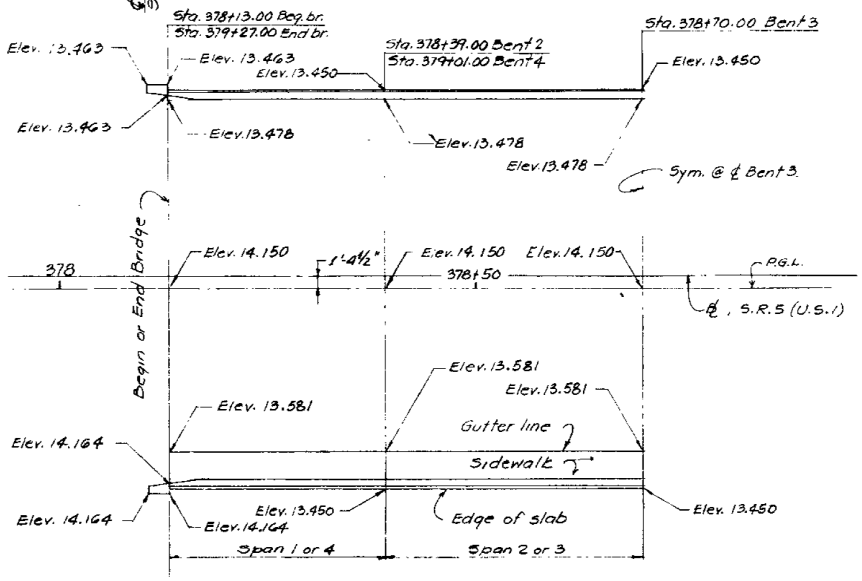
BORING DATE: 1/9 – 1/11/
BORINGS BY: HAIRE & C
SUBMITTED BY: FLORIDA T
ENGINEERI

APPROVED	DRAWING NO.	INDEX
	4 of 11	1252

FED. ROAD DIV. NO.	STATE	PROJECT
3	FLA.	88010

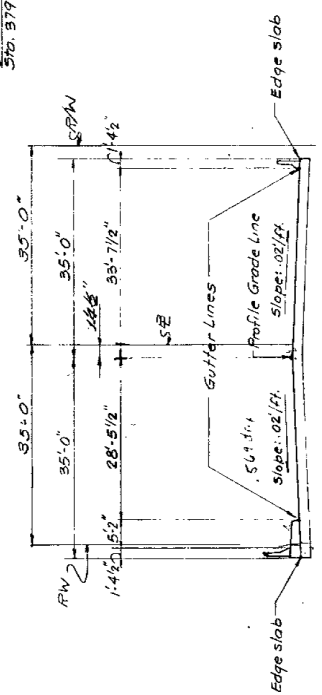


PILE LAYOUT PLAN



HALF PLAN

FINISH GRADE ELEVATIONS



SECTION THRU ROADWAY SHOWING LOCATION OF ELEVATIONS

NOTES:

◀ Indicates battered piles.
End Bent batter : 2" per foot.
Int Bent batter : 1½" per foot.
All piles to be 18"x18" Pre-stressed pre-cast concrete.
Pile Loads: End Bents 45 TONS
Int. Bents 55 TONS
Pile Cut-Off Elev.: End Bents 1 & 5 = 10.825
Int. Bents 2, 3 & 4 = 10.825

PILE LAYOUT & FINISH GRADE EL

STATE OF FLORIDA DEPARTMENT OF TRA
STRUCTURES

STATE ROAD 5 (U.S.1) C
MAIN CANAL

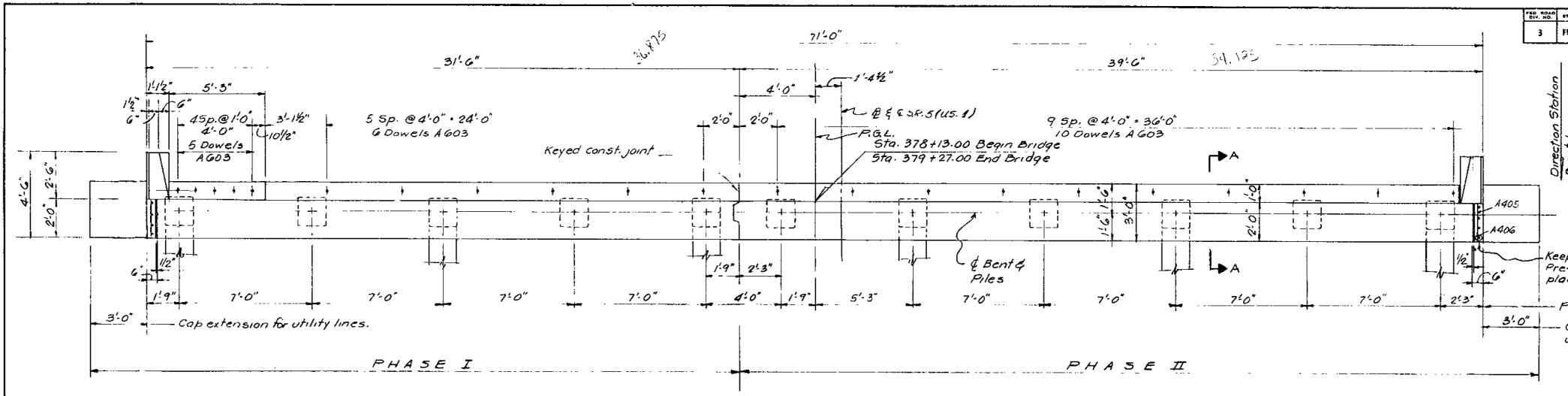
REVISIONS		ROAD NO.	COUNTY	
Date	Description	SR-5	INDIAN RIVER	8801

	Name	Date	APPROVED BY
Designed by	HCE	11/77	
Checked by	R.P.Jr	1/78	
Quantities by	HCE	11/77	
Checked by	R.P.Jr	1/78	
Supervised by	HCE		

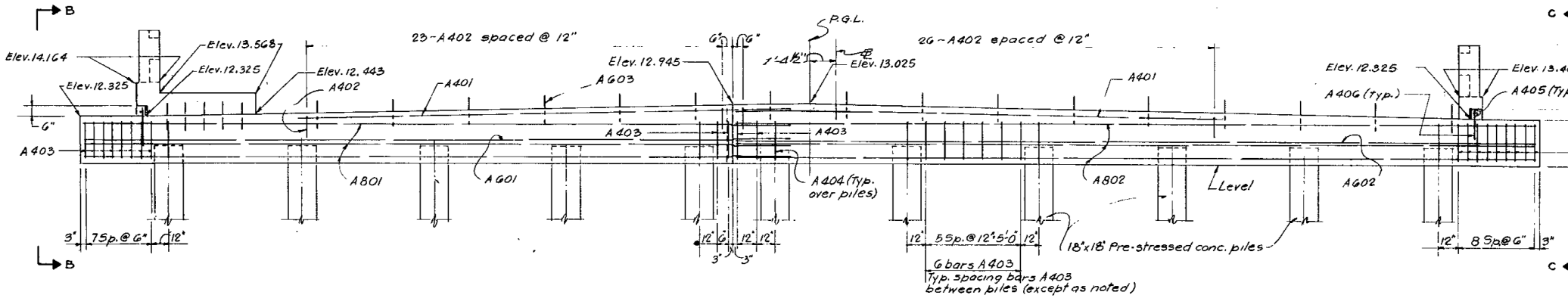
Deputy Design

Drawing No. 5 of 11

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA



PLAN



ELEVATION

NOTES.
Design Load for Piles = 45 Ton
For Barrier details see Sh. B-11
For General Notes see Sh. B-1

END BENTS 1 & 5. PLAN

STATE OF FLORIDA DEPARTME
STRUCTU

STATE ROAD 5
MAIN

ROAD NO.	COUNTY
SR-5	INDIAN RIVER

	Name	Date
Designed by	N.C.R.	Nov. 77
Checked by	R.P.J.R.	JAN 78
Quantities by	N.C.R.	Nov. 77
Checked by	R.P.J.R.	JAN 78
Supervised by	N.C.R.	

REVISIONS	
Date	Description

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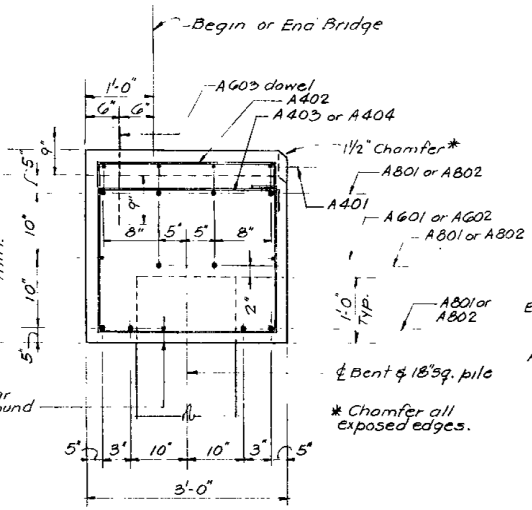
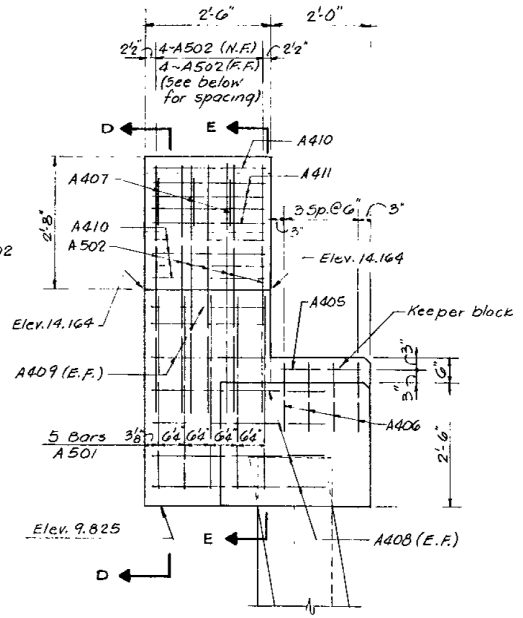
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

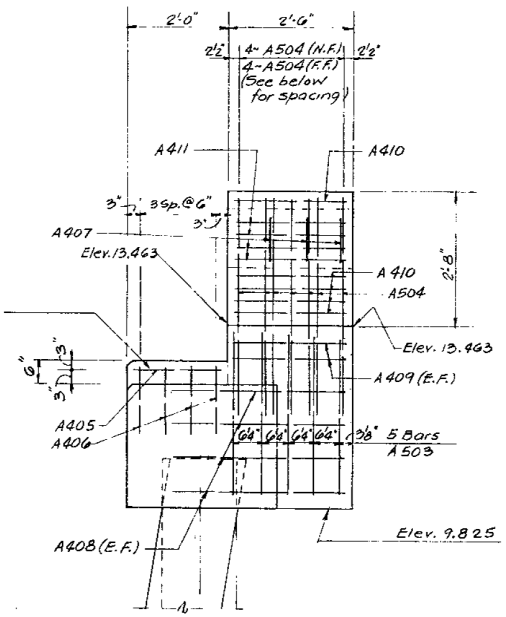
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-3510



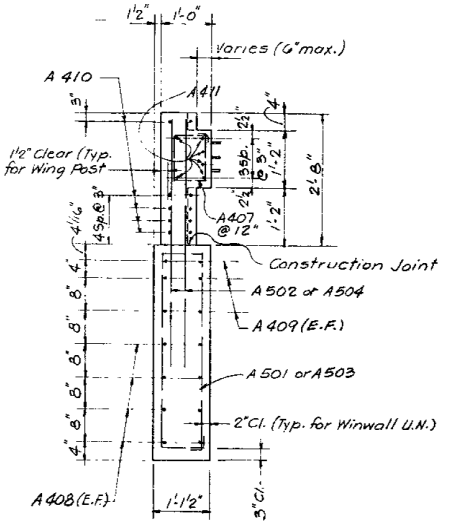
SECTION A-A



ELEVATION B-B



ELEVATION C-C



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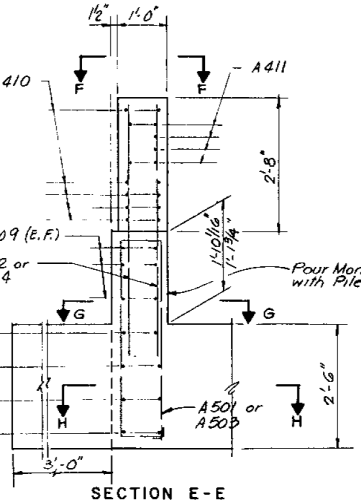
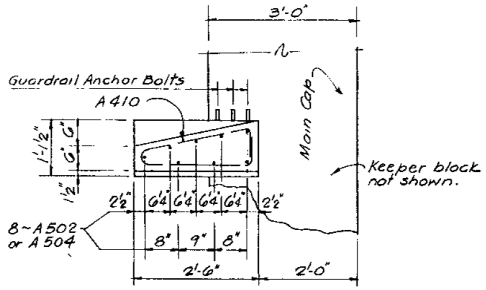


SECTION E-E



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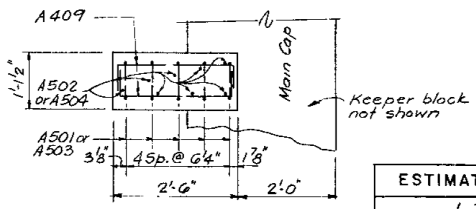
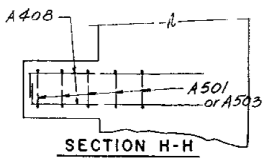


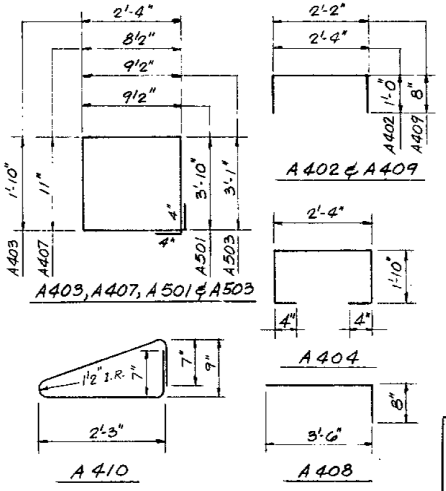
SECTION G-G



SECTION H-H

N.F. Near Face
F.F. For Face
E.F. Each Face

BAR BENDING DIAGRAM



NOTE: All bar dimensions are out-to-out

BILL OF REINFORCING STEEL

MARK	SIZE	NO. REQ'D.	LENGTH	B
A401	4	8	26'-0"	S
A402		49	4'-4"	S
A403		75	9'-0"	
A404		11	6'-8"	
A405		2	1'-8"	S
A406		8	2'-4"	
A407		6	5'-11"	S
A408		16	4'-2"	
A409		10	3'-6"	
A410		10	5'-9"	
A411	4	12	2'-3"	S
A501	5	5	9'-11"	S
A502		8	5'-0"	S
A503		5	8'-5"	S
A504	5	8	4'-6"	S
A601	6	2	37'-3"	S
A602	6	2	42'-3"	
A603	6	21	1'-6"	
A801	8	10	37'-3"	S
A802	8	10	42'-3"	

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANTITY
Class II Concrete (Substructure)	C.Y.	24.51
Reinforcing Steel (Substructure)	Lbs.	3520
Pre-stressed Conc. Piling (18"Sq.)	Lin. Ft.	**

* Bill of Rein. Steel & Est. Quant. for one End Bent only.
** See Summary of Estimated Quantities.

Conc. Breakdown.
Cap : 23.23 c.y.
Wingwall : .85 c.y.
End Post : .43 c.y.

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

REVISIONS	
Date	Description

END BENTS 1 & 5. SECTIONS & DETA

STATE OF FLORIDA DEPARTMENT OF TRANSPORTAT
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

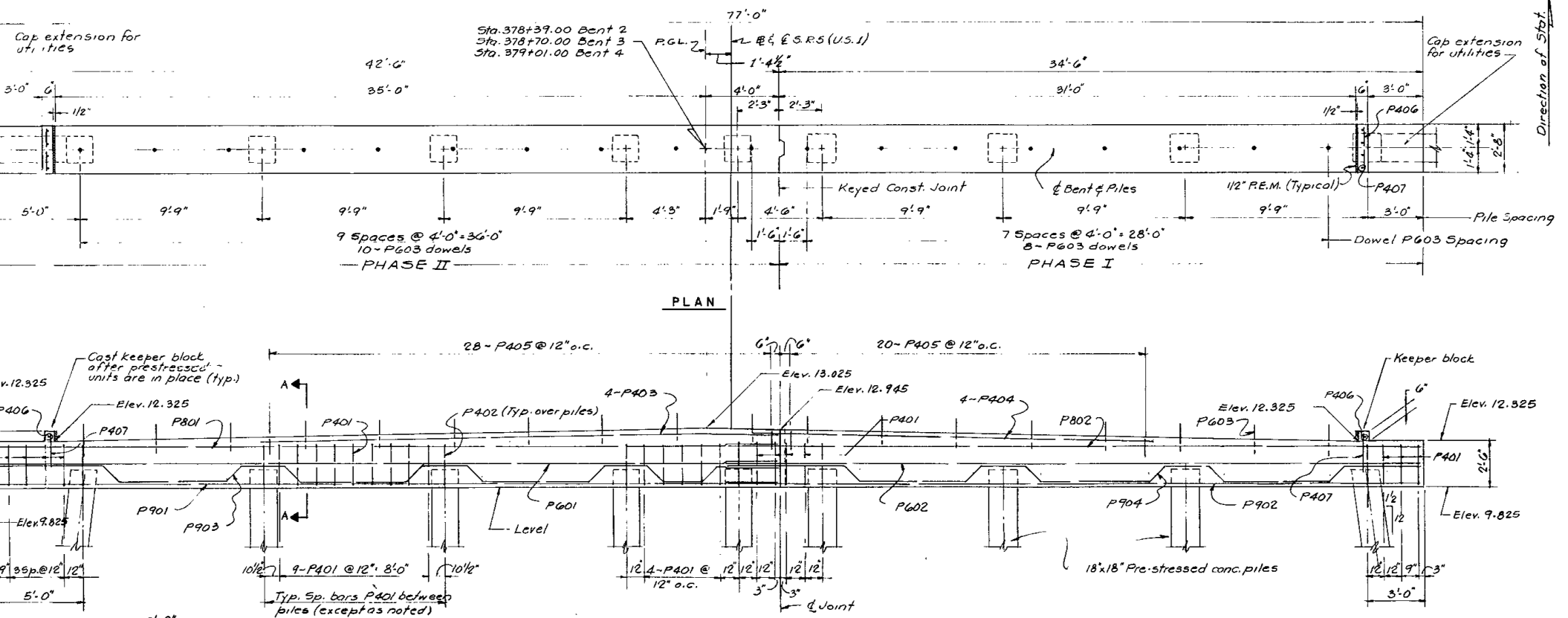
	Names	Dates
Designed by	NCR	Nov. 77
Checked by	RPJR	JAN. 78
Quantities by	NCR	Nov. 77
Checked by	RPJR	JAN 78
Supervised by	NCR	

APPROVED BY

Deputy Design Engineer, Structures

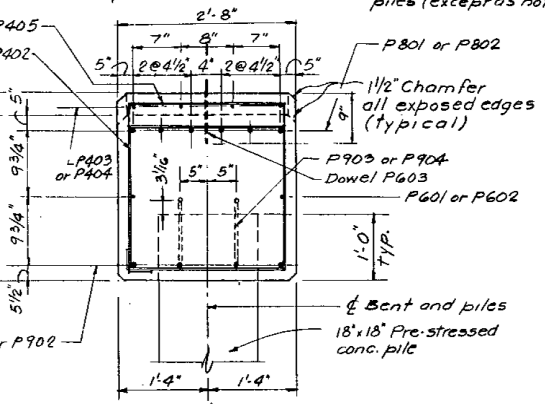
Drawing No. 7 of 11 | 12

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-351



PLAN

ELEVATION



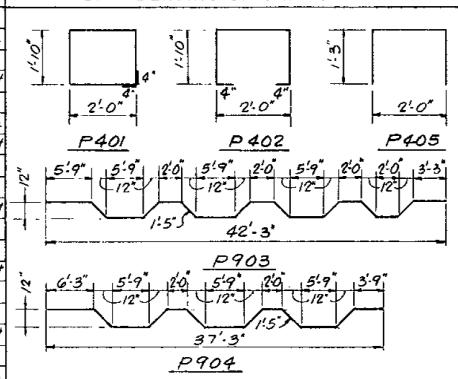
SECTION A-A

GENERAL NOTES
Design Load for Piles: 55 TONS.
For General Notes see Sh. B-1

BILL OF REINFORCING STEEL *

MARK	SIZE	NO. REQ'D	LENGTH	BENDING
P401	4	71	8'-4"	See dia.
P402	4	9	6'-4"	" "
P403	4	4	28'-0"	Straight
P404	4	4	21'-6"	"
P405	4	48	4'-6"	See dia.
P406	4	2	2'-4"	Straight
P407	4	8	1'-8"	"
P601	6	2	42'-2"	Straight
P602	6	2	37'-3"	"
P603	6	18	1'-6"	"
P801	8	6	42'-2"	Straight
P802	8	6	37'-3"	"
P901	9	2	42'-2"	Straight
P902	9	2	37'-3"	"
P903	9	2	45'-7"	See dia.
P904	9	2	39'-9"	" "

BAR BENDING DIAGRAMS



NOTE: All bar dimensions are out-to-out.

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANT.
Class II Concrete (Substructure)	C.Y.	20.73
Reinforcing Steel (Substructure)	Lbs.	3395
Prestressed Conc. Piling (18" Sq.)	Lin.Ft.	**

* Bill of Reinforcing Steel and Estimated Quantities are for one Interior Bent only.
** See Summary of Estimated Quantities.

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MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

REVISIONS	
Date	Description

INTERIOR BENTS 2, 3 & 4

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

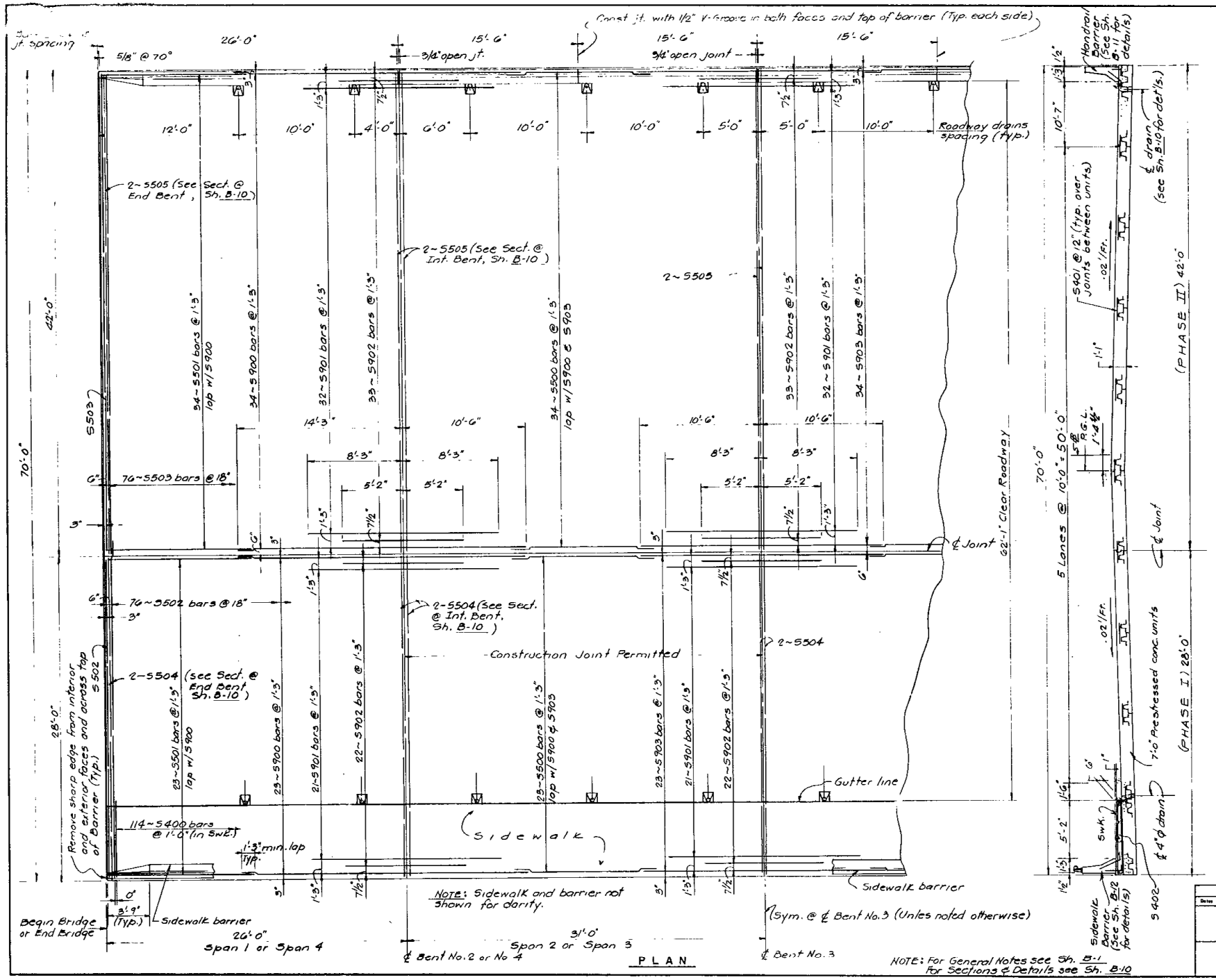
ROAD NO.	COUNTY	PROJECT
SR-5	INDIAN RIVER	88010-35

	Names	Dates
Designed by	N.C.R.	11/77
Checked by	R.P.Jr.	1/78
Quantities by	N.C.R.	11/77
Checked by	R.P.Jr.	1/78
Supervised by	N.C.R.	

APPROVED BY

Deputy Design Engineer, Str.

Drawing No. 8 of 11

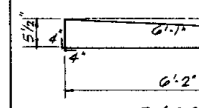


FED. ROAD DIV NO.	STATE
3	FLA.

BILL OF REINFORC

MARK	SIZE	NO. REQ
5400	4	114
5401	4	1026
5402	4	15
5500	5	114
5501	5	114
5502	5	78
5503	5	78
5504	5	16
5505	5	16
5900	9	114
5901	9	159
5902	9	165
5903	9	114

BENDING DIA



5400

NOTE: All bar dimensio

ESTIMATED QUANTI

ITEM
Class II Concrete (Superstr
Reinforcing Steel (Superstru

* Quantities are for all re not include reinforcing in Handrail Barrier. See Sheet B-11 for Handra including dowels set in Deck secondary pour.

Concrete Breakdown

Deck Secondary pour:

Sidewalk :

SUPERSTRUCTURE. SPANS

STATE OF FLORIDA DEPARTMENT STRUCTURE

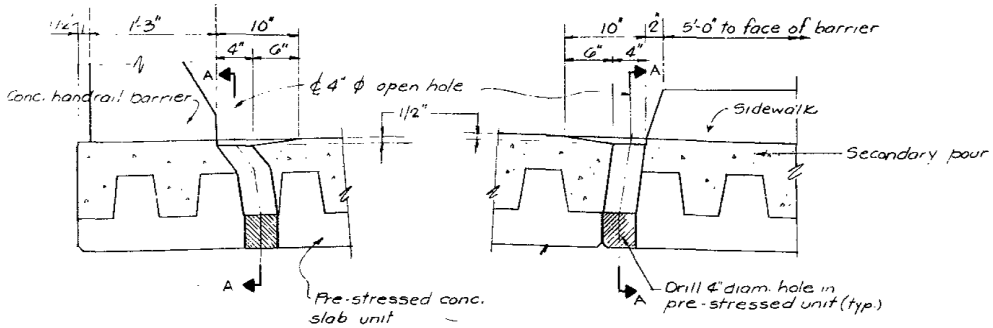
STATE ROAD 5 (
MAIN CA

REVISIONS		ROAD NO.	COUNTY
Dates	Descriptions	SR-5	INDIAN RIVER

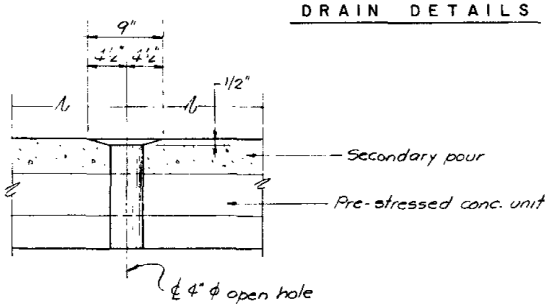
	Names	Dates	APPROVED
Designed by	NCR	11/77	
Checked by	RPJr	11/78	
Quantities by	NCR	11/77	
Checked by	RPJr	11/78	
Supervised by	NCR		

9

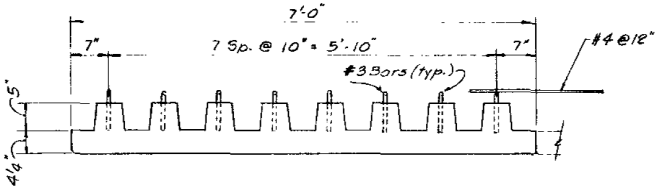
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-3



DRAIN DETAILS



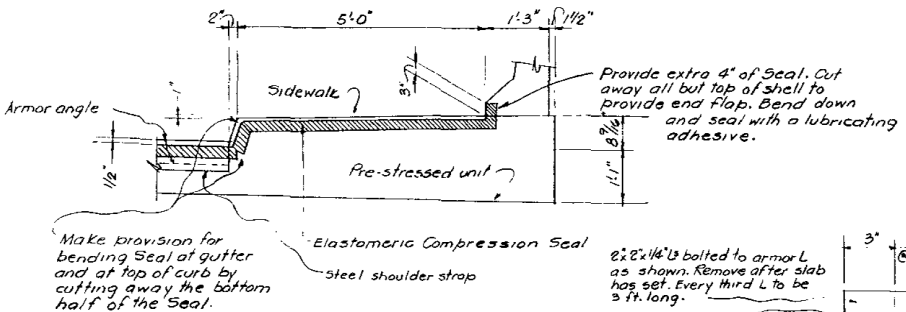
SECTION A-A

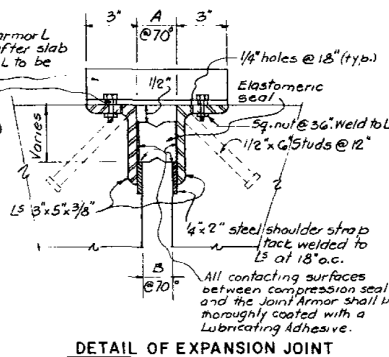


TYPICAL SECTION THRU PRESTRESSED SLAB UNIT

(Furnished by the Department of Transportation)

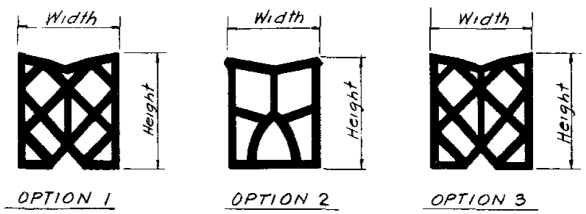
PRESTRESS SLAB UNITS SCHED.		
SIZE	LENGTH	NO. REQ'D.
7'-0" x 9¼"	25'-0"	20
7'-0" x 9¼"	30'-0"	20





DETAIL OF EXPANSION JOINT

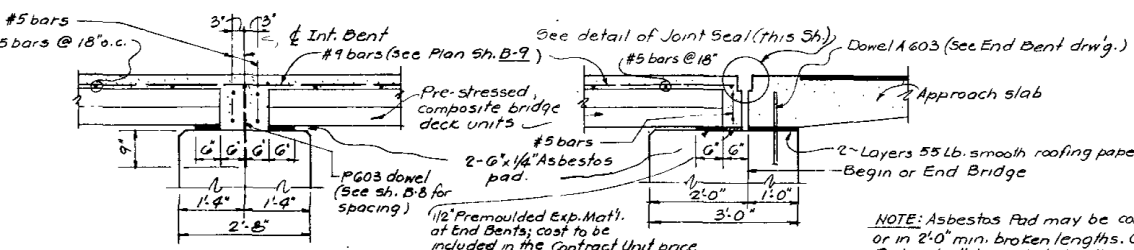
ELASTOMERIC COMPRESSION SEAL DATA					
LOCATION	OPTION	HEIGHT	WIDTH	A	B
End Bents	1	1 5/16"	1½"	1⅛"	5/8"
	2	1 11/16"	1½"	1⅛"	5/8"
	3	1 5/8"	1⅞"	1⅛"	5/8"



OPTION 1 OPTION 2 OPTION 3

ELASTOMERIC COMPRESSION SEALS

1. Joints between adjacent Precast, Prestressed Composite Bridge Deck Units may be sealed with a sand-cement grout or a material approved by the Engineer.
2. Camber will be checked and compensated for in the field.
3. Drilling of holes for 4"ϕ P.V.C. pipe to be done in the field after erection of deck units. Do not use core drills.
4. Form Placement: When differences in camber of the individual panel units the height of the bearing on the caps shall be adjusted so that the underside of the panel units form plane surfaces at the center span without deviation of more than ¼ inch between panel units. When adjustments for camber difference require the thickness of the bearing material on one be greater than 1½ inches the height adjustment shall be made including alternate layers of neoprene bearing not less than ½ inch thick and the total aggregate thickness of felt and fiberboard material shall not exceed 1½ inches.
   The panel units shall be placed with the joints between panel units situated parallel to the centerline of the structure with a tolerance of ± 1½ inch with respect thereto.
5. Longitudinal Joints: Longitudinal joints shall be provided at intervals not exceeding 21 feet on each span where precast pre-stressed panels are used. The joints may be formed or when approved, they may be sawed. Joints in the cast-in-place concrete shall be located directly above and aligned with a mating joint between the panel units. Formed joints shall extend for the full depth of the cast-in-place concrete and sawed joints shall be a minimum of 1¼ inches deep. When more than one longitudinal joint is required, the joints shall be spaced symmetrically about the ℄ of the structure. Longitudinal joints shall be sealed with an approved neoprene compression seal not exceeding ¾ inch in width.
6. Placing Concrete: To insure the necessary full contact between the precast pre-stressed panels and the cast-in-place concrete, at time of concrete placement the interface must be free of any foreign material. Immediately prior to placing the slab concrete the precast pre-stressed panels shall be saturated with water. The original design thickness of the deck slab shall be maintained as at the point of maximum camber in the slab units.



SECTION AT INTERIOR BENT

SECTION AT END BENT

NOTE: Asbestos Pad may be continuous or in 2'-0" min. broken lengths. Cost of Pads shall be included in the contract unit price for Class II Concrete (Superstructure)

ELASTOMERIC COMPRESSION SEAL NOTES

For temperatures other than 70°F. adjust opening .0052 in. per degree difference between 70°F. and the temperature at the time the joint is constructed. For temperatures above 70°F. diminish opening and for temperatures below 70°F. increase opening.
The Expansion Joint Seal shall be installed in accordance with the recommendations of the manufacturer.
The cost of labor and materials required for construction of the joints in the bridge deck shall be included in the Contract Unit Price for Expansion Joint Seals.

REVISIONS	
Date	Description

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERING
LAUDERDALE BY THE SEA, FLORIDA

SUPERSTRUCTURE DETAILS.

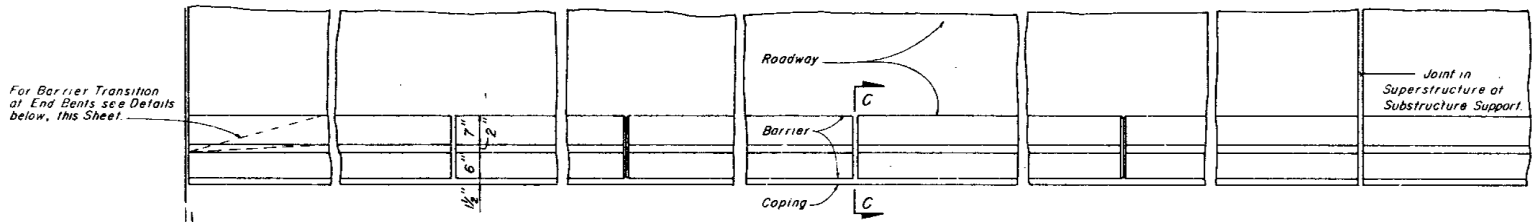
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
S.R.-5	INDIAN RIVER	88010-3

	Names	Dates	APPROVED BY
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.Jr.	JAN. 78	
Quantities by	N.C.R.	NOV 77	Deputy Design Engineer
Checked by	R.P.Jr.	JAN 78	Drawing No. 10 of 11
Supervised by	N.C.R.		

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-35



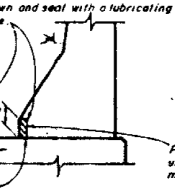
PLAN

End Bent Wing Post — Begin Bridge

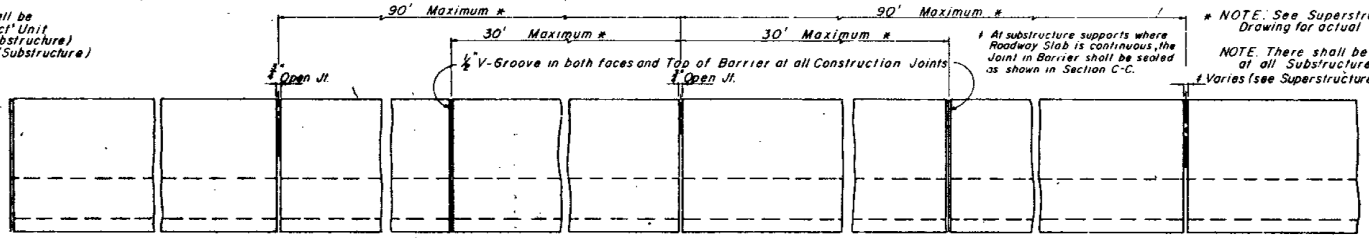
For payment Barrier shall be measured to this point

Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)

extra 4" of Seal. Cut away top of Shell to provide end flop. and seal with a lubricating



Polychloroprene Compression Seals used in 2" Open Joints shall be 1" wide minimum.



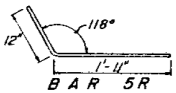
ELEVATION

* NOTE: See Superstructure Drawing for actual Dimensions.

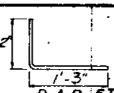
NOTE There shall be a 2" Min. Open Joint at all Substructure Supports.

BENDING DIAGRAMS

* For Slab Type Superstructure. Adjust length of Bars 5R & 5T to compensate for thicker slab. See Superstr. drawing.



BAR 5R



BAR 5T

NOTE. All bar dimensions are out-to-out.

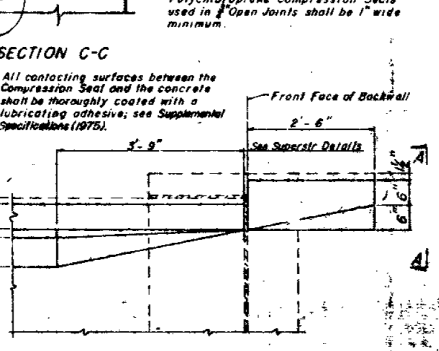
QUANTITIES. Class II Concrete = 0.07594 Cu. Yds. per L of Barrier (Based on Roadway Cross Slope
REINFORCING STEEL = 13.948 lbs. per L of Barrier.

GENERAL NOTES

CONCRETE. Class II Concrete shall be used in Barrier.
REINFORCING STEEL. Reinforcing Steel shall be Grade
PAYMENT. Barrier shall be paid for per linear foot, which include all Concrete and Reinforcing Steel. Barrier s be measured along the center line of the top surface of the
CYLINDER STRENGTH. The Cylinder Strength of the Con shall be 3,400 p.s.i. minimum at 28 days.
MARKERS. Markers recording the Elevation shall be pla top of the Barrier at End Bents. On Bridges longer th one marker shall be placed at each end of the Bridge. Bridges less than 100 ft. long, one marker shall be pl at one end of the Bridge only. Markers are to be furn by the Department of Transportation and installed by Contractor. The Cost of installing the Markers shall b included in the Contract Unit Price for Concrete Ba
ANCHOR BOLTS. Anchor Bolts, Nuts, and Washers shall dip galvanized in accordance with A.S.T.M. A-123.

REINFORCING STEEL NOTES

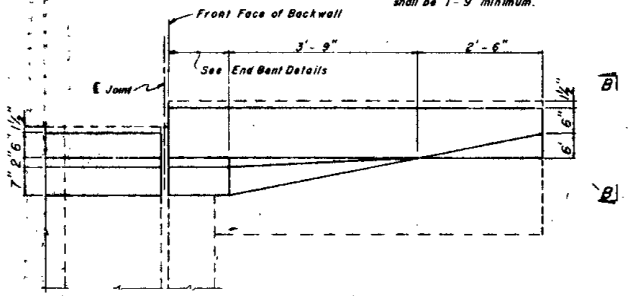
All Reinforcing Steel in Barrier shall be No. 5's. Bars 5R, 5T & 5U to be spaced at 9" c.c.
At all open joints bars 5R, 5T, 5U and the ends of bars 5S shall have 2" min. cover.
At all construction joints bars 5S may be either continuous or spliced. All splices in bars 5S shall be 1'-9" minimum.



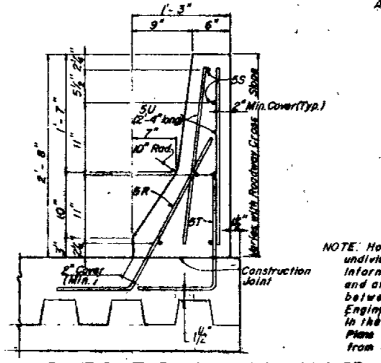
SECTION C-C

PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

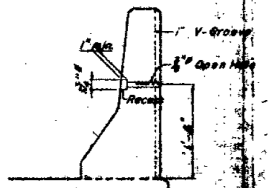
NOTE For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover



PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE

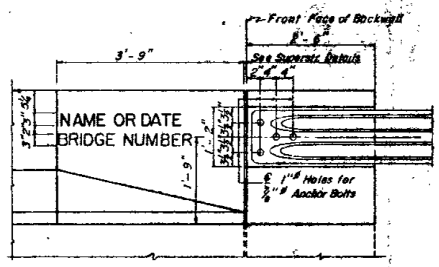


TYPICAL SECTION THRU HANDRAIL BARRIER

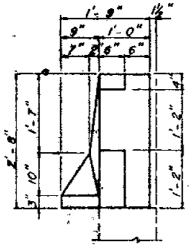


HOLES FOR INCIDENTAL SIGNING

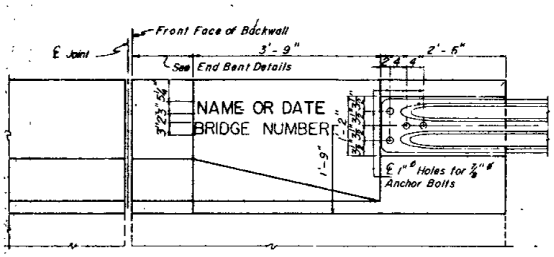
NOTE: Holes and grooves shall be placed on barrier type handrails on bridges, undivided bridges, as shown in the plans for designated type 3 signing, informational, guide, regulatory and warning sign locations both ends of approximately 500' intervals along the right handrails of between designated locations for future signs as directed by the Engineer. The cost of the extra holes and grooves shall be in the contract unit price for Concrete Handrail (Barrier). Plans are not available the Project Engineer should secure inform from the District Maintenance or Traffic Operations Office.



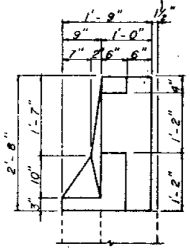
ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



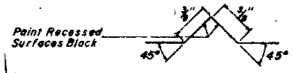
VIEW A-A



ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



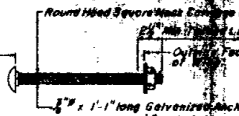
VIEW B-B



SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

NOTES

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The Date to be placed on the drivers left when approaching Bridge. The Date shall be the Year the Bridge is constructed.
Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ⅜" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.



¾" ø x 1'-1" long Galvanized Anch

ANCHOR BOLT DETAIL

NOTE: Cost of Anchor Bolts to be included Contract Unit Price for Guardrail.

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE. For Guardrail Shoe See Standard Drawing in Roadway Plans

STATE OF FLORIDA DEPARTMENT OF TRANSPORT
STRUCTURES

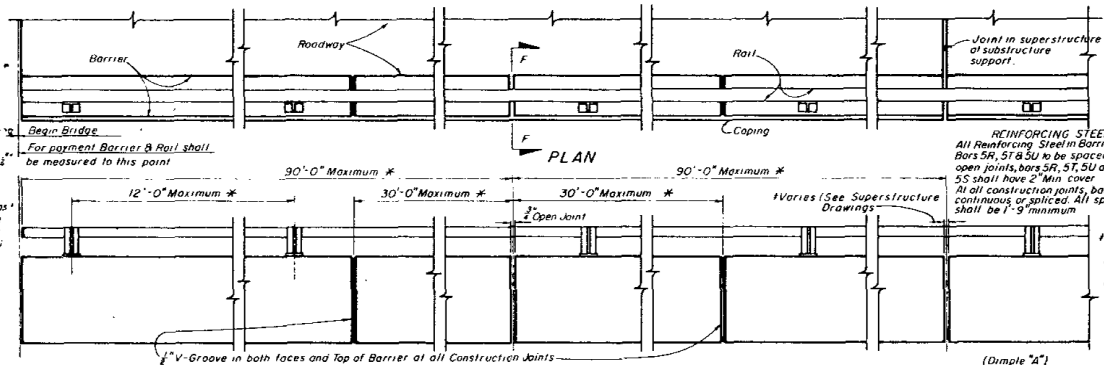
CONCRETE HANDRAIL BARRIE

REVISIONS		ROAD NO.	COUNTY	PROJECT
Date	Descriptions	SR-5	INDIAN RIVER	88010-
10-30-74	Revised Bars 5R & 5T			
8-29-75	Bridge number added to Wingwalls.		Names	Dates
10-3-75	Added Details of holes for Incidental Signing.	Designed by	L.A.L.	3-74
12-8-75	Added V-Groove & Revised Holes as Notes for Incidental Signs.	Checked by	J.R.A.	3-74
3-1-76	Added Supplemental Specifications Section C-C	Quantities by		
		Detailed by		
		Supervised by	S. P. J.	

APPROVED BY: T. Gill
State Highway Engineer, Structures

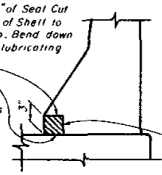
Drawing No. 1 of 1

FED. ROAD SYS. NO.	STATE	PROJECT NO.
3	FLA.	88010-3510

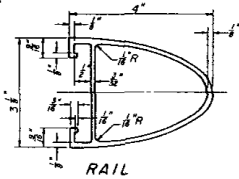


NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive; see 1975 Supplement.

Provide extra 4" of Seal Cut away all but top of Shell to provide end flap. Bend down and seat with a lubricating adhesive

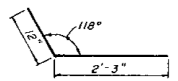


Polychloroprene Compression Seals used in Open Joints shall be 1" wide minimum.



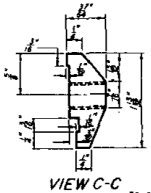
BENDING DIAGRAM

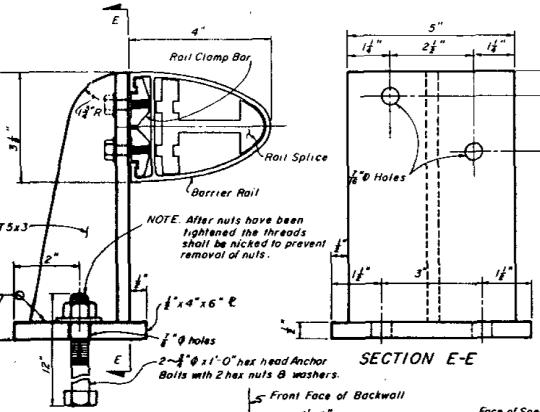
NOTE. All bar dimensions are out-to-

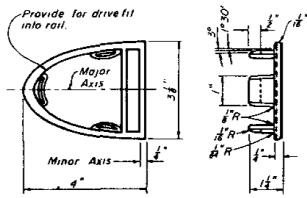


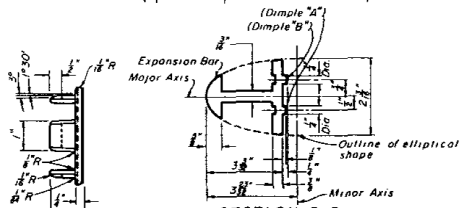
QUANTITIES. Class II Concrete = 0.07594 Cu Yds. per linear ft. of Bar (Based on Roadway Cross Slope of .02 ft.).
REINFORCING STEEL = 20.744 lbs. per linear ft. of Barri

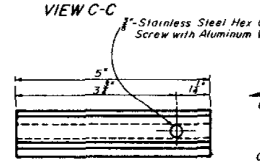
REINFORCING STEEL NOTES
All Reinforcing Steel in Barrier shall be No 5's. Bars 5R, 5T & 5U to be spaced at 9" c.c. At all open joints, bars 5R, 5T, 5U and the ends of bars 5S shall have 2" Min. cover. At all construction joints, bars 5S may be either continuous or spliced. All splices in bars 5S shall be 1'-9" minimum.



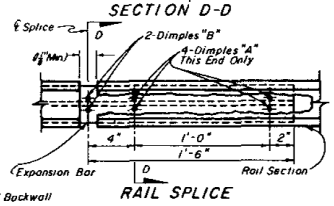








NOTE: At the option of the contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour

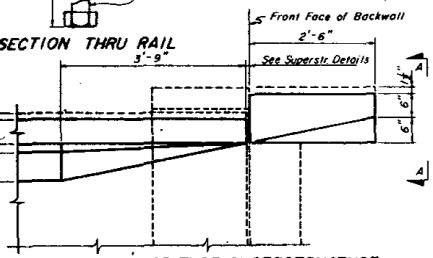


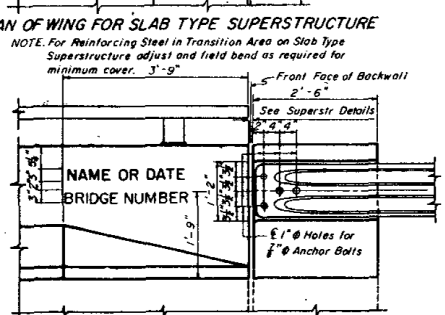
GENERAL NOTES

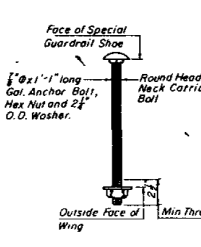
CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
ANCHOR BOLTS: Anchor Bolts, Nuts and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.

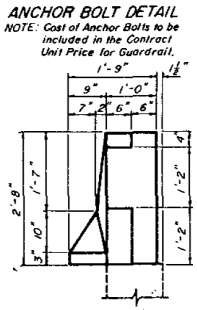
SPECIFICATIONS FOR BRIDGE RAIL

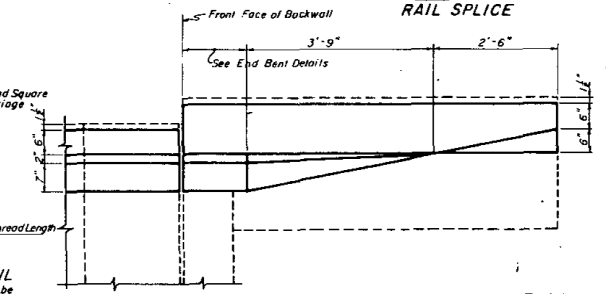
POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S G 70A-F (Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Pa shall be seated on 1/8" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post. Rail expansion joints shall occur in the panel between posts either side of Bridge expansion joints. Rail expansion joints be similar to rail splices with provision for movement equal 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be subm by the contractor for the Engineers approval prior to fabrication.

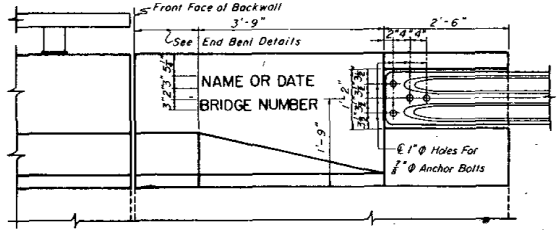


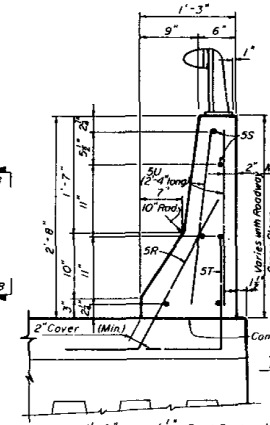


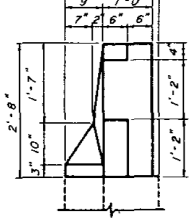


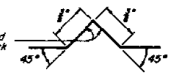












Block Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by 1/4" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS
NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans

REVISIONS	
Date	Description
9/30/74	In reference to 1975 Supplement.
8-23-75	Bridge Number added to Wingwall.

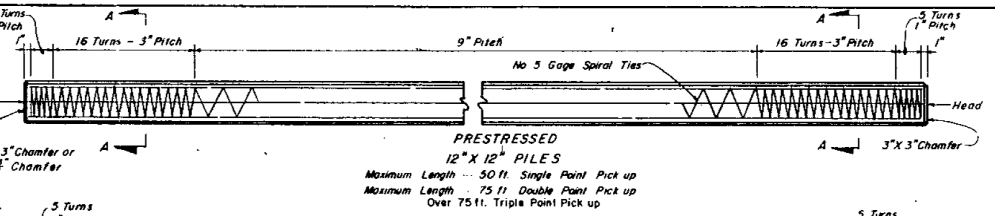
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

SIDEWALK BARRIER

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-35

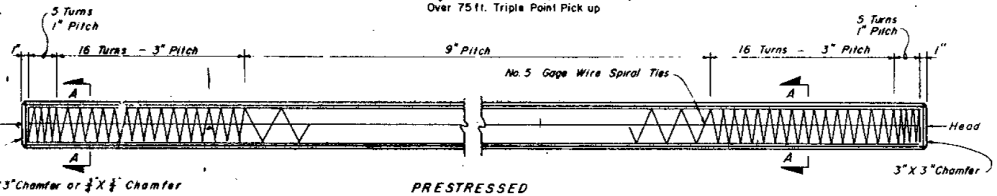
	Names	Dates	APPROVED BY
Designed by	WHD	5-74	T. [illegible]
Checked by	JLM	5-74	
Quantities by			Deputy Design Engineer, Structures
Checked by			Drawing No.
Supervised by	PB		1 of 1

11,

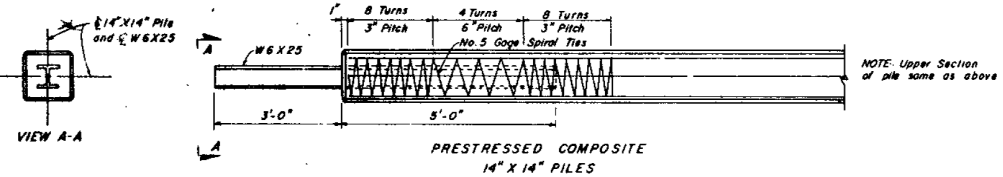


PRESTRESSED
12"X 12" PILES

Maximum Length ... 50 ft. Single Point Pick up
Maximum Length ... 75 ft. Double Point Pick up
Over 75 ft. Triple Point Pick up



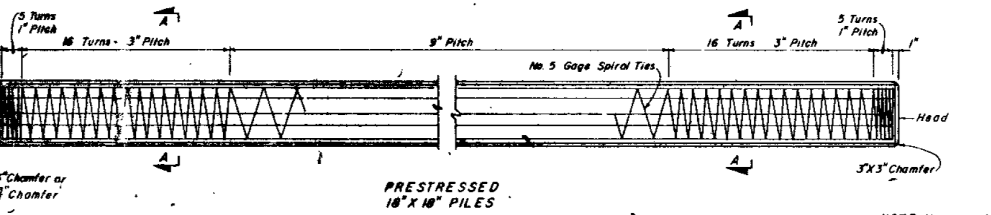
PRESTRESSED
14"X14" PILES



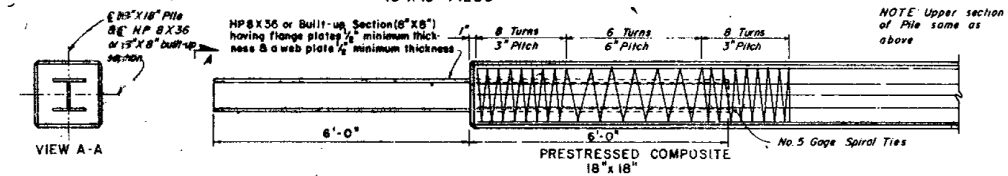
VIEW A-A

PRESTRESSED COMPOSITE
14" X 14" PILES

Maximum Length ... 60 ft. Single Point Pick up
Maximum Length ... 85 ft. Double Point Pick up
Over 85 ft. Triple Point Pick up



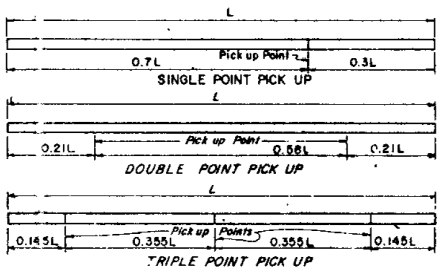
PRESTRESSED
18"X 18" PILES



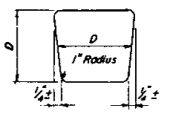
VIEW A-A

PRESTRESSED COMPOSITE
18"X 18"

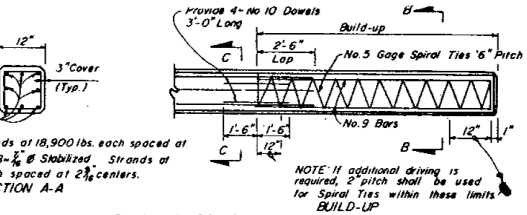
Maximum Length ... 70 ft. Single Point Pick up
Maximum Length ... 95 ft. Double Point Pick up
Over 95 ft. Triple Point Pick up



NOTE: Piles shall be marked at pick up points to indicate proper points for attaching handling lines.

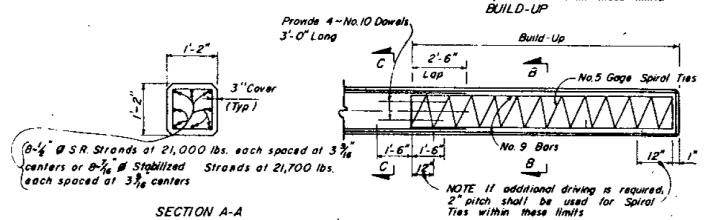


TYPICAL PILE SHAPE
FOR MOLD FORMS



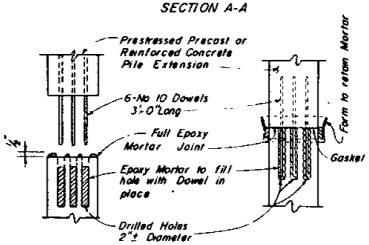
SECTION A-A

BUILD-UP



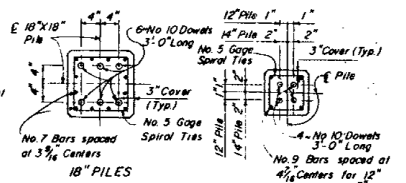
SECTION A-A

BUILD-UP



BEFORE BONDING AFTER BONDING

TYPICAL BONDING DETAILS FOR 18" PILE

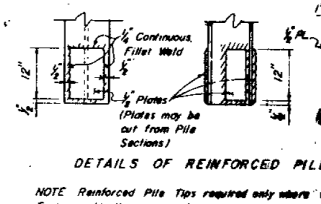


18" PILES

NOTE Spliced Piles may be driven after Splice is two days old.

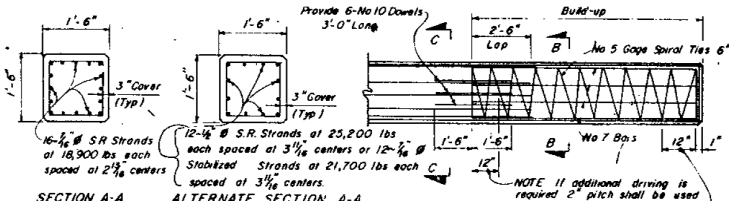
12" & 14" PILES

EPOXY BONDED SPLICE



DETAILS OF REINFORCED PILE

NOTE Reinforced Pile Tips required only where Engineer. At the option of the Contractor and of the Engineer Commercial Tips may be used the Reinforced Pile Tips shown.



SECTION A-A ALTERNATE SECTION A-A

BUILD-UP

SECTION B-B

SECTION C-C

GENERAL NOTES

OCTAGONAL PILES Prestressed Octagonal Piles of equivalent strength may be substituted for square piles Details of Pile shall be submitted to the Engineer for approval.

SPIRAL TIES Each wrap of spiral shall be tied to at least two corner strands.

MATERIAL FOR SPIRAL TIES: Spirals may be manufactured from stock meeting requirements of any grade of reinforcing steel or hard drawn steel.

PILE CUTOFFS In cutting off Concrete Piles an abrasive saw shall be used to score the Concrete at cut off elevation to the approximate depth of Reinforcing Steel.

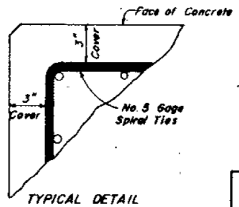
CONCRETE STRENGTH. For Class III Concrete the Cylinder Strength shall be 5,000 p.s.i. minimum at 28 days and 4,000 p.s.i. minimum at transfer of the Prestressing Force.

WEBS: Webs of Wide Flange sections shall be in a vertical position when Composite Pile is cast.

NOTE: All Reinforcing Steel shall be Grade 40 or 60.

APPROVAL: Prior Approval in Writing By the Engineer is Required for Reinforced Concrete Build-Up in Excess of 2'-0". This will not be approved for piles in a coastal environment.

DUNNAGE: Place Dunnage under pick up points shown for double pick up. Where Pile Length exceeds that requiring double point pick up, place dunnage at pickup points called for in Triple Point Pick up.



TYPICAL DETAIL
SHOWING COVER DIMENSION

FLD. ROAD DIV. NO.	STATE	PROJ.
3	FLA.	8801

STATE OF FLORIDA DEPARTMENT OF TRANSP
STRUCTURES

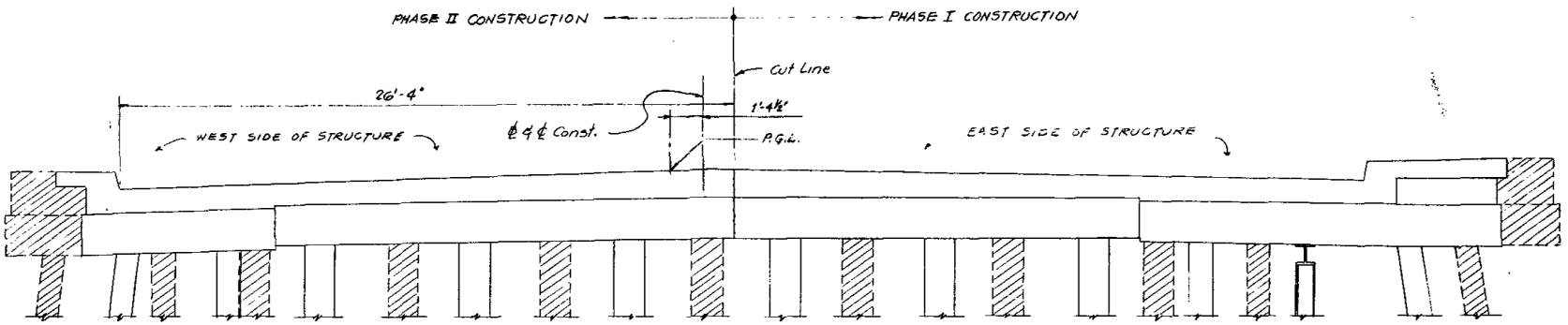
12", 14" AND 18"
PRESTRESSED CONCRETE

REVISIONS			ROAD NO.	COUNTY	
Dates	Descriptions		SR-5	INDIAN RIVER	88010
5-5-75	Revised				
7-22-75	Change Chamfer			Names	Dates
7-28-75	Change Approval Note		Designed by	S.A.B.	5-75
10-8-75	ADD TRIPLE POINT PICK UP		Checked by	L.A.L.	5-75
9-26-76	Change Lo-Steel Strands to Shielded Strands		Quantities by		
			Checked by		
			Supervised by		

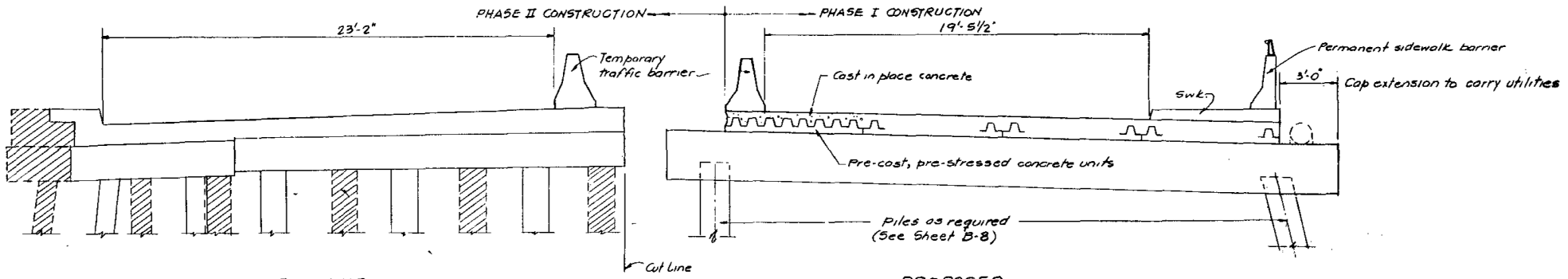
APPROVED BY

Drawing No. 1 of 1

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-351



BRIDGE TYPICAL SECTION
(EXISTING)



LOOKING AHEAD WITH STATION

LEGEND

END BENTS

INTERMEDIATE BENTS

CONSTRUCTION SEQUENCE

1. Install temporary traffic barrier to the West of Center line of Bridge as shown.
2. Remove Eastern section of existing Bridge while maintaining two lanes of traffic in Western portion of Structure.
3. Build Eastern section of proposed structure.
4. Relocate two lanes of traffic to Eastern portion of proposed Structure; remove Western portion of existing Bridge and complete proposed Structure.

CONSTRUCTION SEQUENCE

STATE OF FLORIDA DEPARTMENT OF TRANSPORT
STRUCTURES

STATE ROAD 5 (U.S.1) OVER
MAIN CANAL

ROAD NO.	COUNTY	PROJECT
S.R-5	INDIAN RIVER	88010-3

	Names	Dates
Designed by	NCR	10/77
Checked by	R.P.Jr.	1/78
Quantities by		
Checked by		
Supervised by	NCR	

APPROVED BY

Drawing No. 11 of 11 12

REVISIONS	
Date	Description

PREPARED BY:
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

78 | 1

THIS CONTRACT PLAN SET INCLUDES
SUMMARY OF PAY ITEMS (3 SHEETS)
ROADWAY AND PAVEMENT MARKING PLANS
STRUCTURE PLANS

FOR INDEX OF STRUCTURE PLANS
SEE STRUCTURE PLANS

INDEX OF ROADWAY & PAVEMENT MARKING PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
3	DETAIL SHEET - WARNING DEVICES
4-5	PLAN AND PROFILES
6	CHANNEL CROSS SECTIONS
7	PAVEMENT MARKINGS
8	CONC. APPROACH SLAB-INDEX NO. 12522

ROAD DESIGN STANDARDS (BOOKLET DATED JANUARY 1978)

BGR-01-1	GUARDRAIL CONSTRUCTION (5 SHEETS)
GEC-04	EROSION CONTROL DEVICES, SILT BARRIERS
GSA-01	STANDARD ABBREVIATIONS
GSS-01	STANDARD SYMBOLS FOR KEY MAPS AND PLAN SHEETS (3 SHEETS)
PCG-01	CURB, CURB AND GUTTER

TRAFFIC OPERATIONS STANDARDS (BOOKLET DATED JANUARY 1978)

17346-4	SPECIAL MARKING AREAS (6 SHEETS)
17352	TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKINGS

NOTE: UTILITY ADJUSTMENTS ARE SHOWN ON ROADWAY PLAN AND PROFILE SHEETS.

Total Field Books—

Book Number	Description
019192	Misc. pay item rdwy. book
019203	Align & Ref.
021423	BM's, X-sec, Canal Exc. X-sec
021287	File Data

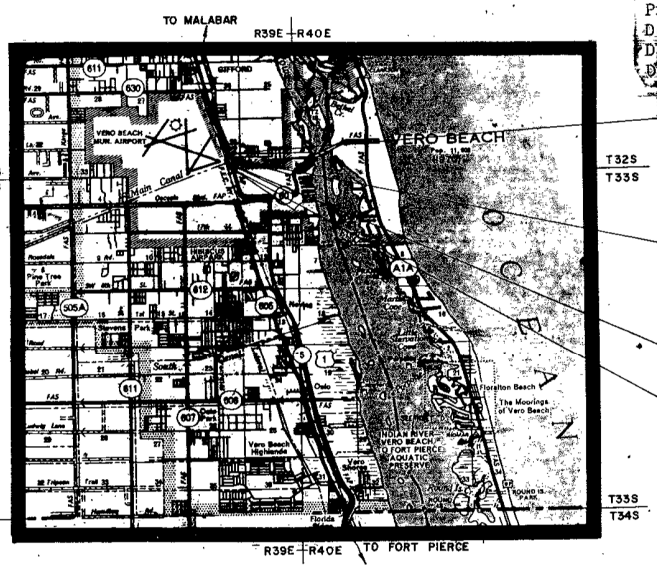
IF ANY
DIRECTLY BEHIND
KEY SHEET

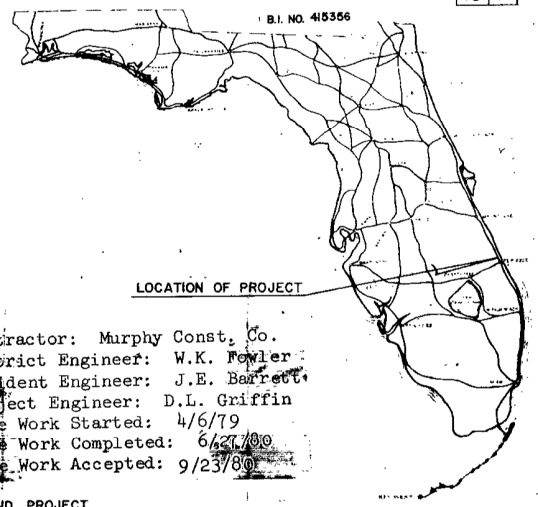
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
AS BUILT PLANS
OF

STATE HIGHWAY

STATE PROJECT NO. 88010-3510
INDIAN RIVER COUNTY

STATE ROAD NO. 5 (US 1)





Contractor: Murphy Const. Co.
District Engineer: W.K. Fowler
Resident Engineer: J.E. Barrett
Project Engineer: D.L. Griffin
Date Work Started: 4/6/79
Date Work Completed: 6/27/80
Date Work Accepted: 9/23/80

END PROJECT
STA. 379+97.00

END BRIDGE 880003
STA 379+27.00

BEGIN BRIDGE 880003
STA 378+13.00

BEGIN PROJECT
STA. 377+13.00

1-MILE

LENGTH OF PROJECT		
	LINEAR FEET	MILES
ROADWAY	170.00	0.032
BRIDGES	114.00	0.021
NET LENGTH OF PROJECT	284.00	0.053
EXCEPTIONS	0.00	0.000
GROSS LENGTH OF PROJECT	284.00	0.053

PROJECT MANAGER: J.L. LOWRY

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA

GOVERNING SPECIFICATIONS: STATE OF FLORIDA, DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1977 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL PROVISIONS FOR THIS PROJECT.

SUBMITTED BY

DIRECTOR OF ROAD OPERATIONS

APPROVED DATE

DIVISION ENGINEER
FEDERAL HIGHWAY ADMINISTRATION

88010-3510

SUMMARY OF ROADWAY PAY ITEMS

ALT	ITEM NUMBER	ITEM		UN IT	88010-3510 FA NON PART				QUANTITY TOTAL
	101- 1-	MOBILIZATION		LS	1.000	✓			1.000
	102- 1-	MAINT OF TRAFFIC		LS	1.000	✓			1.000
	104- 11-	FLOATING SILT BARRIER		LF	110.000	✓			110.000
	110- 1-	CLEARING & GRUBBING		LS	1.000	✓			1.000
	120- 1-	REGULAR EXCAV		CY	465.000	✓			465.000
	120- 5-	CHANNEL EXCAVATION		CY	847.000	✓			847.000
	200- 1- 2	LIMEROCK BASE	(8") (D-CSE)	SY	1112.000	✓			1112.000
	300- 1- 1	BIT MATL	(PRIME COAT)	GA	167.000	✓			167.000
	300- 1- 3	BIT MATL	(TACK COAT)	GA	270.000	✓			270.000
	300- 1- 13	BIT MATL (PLANT MIX)	(ASPH CEM 20)	GA	4647.000	✓			4647.000
	331- 2-	TYPE S-I ASPH CONC		TN	240.000	✓			240.000
	333- 2- 9	TYPE 111 ASPH CONC	(1000 LB STAB)	TN	55.000	✓			55.000
	339- 1-	MISC ASPHALT PAVEMENT		TN	7.000	✓			7.000
	360- 1-	CONC APPRH SLABS		EA	2.000	✓			2.000
	425- 5-	ADJ MANHOLES		EA	1.000	✓			1.000
	520- 1- 10	CONC CURB & GUTTER	(TYPE F)	LF	130.000	✓			130.000
	522- 1-	CONC SIDEWALK	4" THICK	SY	82.000	✓			82.000
	530- 1- 1	RIPRAP (SAND-CEMENT)	(ROADWAY)	CY	7.000	✓			7.000
	536- 1- 1	GUARDRAIL	(RDWY)	LF	237.500	✓			237.500
	536- 6-	END ANCHORAGE ASSEM TYPE II		EA	4.000	✓			4.000
	536- 7-	SPECIAL GUARDRAIL POST		EA	8.000	✓			8.000
	536- 73-	REM OF EXIST GUARDRAIL		LF	125.000	✓			125.000
	570- 2-	SEED & MULCH		SY	62.000				62.000

88010-3510

SUMMARY OF SIGNING PAY ITEMS

A T	ITEM NUMBER	ITEM	UNIT	88010-3510 FA NON PART	QUANTITY TOTAL
	706- 2-	REFLECTIVE PAVEMENT MARKER	EA	77.000	77.000
	710- 4- 41	SOLID TRAFFIC STRIPE (4")	LF	505.000	505.000
	710- 4-181	SOLID TRAFFIC STRIPE ()8")	LF	240.000	240.000
	711- 2-	SKIP TRAFFIC STRIPE, THERMOPLASTIC (4")	LF	1186.000	1186.000
	711- 4-	DIRECTIONAL ARROWS,THERMOPLASTIC	EA	5.000	5.000
	711- 6- 41	SOLID TRAFFIC STRIPE, THERMOPLASTIC (4")	LF	1977.000	1977.000

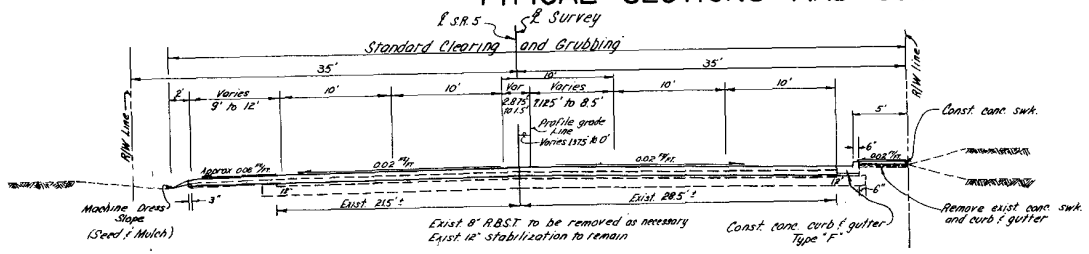
88010-3510

SUMMARY OF BRIDGE PAY ITEMS

ALT	ITEM NUMBER	ITEM		UN	88010-3510 BR # 8800031 FA NON PART	QUANTITY TOTAL
	110- 3-	REM OF EXIST STRUCTURES		LS	1.000	1.000
	400- 2- 4	CLASS II CONC	(SUPERSTRUCTURE)	CY	178.000	178.000
	400- 2- 5	CLASS II CONC	(SUBSTRUCTURE)	CY	111.000	111.000
	400- 5- 4	CONC HANDRAIL	(BARRIER)	LF	114.000	114.000
	400- 5- 5	CONC HANDRAIL	(SIDEWALK BARRIER TYPE)	LF	114.000	114.000
	415- 1- 4	REINF STEEL	(SUPERSTRUCT)	LB	45158.000	45158.000
	415- 1- 5	REINF STEEL	(SUBSTRUCT)	LB	17225.000	17225.000
	450- 71-	RESETTING PREST SLAB UNITS		LF	1100.000	1100.000
	455- 3- 2	PREST CONC PILING FURN	(18" SQ)	LF	1624.000	1624.000
	455- 4- 2	PREST CONC PILING DRIV	(18" SQ)	LF	1624.000	1624.000
	455- 9- 12	UNL TEST PILES	(PREST CONC) (18" SQ)	LF	140.000	140.000
	455- 10- 90	TEST LOADS	(90 TN)	EA	1.000	1.000
	455- 10-110	TEST LOADS	(110 TN)	EA	1.000	1.000
	455- 15-	PREFORMED PILE HOLES		EA	22.000	22.000
	455- 17- 2	PILE SPLICES	(18")	EA	1.000	1.000
	460- 91- 2	EXPANSION JOINT SEAL	(COMPRESSION ELAST)	LF	137.000	137.000
	530- 1- 2	RIPRAP (SAND-CEMENT)	(BRIDGE)	CY	100.000	100.000

TYPICAL SECTIONS AND SUMMARY OF QUANTITIES

STATE PROJ. NO.	SHEET NO.
88010-3510	2



TYPICAL SECTION

Sta. 377+13 to Sta. 377+93
Sta. 379+41 to Sta. 379+97

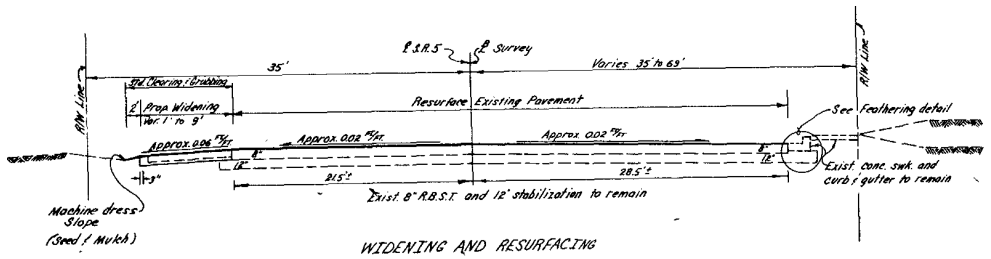
Construct limerock base course (8" thick, double course) primed, with type S-I asphaltic concrete surface course (200 #/SY, double course).

For additional information see Index Nos. BGR-01 & RCG-01

DESIGN SPEED 45 M.P.H.

TRAFFIC DATA

1979 ADT	= 15,000
1987 ADT	= 16,463
1999 ADT	= 18,801
K	= 10%
D	= 55%
24 HR T	8%
Design HR T	1%



WIDENING AND RESURFACING

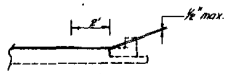
Sta. 375+00 to Sta. 377+13
Sta. 379+97 to Sta. 381+67

LEVELING
Level existing pavement with type III asphaltic concrete (1000 LB STAB)(50 #/SY Avg.)

RESURFACE
Type S-I asphaltic concrete surface course (100 #/S.Y.)

WIDENING
Limerock base course (8" thick, double course) primed, with type S-I asphaltic concrete surface course (200 #/SY, double course)

DESIGN SPEED 45 M.P.H.



FEATHERING DETAIL

NOTES:
1) None of the existing limerock base that is removed is to be used in the construction of new limerock base.
2) For information on Maintenance of Traffic see Bridge Plans.
3) New construction and widening shall be constructed with Type S-I asphaltic concrete surface course (200 #/SY - Double Course), 1ST layer to be (100 #/S.Y.) and the 2ND layer to be constructed along with roadway resurface (100 #/S.Y.)

SUMMARY OF GUARDRAIL

STATION TO STATION		SIDE	LENGTH	END ANCHORAGE	REMARKS
Sta. 377+46.5	Sta. 378+09	Lt.	62.5	1	Guardrail - Bridge
Sta. 377+46.5	Sta. 378+09	Rt.	62.5	1	Guardrail - Bridge
Sta. 379+31	Sta. 379+93.5	Lt.	62.5	1	Guardrail - Bridge
Sta. 379+31	Sta. 379+81	Rt.	50	1	Guardrail - Bridge
Sta. 377+55.5	Sta. 378+18	Lt.	62.5		Remove Guardrail
Sta. 379+23	Sta. 379+85.5	Lt.	62.5		Remove Guardrail
GRAND TOTALS			237.5 L.F. 125 L.F.	4	Const. Guardrail Remove Guardrail

Stationing shown above is approximate. Exact stations to be determined by the Engineer during construction.
Connection of Guardrail to proposed bridge shall be in accordance with Index No. BGR-01
Existing guardrail that is removed shall be delivered by the Contractor To: 5025 - 41ST Street (S. Gifford Rd.) Vero Beach, Florida.

SUMMARY OF EARTHWORK

CHANNEL EXCAVATION	847 C.Y.
REGULAR EXCAVATION	465 C.Y.

PAY ITEM FOOTNOTES:

ITEM NO. 104-11 Included for prevention, control, and abatement of erosion and water pollution and are to be used at locations as directed by the Engineer. Limits shown on plans are approximate only.

ITEM NO. 110-1 Includes the removal of approx. 175 L.F. of conc. curb and gutter and approx. 90 S.Y. of conc. swk.

ITEM NO. 120-1 The pay quantity for this item shall be the plan quantity.

ITEM NO. 331-2 Includes estimated 6 tons for sidestreets.

ITEM NO. 339-1 Included for pavement under guardrail.

ITEM NO. 425-5 Included for the adjustment of the storm sewer manhole at Sta. 380+02

ITEM NO. 530-1-1 Included for the spillway as shown on plans. This is an estimated quantity and is to be increased or decreased as directed by the Engineer.

ITEM NO. 536-7 Included for post placement on approach slabs.

ITEM NO. 570-2 Included in the cost for this item will be approximately 1.3 lbs. grass seed, .05 tons mulch material, .006 tons fertilizer, and 0.13 MG water. Also includes any final dressing that may be needed.

ITEM NO. 706-2 Includes 47 ea. red and colorless and 30 ea. amber & amber (reflective pavement markers).

ITEM NO. 711-6-11 Includes 317 L.F. white and 1080 L.F. yellow.

PLEASE RETAIN THIS SHEET FOR STANDARD MYLAR SHEET YOUR PERMANENT FILES.

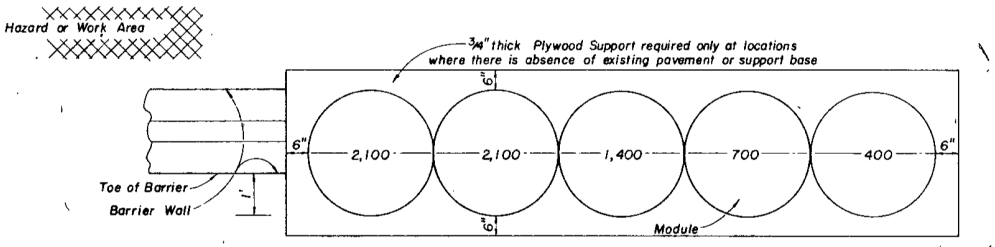
TRAFFIC CONTROL AND SAFE PRACTICES
FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS
FLORIDA DEPARTMENT OF TRANSPORTATION

WARNING DEVICES

PROJ. NO.	SHEET NO.
88010-3510	3

FIGURE 7.3

PLEASE RETAIN THIS SHEET FOR STANDARD PLAN SHEET YOUR PERMANENT FILES.



OFFSET	
"d"	Conditions
6'	Municipal Construction - Low Speed - ADT > 1600
6'	Undivided Highway - Low Speed - ADT < 1600
6'	Undivided Highway - High Speed - ADT < 1600
10'	Undivided Highway - High Speed - ADT > 1600
10'	Divided Highway of Four or More Lanes
10'	Interstate and Other Limited Access Facilities

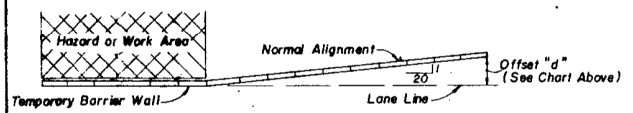
NOTES:
1) Inertial Attenuator to be installed where taper offset from lane line is not obtainable.
2) Number shown inside module indicates the weight in pounds of sand. All modules are approximately 36" inches in height and in diameter.
3) Inertial Attenuator to be installed in accordance with manufacturers specifications and recommendations
4) Module color and marking shall be in accordance with Index No. 17353.
5) Cost of inertial attenuator to be included in the unit cost for Maintenance of Traffic.

TEMPORARY INERTIAL ATTENUATOR

SUMMARY OF MODULES	
WEIGHT	QUANTITY
400 lbs.	1
700 lbs.	1
1,400 lbs.	1
2,100 lbs.	2

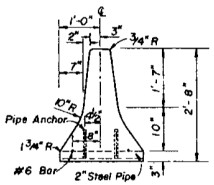
Design Vehicle Wt. 4,500 lbs.
Design Speed 45 m.p.h.
Max. Deceleration 5.96 g's
Avg. Deceleration 4.15 g's

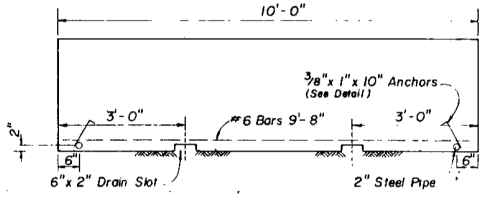
Design Vehicle Wt. 2,000 lbs.
Design Speed 45 m.p.h.
Max. Deceleration 7.06 g's
Avg. Deceleration 4.47 g's



PLAN
WALL ALIGNMENT

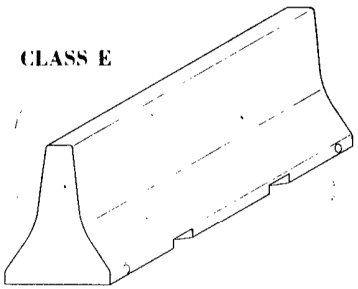
NOTES.
1) For optional wall alignment see detail of temporary inertial attenuator.
2) Temporary barrier to be placed as shown in the plans or as directed by the Engineer.
3) For additional information refer to charts I, II and III in the manual of Traffic Control and Safe Practices.
4) Sections of temporary barrier wall shall be set end-to-end as close together as feasible to form a continuous barrier.
5) Temporary barrier wall shall be delineated by steady burn type "C" lights on 50' centers.
6) For additional information on barrier wall placement see construction sequence on Bridge Plans.





PRECAST WALL UNIT

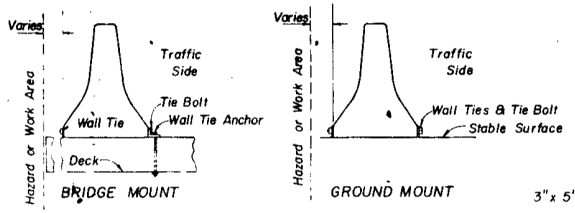
The contractor shall pick up wall units (furnished by D.O.T.) at the D.O.T. Fort Pierce maintenance yard, 3601 Oleander Ave, Fort Pierce. The contractor shall also return the wall units to the Fort Pierce maintenance yard. (Approx. 45 units will be available.) Cost to be included in Pay Item 102-1.



CLASS E

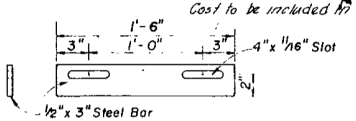
TEMPORARY BARRIER WALL

Wall ties, wall tie anchors and wall tie bolts, are to be furnished by the Contractor and shall become the property of D.O.T. at the completion of the project, and shall be stockpiled as directed by the Engineer.

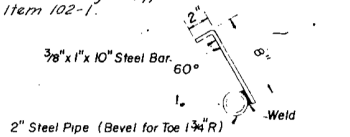


WALL CONNECTION & ANCHORAGE

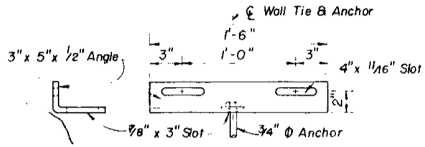
Anchor shall have a pullout and shear capacity of 14,000 lbs. After construction is complete anchor shall be removed to 1" min. below slab surface and hole filled with grout.



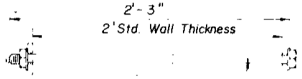
WALL TIE



WALL LIFT PIPE & ANCHOR



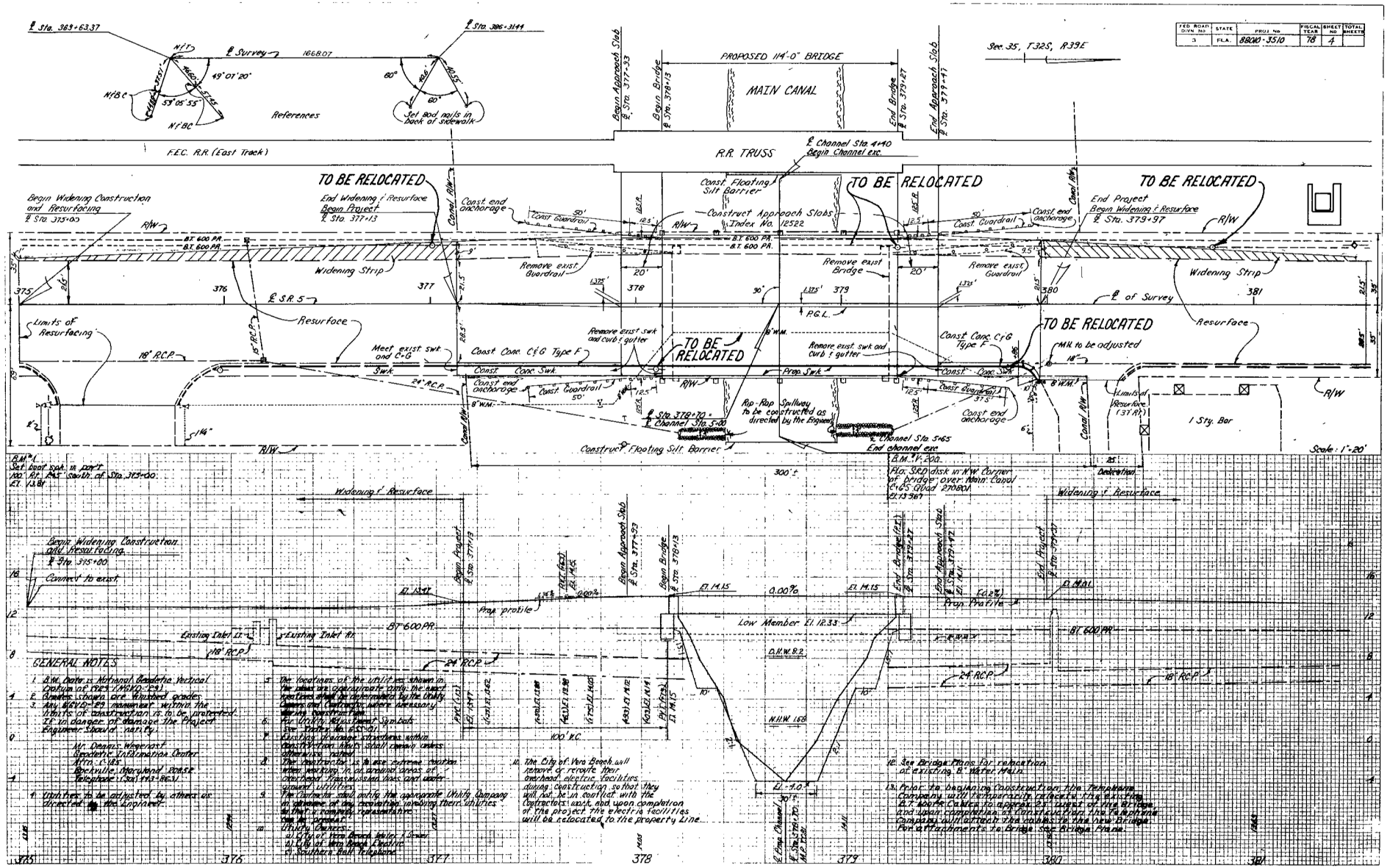
WALL TIE & ANCHOR



WALL TIE BOLT

Approved

Revised Date 10-1-77



FED. ROAD DIVN. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
3	FLA.	8800-3510	78	4	

GENERAL NOTES

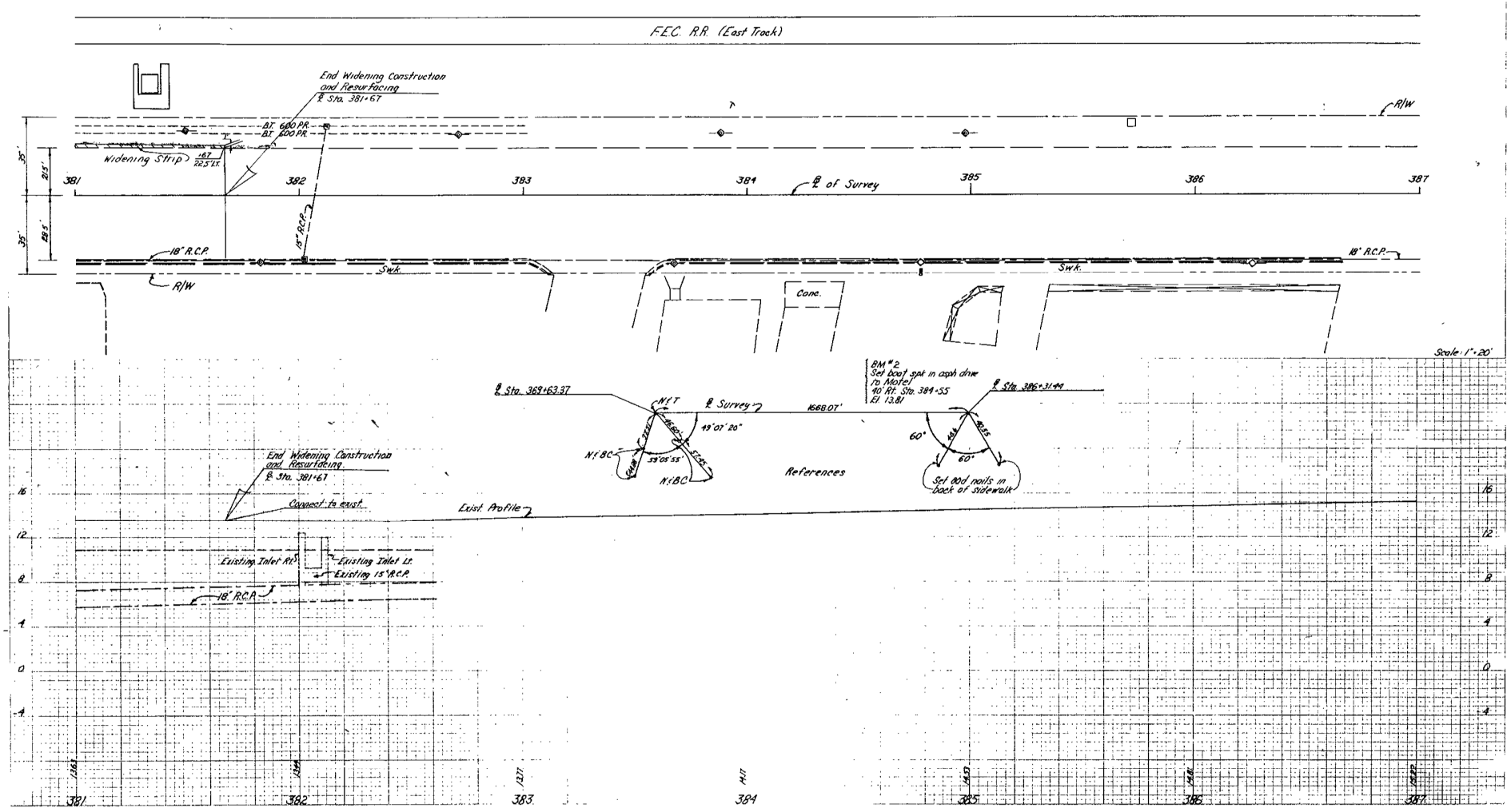
1. B.M. Datum is National Geodetic Vertical Datum of 1929 (NGVD-'29)
2. Erosion Control are Washed grades.
3. Any NGVD-'29 monument within the limits of construction is to be protected. If in danger of damage the Project Engineer should notify:

   Mr. Dennis Wagenhoff
   Geodetic Information Center
   Attn.: C 183
   Rockville, Maryland 20852
   Telephone: (301) 443-8631

4. Utilities to be adjusted by others as directed by the Engineer.
5. The locations of the utilities shown on the plans are approximate only. The exact locations shall be determined by the Utility Owners and Contractor where necessary during construction.
6. For Utility Adjustment Work Plan Sheet No. 4
7. Existing drainage structures within the right-of-way shall remain unless otherwise noted.
8. The Contractor is to use extreme caution when working in or crossing areas of underground transmission and distribution utilities.
9. The Contractor shall notify the appropriate Utility Company in advance of any excavation involving their utilities so that a mutually satisfactory time may be arranged.
10. Utility Contacts:
    a) City of Vero Beach Water & Sewer
    b) City of Vero Beach Electric
    c) Southern Bell Telephone
11. The City of Vero Beach will remove or relocate their overhead electric facilities during construction so that they will not be in conflict with the Contractor's work and upon completion of the project the electric facilities will be relocated to the property line.
12. See Bridge Plans for renumbering of existing 8" Water Main.
13. Prior to beginning Construction the Telephone Company will temporarily relocate the existing B.T. 600 PR Cables to approx. 25' West of their present location and upon completion of Construction the Telephone Company will attach the cables to the new Bridge. For Attachments to Bridge see Bridge Plans.

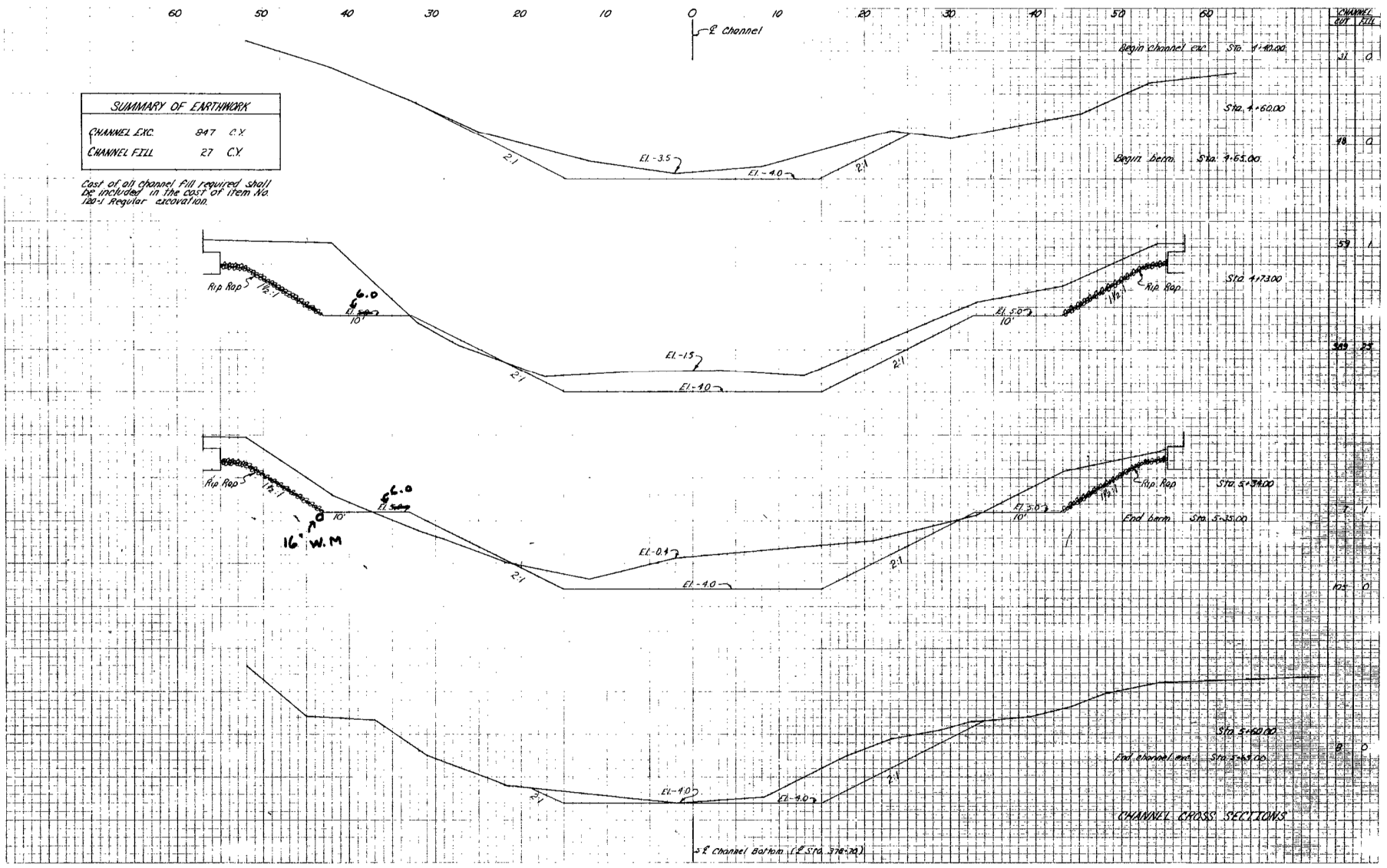
FED. ROAD CONTR. NO.	STATE	PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
3	N.C.	8810-3510		5	

See 35, T32S, R39E

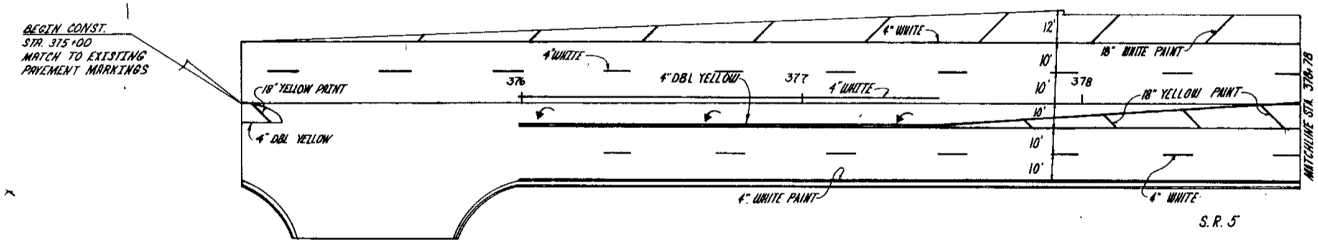


Fed. Road Dist. No.	State	County	Proj.	Proj. No.	Sheet No.
3	Fla.	Indian River	5	88010-3510	6

CROSS SECTIONS

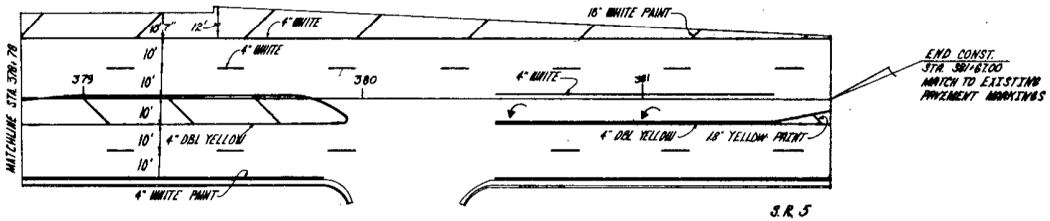


FED. ROAD DIV. NO.	STATE	PROJECT NO.	FEDERAL AID PROJ. NO.	SHEET NO.
9	FLA.	86010-3570		7

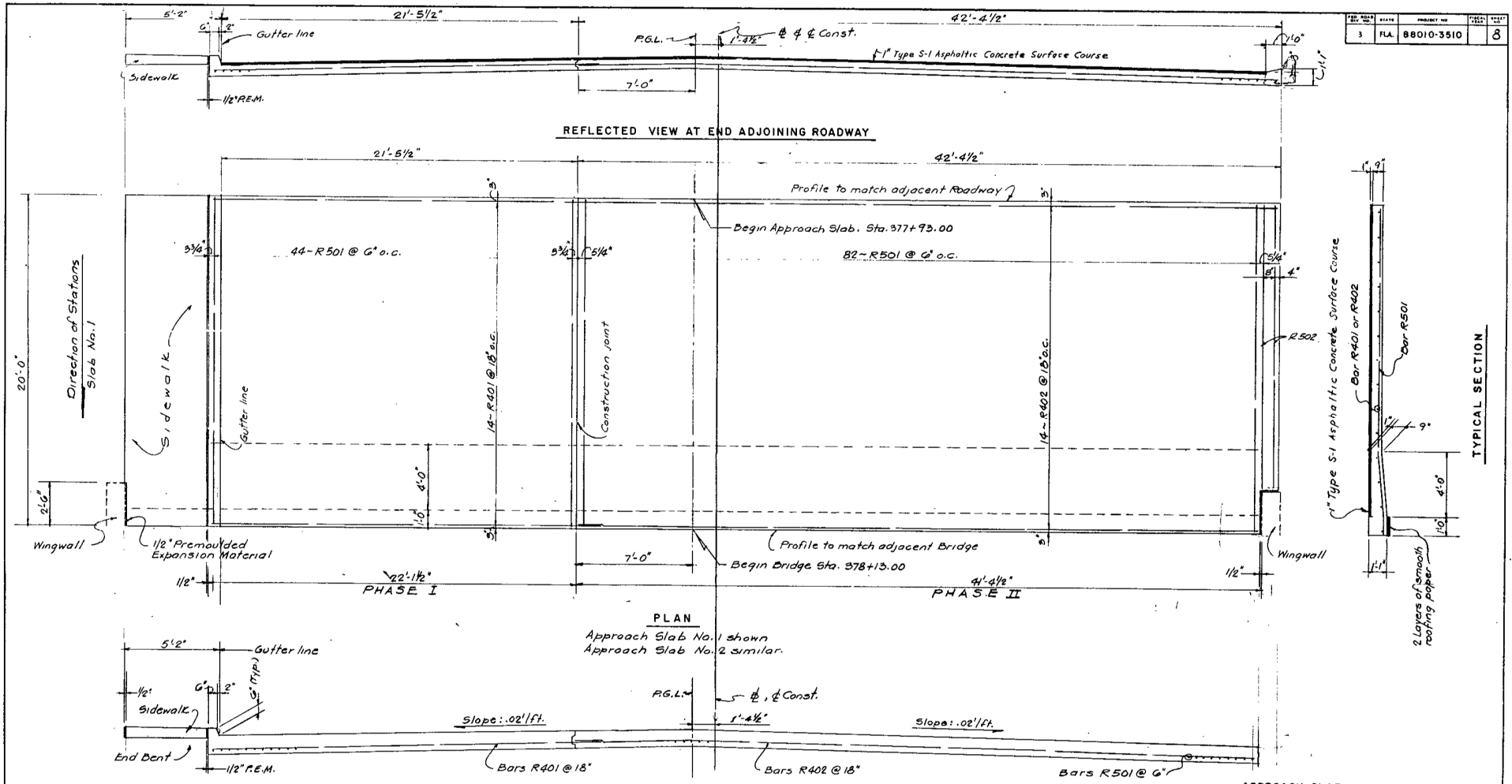


SCALE: 1" = 20'

NOTE: ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC UNLESS OTHERWISE SPECIFIED



FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		8



BILL OF REINFORCING STEEL *				
MARK	SIZE	LENGTH	NO. REQD.	TYPE
R401	4	25'-5"	14	Str.
R402	4	41'-9"	14	"
R501	5	19'-6"	126	"
R502	5	17'-0"	2	"

ESTIMATED QUANTITIES *		
ITEM	UNIT	QUANTITY
Class II Concrete	C.Y.	38.41
Reinforcing Steel	Lbs.	3208

* Bill of Reinforcing Steel and Estimated Quantities are for one Approach Slab only. 2 Required. Sidewalk Quantities are not included.

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

REVISIONS	
Date	Description

APPROACH SLAB

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

	Name	Date	APPROVED BY
Designed by	NCR	11/77	
Checked by	RPT	1/78	
Quantities by	NCR	11/77	Deputy Bridge Engineer, Structures
Checked by	RPT	1/78	
Supervised by	NCR		Drawing No. 1 of 1 — Index No. 12522

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-1

ESTIMATED BRIDGE QUANTITIES *

ITEM NO.	ITEM	UNITS	QUANTITIES
110-3 ▲	Removal of Existing Structure	L.S.	1
400-2-5	Class II Concrete (Substructure)	C.Y.	111
400-2-4	Class II Concrete (Superstructure)	C.Y.	178
400-5-4	Concrete Handrail (Barrier)	L.F.	114
400-5-5	Concrete Handrail (Sidewalk Barrier Type)	L.F.	114
415-1-4	Reinforcing Steel (Superstructure)	Lb.	45,158
415-1-5	Reinforcing Steel (Substructure)	Lb.	17,225
450-71 ***	Resetting Pre stressed Slab Units	L.F.	1,100
455-3-2	Pre stressed Concrete Piling Furnished (18"□)	L.F.	1,624
455-4-2	Pre stressed Concrete Piling Driven (18"□)	L.F.	1,624
455-9-12	Unloaded Test Piles (Pre-stressed Conc.)(18"□)	L.F.	140
455-10-90	Test Load (90 Tons)	Ea.	1 **
455-10-110	Test Load (110 Tons)	Ea.	1 **
455-15	Pre formed Pile Holes	Ea.	22
455-17-2	Pile Splices (18")	Ea.	1
460-91-2	Expansion Joint Seal (Compression Elast.)	L.F.	137
530-1-2	Rip Rap (Sand-Cement)(Bridge)	C.Y.	100

▲ Approx. 7,015 S.F. of Cast in Place Slab Bridge.
* Does not include Quantities for Approach Slab
** The number of test loads may be increased or omitted as directed by the Engineer.

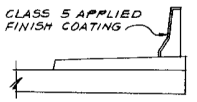
INDEX OF BRIDGE SHEETS

B-1 Summary of Quantities, Index of Drawings, General Notes and Rip-Rap details.
B-2 General Plan and Elevation.
B-3 Bridge Design Data Sheet.
B-4 Soils Data.
B-5 Pile Layout and Finish Grade Elevations.
B-6 End Bents 1 and 5. Plan and Elevation.
B-7 End Bents 1 and 5. Sections and Details.
B-8 Interior Bents 2, 3 and 4.
B-9 Superstructure. Spans 1 thru 4.
D-10 Superstructure Details.
B-11 Concrete Handrail Barrier. (Index 11.407)
B-12 Sidewalk Barrier. (Index 11.460)
B-13 12", 14" and 18" Prestressed Concrete Piles. (Index 3400)
B-14 Construction Sequence.

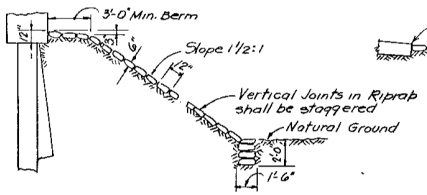
*** The Prestressed Slab Units shall be furnished by the Department of Transportation and shall be picked up by the Contractor at the Ft. Myers Maintenance Yard, 702 Pine Island Road (S.R.78), Ft. Myers, Florida and transported to the job site. The Contractor shall notify Mr. D.M. Heflin, Post Office Box "M", Ft. Myers, Florida, 33902, Phone No. (813) 995-5403 two (2) weeks in advance of the intended date for picking up the Prestressed Slab Units. The cost of picking up the Prestressed Slab Units, transporting them to the job site, and the cost of any necessary cleaning and repairs so that the Units may be used in the proposed structure shall be included in the Contract Unit Price for "Resetting Pre stressed Slab Units."

GENERAL NOTES

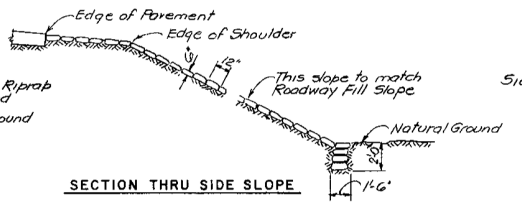
GENERAL SPECIFICATIONS: Florida Department of Transportation Standard Specifications for Road and Bridge Construction (1977) & 1978 Supplement.
DESIGN SPECIFICATIONS: Designed in accordance with the 1973 edition of A.A.S.H.O. Standard Specifications for Highway Bridges and approved revisions.
DESIGN LOADING: HS 20-44 Roadway.
60 P.S.F. Sidewalk.
MATERIAL STRESSES: All allowable stresses are in accordance with the 1973 edition of the A.A.S.H.O. Standard Specifications for all the materials shown on plans.
Maximum working stresses for Concrete: Class II 1360 p.s.i. Class III 2000 p.s.i.
Class II 2200 p.s.i.
REINFORCING STEEL: Grade 60, except pre-stressed concrete piles may be Grade 40.
CONCRETE STRENGTH: (28 days): Class II 3400 p.s.i., Class III 5000 p.s.i. and Class III 5500 p.s.i.
SURFACE FINISH: All surfaces shown in detail below, including top and inside face of End Bent wingwalls, shall receive a Class 5 applied finish coating.
ENVIRONMENT: Non-Coastal.



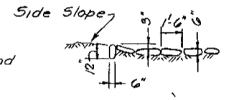
DETAIL SHOWING LOCATION OF APPLIED FINISH COATING



SECTION THRU FORWARD SLOPE



SECTION THRU SIDE SLOPE



SECTION THRU ENDS

RIP - RAP DETAILS

BUDGET ITEM 415356
BRIDGE NO. 88000-3

SUMMARY OF QUANTITIES, INDEX OF DRAWINGS, GEN. NOTES & RIP-RAP DETAILS.

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

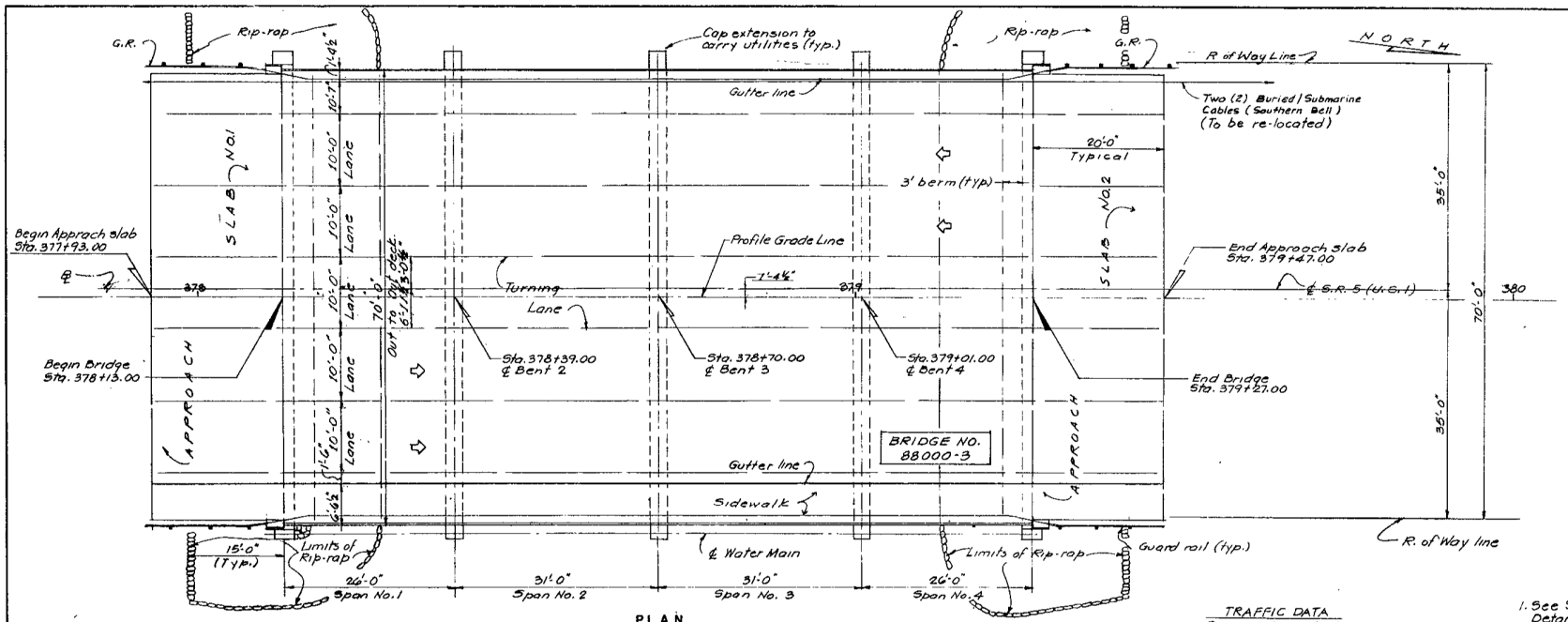
REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions	SR-5	INDIAN RIVER	88010-3510

	Names	Dates
Designed by	N.C.R.	Nov. 77
Checked by	R.P.Ta	JAN-78
Quantities by	N.C.R.	NOV-77
Checked by	R.P.Ta	JAN-
Supervised by	N.C.R.	

APPROVED BY: T. Adkins
District Design Engineer, Structures
Drawing No. 1 of 11
Index No. 12521

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA - FLORIDA

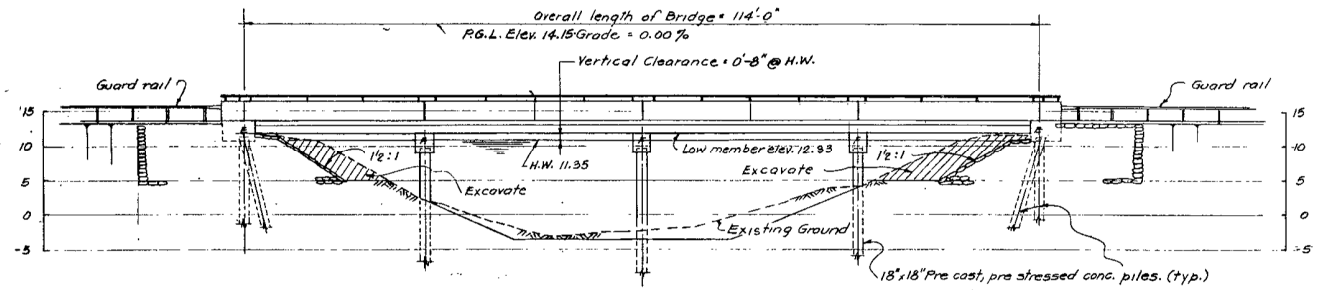
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-2



PLAN

TRAFFIC DATA
Design Speed: 45 M.P.H.

1. See Sh. B-1 for General Notes, Details of Rip-rap and Summary of Quantities.
2. See Sh. B-4 for Soils Data.
3. Existing cast in place concrete bridge to be removed. (2 Phases)
4. See Sh. B-14 for Construction Sequence.
5. Exact location uncertain - Contact Cable Location Bureau toll free 1-800-432-4770



ELEVATION

NOTE: Drive one unloaded test pile 45 Ft. long (18"ø) in each Bent 1 and 5, and one unloaded test pile 50 Ft. long (18"ø) in Bent No.3, in the position of a permanent plumb pile located as directed by the Engineer.

BUDGET ITEM 415356
BRIDGE NO. 88000 3
GENERAL PLAN AND ELEVATION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

	Names	Dates
Designed by	N.C.R.	Nov. 77
Checked by	R.P.	11-78
Quantities by	A.	10-77
Checked by		Jan. 78
		R.

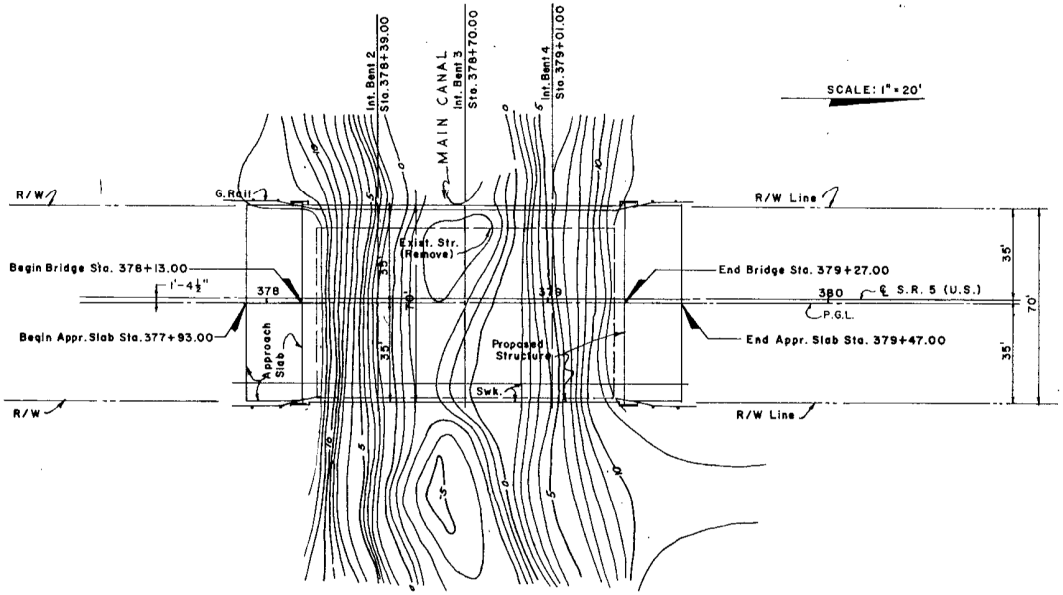
APPROVED BY
Deputy Design Engineer, Structures

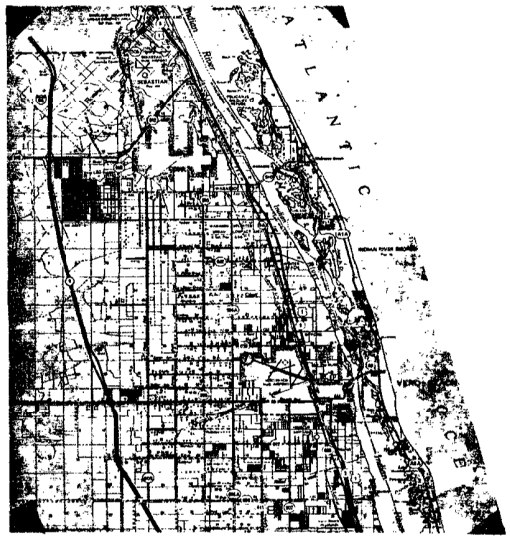
Drawing No. 2 of 11
Index No. 12521

REVISIONS	
Date	Description

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA FLORIDA

FED. ROAD DIV. NO.	STATE	PROJECT No.	FISCAL YEAR	SHEET No.
3	FLA.	88010- 3510		B-3

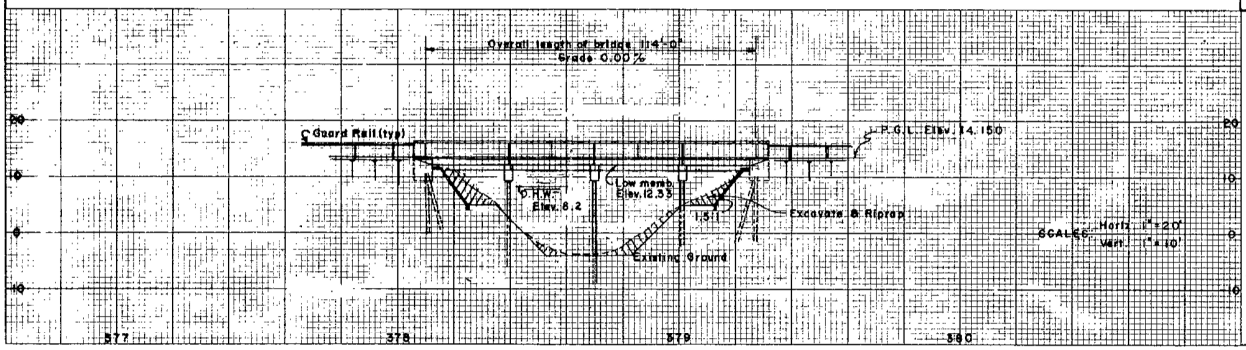




DRAINAGE AREA & LOCATION

EXISTING STRUCTURES

(REFERENCE)	(1)	(2)	(3)	(4)	(5)
FOUNDATION	Conc. Piles				
OVERALL LENGTH	105' 6"				
SPAN LENGTH	5@15' 2@15'3"				
TYPE CONSTRUCTION	Conc.				
SIDEWALKS					
ROADWAY WIDTH	54'				
ELEV LOW MEMBER	12.33				



DESIGN DATA

STRUCTURE RECOMMENDATIONS
1. LOADING HS-20-44
2. BRIDGE ROADWAY WIDTH 62 FT. 1"
3. SIDEWALKS 5'-0" Rt.

DRAINAGE RECOMMENDATIONS
1. BEGIN BRIDGE STATION 378+13.00 END BRIDGE STATION 379+27.00
2. CENTERLINE GRADE ELEVATION 14.15
3. BRIDGE SKEW ANGLE NONE
4. CHANNEL BOTTOM, WIDTH 30'± ELEVATION -4.0 SIDE SLOPES 2:1 approx.
   CENTERLINE CHANNEL BOTTOM, STATION 378+70
   LIMITS OF CHANNEL EXCAVATION RT. R/W LT. R/W
5. CLEARANCE: NAVIGATION: HORIZ. N.A. DRIFT: HORIZ. 15' Min.
   VERT. N.A. ABOVE EL. N.A. VERT. 3.0 ABOVE EL. 8.2
6. DRAINAGE AREA 25 Sq. Miles *
7. WATER STAGE DATA: MAX. STAGE OF RECORD DESIGN H.W. NORMAL FLOW ELEV.
   ELEVATION 7.5-8 8.2 1.58
   DATE OF OCCURRENCE unknown " "
   RECURRENCE INTERVAL " 50 Years
8. DESIGN DISCHARGE 2264 CFS SOURCE Indian River Farms Drainage District & Corps of Engineers
   RECURRENCE INTERVAL 50 YEARS Ft. Drum Study.
9. DESIGN VELOCITY 3.8 FPS

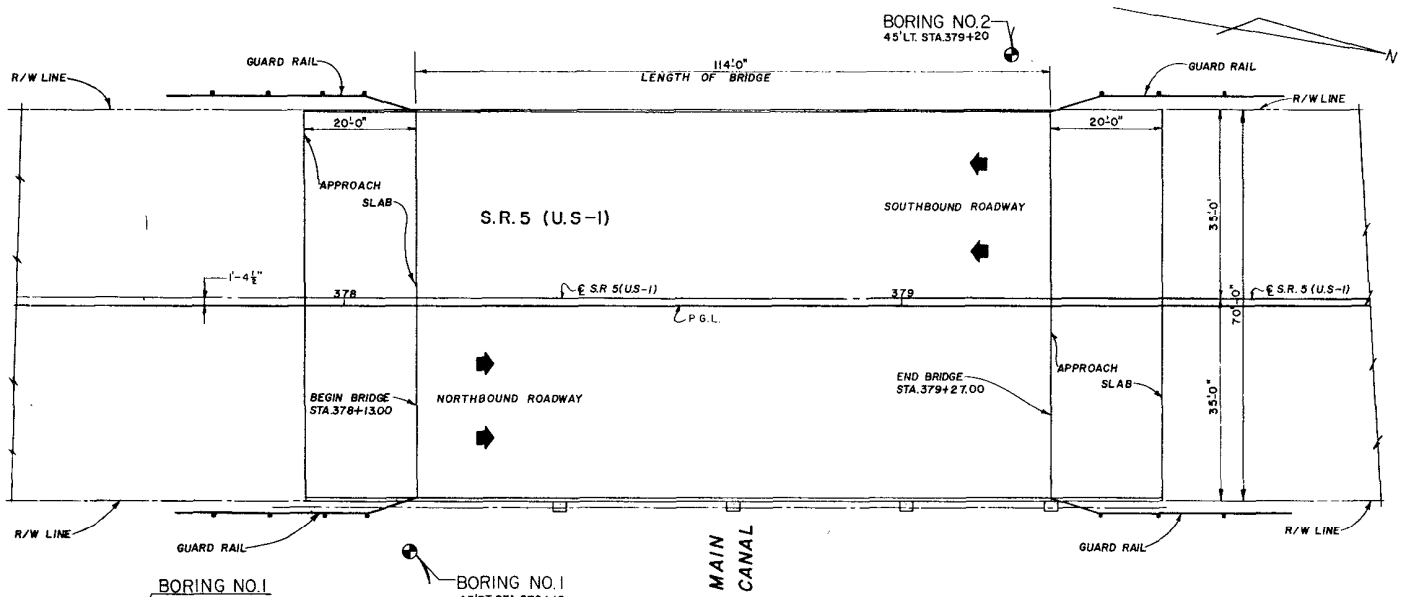
REMARKS: Construct Berm at El. 5.0
* U.S.G.S. report indicates drainage area is indeterminate. D.A. determined by I.R.F.D.D. (Approx.)
There is a saltwater intrusion barrier 4650 ft. east of bridge Elev. 12 ± m.s.l.

BASIC FLOOD (100YR) DATA:
Q100 = 2504 Cfs
EHW = +8.6 MSL

RECOMMENDED DISTRICT DR. ENGR. [signature] 3/20/70
APPROVED ENGINEER OF DRAINAGE

BRIDGE DESIGN DATA SHEET DRAWING NO. 5761 12571 DD IB

STATE	PROJECT No.	FISCAL YEAR	SHEET No.
FLA.	88010-3510		84



NOTES

DUE TO CORE BORING LOCATIONS AND PROCEDURES, STRATA MAY DIFFER WITH SOIL PROFILE.

DEPTHS GIVEN IN DISTANCE BELOW EXISTING GROUND.

NUMBERS TO LEFT OF BORING INDICATE BLOWS ON SPOON FOR 12" PENETRATION.

SPOON: INSIDE DIAMETER 1⅜"
OUTSIDE DIAMETER 2"

HAMMER: WEIGHT 140#
DROP 30"

LEGEND

- ▼ WATER LEVEL
- FINE SILICA SAND WITH LIMEROCK FRAGMENTS
- FINE SILICA SAND
- FINE SILICA SAND WITH SHELL
- CLAYEY SAND WITH SHELL FRAGMENTS

BORING LOCATION PLAN

SCALE 1"=10 FT.

BORING NO.1

ELEV.+13.0'

ELEVATION (FT.)	N	
13	7	DARK GRAY SAND WITH SOME LIMEROCK FRAGMENTS, GAP GRADED, LOOSE, DRY, SUBROUNDED TO ANGULAR.
8	5	GRAY TO BROWN SAND POORLY GRADED, LOOSE, DRY, SUBROUNDED.
3	9	
-2	38	GRAY SAND WITH SHELL, GAP GRADED, DENSE, WET, SUBROUNDED TO ANGULAR.
-7	39	
-12	20	
-17	29	DARK GRAY TO DARK BROWN SAND, POORLY GRADED, DENSE, WET, SUBROUNDED.
-22	40	
-27	31	
-32	41	
-37	36	DARK GRAY SAND WITH SHELL, GAP GRADED, DENSE, WET, SUBROUNDED TO ANGULAR.
-42	44	
-47	35	
-52	41	
-57	42	
-62	36	
-67	39	
-72	32	
-77	39	
-82	33	
-87	53	DARK GRAY CLAYEY SAND WITH SHELL FRAGMENTS, GAP GRADED, DENSE, WET, SUBROUNDED TO ANGULAR.
-92	33	
-97	46	
-102	44	
-107	50/5	
-110	29	TERMINATED 75.0'

BORING NO.2

ELEV.+11.0'

ELEVATION (FT.)	N	
11	7	BROWN SAND WITH TRACE OF LIMEROCK FRAGMENTS, GAP GRADED, LOOSE, DRY, SUBROUNDED TO ANGULAR.
6	5	
1	12	GRAY SAND, POORLY GRADED, LOOSE TO COMPACT, DRY, SUBROUNDED.
-4	21	
-9	38	BROWN TO GRAY SAND WITH SHELL, GAP GRADED, DENSE, TO LOOSE, SUBROUNDED TO ANGULAR.
-14	21	
-19	41	
-24	38	
-29	11	BROWN SAND, POORLY GRADED, COMPACT, WET, SUBROUNDED.
-34	20	
-39	32	
-44	34	
-49	32	
-54	31	
-59	39	
-64	33	
-69	40	
-74	38	GRAY SAND WITH SHELL, GAP GRADED, DENSE, WET, SUBROUNDED TO ANGULAR.
-79	34	
-84	37	
-89	30	
-94	44	
-99	41	
-104	44	
-109	34	
-112	30	TERMINATED 75.0'

SCALE: 1"=10 FT. (VERT.)

ELEVATION (FT.): 30, 20, 10, 0, -10, -20, -30, -40, -50, -60, -70

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
REPORT OF CORE BORINGS FOR STRUCTURE

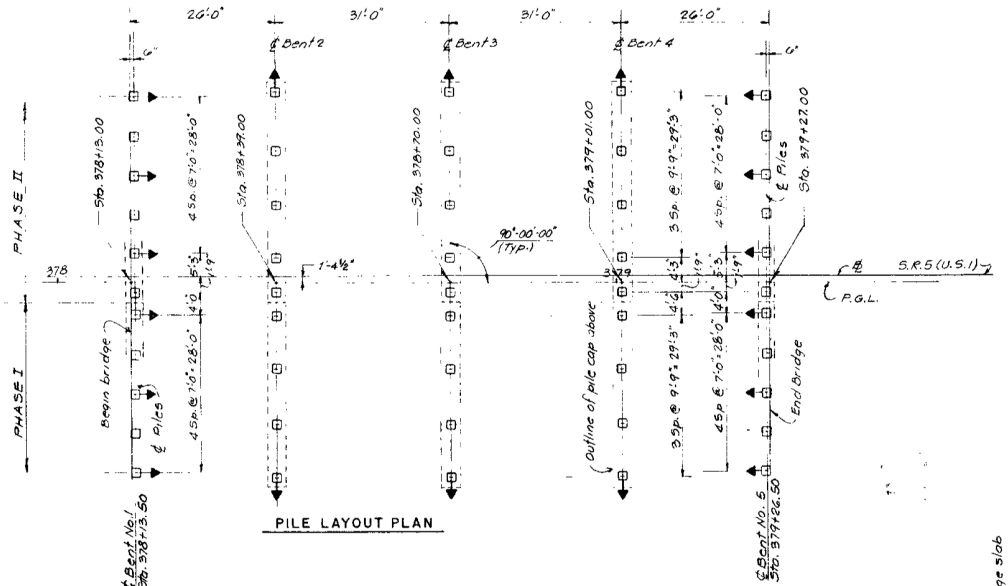
SR5 (U.S.1) OVER MAIN CANAL (BRIDGE NO.3)

PROJ. NO. 99004-3511
BRIDGE NO. 88000 3
COUNTY: INDIAN RIVER

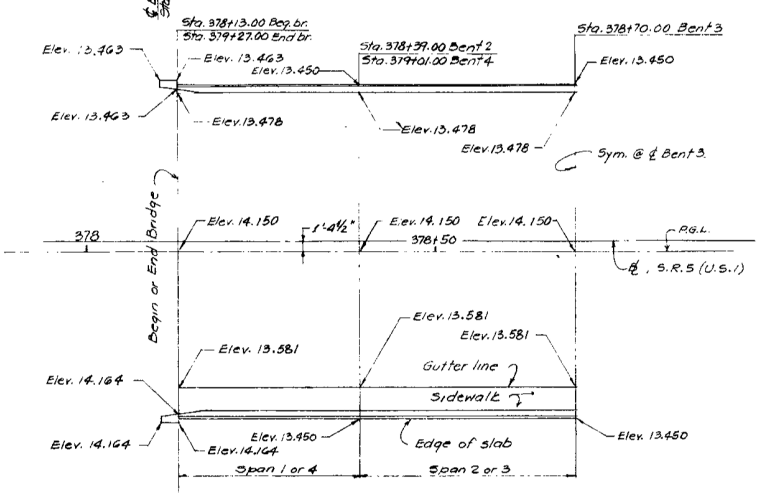
BORING DATE: 1/9 – 1/11/78
BORINGS BY: HAIRE & CONWAY
SUBMITTED BY: FLORIDA TESTING & ENGINEERING

APPROVED	DRAWING NO.	INDEX NO.
	4 of 11	12521

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-5

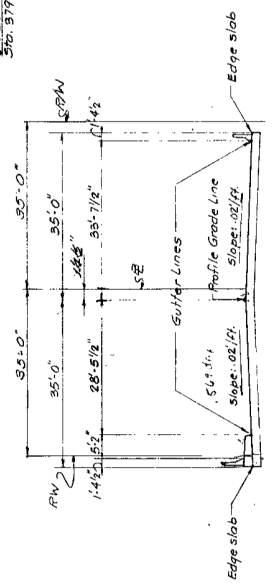


PILE LAYOUT PLAN



HALF PLAN

FINISH GRADE ELEVATIONS



SECTION THRU ROADWAY SHOWING LOCATION OF ELEVATIONS

NOTES:

◀ Indicates battered piles.
End Bent batter : 2" per foot.
Int Bent batter : 1½" per foot.
All piles to be 18"x18" Pre-stressed pre-cast concrete.
Pile Loads: End Bents 45 TONS
Int. Bents 55 TONS
Pile Cut-Off Elev.: End Bents 1 & 5 = 10.825
Int. Bents 2, 3 & 4 = 10.825

PILE LAYOUT & FINISH GRADE ELEVATIONS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	SR-5	INDIAN RIVER	88010-3510

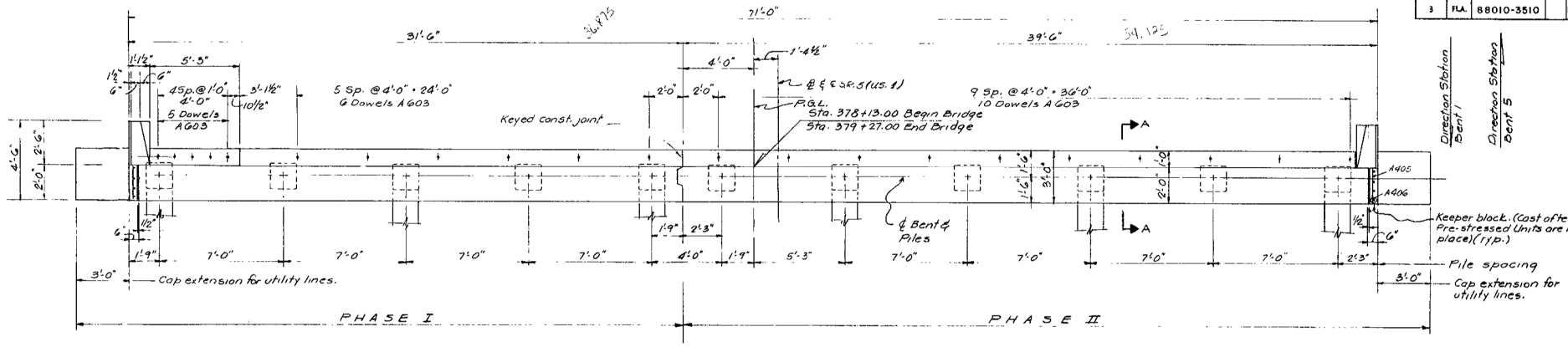
	Name	Date
Designed by	H.C.E.	11/77
Checked by	E.P.T.E.	1/78
Quantities by	H.C.E.	11/77
Checked by	E.P.T.E.	1/78
Supervised by	H.C.E.	

APPROVED BY
County Design Engineer, Structures

Drawing No. 5 of 11 | Index No. 12521

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-6



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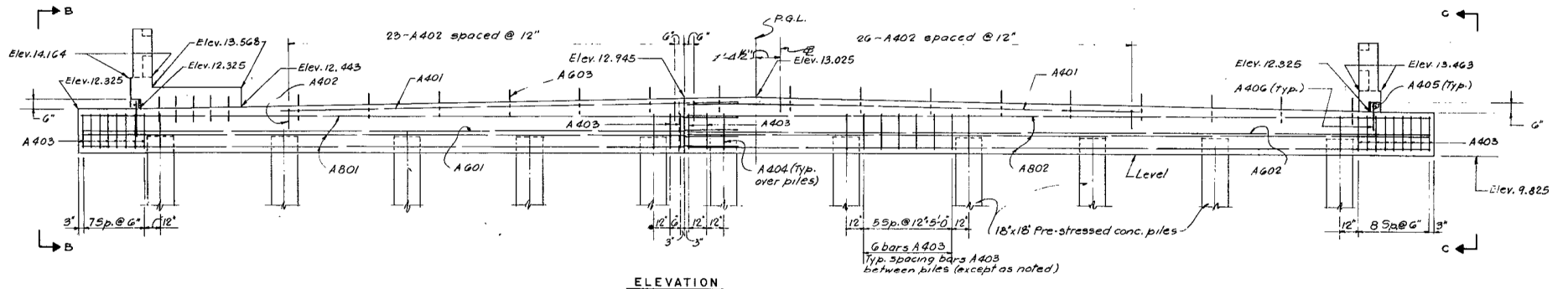

ELEVATION

NOTES.
Design Load for Piles = 45 Ton
For Barrier details see Sh. B-11
For General Notes see Sh. B-1

END BENTS 1 & 5. PLAN & ELEVATION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	SR-5	INDIAN RIVER	88010-3510

	Name	Date
Designed by	N.C.R.	Nov. 77
Checked by	R.P.JR	JAN 78
Quantities by	N.C.R.	Nov. 77
Checked by	R.P.JR	JAN 78
Supervised by	N.C.R.	

APPROVED BY

Deputy Design Engineer, Structures

Drawing No. 6 of 11 | Index No. 12521

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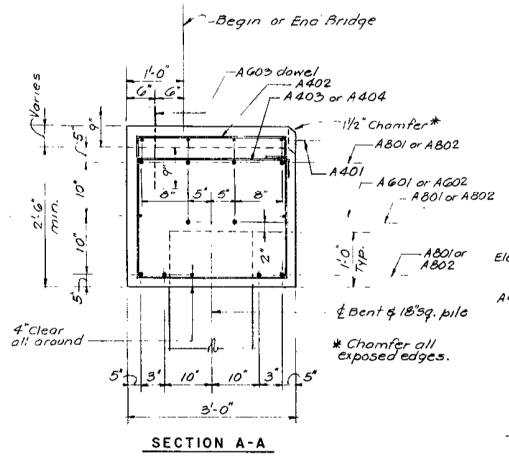
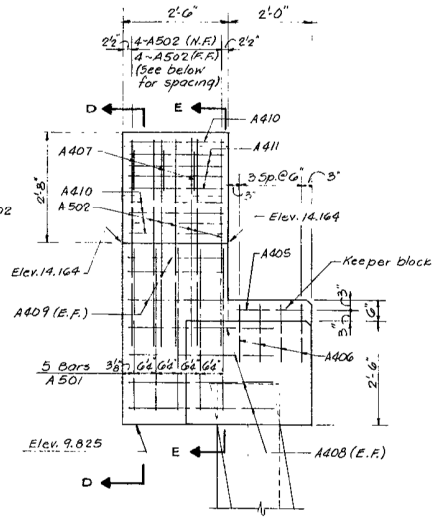
LAUDERDALE BY THE SEA, FLORIDA

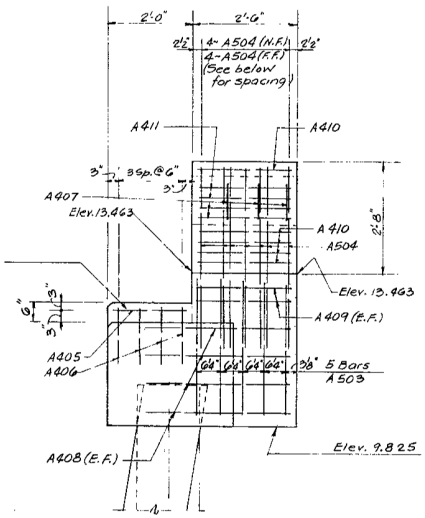
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-7



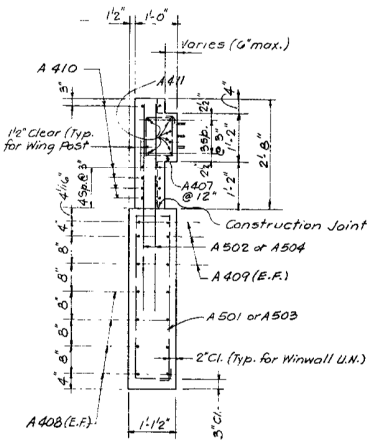
SECTION A-A



ELEVATION B-B



ELEVATION C-C



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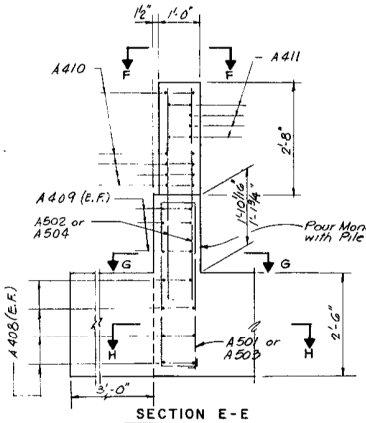

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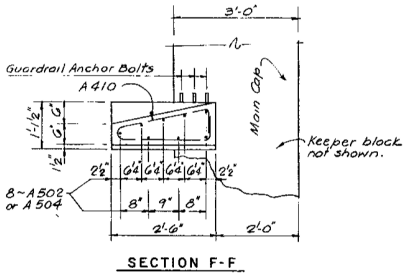

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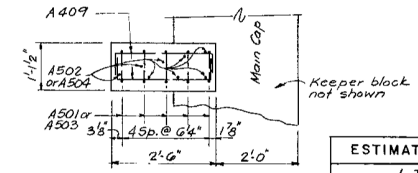
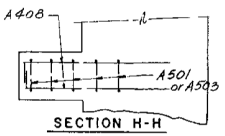


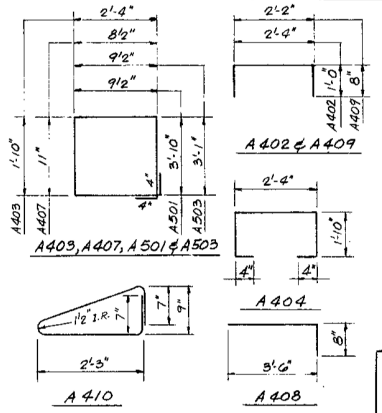
SECTION G-G



SECTION H-H

N.F. Near Face
F.F. For Face
E.F. Each Face

BAR BENDING DIAGRAM



NOTE: All bar dimensions are out-to-out

BILL OF REINFORCING STEEL *

MARK	SIZE	NO. REQD.	LENGTH	BENDING
A 401	4	8	26'-0"	Straight
A 402		49	4'-4"	See diag.
A 403		75	9'-0"	" "
A 404		11	6'-8"	" "
A 405		2	1'-8"	Straight
A 406		8	2'-4"	"
A 407		6	3'-11"	See diag.
A 408		16	4'-2"	" "
A 409		10	5'-6"	" "
A 410		10	5'-9"	" "
A 411	4	12	21'-3"	Straight
A 501	5	5	9'-11"	See diag.
A 502		8	5'-0"	Straight
A 503		5	8'-5"	See diag.
A 504	5	8	4'-6"	Straight
A 601	6	2	37'-3"	Straight
A 602	6	2	42'-3"	"
A 603	6	21	1'-6"	"
A 801	8	10	37'-3"	Straight
A 802	8	10	42'-3"	"

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANTITY
Class II Concrete (Substructure)	C.Y.	24.51
Reinforcing Steel (Substructure)	Lbs.	3520
Pre-stressed Conc. Piling (18"Sq.)	Lin. Ft.	**

* Bill of Rein. Steel & Est. Quant. for one End Bent only.
** See Summary of Estimated Quantities.

Conc. Breakdown.
Cap : 23.23c.y.
Wingwall : .85c.y.
End Post : .43c.y.

PREPARED BY
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CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

REVISIONS	
Date	Description

END BENTS 1 & 5, SECTIONS & DETAILS

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

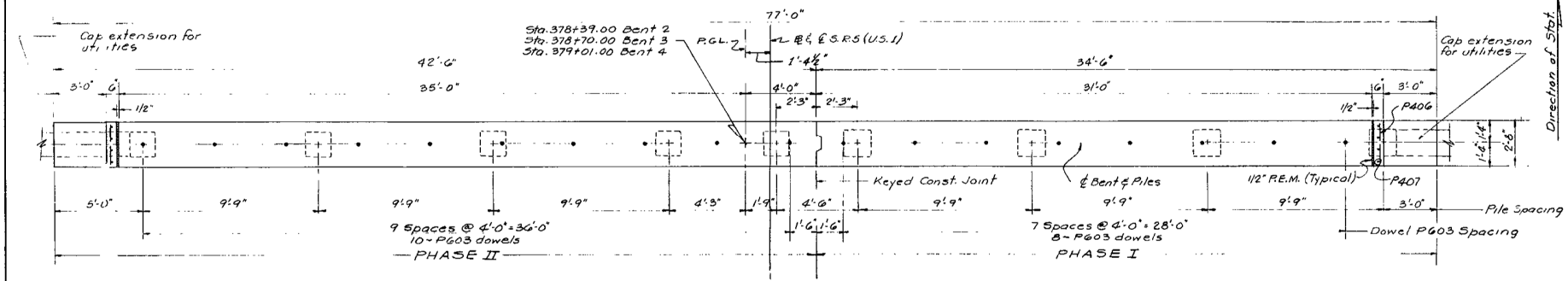
STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

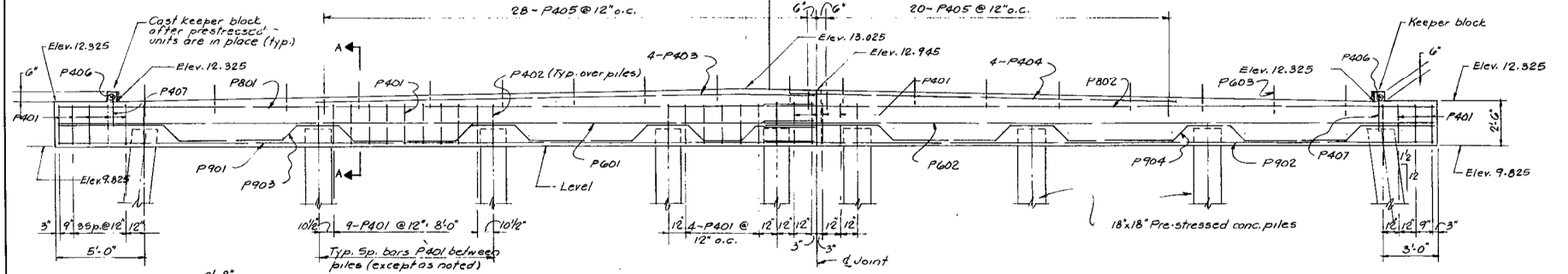
	Name	Date
Designed by	NCR	Nov. 77
Checked by	RPJR	JAN. 78
Quantities by	NCR	Nov. 77
Checked by	RPJR	JAN 78
Supervised by	NCR	

APPROVED BY
Deputy Design Engineer, Structures
Drawing No. 7 of 11
Index No. 12521

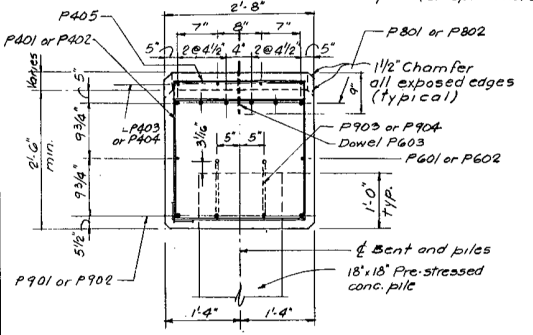
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-8



PLAN



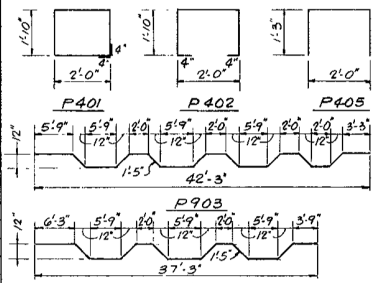
ELEVATION



SECTION A-A

BILL OF REINFORCING STEEL *				
MARK	SIZE	NO. REQ'D	LENGTH	BENDING
P401	4	71	8'-4"	See dia.
P402	4	9	6'-4"	" "
P403	4	4	28'-0"	Straight
P404	4	4	21'-6"	"
P405	4	48	4'-6"	See dia.
P406	4	2	2'-4"	Straight
P407	4	8	1'-8"	"
P601	6	2	42'-2"	Straight
P602	6	2	37'-3"	"
P603	6	18	1'-6"	"
P801	8	6	42'-2"	Straight
P802	8	6	37'-3"	"
P901	9	2	42'-2"	Straight
P902	9	2	37'-3"	"
P903	9	2	45'-7"	See dia.
P904	9	2	39'-9"	" "

BAR BENDING DIAGRAMS



NOTE: All bar dimensions are out-to-out.

ESTIMATED QUANTITIES *		
ITEM	UNIT	QUANT.
Class II Concrete (Substructure)	C.Y.	20.73
Reinforcing Steel (Substructure)	Lbs.	3395
Prestressed Conc. Piling (18" Sq.)	Lin. Ft.	**

* Bill of Reinforcing Steel and Estimated Quantities are for one Interior Bent only.
** See Summary of Estimated Quantities.

GENERAL NOTES
Design Load for Piles: 55 TONS.
For General Notes see Sh. B-1

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CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

REVISIONS	
Date	Description

INTERIOR BENTS 2, 3 & 4

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

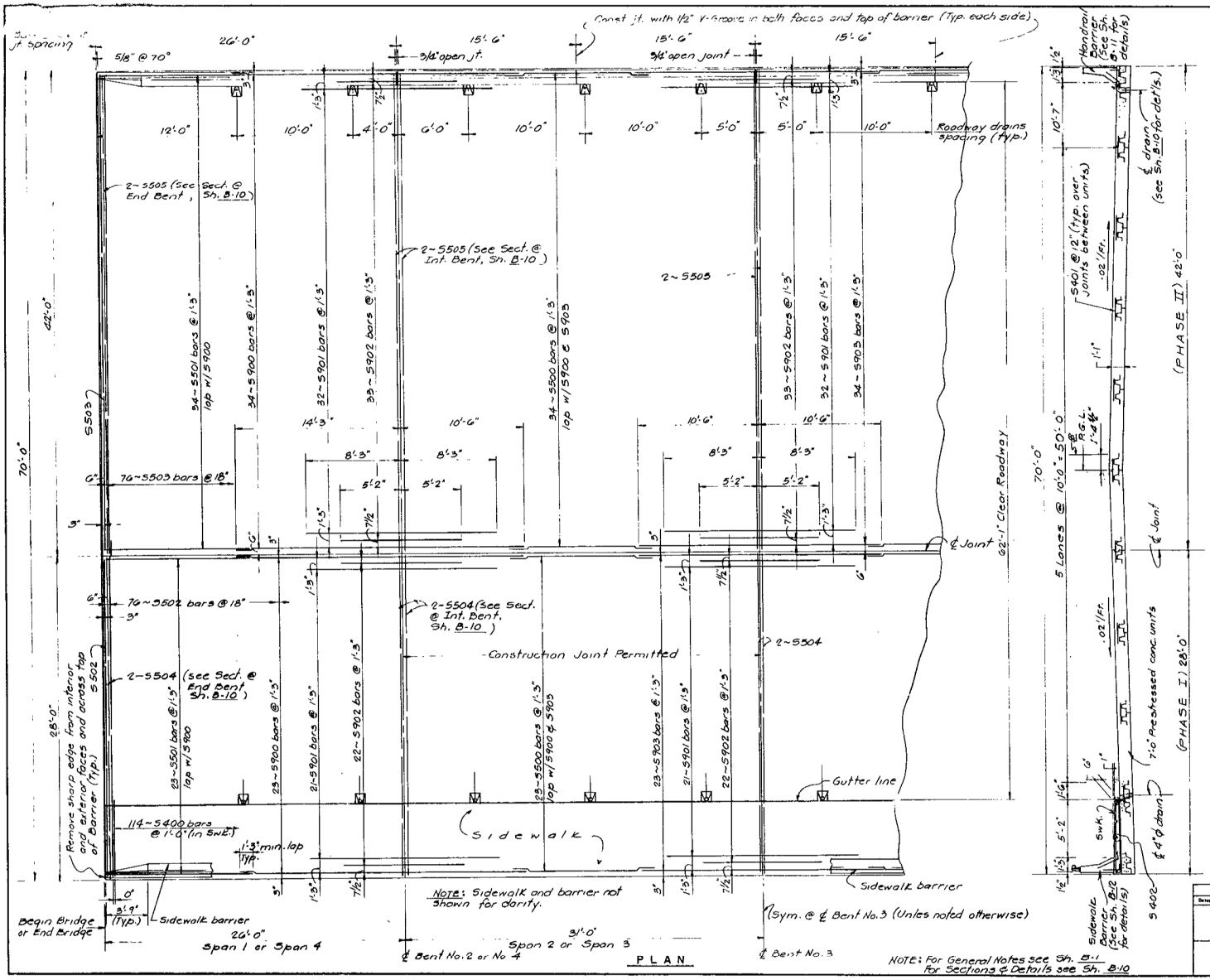
	Names	Dates
Designed by	N.C.R.	11/77
Checked by	R.P.Jr.	1/78
Quantities by	N.C.R.	11/77
Checked by	R.P.Jr.	1/78
Supervised by	N.C.R.	

APPROVED BY

Deputy Design Engineer, Structures

Drawing No. 8 of 11

Index No. 12521

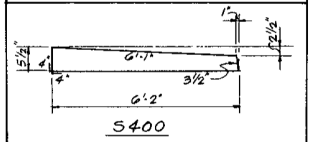


FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-9

BILL OF REINFORCING STEEL *

MARK	SIZE	NO. REQ.	LENGTH	BENDING
S 400	4	114	13'-8"	See diag.
S 401	4	1026	2'-0"	Straight
S 402	4	15	38'-10"	"
S 500	5	114	12'-6"	"
S 501	5	114	12'-9"	"
S 502	5	78	29'-0"	"
S 503	5	78	41'-9"	"
S 504	5	16	27'-6"	"
S 505	5	16	41'-6"	"
S 900	9	114	22'-9"	"
S 901	9	159	16'-6"	"
S 902	9	165	10'-4"	"
S 903	9	114	21'-0"	"

BENDING DIAGRAMS



S400

NOTE: All bar dimensions are out to out.

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANTITY
Class II Concrete (Superstruct.)	C.Y.	177.52
Reinforcing Steel (Superstruct.)	Lb.	45,158

* Quantities are for all four spans, and do not include reinforcing steel and conc. in Handrail Barrier. See Sheet B-11 for Handrail Barrier Reinf. including dowels set in Sidewalk and Deck secondary pour.

Concrete Breakdown

Deck Secondary pour: 162.71 c.y.
Sidewalk : 14.81 c.y.

SUPERSTRUCTURE. SPANS I THRU 4

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions	SR-5	INDIAN RIVER	88010-3510

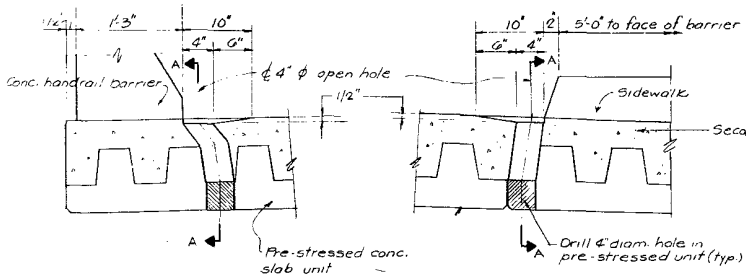
	Names	Dates
Designed by	NGR	11/77
Checked by	RPJr	1/78
Quantities by	NGR	11/77
Checked by	RPJr	1/78
Supervised by	NGR	

APPROVED BY

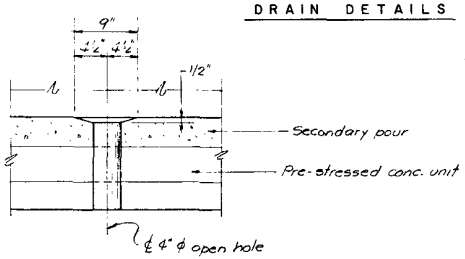
Deputy District Engineer, Structures

Drawing No. 9 of 11 | Index No. 12521

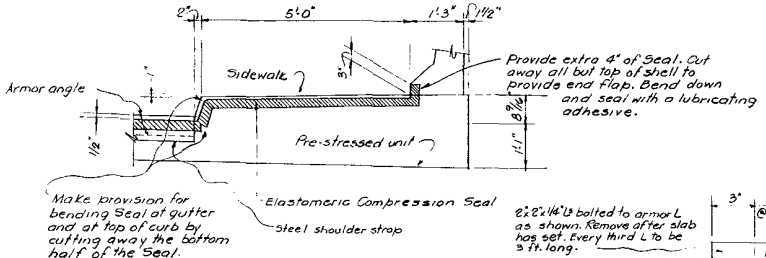
FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-10



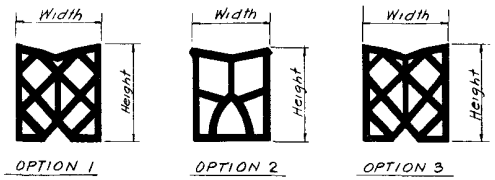
DRAIN DETAILS



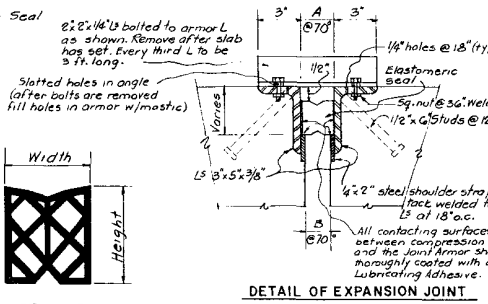
SECTION A-A



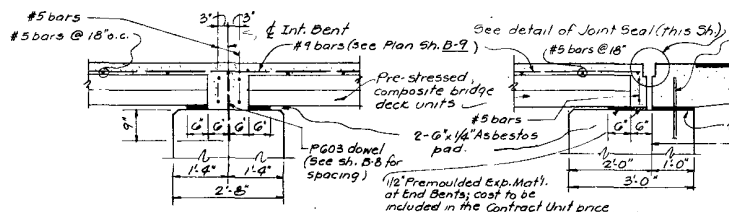
ELASTOMERIC COMPRESSION SEAL DATA					
LOCATION	OPTION	HEIGHT	WIDTH	A	B
End Bents	1	1 5/16"	1½"	1⅛"	5/8"
	2	1 1/16"	1½"	1⅛"	5/8"
	3	1 3/8"	1⅞"	1⅛"	5/8"



ELASTOMERIC COMPRESSION SEALS



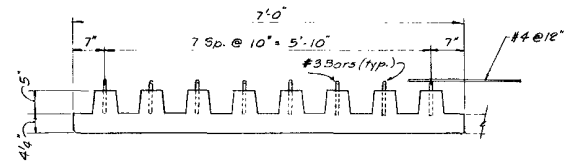
DETAIL OF EXPANSION JOINT



SECTION AT INTERIOR BENT

SECTION AT END BENT

NOTE: Asbestos Pad may be continuous or in 2'-0" min. broken lengths. Cost of Pads shall be included in the contract unit price for Class II Concrete (Superstructure)



TYPICAL SECTION THRU PRESTRESSED SLAB UNIT

(Furnished by the Department of Transportation)

PRESTRESS SLAB UNITS SCHED.		
SIZE	LENGTH	NO. REQ'D.
7'-0" x 9¼"	25'-0"	20
7'-0" x 9¼"	30'-0"	20

1. Joints between adjacent Precast, Prestressed, Composite Bridge Deck Units may be sealed with a sand-cement grout or a material approved by the Engineer.
2. Camber will be checked and compensated for in the field.
3. Drilling of holes for 4" Ø P.V.C. pipe to be done in the field after erection of deck units. Do not use impact drills.
4. Form Placement: When differences in camber occur between the individual panel units the height of the bearing material on the caps shall be adjusted so that the underneath side of the panel units form plane surfaces at the center of the span without deviation of more than ¼ inch between the panel units. When adjustments for camber differences require the thickness of the bearing material on the cap to be greater than 1½ inches the height adjustment shall be made including alternate layers of neoprene bearing mat'l. not less than ½ inch thick and the total aggregate thickness of felt and fiberboard material shall be limited to 1½ inches.
   The panel units shall be placed with the joints between the panel units situated parallel to the centerline of the structure with a tolerance of ± ½ inch with respect to ℄.
5. Longitudinal Joints: Longitudinal joints shall be spaced at intervals not exceeding 21 feet on each span where precast pre-stressed panels are used. The joints shall be formed or when approved, they may be sawed. The joint in the cast-in-place concrete shall be located directly above and aligned with a mating joint between the panel units. Formed joints shall extend for the full depth of the cast-in-place concrete and sawed joints shall be a minimum of 1¼ inches deep. When more than one longitudinal joint is required, the joints shall be spaced symmetrically about the ℄ of the structure. Longitudinal joints shall be sealed with an approved neoprene compression seal not exceeding ¾ inch in width.
6. Placing Concrete: To insure the necessary full bond between the precast pre-stressed panels and the cast-in-place concrete, at time of concrete placement this interface must be free of any foreign material. Immediately prior to placing the slab concrete, the precast pre-stressed panels shall be saturated with water. The original design thickness of the deck slab shall be maintained as at the point of maximum camber in the slab units.

ELASTOMERIC COMPRESSION SEAL NOTES

For temperatures other than 70°F. adjust opening .0052 in. per degree difference between 70°F. and the temperature at the time the joint is constructed. For temperatures above 70°F. diminish opening and for temperatures below 70°F. increase opening.
The Expansion Joint Seal shall be installed in accordance with the recommendations of the manufacturer.
The cost of labor and materials required for construction of the joints in the bridge deck shall be included in the Contract Unit Price for Expansion Joint Seals.

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERING
LAUDERDALE BY THE SEA - FLORIDA

REVISIONS	
Date	Description

SUPERSTRUCTURE DETAILS.

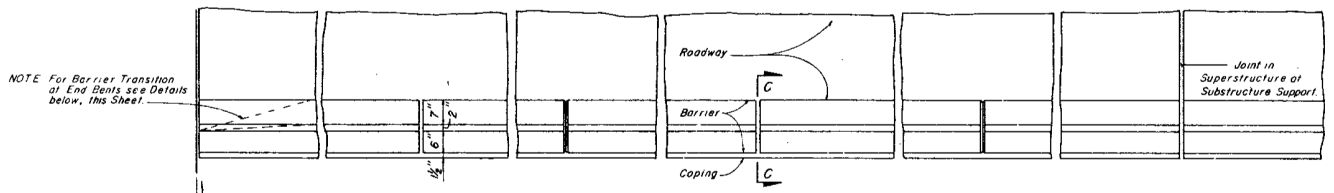
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

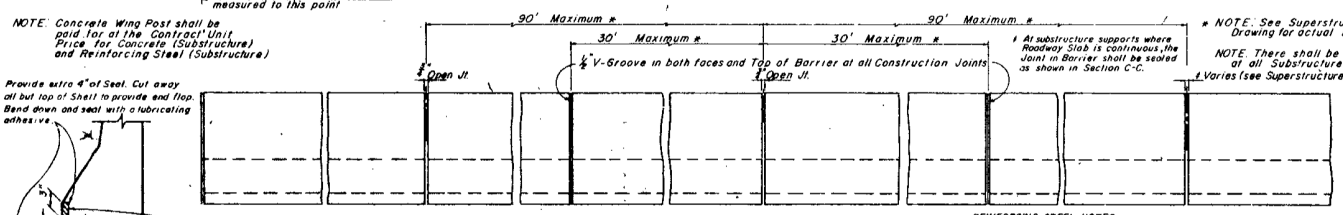
ROAD NO.	COUNTY	PROJECT NO
S.R.-5	INDIAN RIVER	88010-3510

	Name	Date	APPROVED BY
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.T.	JAN. 78	
Quantities by	N.C.R.	NOV 77	District Design Engineer, Structures
Checked by	R.P.T.	JAN 78	
Supervised by	N.C.R.		Drawing No. 10 of 11 Index No. 18521

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-11

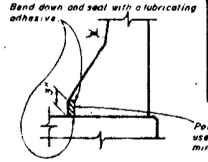


PLAN



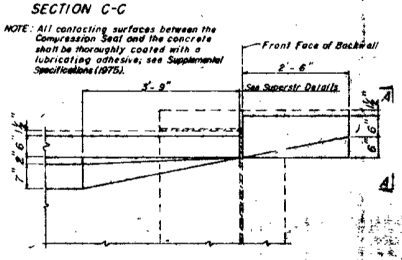
ELEVATION

NOTE: Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)



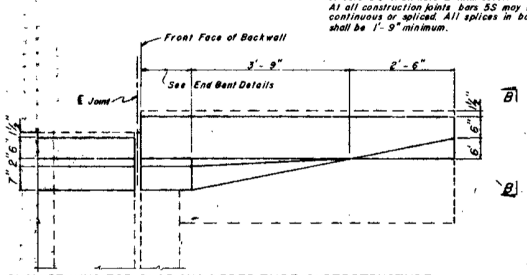
SECTION C-C

NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive; see Supplemental Specifications (1975).



PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

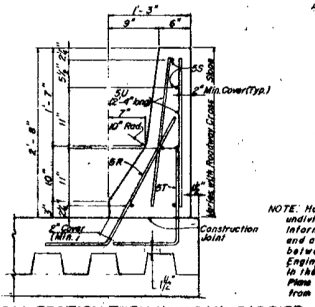
NOTE For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover



PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE

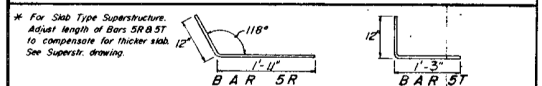
REINFORCING STEEL NOTES

All Reinforcing Steel in Barrier shall be No. 5's. Bars 5R, 5T & 5U to be spaced at 9" c.c. At all open joints bars 5R, 5T, 5U and the ends of bars 5S shall have 2" min. cover. At all construction joints bars 5S may be either continuous or spliced. All splices in bars 5S shall be 1'-9" minimum.



TYPICAL SECTION THRU HANDRAIL BARRIER

BENDING DIAGRAMS

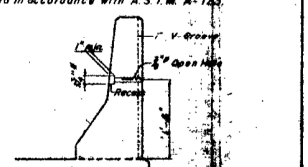


NOTE. All bar dimensions are out-to-out.

QUANTITIES: Class II Concrete = 0.07594 Cu. Yds. per linear ft. of Barrier (Based on Roadway Cross Slope of .02 ft.). REINFORCING STEEL = 13.948 lbs. per linear ft. of Barrier.

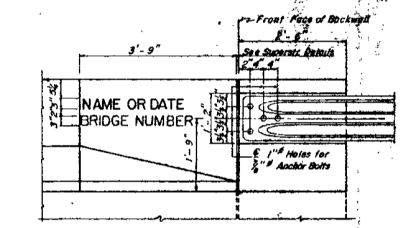
GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Concrete and Reinforcing Steel. Barrier shall be measured along the center line of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
ANCHOR BOLTS: Anchor Bolts, Nuts, and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-153.

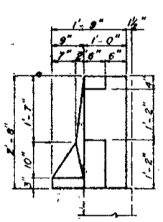


HOLES FOR INCIDENTAL SIGNING

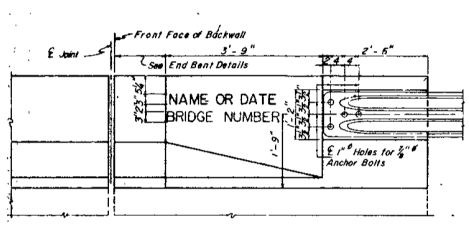
NOTE: Holes and grooves shall be placed on Barrier Type Approach Rail on Divided and undivided bridges, as shown in the plans for designated Type 3 regulatory, informational, guide, regulatory and warning sign locations (see Roadway plans) and at approximately 500' intervals along the right handrails of bridges between designated locations for future signs as directed by the Engineer. The cost of the extra holes and grooves shall be included in the contract unit price for Concrete Handrail (Barrier). Sign locations Plans are not available the Project Engineer should secure necessary information from the District Maintenance or Traffic Operations Office.



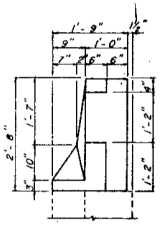
ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



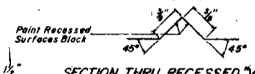
VIEW A-A



ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



VIEW B-B



SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

NOTES

This Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The Date to be placed on the drivers left when approaching Bridge. The Date shall be the Year the Bridge is constructed.
Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by 3/4" V Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

ANCHOR BOLT DETAIL

NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail.

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans

REVISIONS			
Date	Description		
10-30-74	Revised Bars 5R & 5T		
11-25-74	Bridge Number added to Wingwall.		
12-3-74	Added Detail of Holes for Incidental Signing.		
12-5-74	Added Detail of Barrier Back Face, Revised Bars 5R, 5T, 5U, 5V, 5W & 5X.		
1-3-75	Added Supplemental Specifications Section C-C		

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

CONCRETE HANDRAIL BARRIER

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

	Name	Date
Designed by	L.A.L.	3-74
Checked by	J.R.A.	3-74
Quantities by		
Checked by		
Supervised by	S.P.J.	

APPROVED BY: T. [illegible]
Assistant State Highway Engineer, Structures

Sheets No. 1 of 1 Sheets
Index No. 11407

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-12

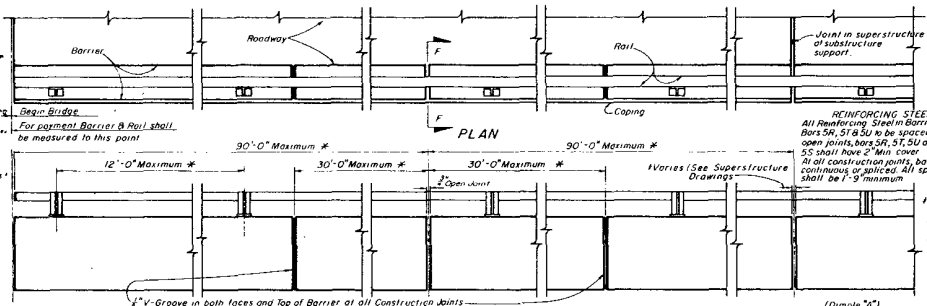
NOTE: For Barrier Transition at End Bents see Details below, this sheet

* NOTE: See Superstructure Drawing for actual Dimensions

NOTE: There shall be a ½" Min. Open Joint at all Substructure Supports

NOTE: Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure).

NOTE: Rail shall be continuous over a minimum of 3 Posts before splicing



PLAN

ELEVATION

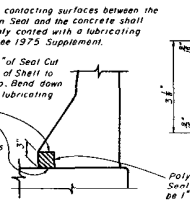
REINFORCING STEEL NOTES:
All Reinforcing Steel in Barrier shall be No. 5's. Bars 5R, 5T & 5U to be spaced at 9" c.c. At all open joints, bars 5R, 5T, 5U and the ends of bars 5S shall have 2" Min. cover. At all construction joints, bars 5S may be either continuous or spliced. All splices in bars 5S shall be 1'-9" minimum.

* At substructure supports where Roadway Slab is continuous, the Joint in Barrier shall be sealed as shown in Section F-F.

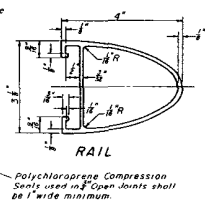
NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive; see 1975 Supplement.

Provide extra 4" of Seal Cut away all but top of Shell to provide end Flap. Bend down and seat with a lubricating adhesive

Polychloroprene Compression Seals used in ¾" Open Joints shall be 1" wide minimum.



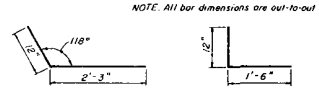
SECTION F-F



RAIL

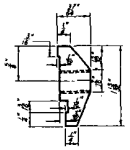
BENDING DIAGRAM

NOTE: All bar dimensions are out-to-out

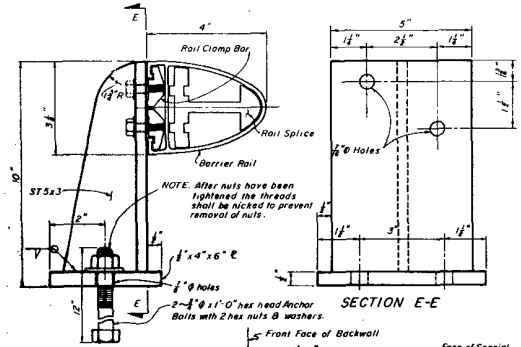


BAR 5R BAR 5T

QUANTITIES: Class II Concrete = 0.07594 Cu Yds. per lineal ft. of Barrier. (Based on Roadway Cross Slope of .02Ft/ft.).
REINFORCING STEEL = 20.744 lbs. per lineal ft. of Barrier.

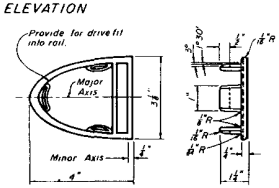


VIEW C-C

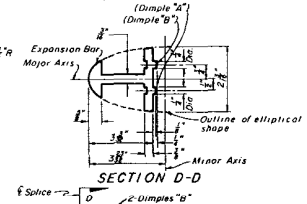


SECTION E-E

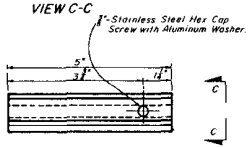
SECTION THRU RAIL



RAIL END CAP

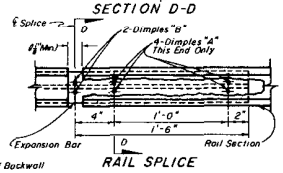


SECTION D-D



RAIL CLAMP BAR

NOTE: At the option of the contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour



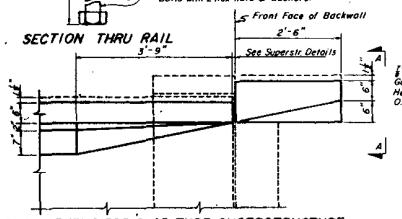
RAIL SPLICE

GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include all Rail, Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge only. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
ANCHOR BOLTS: Anchor Bolts, Nuts and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.

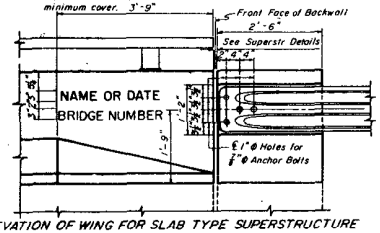
SPECIFICATIONS FOR BRIDGE RAIL

POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A-36 or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S.G 70A-F (Aluminum Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Posts shall be seated on ¼" thick resilient pads in accordance with Article 932-21. The dimension shall be the same as the post base. Rail expansion joints shall occur in the panel between posts on either side of Bridge expansion joints. Rail expansion joints shall be similar to rail splices with provision for movement equal to 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be submitted by the contractor for the Engineers approval prior to fabrication.

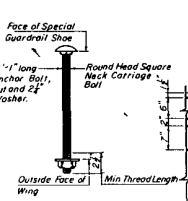


PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover. 3'-9"

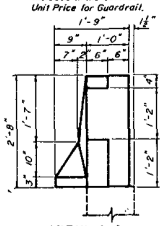


ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE

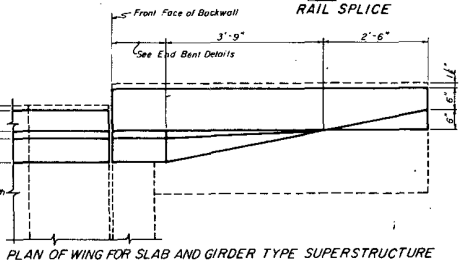


ANCHOR BOLT DETAIL

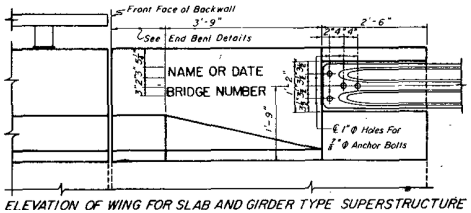
NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail.



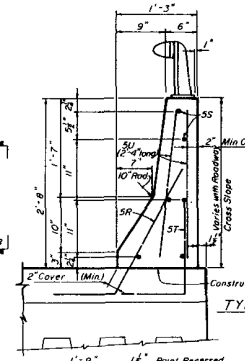
VIEW A-A



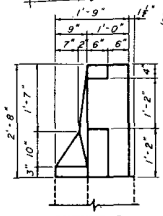
PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



TYPICAL SECTION THRU SIDEWALK BARRIER



VIEW B-B

Paint Recessed Surfaces Black

SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ¾" "V" Grooves. "V" grooves shall be formed by preformed Letters and Figures.

The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans

REVISIONS		
Date	Description	
6-90	In reference to 1975 Supplement.	
8-29-90	Bridge Number added to Wing wall	

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

SIDEWALK BARRIER

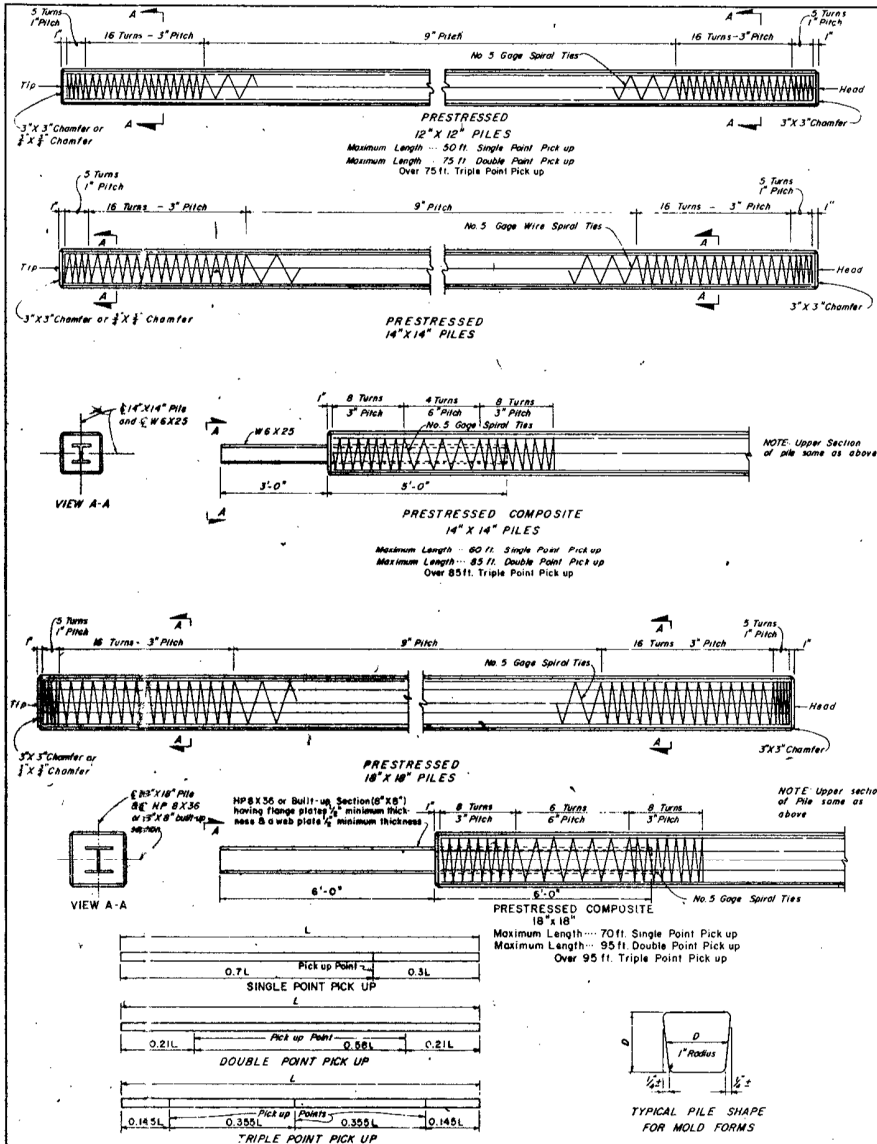
ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

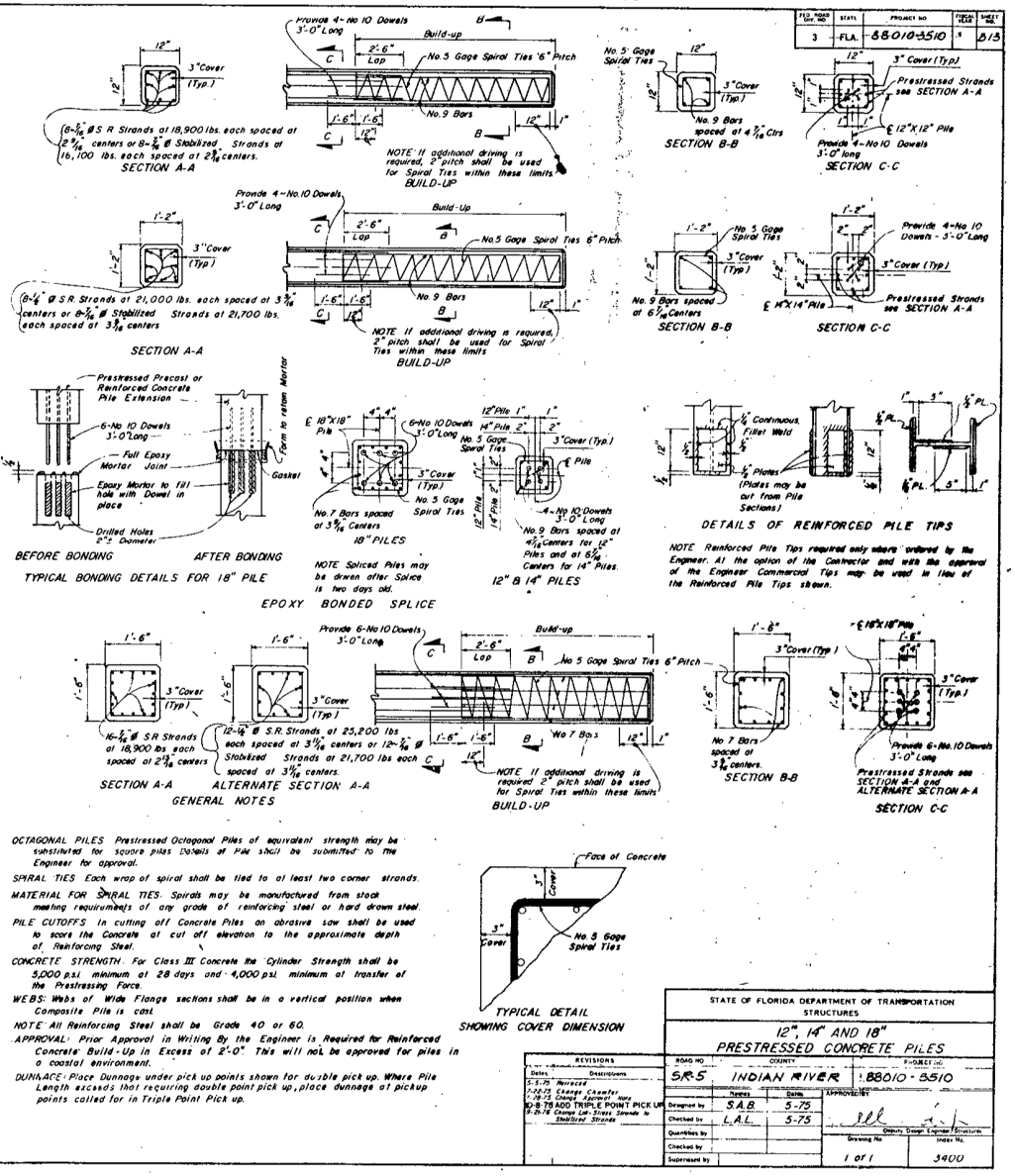
	Name	Date	APPROVED BY
Designed by	WHD	5-74	
Checked by	J.L.M	5-74	
Quantities by			
Checked by			
Supervised by	PB		

Bridge Design Engineer, Structures

Drawing No. 1 of 1

State No. 11,460





FED. ROAD DIV. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510	5	513

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

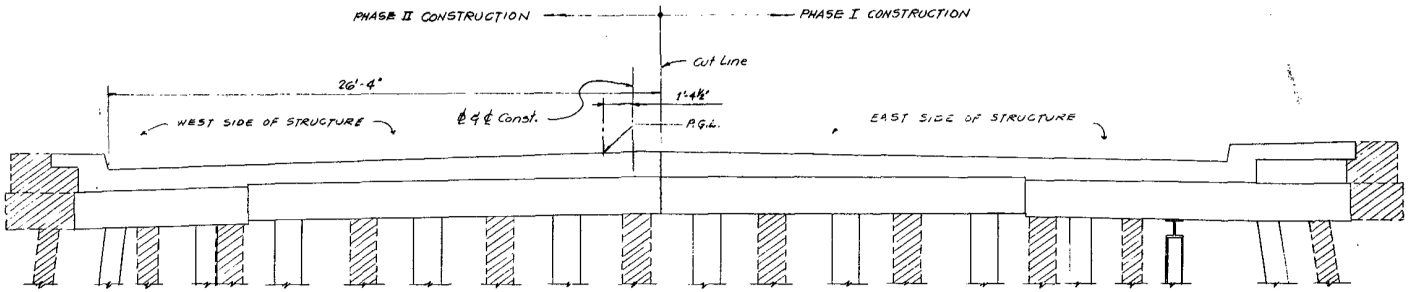
12", 14" AND 18" PRESTRESSED CONCRETE PILES

REVISIONS				ROAD NO.	COUNTY	PROJECT NO.
Dates	Descriptions			SR-5	INDIAN RIVER	88010-3510
5-1-75 Revised						
7-16-75 Change Counter					Names	Dates
7-16-75 Change Filament Wire				Designed by	S.A.B.	5-75
10-8-75 ADD TRIPLE POINT PICK UP				Checked by	L.A.L.	5-75
9-26-78 Change Lot Sizes Strands to Stabilized Strands				Quantities by		
				Checked by		
				Supervised by		

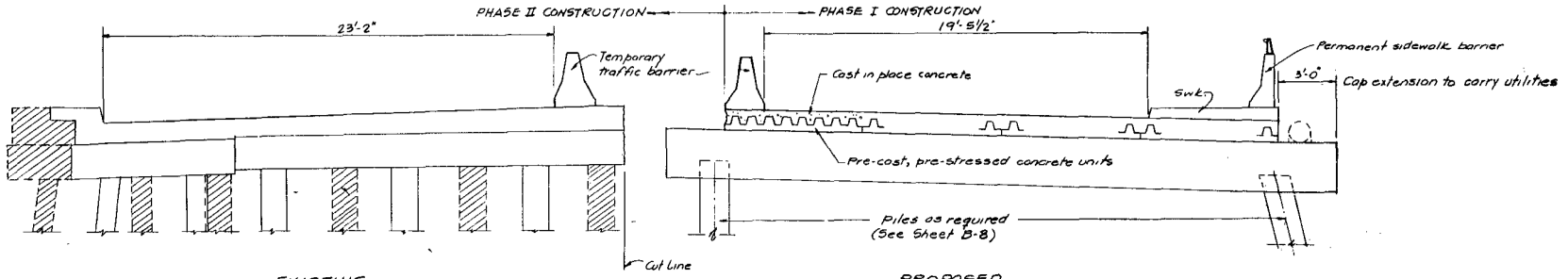
APPROVED BY: Deputy Chief Engineer Structures

Drawing No. 1 of 1 | Index No. 3400

FED. ROAD DIST. NO.	STATE	PROJECT NO.	FISCAL YEAR	SHEET NO.
3	FLA.	88010-3510		B-14



BRIDGE TYPICAL SECTION
(EXISTING)



LOOKING AHEAD WITH STATION

LEGEND

END BENTS

INTERMEDIATE BENTS

CONSTRUCTION SEQUENCE

1. Install temporary traffic barrier to the West of Center line of Bridge as shown.
2. Remove Eastern section of existing Bridge while maintaining two lanes of traffic in Western portion of Structure.
3. Build Eastern section of proposed structure.
4. Relocate two lanes of traffic to Eastern portion of proposed Structure, remove Western portion of existing Bridge and complete proposed Structure.

CONSTRUCTION SEQUENCE

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER
MAIN CANAL

REVISIONS		ROAD NO.	COUNTY	PROJECT NO.
Date	Description	S.R-5	INDIAN RIVER	88010-3510

	Initials	Date
Designed by	NCR	10/77
Checked by	R.P.Tr.	1/78
Quantities by		
Checked by		
Supervised by	NCR	

APPROVED BY

Bureau Bridge Evaluation, Structures

Drawing No. 11 of 11 | Index No. 12.52.1

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

Bridge No.	**880085**	**Analysis Method:**	**LRFR-LRFD**
Location	**SR5 (US1) over Main Canal, Indian County**		
Description	**Concrete prestressed panels with CIP deck (4 spans, 26-31-31-26)**		

FDOT Bridge Load Rating Summary Form (Page 1 of 1)

Rating Type	Rating Type	Gross Axle Weight (tons)	Moment/Shear/Service		Dead Load Factor	Live Load Factor	Live Load Distrib. Factor (axles)	Rating Factor	Span No. - Girder No., Interior/Exterior, %Span Length	RF·Weight (tons)
Level	**Vehicle**	**Weight**	**Member Type**	**Limit**	**DC**	**LL**	**LLDF**	**RF**	**Governing Location**	**RATING**
Inventory	HL93	36	Prestressed	Strength, Moment	1.25/0.90	1.75	NA	0.944	Bending at middle of Spans 2 and 3	34.0
Operating	HL93	36	Prestressed	Strength, Moment	1.25/0.90	1.35	NA	1.224	Bending at middle of Spans 2 and 3	44.1
Permit	FL120	60	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.083	Bending at middle of Spans 2 and 3	65.0
Permit Max Span	FL120	60	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.083	Bending at middle of Spans 2 and 3	65.0
Legal	SU2	17	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	2.706	Bending at middle of Spans 2 and 3	46.0
	SU3	33	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.514	Bending at middle of Spans 2 and 3	50.0
	SU4	35	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.393	Bending at middle of Spans 2 and 3	48.8
	C3	28	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	2.133	Bending at middle of Spans 2 and 3	59.7
	C4	36.7	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.501	Bending at middle of Spans 2 and 3	55.0
	C5	40	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.492	Bending at middle of Spans 2 and 3	59.7
	ST5	40	Prestressed	Strength, Moment	1.25/0.90	1.35	0.499	1.737	Bending at middle of Spans 2 and 3	69.5
Emergency Vehicle (EV)	EV2	28.75	Member Type	Limit Test	NA	NA				-1
	EV3	43	Member Type	Limit Test	NA	NA				-1

Original Design Load	H20	
Rating Type, *Analysis*	LRFR-LRFD	
Distribution Method	AASHTO Formula	
Impact Factor	33.0%	(axle loading)
FL120 Gov. Span Length	31.0	(feet)
Minimum Span Length	26.0	(feet)
Recommended Posting	At/Above legal loads. Posting Not Required.	
Recommended SU Posting	99	(tons)
Recommended C Posting	99	(tons)
Recommended ST5 Posting	99	(tons)
Owner	01 State Highway Agency	
Location	Neither interstate traffic nor within 1 mile reasonable access to an interstate	
EV Posting	No. EV posting is not recommended. The FAST Act does not apply	
Floor Beam Present?	No	
Segmental Bridge?	No	
Project No. & Reason	FIN No.	Update
Plans Status	Built	

Performed by: Soheila Sadough Date: 06/04/23

Checked by: Date:

This item has been digitally signed and sealed by

Soheila Sadough

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

P.E. Seal

Comments:

This 01-01-2022 summary follows the FDOT Bridge Load Rating Manual (BLRM), and the FDOT BMS Coding Guide.
*Recommended SU Posting levels for Florida SU trucks adequately restricts AASHTO SU trucks; see BLRM Chapter 7.

fdot.gov/maintenance/LoadRating.shtm

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SECTION 2 – BRIDGE DESCRIPTION 3

SECTION 3 – LOAD RATING PARAMETERS AND CRITERIA 5

APPENDIX A – Bridge Plans
APPENDIX B – Existing Load Rating
APPENDIX C – Load Rating Computations

SECTION 1 – EXECUTIVE SUMMARY

The objective of this evaluation is to load rate Bridge No. 880085, SR5 (US1), over the Main Canal located in Indian County. The bridge consists of four spans with simple precast slabs and a continuous cast-in-place deck. The structure was designed in the late 1970s using the AASHTO Standard Specifications of 1973 and built in 1980. The total length of the bridge is 114 feet, with four spans of 26-31-31-26 feet. The bridge width is 70 feet.

The load rating is performed using the LRFR methodology. The load rating evaluation is performed using spreadsheets. The analysis for live loads is performed using MIDAS Civil. The rating is based on the design drawings included in Appendix A. The design drawings do not show details related to the prestressing of the precast slab panels, and this information was gathered from the existing load ratings in 1990 and included in Appendix B. The rating is performed for the HL-93 design load at the inventory and operating rating, the Florida permit vehicle FL120, and the legal loads, SU2, SU3, SU4, C3, C4, C5, and ST5.

The results for the load rating analysis of the superstructure for the design load (HL-93) are as follows:

For the HL-93 design vehicle, the LRFR rating factor at inventory level is 0.944, with a load carrying capacity of 34.0 tons, and is controlled by bending at the middle of the interior spans 2 and 3 at the strength limit state. The operating rating is 1.224 with a load carrying capacity of 44 tons and occurs at the same location as the inventory rating. The FL-120 LRFR operating rating factor is 1.083, with a load carrying capacity of 39 tons. All ratings for the legal loads are adequate. The details of the load rating analysis are presented in Appendix C.

SECTION 2 – BRIDGE DESCRIPTION

Bridge No. 880085, SR5 (US1) over Main Canal is in Indian County and consists of four simply supported spans. The superstructure consists of flat slabs with prestressed slab units with a cast-in-place concrete toping. The structure was designed in the late 70's using the AASHTO Standard Specifications of 1973 and built in 1980. The total length of the bridge is 114 ft with four spans of 26-32-31-26 feet. The bridge width is 70 ft.

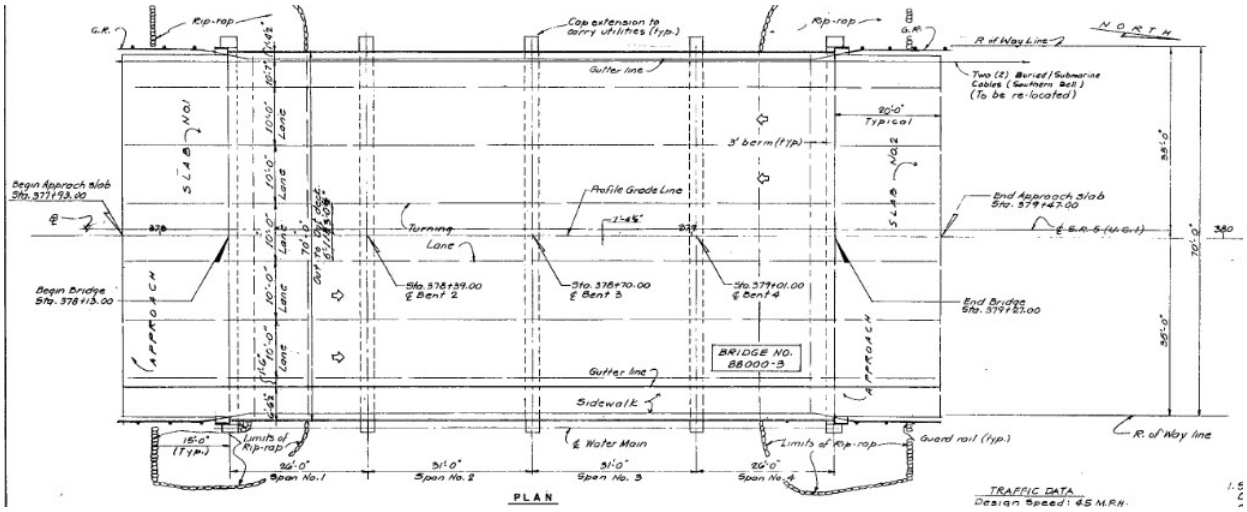


Figure 2-1: Plan View

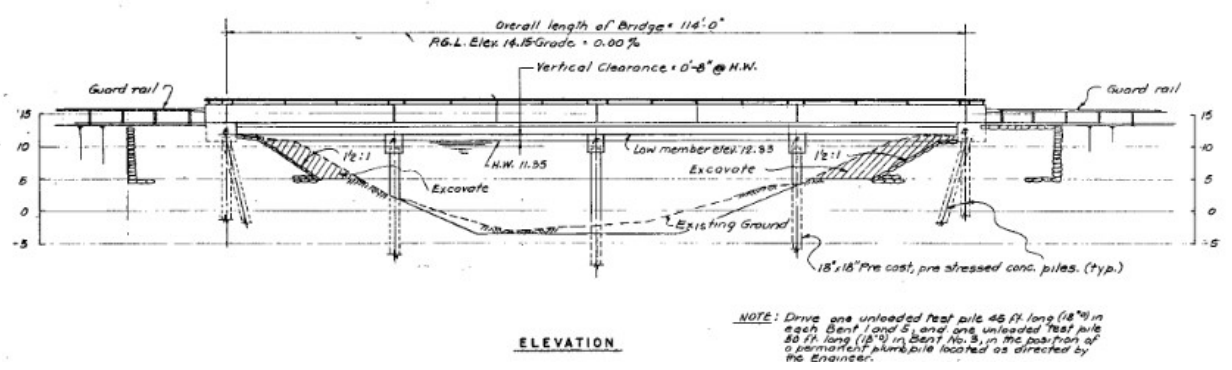


Figure 2-2: Elevation View

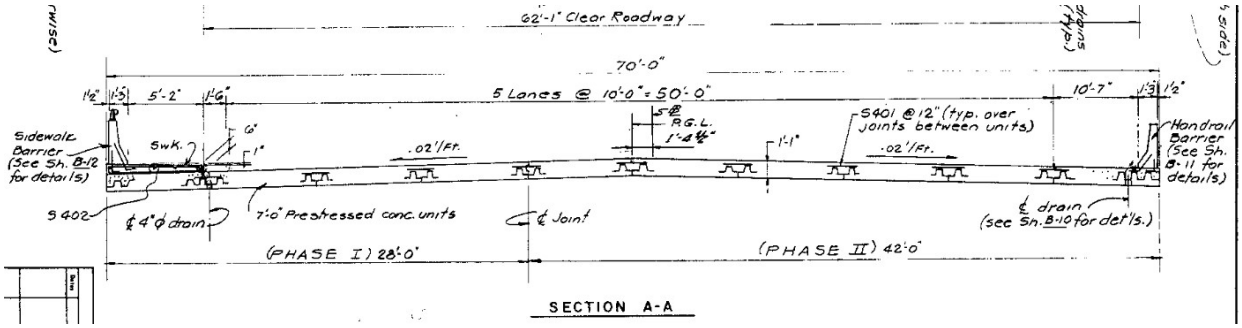


Figure 2-3: Cross Section

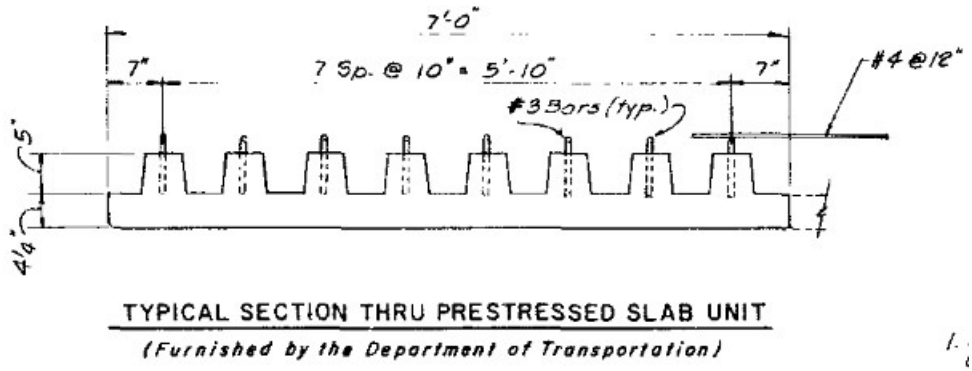


Figure 2-3: Typical Prestresses Slab Unit

The existing bridge drawings do not show the prestressed reinforcement for the slab unit. The information used for this rating was gathered from the existing load rating.

Additional details of the bridge are included in the design drawings in Appendix A.

SECTION 3 – LOAD RATING PARAMETERS AND CRITERIA

Standards and Specifications

- AASHTO Manual for Bridge Evaluation, 3er Edition (2018).
- FDOT Structures Manual, January 2023.
- FDOT Bridge Load Rating Manual, January 2022.
- American Association of State Highway and Transportation Officials (AASHTO) LRFD Bridge Design Specifications – 9th Edition

Load Rating Method

- Load and Resistance Factor Rating (LRFR).

Load Rating Program Used

- Leap Bridge Concrete (prestress beams)
- In house spreadsheets (Concrete T beams)
- Midas Civil for live load analysis

Loadings

- Dead Loads (DC):
  - Concrete, Structural: 150 pcf
  - Barriers and sidewalks: Weight evaluated within calcs

- Live Load (LL+IM):
  - Design Loading: HL-93
  - Permit Loading: FL 120
  - Legal Loads: SU2, SU3, SU4, C3, C4, C5 and ST5.

- Material Properties
  - Reinforcing Steel: Grade 60
  - Reinforcing Strands: ½" diameter, Grade 270
  - Concrete:
    - Deck: 3.4 ksi
    - Precast panels: 5.0 ksi

Bridge Plans

The design plans are provided in Appendix A.

Summary of Load Rating

The rating is controlled by bending at the strength limit state at the middle of the interior spans 2 and 3.

Level	Vehicle	Limit	RF
Inventory	HL93	Service	1.084
		Strength	0.944
Operating	HL93	Strength	1.224
Legal	SU2	Strength	2.706
	SU3	Strength	1.514
	SU4	Strength	1.393
	C3	Strength	2.133
	C4	Strength	1.501
	C5	Strength	1.492
	ST5	Strength	1.737
Permit	FL120	Strength	1.083

The load rating computation details are shown in Appendix C.

APPENDIX A

Bridge Plans

78 | 1

THIS CONTRACT PLAN SET INCLUDES
SUMMARY OF PAY ITEMS (3 SHEETS)
ROADWAY AND PAVEMENT MARKING PLANS
STRUCTURE PLANS

FOR INDEX OF STRUCTURE PLANS
SEE STRUCTURE PLANS

INDEX OF ROADWAY & PAVEMENT MARKING PLANS

SHEET NO.	SHEET DESCRIPTION
1	KEY SHEET
2	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
3	DETAIL SHEET - WARNING DEVICES
4-5	PLAN AND PROFILES
6	CHANNEL CROSS SECTIONS
7	PAVEMENT MARKINGS
8	CONC. APPROACH SLAB - INDEX NO. 12522

ROAD DESIGN STANDARDS (BOOKLET DATED JANUARY 1978)

BGR - 01 - 1	GUARDRAIL CONSTRUCTION (5 SHEETS)
GEC - 04	EROSION CONTROL DEVICES, SILT BARRIERS
GSA - 01	STANDARD ABBREVIATIONS
GSS - 01	STANDARD SYMBOLS FOR KEY MAPS AND PLAN SHEETS (3 SHEETS)
PCG - 01	CURB, CURB AND GUTTER

TRAFFIC OPERATIONS STANDARDS (BOOKLET DATED JANUARY 1978)

17346-A	SPECIAL MARKING AREAS (6 SHEETS)
17352	TYPICAL PLACEMENT OF REFLECTIVE PAVEMENT MARKINGS

NOTE: UTILITY ADJUSTMENTS ARE SHOWN ON ROADWAY PLAN AND PROFILE SHEETS.

eld Books—
ber

Description
Misc. pay items rdwy. book
Align & Ref.
BM's, X-sec, Canal Exc. X-sec
Pile Data

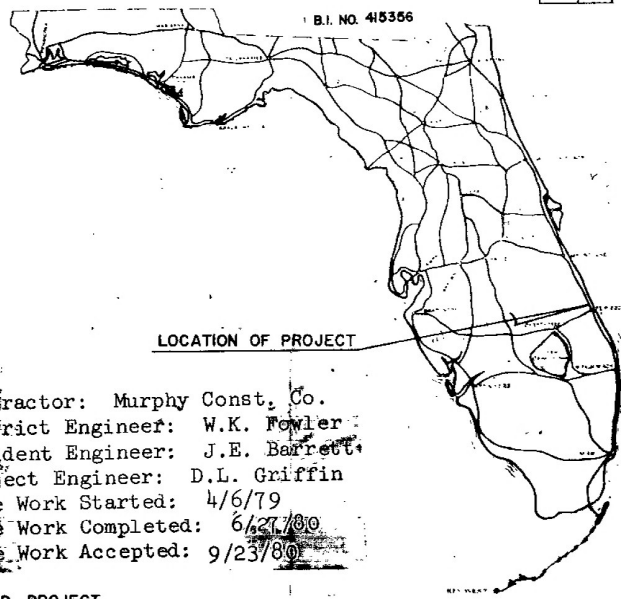
IF ANY
DIRECTLY BEHIND
KEY SHEET

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
AS BUILT PLANS
OF

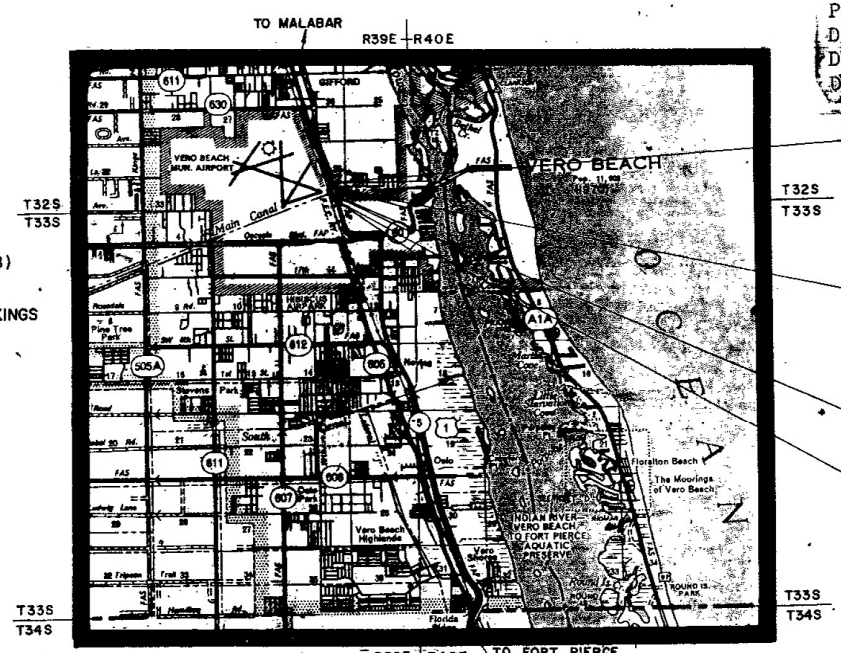
STATE HIGHWAY

STATE PROJECT NO. 88010-3510
INDIAN RIVER COUNTY

STATE ROAD NO. 5 (US 1)



Contractor: Murphy Const. Co.
District Engineer: W.K. Fowler
Resident Engineer: J.E. Barrett
Project Engineer: D.L. Griffin
Date Work Started: 4/6/79
Date Work Completed: 6/27/80
Date Work Accepted: 9/23/80



END PROJECT
STA. 379+97.00

END BRIDGE 880003
STA 379+27.00

BEGIN BRIDGE 880003
STA 378+13.00

BEGIN PROJECT
STA. 377+13.00

1-MILE

LENGTH OF PROJECT		
	LINEAR FEET	MILES
ROADWAY	170.00	0.032
BRIDGES	114.00	0.021
NET LENGTH OF PROJECT	284.00	0.053
EXCEPTIONS	0.00	0.000
GROSS LENGTH OF PROJECT	284.00	0.053

PROJECT MANAGER: J.L. LOWRY

ATTENTION IS DIRECTED TO THE FACT THAT THESE PLANS MAY HAVE BEEN REDUCED IN SIZE BY REPRODUCTION. THIS MUST BE CONSIDERED WHEN OBTAINING SCALED DATA

GOVERNING SPECIFICATIONS: STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION, STANDARD SPECIFICATIONS, DATED 1977 AND SUPPLEMENTS THERETO IF NOTED IN THE SPECIAL PROVISIONS FOR THIS PROJECT.

SUBMITTED BY

DIRECTOR OF ROAD OPERATIONS

APPROVED DATE

DIVISION ENGINEER
FEDERAL HIGHWAY ADMINISTRATION

88010-3510

SUMMARY OF ROADWAY PAY ITEMS

ALT	ITEM NUMBER	ITEM		UNIT	88010-3510 FA NON PART				QUANTITY TOTAL
	101- 1-	MOBILIZATION		LS	1.000	✓			1.00
	102- 1-	MAINT OF TRAFFIC		LS	1.000	✓			1.00
	104- 11-	FLOATING SILT BARRIER		LF	110.000	✓			110.00
	110- 1-	CLEARING & GRUBBING		LS	1.000	✓			1.00
	120- 1-	REGULAR EXCAV		CY	465.000	✓			465.00
	120- 5-	CHANNEL EXCAVATION		CY	847.000	✓			847.00
	200- 1- 2	LIMEROCK BASE	(8") (D-CSE)	SY	1112.000	✓			1112.00
	300- 1- 1	BIT MATL	(PRIME COAT)	GA	167.000	✓			167.00
	300- 1- 3	BIT MATL	(TACK COAT)	GA	270.000	✓			270.00
	300- 1- 13	BIT MATL (PLANT MIX)	(ASPH CEM 20)	GA	4647.000	✓			4647.00
	331- 2-	TYPE S-I ASPH CONC		TN	240.000	✓			240.00
	333- 2- 9	TYPE 111 ASPH CONC	(1000 LB STAB)	TN	55.000	✓			55.00
	339- 1-	MISC ASPHALT PAVEMENT		TN	7.000	✓			7.00
	360- 1-	CONC APPRH SLABS		EA	2.000	✓			2.00
	425- 5-	ADJ MANHOLES		EA	1.000	✓			1.00
	520- 1- 10	CONC CURB & GUTTER	(TYPE F)	LF	130.000	✓			130.00
	522- 1-	CONC SIDEWALK,	4" THICK	SY	82.000	✓			82.00
	530- 1- 1	RIPRAP (SAND-CEMENT)	(ROADWAY)	CY	7.000	✓			7.00
	536- 1- 1	GUARDRAIL	(RDWY)	LF	237.500	✓			237.50
	536- 6-	END ANCHORAGE ASSEM TYPE II		EA	4.000	✓			4.00
	536- 7-	SPECIAL GUARDRAIL POST		EA	8.000	✓			8.00
	536- 73-	REM OF EXIST GUARDRAIL		LF	125.000	✓			125.00
	570- 2-	SEED & MULCH		SY	62.000				62.00

88010-3510

SUMMARY OF SIGNING PAY ITEMS

A L T	ITEM NUMBER	ITEM	UNIT	88010-3510	QUANT
				FA NON PART	TOTAL
	706- 2-	REFLECTIVE PAVEMENT MARKER	EA	77.000	77.
	710- 4- 41	SOLID TRAFFIC STRIPE (4")	LF	505.000	505.
	710- 4-181	SOLID TRAFFIC STRIPE ()8")	LF	240.000	240.
	711- 2-	SKIP TRAFFIC STRIPE, THERMOPLASTIC (4")	LF	1186.000	1186.
	711- 4-	DIRECTIONAL ARROWS,THERMOPLASTIC	EA	5.000	5.
	711- 6- 41	SOLID TRAFFIC STRIPE, THERMOPLASTIC (4")	LF	1977.000	1977.

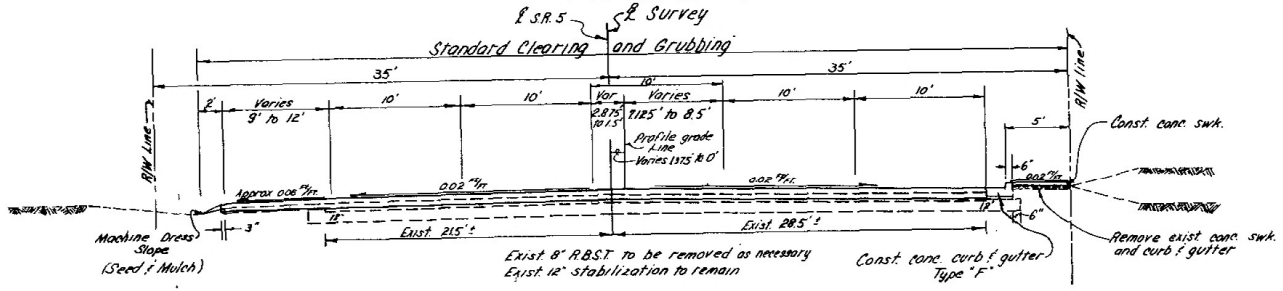
88010-3510

SUMMARY OF BRIDGE PAY ITEMS

ALT	ITEM NUMBER	ITEM		UN IT	88010-3510 BR # 880003 FA NON PART	QUANTITY TOTAL
	110- 3-	REM OF EXIST STRUCTURES		LS	1.000	1.0
	400- 2- 4	CLASS II CONC	(SUPERSTRUCTURE)	CY	178.000	178.0
	400- 2- 5	CLASS II CONC	(SUBSTRUCTURE)	CY	111.000	111.0
	400- 5- 4	CONC HANDRAIL	(BARRIER)	LF	114.000	114.0
	400- 5- 5	CONC HANDRAIL	(SIDEWALK BARRIER TYPE)	LF	114.000	114.0
	415- 1- 4	REINF STEEL	(SUPERSTRUCT)	LB	45158.000	45158.0
	415- 1- 5	REINF STEEL	(SUBSTRUCT)	LB	17225.000	17225.0
	450- 71-	RESETTING PREST SLAB UNITS		LF	1100.000	1100.0
	455- 3- 2	PREST CONC PILING FURN	(18" SQ)	LF	1624.000	1624.0
	455- 4- 2	PREST CONC PILING DRIV	(18" SQ)	LF	1624.000	1624.0
	455- 9- 12	UNL TEST PILES	(PREST CONC) (18" SQ)	LF	140.000	140.0
	455- 10- 90	TEST LOADS	(90 TN)	EA	1.000	1.0
	455- 10-110	TEST LOADS	(110 TN)	EA	1.000	1.0
	455- 15-	PREFORMED PILE HOLES		EA	22.000	22.0
	455- 17- 2	PILE SPLICES	(18")	EA	1.000	1.0
	460- 91- 2	EXPANSION JOINT SEAL	(COMPRESSION ELAST)	LF	137.000	137.0
	530- 1- 2	RIPRAP (SAND-CEMENT)	(BRIDGE)	CY	100.000	100.0

TYPICAL SECTIONS AND SUMMARY OF QUANTITIES

STATE PROJ.
88010-3510



TYPICAL SECTION

Sta. 377+13 to Sta. 377+93
Sta. 379+47 to Sta. 379+97

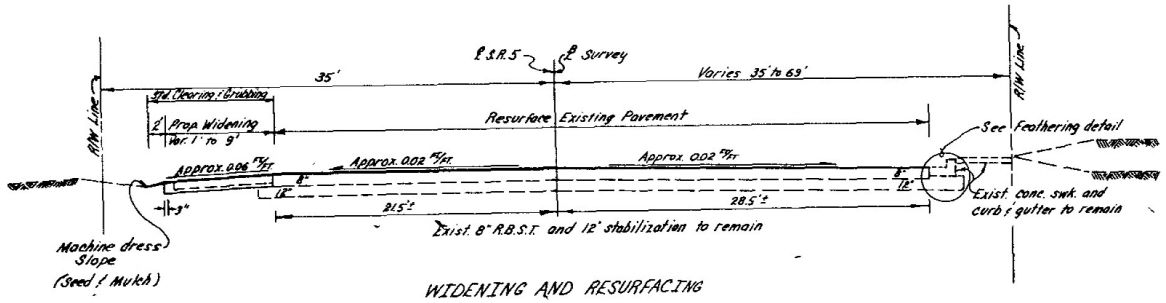
Construct limerock base course (8" thick, double course) primed, with type S-I aspholtic concrete surface course (200#/S.Y., double course).

For additional information see Index Nos. BGR-01 & PGG-01

DESIGN SPEED 45 M.P.H.

TRAFFIC DATA

1979 ADT	=	15,000
1987 ADT	=	16,463
1999 ADT	=	18,801
K	=	10%
D	=	55%
24 HR T		8%
Design H.R.T.		1%



WIDENING AND RESURFACING

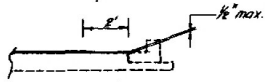
Sta. 375+00 to Sta. 377+13
Sta. 379+97 to Sta. 381+67

LEVELING
Level existing pavement with type III asphaltic concrete (1000 LB STAB)(50#/Sy Avg.)

RESURFACE
Type S-I asphaltic concrete surface course (100#/S.Y.)

WIDENING
Limerock base course (8" thick, double course) primed, with type S-I asphaltic concrete surface course (200#/S.Y., double course)

DESIGN SPEED 45 M.P.H.



FEATHERING DETAIL

NOTES:
1) None of the existing limerock base that is removed is to be used in the construction of new limerock base.
2) For information on Maintenance of Traffic see Bridge Plans.
3) New construction and widening shall be constructed with Type S-I asphaltic concrete surface course (200#/S.Y. - Double Course), 1st layer to be (100#/S.Y.) and the 2nd layer to be constructed along with roadway resurface (100#/S.Y.)

SUMMARY OF GUARDRAIL

STATION TO STATION		SIDE	LENGTH	END ANCHORAGE	REMARKS
Sta. 377+46.5	Sta. 378+09	Lt.	62.5	1	Guardrail - Bridge
Sta. 377+46.5	Sta. 378+09	Rt.	62.5	1	Guardrail - Bridge
Sta. 379+31	Sta. 379+93.5	Lt.	62.5	1	Guardrail - Bridge
Sta. 379+31	Sta. 379+81	Rt.	50	1	Guardrail - Bridge
Sta. 377+55.5	Sta. 378+18	Lt.	62.5		Remove Guardrail
Sta. 379+23	Sta. 379+85.5	Lt.	62.5		Remove Guardrail
GRAND TOTALS			237.5 L.F.	4	Const. Guardrail
			185 L.F.		Remove Guardrail

Stationing shown above is approximate. Exact stations to be determined by the Engineer during construction.
Connection of Guardrail to proposed bridge shall be in accordance with Index No. BGR-01
Existing guardrail that is removed shall be delivered by the Contractor to: 5025 - 41st Street (S. Gifford Rd.) Vero Beach, Florida.

SUMMARY OF EARTHWORK

CHANNEL EXCAVATION	847 C.Y.
REGULAR EXCAVATION	465 C.Y.

PAY ITEM FOOTNOTES:

ITEM NO. 104-11 Included for prevention, control, and abatement of erosion and water pollution and are to be used at locations as directed by the Engineer. Limits shown on plans are approximate only.

ITEM NO. 110-1 Includes the removal of approx. 175 L.F. of conc. curb and gutter and approx. 90 S.Y. of conc. swk.

ITEM NO. 120-1 The pay quantity for this item shall be the plan quantity.

ITEM NO. 331-2 Includes estimated 6 tons for sidestreets.

ITEM NO. 339-1 Included for pavement under guardrail.

ITEM NO. 425-5 Included for the adjustment of the storm sewer manhole at Sta. 380+02

ITEM NO. 530-1-1 Included for the spillway as shown on plans. This is an estimated quantity and is to be increased or decreased as directed by the Engineer.

ITEM NO. 536-7 Included for post placement on approach slabs.

ITEM NO. 570-2 Included in the cost for this item will be approximately 1.3 lbs. grass seed, .05 tons mulch material, .006 tons Fertilizer, and 0.13 MG water. Also includes any final dressing that may be needed.

ITEM NO. 706-2 Includes 47 ea. red and colorless and 30 ea. amber & amber (reflective pavement markers).

ITEM NO. 711-6-41 Includes 317 L.F. white and 1080 L.F. yellow.

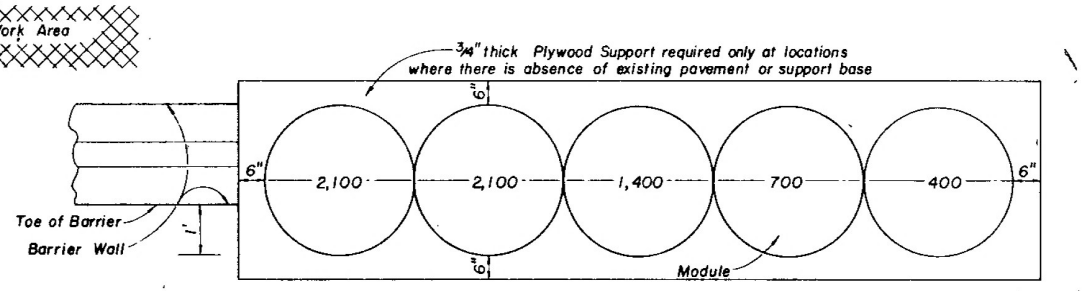
TRAFFIC CONTROL AND SAFE PRACTICES
FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE AND UTILITY OPERATIONS
FLORIDA DEPARTMENT OF TRANSPORTATION

WARNING DEVIC

PROJ. NO.	SHE
88010-3510	

OFFSET

"d"	Conditions
6'	Municipal Construction - Low Speed - ADT > 1600
6'	Undivided Highway - Low Speed - ADT < 1600
6'	Undivided Highway - High Speed - ADT < 1600
10'	Undivided Highway - High Speed - ADT > 1600
10'	Divided Highway of Four or More Lanes
10'	Interstate and Other Limited Access Facilities



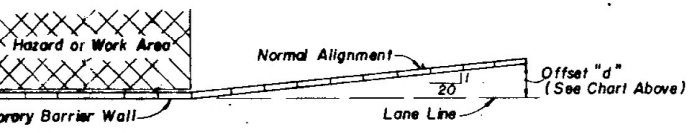
NOTES:
1) Inertial Attenuator to be installed where taper offset from lane line is not obtainable.
2) Number shown inside module indicates the weight in pounds of sand. All modules are approximately 36" inches in height and in diameter.
3) Inertial Attenuator to be installed in accordance with manufacturers specifications and recommendations
4) Module color and marking shall be in accordance with Index No. 17353.
5) Cost of inertial attenuator to be included in the unit cost for Maintenance of Traffic.

TEMPORARY INERTIAL ATTENUATOR

SUMMARY OF MODULES	
WEIGHT	QUANTITY
400 lbs.	1
700 lbs.	1
1,400 lbs.	1
2,100 lbs.	2

Design Vehicle Wt. 4,500 lbs.
Design Speed 45 m.p.h.
Max. Deceleration 5.96 g's
Avg. Deceleration 4.15 g's

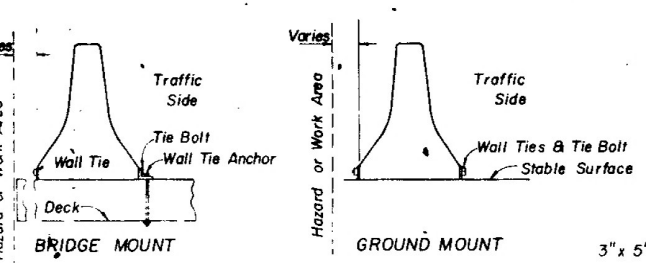
Design Vehicle Wt. 2,000 lbs.
Design Speed 45 m.p.h.
Max. Deceleration 7.06 g's
Avg. Deceleration 4.47 g's



PLAN

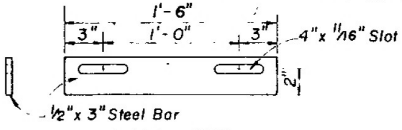
WALL ALIGNMENT

OTES.
1) For optional wall alignment see detail of Temporary Inertial Attenuator.
2) Temporary barrier to be placed as shown in the plans or as directed by the Engineer.
3) For additional information refer to charts I, II and III in the manual of Traffic Control and Safe Practices.
4) Sections of temporary barrier wall shall be set end-to-end as close together as feasible to form a continuous barrier.
5) Temporary barrier wall shall be delineated by steady burn type "C" lights on 50' centers.
6) For additional information on barrier wall placement see construction sequence on Bridge Plans.

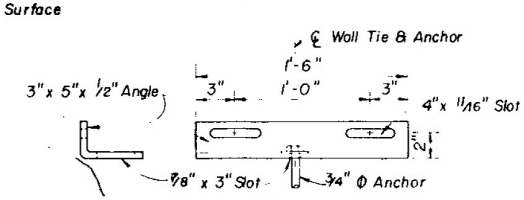


WALL CONNECTION & ANCHORAGE

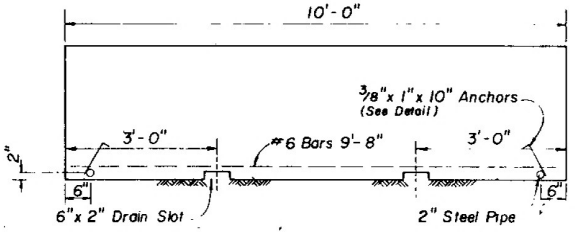
nchor shall have a pullout and shear capacity of 14,000 lbs. After onstruction is complete anchor shall be removed to 1" min. below slab urface and hole filled with grout.



WALL TIE

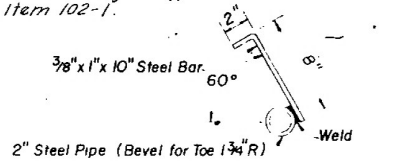


WALL TIE & ANCHOR

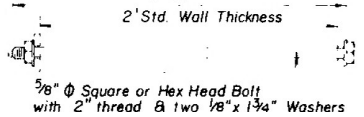


PRECAST WALL UNIT

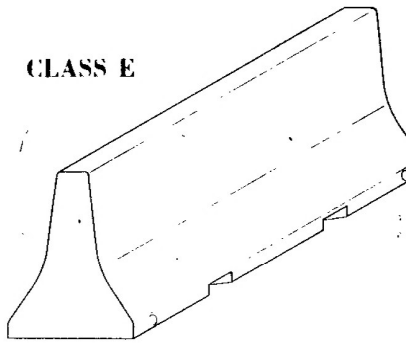
The contractor shall pick up wall units (furnished by D.O.T.) at the D.O.T. Fort Pierce maintenance yard, 3601 Oleander Ave, Fort Pierce. The contractor shall also return the wall units to the Fort Pierce maintenance yard. (Approx. 45 units will be available.) Cost to be included in Pay Item 102-1.



WALL LIFT PIPE & ANCHOR



WALL TIE BOLT



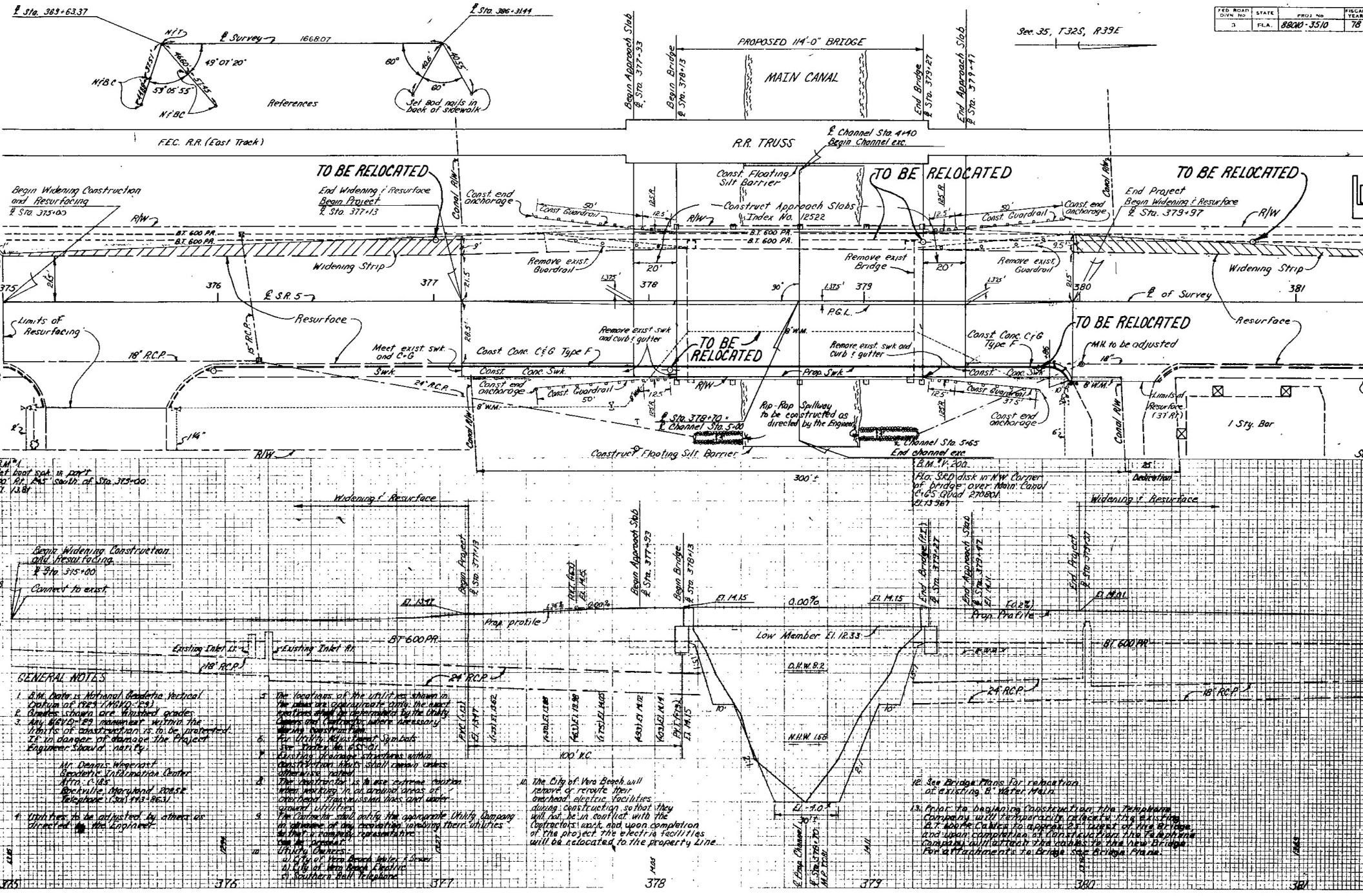
CLASS E

TEMPORARY BARRIER WALL

Wall ties, wall tie, anchors and wall tie bolts, are to be furnished by the Contractor and shall become the property of D.O.T. at the completion of the project, and shall be stockpiled as directed by the Engineer.

Approved

Revised Date 10-1-77



FED. ROAD DIVN. NO.	STATE	PROJ. No.	FISCAL YEAR
3	FLA.	8800-3510	78

GENERAL NOTES

1. B.M. Datum is National Geodetic Vertical Datum of 1929 (NGVD-29).
2. Grades shown are finished grades.
3. Any elev. of NGVD-29 encountered within the limits of construction is to be protected. If in danger of damage the Project Engineer should notify:

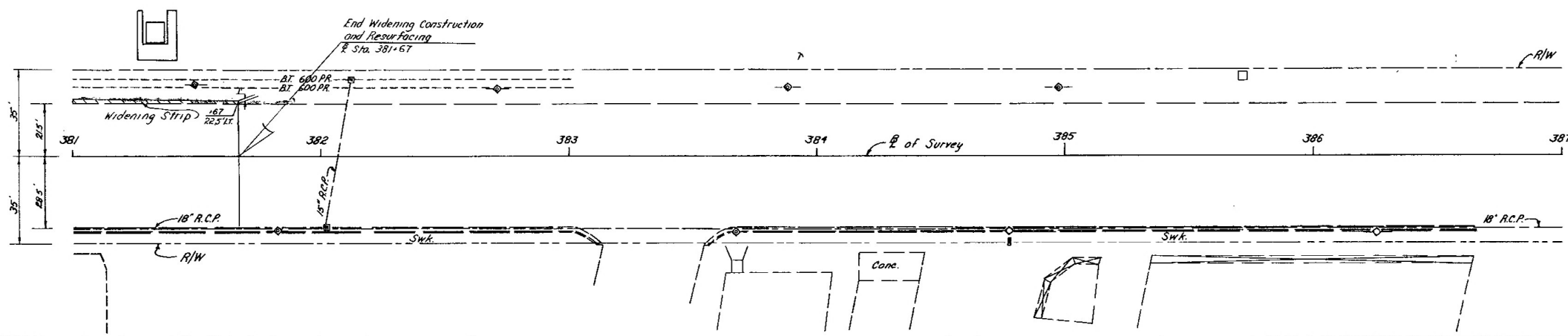
   Mr. Daniel Wagerost
   Geodetic Information Center
   Attn. C 185
   Rockville, Maryland 20852
   Telephone (301) 443-8631

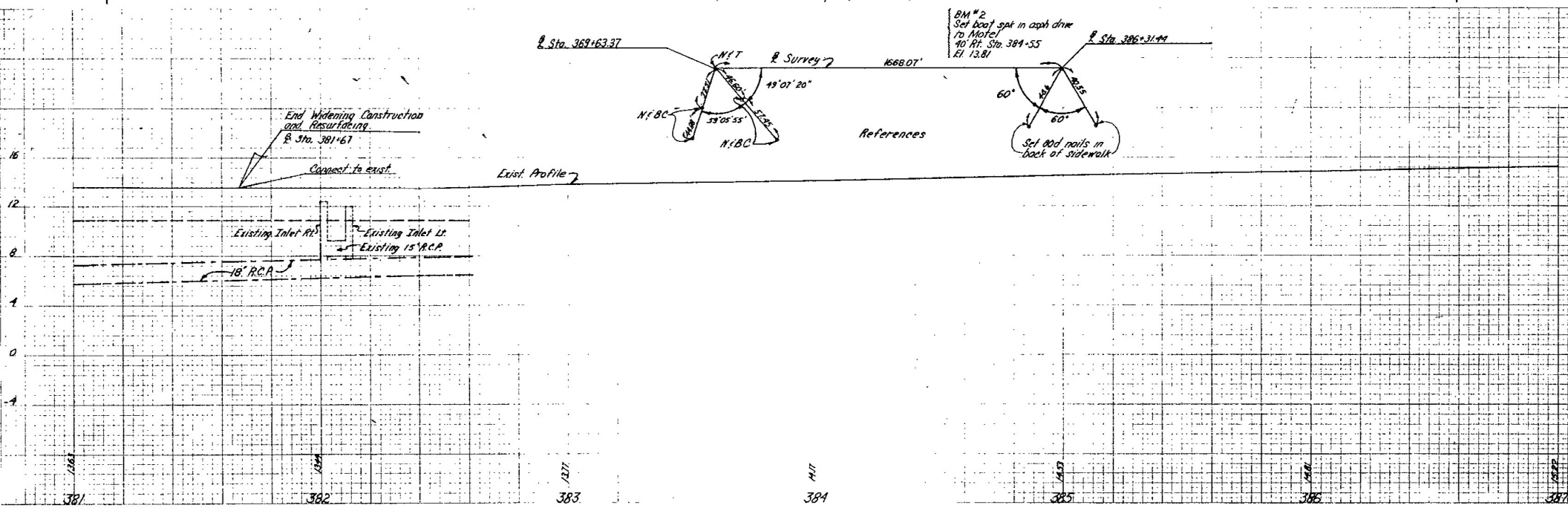
4. Manholes to be adjusted by others as directed by the Engineer.
5. The locations of the utilities shown in the plans are approximate only. The exact locations shall be determined by the Utility Owners and Contractor where necessary during construction.
6. For Utility Adjustment Schedule See Drawing No. 6 of 21.
7. Existing drainage structures within construction limits shall remain unless otherwise noted.
8. The contractor is to exercise extreme caution when working in or around areas of overhead, aerial and underground utilities.
9. The Contractor shall notify the appropriate Utility Company or owner of any excavation involving their utilities so that a company representative may be present.
10. Utility Owners:
    a) City of Vero Beach Water & Sewer
    b) City of Vero Beach Electric
    c) Southern Bell Telephone
10. The City of Vero Beach will remove or reroute their overhead electric facilities during construction so that they will not be in conflict with the Contractors work and upon completion of the project the electric facilities will be relocated to the property line.
12. See Bridge Plans for removal of existing B.T. 600 PR.
13. Prior to beginning construction the Telephone Company will temporarily relocate the existing B.T. 600 PR. Cables to approx. 21' west of the Bridge, and upon completion of construction the Telephone Company will attach the cables to the new Bridge. For attachments to Bridge see Bridge Plans.

F.A. ROAD	STATE	PROJ. No.
3	FLA.	8810-3510

Sec 35, T32S, R39E

F.E.C. R.R. (East Track)



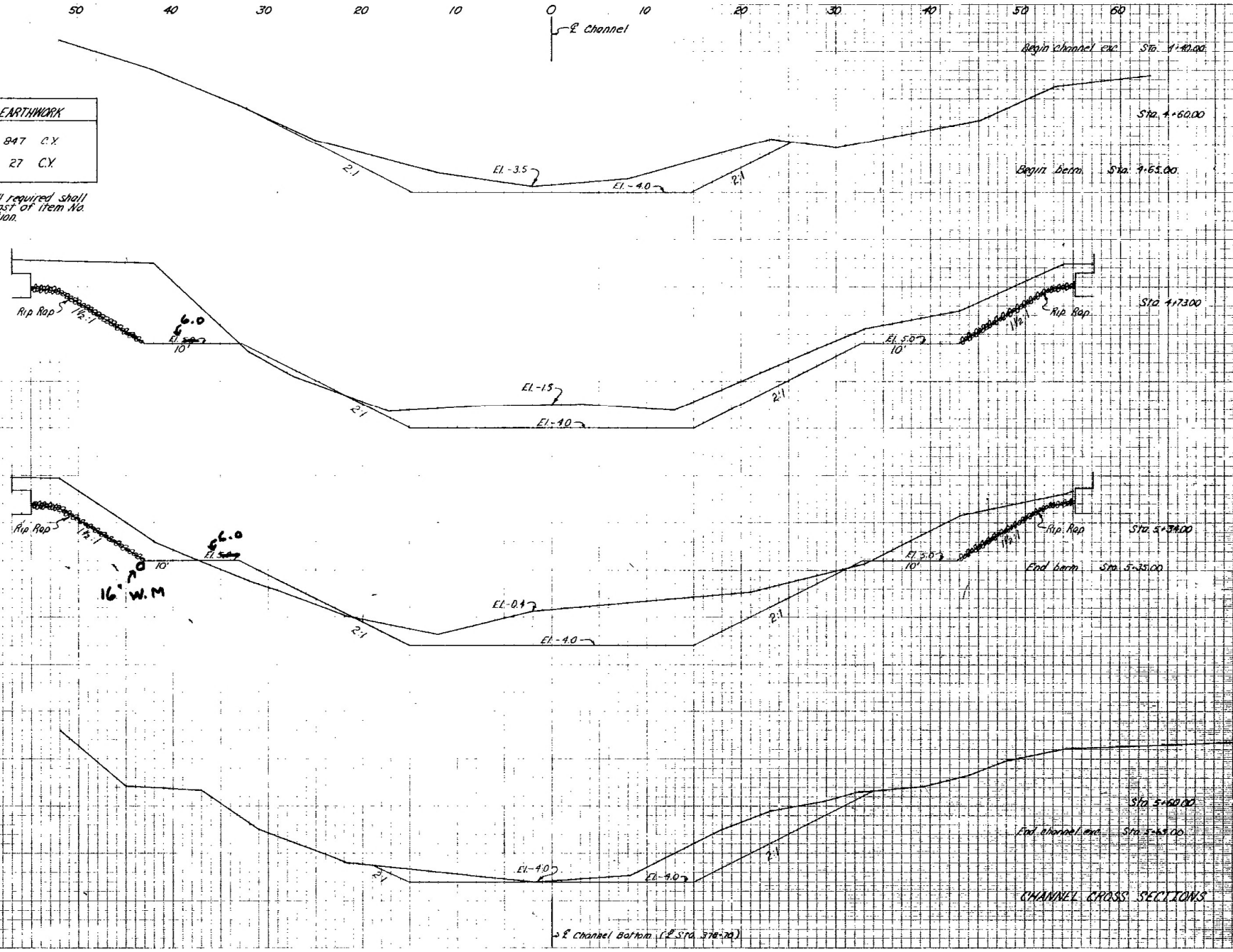


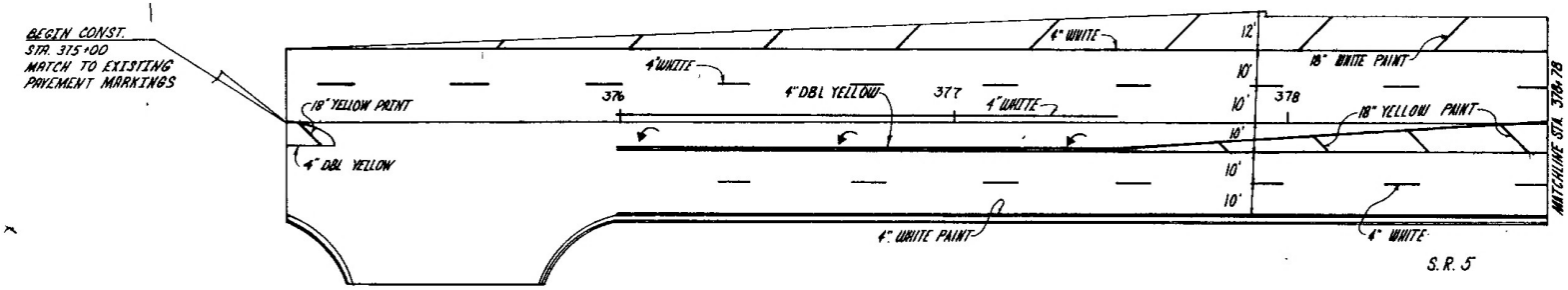
Fed. Road Dist. No.	State	County	Proj.	Proj.
3	Fla.	Indian River	S	8801K

CROSS SECTIONS

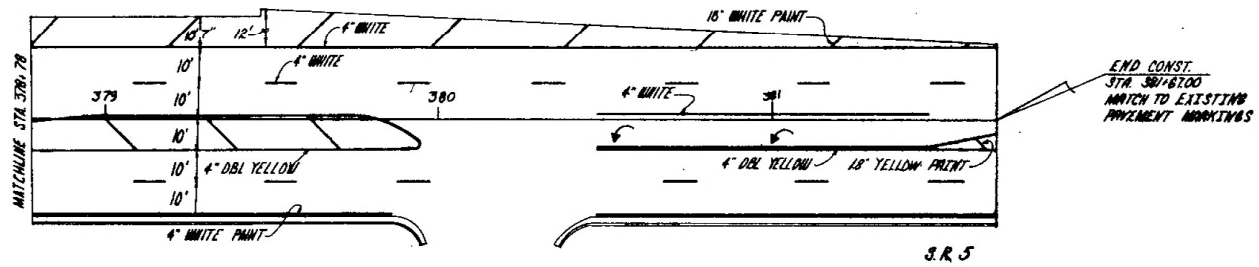
SUMMARY OF EARTHWORK		
CHANNEL EXC.	847	C.Y.
CHANNEL FILL	27	C.Y.

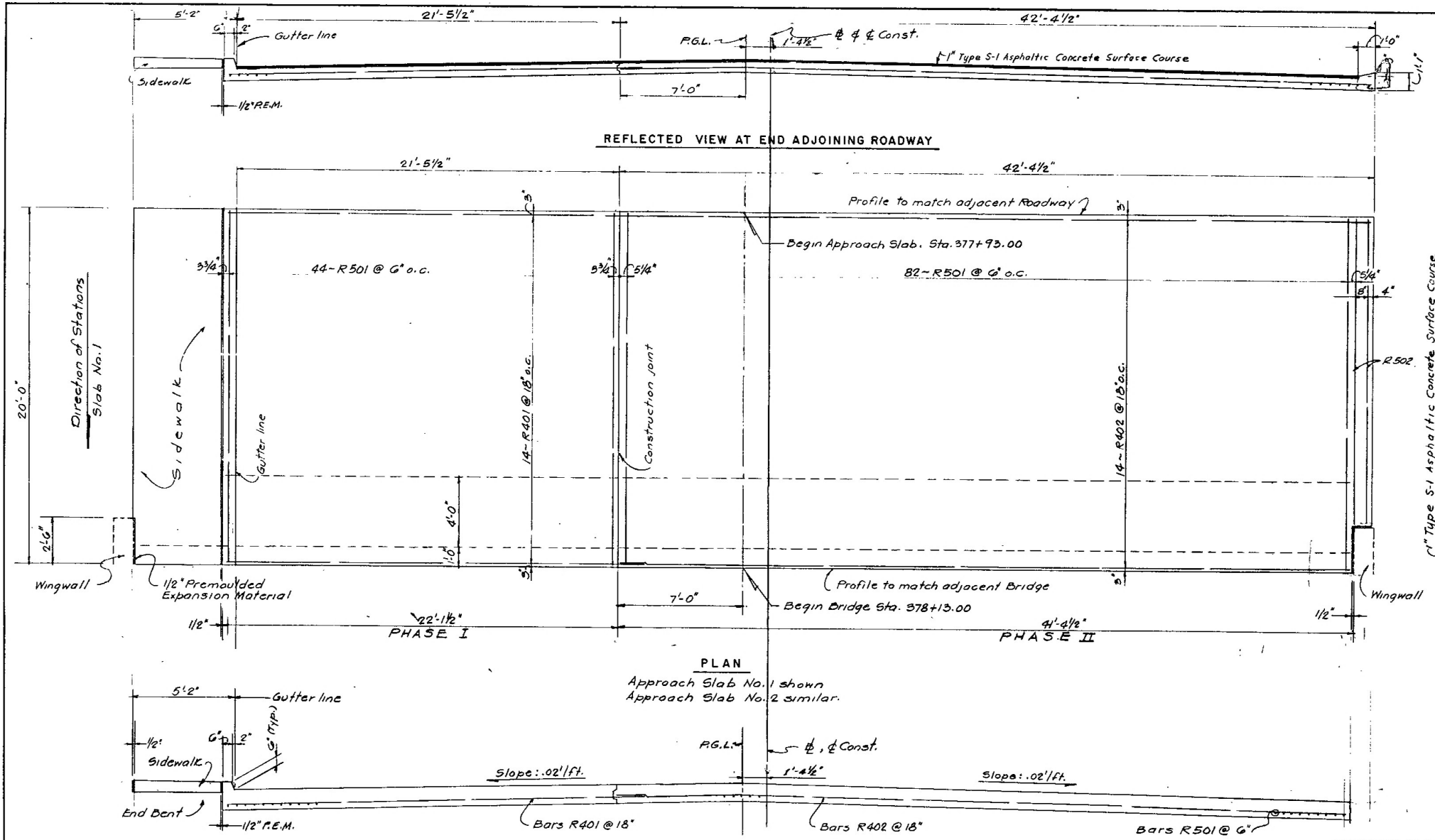
Cost of all channel fill required shall be included in the cost of item No. 120-1 Regular excavation.





NOTE: ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC UNLESS OTHERWISE SPECIFIED





BILL OF REINFORCING STEEL*				
MARK	SIZE	LENGTH	NO. REQD.	TYPE
R401	4	25'-5"	14	Str.
R402	4	41'-9"	14	"
R501	5	19'-6"	126	"
R502	5	17'-0"	2	"

ESTIMATED QUANTITIES *		
ITEM	UNIT	QUANTITY
Class II Concrete	C.Y.	38.41
Reinforcing Steel	Lbs.	3208

* Bill of Reinforcing Steel and Estimated Quantities are for one Approach Slab only. 2 Required. Sidewalk Quantities are not included.

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

REVISIONS	
Date	Description

APPROACH SLAB

STATE OF FLORIDA DEPARTME
STRUCTU

STATE ROAD 5
MAIN C

ROAD NO.	COUNTY
SR-5	INDIAN RIVER

	Name	Date	APPRO
Designed by	NCR	11/77	
Checked by	RPJr	1/78	
Quantities by	NCR	11/77	
Checked by	RPJr	1/78	
Supervised by	NCR		

FED. ROAD DIV. NO.	STATE	PROJECT
3	FLA.	88010

ESTIMATED BRIDGE QUANTITIES *

ITEM NO.	ITEM	UNITS	QUANTITIES
110-3 ▲	Removal of Existing Structure	L.S.	1
400-2-5	Class II Concrete (Substructure)	C.Y.	111
400-2-4	Class II Concrete (Superstructure)	C.Y.	178
400-5-4	Concrete Handrail (Barrier)	L.F.	114
400-5-5	Concrete Handrail (Sidewalk Barrier Type)	L.F.	114
415-1-4	Reinforcing Steel (Superstructure)	Lb.	45,158
415-1-5	Reinforcing Steel (Substructure)	Lb.	17,225
450-71***	Resetting Pre stressed Slab Units	L.F.	1,100
455-3-2	Pre stressed Concrete Piling Furnished (18"ø)	L.F.	1,624
455-4-2	Pre stressed Concrete Piling Driven (18"ø)	L.F.	1,624
455-9-12	Unloaded Test Piles (Pre-stressed Conc)(18"ø)	L.F.	140
455-10-90	Test Load (90 Tons)	Ea.	1 **
455-10-110	Test Load (110 Tons)	Ea.	1 **
455-15	Pre formed Pile Holes	Ea.	22
455-17-2	Pile Splices (18")	Ea.	1
460-91-2	Expansion Joint Seal (Compression Elast.)	L.F.	137
530-1-2	Rip Rap (Sand-Cement)(Bridge)	C.Y.	100

▲ Approx. 7,015 S.F. of Cast in Place Slab Bridge.
* Does not include Quantities for Approach Slab
** The number of test loads may be increased or omitted as directed by the Engineer.

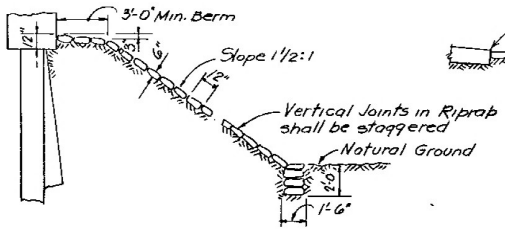
INDEX OF BRIDGE SHEETS

B-1 Summary of Quantities, Index of Drawings, General Notes and Rip-Rap details.
B-2 General Plan and Elevation.
B-3 Bridge Design Data Sheet.
B-4 Soils Data.
B-5 Pile Layout and Finish Grade Elevations.
B-6 End Bents 1 and 5. Plan and Elevation.
B-7 End Bents 1 and 5. Sections and Details.
B-8 Interior Bents 2, 3 and 4.
B-9 Superstructure. Spans 1 thru 4.
B-10 Superstructure Details.
B-11 Concrete Handrail Barrier. (Index 11,407)
B-12 Sidewalk Barrier. (Index 11,460)
B-13 12", 14" and 18" Prestressed Concrete Piles. (Index 3400)
B-14 Construction Sequence.

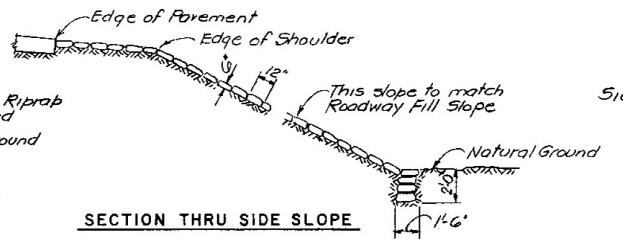
*** The Prestressed Slab Units shall be furnished by the Department of Transportation and shall be picked up by the Contractor at the Ft. Myers Maintenance Yard, 702 Pine Island Road (S.R. 78), Ft. Myers, Florida and transported to the job site.
The Contractor shall notify Mr. D.M. Heflin, Post Office Box "M", Ft. Myers, Florida, 33902, Phone No. (813) 995-5403 two (2) weeks in advance of the intended date for picking up the Prestressed Slab Units. The cost of picking up the Prestressed Slab Units, transporting them to the job site, and the cost of any necessary cleaning and repairs so that the Units may be used in the proposed structure shall be included in the Contract Unit Price for "Resetting Pre stressed Slab Units."

GENERAL NOTES

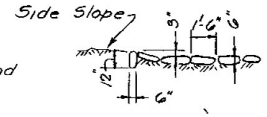
GENERAL SPECIFICATIONS: Florida Department of Transportation Standard Specifications for Road and Bridge Construction (1977) & 1978 Supplement.
DESIGN SPECIFICATIONS: Designed in accordance with the 1973 edition of A.A.S.H.O. Standard Specifications for Highway Bridges and approved revisions.
DESIGN LOADING: HS 20-44 Roadway.
60 P.S.F. Sidewalk.
MATERIAL STRESSES: All allowable stresses are in accordance with the 1973 edition of the A.A.S.H.O. Standard Specifications for all the materials shown on plans.
Maximum working stresses for Concrete: Class II 1360 p.s.i. Class III 2000 p.s.i. Class IV 2200 p.s.i.
REINFORCING STEEL: Grade 60, except pre-stressed concrete piles may be Grade 40.
CONCRETE STRENGTH: (28 days): Class II 3400 p.s.i., Class III 5000 p.s.i. and Class IV 5500 p.s.i.
SURFACE FINISH: All surfaces shown in detail below, including top and inside face of End Bent wingwalls, shall receive a Class 5 applied finish coating.
ENVIRONMENT: Non-Coastal.



SECTION THRU FORWARD SLOPE

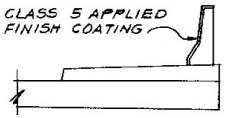


SECTION THRU SIDE SLOPE



SECTION THRU ENDS

RIP-RAP DETAILS



DETAIL SHOWING LOCATION OF APPLIED FINISH COATING

BUDGET ITEM 415356
BRIDGE NO. 88000-3

SUMMARY OF QUANTITIES, IND
DRAWINGS, GEN. NOTES & RIP-RA

STATE OF FLORIDA DEPARTMENT OF TRA
STRUCTURES

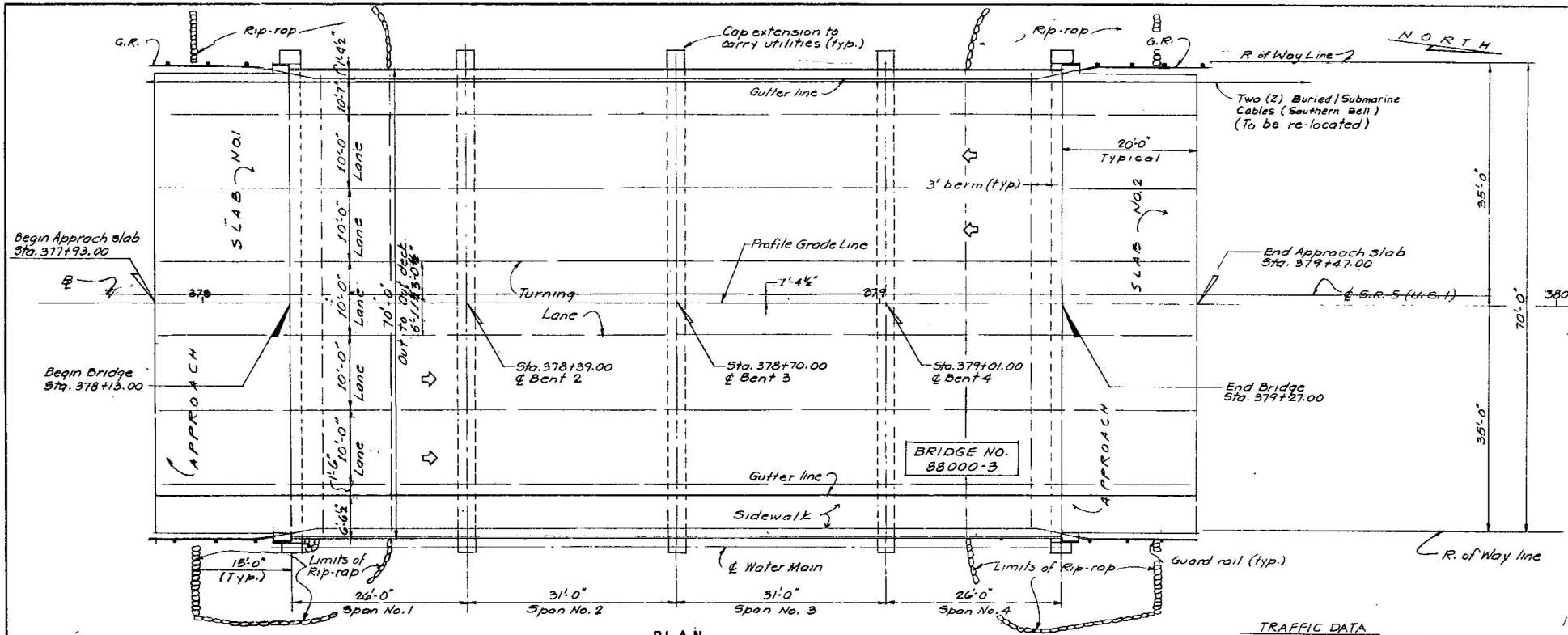
STATE ROAD 5 (U.S.1) C
MAIN CANAL

REVISIONS		ROAD NO.	COUNTY	
Dates	Descriptions	SR-5	INDIAN RIVER	8801C

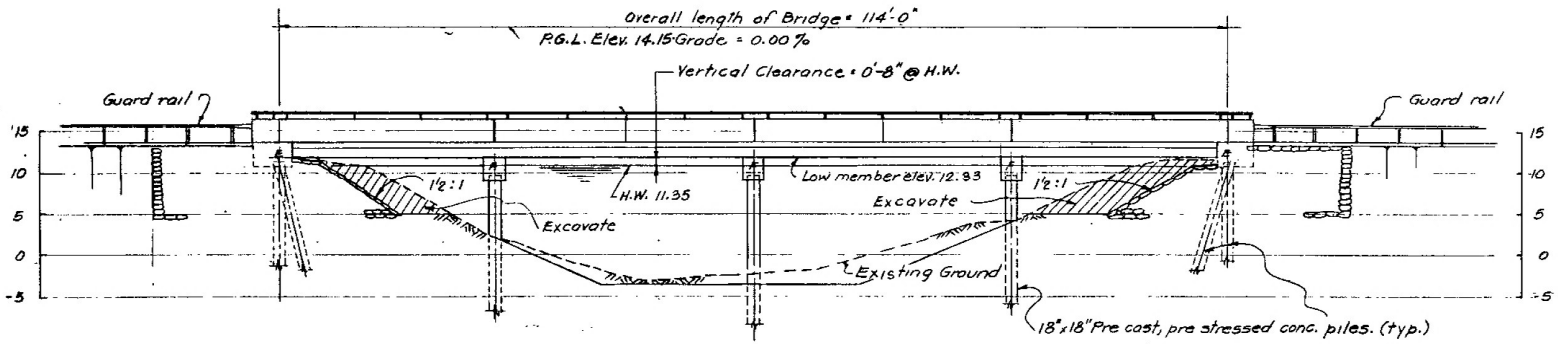
	Names	Dates	APPROVED BY
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.Jr.	JAN-78	
Quantities by	N.C.R.	NOV-77	
Checked by	R.P.Jr.	JAN-	
Supervised by	N.C.R.		

Drawing No. 1 of 11

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA-FLORIDA



PLAN



ELEVATION

NOTE: Drive one unloaded test pile 45 ft. long (18"ø) in each Bent 1 and 5, and one unloaded test pile 50 ft. long (18"ø) in Bent No. 3, in the position of a permanent plumb pile located as directed by the Engineer.

TRAFFIC DATA
Design Speed: 45 M.P.H.

1. See Sh. B-1 for G
Details of Rip-ra
of Quantities.
2. See Sh. B-4 for
3. Existing cast in p
bridge to be rem
4. See Sh. B-14 for Co
Sequence.
5. Exact location unc
Cable Location Bure
1-800-432-4770

BUDGET ITEM 415356
BRIDGE NO. 88000 3
GENERAL PLAN AND ELEV

STATE OF FLORIDA DEPARTMENT
STRUCTURE

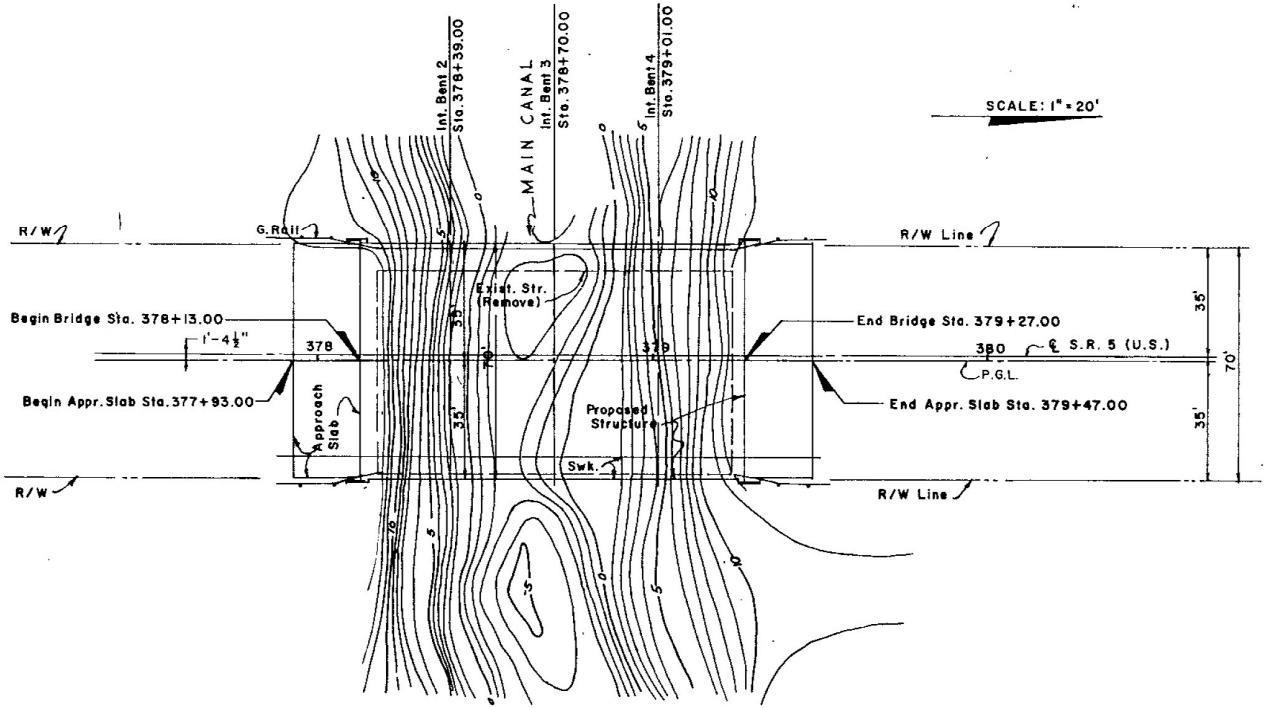
STATE ROAD 5 (
MAIN C

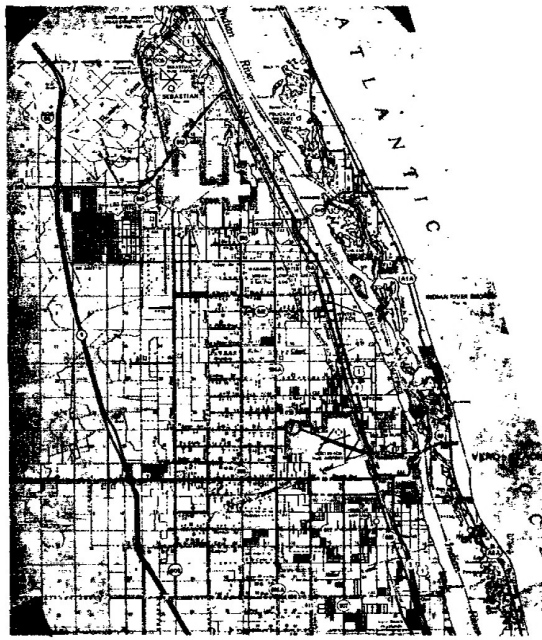
REVISIONS		ROAD NO.	COUNTY
Date	Description	SR-5	INDIAN RIVER

	Name	Date	APPROVED
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.	JAN-78	T.
Quantities by	A.	NOV. 77	
Checked by		JAN. 78	D.
		R.	2

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA FLORIDA

FED. ROAD DIV. No.	STATE	PROJECT No.
3	FLA.	88010-35[illegible]

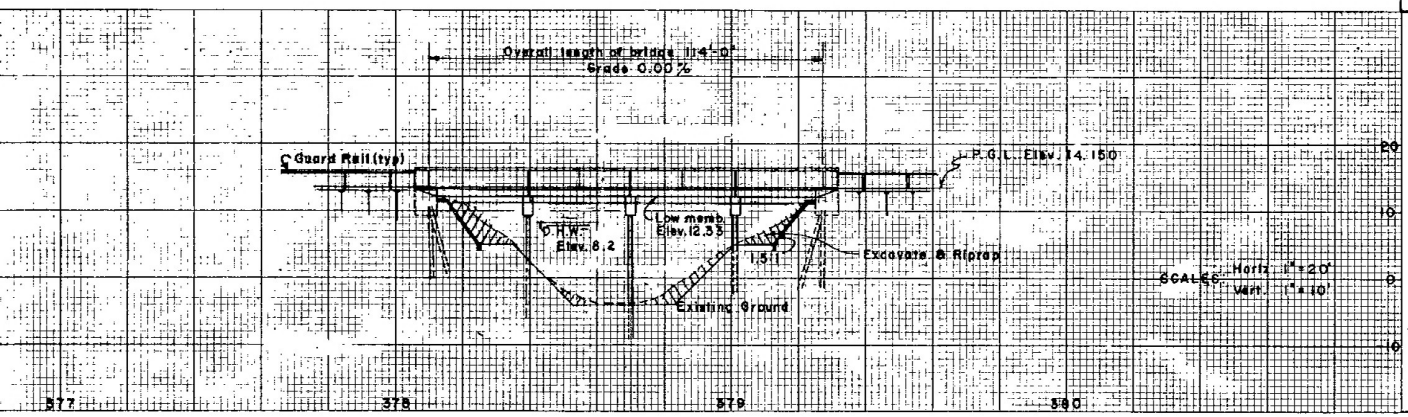




DRAINAGE AREA & LOCATION

EXISTING STRUCTURES

(REFERENCE)	(1)	(2)	(3)	(4)	(5)
FOUNDATION	Conc. Piles				
OVERALL LENGTH	105' 6"				
SPAN LENGTH	5@15' 2@15'3"				
TYPE CONSTRUCTION	Conc.				
SIDEWALKS					
ROADWAY WIDTH	54'				
ELEV LOW MEMBER	12.33				



DESIGN DATA

STRUCTURE RECOMMENDATIONS
1. LOADING HS-20-44
2. BRIDGE ROADWAY WIDTH 62
3. SIDEWALKS 5'-0" Rt.

DRAINAGE RECOMMENDATIONS
1. BEGIN BRIDGE STATION 378+13.00 END BRIDGE STATION 379+27.00
2. CENTERLINE GRADE ELEVATION 14.15
3. BRIDGE SKEW ANGLE NONE
4. CHANNEL BOTTOM, WIDTH 30'± ELEVATION -4.0 SIDE SLOPES 2:1
   CENTERLINE CHANNEL BOTTOM, STATION 378+70
   LIMITS OF CHANNEL EXCAVATION RT. R/W LT. R/W
5. CLEARANCE: NAVIGATION: HORIZ. N.A. DRIFT: HORIZ. 15' Min.
   VERT. N.A. ABOVE EL. N.A. VERT. 3.0 ABOVE EL. 8.2
6. DRAINAGE AREA 25 Sq. Miles *
7. WATER STAGE DATA:

	MAX. STAGE OF RECORD	DESIGN H.W.	NORMAL FLOW ELEV.
ELEVATION	7.5-8	8.2	1.58
DATE OF OCCURRENCE	unknown		
RECURRENCE INTERVAL	"	50 Years	

8. DESIGN DISCHARGE 2264 CFS SOURCE Indian River Farms Drainage District & Corps. Ft. Drum Study.
   RECURRENCE INTERVAL 50 YEARS
9. DESIGN VELOCITY 3.8 FPS

REMARKS: Construct Berm at El. 5.0

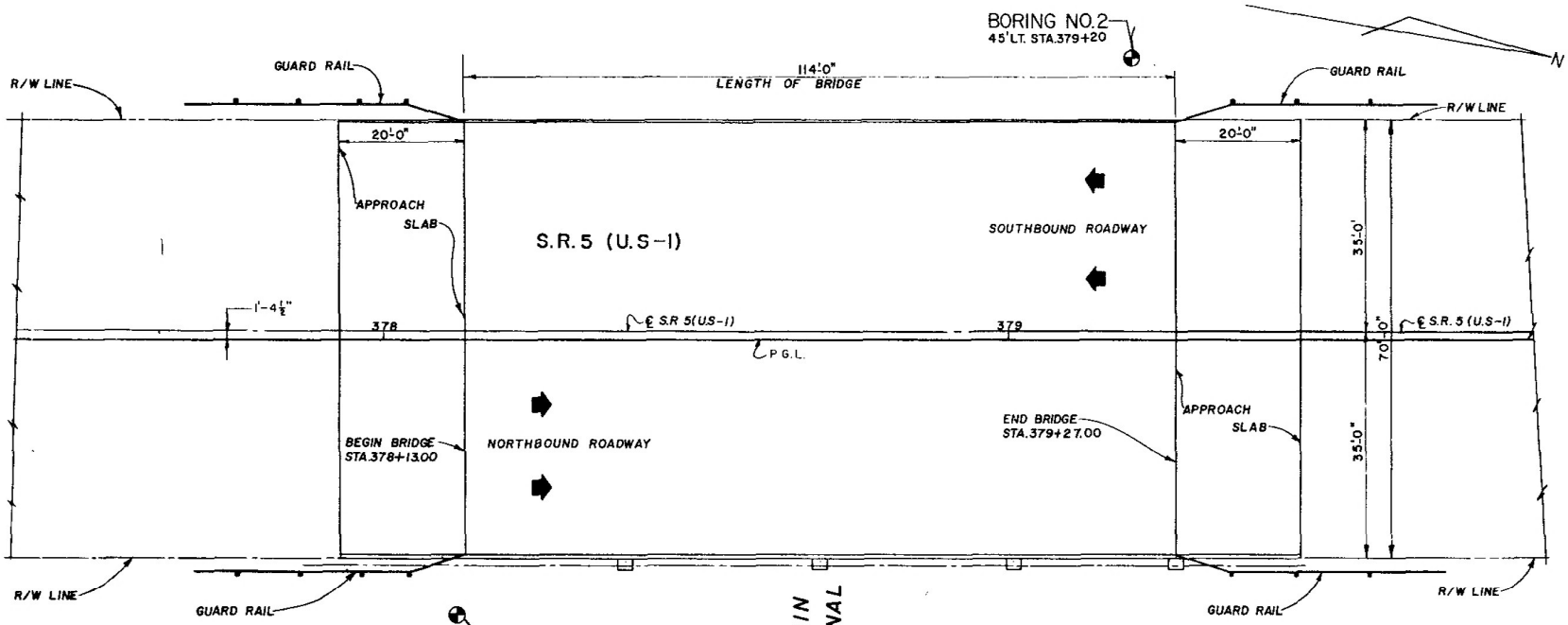
* U.S.G.S. report indicates drainage area is indeterminate. D.A. determined by I.R.F.D.D. (Approx.)
There is a saltwater intrusion barrier 4650 ft. east of bridge Elev. 1.2 ± m.s.l.

BASIC FLOOD (100 YR) DATA:
Q100 = 2504 Cfs
EHW = + 8.6' MSL

RECOMMENDED DISTRICT DR. ENGR.
APPROVED ENGINEER OF DRAINAGE

BRIDGE DESIGN DATA SHEET DRAWING NO. 3-[illegible]-12521 DD IB

STATE	PROJECT NO.
FLA.	88010-3510



BORING LOCATION PLAN

SCALE 1"=10 FT.

NOTES

DUE TO CORE BORING LOCATIONS AND PROCED
STRATA MAY DIFFER WITH SOIL PROFILE.

DEPTHS GIVEN IN DISTANCE BELOW EXISTING

NUMBERS TO LEFT OF BORING INDICATE BL
SPOON FOR 12" PENETRATION.

SPOON: INSIDE DIAME
OUTSIDE DIAM

HAMMER: WEIGHT 140
DROP 30"

LEGEND

- WATER LEVEL
- FINE SILICA SAND WITH LIMEROCK FRAGMENTS
- FINE SILICA SAND
- FINE SILICA SAND WITH SHELL
- CLAYEY SAND WITH SHELL FRAGMENTS

BORING NO.1

ELEV.+13.0'

ELEVATION (FT.)	N	
30		
20	7	DARK GRAY SAND WITH SOME LIMEROCK FRAGMENTS, GAP GRADED, LOOSE, DRY, SUBROUNDED TO ANGULAR.
	5	GRAY TO BROWN SAND POORLY GRADED, LOOSE, DRY,
	9	SUBROUNDED.
10	38	
	39	GRAY SAND WITH SHELL, GAP GRADED, DENSE, WET,
	20	SUBROUNDED TO ANGULAR.
0	29	
	40	DARK GRAY TO DARK BROWN SAND, POORLY GRADED,
	31	DENSE, WET, SUBROUNDED.
	41	
-10	36	
	44	
	35	
-20	41	DARK GRAY SAND WITH SHELL, GAP GRADED, DENSE,
	42	WET, SUBROUNDED TO ANGULAR.
	36	
	39	
-30	32	
	39	
	33	
-40	53	DARK GRAY CLAYEY SAND WITH SHELL FRAGMENTS,
	33	GAP GRADED, DENSE, WET, SUBROUNDED TO ANGULAR.
	46	
	44	
-50	50/5"	
-60		TERMINATED 75.0'
-70		

BORING NO.2

ELEV.+11.0'

ELEVATION (FT.)	N	
30		
20	7	BROWN SAND WITH TRACE OF LIMEROCK FRAGMENTS, GAP GRADED, LOOSE, DRY, SUBROUNDED TO ANGULAR.
	5	
10	12	GRAY SAND, POORLY GRADED, LOOSE TO COMPACT,
	21	DRY, SUBROUNDED.
0	38	
	21	BROWN TO GRAY SAND WITH SHELL, GAP GRADED, DENSE,
	41	TO LOOSE, SUBROUNDED TO ANGULAR.
-10	38	
	11	
	20	BROWN SAND, POORLY GRADED, COMPACT, WET,
-20	32	SUBROUNDED.
	34	
	32	
-30	31	
	39	
	33	
-40	40	GRAY SAND WITH SHELL, GAP GRADED, DENSE, WET,
	38	SUBROUNDED TO ANGULAR.
	34	
	37	
-50	30	
	44	
	41	
-60	44	
	34	
	30	
-70		TERMINATED 75.0'

SCALE: 1"=10 FT. (VERT.)

STATE OF FLORIDA DEPARTMENT OF TRANSPOR
REPORT OF CORE BORINGS FOR STRUCTU

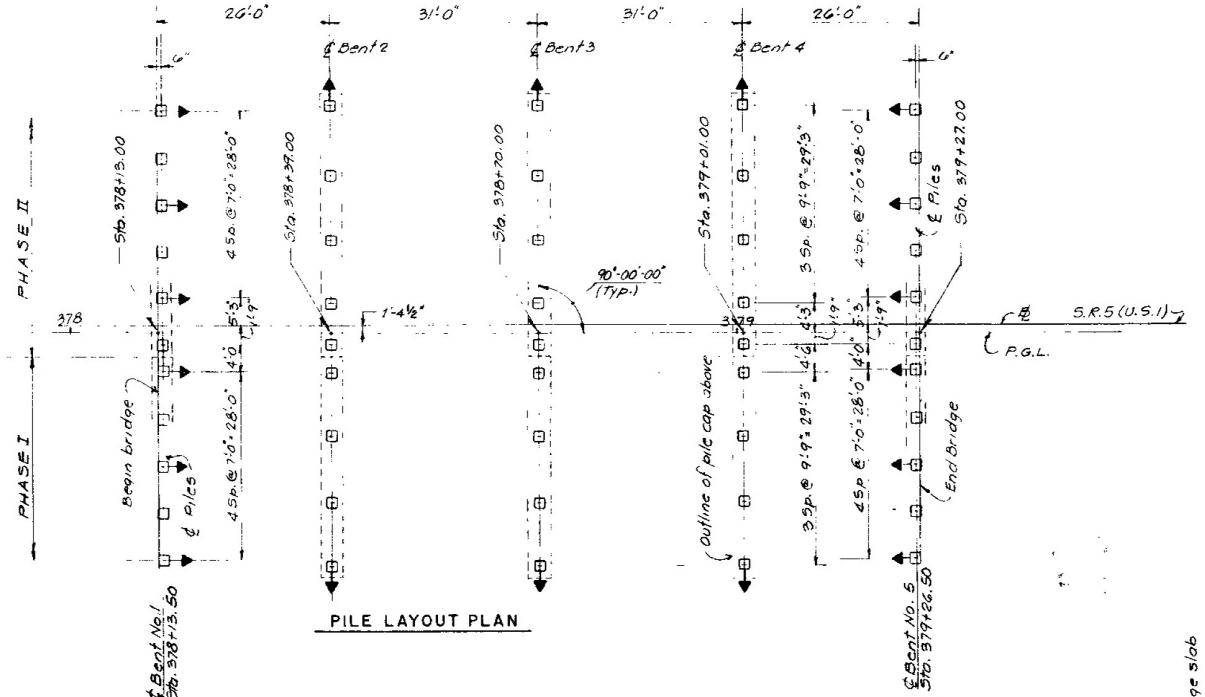
SR5 (U.S.1) OVER MAIN CANAL (BRIDGE NO.

PROJ. NO. 99004-3511
BRIDGE NO. 88000 3
COUNTY: INDIAN RIVER

BORING DATE: 1/9 – 1/11/
BORINGS BY: HAIRE & C
SUBMITTED BY: FLORIDA T
ENGINEERI

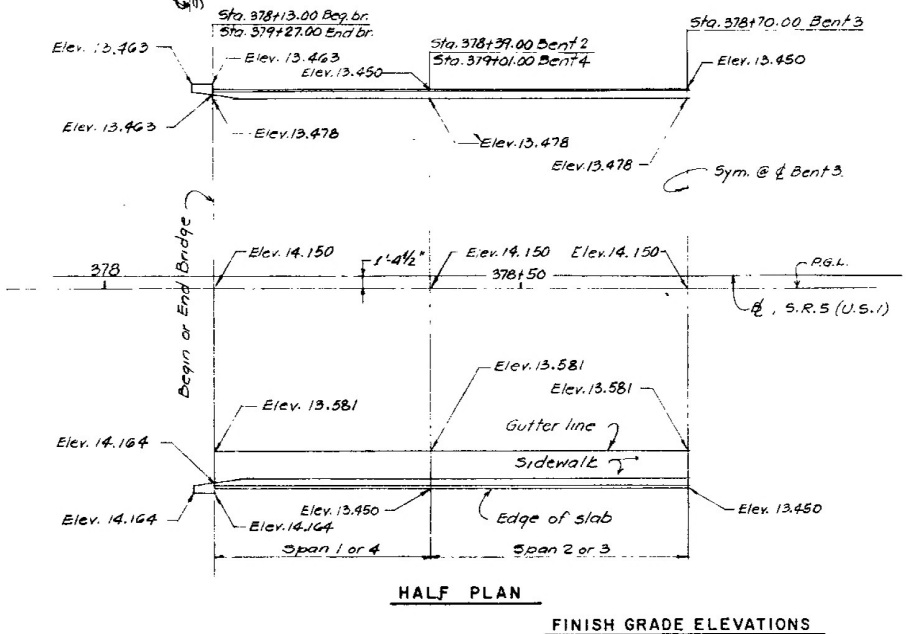
APPROVED	DRAWING NO.	INDEX
	4 of 11	1252

FED. ROAD DIV. NO.	STATE	PROJECT
3	FLA.	88010



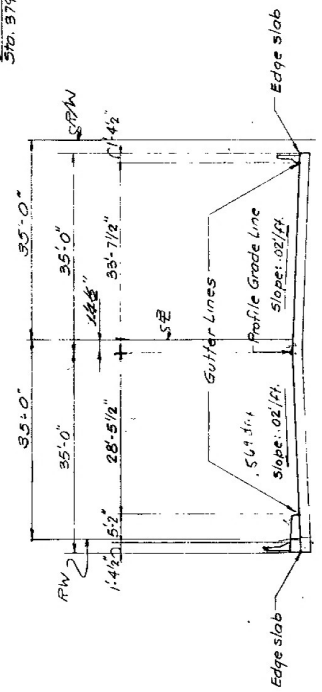
PILE LAYOUT PLAN

NOTES:
- ◄ Indicates battered piles.
- End Bent batter : 2" per foot.
- Int Bent batter : 1½" per foot.
- All piles to be 18"x18" Pre-stressed pre-cast concrete.
- Pile Loads: End Bents 45 TONS
- Int. Bents 55 TONS
- Pile Cut-Off Elev.: End Bents 1 & 5 = 10.825
- Int. Bents 2, 3 & 4 = 10.825



HALF PLAN

FINISH GRADE ELEVATIONS



SECTION THRU ROADWAY SHOWING LOCATION OF ELEVATIONS

PILE LAYOUT & FINISH GRADE EL

STATE OF FLORIDA DEPARTMENT OF TRA
STRUCTURES

STATE ROAD 5 (U.S.1) C
MAIN CANAL

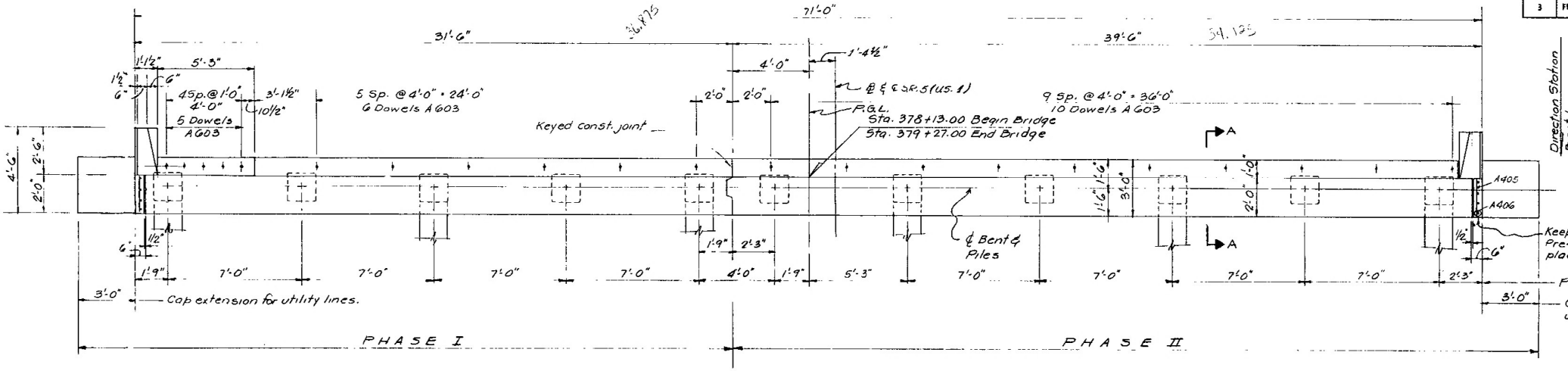
REVISIONS		ROAD NO.	COUNTY	
Date	Description	SR-5	INDIAN RIVER	8801

	Name	Date	APPROVED BY
Designed by	HCE	11/77	
Checked by	R.P.Jr	1/78	
Quantities by	HCE	11/77	
Checked by	R.P.Jr	1/78	
Supervised by	HCE		

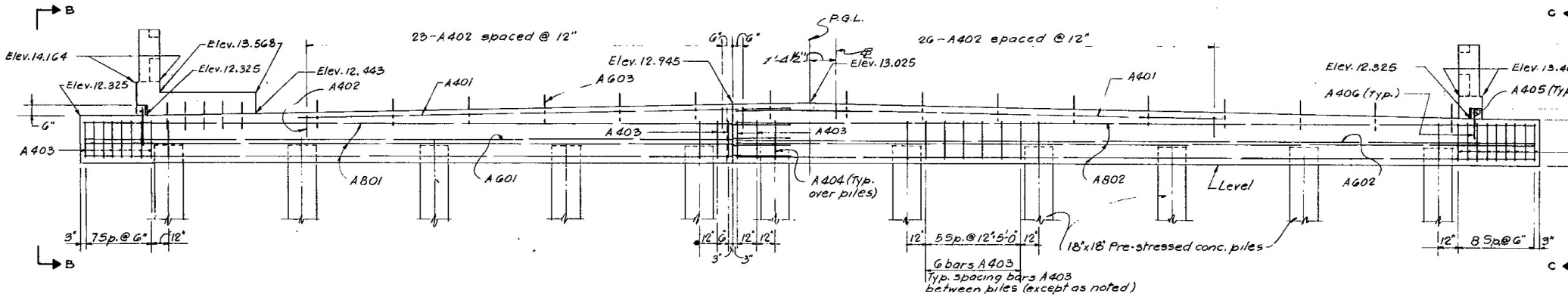
Deputy Design

Drawing No.
5 of 11

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA



PLAN



ELEVATION

NOTES.
Design Load for Piles = 45 Ton
For Barrier details see Sh. B-11
For General Notes see Sh. B-1

END BENTS 1 & 5. PLAN

STATE OF FLORIDA DEPARTME
STRUCTU

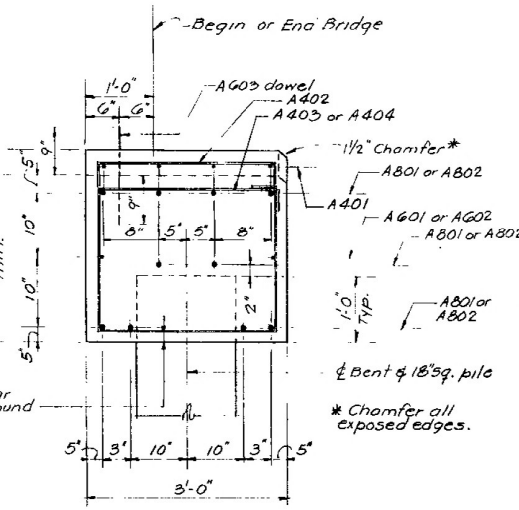
STATE ROAD 5
MAIN

REVISIONS		ROAD NO.	COUNTY
Date	Description	SR-5	INDIAN RIVER

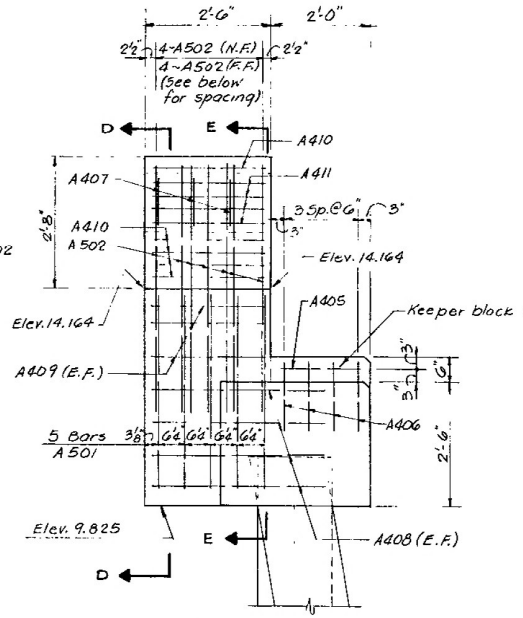
	Name	Date
Designed by	N.C.R.	Nov. 77
Checked by	R.P.J.r.	JAN 78
Quantities by	N.C.R.	Nov. 77
Checked by	R.P.J.r.	JAN 78
Supervised by	N.C.R.	

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

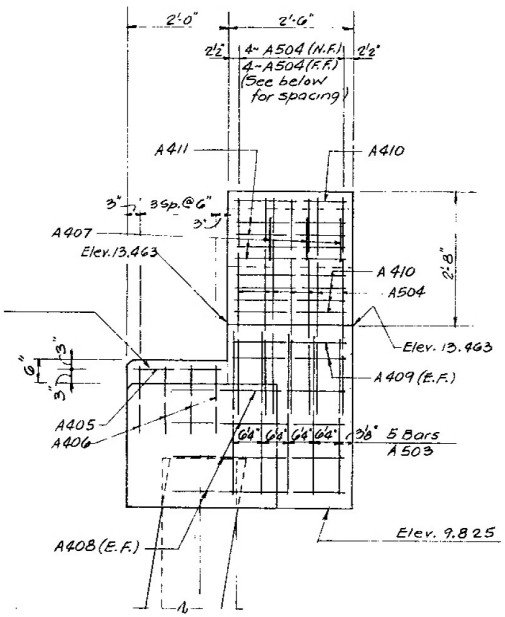
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-3510



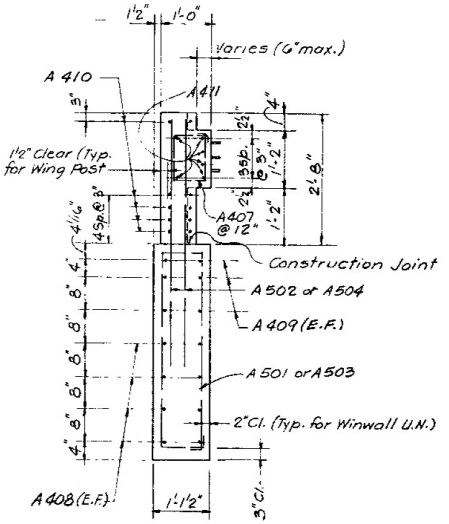
SECTION A-A



ELEVATION B-B



ELEVATION C-C



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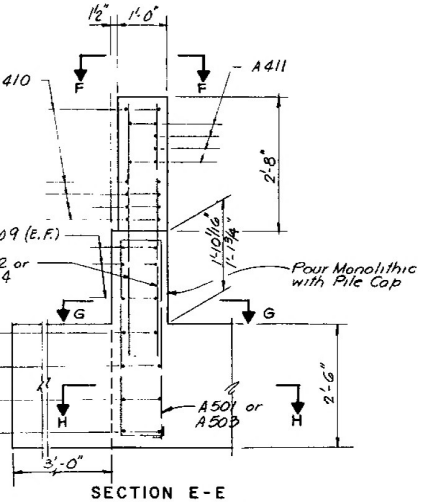
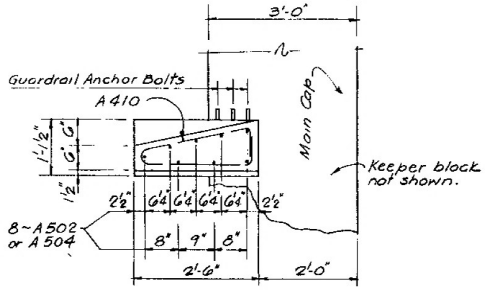
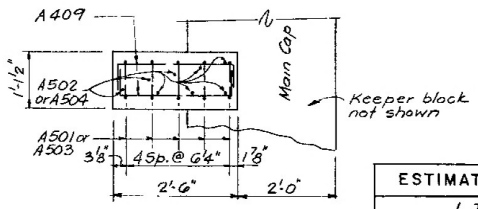


SECTION E-E

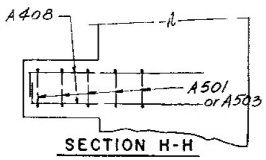
N.F. Near Face
F.F. For Face
E.F. Each Face



SECTION F-F

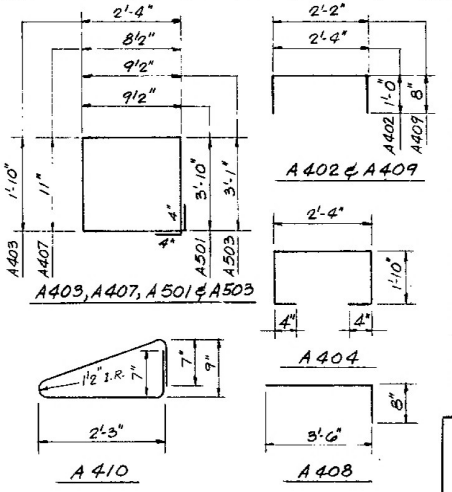


SECTION G-G



SECTION H-H

BAR BENDING DIAGRAM



NOTE: All bar dimensions are out-to-out

BILL OF REINFORCING STEEL

MARK	SIZE	NO. REQ'D.	LENGTH	B
A401	4	8	26'-0"	5
A402		49	4'-4"	5
A403		75	9'-0"	
A404		11	6'-8"	
A405		2	1'-8"	5
A406		8	2'-4"	
A407		6	5'-11"	5
A408		16	4'-2"	
A409		10	3'-6"	
A410		10	5'-9"	
A411	4	12	2'-3"	5
A501	5	5	9'-11"	5
A502		8	5'-0"	5
A503		5	8'-5"	5
A504	5	8	4'-6"	5
A601	6	2	37'-3"	5
A602	6	2	42'-3"	
A603	6	21	1'-6"	
A801	8	10	37'-3"	5
A802	8	10	42'-3"	

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANTITY
Class II Concrete (Substructure)	C.Y.	24.51
Reinforcing Steel (Substructure)	Lbs.	3520
Pre-stressed Conc. Piling (18"Sq.)	Lin. Ft.	**

* Bill of Rein. Steel & Est. Quant. for one End Bent only.
** See Summary of Estimated Quantities.

Conc. Breakdown.
Cap : 23.23c.y.
Wingwall : .85c.y.
End Post : .43c.y.

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLORIDA

REVISIONS	
Date	Description

END BENTS 1 & 5. SECTIONS & DETA

STATE OF FLORIDA DEPARTMENT OF TRANSPORTAT
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3510

	Name	Date
Designed by	NCR	Nov. 77
Checked by	RPJR	JAN. 78
Quantities by	NCR	Nov. 77
Checked by	RPJR	JAN 78
Supervised by	NCR	

APPROVED BY

Deputy Design Engineer, Structu

Drawing No. 7 of 11

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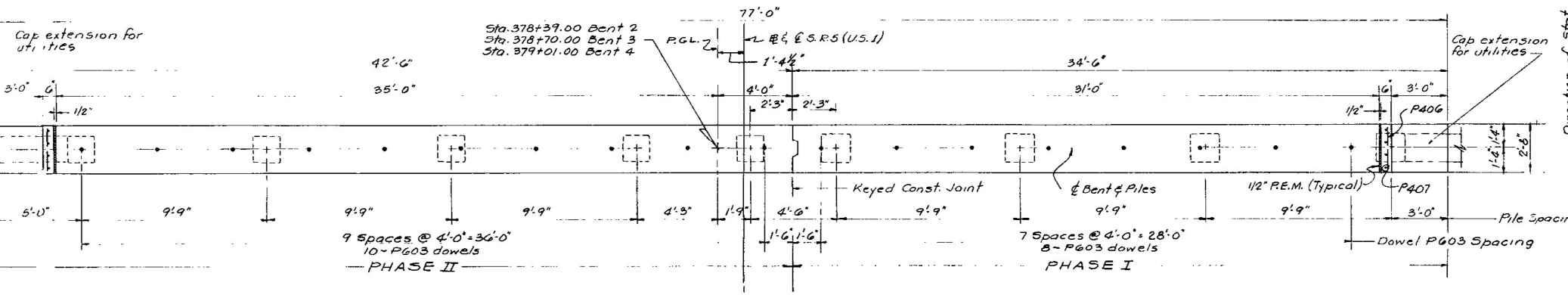
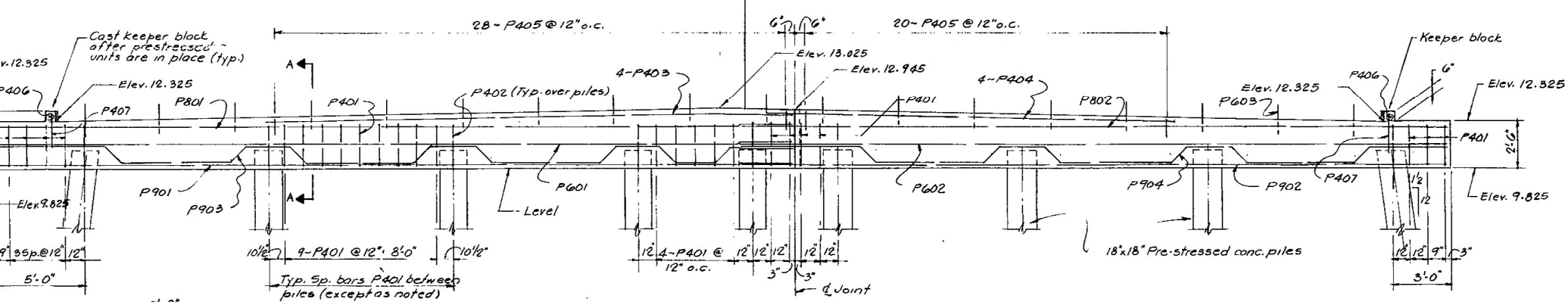
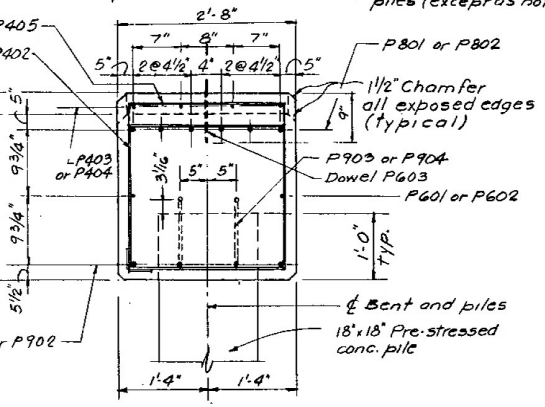
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-351



PLAN



ELEVATION

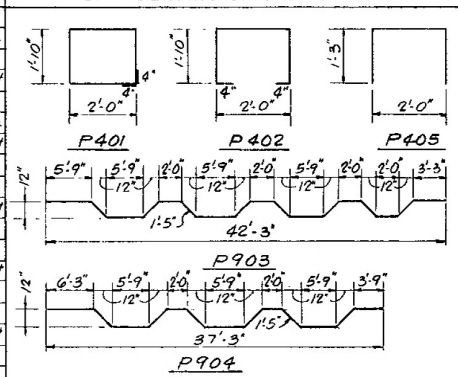


SECTION A-A

BILL OF REINFORCING STEEL *

MARK	SIZE	NO. REQ'D	LENGTH	BENDING
P401	4	71	8'-4"	See dia.
P402	4	9	6'-4"	" "
P403	4	4	28'-0"	Straight
P404	4	4	21'-6"	"
P405	4	48	4'-6"	See dia.
P406	4	2	2'-4"	Straight
P407	4	8	1'-8"	"
P601	6	2	42'-2"	Straight
P602	6	2	37'-3"	"
P603	6	18	1'-6"	"
P801	8	6	42'-2"	Straight
P802	8	6	37'-3"	"
P901	9	2	42'-2"	Straight
P902	9	2	37'-3"	"
P903	9	2	45'-7"	See dia.
P904	9	2	39'-9"	" "

BAR BENDING DIAGRAMS



NOTE: All bar dimensions are out-to-out.

ESTIMATED QUANTITIES *

ITEM	UNIT	QUANT.
Class II Concrete (Substructure)	C.Y.	20.73
Reinforcing Steel (Substructure)	Lbs.	3395
Prestressed Conc. Piling (18" Sq.)	Lin.Ft.	**

* Bill of Reinforcing Steel and Estimated Quantities are for one Interior Bent only.
** See Summary of Estimated Quantities.

GENERAL NOTES
Design Load for Piles: 55 TONS.
For General Notes see Sh. B-1

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

REVISIONS	
Date	Description

INTERIOR BENTS 2, 3 & 4

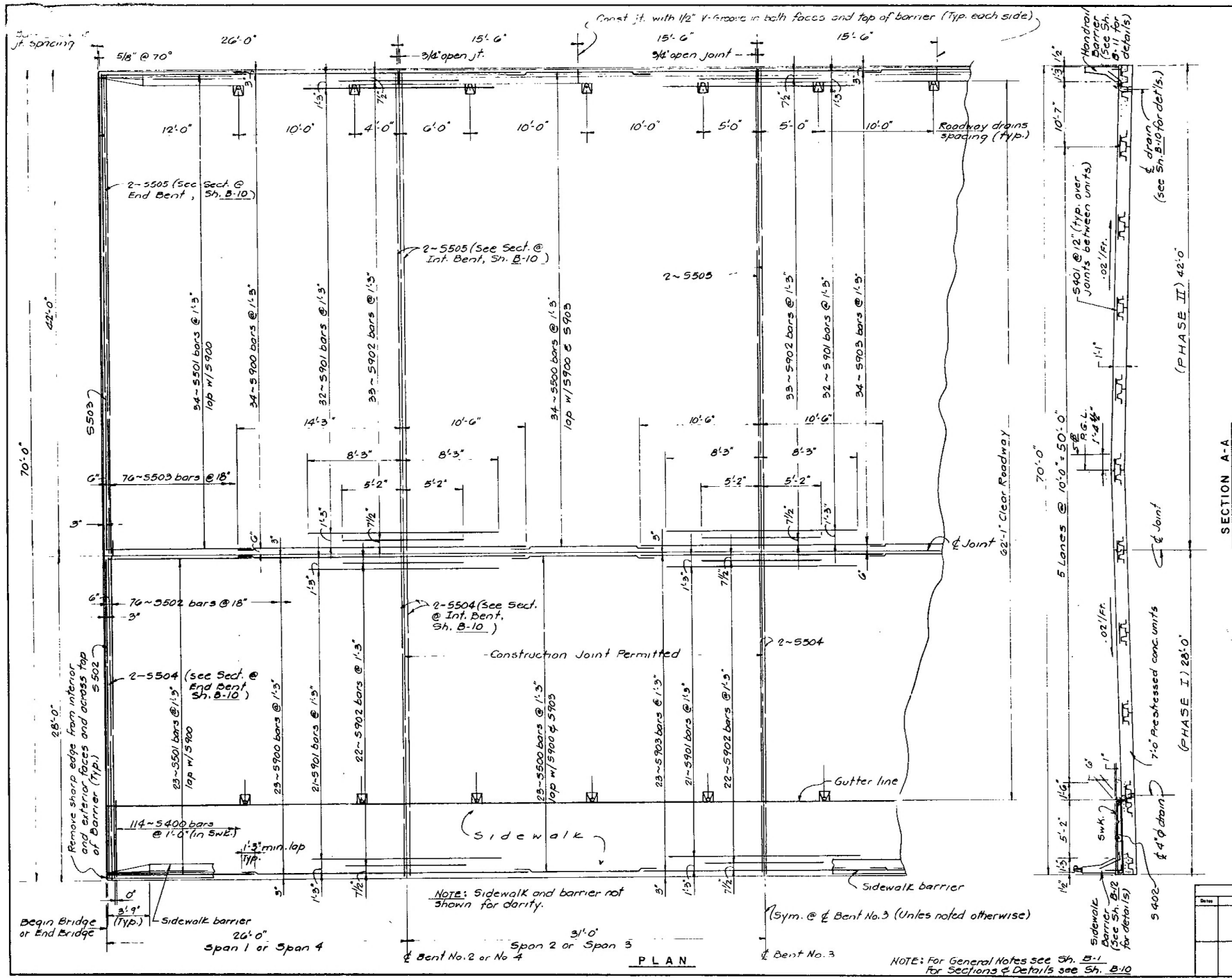
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT
SR-5	INDIAN RIVER	88010-35

	Names	Dates
Designed by	N.C.R.	11/77
Checked by	R.P.Jr.	1/78
Quantities by	N.C.R.	11/77
Checked by	R.P.Jr.	1/78
Supervised by	N.C.R.	

APPROVED BY
Deputy Design Engineer, Str.
Drawing No. 8 of 11

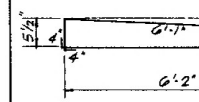


FED. ROAD DIV NO.	STATE
3	FLA.

BILL OF REINFORC

MARK	SIZE	NO. REQ
S400	4	114
S401	4	1026
S402	4	15
S500	5	114
S501	5	114
S502	5	78
S503	5	78
S504	5	16
S505	5	16
S900	9	114
S901	9	159
S902	9	165
S903	9	114

BENDING DIA



NOTE: All bar dimensio

ESTIMATED QUANTI

ITEM
Class II Concrete (Superstr
Reinforcing Steel (Superstru

* Quantities are for all R not include reinforcing in Handrail Barrier. See Sheet B-11 for Handra including dowels set in Deck secondary pour.

Concrete Breakdown

Deck Secondary pour:

Sidewalk

SUPERSTRUCTURE. SPANS

STATE OF FLORIDA DEPARTMENT STRUCTURE

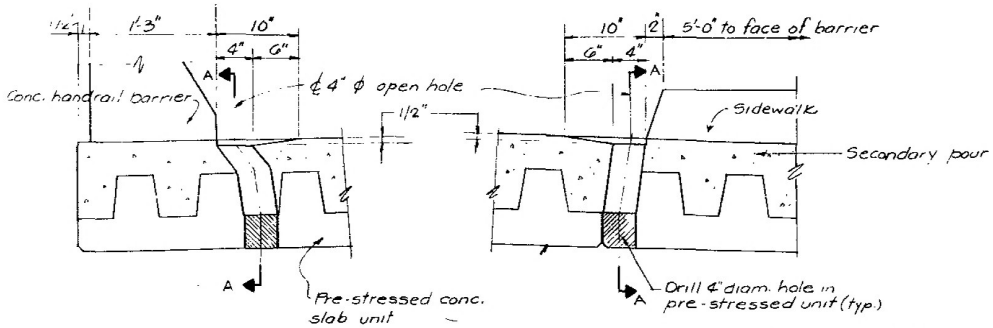
STATE ROAD 5 (U MAIN CA

REVISIONS		ROAD NO.	COUNTY
Dates	Descriptions	SR-5	INDIAN RIVER

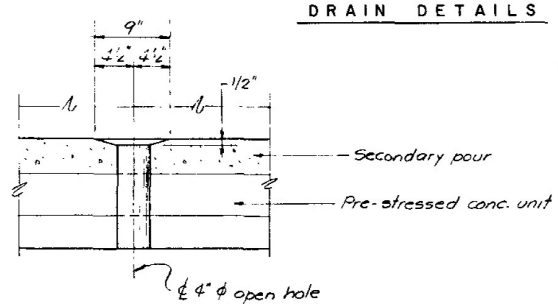
	Names	Dates	APPROVED
Designed by	NCR	11/77	
Checked by	RPJr	11/78	
Quantities by	NCR	11/77	
Checked by	RPJr	11/78	
Supervised by	NCR		

9

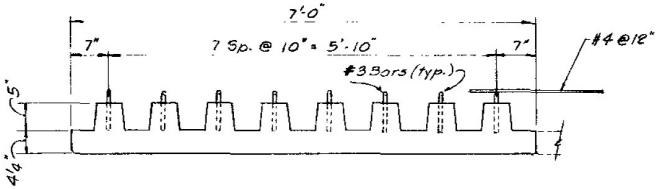
FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-3



DRAIN DETAILS



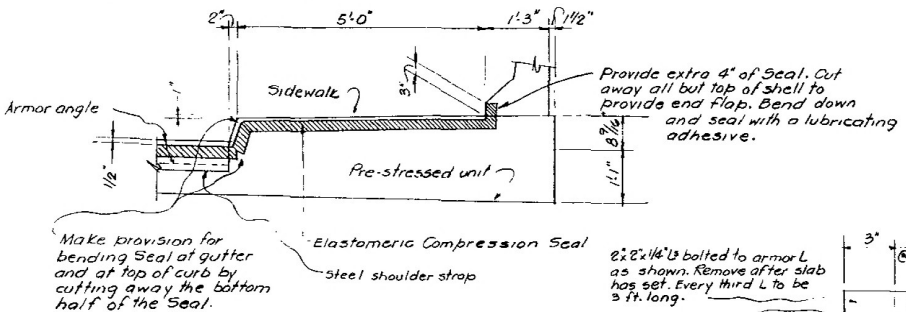
SECTION A-A

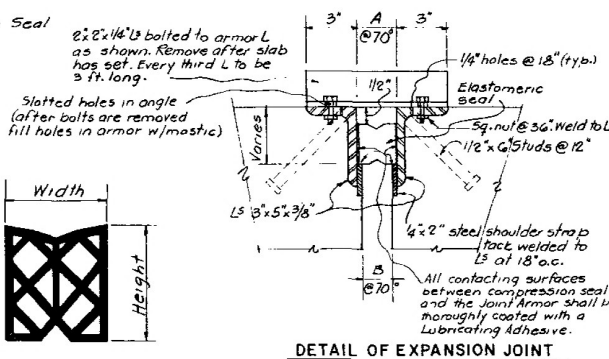


TYPICAL SECTION THRU PRESTRESSED SLAB UNIT

(Furnished by the Department of Transportation)

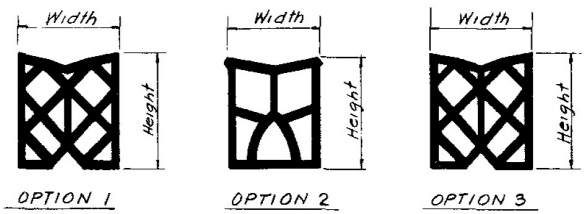
PRESTRESS SLAB UNITS SCHED.		
SIZE	LENGTH	NO. REQ'D.
7'-0" x 9¼"	25'-0"	20
7'-0" x 9¼"	30'-0"	20





DETAIL OF EXPANSION JOINT

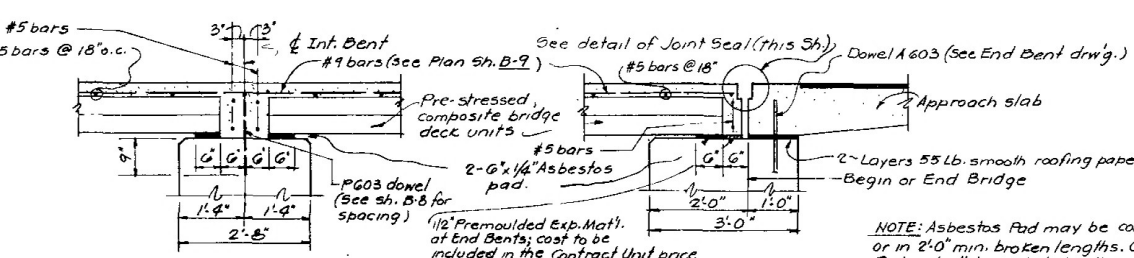
ELASTOMERIC COMPRESSION SEAL DATA					
LOCATION	OPTION	HEIGHT	WIDTH	A	B
End Bents	1	1 5/16"	1½"	1⅛"	5/8"
	2	1 11/16"	1½"	1⅛"	5/8"
	3	1 5/8"	1⅞"	1⅛"	5/8"



OPTION 1 OPTION 2 OPTION 3

ELASTOMERIC COMPRESSION SEALS

1. Joints between adjacent Precast, Prestressed Composite Bridge Deck Units may be sealed with a sand-cement grout or a material approved by the Engineer.
2. Camber will be checked and compensated for in the field.
3. Drilling of holes for 4" ϕ P.V.C. pipe to be done in the field after erection of deck units. Do not use core drills.
4. Form Placement: When differences in camber of the individual panel units the height of the bearing on the caps shall be adjusted so that the underside of the panel units form plane surfaces at the center of span without deviation of more than ¼ inch between panel units. When adjustments for camber differences require the thickness of the bearing material on the caps to be greater than 1½ inches the height adjustment shall be made including alternate layers of neoprene bearing not less than ½ inch thick and the total aggregate thickness of felt and fiber board material shall not exceed 1½ inches.
   The panel units shall be placed with the joints between panel units situated parallel to the centerline of the structure with a tolerance of ± 1½ inch with respect thereto.
5. Longitudinal Joints: Longitudinal joints shall be provided at intervals not exceeding 21 feet on each span where precast pre-stressed panels are used. The joints may be formed or when approved, they may be sawed. Joints formed in the cast-in-place concrete shall be located directly above and aligned with a mating joint between the panel units. Formed joints shall extend for the full depth of the cast-in-place concrete and sawed joints shall be cut to a minimum of 1¼ inches deep. When more than one longitudinal joint is required, the joints shall be spaced symmetrically about the ℄ of the structure. Longitudinal joints shall be sealed with an approved neoprene compression seal not exceeding 3/4 inch in width.
6. Placing Concrete: To insure the necessary full contact between the precast pre-stressed panels and the cast-in-place concrete, at time of concrete placement the interface must be free of any foreign material. Immediately prior to placing the slab concrete the precast pre-stressed panels shall be saturated with water. The original design thickness of the deck slab shall be maintained as at the point of maximum camber in the slab units.



½" Premoulded Exp. Mat'l. at End Bents; cost to be included in the Contract Unit price for Class II Concrete (Superstructure)

SECTION AT INTERIOR BENT

SECTION AT END BENT

NOTE: Asbestos Pad may be continuous or in 2'-0" min. broken lengths. Cost of Pads shall be included in the contract unit price for Class II Concrete (Superstructure)

ELASTOMERIC COMPRESSION SEAL NOTES

For temperatures other than 70° F. adjust opening .0052 in. per degree difference between 70° F. and the temperature at the time the joint is constructed. For temperatures above 70° F. diminish opening and for temperatures below 70° F. increase opening.

The Expansion Joint Seal shall be installed in accordance with the recommendations of the manufacturer.

The cost of labor and materials required for construction of the joints in the bridge deck shall be included in the Contract Unit Price for Expansion Joint Seals.

REVISIONS	
Date	Description

PREPARED BY
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERING
LAUDERDALE BY THE SEA, FLORIDA

SUPERSTRUCTURE DETAILS.

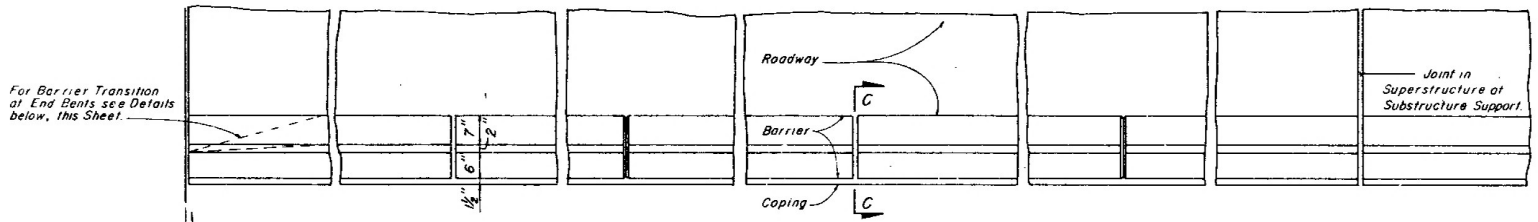
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION
STRUCTURES

STATE ROAD 5 (U.S.1) OVER MAIN CANAL

ROAD NO.	COUNTY	PROJECT
S.R.-5	INDIAN RIVER	88010-3

	Names	Dates	APPROVED BY
Designed by	N.C.R.	Nov. 77	
Checked by	R.P.Jr.	JAN. 78	
Quantities by	N.C.R.	NOV 77	Deputy Design Engineer
Checked by	R.P.Jr.	JAN 78	Drawing No. 10 of 11
Supervised by	N.C.R.		

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-35

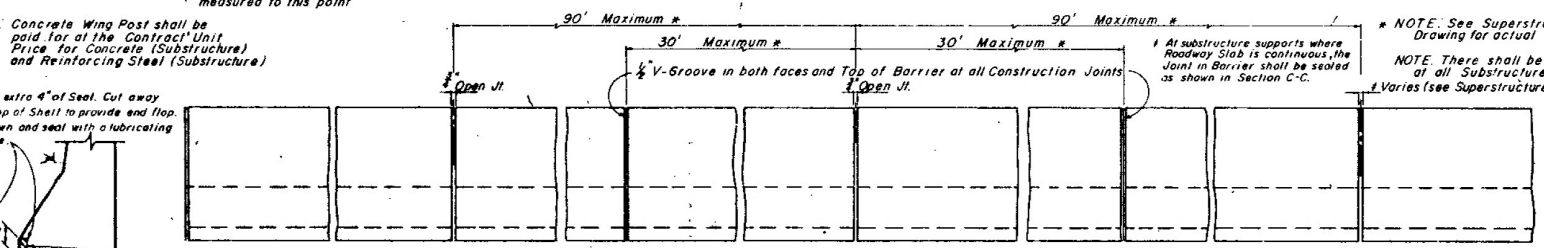


PLAN

End Bent Wing Post — Begin Bridge

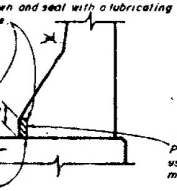
For payment Barrier shall be measured to this point

Concrete Wing Post shall be paid for at the Contract Unit Price for Concrete (Substructure) and Reinforcing Steel (Substructure)



ELEVATION

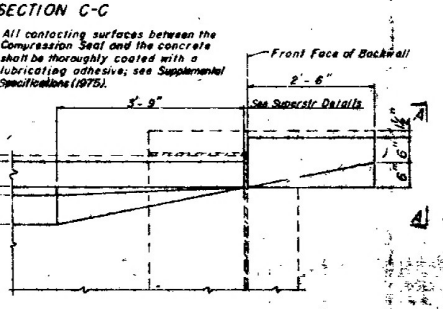
extra 4" of Seal. Cut away top of Shelf to provide end flop. Fill and seal with a lubricating



Polychloroprene Compression Seals used in 1" Open Joints shall be 1" wide minimum.

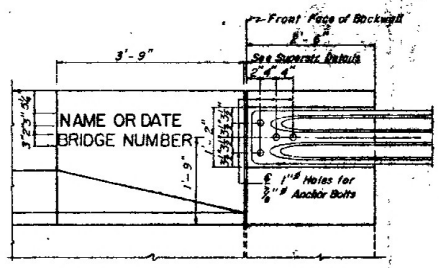
SECTION C-C

All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive; see Supplemental Specifications (1975).

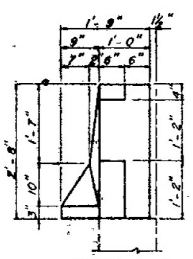


PLAN OF WING FOR SLAB TYPE SUPERSTRUCTURE

NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover



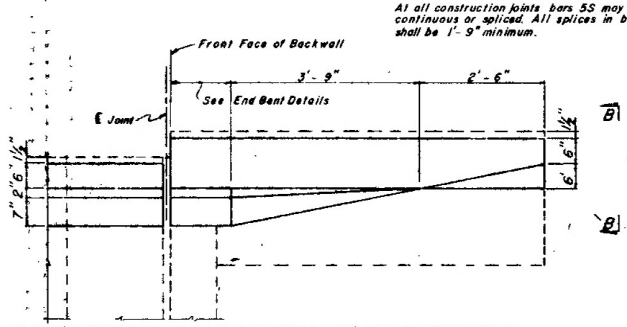
ELEVATION OF WING FOR SLAB TYPE SUPERSTRUCTURE



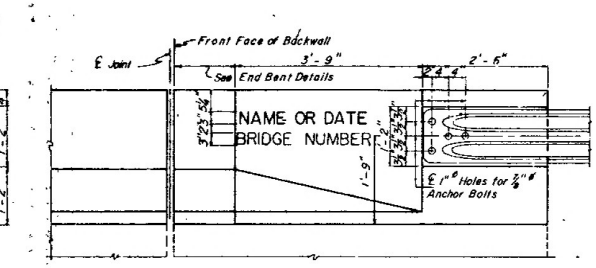
VIEW A-A

REINFORCING STEEL NOTES

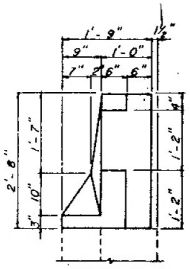
All Reinforcing Steel in Barrier shall be No. 5's. Bars 5R, 5T & 5U to be spaced at 9" c.c. At all open joints bars 5R, 5T, 5U and the ends of bars 5S shall have 2" min. cover. At all construction joints bars 5S may be either continuous or spliced. All splices in bars 5S shall be 1'-9" minimum.



PLAN OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



ELEVATION OF WING FOR SLAB AND GIRDER TYPE SUPERSTRUCTURE



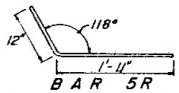
VIEW B-B

DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

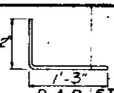
NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans

BENDING DIAGRAMS

* For Slab Type Superstructure. Adjust length of Bars 5R & 5T to compensate for thicker slab. See Superstr. drawing.



BAR 5R



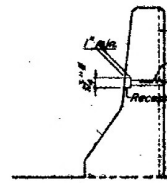
BAR 5T

NOTE: All bar dimensions are out-to-out.

QUANTITIES: Class II Concrete = 0.0759 Cu. Yds. per l of Barrier (Based on Roadway Cross Slope
REINFORCING STEEL = 13.94 lbs. per l of Barrier.

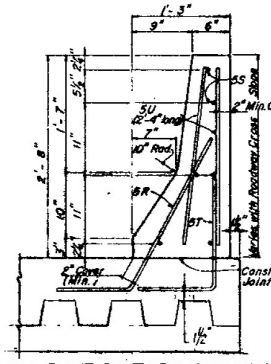
GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade
PAYMENT: Barrier shall be paid for per linear foot, which include all Concrete and Reinforcing Steel. Barrier s be measured along the center line of the top surface of the
CYLINDER STRENGTH: The Cylinder Strength of the Con shall be 3,400 p.s.i. minimum at 28 days.
MARKERS: Markers recording the Elevation shall be pla top of the Barrier at End Bents. On Bridges longer th one marker shall be placed at each end of the Bridge. Bridges less than 100 ft. long, one marker shall be pl at one end of the Bridge only. Markers are to be furn by the Department of Transportation and Installed by Contractor. The Cost of Installing the Markers shall b included in the Contract Unit Price for Concrete Ha
ANCHOR BOLTS: Anchor Bolts, Nuts, and Washers shall dip galvanized in accordance with A.S.T.M. A-123.

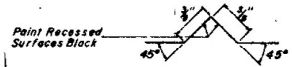


HOLES FOR INCIDENTAL SIGNING

NOTE: Holes and grooves shall be placed on barrier type handrail on bridges undivided bridges, as shown in the plans for designated type 3 installation informational, guide, regulatory and warning sign locations and at approximately 500' intervals along the right handrails of bridges between designated locations for future signs as directed by the Engineer. The cost of the extra holes and grooves shall be included in the contract unit price for Concrete Handrail (Barrier). Plans are not available the Project Engineer should secure necessary from the District Maintenance or Traffic Operations Office.



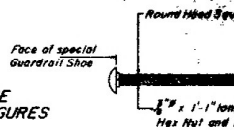
TYPICAL SECTION THRU HANDRAIL BARRIER



SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

NOTES

This Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The Date to be placed on the drivers left when approaching Bridge. The Date shall be the Year the Bridge is constructed.
Black Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by ¾" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.



ANCHOR BOLT DETAIL

NOTE: Cost of Anchor Bolts to be included Contract Unit Price for Guardrail.

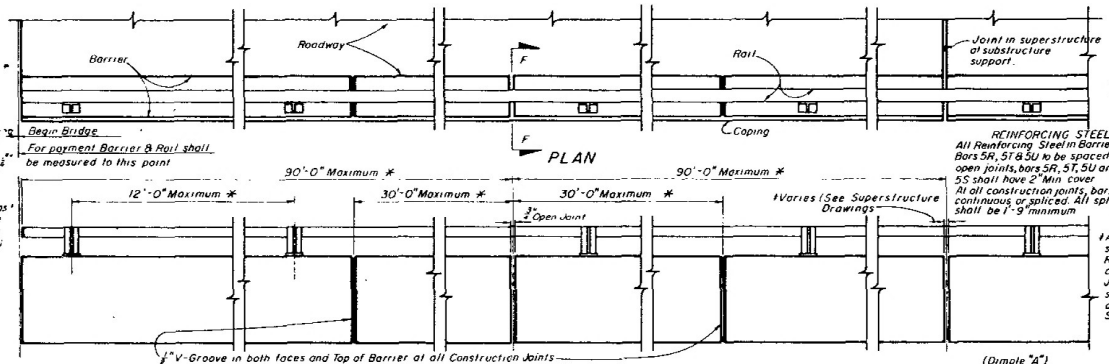
STATE OF FLORIDA DEPARTMENT OF TRANSPORT
STRUCTURES

CONCRETE HANDRAIL BARRIE

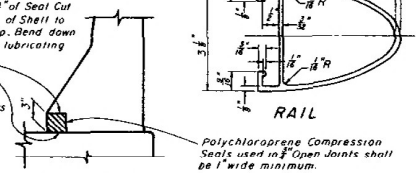
REVISIONS		ROAD NO.	COUNTY	PROJECT
Date	Description	SR-5	INDIAN RIVER	88010-
10-30-74	Revised Bars 5B & 5T			
8-29-75	Bridge number added to Wingwalls.			
10-3-75	Added Details of Holes for Incidental Signing.		Name	Date
12-8-75	Added V-Groove & Revised Note on Holes for Incidental Signs.	Designed by	L.A.L.	3-74
3-1-76	Added Supplemental Specifications Section C-C	Checked by	J.R.A.	3-74
		Quantities by		
		Checked by		
		Supervised by	S. P. J.	

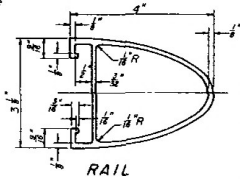
APPROVED BY: T. [illegible]
State Highway Engineer, Structures
Drawing No.
1 of 1

FED. ROAD SYS. NO.	STATE	PROJECT NO.
3	FLA.	88010-3510



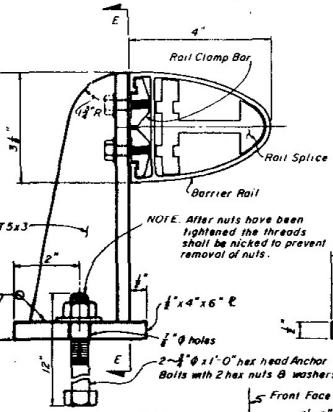
NOTE: All contacting surfaces between the Compression Seal and the concrete shall be thoroughly coated with a lubricating adhesive; see 1975 Supplement.

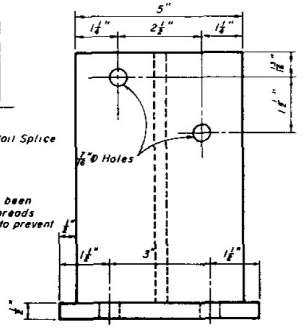


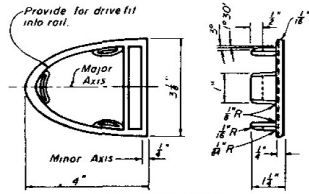


REINFORCING STEEL NOTES

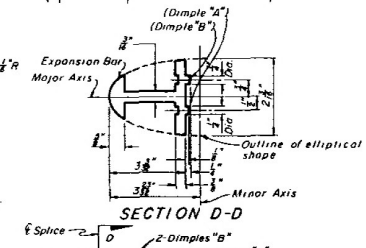
All Reinforcing Steel in Barrier shall be No 5's. Bars 5R, 5T & 5U to be spaced at 9" c.c. At all open joints, bars 5R, 5T, 5U and the ends of bars 5S shall have 2" Min cover. At all construction joints, bars 5S may be either continuous or spliced. All splices in bars 5S shall be 1'-9" minimum.

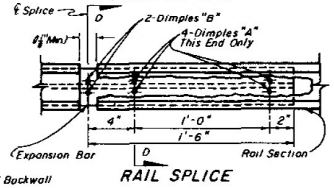


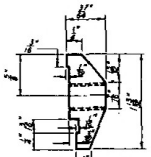


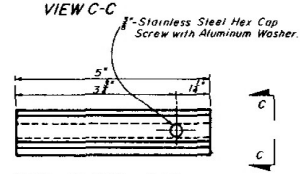


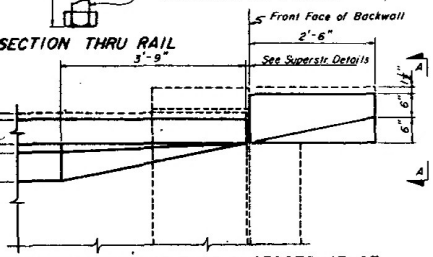
NOTE: At the option of the contractor, the bottom nut shown in "Section Thru Rail" may be used in conjunction with top nut to secure Anchor Bolt to form work during pour

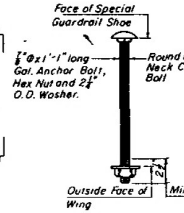




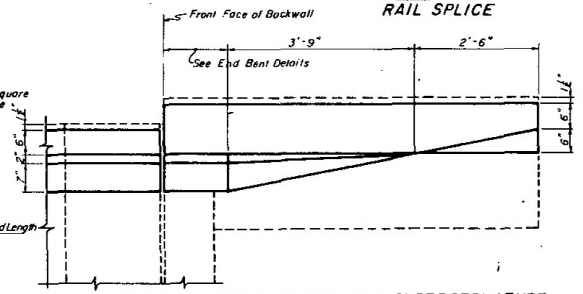


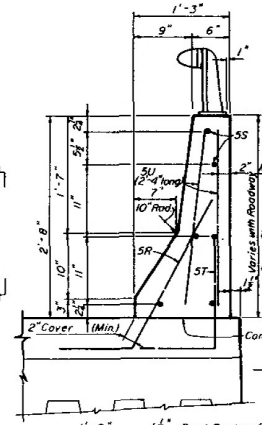


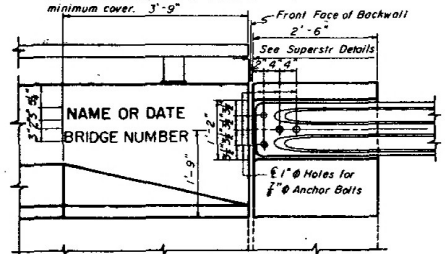




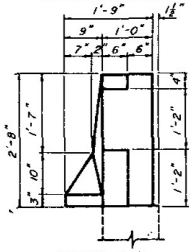
NOTE: Cost of Anchor Bolts to be included in the Contract Unit Price for Guardrail.

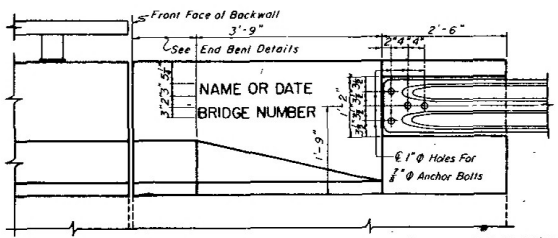


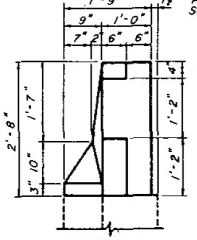




NOTE: For Reinforcing Steel in Transition Area on Slab Type Superstructure adjust and field bend as required for minimum cover.







DETAILS OF GUARDRAIL ATTACHMENT AT WING POSTS

NOTE: For Guardrail Shoe See Standard Drawing in Roadway Plans

SECTION THRU RECESSED "V" GROOVE TO FORM INSCRIBED LETTERS AND FIGURES

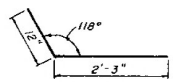
Block Plastic Letters and Figures 3" in height as approved by the Engineer may be used in lieu of Letters and Figures formed by 1/4" "V" Grooves. "V" Grooves shall be formed by preformed Letters and Figures.

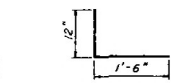
The Name and Bridge Number to be placed on the Barrier shall be seen on the drivers right when approaching Bridge. The date to be placed on the drivers left when approaching Bridge. The date shall be the Year the Bridge is constructed.

REVISIONS	
Date	Description
9/30/74	In reference to 1975 Supplement.
8-29-75	Bridge Number added to Wingwall.

BENDING DIAGRAM

NOTE. All bar dimensions are out-to-





QUANTITIES. Class II Concrete = 0.07594 Cu Yds. per linear ft. of Bar (Based on Roadway Cross Slope of .02"/ft.).
REINFORCING STEEL = 20.744 lbs. per linear ft. of Barri

GENERAL NOTES

CONCRETE: Class II Concrete shall be used in Barrier.
REINFORCING STEEL: Reinforcing Steel shall be Grade 60.
PAYMENT: Barrier shall be paid for per linear foot, which shall include a Concrete and Reinforcing Steel. Barrier shall be measured along the centerline of the top surface of the Barrier.
CYLINDER STRENGTH: The Cylinder Strength of the Concrete shall be 3,400 p.s.i minimum at 28 days.
MARKERS: Markers recording the Elevation shall be placed on top of the Barrier at End Bents. On Bridges longer than 100 ft. one marker shall be placed at each end of the Bridge. On Bridges less than 100 ft. long, one marker shall be placed at one end of the Bridge. Markers are to be furnished by the Department of Transportation and installed by the Contractor. The Cost of installing the Markers shall be included in the Contract Unit Price for Concrete Barrier.
ANCHOR BOLTS: Anchor Bolts, Nuts and Washers shall be hot dip galvanized in accordance with A.S.T.M. A-123.

SPECIFICATIONS FOR BRIDGE RAIL

POST: Fabricated wrought aluminum A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5 with welding using filler wire 4043.
RAIL & RAIL SPLICE: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
RAIL CLAMP BAR: Aluminum; A.S.T.M. B221, alloy 6061-T6 or alloy 6351-T5.
ANCHOR BOLTS: Anchor Bolts shall be in accordance with A.S.T.M. A or A-307. Anchor Bolts, nuts and washers shall be hot-dip galvanized in accordance with A.S.T.M. Designation A-153.
RAIL END CAP: A.S.T.M. B 26 sand cast aluminum alloy, S.G 70A-F (Assoc. alloy designation A-356-F).
RAIL INSTALLATION: Rail Post shall be normal to Profile Grade. Pa shall be sealed on 1/8" thick resilient pads in accordance with Article 932-2.1. The dimension shall be the same as the post. Rail expansion joints shall occur in the panel between posts either side of Bridge expansion joints. Rail expansion joints be similar to rail splices with provision for movement equal 1.5 times the bridge joint opening.
SHOP DRAWINGS: Complete details and description of materials of the proposed bridge rail shall be subm by the contractor for the Engineers approval prior to fabrication.

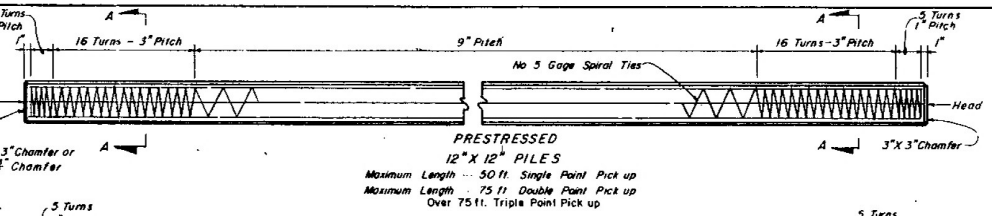
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATI STRUCTURES

SIDEWALK BARRIER

ROAD NO.	COUNTY	PROJECT NO.
SR-5	INDIAN RIVER	88010-3

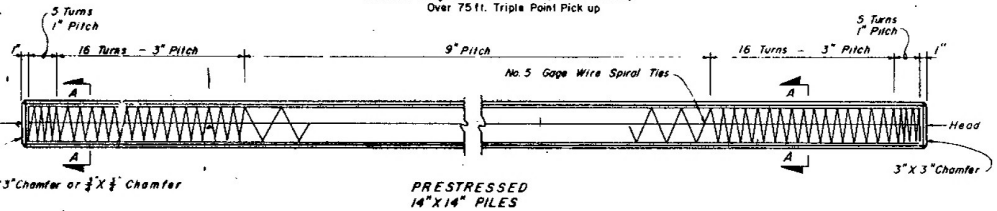
	Names	Dates
Designed by	WHD	5-74
Checked by	JLM	5-74
Quantities by		
Checked by		
Supervised by	PB	

APPROVED BY: T. [illegible]
Bridge Quality Engineer, Structu
Drawing No. 1 of 1

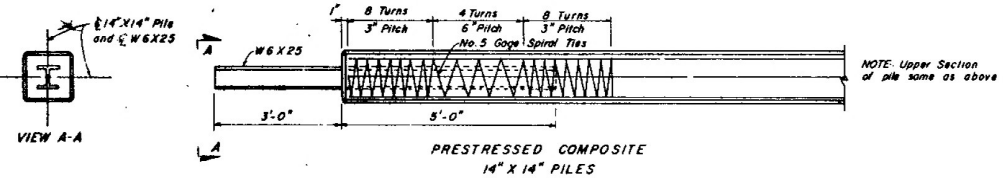


PRESTRESSED
12"X 12" PILES

Maximum Length ... 50 ft. Single Point Pick up
Maximum Length ... 75 ft. Double Point Pick up
Over 75 ft. Triple Point Pick up

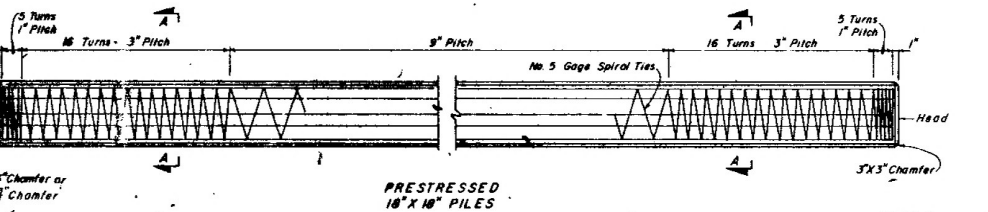


PRESTRESSED
14"X14" PILES

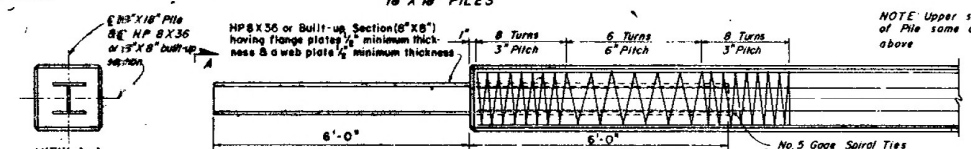


PRESTRESSED COMPOSITE
14" X 14" PILES

Maximum Length ... 60 ft. Single Point Pick up
Maximum Length ... 85 ft. Double Point Pick up
Over 85 ft. Triple Point Pick up

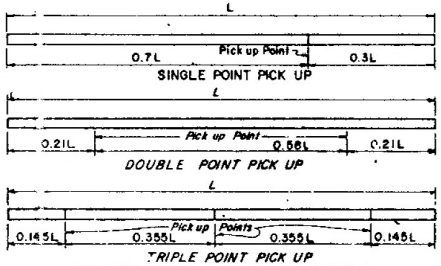


PRESTRESSED
18"X 18" PILES

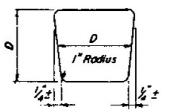


PRESTRESSED COMPOSITE
18"x 18"

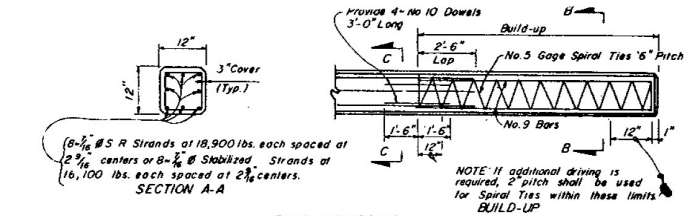
Maximum Length .... 70 ft. Single Point Pick up
Maximum Length .... 95 ft. Double Point Pick up
Over 95 ft. Triple Point Pick up

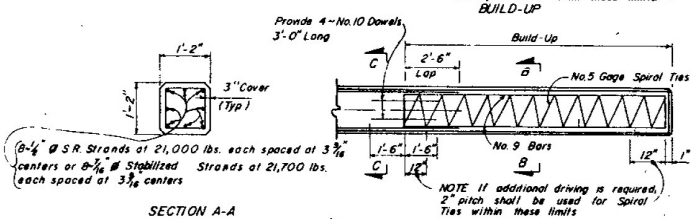


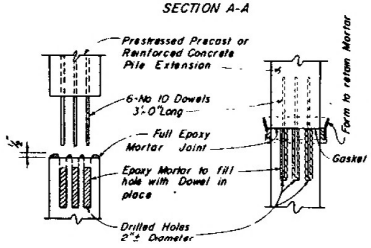
NOTE: Piles shall be marked at pick up points to indicate proper points for attaching handling lines.

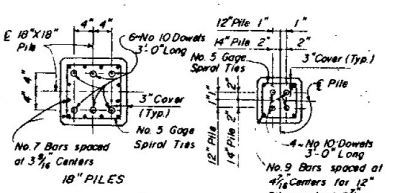


TYPICAL PILE SHAPE
FOR MOLD FORMS



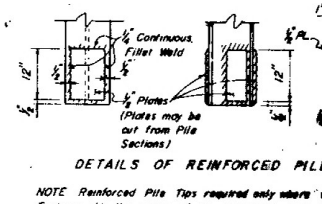




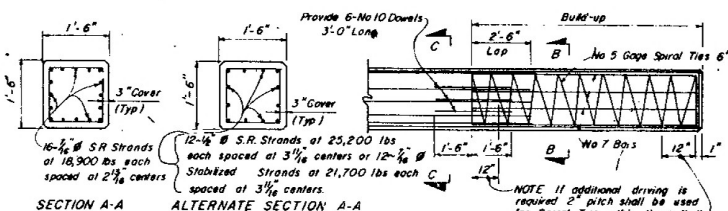


NOTE Spliced Piles may be driven after Splice is two days old.

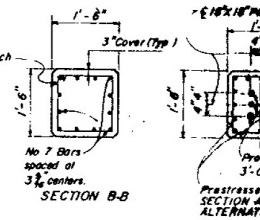
EPOXY BONDED SPLICE



NOTE Reinforced Pile Tips required only where Engineer. At the option of the Contractor and of the Engineer Commercial Tips may be use the Reinforced Pile Tips shown.



GENERAL NOTES



OCTAGONAL PILES Prestressed Octagonal Piles of equivalent strength may be substituted for square piles Details of Pile shall be submitted to the Engineer for approval.

SPIRAL TIES Each wrap of spiral shall be tied to at least two corner strands.

MATERIAL FOR SPIRAL TIES: Spirals may be manufactured from stock meeting requirements of any grade of reinforcing steel or hard drawn steel.

PILE CUTOFFS In cutting off Concrete Piles an abrasive saw shall be used to score the Concrete at cut off elevation to the approximate depth of Reinforcing Steel.

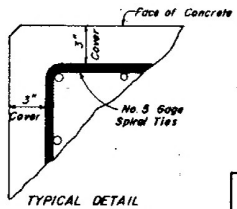
CONCRETE STRENGTH. For Class III Concrete the Cylinder Strength shall be 5,000 p.s.i minimum at 28 days and 4,000 p.s.i. minimum at transfer of the Prestressing Force.

WEBS: Webs of Wide Flange sections shall be in a vertical position when Composite Pile is cast.

NOTE: All Reinforcing Steel shall be Grade 40 or 60.

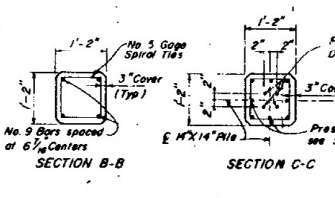
APPROVAL: Prior Approval in Writing By the Engineer is Required for Reinforced Concrete Build-Up in Excess of 2'-0". This will not be approved for piles in a coastal environment.

DUNNAGE: Place Dunnage under pick up points shown for double pick up. Where Pile Length exceeds that requiring double point pick up, place dunnage at pickup points called for in Triple Point Pick up.



TYPICAL DETAIL
SHOWING COVER DIMENSION

FLD. ROAD DIV. NO.	STATE	PROJ.
3	FLA.	8801



REVISIONS			
Dates	Descriptions		
5-5-75	Revised		
7-22-75	Change Chamfer		
7-28-75	Change Approval Note		
10-8-75	ADD TRIPLE POINT PICK UP		
9-26-76	Change Lat. Stress Strands to Stabilized Strands		

STATE OF FLORIDA DEPARTMENT OF TRANS
STRUCTURES

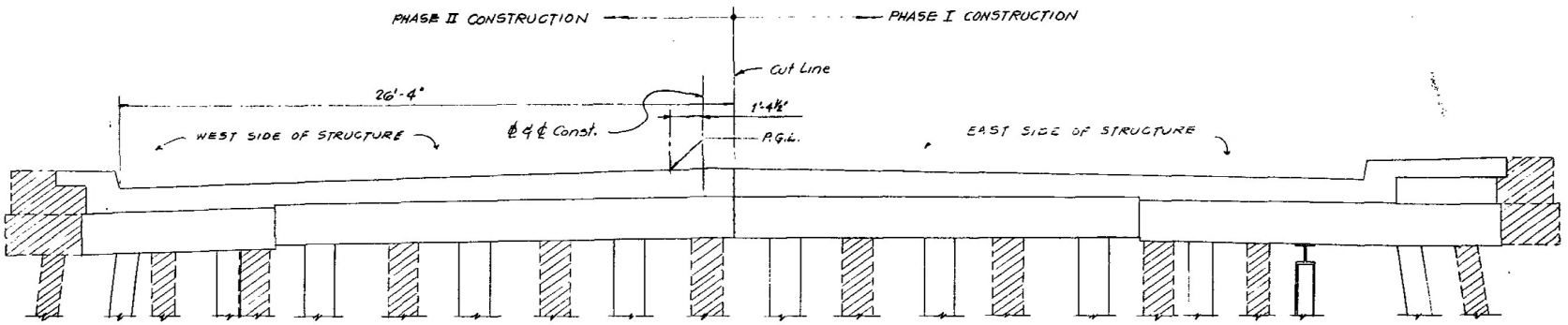
12", 14" AND 18"
PRESTRESSED CONCRETE

ROAD NO.	COUNTY	
SR-5	INDIAN RIVER	88010

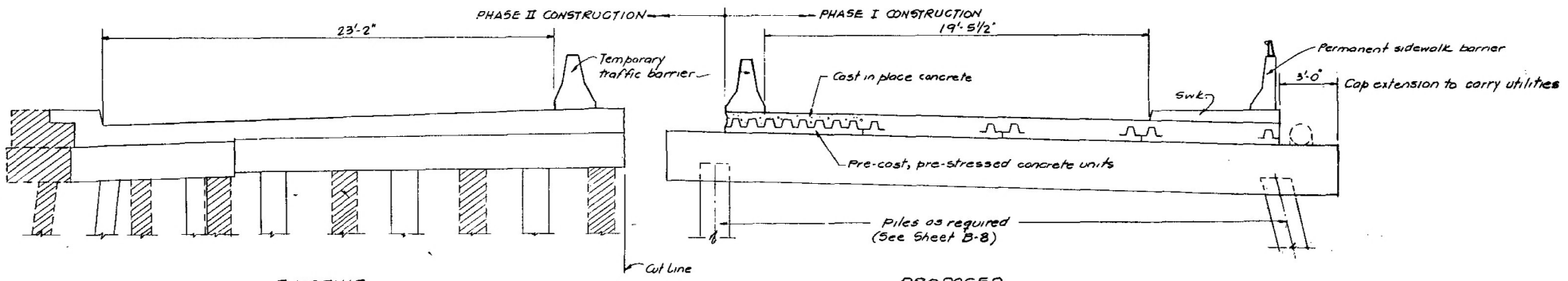
	Names	Dates	APPROVED BY
Designed by	S.A.B.	5-75	
Checked by	L.A.L.	5-75	
Quantities by			
Checked by			
Supervised by			

Drawing No. 1 of 1

FED. ROAD DIV. NO.	STATE	PROJECT NO.
3	FLA.	88010-351



BRIDGE TYPICAL SECTION
(EXISTING)



LOOKING AHEAD WITH STATION

LEGEND

END BENTS

INTERMEDIATE BENTS

CONSTRUCTION SEQUENCE

1. Install Temporary traffic barrier to the West of Centerline of Bridge as shown.
2. Remove Eastern section of existing Bridge while maintaining two lanes of traffic in Western portion of Structure.
3. Build Eastern section of proposed structure.
4. Relocate two lanes of traffic to Eastern portion of proposed Structure; remove Western portion of existing Bridge and complete proposed Structure.

CONSTRUCTION SEQUENCE

STATE OF FLORIDA DEPARTMENT OF TRANSPORT
STRUCTURES

STATE ROAD 5 (U.S.1) OVER
MAIN CANAL

REVISIONS		ROAD NO.	COUNTY:	PROJECT
Date	Description	S.R-5	INDIAN RIVER	88010-3

	Name	Date
Designed by	NCR	10/77
Checked by	R.P.J.	1/78
Quantities by		
Checked by		
Supervised by	NCR	

APPROVED BY

Drawing No. 11 of 11 12

PREPARED BY:
MID-SOUTH ENGINEERING CO.
CONSULTING ENGINEERS
LAUDERDALE BY THE SEA, FLA.

APPENDIX B

Existing Load Rating

Card 02: Year built 80 clear roadway = 62'-0"
Length = 114'-0" No. of Spans 4

BRIDGE NO 880085

03/07/90

PRESTRESSED ~~SOLID~~ SOLID UNITS COMPOSITE

MEMBER ID G01 (SPAN 1) (25'-3")

1 of 4

CARD 7

E. PEREZ

Loss(kips/sq in) —

F's(kips/sq in) 270 ksi.

F"c(lbs/sq in) 5000

From field measurement: 7 cables @ 0.170" ϕ

Other

$A_{strand} = \frac{7(0.170)^2(\pi)}{4} = 0.159 \approx 0.153 \cdot 270$ ksi

CARD 8

Effective span length 4 continous spans. Spans 1 & 4: $26'-0" - \frac{9}{12} \cdot 25'-3"$

Spans 2 & 3 = 31'-0" (composite)

Liveload distribution - Load fraction

$S = \frac{12NL+9}{Ng}$ $\frac{NL-5}{Ng \geq 10}$ so $\frac{12(5)+9}{10} = 6.90$

$C = k\frac{W}{L}$ $k = 0.70$ $W = 70$ $L = 31.0$ $C = (0.70)\frac{70}{31} = 1.580$ C

$D = S + \frac{NL}{16} + \left(3 - \frac{2NL}{7}\right)\left(1 - \frac{C}{3}\right)^2 = 5 + \frac{5}{10} + \left(3 - \frac{2(5)}{7}\right)\left(1 - \frac{1.580C}{3}\right)^2 = 5.852$

Load fraction = S/D = $\frac{6.90}{5.852} = 1.179$. Because more than 3 lanes decrease load fraction in 10% = 1.061

CARD 9 (If necessary) —

CARD 10

Superimposed deadloads

1. Barrier walls $\frac{0.07594(2)(27)(152)}{10} = 61.51$
2. Curbs
3. Median
4. Sidewalks $\frac{6.5417(0.5)(150)}{10} = 49.06$
5. Rails

110.6

6. Posts
7. Asphalt
8. Other

Total weight per ft per unit 111.0 Length 25'-3"

9. Concentrated loads NONE.

Span 1: Range 1 = 20'-1" 1-1
2 5'-2" 2-2

Span 2
1 5'-2" 3-3
2 20'-8" 4-4
3 5'-2" 3-3

Span 3. Range 1 5'-2" 3-3
2 20'-8" 4-4
3 5'-2" 3-3

Span 4 Range 1 - 5'-2" 2-2
Range 2. 20'-1" 1-1

CARD 11

Range 1 20'-1" Section 1-1

Range 2 - 5'-2" Section 2 2

CARD 15

Void description (SECTION 1)

Diameter N/A

Center to bot. of beam N/A -

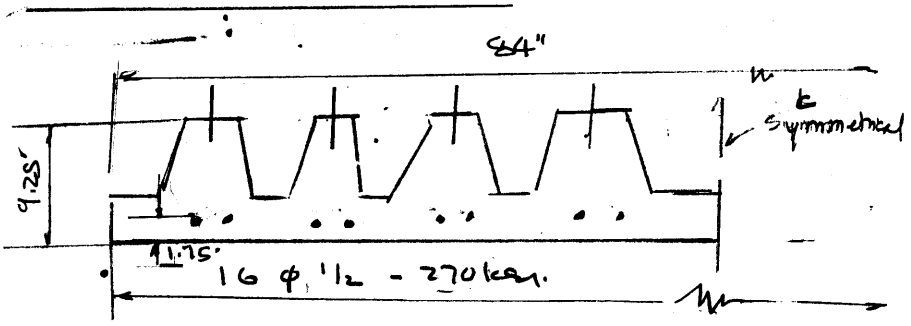
Concrete shape description

Beam depth 9.25'

Top flange width 84.0"

Prestressing strand layout 1k 1608. 1.75

From field measurement:



SECTION 2
beam depth. 9.25'
Top width. 84.0
A_{s+} = 11.20
d_y = 13 - 1.81 = 11.19"

Card 14: Span 1

Range 1 Section 1 C

slab width 84.0 Fillet - thickness 0 Effective slab width = 84.0.

slab thickness 3.75 Fillet width = 0 Typical slab thickness 3.75

d_y = 1.8750'

A_{s+} = # 9 @ 7.50" = $\frac{1.06(84)}{7.50}$ = 11.20 in²

d_y = 1.25 + $\frac{1.128}{2}$ = 1.81"

f_y = 60,000 psi

SECTION 2:

Beam depth = 9.25" 1K 1608 1.75

Top flange = 84.0 2T 11.39 11.19

A_{STOP} = 11.20'

d_y = 13.0 - 1.81 = 11.19"

BRIDGE NO 8800 65

2 4 4

PRESTRESSED SONOVOID UNITS

MEMBER ID G01 (4 — 2-31.0")

CARD 7

Loss(kips/sq in) _____ F's(kips/sq in) 220

F"c(lbs/sq in) _____

Other

CARD 8

Effective span length 31'-0"

Liveload distribution - Load fraction

S = _____

C = _____

D = _____

Load fraction = S/D = _____

CARD 9 (If necessary)

CARD 10

Superimposed deadloads

1. Barrier walls
2. Curbs
3. Median
4. Sidewalks
5. Rails
6. Posts
7. Asphalt
8. Other

Total weight per ft per unit 111.0 Length 31'-0"

9. Concentrated loads

CARD 11

Range 1 5'-2' Section 3-3
2 20'-8" 4-4
3 - 51'-2" 3-3

CARD 15

Void description SECTION 3

Diameter —

Center to bot. of beam —

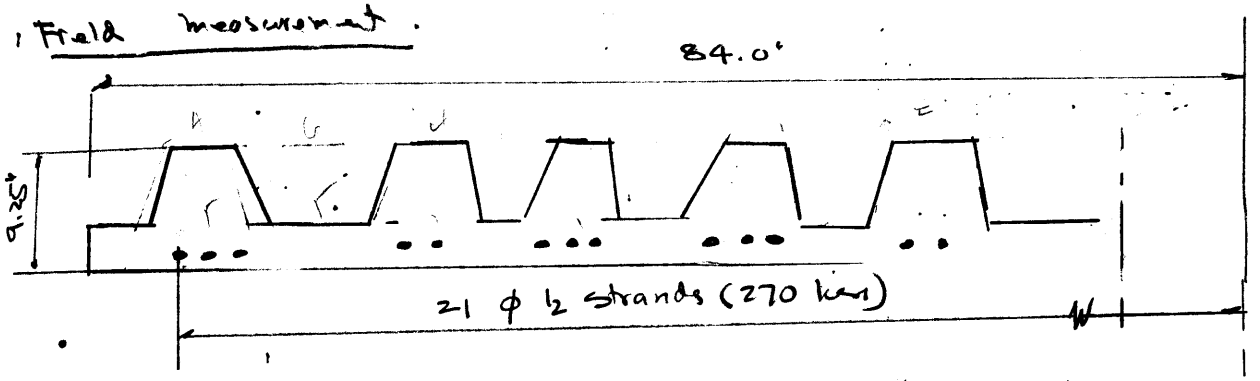
Concrete shape description

Beam depth 9.25"

Top flange width 84.0"

Prestressing strand layout 1k 2108 1.75
ZT 11.20 11.19

Field measurement.



Section 4

beam depth - 9.25 1k 2108 1.75
beam width - 84

Card 15: Same as Sp 1 except: Range length 31.0"

BRIDGE NO 880085

3 of 4

PRESTRESSED SONOVOID UNITS

MEMBER ID G1C (Span 3)

CARD 7

Loss(kips/sq in) — F's(kips/sq in) 270 ksi

F"c(lbs/sq in) _____

Other

CARD 8

Effective span length 31.01

Liveload distribution - Load fraction

S = _____

C = _____

D = _____

Load fraction = S/D = _____

CARD 9 (If necessary)

CARD 10

Superimposed deadloads

1. Barrier walls
2. Curbs
3. Median
4. Sidewalks
5. Rails
6. Posts
7. Asphalt
8. Other

Total weight per ft per unit 111.0 Length 31

9. Concentrated loads

CARD 11

Range 1 5'-2" Section 3-3

2 20'-8" 4-4

3 5'-2 3-3

CARD 15

Void description

Diameter _____

Center to bot. of beam _____

Concrete shape description

Beam depth _____

Top flange width _____

Prestressing strand layout

SECTION 3-3 (same as Span 2)

Sect. 4.4 (same as Span 2)

Card 15: Same as Span 2.

BRIDGE NO 880085

4 of 4

PRESTRESSED SONOVOID UNITS

MEMBER ID G01 (Sp 4)

CARD 7

Loss(kips/sq in) _____ F's(kips/sq in) _____

F"c(lbs/sq in) _____

Other

CARD 8

Effective span length 25'-3"

_____

Liveload distribution - Load fraction

S = _____

C = _____

D = _____

Load fraction = S/D = _____

CARD 9 (If necessary)

CARD 10

Superimposed deadloads

1. Barrier walls
2. Curbs
3. Median
4. Sidewalks
5. Rails
6. Posts
7. Asphalt
8. Other

Total weight per ft per unit 111.6 Length 25'-3"

9. Concentrated loads

CARD 11

Range 1 5'-2" Section 2-2

Rang 2 20'-4" Sect. 1-1

CARD 15

Void description

Diameter _____

Center to bot. of beam _____

Concrete shape description

Beam depth _____

Top flange width _____

Prestressing strand layout

Sect 2 & 1 are same as Sp 1

Card 15 same as Sp 1

1- CHECK DEAD LOAD MOMENT AT MIDDLE SPAN (CP. 1.5 & 2.5)

CP. 1.5 (Middle Spc 1 as simple support)

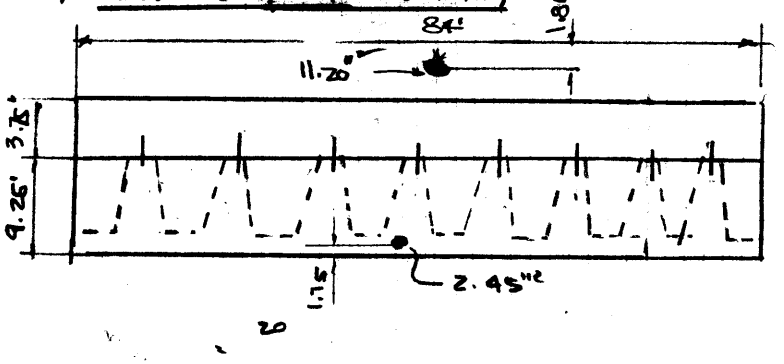
$$M_{DL} = \frac{(9.25+3.25)\,84\,(150)\,(25.25)^2}{144\,(8)\,(1000)} = 90.7 \text{ ft-kip} \quad \text{ok - Bars.}$$

CP. 2.0 (Middle Spc 2 as simple support)

$$M_{DL} = \frac{(9.25+3.25)(84)(150)(31)^2}{144\,(8)\,(1000)} = 136.6 \text{ k-ft} \quad \text{ok - Bars}$$

2- CHECK SECTION PROPERTIES OF GIRDERS AT SPANS 1 & 4 (Middle Spc)

a) Non-composite section



DATA:

$f'_{c\,slab} = 3{,}400$ psi

$f'_{girder} = 5000$ psi

$f_y = 60{,}000$ psi

$f_s = 270$ ksi.

$A_{rp\,steel} = 11.20"^2$

$A_{prest} = 16(0.153) = 2.45"^2$

$$n_{beam} = \frac{29{,}000{,}000}{5700\sqrt{5000}} = 7.20$$

$$S_{SLAB} = \frac{29{,}000{,}000}{5700\sqrt{3400}} = 8.72"$$

$$n_{composite} = \frac{N_{beam}}{N_{slab}} = \frac{7.20}{8.72} = 0.83$$

	A	dy	Ad	dy_o	I_o	Ad^2	$I_o + Ad^2$
UNI	9.25(84) = 777.0	4.625"	3593.6	0.045	5540.2	1.57	5541.57
PRT	2.45(7.20-1) = 15.19	1.7500	26.6	2.830	—	121.56	121.57
	792.19		3620.2				$\Sigma I = 5663.13"^4$ = 5639.8 Bars OK

$$dy = \frac{3620.2}{792.19} = 4.57" \quad \text{Bars } 4.58" \text{ ok}$$

$$S_{bottom} = \frac{5663.13}{4.57} = 1239.2^{in^2} - 1231.3 \text{ Check Bars}$$

$$S_{top} = \frac{5663.13}{} \quad 1210.1 - 1207.8 \text{ Check Bars}$$

b) Composite Section:

	A	d	Ad	I_o	d_o -	Ad^2	$I_o + Ad^2$
GIRDER	= 792.19	4.57	3620.3	5663.13	1.63	2104.8	7767.9
slab, 3.75(84)(0.83) =	261.45	11.1250	2908.6	306.39	4.925	6341.6	6648.0
	1053.6		6528.9				I_o 14,415.9

$d_{to} = \frac{6528.9}{1053.6} = 6.20'$ - Bar 6.20' ∴ check Bar

$14,306^{in^4}$ check Bar.

$S_{bc} = \frac{14,415.9}{6.20} = 2,325.1'' \sim 2307.3$ check Bar.

$PI = 0.70(270)(2.45) = 463.0$ ft-kip check Bar.

$FF = [0.70(270,000) - 348,31.3]\,2.45 = 377.7$ ft-kip check Bar.

3- CHECK AVAILABLE MOMENT CAPACITY AT MIDDLE SPAN 1 (CP 1.5)

a) Non-composite section (+ Bend)

$M_u = A_s^* f_{su}^* d\left(1 - 0.6\frac{p^* f_{su}^*}{f'_c}\right)$ if $kd \leq t_f$

$p^* = \frac{A_s^*}{bd} = \frac{2.45}{84(7.58)} = 0.0039$

$f_{su}^* = f'_s\left(1 - 0.5\frac{p^* f'_s}{f'_c}\right) = 270,000\left(1 - 0.5\frac{0.0039(270,000)}{5000}\right) = 241,650$ psi

$kd = \frac{1.40\, d\, p^* f_{su}^*}{f'_c} = \frac{1.40(7.58)(0.0039)(241,650)}{5000} = 1.97' < 3.75'$

$M_u = 2.45(241,650)(7.50)\left(1 - 0.6\frac{0.0039(241,650)}{5000}\right) = 328.3$ ft-kip

Inventory $= \left(\frac{M_u}{1.3} - M_{DL}\right)\frac{3}{5} = \left(\frac{328.3}{1.3} - 90.7\right)\frac{3}{5} = 97.10$ ok

Check Max:

Inventory $= \left(6\sqrt{f'_c} + \frac{P}{A} + \frac{P_e}{S} - M_{DL}\right)S_b = \left[6\sqrt{5000} + \frac{377.7}{777.0} + \frac{377.7(2.83)}{1231.3} - \frac{90.7(12)}{1231.3}\right)\frac{1231.3}{12} = 91.78$ ok

b) composite section:

b.1 - + Bend

$$\rho^* = \frac{2.45}{84(11.25)} = 0.0026$$

$$f_{su}^* = 270{,}000\left(1 - 0.5\,\frac{0.0026(2760)}{3400}\right) = 242{,}205.9 \text{ psi}$$

$$kd = \frac{1.40(11.25)(0.0026)(242{,}205.9)}{3400} = 2.91 < 3.75 \text{ dl}$$

$$M_u = 2.45(242{,}205.9)(11.25)\left(1 - 0.5\,\frac{0.0026(242{,}205.9)}{3400}\right) = 494.7 \text{ ft-kip}$$

BAR 494.6 uc

Operating: Load Factor: $\left(\frac{494.6}{1.3} - 90.7 - 4.5\right) = 285.3$

Crack: $\left[8.25\sqrt{5000} + \frac{377.7}{777.0} + \frac{377.7(2.83)}{1231.3} - \frac{90.7(12)}{1231.3} - \frac{4.5(12)}{2307.3}\right]^{\frac{S_c}{12}}$

$= 1.0308\left(\frac{2307.3}{12}\right) = 198.2^k$ governs.

Inventory: Load Factor: $285.3\left(\frac{3}{5}\right) = 171.2$

Crack Moment: $198.2 - \frac{2.25\sqrt{5000}}{1200}(2307.3) = 167.6^{ft\text{-}k}$ govern

b.2 - (-) Bend

Elastic: $\left[6\sqrt{f'_c} + \frac{P}{A} - \frac{Pe}{S_t} + \frac{M_{D(L)}}{S_L} + \frac{M_{SDL}}{S_{tc}}\right] S_{tc}$

Inventory: $\left(6\sqrt{5000} + \frac{377.7}{777.0} - \frac{377.7(2.83)}{1207.8} + \frac{90.7(12)}{1207.8} + \frac{4.5(12)}{1207.8}\right)\frac{1207.8}{12}$

$= 97.75$ FT-KIP

ULTIMATE MOMENT: $M_u = M_{LL} - M_{ji} = 0$

$\therefore M_u \leq M_{DL}$

Available inventory $= \frac{3}{5}(M_D + M_{SDL}) = \frac{3}{5}(90.7 + 4.50) = 57.1^k$ governs

Available operating $= 90.7 + 4.50 = 95.2$ uc BMB governs

4 - CHECK AVAILABLE MOMENT CAPACITY AT SUPPORT 2 & 3

a) - Bend

$$M_{u2} = A_s\left(f'_y\right)(d')\left(1 - 0.6\frac{P f_y}{f'_c}\right) \quad \text{if } kd \le t.$$

$A_s = 11.20\ in^2$

$f_y = 60{,}000$ psi

$f'_c = 5000$ psi

$d' = 11.19"$

$b = 84"$

$$p = \frac{A_s}{bd} = \frac{11.20}{84(11.19)} = 0.0119"$$

$$kd = \frac{1.4(d)(p)(f_y)}{f'_c} = \frac{1.4(11.20)(0.0119)(60)}{5} = 2.24 < 3.75" \text{ ok}$$

$$M_{u2} = 11.20(60)(11.19)\left(1 - 0.6\frac{0.0119(60)}{5}\right) = 572.9 \text{ ft-k}$$

BAR 572.7 ok

b) + Bend

$A_s^+ = 3.22\ in^2$ $\quad f_s = 270{,}000$

$d = 11.25$ $\quad f'_c = 3400$

$b = 84.0$

$$p^+ = \frac{3.22}{84(11.25)} = 0.0034$$

$$f_{su}^+ = 270\left(1 - 0.5\frac{0.0034(270)}{3.4}\right) = 233{,}470.6 \text{ psi}$$

$$M_u^+ = 270(11.25)(3.22)\left(1 - 0.6\frac{0.0034(233.4706)}{3.4}\right) = 605.8 \text{ ft-k}$$

BAR 605.6 ok

Operating:

$$+\text{bend} = \frac{605.2}{1.2} + 8.8 = 474.3$$

$$-\text{bend} = \frac{572.7}{1.3} - 8.8 = 431.7$$ Bars check governs

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                                                RECORD                                                
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 MAIN -- NEW STRUCTURE I.D.= 880-065

  SRATE1 -- MEMBER I.D.=    G 1
*** WARNING 5805300 ***  STRUCTURE ID  880-065
                         MEMBER ID        G 1
*** WARNING 6300900 ***  STRUCTURE ID  880-065
                         MEMBER ID        G 1
*** WARNING 6301000 ***  STRUCTURE ID  880-065
                         MEMBER ID        G 1
```

STRUCTURE I.D. = 880-065

STRUCTURE HEADER AND DESCRIPTION

100-- 2 E. PEREZ EA/I/O/P = FILE REQUESTS AND OUTPUT DATA EXCEPTIONS
TYPE = CPS YEAR = 80 LEN = 114.00 FT. WIDTH = 62.00 FT. 4 SPANS SP.LOAD =
INV.LL.TRK.= OP.LL.TRK.=

COMMENTS

200-- 6 1 STRUCTURE IS ON SR 5 (US 1) OVER MAIN CANAL IN VERO.
300-- 6 2 HS20-44, 4 CONTINUOUS SPANS.

SPECIFICATIONS GENERALLY APPLICABLE TO STRUCTURE MEMBERS

	STRUCT STEEL	REINF. CONCRETE	COMPOSITE STEEL/CONC	PRESTRESSED CONCRETE			IMPACT FACTOR INV	OP	POST	SPEC	TIMBER
400-- 7	FY= 0.	FY = 0.	FY = 0.	LOSS = 0.	F'S = 270.	MAX =	.00	.00	.00	.00	FY = 0.
		F'C= 0.	F'C= 0.	EG/EC= 0.000	F''C= 0.	MIN =	.00	.00	.00	.00	FV = 0.

MEMBER SPECIFICATIONS AND REQUIRED ANALYSIS-GIRDER,STRINGER AND FLOOR BEAM

MEMBER ID	SPANS SYMM	STIFF. CODE	SPAN 1 (SPAN 4)	SPAN 2 (SPAN 5)	SPAN 3 (SPAN 6)	MATL CODE	ALLOWABLE STRESS FY	FB	FC*	FC**	LL DIST. FACTOR	END FL.BM	THRU DECK	MAX INV	IMPACT FACTOR OP.	POST	SPEC
500-- 8	G 1	4 X	25.250	31.000	0.000	CPS	0.00		0.00		1.061			.00	.00	.00	.00

SUPERIMPOSED DEAD LOADS-GIRDERS,STRINGERS AND FLOOR BEAMS

MEMBER ID	SYMM.	SPAN NO.	DISTANCE FR. LEFT SUPP.	LOAD TYPE	LOAD P OR W(L)	W(R)	LENGTH
600--10	G 1	X 1	0.000FT.	W	111.0	0.0	25.250FT.

700---10 G 1 X 2 0.000FT. W 111.0 0.0 31.000FT.

SECTION RANGE SPECIFICATIONS

MEMBER ID	SYMM.	SPAN NO.	RANGE NO.	RANGE LENGTH	SECTION NO. LEFT	SECTION NO. RIGHT	SEC. VAR. CODE	HINGE 1 DIST.	HINGE 2 DIST.	HYBRID GIRDER CODE	HYBRID GIRDER FY	CODE	FY
800---11	G 1	1	1	20.083FT.	1	1		0.000FT.	0.000FT.		0.		0.
700---11	G 1	1	2	5.167FT.	2	2		0.000FT.	0.000FT.		0.		0.
1000---11	G 1	2	1	5.167FT.	3	3		0.000FT.	0.000FT.		0.		0.
1100---11	G 1	2	2	20.667FT.	4	4		0.000FT.	0.000FT.		0.		0.
1200---11	G 1	3	3	5.167FT.	3	3		0.000FT.	0.000FT.		0.		0.
1300---11	G 1	3	1	5.167FT.	3	3		0.000FT.	0.000FT.		0.		0.
1400---11	G 1	3	2	20.667FT.	4	4		0.000FT.	0.000FT.		0.		0.
1500---11	G 1	3	3	5.167FT.	3	3		0.000FT.	0.000FT.		0.		0.
1600---11	G 1	4	1	5.167FT.	2	2		0.000FT.	0.000FT.		0.		0.
1700---11	G 1	4	2	20.083FT.	1	1		0.000FT.	0.000FT.		0.		0.

SECTION PROPERTIES (COMPOSITE) - GIRDERS, STRINGERS, FLOOR BEAMS

MEMBER ID	SYMM	SPAN RANGE	RANGE LENGTH	COMP CODE	N SECT SAME	A	B	WIDTH	THICK -NESS	FILLET WIDTH	FILLET THICK.	EFFECT. WIDTH	EFFECT. THICK.	DIST TO TOP SECT.
1800---14	G 1	1 1	25.250FT.	C	0	1	0	84.00	3.75	0.00	0.00	84.00	3.75	1.87
1700---14	G 1	2 1	31.000FT.	C	0	1	0	84.00	3.75	0.00	0.00	84.00	3.75	1.87
2000---14	G 1	3 1	31.000FT.	C	0	1	0	84.00	3.75	0.00	0.00	84.00	3.75	1.87
2100---14	G 1	4 1	25.250FT.	C	0	1	0	84.00	3.75	0.00	0.00	84.00	3.75	1.87

SECTION PROPERTIES (PRESTRESSED CONCRETE) - GIRDERS,STRINGERS,FLOOR BEAMS

MEMBER ID.	SAME SECT	ADR	** VOIDS DESCRIPTION ** DEPTH	WIDTH	DIST.	BEAM DESCRIPTION CODE	DEPTH	TFLW	TFLT	TFIT	WEBT	BFIT	BFLT	BFLW	STRANDS I	ASI	DI
2200---15	G 1	1 0	0.0	0.00	0.0	9.25	84.0	0.0	0.00	84.00	0.00	0.0	0.0	1	K	1608.00	1.75
2300---15	G 1	2 0	0.0	0.00	0.0	9.25	84.0	0.0	0.00	84.00	0.00	0.0	0.0	1	K	1608.00	1.75
2400---15	G 1	2 0	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.0	2	T	11.20	11.19
2500---15	G 1	3 0	0.0	0.00	0.0	9.25	84.0	0.0	0.00	84.00	0.00	0.0	0.0	1	K	2108.00	1.75
2600---15	G 1	3 0	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.00	0.00	0.0	0.0	2	T	11.20	11.19
2700---15	G 1	4 0	0.0	0.00	0.0	9.25	84.0	0.0	0.00	84.00	0.00	0.0	0.0	1	K	2108.00	1.75

SUMMARY OF RATING CALCULATIONS-------STRUCTURE MEMBER
INVENTORY AND/OR OPERATING ANALYSIS

INPUT CODING --

STRUCTURE

D/P STR. I.D.-- 880-085

DATE 7/ 3/90
BY E. PEREZ

	INVENTORY		OPERATING	
	LIVE LOAD	RATING	LIVE LOAD	RATING
	HS20	HS 26.10	HS20	HS 32.07

STRUCTURE DESCRIPTION --

IDENTIFICATION	
TYPE	CPS
YEAR OF CONSTR.	1980
LENGTH	114.00 FEET
ROADWAY WIDTH	62.00 FEET
NUMBER OF SPANS	4

LOCATION --

DISTRICT	
COUNTY	
CONSTR. RTE.	
CONSTR. SEC.	
CONSTR. STA.	0
KEY RTE.	
MARKED RTE.	

MICROFILM REEL NUMBERS --

DESIGN PLANS
COMPUTATIONS
CORRESPONDENCE

ANALYST REMARKS --

STRUCTURE IS ON SR 5 (US 1) OVER MAIN CANAL IN VERO.
HS20-44. 4 CONTINUOUS SPANS.

INVENTORY RATING SUMMARY --

MEMBER ID.	G 1
SPAN	1
CRITICAL C.P. DIST.	12.6 FEET
LIVE LOAD DESIGNATION	HS20

	MOMENT (FT. KIPS)
MEMBER CAPACITY	0.0
DL EFFECT	95.1
CAPACITY FOR (LL+I)	-57.1
ACTUAL (LL+I)	-43.7

INVENTORY RATING HS 26.10

OPERATING RATING SUMMARY --

MEMBER ID.	G 1
SPAN	2
CRITICAL C.P. DIST.	15.5 FEET
LIVE LOAD DESIGNATION	HS20

	MOMENT (FT. KIPS)
MEMBER CAPACITY	465.5
DL EFFECT	141.2
CAPACITY FOR (LL+I)	190.1
ACTUAL (LL+I)	118.5

OPERATING RATING HS 32.07

SUMMARY OF RATING CALCULATIONS------STRUCTURE MEMBER
POSTING ANALYSIS

INPUT CODING --

STRUCTURE D/P STR. I.D.-- 880-065

DATE 7/ 3/90
BY E. PEREZ

	INVENTORY LIVE LOAD	INVENTORY RATING	OPERATING LIVE LOAD	OPERATING RATING	POSTING TRUCK TYPE	POSTING GROSS TONS
	HS20	HS 24.10	HS20	HS 32.07	VEH.SU2	39.33
					VEH.SU3	42.65
					VEH.SU4	41.67

STRUCTURE DESCRIPTION --

IDENTIFICATION
TYPE CPS
YEAR OF CONSTR. 1980
LENGTH 114.00 FEET
ROADWAY WIDTH 62.00 FEET
NUMBER OF SPANS 4

LOCATION --

DISTRICT
COUNTY
CONSTR. RTE.
CONSTR. SEC.
CONSTR. STA. 0
KEY RTE.
MARKED RTE.

MICROFILM REEL NUMBERS --

DESIGN PLANS
COMPUTATIONS
CORRESPONDENCE

ANALYST REMARKS --

STRUCTURE IS ON SR 5 (US 1) OVER MAIN CANAL IN VERO.
HS20-44. 4 CONTINUOUS SPANS.

TRUCK TYPE VEH. SU2
MEMBER ID. G 1
SPAN 2
CRITICAL C.P. DIST. 15.5 FEET

	MOMENT (FT. KIPS)
MEMBER CAPACITY	465.5
DL EFFECT	141.2
CAPACITY FOR (LL+I)	190.1
ACTUAL (LL+I)	84.3

POSTING GROSS TONNAGE 38.3

TRUCK TYPE VEH. SU3
MEMBER ID. G 1
SPAN 2
CRITICAL C.P. DIST. 15.5 FEET

	MOMENT (FT. KIPS)
MEMBER CAPACITY	465.5
DL EFFECT	141.2
CAPACITY FOR (LL+I)	190.1
ACTUAL (LL+I)	147.4

POSTING GROSS TONNAGE 42.6

TRUCK TYPE VEH. SU4
MEMBER ID. G 1
SPAN 2
CRITICAL C.P. DIST. 15.5 FEET

	MOMENT (FT. KIPS)
MEMBER CAPACITY	465.5
DL EFFECT	141.2
CAPACITY FOR (LL+I)	190.1
ACTUAL (LL+I)	159.6

POSTING GROSS TONNAGE 41.7

SUMMARY OF RATING CALCULATIONS----------STRUCTURE
INVENTORY AND/OR OPERATING ANALYSIS

STRUCTURE _____ D/P STR. ID-- 880-085

INPUT CODING--

DATE 7/ 3/90
BY E. PEREZ

	INVENTORY	OPERATING
LIVE LOAD	HS20	HS20
RATING	HS 26.1	HS 32.1

STRUCTURE DESCRIPTION--

IDENTIFICATION	
TYPE	CPS
YEAR OF CONSTR.	1980
LENGTH	114.00 FEET
ROADWAY WIDTH	62.00 FEET
NUMBER OF SPANS	4

LOCATION--

DISTRICT	
COUNTY	
CONSTR. RTE.	
CONSTR. SEC.	
CONSTR. STA.	0
KEY RTE.	
MARKED RTE.	

MICROFILM REEL NUMBERS--

DESIGN PLANS
COMPUTATIONS
CORRESPONDENCE

ANALYST REMARKS--

STRUCTURE IS ON SR 5 (US 1) OVER MAIN CANAL IN VERO.
HS20-44. 4 CONTINUOUS SPANS.

INVENTORY RATING SUMMARY

MEMBER I.D.	G 1
SPAN	1
CRITICAL C.P. DIST.	12.6 FEET
LIVE LOAD DESIGNATION	HS20

	MOMENT (FOOT-KIPS)
MEMBER CAPACITY	0.0
DL EFFECT	95.1
CAPACITY FOR (LL+I)	-57.1
ACTUAL (LL+I)	-43.7

INVENTORY RATING HS 26.10

OPERATING RATING SUMMARY

MEMBER I.D.	G 1
SPAN	2
CRITICAL C.P. DIST.	15.5 FEET
LIVE LOAD DESIGNATION	HS20

	MOMENT (FOOT-KIPS)
MEMBER CAPACITY	465.5
DL EFFECT	141.2
CAPACITY FOR (LL+I)	190.1
ACTUAL (LL+I)	118.5

OPERATING RATING HS 32.07

SUMMARY OF RATING CALCULATIONS----------STRUCTURE
POSTING ANALYSIS

STRUCTURE

INPUT CODING--

D/P STR. ID-- 880-085

DATE 7/ 3/90
BY E. PEREZ

	INVENTORY		OPERATING		POSTING	
	LIVE LOAD	RATING	LIVE LOAD	RATING	TRUCK TYPE	GROSS TONS
	HS20	HS 26.10	HS20	HS 32.07	VEH.SU2	38.3
					VEH.SU3	42.6
					VEH.SU4	41.7

STRUCTURE DESCRIPTION--

IDENTIFICATION
TYPE CPS
YEAR OF CONSTR. 1980
LENGTH 114.00 FEET
ROADWAY WIDTH 62.00 FEET
NUMBER OF SPANS 4

LOCATION--

DISTRICT
COUNTY
CONSTR. RTE.
CONSTR. SEC.
CONSTR. STA. 0
KEY RTE.
MARKED RTE.

MICROFILM REEL NUMBERS--

DESIGN PLANS
COMPUTATIONS
CORRESPONDENCE

ANALYST REMARKS--

STRUCTURE IS ON SR 5 (US 1) OVER MAIN CANAL IN VERO.
HS20-44. 4 CONTINUOUS SPANS.

POSTING RATING SUMMARY

TRUCK TYPE	VEH.SU2	TRUCK TYPE	VEH.SU3	TRUCK TYPE	VEH.SU4
MEMBER I.D.	G 1	MEMBER I.D.	G 1	MEMBER I.D.	G 1
SPAN	2	SPAN	2	SPAN	2
CRITICAL C.P. DIST.	15.5 FEET	CRITICAL C.P. DIST.	15.5 FEET	CRITICAL C.P. DIST.	15.5 FEET
	MOMENT (FOOT-KIPS)		MOMENT (FOOT-KIPS)		MOMENT (FOOT-KIPS)
MEMBER CAPACITY	465.5	MEMBER CAPACITY	465.5	MEMBER CAPACITY	465.5
DL EFFECT	141.2	DL EFFECT	141.2	DL EFFECT	141.2
CAPACITY FOR (LL+I)	190.1	CAPACITY FOR (LL+I)	190.1	CAPACITY FOR (LL+I)	190.1
ACTUAL (LL+I)	84.3	ACTUAL (LL+I)	147.1	ACTUAL (LL+I)	159.6
POSTING GROSS TONNAGE	38.3	POSTING GROSS TONNAGE	42.6	POSTING GROSS TONNAGE	41.7

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING
D/P STRUCTURE I.D. = 880-065
MEMBER I.D. -- G 1
C.P. LOCATION -- 1.40

***** LIVE LOAD CALCULATIONS (IMPACT FACTOR = 0.300 FOR +BEND AND = 0.300 FOR -BEND)

LIVE LOAD		-- LIVE LOAD -- TRUCK MOMENT					LANE MOMENT			FIXED		SHEAR	
		REDIS LL+I FT-KIPS	LL+IMP FT-KIPS	LL FT-KIPS	LOC.NO. 1 WHEEL FT.	DIR	LL+IMP FT-KIPS	LL FT-KIPS	LOC.CONC. LOAD #1 FT.	LOC.CONC. LOAD #2 FT.	+V KIPS	-V KIPS	LEFT KIPS	RIGHT KIPS
INV. HS20	+BEND	0.00	115.6	88.9	38.100	R	94.4	72.6	10.100	0.000	0.00	0.00	11.47	11.47
	-BEND	0.00	35.0	26.9	59.451	R	-23.1	-17.8	37.650	0.000	0.00	0.00		
INV. 2	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 3	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 4	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 5	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 6	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
OPER HS20	+BEND	0.00	115.6	88.9	38.100	R	94.4	72.6	10.100	0.000	0.00	0.00	11.47	11.47
	-BEND)	0.00	35.0	26.9	59.451	R	-23.1	-17.8	37.650	0.000	0.00	0.00		
OPER 2, ST5	+BEND	0.00	103.3	79.5	41.100		0.0	0.0	0.000	0.000	0.00	0.00	-8.51	-8.51
	-BEND	0.00	21.6	16.6	0.444		0.0	0.0	0.000	0.300	0.00	0.00		
POST 1 SU2	+BEND	0.00	83.6	64.3	23.100	R					0.00	0.00	8.27	8.27
	-BEND	0.00	20.9	16.1	47.550	R					0.00	0.00		
POST 4 C3	+BEND	0.00	90.5	69.6	20.103						0.00	0.00	-9.23	-9.23
	-BEND	0.00	19.1	14.7	30.751						0.00	0.00		
POST 2 SU3	+BEND	0.00	141.2	108.6	21.105	R					0.00	0.00	13.06	13.06
	-BEND	0.00	39.5	30.4	46.948	R					0.00	0.00		
POST 5 C4	+BEND	0.00	131.9	101.5	-21.736						0.00	0.00	-13.50	-13.50
	-BEND	0.00	27.8	21.4	70.549						0.00	0.00		
POST 3 SU4	+BEND	0.00	155.1	119.3	23.434	R					0.00	0.00	13.14	13.14
	-BEND	0.00	43.0	33.1	48.950	R					0.00	0.00		
POST 6 C5	+BEND	0.00	131.9	101.5	-21.736						0.00	0.00	-13.47	-13.47
	-BEND	0.00	28.9	22.3	67.450						0.00	0.00		
SPEC	+BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000						0.00	0.00		
SPEC 2	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
SPEC 3	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
SPEC 4	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
SPEC 5	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING

D/P STRUCTURE I.D. = 880-085
MEMBER I.D. = G 1
C.F. LOCATION = 1.40

***** RATING FACTOR *****

	-- RATING FACTOR FOR -- MOMENT TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SERVICEABILITY TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SHEAR LEFT	SHEAR RIGHT	RATING VALUE	SAFE LOAD CAP.(TONS)
INV. HS20	1.498	1.578	1.498	1.578	0.000	0.000	0.000	0.000	0.000	0.000	HS 30.0	53.9
INV. 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
OPER HS20	2.496	2.630	1.766	2.630	0.000	0.000	0.000	0.000	0.000	0.000	HS 35.3	63.6
OPER 2 ST5	2.793	4.262	1.976	4.262	0.000	0.000	0.000	0.000	0.000	0.000	0.0	79.0
POST 1 SU2	3.451	4.408	2.442	4.408	0.000	0.000	0.000	0.000	0.000	0.000		41.5
POST 4 C3	3.186	4.814	2.254	4.814	0.000	0.000	0.000	0.000	0.000	0.000		63.1
POST 2 SU3	2.042	2.331	1.445	2.331	0.000	0.000	0.000	0.000	0.000	0.000		47.7
POST 5 C4	2.187	3.309	1.547	3.309	0.000	0.000	0.000	0.000	0.000	0.000		56.7
POST 3 SU4	1.860	2.140	1.316	2.140	0.000	0.000	0.000	0.000	0.000	0.000		46.0
POST 6 C5	2.187	3.179	1.547	3.179	0.000	0.000	0.000	0.000	0.000	0.000		61.9
SPEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING
D/P STRUCTURE I.D. = 880-085
MEMBER I.D. = G 1
C.F. LOCATION = 1.50

***** LIVE LOAD CALCULATIONS (IMPACT FACTOR = 0.300 FOR +BEND AND = 0.300 FOR -BEND)

	LIVE LOAD		TRUCK MOMENT REDIS LL+I FT-KIPS	TRUCK MOMENT LL+IMP FT-KIPS	TRUCK MOMENT LL FT-KIPS	LIVE LOAD LOC.NO. 1 WHEEL FT.	LIVE LOAD DIR	LANE MOMENT LL+IMP FT-KIPS	LANE MOMENT LL FT-KIPS	FIXED LOC.CONC. LOAD #1 FT.	FIXED LOC.CONC. LOAD #2 FT.	FIXED SHEAR +V KIPS	SHEAR -V KIPS	SHEAR LEFT KIPS	SHEAR RIGHT KIPS
INV.	HS20	+BEND	0.00	113.9	87.6	-15.375	L	94.2	72.5	12.625	0.000	0.00	0.00	14.11	14.11
		-BEND	0.00	43.7	33.6	59.451	R	-28.9	-22.2	37.650	0.000	0.00	0.00		
INV. 2		+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
INV. 3		+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
INV. 4		+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
INV. 5		+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
INV. 6		+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
OPER	HS20	+BEND	0.00	113.9	87.6	-15.375	L	94.2	72.5	12.625	0.000	0.00	0.00	14.11	14.11
		-BEND	0.00	43.7	33.6	59.451	R	-28.9	-22.2	37.650	0.000	0.00	0.00		
OPER 2	ST5	+BEND	0.00	100.5	77.3	43.626		0.0	0.0	0.000	0.000	0.00	0.00		
		-BEND	0.00	28.0	21.6	1.349		0.0	0.0	0.000	0.000	0.00	0.00	-13.04	-13.04
POST 1	SU2	+BEND	0.00	78.3	60.2	-0.375	L					0.00	0.00		
		-BEND	0.00	26.1	20.1	47.550	R					0.00	0.00	9.02	9.02
POST 4	C3	+BEND	0.00	84.7	65.2	22.624						0.00	0.00		
		-BEND	0.00	23.9	18.4	30.751						0.00	0.00	-11.13	-11.13
POST 2	SU3	+BEND	0.00	135.9	104.6	23.627	R					0.00	0.00		
		-BEND	0.00	49.3	38.0	46.948	R					0.00	0.00	15.14	15.14
POST 5	C4	+BEND	0.00	128.7	99.0	-23.375						0.00	0.00		
		-BEND	0.00	34.8	26.7	70.549						0.00	0.00	-17.10	-17.10
POST 3	SU4	+BEND	0.00	149.5	115.0	-0.709	L					0.00	0.00		
		-BEND	0.00	53.7	41.3	48.950	R					0.00	0.00	15.57	15.57
POST 6	C5	+BEND	0.00	128.7	99.0	-23.375						0.00	0.00		
		-BEND	0.00	36.2	27.8	67.450						0.00	0.00	-17.28	-17.28
SPEC		+BEND	0.00	0.0	0.0	0.000						0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
SPEC 2		+BEND	0.00	0.0	0.0	0.000						0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
SPEC 3		+BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
SPEC 4		+BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
SPEC 5		+BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
		-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
							L					0.00	0.00		

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING

DATE 7/ 3/90

D/P STRUCTURE I.D. = 880-085
MEMBER I.D. -- G 1
C.P. LOCATION -- 1.50

***** RATING FACTOR *****

		-- RATING FACTOR FOR -- MOMENT TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SERVICEABILITY TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SHEAR LEFT	RIGHT	RATING VALUE	SAFE LOAD CAP.(TONS)
INV.	HS20	1.503	1.305	1.503	1.305	0.000	0.000	0.000	0.000	0.000	0.000	HS 26.1	47.0
INV. 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
OPER	HS20	2.505	2.175	1.740	2.175	0.000	0.000	0.000	0.000	0.000	0.000	HS 34.8	62.6
OPER 2	ST5	2.838	3.392	1.971	3.392	0.000	0.000	0.000	0.000	0.000	0.000	0.0	78.9
POST 1	SU2	3.644	3.646	2.531	3.646	0.000	0.000	0.000	0.000	0.000	0.000		43.0
POST 4	C3	3.368	3.981	2.340	3.981	0.000	0.000	0.000	0.000	0.000	0.000		65.5
POST 2	SU3	2.099	1.927	1.458	1.927	0.000	0.000	0.000	0.000	0.000	0.000		46.1
POST 5	C4	2.216	2.737	1.539	2.737	0.000	0.000	0.000	0.000	0.000	0.000		56.4
POST 3	SU4	1.909	1.770	1.326	1.770	0.000	0.000	0.000	0.000	0.000	0.000		44.4
POST 6	C5	2.216	2.629	1.539	2.629	0.000	0.000	0.000	0.000	0.000	0.000		61.6
SPEC		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING
D/P STRUCTURE I.D. = 880-085
MEMBER I.D. -- G 1
C.F. LOCATION -- 2.00

***** LIVE LOAD CALCULATIONS (IMPACT FACTOR = 0.300 FOR +BEND AND = 0.300 FOR -BEND)

LIVE LOAD		-- LIVE LOAD -- TRUCK MOMENT REDIS LL+I FT-KIPS	TRUCK MOMENT LL+IMP FT-KIPS	TRUCK MOMENT LL FT-KIPS	TRUCK MOMENT LOC.NO. 1 WHEEL FT.	TRUCK MOMENT DIR	LANE MOMENT LL+IMP FT-KIPS	LANE MOMENT LL FT-KIPS	LANE MOMENT LOC.CONC. LOAD #1 FT.	LANE MOMENT LOC.CONC. LOAD #2 FT.	FIXED SHEAR +V KIPS	FIXED SHEAR -V KIPS	SHEAR LEFT KIPS	SHEAR RIGHT KIPS
INV. HS20	+BEND	0.00	23.3	17.9	90.451	R	15.1	11.6	68.650	0.000	0.00	0.00	34.91	34.91
	-BEND	0.00	107.2	82.5	45.675	R	-104.2	-80.1	37.650	15.150	0.00	0.00		
INV. 2	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 3	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 4	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 5	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 6	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
OPER HS20	+BEND	0.00	23.3	17.9	90.451	R	15.1	11.6	68.650	0.000	0.00	0.00	34.91	34.91
	-BEND	0.00	107.2	82.5	45.675	R	-104.2	-80.1	37.650	15.150	0.00	0.00		
OPER 2 ST5	+BEND	0.00	5.1	3.9	138.751		0.0	0.0	0.000	0.000	0.00	0.00	-29.22	28.33
	-BEND	0.00	90.7	69.7	74.576		0.0	0.0	0.000	0.300	0.00	0.00		
POST 1 SU2	+BEND	0.00	13.9	10.7	78.550	R					0.00	0.00	20.12	20.12
	-BEND	0.00	52.2	40.1	47.550	R					0.00	0.00		
POST 4 C3	+BEND	0.00	12.8	9.8	61.751						0.00	0.00	-22.09	21.79
	-BEND	0.00	91.9	70.7	44.550						0.00	0.00		
POST 2 SU3	+BEND	0.00	26.3	20.2	77.947	R					0.00	0.00	36.60	36.60
	-BEND	0.00	98.8	76.0	20.450	L					0.00	0.00		
POST 5 C4	+BEND	0.00	18.7	14.4	101.549						0.00	0.00	-29.70	30.38
	-BEND	0.00	120.0	92.3	5.048						0.00	0.00		
POST 3 SU4	+BEND	0.00	28.6	22.0	79.950	R					0.00	0.00	38.43	38.43
	-BEND	0.00	107.5	82.7	48.950	R					0.00	0.00		
POST 6 C5	+BEND	0.00	19.5	15.0	100.483						0.00	0.00	-30.37	32.20
	-BEND	0.00	127.5	98.1	3.508						0.00	0.00		
SPEC	+BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000						0.00	0.00		
SPEC 2	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		
SPEC 3	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		
SPEC 4	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		
SPEC 5	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING
D/P STRUCTURE I.D. = 880-085
MEMBER I.D. -- G 1
C.P. LOCATION -- 2.00

***** RATING FACTOR *****

		-- RATING FACTOR FOR -- MOMENT TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SERVICEABILITY TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	--- RATING FACTOR FOR -- SHEAR LEFT	RIGHT	RATING VALUE	SAFE LOAD CAP.(TONS)
INV.	HS20	12.207	2.416	12.207	2.416	0.000	0.000	0.000	0.000	0.000	0.000	HS 48.3	87.0
INV. 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
OPER	HS20	20.345	4.027	18.846	4.027	0.000	0.000	0.000	0.000	0.000	0.000	HS 80.5	145.0
OPER 2	ST5	93.144	4.763	86.279	4.763	0.000	0.000	0.000	0.000	0.000	0.000	0.0	190.5
POST 1	SU2	34.135	8.275	31.619	8.275	0.000	0.000	0.000	0.000	0.000	0.000		140.7
POST 4	C3	37.136	4.697	34.399	4.697	0.000	0.000	0.000	0.000	0.000	0.000		131.5
POST 2	SU3	18.044	4.369	16.714	4.369	0.000	0.000	0.000	0.000	0.000	0.000		144.2
POST 5	C4	25.353	3.597	23.484	3.597	0.000	0.000	0.000	0.000	0.000	0.000		131.8
POST 3	SU4	16.567	4.017	15.346	4.017	0.000	0.000	0.000	0.000	0.000	0.000		140.6
POST 6	C5	24.372	3.387	22.576	3.387	0.000	0.000	0.000	0.000	0.000	0.000		135.5
SPEC		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING
D/F STRUCTURE I.D. = 880-085
MEMBER I.D. --- G 1
C.P. LOCATION --- 2.50

***** LIVE LOAD CALCULATIONS (IMPACT FACTOR = 0.300 FOR +BEND AND = 0.300 FOR -BEND)

LIVE LOAD		-- LIVE LOAD -- TRUCK MOMENT REDIS LL+I FT-KIPS	TRUCK MOMENT LL+IMP FT-KIPS	TRUCK MOMENT LL FT-KIPS	LOC.NO. 1 WHEEL FT.	DIR	LANE MOMENT LL+IMP FT-KIPS	LANE MOMENT LL FT-KIPS	LOC.CONC. LOAD #1 FT.	LOC.CONC. LOAD #2 FT.	FIXED SHEAR +V KIPS	FIXED SHEAR -V KIPS	SHEAR LEFT KIPS	SHEAR RIGHT KIPS
INV. HS20	+BEND	0.00	118.5	91.2	12.750	L	98.1	75.5	40.750	0.000	0.00	0.00	12.22	12.22
	-BEND	0.00	30.7	23.7	90.451	R	-26.1	-20.1	68.650	0.000	0.00	0.00		
INV. 2	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 3	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 4	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 5	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 6	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
OPER HS20	+BEND	0.00	118.5	91.2	12.750	L	98.1	75.5	40.750	0.000	0.00	0.00	12.22	12.22
	-BEND	0.00	30.7	23.7	90.451	R	-26.1	-20.1	68.650	0.000	0.00	0.00		
OPER 2 ST5	+BEND	0.00	107.8	82.9	71.748		0.0	0.0	0.000	0.000	0.00	0.00	10.47	10.47
	-BEND	0.00	12.1	9.3	31.851		0.0	0.0	0.000	0.300	0.00	0.00		
POST 1 SU2	+BEND	0.00	84.3	64.9	53.750	R					0.00	0.00	8.12	8.12
	-BEND	0.00	18.3	14.1	78.550	R					0.00	0.00		
POST 4 C3	+BEND	0.00	81.6	62.8	30.750						0.00	0.00	-10.42	-10.42
	-BEND	0.00	16.8	13.0	61.751						0.00	0.00		
POST 2 SU3	+BEND	0.00	147.1	113.1	51.752	R					0.00	0.00	12.99	12.99
	-BEND	0.00	34.7	26.7	77.947	R					0.00	0.00		
POST 5 C4	+BEND	0.00	116.9	89.9	8.914						0.00	0.00	-14.52	-14.52
	-BEND	0.00	25.2	19.4	-19.210						0.00	0.00		
POST 3 SU4	+BEND	0.00	159.6	122.8	54.084	R					0.00	0.00	13.17	13.17
	-BEND	0.00	37.8	29.0	79.950	R					0.00	0.00		
POST 6 C5	+BEND	0.00	117.3	90.3	8.916						0.00	0.00	-14.45	-14.45
	-BEND	0.00	25.7	19.7	100.483						0.00	0.00		
SPEC	+BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000						0.00	0.00		
SPEC 2	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
SPEC 3	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
SPEC 4	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		
SPEC 5	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	L					0.00	0.00		

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING

D/P STRUCTURE I.D. = 880-085
MEMBER I.D. -- G 1
C.P. LOCATION -- 2.50

***** RATING FACTOR *****	-- RATING FACTOR FOR -- MOMENT TOP		BOTT		-- RATING FACTOR FOR -- SERVICEABILITY TOP		BOTT		-- RATING FACTOR FOR -- SHEAR		RATING VALUE	SAFE LOAD CAP.(TONS)
	+BEND	-BEND	+BEND	-BEND	+BEND	-BEND	+BEND	-BEND	LEFT	RIGHT		
INV. HS20	1.642	2.755	1.642	2.755	0.000	0.000	0.000	0.000	0.000	0.000	HS 32.8	59.1
INV. 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
OPER HS20	2.736	4.592	1.604	4.592	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
OPER 2 ST5	3.009	11.479	1.763	11.479	0.000	0.000	0.000	0.000	0.000	0.000	HS 32.1	57.7
POST 1 SU2	3.847	7.704	2.255	7.704	0.000	0.000	0.000	0.000	0.000	0.000	0.0	70.5
POST 4 C3	3.974	8.301	2.329	8.381	0.000	0.000	0.000	0.000	0.000	0.000		38.3
POST 2 SU3	2.205	4.072	1.292	4.072	0.000	0.000	0.000	0.000	0.000	0.000		85.2
POST 5 C4	2.776	5.521	1.627	5.591	0.000	0.000	0.000	0.000	0.000	0.000		42.6
POST 3 SU4	2.032	3.739	1.191	3.739	0.000	0.000	0.000	0.000	0.000	0.000		59.6
POST 6 C5	2.764	5.500	1.620	5.500	0.000	0.000	0.000	0.000	0.000	0.000		41.7
SPEC	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		64.8
SPEC 2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 3	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
												0.0

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING

DATE 7/ 3/90

D/P STRUCTURE I.D. = 880-085
MEMBER I.D. -- G 1
C.P. LOCATION -- 3.00

***** LIVE LOAD CALCULATIONS (IMPACT FACTOR = 0.300 FOR +BEND AND = 0.300 FOR -BEND)

LIVE LOAD		-- LIVE LOAD -- TRUCK MOMENT REDIS LL+I FT-KIPS	TRUCK MOMENT LL+IMP FT-KIPS	TRUCK MOMENT LL FT-KIPS	TRUCK MOMENT LOC.NO. 1 WHEEL FT.	TRUCK MOMENT DIR	LANE MOMENT LL+IMP FT-KIPS	LANE MOMENT LL FT-KIPS	LANE MOMENT LOC.CONC. LOAD #1 FT.	LANE MOMENT LOC.CONC. LOAD #2 FT.	FIXED SHEAR +V KIPS	FIXED SHEAR -V KIPS	SHEAR LEFT KIPS	SHEAR RIGHT KIPS
INV.	HS20 +BEND	0.00	18.8	14.5	120.301	R	17.0	13.1	97.350	0.000	0.00	0.00	34.88	34.88
	-BEND	0.00	108.1	83.1	36.050	L	-109.6	-84.3	68.650	43.850	0.00	0.00		
INV. 2	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 3	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 4	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 5	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
INV. 6	+BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000		0.0	0.0	0.000	0.000	0.00	0.00		
OPER	HS20 +BEND	0.00	18.8	14.5	120.301	R	17.0	13.1	97.350	0.000	0.00	0.00	34.88	34.88
	-BEND	0.00	108.1	83.1	36.050	L	-109.6	-84.3	68.650	43.850	0.00	0.00		
OPER 2	ST5 +BEND	0.00	7.9	6.0	164.350		0.0	0.0	0.000	0.000	0.00	0.00	-28.50	28.49
	-BEND	0.00	95.5	73.5	105.450		0.0	0.0	0.000	0.300	0.00	0.00		
POST 1	SU2 +BEND	0.00	11.4	8.7	107.826	R					0.00	0.00	20.08	20.08
	-BEND	0.00	50.8	39.1	50.055	L					0.00	0.00		
POST 4	C3 +BEND	0.00	12.4	9.5	92.308						0.00	0.00	-22.14	22.14
	-BEND	0.00	93.7	72.1	75.549						0.00	0.00		
POST 2	SU3 +BEND	0.00	21.4	16.4	108.349	R					0.00	0.00	36.48	36.48
	-BEND	0.00	97.4	74.9	51.450	L					0.00	0.00		
POST 5	C4 +BEND	0.00	18.5	14.3	131.709						0.00	0.00	-30.32	30.32
	-BEND	0.00	124.2	95.6	34.548						0.00	0.00		
POST 3	SU4 +BEND	0.00	23.5	18.0	109.800	R					0.00	0.00	38.30	38.30
	-BEND	0.00	104.5	80.4	53.148	L					0.00	0.00		
POST 6	C5 +BEND	0.00	18.5	14.3	131.709						0.00	0.00	-32.11	32.11
	-BEND	0.00	133.6	102.7	33.717						0.00	0.00		
SPEC	+BEND	0.00	0.0	0.0	0.000						0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000						0.00	0.00		
SPEC 2	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		
SPEC 3	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		
SPEC 4	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		
SPEC 5	+BEND	0.00	0.0	0.0	0.000	R					0.00	0.00	0.00	0.00
	-BEND	0.00	0.0	0.0	0.000	R					0.00	0.00		

DATE 7/ 3/90

LIVE LOAD DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER - LOAD FACTOR RATING
D/P STRUCTURE I.D. = 880-085
MEMBER I.D. -- G 1
C.P. LOCATION --- 3.00

***** RATING FACTOR *****

		-- RATING FACTOR FOR -- MOMENT TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SERVICEABILITY TOP +BEND	TOP -BEND	BOTT +BEND	BOTT -BEND	-- RATING FACTOR FOR -- SHEAR LEFT	SHEAR RIGHT	RATING VALUE	SAFE LOAD CAP.(TONS)
INV.	HS20	15.146	2.363	15.146	2.363	0.000	0.000	0.000	0.000	0.000	0.000	HS 47.3	85.1
INV. 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
INV. 6		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0	0.0
OPER	HS20	25.243	3.938	23.383	3.938	0.000	0.000	0.000	0.000	0.000	0.000	HS 78.8	141.8
OPER 2	ST5	60.406	4.521	55.954	4.521	0.000	0.000	0.000	0.000	0.000	0.000	0.0	180.9
POST 1	SU2	41.786	8.501	38.707	8.501	0.000	0.000	0.000	0.000	0.000	0.000		144.5
POST 4	C3	38.369	4.609	35.541	4.609	0.000	0.000	0.000	0.000	0.000	0.000		129.1
POST 2	SU3	22.197	4.433	20.561	4.433	0.000	0.000	0.000	0.000	0.000	0.000		146.3
POST 5	C4	25.597	3.475	23.710	3.475	0.000	0.000	0.000	0.000	0.000	0.000		127.3
POST 3	SU4	20.220	4.131	18.730	4.131	0.000	0.000	0.000	0.000	0.000	0.000		144.6
POST 6	C5	25.597	3.232	23.710	3.232	0.000	0.000	0.000	0.000	0.000	0.000		129.3
SPEC		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 2		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 3		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 4		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0
SPEC 5		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.0

DETAIL DATA FOR FLEXURAL MEMBER

DATE 07/03/90

NO. SPANS = 4
SYMMETRICAL

D/P STRUCTURE I.D. 880-085
MEMBER I.D.--G01
MATERIAL--CPS
LL DIST. FACT. = 1.061

SPAN NO.	LENGTH FT.	RNG. NO.	LENGTH FT.	SEC.NO. LT	SEC.NO. RT	VAR CODE S T F	VAR CODE I B	DL DUE TO MEM. WEIGHT W(LT) LBS/FT	DL DUE TO MEM. WEIGHT W(RT) LBS/FT
1	25.250	1	20.083	01	01			809.4	809.4
		2	5.167	02	02			809.4	809.4
2	31.000	1	5.167	03	03			809.4	809.4
		2	20.667	04	04			809.4	809.4
		3	5.167	03	03			809.4	809.4

SUPERIMPOSED DISTRIBUTED DL(S)
LENGTH DISTRIBUTED**********
DIST. FROM LT SUPPORT***

SPAN NO.	W(LT) LBS/FT	W(RT) LBS/FT	* FT.	* FT.
1	111.0	111.0	0.000	25.250
2	111.0	111.0	25.250	31.000
3	111.0	111.0	56.250	31.000
4	111.0	111.0	87.250	25.250

SUPERIMPOSED CONCENTRATED DL(S)
DIST. FROM LT SUPPORT****

STIFF TRANS.	STIFF LONG.	SPAN NO.	F KIPS	* FT.

CHECK POINTS RATED--

SPAN NO.	DIS FRM LT SPRT FT.	FUNC M	FUNC VL	FUNC VR
1	0.000			X
1	10.100	X	X	X
1	12.625	X	X	X
1	25.250	X	X	X
2	0.000	X	X	X
2	15.500	X	X	X
2	31.000	X	X	X

DETAIL DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER

DATE 07/03/90

D/P STRUCTURE I.D. 880-085
MEMBER I.D.--G01
C.P. LOCATION 1.4

***** SECTION PROPERTIES IN RANGE 1 OF SPAN 1

	H IN.	AREA SQ.IN.	AS SQ.IN.	CT IN.	DA IN.	ECC IN	FI KIPS	IX + BEND IN**4	IX - BEND IN**4	C (BOT) IN.	SECTION MODULUS TOP + BEND IN**3	TOP - BEND IN**3	BOTTOM + BEND IN**3	BOTTOM - BEND IN**3	C O M
NON-COM	9.25	777.00	2.45	4.67	2.00	2.83	463.0	5639.8	5639.8	4.58	1207.8	1207.8	1231.3	1231.3	P
					LOSS =		35057.0	14306.0	5639.8	6.20	4691.1	0.0	2307.3	0.0	N
SLAB RESTEEL			0.00	0.00	FF =		377.1	14306.0	5639.8	6.20	4691.1	0.0	2307.3	0.0	3N
NON-COMP: D =		7.50	KD =	1.32	JD =	7.06		*** COMP:		D=	11.25	KD =	1.99	JD =	10.59	

***** INFLUENCE LINE (SIMPLE SPAN)

X-DIST (FT.)
Y-ORDINATE

POS AREA =

***** ORDINATES OF AND AREAS UNDER INFLUENCE LINE (CONTINUOUS SPAN)

	SPAN 1	SPAN 2	SPAN 3	SPAN 4	SPAN 5	SPAN 6
T 0	0.000	0.000	0.000	0.000	0.000	0.000
E 1	1.272	- 0.532	0.142	- 0.031	0.000	0.000
N 2	2.559	- 0.870	0.232	- 0.052	0.000	0.000
T 3	3.875	- 1.044	0.279	- 0.065	0.000	0.000
H 4	5.235	- 1.081	0.288	- 0.070	0.000	0.000
5	4.130	- 1.010	0.269	- 0.068	0.000	0.000
P 6	3.097	- 0.857	0.228	- 0.061	0.000	0.000
O 7	2.154	- 0.652	0.173	- 0.049	0.000	0.000
I 8	1.313	- 0.422	0.111	- 0.035	0.000	0.000
N 9	0.590	- 0.195	0.051	- 0.018	0.000	0.000
T 0	0.000	0.000	0.000	0.000	0.000	0.000
POS AREA	61.2	0.0	5.5	0.0	0.0	0.0
NEG AREA	0.0	20.7	0.0	1.1	0.0	0.0

***** ULTIMATE STRENGTH ***** MOMENT CAPACITY

	PRESTRESS STEEL PSI	CONC PSI	TOP + BEND FT-KIPS	TOP - BEND FT-KIPS	BOTTOM + BEND FT-KIPS	BOTTOM - BEND FT-KIPS
SLAB *=FY	60000.*	3400.				
INVENTORY	270000.	5000.	228.3	0.0	228.3	0.0
OPERATING	270000.	5000.	380.5	0.0	380.5	0.0
POST VEH1	270000.	5000.	380.5	0.0	380.5	0.0
POST VEH2	270000.	5000.	380.5	0.0	380.5	0.0
POST VEH3	270000.	5000.	380.5	0.0	380.5	0.0
POST SPEC	0.	0.	0.0	0.0	0.0	0.0

***** DL MOMENT EFFECT

	DL FT-KIPS	SDL FT-KIPS
	87.0	5.0

AREA TOTALS **** ULT MOM CAP FT-KIPS: 66.7 POS, 21.8 NEG

***** AVAIL.CAPAC.FOR LL+IMPACT

	TOP +BEND F-KPS	TOP -BEND F-KPS	BOT +BEND F-KPS	BOT -BEND F-KPS
INVENTORY	173.1	55.2	173.1	55.2
OPERATING	288.5	92.0	204.1	92.0
VEH. 1	288.5	92.0	204.1	92.0
VEH. 2	288.5	92.0	204.1	92.0
VEH. 3	288.5	92.0	204.1	92.0
SPECIAL	0.0	0.0	0.0	0.0

***** LIVE LOAD AND RATING CALCULATIONS (IMPACT FACTOR = .300 FOR +BEND AND = .300 FOR -BEND)

LIVE LOAD		TRUCK LOAD LL+IMP FT-KIPS	TRUCK LOAD LL FT-KIPS	TRUCK LOAD LOC.NO. 1 WHEEL FT.	DIR	AXLE SPACE FT.	LANE LOAD LL+IMP FT-KIPS	LANE LOAD LL FT-KIPS	LOC.CONC LOAD FT.	LOC.CONC LOAD 2 FT.	RATING FACT.	SAFE LOAD CAPACITY TONS	RATING VALUE
INV HS20	+BEND	115.6	88.9	38.100	R		94.4	72.6	10.100		1.498	53.9	HS 30.0
	-BEND	35.0	26.9	59.451	R		23.1	17.8	37.650	0.000			
OPER HS20	+BEND	115.6	88.9	38.100	R		94.4	72.6	10.100		1.766	63.6	HS 35.3
	-BEND	35.0	26.9	59.451	R		23.1	17.8	37.650	0.000			
POST VEH1	+BEND	83.6	64.3	23.100	R						2.442	41.5	
	-BEND	20.9	16.1	47.550	R								
POST VEH2	+BEND	141.2	108.6	21.105	R						1.445	47.7	
	-BEND	39.5	30.4	46.948	R								
POST VEH3	+BEND	155.1	119.3	23.434	R						1.316	46.0	
	-BEND	43.0	33.1	48.950	R								
POST SPEC	+BEND	0.0	0.0	0.000							0.000	0.0	
	-BEND	0.0	0.0	0.000									

DETAIL DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER

DATE 07/03/90

D/P STRUCTURE I.D. 880-085
MEMBER I.D.--G01
C.P. LOCATION 2.5

***** SECTION PROPERTIES IN RANGE 1 OF SPAN 2

	H IN.	AREA SQ.IN.	AS SQ.IN.	CT IN.	DA IN.	ECC IN.	FI KIPS	IX + BEND IN**4	IX - BEND IN**4	C (BOT) IN.	SECTION MODULUS TOP + BEND IN**3	TOP - BEND IN**3	BOTTOM + BEND IN**3	BOTTOM - BEND IN**3	C O M P
NON-COM	9.25	777.00	3.22	4.68	2.00	2.82	607.7	5670.3	5670.3	4.57	1210.8	1210.8	1241.7	1241.7	P
						LOSS =	36657.4	14381.5	5670.3	6.18	4691.0	0.0	2325.5	0.0	N
SLAB RESTEEL			0.00	0.00		FF =	489.8	14381.5	5670.3	6.18	4691.0	0.0	2325.5	0.0	3N
NON-COMP D =	7.50	KD =	1.50	JD =	7.00		*** COMP:		D=	11.25	KD =	2.24	JD =	10.50	

***** INFLUENCE LINE (SIMPLE SPAN)

X-DIST (FT.)
Y-ORDINATE

POS AREA =

***** ULTIMATE STRENGTH ***** MOMENT CAPACITY

PRESTRESS	STEEL / CONC FST	FST	TOP + BEND FT-KIPS	TOP - BEND FT-KIPS	BOTTOM + BEND FT-KIPS	BOTTOM - BEND FT-KIPS
SLAB *=FY	60000.*	3400.	0.0	0.0	0.0	0.0
INVENTORY	270000.	5000.	279.3	0.0	279.3	0.0
OPERATING	270000.	5000.	465.5	0.0	465.5	0.0
POST VEH1	270000.	5000.	465.5	0.0	465.5	0.0
POST VEH2	270000.	5000.	465.5	0.0	465.5	0.0
POST VEH3	270000.	5000.	465.5	0.0	465.5	0.0
POST SPEC		0.	0.0	0.0	0.0	0.0

***** ORDINATES OF AND AREAS UNDER INFLUENCE LINE (CONTINUOUS SPAN)

		SPAN 1	SPAN 2	SPAN 3	SPAN 4	SPAN 5	SPAN 6
T	0	0.000	0.000	0.000	0.000	0.000	0.000
E	1	0.222	0.652	0.468	0.102	0.000	0.000
N	2	0.431	1.305	0.766	0.172	0.000	0.000
T	3	0.613	2.552	0.918	0.213	0.000	0.000
H	4	0.754	3.813	0.950	0.229	0.000	0.000
	5	0.842	5.266	0.886	0.224	0.000	0.000
P	6	0.862	3.818	0.751	0.201	0.000	0.000
O	7	0.801	2.560	0.570	0.163	0.000	0.000
I	8	0.646	1.516	0.368	0.115	0.000	0.000
N	9	0.384	0.660	0.169	0.059	0.000	0.000
T	0	0.000	0.000	0.000	0.000	0.000	0.000
POS AREA		0.0	69.3	0.0	3.7	0.0	0.0
NEG AREA		14.0	0.0	18.1	0.0	0.0	0.0

***** DL MOMENT EFFECT

DL FT-KIPS	SDL FT-KIPS
136.6	4.5

AREA TOTALS **** ULT MOM CAP FT-KIPS
73.0 POS 605.2
32.2 NEG 0.0

***** AVAIL.CAPAC.FOR LL+IMPACT

	TOP +BEND F-KPS	TOP -BEND F-KPS	BOT +BEND F-KPS	BOT -BEND F-KPS
INVENTORY	194.6	84.7	194.6	84.7
OPERATING	324.4	141.2	190.1	141.2
VEH. 1	324.4	141.2	190.1	141.2
VEH. 2	324.4	141.2	190.1	141.2
VEH. 3	324.4	141.2	190.1	141.2
SPECIAL	0.0	0.0	0.0	0.0

***** LIVE LOAD AND RATING CALCULATIONS (IMPACT FACTOR = .300 FOR +BEND AND = .300 FOR -BEND)

LIVE LOAD		TRUCK LOAD LL+IMP FT-KIPS	TRUCK LOAD LL FT-KIPS	LOC.NO. 1 WHEEL FT.	DIR	AXLE SPACE FT.	LANE LOAD LL+IMP FT-KIPS	LANE LOAD LL FT-KIPS	LOC.CONC LOAD FT.	LOC.CONC LOAD 2 FT.	RATING FACT.	SAFE LOAD CAPACITY TONS	RATING VALUE
INV HS20	+BEND	118.5	91.2	12.750	L		98.1	75.5	40.750		1.642	59.1	HS 32.8
	-BEND	30.7	23.7	90.451	R		26.1	20.1	68.650	0.000			
OPER HS20	+BEND	118.5	91.2	12.750	L		98.1	75.5	40.750		1.604	57.7	HS 32.1
	-BEND	30.7	23.7	90.451	R		26.1	20.1	68.650	0.000			
POST VEH1	+BEND	84.3	64.9	53.750	R						2.255	38.3	
	-BEND	18.3	14.1	78.550	R								
POST VEH2	+BEND	147.1	113.1	51.752	R						1.292	42.6	
	-BEND	34.7	26.7	77.947	R								
POST VEH3	+BEND	159.6	122.8	54.084	R						1.191	41.7	
	-BEND	37.8	29.0	79.950	R								
POST SPEC	+BEND	0.0	0.0	0.000							0.000	0.0	
	-BEND	0.0	0.0	0.000									

DETAIL DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER

DATE 07/03/90

D/P STRUCTURE I.D. 880-085
MEMBER I.D.--G01
C.F. LOCATION 1.5

***** SECTION PROPERTIES IN RANGE 1 OF SPAN 1

	H IN.	AREA SQ.IN.	AS SQ.IN.	CT IN.	DA IN.	ECC IN.	FI KIPS	IX + BEND IN**4	IX - BEND IN**4	C (BOT) IN.	SECTION MODULUS TOP + BEND IN**3	TOP - BEND IN**3	BOTTOM + BEND IN**3	BOTTOM - BEND IN**3	C O / P N 3N
NON-COM	9.25	777.00	2.45	4.67	2.00	2.83	463.0	5639.8	5639.8	4.58	1207.8	1207.8	1231.3	1231.3	
SLAB RESTEEL		0.00	0.00			LOSS =	34831.3	14306.0	5639.8	6.20	4691.1	0.0	2307.3	0.0	
NON-COMP: D =	7.50	KD =	1.32	JD =	7.06	FF =	377.7	14306.0	5639.8	6.20	4691.1	0.0	2307.3	0.0	
								*** COMP:		D=	11.25	KD =	1.99	JD =	10.59

***** INFLUENCE LINE (SIMPLE SPAN)

X-DIST (FT.)
Y-ORDINATE

POS AREA =

***** ORDINATES OF AND AREAS UNDER INFLUENCE LINE (CONTINUOUS SPAN)

	SPAN 1	SPAN 2	SPAN 3	SPAN 4	SPAN 5	SPAN 6
T 0	0.000	0.000	0.000	0.000	0.000	0.000
E 1	0.959 -	0.664	0.178 -	0.039	0.000	0.000
N 2	1.936 -	1.088	0.290 -	0.065	0.000	0.000
T 3	2.950 -	1.305	0.348 -	0.081	0.000	0.000
H 4	4.019 -	1.352	0.360 -	0.087	0.000	0.000
5	5.162 -	1.262	0.336 -	0.085	0.000	0.000
P 6	3.872 -	1.072	0.285 -	0.076	0.000	0.000
O 7	2.492 -	0.815	0.216 -	0.062	0.000	0.000
I 8	1.641 -	0.528	0.139 -	0.043	0.000	0.000
N 9	0.738 -	0.244	0.064 -	0.022	0.000	0.000
T 0	0.000	0.000	0.000	0.000	0.000	0.000
POS AREA	60.5	0.0	6.9	0.0	0.0	0.0
NEG AREA	0.0	25.8	0.0	1.4	0.0	0.0

***** ULTIMATE STRENGTH ***** MOMENT CAPACITY

	PRESTRESS STEEL / CONC FSI	FSI	TOP + BEND FT-KIPS	TOP - BEND FT-KIPS	BOTTOM + BEND FT-KIPS	BOTTOM - BEND FT-KIPS
SLAB *=FY	60000.*	3400.				
INVENTORY	270000.	5000.	228.3	0.0	228.3	0.0
OPERATING	270000.	5000.	380.5	0.0	380.5	0.0
POST VEH1	270000.	5000.	380.5	0.0	380.5	0.0
POST VEH2	270000.	5000.	380.5	0.0	380.5	0.0
POST VEH3	270000.	5000.	380.5	0.0	380.5	0.0
POST SPEC	0.	0.	0.0	0.0	0.0	0.0

***** DL MOMENT EFFECT

	DL FT-KIPS	SDL FT-KIPS
	90.7	4.5

AREA TOTALS ***** ULT MOM CAP FT-KIPS
67.4 POS 494.6
27.2 NEG 0.0

***** AVAIL.CAPAC.FOR LL+IMPACT

	TOP +BEND F-KIPS	TOP -BEND F-KIPS	BOT +BEND F-KIPS	BOT -BEND F-KIPS
INVENTORY	171.2	57.1	171.2	57.1
OPERATING	285.4	95.1	198.2	95.1
VEH. 1	285.4	95.1	198.2	95.1
VEH. 2	285.4	95.1	198.2	95.1
VEH. 3	285.4	95.1	198.2	95.1
SPECIAL	0.0	0.0	0.0	0.0

***** LIVE LOAD AND RATING CALCULATIONS (IMPACT FACTOR = .300 FOR +BEND AND = .300 FOR -BEND)

LIVE LOAD		TRUCK LOAD LL+IMP FT-KIPS	TRUCK LOAD LL FT-KIPS	TRUCK LOAD LOC.NO. 1 WHEEL FT.	DIR	AXLE SPACE FT.	LANE LOAD LL+IMP FT-KIPS	LANE LOAD LL FT-KIPS	LANE LOAD LOC.CONC LOAD FT.	LANE LOAD LOC.CONC LOAD 2 FT.	RATING FACT.	SAFE LOAD CAPACITY TONS	RATING VALUE
INV HS20	+BEND	113.9	87.6 -	15.375	L		94.2	72.5	12.625		1.305	47.0	HS 26.1
	-BEND	43.7	33.6	59.451	R		28.9	22.2	37.650	0.000			
OPER HS20	+BEND	113.9	87.6 -	15.375	L		94.2	72.5	12.625		1.740	62.6	HS 34.8
	-BEND	43.7	33.6	59.451	R		28.9	22.2	37.650	0.000			
POST VEH1	+BEND	78.3	60.2 -	0.325	L						2.531	43.0	
	-BEND	26.1	20.1	47.550	R								
POST VEH2	+BEND	135.9	104.6	23.627	R						1.458	48.1	
	-BEND	49.3	38.0	46.948	R								
POST VEH3	+BEND	149.5	115.0 -	0.709	L						1.326	46.4	
	-BEND	53.7	41.3	48.950	R								
POST SPEC	+BEND	0.0	0.0	0.000							0.000	0.0	
	-BEND	0.0	0.0	0.000									

DETAIL DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER

DATE 07/03/90

D/P STRUCTURE I.D. 880-085
MEMBER I.D.--G01
C.P. LOCATION 2.0

***** SECTION PROPERTIES IN RANGE 1 OF SPAN 2

	H IN.	AREA SQ.IN.	AS SQ.IN.	CT IN.	DA IN.	ECC IN.	FI KIPS	IX + BEND IN**4	IX - BEND IN**4	C (BOT) IN.	SECTION MODULUS TOP + BEND IN**3	TOP - BEND IN**3	BOTTOM + BEND IN**3	BOTTOM - BEND IN**3	C O M
NON-COM	9.25	777.00	3.22	4.68	1.75	2.82	607.7	5670.3	5670.3	4.57	1210.8	1210.8	1241.7	1241.7	P
					LOSS =		45667.1	14381.5	5670.3	6.18	4691.0	0.0	2325.5	0.0	N
SLAB RESTEEL			11.20	11.17	FF =		460.8	14381.5	5670.3	6.18	4691.0	0.0	2325.5	0.0	3N
NON-COMP. D =	7.50		KD =	1.50	JD =	7.00		*** COMP.		D=	11.25	KD =	2.24	JD =	10.50

***** INFLUENCE LINE (SIMPLE SPAN)

X-DIST (FT.)
Y-ORDINATE

POS AREA =

***** ORDINATES OF AND AREAS UNDER INFLUENCE LINE (CONTINUOUS SPAN)

	SPAN 1	SPAN 2	SPAN 3	SPAN 4	SPAN 5	SPAN 6
T 0	0.000	0.000	0.000	0.000	0.000	0.000
E 1	0.608	1.329	0.355	0.077	0.000	0.000
N 2	1.178	2.176	0.581	0.130	0.000	0.000
T 3	1.675	2.611	0.696	0.162	0.000	0.000
H 4	2.062	2.703	0.720	0.174	0.000	0.000
5	2.301	2.524	0.672	0.170	0.000	0.000
P 6	2.356	2.143	0.569	0.152	0.000	0.000
D 7	2.191	1.630	0.432	0.124	0.000	0.000
I 8	1.767	1.055	0.279	0.087	0.000	0.000
N 9	1.049	0.489	0.128	0.045	0.000	0.000
T 0	0.000	0.000	0.000	0.000	0.000	0.000
AREA TOTALS	0.0	0.0	13.7	0.0	0.0	0.0
POS AREA	0.0	0.0	13.7	0.0	0.0	0.0
NEG AREA	38.3	51.6	0.0	2.8	0.0	0.0

PRESTRESS	STEEL / CONC PSI	TOP PSI	***** ULTIMATE STRENGTH ***** MOMENT CAPACITY TOP + BEND FT-KIPS	TOP - BEND FT-KIPS	BOTTOM + BEND FT-KIPS	BOTTOM - BEND FT-KIPS
SLAB *=FY	60000.*	3400.				
INVENTORY	270000.	5000.	272.3	264.3	279.3	264.3
OPERATING	270000.	5000.	465.5	440.6	465.5	440.6
POST VEH1	270000.	5000.	465.5	440.6	465.5	440.6
POST VEH2	270000.	5000.	465.5	440.6	465.5	440.6
POST VEH3	270000.	5000.	465.5	440.6	465.5	440.6
POST SPEC	0.	0.	0.0	0.0	0.0	0.0

	***** DL MOMENT EFFECT DL FT-KIPS	SDL FT-KIPS		***** AVAIL.CAPAC.FOR LL+IMPACT TOP +BEND F-KPS	TOP -BEND F-KPS	BOT +BEND F-KPS	BOT -BEND F-KPS
	0.0	6.8	INVENTORY	284.6	259.1	284.6	259.1
			OPERATING	474.3	431.8	439.4	431.8
**** ULT MOM CAP			VEH. 1	474.3	431.8	439.4	431.8
			VEH. 2	474.3	431.8	439.4	431.8
	505.2		VEH. 3	474.3	431.8	439.4	431.8
	572.7		SPECIAL	0.0	0.0	0.0	0.0

***** LIVE LOAD AND RATING CALCULATIONS (IMPACT FACTOR = .300 FOR +BEND AND = .300 FOR -BEND)

LIVE LOAD		TRUCK LOAD LL+IMP FT-KIPS	TRUCK LOAD LL FT-KIPS	LOC.NO. 1 WHEEL FT.	DIR	AXLE SPACE FT.	LANE LOAD LL+IMP FT-KIPS	LANE LOAD LL FT-KIPS	LOC.CONC LOAD FT.	LOC.CONC LOAD 2 FT.	RATING FACT.	SAFE LOAD CAPACITY TONS	RATING VALUE
INV HS20	+BEND	23.3	17.9	90.451	R		15.1	11.6	68.650				
	-BEND	107.2	82.5	45.675	R		104.2	80.1	37.650	15.150	2.416	87.0	HS 48.3
OPER HS20	+BEND	23.3	17.9	90.451	R		15.1	11.6	68.650				
	-BEND	107.2	82.5	45.675	R		104.2	80.1	37.650	15.150	4.027	145.0	HS 80.5
POST VEH1	+BEND	13.9	10.7	78.550	R								
	-BEND	52.2	40.1	47.550	R						8.275	140.7	
POST VEH2	+BEND	26.3	20.2	77.947	R								
	-BEND	98.8	76.0	20.450	L						4.369	144.2	
POST VEH3	+BEND	28.6	22.0	79.950	R								
	-BEND	107.5	82.7	48.950	R						4.017	140.6	
POST SPEC	+BEND	0.0	0.0	0.000							0.000	0.0	
	-BEND	0.0	0.0	0.000									

DETAIL DATA AT MOMENT CHECK POINT FOR
COMPOSITE PRESTRESSED CONCRETE FLEXURAL MEMBER

DATE 07/03/90

D/P STRUCTURE I.D. 880-085
MEMBER I.D.--G01
C.F. LOCATION 3.0

***** SECTION PROPERTIES IN RANGE 1 OF SPAN 3

	H IN.	AREA SQ.IN.	AS SQ.IN.	CT IN.	DA IN.	ECC IN	FI KIPS	IX + BEND IN**4	IX - BEND IN**4	C (BOT) IN.	SECTION MODULUS TOP + BEND IN**3	TOP - BEND IN**3	BOTTOM + BEND IN**3	BOTTOM - BEND IN**3	C O M
NON-COM	9.25	777.00	3.22	4.68	1.75	2.82	607.7	5670.3	5670.3	4.57	1210.8	1210.8	1241.7	1241.7	P
						LOSS =	45667.7	14381.5	5670.3	6.18	4691.0	0.0	2325.5	0.0	N
SLAB RESTEEL			11.20	11.19		FF =	460.8	14381.5	5670.3	6.18	4691.0	0.0	2325.5	0.0	3N
NON-COMP: D =	7.50	KD =	1.50	JD =	7.00			*** COMP:	D=	11.25	KD =	2.24	JD =	10.50	

***** INFLUENCE LINE (SIMPLE SPAN)

X-DIST (FT.)
Y-ORDINATE

POS AREA =

***** ORDINATES OF AND AREAS UNDER INFLUENCE LINE (CONTINUOUS SPAN)

	SPAN 1	SPAN 2	SPAN 3	SPAN 4	SPAN 5	SPAN 6
T 0	0.000	0.000	0.000	0.000	0.000	0.000
E 1	0.163	- 0.467	- 1.292	0.282	0.000	0.000
N 2	0.316	- 1.014	- 2.114	0.474	0.000	0.000
T 3	0.450	- 1.571	- 2.533	0.588	0.000	0.000
H 4	0.553	- 2.070	- 2.620	0.633	0.000	0.000
5	0.618	- 2.443	- 2.443	0.618	0.000	0.000
P 6	0.633	- 2.620	- 2.070	0.553	0.000	0.000
O 7	0.588	- 2.533	- 1.571	0.456	0.000	0.000
I 8	0.474	- 2.113	- 1.014	0.316	0.000	0.000
N 9	0.282	- 1.292	- 0.467	0.163	0.000	0.000
T 0	0.000	0.000	0.000	0.000	0.000	0.000
POS AREA	10.3	0.0	0.0	10.3	0.0	0.0
NEG AREA	0.0	50.0	50.0	0.0	0.0	0.0

***** ULTIMATE STRENGTH ***** MOMENT CAPACITY

PRESTRESS STEEL / CONC	PSI	PSI	TOP + BEND FT-KIPS	TOP - BEND FT-KIPS	BOTTOM + BEND FT-KIPS	BOTTOM - BEND FT-KIPS
SLAB *=FY	60000.*	3400.				
INVENTORY	270000.	5000.	279.3	264.3	279.3	264.3
OPERATING	270000.	5000.	465.5	440.6	465.5	440.6
POST VEH1	270000.	5000.	465.5	440.6	465.5	440.6
POST VEH2	270000.	5000.	465.5	440.6	465.5	440.6
POST VEH3	270000.	5000.	465.5	440.6	465.5	440.6
POST SPEC	0.	0.	0.0	0.0	0.0	0.0

***** DL MOMENT EFFECT

DL FT-KIPS	SDL FT-KIPS
0.0	- 8.8

AREA TOTALS **** ULT MOM CAP FT-KIPS

	20.6	POS
	100.0	NEG

***** AVAIL.CAPAC.FOR LL+IMPACT

	TOP +BEND F-KPS	TOP -BEND F-KPS	BOT +BEND F-KPS	BOT -BEND F-KPS
INVENTORY	284.6	259.1	284.6	259.1
OPERATING	474.3	431.8	439.4	431.8
VEH. 1	474.3	431.8	439.4	431.8
VEH. 2	474.3	431.8	439.4	431.8
VEH. 3	474.3	431.8	439.4	431.8
SPECIAL	0.0	0.0	0.0	0.0
	605.2			
	572.7			

***** LIVE LOAD AND RATING CALCULATIONS (IMPACT FACTOR = .300 FOR +BEND AND = .300 FOR -BEND)

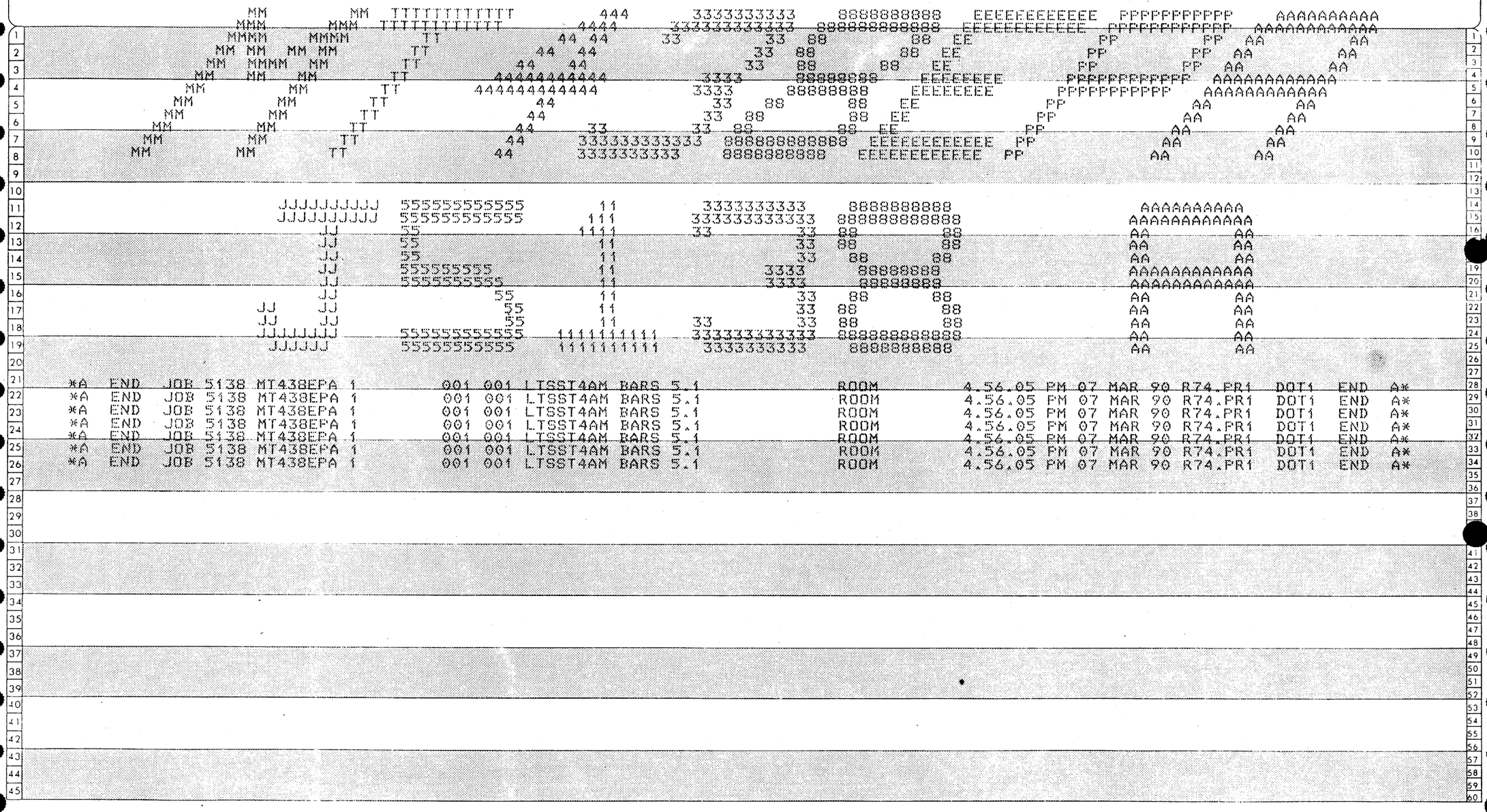
LIVE LOAD		TRUCK LOAD LL+IMP FT-KIPS	TRUCK LOAD LL FT-KIPS	LOC.NO. 1 WHEEL FT.	DIR	AXLE SPACE FT.	LANE LOAD LL+IMP FT-KIPS	LANE LOAD LL FT-KIPS	LOC.CONC LOAD FT.	LOC.CONC LOAD 2 FT.	RATING FACT.	SAFE LOAD CAPACITY TONS	RATING VALUE
INV HS20	+BEND	18.8	14.5	120.301	R		17.0	13.1	97.350				
	-BEND	108.1	83.1	36.050	L		109.6	84.3	68.650	43.850	2.363	85.1	HS 47.3
OPER HS20	+BEND	18.8	14.5	120.301	R		17.0	13.1	97.350				
	-BEND	108.1	83.1	36.050	L		109.6	84.3	68.650	43.850	3.938	141.8	HS 78.8
POST VEH1	+BEND	11.4	8.7	107.826	R								
	-BEND	50.8	39.1	50.055	L						8.501	144.5	
POST VEH2	+BEND	21.4	16.4	108.349	R								
	-BEND	97.4	74.9	51.450	L						4.433	146.3	
POST VEH3	+BEND	23.5	18.0	109.800	R								
	-BEND	104.5	80.4	53.148	L						4.131	144.6	
POST SPEC	+BEND	0.0	0.0	0.000									
	-BEND	0.0	0.0	0.000							0.000	0.0	

DATE 07/03/90

SUMMARY OF SHEAR ANALYSIS

D/P STRUCTURE I.D. 880-085

MEMB. ID	MATL	SPAN NO.	DIS FRM LT SPRT FT.	L R	DL SHEAR KIPS	SDL SHEAR KIPS	---INVENTORY--- LL+I MAX.V KIPS	T L	LL+I MIN.V KIPS	T L	---OPERATING--- LL+I MAX.V KIPS	T L	LL+I MIN.V KIPS	T L	--VEH. 1 -- LL+I MAX.V KIPS	LL+I MIN.V KIPS	--VEH. 2 -- LL+I MAX.V KIPS	LL+I MIN.V KIPS	--VEH. 3 -- LL+I MAX.V KIPS	LL+I MIN.V KIPS	--SPECIAL-- LL+I MAX.V KIPS	LL+I MIN.V KIPS
G01	CPS	1	0.000	L	14.4	1.1	29.6	T	3.5	T	29.6	T	3.5	T	18.4	2.1	31.9	3.9	33.0	4.3		
		1	10.100	L	0.8	0.1	11.5	T	554.5	L	11.5	T	554.5	L	8.3	7.3	13.1	11.7	13.1	11.1		
		1	12.625	L	0.0	0.3	9.1	T	14.1	T	9.1	T	14.1	T	6.2	9.0	9.3	15.1	9.2	15.6		
		2	0.000	L	17.6	1.7	34.9	T	3.5	T	34.9	T	3.5	T	20.1	2.1	36.6	3.9	38.4	4.3		
		2	15.500	L	0.0	0.0	11.7	T	12.2	T	11.7	T	12.2	T	8.1	8.0	13.0	12.8	13.2	13.0		
		3	0.000	L	17.6	1.7	34.9	T	2.9	T	34.9	T	2.9	T	20.1	1.7	36.5	3.3	38.3	3.6		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JJJJJJ 5555555555 1111111111 3333333333 8888888888 AA AA
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A
A END JOB 5138 MT438EPA 1 001 001 LTSST4AM BARS 5.1 ROOM 4.56.05 PM 07 MAR 90 R74.PR1 DOT1 END A

APPENDIX C

Load Rating Computations

Bridge 880085 load rating calculations

1. Assumptions

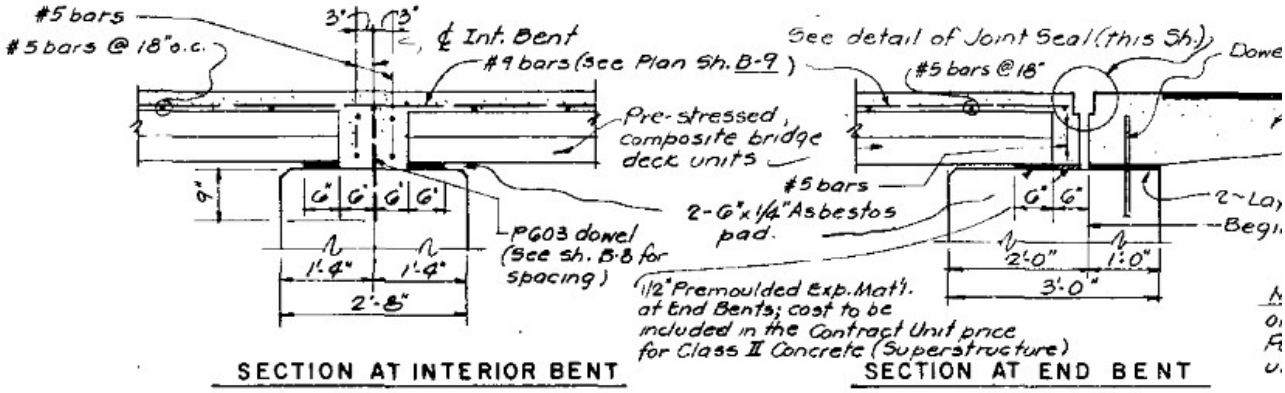
1. Perform the load rating using LRFR.
2. Slightly/Moderately Aggressive Environment: for prestressed slab unit consider 6*sqrt(f'c) for tension (Inventory Load Rating).
3. The rating is performed manually. The analysis for live loads is performed using MIDAS.
4. The prestressed slab units are simply supported for non-composite dead loads. The slab topping provides continuity for composite dead and live loads, however, there is not at full connection at the intermediate diaphragms and consequently the system will be treated as fully simple supported.

2. Geometry

Span Lengths:	Span 1 & 4 =	**26** ft
	Spans 2 & 3 =	**31** ft

Span lengths (Centerline of bearing to centerline of bearing):

Span 1 & 4 =	24.5 ft
Spans 2 & 3 =	29.5 ft



Bridge width =	**70** ft	
Sidewalk width =	**6.541667** ft	(one side only)
Barrier width =	**1.375** ft	
Curb-to-curb distance =	**62.08333** ft	
Number of traffic lanes =	5	

3. Material Data

Concrete f'c (CIP toping) =	**3.4**	ksi
Concrete f'c (Prestressed slab units) =	**5**	ksi
Reinforcing Steel Yield strength, Fy =	**60**	ksi
Prestressed strands, fsu =	**270**	ksi

4. Loads

The analysis is performed for each panel width. The panels are placed back-to-back .

Width of precast panel = **7** ft

4.1 Dead Loads

a) Deck (non-composite)

Thickness (PS slab + CIP toping) = **1.0833333** ft

Weight (DC non-composite) = 1.1375 k/ft per precast panel

b) Composite:

Sidewalk:

Average Thickness = **6.5654167** ft

Weight = 0.5368596 k/ft

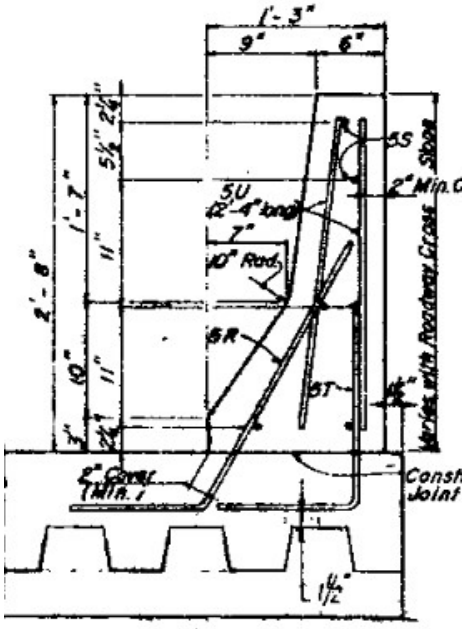
Barrier:

Area = (15*3+(15+8)/2*10+(6+8)/2*19)/144=
2.034722 ft2

Weight = 0.305208 k/ft

Aluminum rail = 0.015 k/ft

Weight of 2 barriers + rail = 0.625417 k/ft

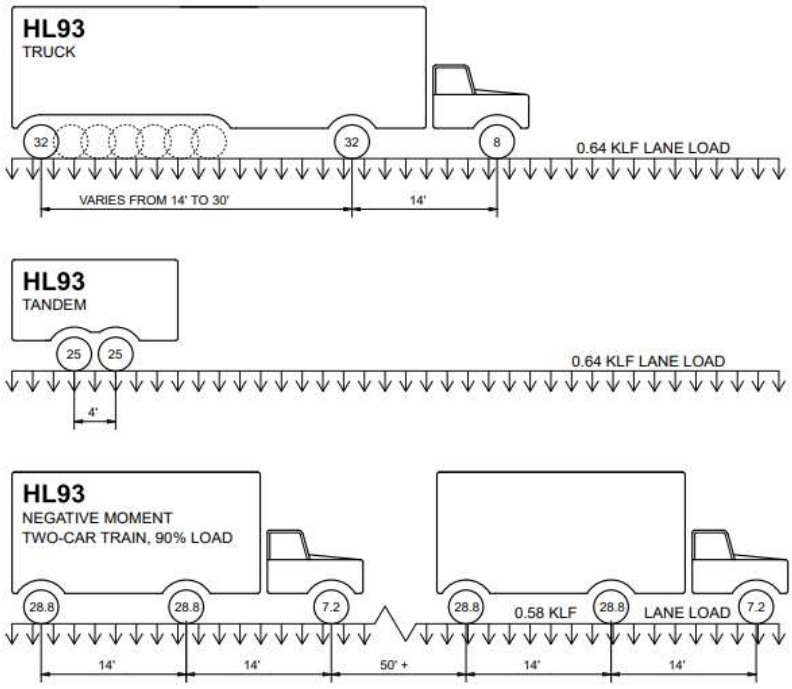


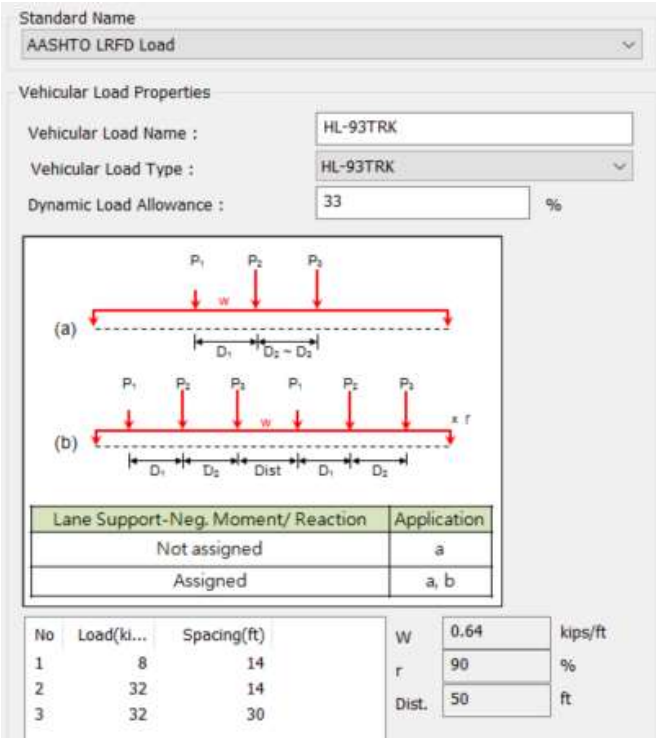
Distribute the composite load equally along the whole width of the bridge

Total composite load = 0.116228 k/ft per precast panel

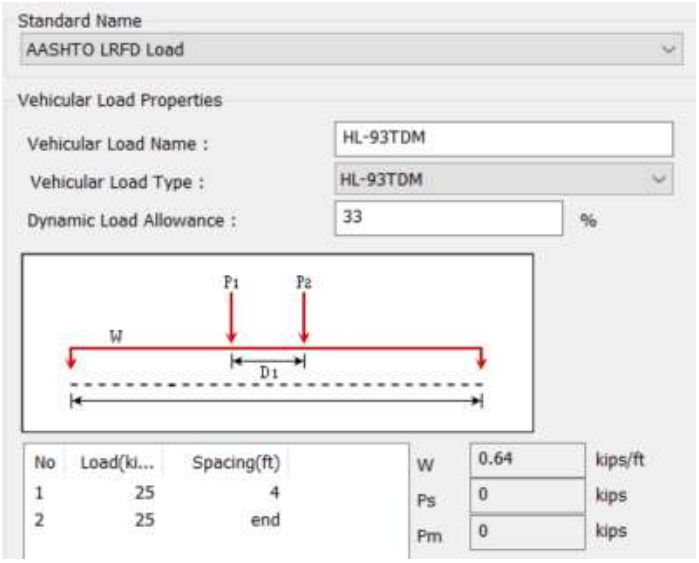
4.2 Live Loads

a) Design Live Load - HL93:





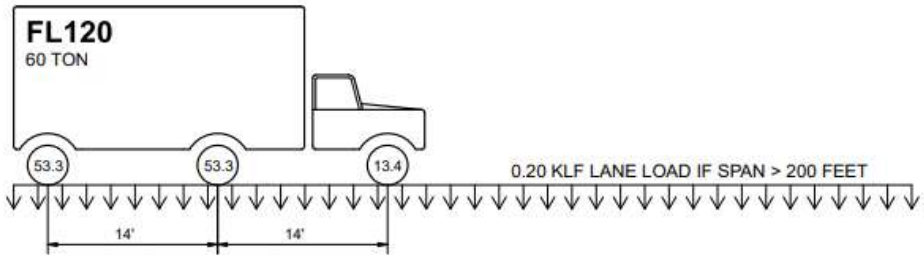
MIDAS definition of HL93 truck and negative moment two trucks

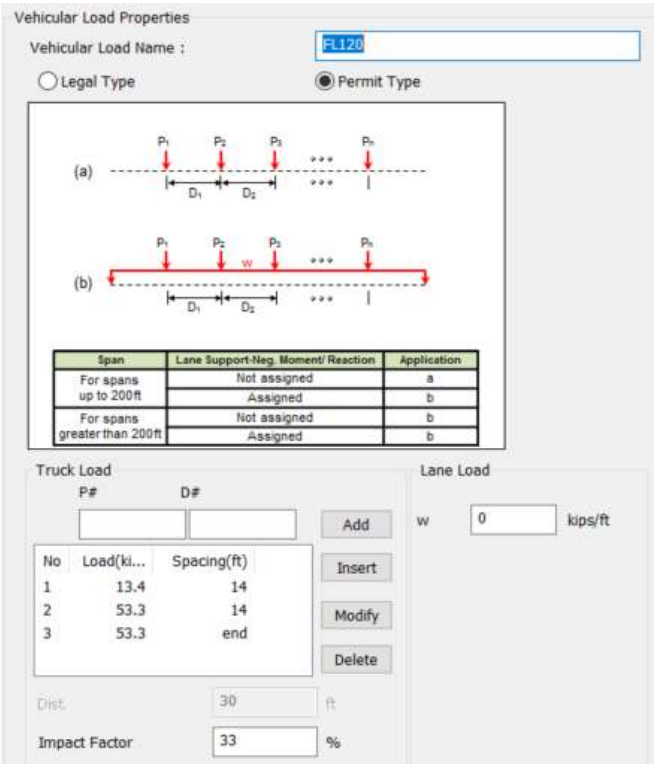


MIDAS definition of HL93 tandem

Analysis is performed for one lane of traffic and envelopes of response between the 3 cases shown above are

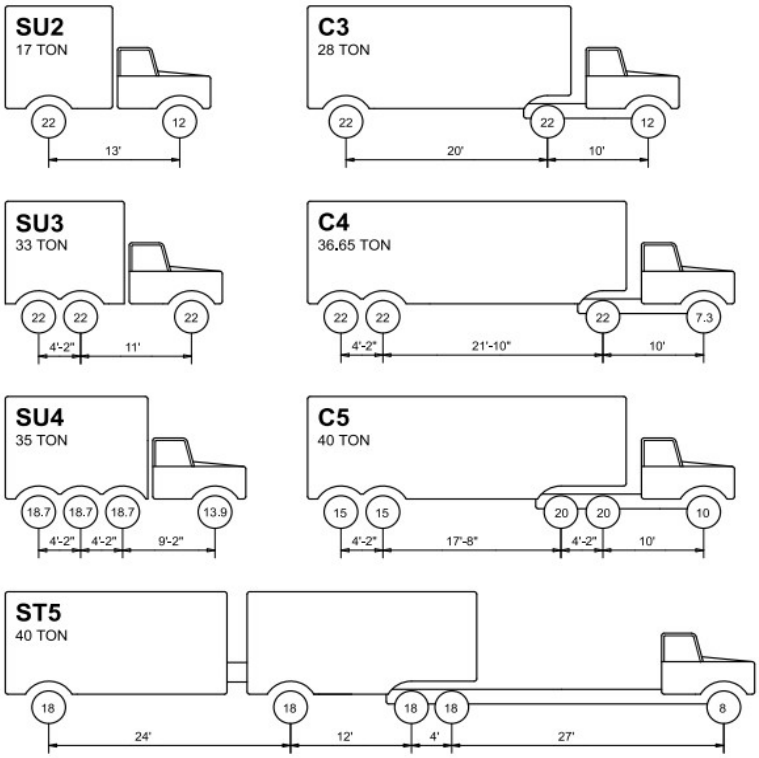
b) Permit Vehicle, FL120





MIDAS definition of FL120

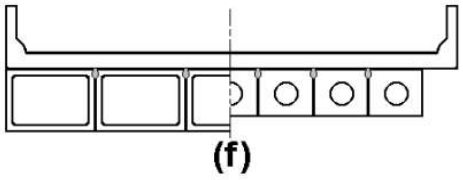
c)Similar definition for the legal loads



```
NAME=SU2, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, SU2, 1, 0, 1, L1
NAME=SU3, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, SU3, 1, 0, 1, L1
NAME=SU4, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, SU4, 1, 0, 1, L1
NAME=C3, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, C3, 1, 0, 1, L1
NAME=C4, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, C4, 1, 0, 1, L1
NAME=C5, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, C5, 1, 0, 1, L1
NAME=ST5, 0, 1, 1, 0.85, 0.65, 0.65, 0.65, INDEPENDENT, , 0, NO, 0
      1, 1, 1, 1, 1, 0.5, 0.25
      VL, ST5, 1, 0, 1, L1
```

5. Live Load Distribution Factor (Slab type bridge, AASHTO 4.6.2.2 Beam-Slab Bridges)

The particular type of section (precast panel with a CIP deck) is considered to be represented by case (f) in AASHTO Table 4.6.2.2.1-1

Precast Solid, Voided, or Cellular Concrete Boxes with Shear Keys	Cast-in-place concrete overlay	 (f)

5.1 Distribution factors for Interior Beams

Concrete Beams used in Multibeam Decks	f, g	One Design Lane Loaded: $k\left(\frac{b}{33.3L}\right)^{0.5}\left(\frac{I}{J}\right)^{0.25}$ where: $k = 2.5(N_b)^{-0.2} \geq 1.5$ Two or More Design Lanes Loaded: $k\left(\frac{b}{305}\right)^{0.6}\left(\frac{b}{12.0L}\right)^{0.2}\left(\frac{I}{J}\right)^{0.06}$	$35 \leq b \leq 60$ $20 \leq L \leq 120$ $5 \leq N_b \leq 20$

where:

Nb = Number of beams = **10**

b = Beam width (in) = 84 in

The computations are performed for the central spans , since it controls the design.

L1 = Span length (ft) = 24.5 ft

L2 = Span length (ft) = 29.5 ft

From Table 4.6.2.2.1-3: I/J = 0.54*(d/b)+0.16

d = (depth of beam) =	**9.25**	in
I/J =	0.219464	

a) One design lane:

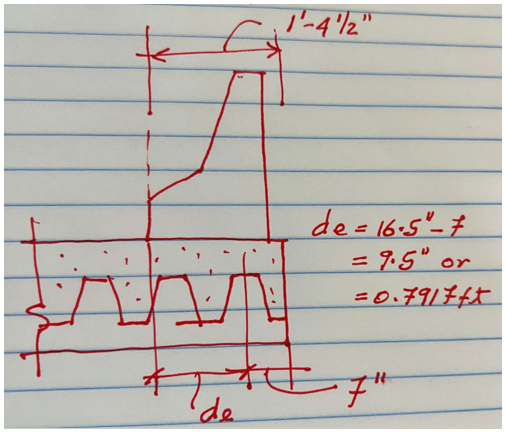
k =	1.577393
DF Span 1=	0.34643
DF Span 2=	0.315709

b) Two or more design lanes:

DF Span 1=	0.517125
DF Span 2=	0.49827

5.2 Distribution factors for Exterior Beams

Concrete Box Beams Used in Multibeam Decks	f, g	$g = e\, g_{interior}$ $e = 1.125 + \frac{d_e}{30} \geq 1.0$	$g = e\, g_{interior}$ $e = 1.04 + \frac{d_e}{25} \geq 1.0$	$d_e \leq 2.0$



de is negative

a) One design lane:

e =	1.09861
DF Span 1=	0.380591
DF Span 2=	0.346841

b) Two or more design lanes:

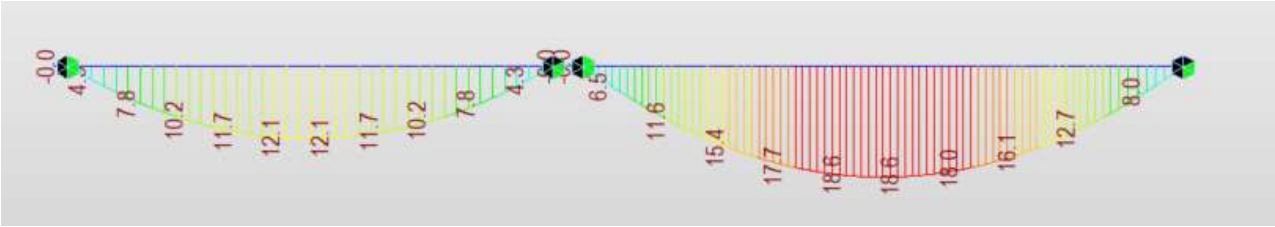
e =	1.008332
DF Span 1=	0.521434
DF Span 2=	0.502422

Summary:

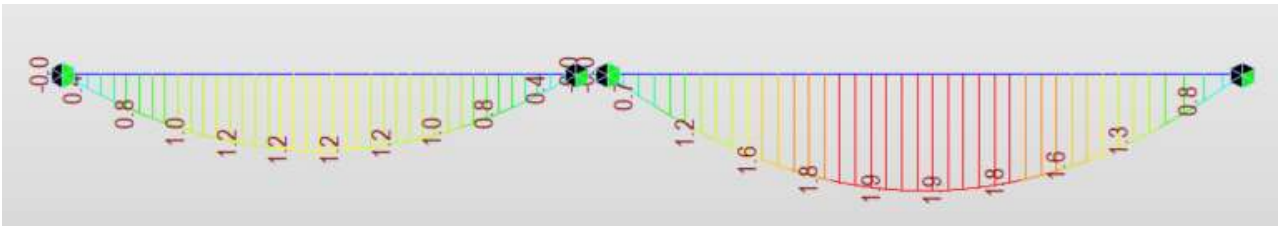
a) Span 1 & 4:	DF =	0.521
b) Spans 2& 3:	DF =	0.502

6. Structural analysis results

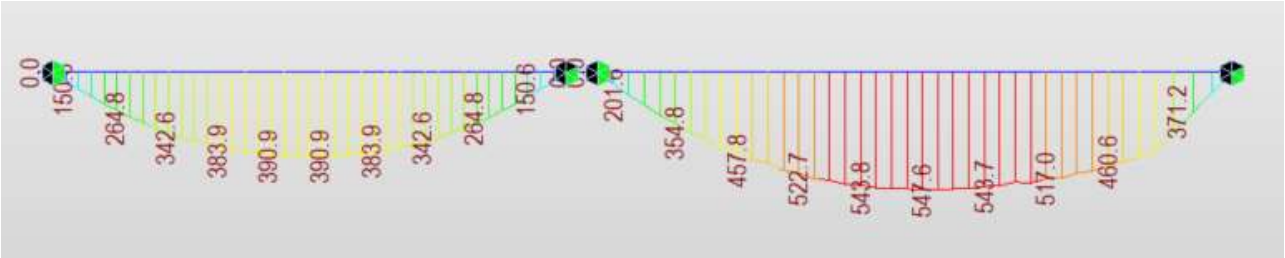
Midas Structural model of span 1 and span 2 (each span simple supported).



Non-composite dead load moments (k-ft)



Composite dead load moments (k-ft)



Live load moment - HL 93 (k-ft).

Since the controlling load rating location (bending) is at the middle of the span, the tabulated values are shown in the table below:

DC1 and DC2 are reported by ft of slab. Live load moments are reported by lane of loading

Span	Elem	Load	Part	Shear-z (ki	Moment-y (ft*kips)
Span 1	7	DC1	I[7]	0	12.15
	7	DC1	J[8]	0.4	11.66
	7	DC2	I[7]	0	1.24
	7	DC2	J[8]	0.04	1.19
	7	HL93(max)	I[7]	29.79	388.83
	7	HL93(max)	J[8]	37.3	383.92
	7	C3(max)	I[7]	16.1	197.17
	7	C3(max)	J[8]	20.62	202.05
	7	C4(max)	I[7]	24.28	297.48
	7	C4(max)	J[8]	30.14	295.33
	7	C5(max)	I[7]	22.08	285.4
	7	C5(max)	J[8]	27.69	271.32
	7	FL120(max	I[7]	35.44	434.2
	7	FL120(max	J[8]	44.56	436.68
	7	ST5(max)	I[7]	20.03	248.38
	7	ST5(max)	J[8]	24.82	249.93
	7	SU2(max)	I[7]	15.12	179.22
	7	SU2(max)	J[8]	18.66	182.9
	7	SU3(max)	I[7]	24.28	315.76
	7	SU3(max)	J[8]	30.14	314.25
	7	SU4(max)	I[7]	24.62	353.37
	7	SU4(max)	J[8]	32.08	345.2
Span 2	19	DC1	I[20]	-0.06	18.55
	19	DC1	J[21]	0.42	18.03
	19	DC2	I[20]	-0.01	1.9
	19	DC2	J[21]	0.04	1.84
	19	HL93(max)	I[20]	30.33	543.81
	19	HL93(max)	J[21]	37.83	543.72
	19	C3(max)	I[20]	16.77	311.98
	19	C3(max)	J[21]	21.18	324.74
	19	C4(max)	I[20]	24.5	443.36
	19	C4(max)	J[21]	30.21	450.73
	19	C5(max)	I[20]	22.53	446.02
	19	C5(max)	J[21]	29.02	444.89
	19	FL120(max	I[20]	36.32	614.46
	19	FL120(max	J[21]	50.15	644.5
	19	ST5(max)	I[20]	20.18	383.24
	19	ST5(max)	J[21]	26.2	372.63
	19	SU2(max)	I[20]	15.19	240.6
	19	SU2(max)	J[21]	19.6	245.99
	19	SU3(max)	I[20]	24.5	444.02
	19	SU3(max)	J[21]	32.66	439.73
	19	SU4(max)	I[20]	26.1	479.81
	19	SU4(max)	J[21]	33.5	477.77

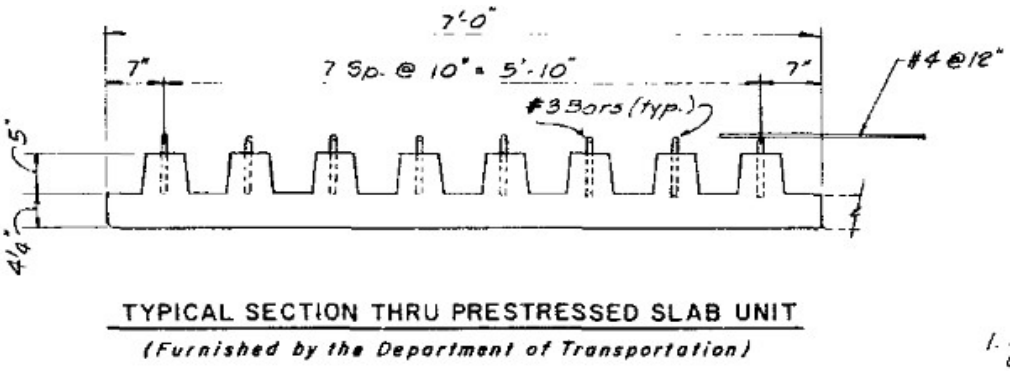
Ms per beam (7 ft wide)

Ms = (Dc1+Dc2)*7+0.8 LL*DF

Span	Live Load	Part	Ms
Span 1	HL93	I[7]	255.9
		J[8]	253.9
	C3	I[7]	176.0
		J[8]	178.0
	C4	I[7]	217.8
		J[8]	216.9
	C5	I[7]	212.8
		J[8]	206.9
	FL120	I[7]	274.9
		J[8]	275.9
	ST5	I[7]	197.3
		J[8]	198.0
	SU2	I[7]	168.5
		J[8]	170.0
	SU3	I[7]	225.4
		J[8]	224.8
	SU4	I[7]	241.1
		J[8]	237.7
Span 2	HL93	I[20]	361.7
		J[21]	361.7
	C3	I[20]	268.5
		J[21]	273.7
	C4	I[20]	321.4
		J[21]	324.3
	C5	I[20]	322.4
		J[21]	322.0
	FL120	I[20]	390.1
		J[21]	402.2
	ST5	I[20]	297.2
		J[21]	292.9
	SU2	I[20]	239.9
		J[21]	242.0
	SU3	I[20]	321.6
		J[21]	319.9
	SU4	I[20]	336.0
		J[21]	335.2

7. Computation of Section properties and bending capacities

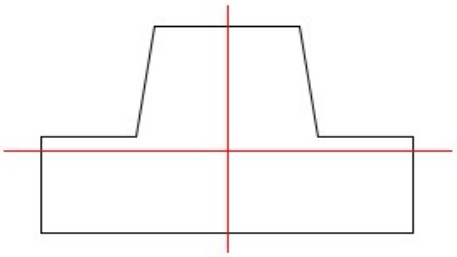
Elasticity modulus CIP deck = Edeck =	3323.643	ksi
Elasticity modulus slab precast panel = Epanel =	4030.509	ksi
n = modular ratio = Edeck/Epanel =	0.824621	



TYPICAL SECTION THRU PRESTRESSED SLAB UNIT
(Furnished by the Department of Transportation)

Precast panel equivalent section (for a 7ft panel length)

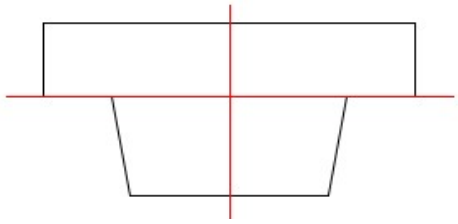
Bottom width =	84	in	
Width at Elevation 4.25 in =	40	in	tooth width = 5in at bottom
Width at Elevation 9 in =	32	in	tooth width = 4in at top



Area =	528.5	in^2
Ycg =	3.668677	in
Ix =	3336.328	in^4
S top =	597.7665	in^3
S bottom =	909.4089	in^3

Cast in place section equivalent section (for a 7ft panel length):

Top width =	84	in
Width at top of precast section tooth =	52	in
Width at bottom of precast section tooth=	44	in



Area =	547.5	in^2
Ycg =	9.2376332	in
Ix =	3357.9892	in^4
S top =	892.52041	in^3
S bottom =	673.26306	in^3

Composite section properties for a deck width of 84 inches

Aprecast = 528.5 in^2 Adeck = 547.5 in^2

Acomposite = Aprecast + n. A deck = 979.9801 in^2

Ycg_comp= Sum (AxYcg _Precast + n*Adeck * Ycg deck)/A composite = 4.798849 in

I composite = sum(Io,i + Ai (Ycomp-Ycgi)^2),i=precast, deck = 15675.87 in^4

Section Modulus

Sbottom-precast = I composite /Ycg_comp = 3266.59 in^3

Stop-precast = I composite /(9.25-Ycg_comp) = 3521.756 in^3

Stop-deck = I composite /(13-Ycg_comp) = 1911.423 in^3

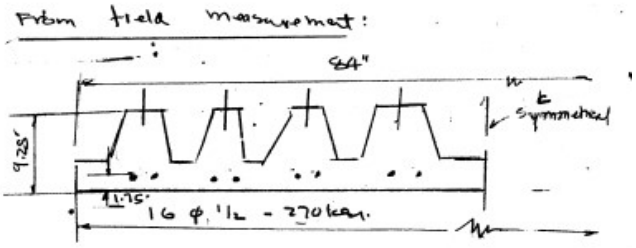
Summary (Section properties)

Noncomposite:	Area =	528.5 in^2	Precast Panel
	Sbottom =	909.4089 in^3	
	Stop =	597.7665 in^3	
Composite:	Area =	979.9801 in^2	
	Sbottom =	3266.59 in^3	
	Stop =	3521.756 in^3	
	Stop_deck =	1911.423 in^3	

8. Section ultimate bending capacity and prestress losses for service condition checking.

a) Spans 1 and 4; 26 ft spans

From existing load rating:



Aps = 16 -1/2" strands = 2.448 in^2

Section width = 84 in

dp = 13-1.75 = 11.25 in

Assume low relaxation strands

K = 0.28

for rectangular section behavior:

Neutral axis position, c:

$$c = \frac{A_{ps} f_{pu} + A_s f_s - A_s' f_s'}{\alpha_1 f_c' \beta b + k A_{ps} \frac{f_{pu}}{d_p}}$$

fpu = 270 ksi

f'c = 3.4 ksi

$\alpha 1$ = 0.85

$\beta 1$ = 0.85

c = 2.966653 in

a = $\beta 1$ c = 2.521655 in Compression block depth

Stress in prestresing steel, fps = 250.06409 ksi

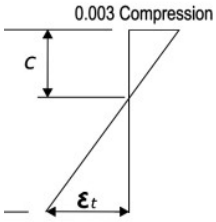
$$f_{ps} = f_{pu}\left(1 - k\frac{c}{d_p}\right)$$

Nominal Flexural Resistance, Mr = ϕ Mn

ϕ from article 5.5.4.2

Mn = Aps fps (dp-a/2) = 6114.941 k-in or 509.5784 k-ft

$$0.75 \le \phi = 0.75 + \frac{0.25(\varepsilon_t - \varepsilon_{cl})}{(\varepsilon_{tl} - \varepsilon_{cl})} \le 1.0 \qquad (5.5.4.2\text{-}1)$$



εt = (dp/c-1)εu (0.003) = 0.0083765 in/in net tensile strain in steel

ecl = 0.002 Compression controlled strain limit in steel

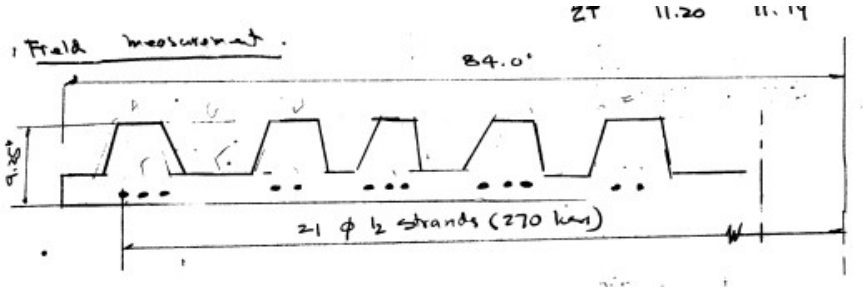
etl = 0.005 Tension controlled strain limit in steel

ϕ= 1

Mr = C = 509.58 K-ft

b) Spans 2 and 3; 31 ft spans

From existing load rating:



Aps = 21 -1/2" strands = 3.213 in^2

dp = 13-1.75 = 11.25 in

Assume low relaxation strands

K = 0.28

for rectangular section behavior:

$$c = \frac{A_{ps} f_{pu} + A_s f_s - A'_s f'_s}{\alpha_1 f'_c \beta_1 b + k A_{ps} \frac{f_{pu}}{d_p}}$$

Neutral axis position, c:

fpu = 270 ksi

f'c = 3.4 ksi

$\alpha 1$ = 0.85

$\beta 1$ = 0.85

c = 3.805914 in

a = $\beta 1$ c = 3.235027 in Compression block depth

Stress in prestresing steel, fps = 244.42426 ksi

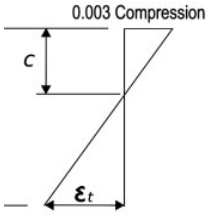
$$f_{ps} = f_{pu}\left(1 - k\frac{c}{d_p}\right)$$

Nominal Flexural Resistance, Mr = ϕ Mn

ϕ from article 5.5.4.2

Mn = Aps fps (dp-a/2) = 7564.73 k-in or 630.3942 k-ft

$$0.75 \le \phi = 0.75 + \frac{0.25(\varepsilon_t - \varepsilon_{cl})}{(\varepsilon_{tl} - \varepsilon_{cl})} \le 1.0 \qquad (5.5.4.2\text{-}1)$$



εt = (dp/c-1)εu (0.003) = 0.0058678 in/in net tensile strain in steel

ecl = 0.002 Compression controlled strain limit in steel

etl = 0.005 Tension controlled strain limit in steel

ϕ= 1

Mr = C = 630.39 K-ft

8.1 Prestress losses

a) Elastic shortening:

Ep = 28500 ksi

Ect =?

Strength of concrete at transfer, f'ci

f'ci = 4 ksi

Ect = 3604.997 ksi

Self-weight of member, sw

sw = 0.550521 k/ft

Mdc at middle of beam (consider max span)

Mdc = 59.88634 k-ft

Prestress initial pulling force, 75% fpu

fpi = 202.5 ksi

$$\Delta f_{pES} = \frac{E_p}{E_{ct}} f_{cgp} \qquad (5.9.3.2.3a\text{-}1)$$

where:

E_p = modulus of elasticity of prestressing steel (ksi)

E_{ct} = modulus of elasticity of concrete at transfer or time of load application (ksi)

f_{cgp} = concrete stress at the center of gravity of prestressing tendons due to the prestressing force immediately after transfer and the self-weight of the member at the section of maximum moment (ksi).

Assume elastic shortening loss = 0.042 fpu (iterate on this guess)

Prestress stress at transfer = 191.16 ksi

A nc = 528.5 in^2

S at cg of strands = 1738.869 in^3

fcg = 1.426582 ksi

Δf_{pES} = 11.27812 ksi or 0.042 fpu

b) Long term losses (Use AASHTO

H = 75% Relative humididty

fpi = 202.5 ksi

Aps = 3.213 in^2

Ag = 1092 in^2

γ_h = 0.95

γ_{st} = 1.000

Δf_{pR} = 2.4 ksi

Δf_{pLT} = 19.46026 ksi

$$\Delta f_{pLT} = 10.0\frac{f_{pi}A_{ps}}{A_g}\gamma_h\gamma_{st} + 12.0\gamma_h\gamma_{st} + \Delta f_{pR} \qquad (5.9.3.3\text{-}1)$$

in which:

$$\gamma_h = 1.7 - 0.01H \qquad (5.9.3.3\text{-}2)$$

$$\gamma_{st} = \frac{5}{(1 + f'_{ci})} \qquad (5.9.3.3\text{-}3)$$

where:

f_{pi} = prestressing steel stress immediately prior to transfer (ksi)

γ_h = correction factor for relative humidity of the ambient air

Total prestress loss = 30.73838 ksi

Stresses in prestressed steel after losses:

Assume that prestress was pulled at 75% of fpu

Assume a lump sum loss of 45 ksi (approximation used in AASHTO standard specs, 9.16.2.2)

fpo = 171.7616 ksi or 63.62% of fpu

Compression stress in tension fiber (bottom od deck)

σ bottom PT = P/A + P.e/Sbottom

e = Ycg prestress panel - 1.75 = 1.9186771 in

Sbottom-prestress panel = 909.40894 in^3

Area_prestress panel = 528.5 in^2

At Spans 1 and 4:

P = 420.4724 k

σ bottom PT = 1.682711 ksi

At Spans 2 and 3:

P = 551.8701 k

σ bottom PT = 2.208559 ksi

9. Load Rating for Design Vehicle HL93, Permit Load and Legal Loads

Rating equation: Use MBE Equation 6A.4.2.1-1 as expanded below:

$$RF = \frac{C - \left[\gamma_{DC}\cdot DC + \gamma_{DW}\cdot DW + \gamma_{EL}\cdot EL + \gamma_{FR}\cdot FR + \gamma_{CR}\cdot(TU + CR + SH)\right]}{\gamma_{LL}\cdot(LL + IM)}$$

RF	Rating factor
C	Factored capacity.
γ	Load factor
DC	Component dead load
DW	Wearing dead load
EL	Permanent locked-in erection forces
FR	Bearing friction, or frame action
TU	Uniform temperature
CR	Creep
SH	Shrinkage
LL	Live load
IM	Dynamic impact

FDOT Table 6A.4.2.2-1—LRFR Limit States and Load

Bridge Type	Limit	DC[7]	LL Inventory	LL Operating	LL Legal	LL FL120	LL EV
Steel[3]	Strength[1]	1.25/0.90	1.75	1.35	***1.35***	***1.35***	1.30
	Service[2] II	1.00	1.30	1.00	***1.30***	***0.90***	***0.90***
Reinforced Concrete[4]	Strength[1]	1.25/0.90	1.75	1.35	***1.35***	***1.35***	1.30
	Service[2] I	NA	NA	NA	NA	*NA*	NA
Prestressed Concrete[5]	Strength[1]	1.25/0.90	1.75	1.35	***1.35***	***1.35***	1.30
	Service[2] III	1.00	0.80	*NA, 0.80[5]*	*NA, 0.80[5]*	*NA, 0.70[5]*	*NA, 0.70[5]*

a) Inventory Rating for HL93

a1) Service conditions (tension stress at deck bottom is checked)

C = Capacity = 6 sqrt (f'c) = 0.4242641 ksi

Sbottom nc = 909.4089 in^3

Sbottom c = 3266.59 in^3

a1.1) Spans 1 and 4

Mdc1 (nc) = 85.05 k-ft

Mdc2 (c) = 8.68 k-ft

M(LL+I) = 202.7492 k-ft 0.8 M(LL+I) = 162.1994 k-ft

σdc1 = 1.122267 ksi

σdc2 = 0.031886 ksi

σ(LL +I)= 0.595849 ksi

RF = 1.599

a1.2) Spans 2 and 3

Mdc1 (nc) = 129.85 k-ft

Mdc2 (c) = 13.3 k-ft

M(LL+I) = 273.2219 k-ft 0.8 M(LL+I) = 218.5775 k-ft

σdc1 = 1.713421 ksi

σdc2 = 0.048858 ksi

σ(LL +I)= 0.802957 ksi

RF = 1.084

a2) Strength conditions

γ_{dc} = 1.25 γ_{LL} = 1.75

a2.1) Spans 1 and 4

C = Capacity = Mr = 509.58 k-ft

RF = 1.106

a2.2) Spans 2 and 3

C = Capacity = Mr = 630.39 k-ft

RF = 0.944

b) Operating Rating for HL93

In accordance to the FDOT LR manual, only strength conditions are checked.

b1.1) Spans 1 and 4

γ_{dc} = 1.25 γ_{LL} = 1.35

RF = **1.434**

b1.2) Spans 2 and 3

RF = **1.224**

c) Rating Factors for Legal and Permit vehicle

γ_{dc} = 1.25 γ_{LL} = 1.35

c1) Spans 1 and 4

C = Capacity = Mr = 509.58 k-ft

Mdc1 (nc) = 85.05 k-ft

Mdc2 (c) = 8.68 k-ft

Vehicle	M (LL+I)	RF
SU2	93.45	3.110
SU3	164.65	1.765
SU4	184.26	1.578
C3	102.81	2.827
C4	155.12	1.874
C5	148.82	1.953
ST5	129.51	2.244
FL120	226.41	1.284

c1) Spans 2 and 3

C = Capacity = Mr = 630.39 k-ft

Mdc1 (nc) = 129.85 k-ft

Mdc2 (c) = 13.3 k-ft

Vehicle	M (LL+I)	RF
SU2	123.59	2.706
SU3	220.93	1.514
SU4	240.04	1.393
C3	156.75	2.133
C4	222.75	1.501
C5	224.09	1.492
ST5	192.55	1.737
FL120	308.72	1.083

10. Load Rating Summary

Bending at middle of spans 2 and 3 controls

Level	Vehicle	Limit	RF
Inventory	HL93	Service	1.084
		Strength	0.944
Operating	HL93	Strength	1.224
Legal	SU2	Strength	2.706
	SU3	Strength	1.514
	SU4	Strength	1.393
	C3	Strength	2.133
	C4	Strength	1.501
	C5	Strength	1.492
	ST5	Strength	1.737
Permit	FL120	Strength	1.083

Precast

Properties of an Area Defined by their Vertex Coordinates

HSF 1995/LMV 1996

	Vertex Coordinates	
	x	y
1	0	0
2	41	0
3	41	4.25
4	20	4.25
5	16	9.25
6	-16	9.25
7	-20	4.25
8	-41	4.25
9	-41	0
10	0	0
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
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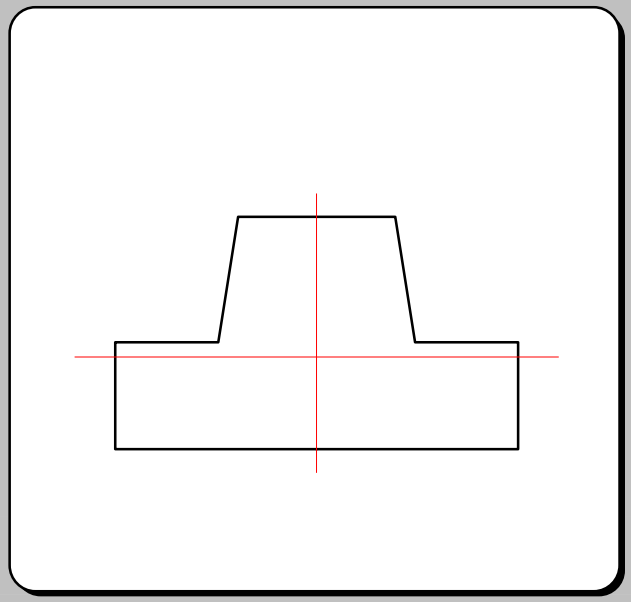
22		
23		
24		
25		
26		
27		
28		
29		

Circles: Add (R+) or Subtract (R-)		
R	x	y



Input coordinates in the counterclockwise direction if area is positive and clockwise if area is negative. Leave a blank line each block of coordinates that defines an area.

Area = 528.500

Original Axes

y_{max} = 9.250
y_{min} = 0.000
Ix = 1.0450E+04
Iy = 2.1496E+05
Ixy = 0.0000E+00
J = 2.1496E+05

Centroidal Axes

x_g = 0.000
y_g = 3.669
Ix = 3.3363E+03
Iy = 2.1496E+05
Ixy = 0.0000E+00
J = 2.1829E+05
i = 20.323
S_{top} = 5.9777E+02
S_{bot} = 9.0941E+02

Principal Axes

ϕ = 0.00
Ix = 3.3363E+03
Iy = 2.1496E+05

Notional Thickness

Perimeter = 177.306
h_o = 5.961
(λ = 1)

Perimeters of inside and outside areas.

CIP

Properties of an Area Defined by their Vertex Coordinates

HSF 1995/LMV 1996

	Vertex Coordinates	
	x	y
1	0	13
2	-41	13
3	-41	9.25
4	-26	9.25
5	-22	4.25
6	22	4.25
7	26	9.25
8	41	9.25
9	41	13
10	0	13
11		
12		
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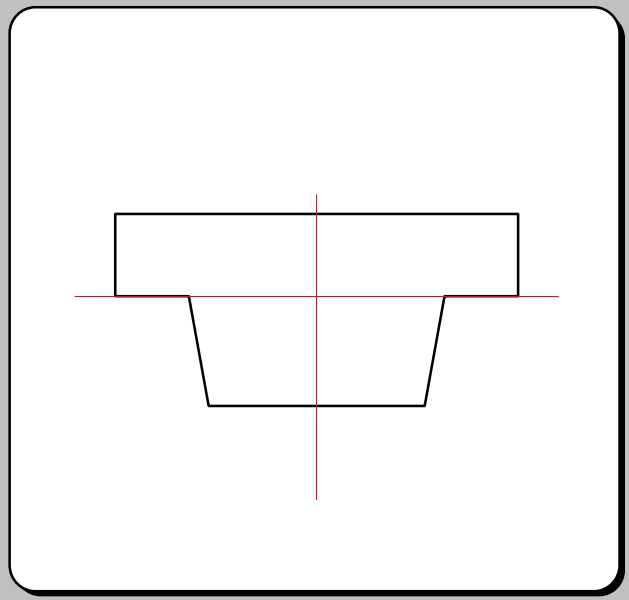
29		

Circles: Add (R+) or Subtract (R-)		
R	x	y



Input coordinates in the counterclockwise direction if area is positive and clockwise if area is negative. Leave a blank line each block of coordinates that defines an area.

Area = 547.500

Original Axes

y_{max} = 13.000
y_{min} = 4.250
Ix = 5.0078E+04
Iy = 2.1870E+05
Ixy = 0.0000E+00
J = 2.1870E+05

Centroidal Axes

x_g = 0.000
y_g = 9.238
Ix = 3.3580E+03
Iy = 2.1870E+05
Ixy = 4.2008E-12
J = 2.2206E+05
i = 20.139
S_{top} = 8.9252E+02
S_{bot} = 6.7326E+02

Principal Axes

ϕ = 0.00
Ix = 3.3580E+03
Iy = 2.1870E+05

Notional Thickness

Perimeter = 176.306
h_o = 6.211
(λ = 1)

Perimeters of inside and outside areas.

PLAT OF AVIATION BOULEVARD RIGHT OF WAY

(BETWEEN 43RD AVENUE AND AIRPORT DRIVE, & 27TH AVENUE AND US HIGHWAY #1)

BEING A PART OF SECTION 34, TOWNSHIP 32 SOUTH, RANGE 39 EAST & SECTION 35, TOWNSHIP 33 SOUTH , RANGE 39 EAST CITY OF VERO BEACH, INDIAN RIVER COUNTY, FLORIDA

PLAT BOOK _____

PAGE _____

DOCKET No. _____

N

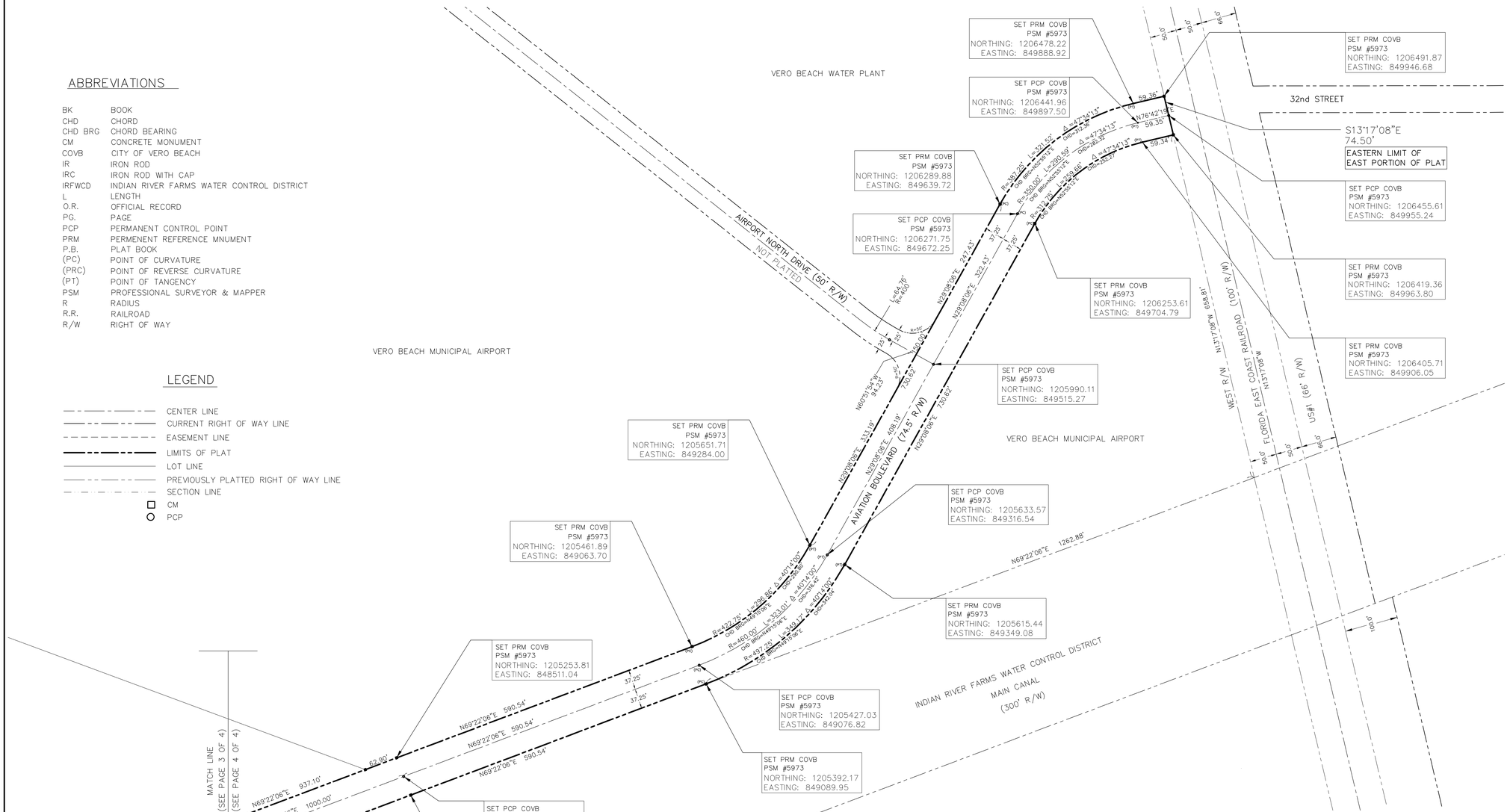
SCALE 1"= 100'

ABBREVIATIONS

BK	BOOK
CHD	CHORD
CHD BRG	CHORD BEARING
CM	CONCRETE MONUMENT
COVB	CITY OF VERO BEACH
IR	IRON ROD
IRC	IRON ROD WITH CAP
IRFWCD	INDIAN RIVER FARMS WATER CONTROL DISTRICT
L	LENGTH
O.R.	OFFICIAL RECORD
PG.	PAGE
PCP	PERMANENT CONTROL POINT
PRM	PERMENENT REFERENCE MNUMENT
P.B.	PLAT BOOK
(PC)	POINT OF CURVATURE
(PRC)	POINT OF REVERSE CURVATURE
(PT)	POINT OF TANGENCY
PSM	PROFESSIONAL SURVEYOR & MAPPER
R	RADIUS
R.R.	RAILROAD
R/W	RIGHT OF WAY

LEGEND

- CENTER LINE
- CURRENT RIGHT OF WAY LINE
- EASEMENT LINE
- LIMITS OF PLAT
- LOT LINE
- PREVIOUSLY PLATTED RIGHT OF WAY LINE
- SECTION LINE
- CM
- PCP



NOTE: AREA OF PLATTED RIGHT OF WAY BETWEEN 43RD AVENUE AND FLORIDA EASET COAST RAILROAD CONTAINS 8.48 ACRES.

PLAT OF AVIATION BOULEVARD

CITY PROJECT NO.	SCALE	DRWN BY	DATE
2011-11	1"= 100'	DG	02/2013
		CHKD BY MKF	DATE 02/2013

CITY OF VERO BEACH
DEPARTMENT OF PUBLIC WORKS
SURVEY DIVISION

1053 20TH PLACE
VERO BEACH, FLORIDA 32960
(772) 978-4870

RIGHT OF WAY CONTROL SURVEY

AVIATION BOULEVARD

FROM 43rd AVENUE EAST TO EAST OF U.S.1

PREPARED FOR:

THE CITY OF VERO BEACH, FLORIDA

TRAVERSING THROUGH SECTIONS 34 AND 35
TOWNSHIP 32 SOUTH, RANGE 39 EAST
AND
SECTIONS 2 AND 3
TOWNSHIP 33 SOUTH, RANGE 39 EAST

SEPTEMBER 2006

GENERAL NOTES:

1. BEARINGS AND COORDINATES AS SHOWN HEREON ARE BASED ON FLORIDA STATE PLANE COORDINATE SYSTEM, EAST ZONE, NORTH AMERICAN DATUM OF 1983/1999 READJUSTMENT. THE WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 34, TOWNSHIP 32 SOUTH, RANGE 39 EAST BEARS NORTH 00°58'55" EAST AND ALL OTHER BEARINGS SHOWN HEREON ARE RELATIVE THERETO.

2. STATION AND OFFSETS ARE RELATIVE TO THE BASELINE OF SURVEY FOR AVIATION BLVD. UNLESS OTHERWISE NOTED.

3. ALL BEARINGS AND DISTANCES ARE CALCULATED UNLESS OTHERWISE SPECIFIED.

4. UNDERGROUND FOUNDATION ENCROACHMENTS NOT LOCATED.

5. PROPERTY BOUNDARIES DETERMINED FROM FIELD SURVEY, PLATS OF RECORD.

6. ONLY FIXED IMPROVEMENTS PERTINENT TO THE PARCELS TO BE ACQUIRED ARE SHOWN. FIXED INTERIOR IMPROVEMENTS NOT LOCATED.

7. THIS CONTROL SURVEY WAS PREPARED UNDER THE RESPONSIBLE CHARGE OF G. MARTIN BURDETTE, FLORIDA PROFESSIONAL LAND SURVEYOR AND MAPPER NUMBER 4136. CERTIFIED COPIES OF THIS SURVEY ARE FILED OF RECORD IN INDIAN RIVER COUNTY.

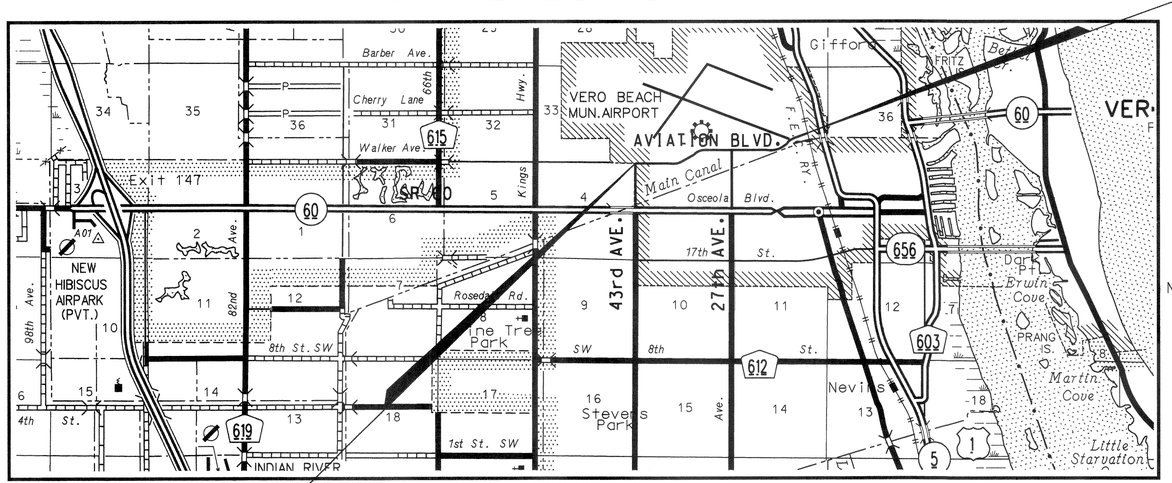
8. THIS CONTROL SURVEY WAS PREPARED FOR THE PURPOSE OF PREPARING RIGHT OF WAY MAPS FOR ROADWAY EXPANSION PURPOSES.

9. SIDE STREET ALIGNMENTS ARE ASSIGNED A STATION OF 30+00.00 AT THE POINT OF INTERSECTION WITH THE BASELINE OF SURVEY FOR AVIATION BLVD. UNLESS OTHERWISE NOTED.

10. RIGHT OF WAY MONUMENTS TO BE SET AFTER CONSTRUCTION OF PROJECT IS COMPLETED.

LEGEND:

Δ OR D =	DELTA ANGLE
(DESC.)	PER DESCRIPTION
(F)	FIELD MEASURED
(P)	PER PLAT
ADD.	ADDITIONAL
℄	BASELINE
BLDG.	BUILDING
℄	CENTERLINE
CBS	CONCRETE BLOCK STRUCTURE
CMON	CONCRETE MONUMENT
CONC.	CONCRETE
COR.	CORNER
COVB	CITY OF VERO BEACH
D.B.	DEED BOOK
D.E.	DRAINAGE EASEMENT
DED.	DEDICATED
E	EASTING
E/P	EXISTING EDGE OF PAVEMENT
EXIST.	EXISTING
F.E.C.	FLORIDA EAST COAST
FKA	FORMALLY KNOWN AS
FND.	FOUND
IP	IRON PIPE
IR	IRON ROD
IR&C	IRON ROD & CAP
LT.	LEFT
MON	MONUMENT
N	NORTHING
NL&TT	NAIL & TIN TAB
NO.	NUMBER
O.R.B.	OFFICIAL RECORD BOOK
P.B.	PLAT BOOK
P.I.	POINT OF INTERSECTION
PG.	PAGE
PKNL&TT	PK NAIL & TIN TAB
PKNL&W	PK NAIL & WASHER
ℙ	PROPERTY LINE
R	RADIUS
RES.	RESIDENCE
R/R	RAILROAD
RT.	RIGHT
R/W	RIGHT OF WAY
S.R.	STATE ROAD
SEC.	SECTION
STA.	STATION
T.C.E.	TEMPORARY CONSTRUCTION EASEMENT
P.E.	PERMANENT EASEMENT
U.E.	UTILITY EASEMENT
WD. FRM.	WOOD FRAMED



LOCATION MAP

LENGTH: APPROX. 1.96 MILES

BEGIN R/W CONTROL SURVEY
PI STA. 10+00
℄ SURVEY AVIATION BLVD.

END R/W CONTROL SURVEY
PI STA. 113+23.86
℄ AVIATION BLVD.

NOT TO SCALE

UTILITIES:

SOUTHERN BELL
FLORIDA POWER & LIGHT CO.
COMCAST CABLE

REFERENCES

1. PROPERTY MAP, CITY OF VERO BEACH DEPARTMENT OF ENGINEERING AND PUBLIC WORKS.ENGINEERING DIVISION
2. COMPOSITE MAP.CITY OF VERO BEACH DEPARTMENT OF ENGINEERING AND PUBLIC WORKS.ENGINEERING DIVISION
3. RIGHT OF WAY MAP, SR 5 (U.S.1) 5. RECORD PLATS
PLAT BOOK 15 PAGE 12A
PLAT BOOK 13 PAGE 64
PLAT BOOK 2 PAGE 25
PLAT BOOK 7 PAGE 85
4. ORIGINAL GOVERNMENT SURVEYS

RECEIVED
OCT 10 2006

SURVEYOR'S CERTIFICATION

I HEREBY CERTIFY THIS RIGHT OF WAY CONTROL SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE CENTERLINE AND/OR BASELINE FOR THE TRANSPORTATION FACILITY SHOWN AND DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 61G17-6 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES.

THIS DRAWING, CONSISTING OF SHEETS 1 THROUGH 10 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON AUGUST 4, 2006.

G. MARTIN BURDETTE
PROFESSIONAL SURVEYOR AND MAPPERS NO. 4136
BURDETTE & ASSOCIATES, INC.
LB 6449
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
772-299-4488
DATE:

NOT VALID UNLESS SIGNED AND EMBOSSED WITH SURVEYOR'S SEAL

SHEET INDEX

SHEET NO.	SHEET DESCRIPTION
1	COVER SHEET
2-3	KEY MAP
4-10	DETAIL SHEETS
11-12	PNC SHEETS
N/A	TABULATION SHEETS

COVER SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

THE CITY OF VERO BEACH, FLORIDA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE
CITY OF VERO BEACH SURVEYOR

REVISION	BY	DATE

REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S.1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 1 OF 12

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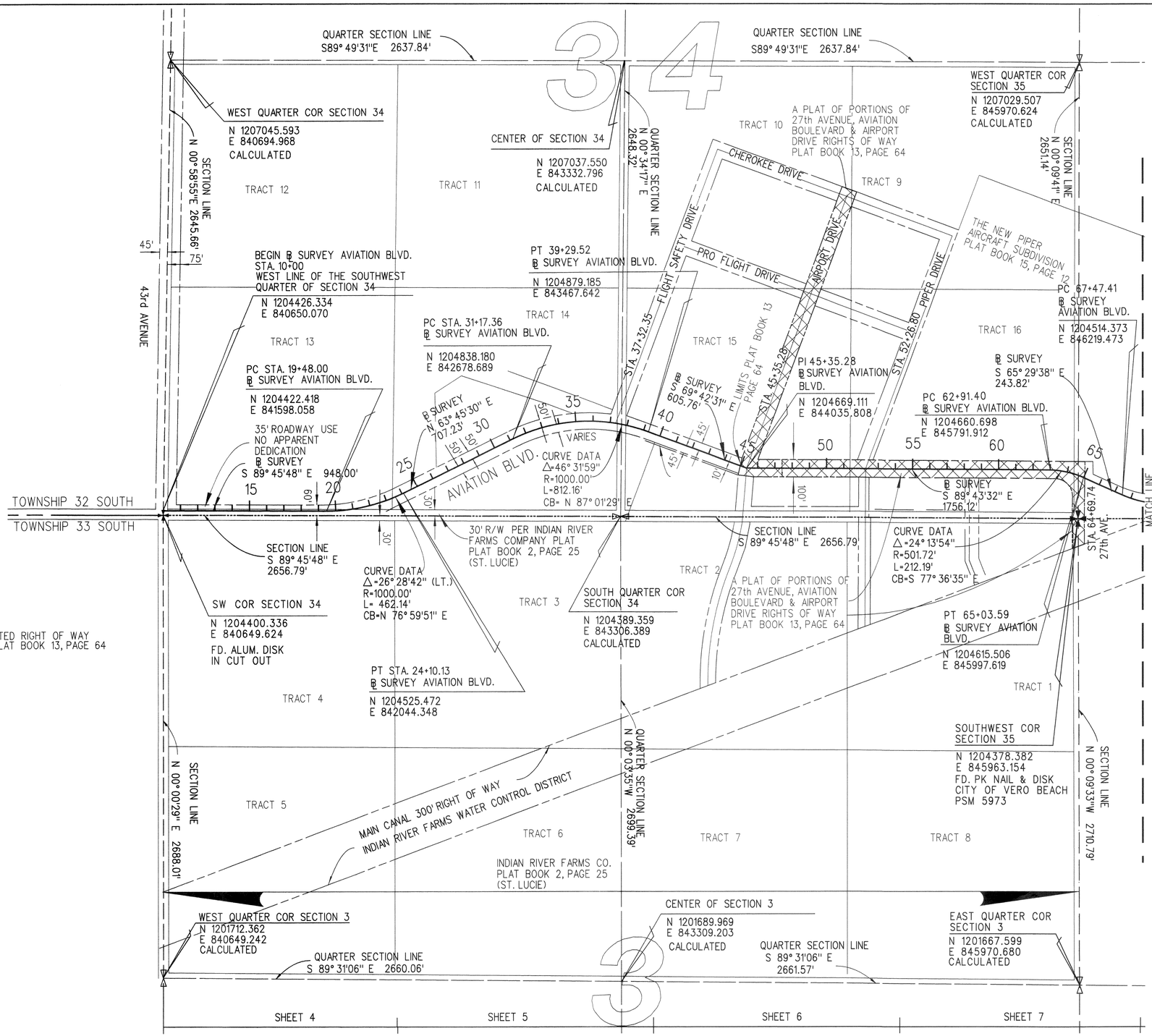

NOTE:

▨ = DEDICATED RIGHT OF WAY PER PLAT BOOK 13, PAGE 64

300 150 0 300
GRAPHIC SCALE IN FEET
SCALE: 1" = 300'

KEY SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH, FLORIDA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE

REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 2 OF 12

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35

QUARTER SECTION LINE
S89° 46'52"E 2665.31'

CENTER OF SECTION 35
N 1207019.323
E 848635.913
CALCULATED

CURVE DATA
Δ=47° 41'52"
R=353.97'
L=294.67'
CB=N 52° 59'02" E

PT 111+35.83
℄ SURVEY
AVIATION BLVD.
N 1206442.584
E 849900.200

END ℄ SURVEY
AVIATION BLVD.
113+23.86
N 1206485.416
E 850083.288

QUARTER SECTION LINE
S89° 46'52"E 2670.01'

EAST QUARTER COR SECTION 35
N 1207009.120
E 851305.899
FD. CONCRETE MONUMENT

300 150 0 300
GRAPHIC SCALE IN FEET
SCALE: 1" = 300'

PC 108+41.16
℄ SURVEY AVIATION BLVD.
N 1206270.258
E 849671.648

32nd STREET

74.50'

110

105

100

95

90

85

80

75

70

F.E.C. RAILROAD RIGHT OF WAY

℄ SURVEY S.R. 5 (U.S. 1)

SECTION LINE
N 00° 11'00" E 2650.29'

QUARTER SECTION LINE
N 00° 07'18" E 2650.72'

PC 97+89.52
℄ SURVEY AVIATION BLVD.
N 1205426.651
E 849077.893

℄ SURVEY
N 29° 08'06" E
731.49'

℄ SURVEY
N 76° 49'59" E
188.03'

PI 78+34.54
℄ SURVEY
AVIATION BLVD.
N 1204738.350
E 847248.092

℄ SURVEY
N 69° 23'08" E 1954.98'

AVIATION BLVD.

74.50' ROADWAY
NO APPARENT
DEDICATION

USE

PT 101+09.67
℄ SURVEY AVIATION BLVD.
N 1205631.318
E 849315.507

CURVE DATA
Δ =40° 15'02" (LT.)
R=455.73'
L=320.15'
CB= N 49° 15'37" E

℄ SURVEY
N 66° 22'49" E
300.41'

℄ SURVEY
N 69° 23'08" E
336.59'

MAIN CANAL 300' RIGHT OF WAY
INDIAN RIVER FARMS WATER CONTROL DISTRICT

SOUTHEAST COR SECTION 35
N 1204358.842
E 851297.421
FD. DISK IN BOX CUT

MATCH LINE

TOWNSHIP 32 SOUTH
TOWNSHIP 33 SOUTH

SECTION LINE
S 89° 47'24" E 2667.15'

SECTION LINE
S 89° 47'24" E 2667.15'

PI 75+34.13
℄ SURVEY AVIATION BLVD.
N 1204617.985
E 846972.845

PT 71+97.54
℄ SURVEY AVIATION BLVD.
N 1204499.480
E 846657.809

CURVE DATA
Δ=45° 07'14" (LT.)
R=571.59'
L=450.13'
CB=S 88° 03'15" E 438.59'

SOUTH QUARTER COR SECTION 35
N 1204368.612
E 848630.287
CALCULATED

SECTION LINE
N 00° 04'50"W 2764.69'

QUARTER SECTION LINE
N 00° 00'04"E 2737.88'

CENTER OF SECTION 2
N 1201630.731
E 848630.241
FD. CONC. MON. WITH
ALUMINUM DISK
CITY OF VERO BEACH

EAST QUARTER COR SECTION 2
N 1201594.157
E 851301.311
FND. 4X4 CONC. MONUMENT

QUARTER SECTION LINE
N89° 12'21"W 2659.82'

QUARTER SECTION LINE
N89° 12'56"W 2671.32'

N 1201593.887
E 851309.353
FND. 1/2" IP IN
CONCRETE

2

SHEET 8 | SHEET 9 | SHEET 10

KEY SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH, FLORIDA
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE	REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY:
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 3 OF 12

AVIATION.dgn 9/20/2006 9:50:48 AM

50 25 0 50
GRAPHIC SCALE IN FEET
SCALE: 1" = 50'

MATCH LINE

TRACT LINE

50' R/W PER INDIAN RIVER FARMS COMPANY PLAT PLAT BOOK 2, PAGE 25 (ST. LUCIE)

℄ SURVEY 43rd AVE.

120' R/W 43rd AVENUE R/W
FROM WALKER AVENUE TO SOUTH GIFFORD ROAD
PLAT BOOK 7, PAGE 85

INDIAN RIVER
FARMS COMPANY PLAT
PLAT BOOK 2, PAGE 25
(ST. LUCIE)

TRACT 13

CURVE DATA
△=26° 28'42" (LT.)
R=1000.00'
L= 462.14'
CB=N 76° 59'51" E

PC STA. 19+48.00
℄ SURVEY AVIATION BLVD.
N 1204422.418
E 841598.058

BEGIN ℄ SURVEY AVIATION BLVD.
STA. 10+00
N 1204426.334
E 840650.070
WEST LINE OF THE SOUTHWEST QUARTER OF SECTION 34

30' ROADWAY USE
NO APPARENT
DEDICATION

AVIATION BLVD.
S 89° 45'48" E

+68.66
33.74' (LT.)
FND. IRC
UNABLE TO
READ

+16.13
33.82' (LT.)
FND. 5/8" IRC
"5973 COVB"

R=950.00' D=26° 28'42" L=439.03'

EXIST. R/W LINE

S 89° 45'48" E 948.00'
℄ SURVEY

S 89° 45'48" E 2656.79'
SECTION LINE

TOWNSHIP 32 SOUTH
TOWNSHIP 33 SOUTH

EXIST. R/W LINE

60' R/W PER INDIAN RIVER
FARMS COMPANY PLAT
PLAT BOOK 2, PAGE 25
(ST. LUCIE)

+55.55
55.95' (RT.)
FND. IRC
"PLS 3909"

+47.55
0.14' (RT.)
FND. PK NAIL
& WASHER
"5243

+28.08
67.60' (RT.)

BEGIN ℄ SURVEY 43rd AVE.
STA. 10+00 = STA. 10+14.66 26.00' RT.
℄ SURVEY AVIATION BLVD.
N 1204400.274
E 840664.625
SOUTH LINE
SECTION 34

SW COR SECTION 34
N 1204400.336
E 840649.624
FD. ALUM. DISK
IN CUT OUT

N. 00°58'55"E. 2645.66'
SECTION LINE

INDIAN RIVER
FARMS COMPANY PLAT
PLAT BOOK 2, PAGE 25
(ST. LUCIE)

TRACT 4

TRACT LINE

DETAIL SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE

REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 4 OF 12

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GRAPHIC SCALE IN FEET
SCALE: 1" = 50'

INDIAN RIVER
FARMS COMPANY PLAT
PLAT BOOK 2, PAGE 25
(ST. LUCIE)
TRACT 14

PC STA. 31+17.36
℄ SURVEY AVIATION BLVD.
N 1204838.180
E 842678.689

+88.34
50.05' (LT.)
FND. 5/8" IRC
"PSM 5973 COVB"

+89.21
50.00' (LT.)

+98.09
50.00' (LT.)
FND. 1/2" IRC
"PLS 4456"

+98.10
50.00' (LT.)

R=1050.00' D=33°16'25" L=609.77'

+17.48
48.86' (LT.)
FND. 5/8" IRC
"PSM 5973 COVB"

AVIATION BLVD.
N 63°45'30" E

ROADWAY USE
WIDTH VARIES
NO APPARENT DEDICATION

R=950.00' D=46°31'59" L=771.55'

+17.48
0.00' (LT.)
FND. PK &
DISK
"5243"

P.C. R/W LINE
+24.36
49.98' (RT.)

+24.73
50.07' (RT.)
FND. IRC
"ROS 5243 PRM"
"TAYLOR"

CURVE DATA
Δ=46°31'59"
R=1000.00'
L=812.16'
CB= N 87°01'29" E

+32.33
0.01' (RT.)
FND. PK & DISK
"5243"

+46.94
49.86' (LT.)
FND. 5/8" IRC
"5973 COVB"

100' ROADWAY USE
NO APPARENT
DEDICATION

N 63°45'30" E

PT STA. 24+10.13
℄ SURVEY AVIATION BLVD.
N 1204525.472
E 842044.348

N 63°45'30" E 707.23'
℄ SURVEY

TRACT LINE

+09.63
0.03' (LT.)
FND. PK AND DISK
"5243"

STA 37+32.35

N 20°22'39" E

FLIGHT SAFETY DRIVE

+86.22
53.81' (LT.)
FND. 5/8" IRC
"RLS 5243"
"TAYLOR"

MATCH LINE

50' R/W PER INDIAN RIVER
FARMS COMPANY PLAT
PLAT BOOK 2, PAGE 25
(ST. LUCIE)

TRACT LINE

QUARTER SECTION LINE

N 00°34'17" E 2648.32'

TRACT LINE

SOUTH QUARTER COR
SECTION 34
N 1204389.359
E 843306.389
CALCULATED

EXIST. R/W LINE

TOWNSHIP 32 SOUTH
TOWNSHIP 33 SOUTH

S 89°45'48" E 2656.79'
SECTION LINE

EXIST. R/W LINE

60' R/W PER INDIAN RIVER
FARMS COMPANY PLAT
PLAT BOOK 2, PAGE 25
(ST. LUCIE)

QUARTER SECTION LINE

N 00°03'35" W
2699.39'

DETAIL SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE

REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 5 OF 12

AVBLVD.dgn 9/20/2006 3:15:02 PM

PT 39+29.52
℄ SURVEY AVIATION BLVD.
N 1204879.185
E 843467.642

+29.66
0.00' (LT.)
FND. PK & DISK
"5243 "

+82.89
44.98' (RT.)
FND. 5/8" IRC
"RLS 5243"
"TAYLOR"

+58.77
45.00' (LT.)
FND 5/8" IRC
"RLS 5243"
"TAYLOR"

+90.34
44.96' (LT.)
FND 5/8" IRC
IN CONC.
"RLS 5243 TAYLOR"

+82.84
54.95' (RT.)
FND. 5/8" IRC
"RLS 5243"
"TAYLOR"

+34.38
44.98' (RT.)
FND. 5/8" IRC
IN CONC.
"RLS 5243 PRM"

+04.21
54.95' (RT.)
FND. PK & DISK
"5243"

+05.61
59.95' (RT.)
FND 5/8" IRC
"RLS 5243"
"TAYLOR"

S 69° 42'31" E
S 69° 42'31" E 605.76'
℄ SURVEY
N 56° 50'18" E
N 12° 30'06" E
N 83° 57'53" W
N 04° 36'41" E
N 20° 19'21" E
N 20° 19'21" E

39 40 41 42 43 44 45 46 47 48 49 50 51 52 53

45' 45' 55'

100' ROADWAY USE
NO APPARENT
DEDICATION

EXIST. R/W LINE
EXIST. R/W LINE

34 A PLAT OF PORTIONS OF
2.71h AVENUE E AVIATION
BOULEVARD & AIRPORT
DRIVE RIGHTS OF WAY
PLAT BOOK 13, PAGE 64

35 36 32 33

AIRPORT DRIVE

STA. 45+35.28 31

PI 45+35.28
℄ SURVEY AVIATION BLVD. =
30+00 ℄ SURVEY AIRPORT DR.
N 1204669.111
E 844035.808
FND. PK & DISK

+01.39
50.02' (LT.)
FND. 4"X4" CONC. MON.
"RLS 944 - PRM
LLOYD & ASSOC."

+78.65
50.26' (LT.)
FND. 1" IP

S 89° 43'32" E
S 89° 43'32" E 1756.12'
℄ SURVEY
N 89° 43'32" W

EXIST. R/W LINE
EXIST. R/W LINE

50' 50'

AVIATION BLVD.

TRACT LINE

GRAPHIC SCALE IN FEET
50 25 0 50
SCALE: 1" = 50'

PI STA. 52+26.80
℄ SURVEY AVIATION BLVD. =
30+00 ℄ SURVEY PIPER DR.
N 1204665.798
E 844727.321

+26.86
0.23' (LT.)
FND. PK & DISK
"PSM 5973 CITY OF VERO
BEACH"

+78.28
50.08' (LT.)
FND. 2" IP

+46.79
49.80' (RT.)
FND. 5/8" IRC
"PSM 5973 COVB"

+34.46 ℄ SURVEY PIPER DR
0.57' (LT.)
FND. PK NAIL & DISK

PIPER DRIVE
STA. 52+26.80
N 20° 28'07" E
64.50'
22.50'
N 00° 16'53" E

MATCH LINE

TOWNSHIP 32 SOUTH
TOWNSHIP 33 SOUTH
S 89° 45'48" E 2656.79'
SECTION LINE

26 27 28 29 30 31 32 33

DETAIL SHEET

BURDETTE & ASSOCIATES, INC. 1680 STONEWALL DRIVE VERO BEACH, FLORIDA 32966 (772) 299-4488	CITY OF VERO BEACH DEPARTMENT OF PUBLIC WORKS	APPROVED BY _____ DATE _____ REVISION BY DATE REVISION BY DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 6 OF 12

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THE NEW PIPER AIRCRAFT SUBDIVISION
PLAT BOOK 15 PAGE 12A

PI STA. 64+69.74
℄ SURVEY AVIATION BLVD. =
29+60.93 ℄ SURVEY 27th AVE.
N 1204628.498
E 845966.367

GRAPHIC SCALE IN FEET
SCALE: 1" = 50'

CURVE DATA
Δ =24° 13'54"
R=501.72'
L=212.19'
CB=S 77° 36'35" E

PC 62+91.40
℄ SURVEY AVIATION BLVD.
N 1204660.698
E 845791.912

+00.00 ℄ SURVEY PIPER DR.
22.59' (RT.)
FND. IRON ROD
(NO CAP)

+74.24
89.07' (LT.)
FND. CONC. MON.,
"P.R.M. RLS 0944"

+10.59
106.74' (LT.)
FND. IRON ROD
(NO CAP)

PC 67+47.41
℄ SURVEY
AVIATION BLVD.
N 1204514.373
E 846219.473

EXIST. R/W LINE

S 89° 43'32" E

AVIATION BLVD.

S 89° 43'32" E 1756.12'

EXIST. R/W LINE

A PLAT OF PORTIONS OF 27th AVENUE, AVIATION BOULEVARD & AIRPORT DRIVE RIGHTS OF WAY PLAT BOOK 13, PAGE 64

50'

50'

S 89° 43'32" E

+30.66
49.78' (RT.)
FND. 5/8" IRC
"PSM 5973"

+85.47
49.80' (RT.)
FND. 5/8" IRC
"PSM 5973"

+65.80
49.71' (RT.)
FND. 5/8" IRC
"RLS 944"

R=100.00' D=90° 27'52" L=157.80'

+35.80
72.50' (RT.)
FND. 5/8" IRC
"WITNESS LB 6449"

EXIST. R/W LINE

N 00° 09'41" E 2651.14' SECTION LINE

STA. 64+69.74

35' 35'

S 00° 44'09" W

S 01° 07'15" E

S 65° 29'38" E

S 65° 29'38" E 243.82'
℄ SURVEY

℄ SURVEY
N 00° 44'09" E

PT 65+03.59
℄ SURVEY
AVIATION BLVD.
N 1204615.506
E 845997.619

MATCH LINE

+70.08 (℄ 27th AVE.)
35.75'(LT.)
FND. 5/8" IRC
"RSL944"

+38.65 (℄ 27th AVE.)
35.92' (LT.)
FND. NAIL & DISK
"LB4318"

+16.08 (℄ 27th AVE.)
34.55' (RT.)
FND. "X" IN
CONC. CURB

TOWNSHIP 32 SOUTH
S 89° 45'48" E 2656.79' TOWNSHIP 33 SOUTH
SECTION LINE

+10.06 (℄ 27th AVE.)
34.83' (LT.)
"FND. CONC. MON., RLS?"

S 89° 47'24" E 2667.15'
SECTION LINE

EXIST. R/W LINE

+47.64 (℄ 27th AVE.)
10.48' (LT.)
FND. "X" IN
CONC. CURB

27th AVE.

N 00° 09'33" W 2710.79'

S 00° 09'33" E

S 00° 09'33" E

℄ SURVEY &
SECTION LINE

SOUTHWEST COR SECTION 35
N 1204378.382
E 845963.154
FD. PK NAIL & DISK
CITY OF VERO BEACH
PSM 5973

INDIAN RIVER FARMS WATER CONTROL DISTRICT
(300' WIDE)

DETAIL SHEET

BURDETTE & ASSOCIATES, INC. 1680 STONEWALL DRIVE VERO BEACH, FLORIDA 32966 (772) 299-4488	CITY OF VERO BEACH DEPARTMENT OF PUBLIC WORKS	APPROVED BY DATE

REVISION	BY	DATE

REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 7 OF 12

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THE NEW PIPER AIRCRAFT SUBDIVISION
PLAT BOOK 15 PAGE 12A

MATCH LINE

MATCH LINE

50 25 0 50
GRAPHIC SCALE IN FEET
SCALE: 1" = 50'

PI 78+34.54
℄ SURVEY AVIATION BLVD.
N 1204738.350
E 847248.092

PT 71+97.54
℄ SURVEY
AVIATION BLVD.
N 1204499.480
E 846657.809

CURVE DATA
Δ=45° 07'14" (LT.)
R=571.59'
L=450.13'
CB=S 88° 03'15" E 438.59'

N 69° 23'08" E 2591.57'

AVIATION BLVD.

℄ SURVEY N 66° 22'49" E 300.41'

74.50' ROADWAY USE
NO APPARENT
DEDICATION

37.25'
37.25'

N 69° 23'08" E 1954.98'
℄ SURVEY

INDIAN RIVER FARMS WATER CONTROL DISTRICT
(300' WIDE)

R=562.75' D=45° 07'14" L=443.17' (C) (P)

53'
21.50'

N 69° 23'08" E 336.59'
℄ SURVEY

N 69° 23'08" E 3303.99'

PI 75+34.13
℄ SURVEY AVIATION BLVD.
N 1204617.985
E 846972.845

TOWNSHIP 32 SOUTH
TOWNSHIP 33 SOUTH

S 89° 47'24" E 2667.15'
SECTION LINE

DETAIL SHEET

BURDETTE & ASSOCIATES, INC. 1680 STONEWALL DRIVE VERO BEACH, FLORIDA 32966 (772) 299-4488	CITY OF VERO BEACH DEPARTMENT OF PUBLIC WORKS	APPROVED BY	DATE	REVISION	BY	DATE	REVISION	BY	DATE		BY	DATE	RIGHT OF WAY CONTROL SURVEY AVIATION BOULEVARD FROM 43rd AVE. EAST TO EAST OF U.S. 1	MAPS PREPARED BY BURDETTE & ASSOCIATES, INC.	FIELD BOOK NO.'S
										PRELIM	CASASUS	AUG. 2006			
										FINAL	GMB	AUG. 2006			SCALE: AS SHOWN
										CHECKED	JBC	AUG. 2006			SHEET 8 OF 12

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50 25 0 50
GRAPHIC SCALE IN FEET
SCALE: 1" = 50'

QUARTER SECTION LINE
N 00°07'18" E 2650.72'

MATCH LINE

+35.58
37.26' (LT.)
FND.4X4 CONC.
MON. W/IR

N 69° 23'08" E

THE NEW PIPER AIRCRAFT SUBDIVISION
PLAT BOOK 15 PAGE 12A

N 69° 23'08" E 1954.98'
℄ SURVEY

N 69° 23'08" E

74.50'

INDIAN RIVER FARMS WATER CONTROL DISTRICT
(300' WIDE)

AVIATION BLVD.

83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98

DETAIL SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE

REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVENUE EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 9 OF 12

AVBLVD.dgn 9/20/2006 4:11:18 PM

50 25 0 50
GRAPHIC SCALE IN FEET
SCALE: 1" = 50'

PT 111+35.83
℄ SURVEY
N 1206442.584
E 849900.200

CURVE DATA
△=47° 41'52"
R=353.97'
L=294.87'
CB=N 52° 59'02" E

PC 108+41.16
℄ SURVEY AVIATION BLVD.
N 1206270.258
E 849671.648

R=391.22' D=47° 41'51" L=325.68'

52.96'

AVIATION BLVD.

R=316.72' D=47° 41'51" L=263.66'

53.10'

N 76° 49'59" E 188.03'
℄ SURVEY

END ℄ SURVEY AVIATION BLVD.
STA 113+23.86 = STA. 387+02.29
℄ SURVEY U.S. 1 = ℄ STA. 30+00 32nd ST.
N 1206485.416
E 850083.288

N 29° 08'06" E 731.49'
℄ SURVEY

74.50'

℄ PT 101+09.67
SURVEY AVIATION BLVD.
N 1205631.318
E 849315.507

PC 97+89.52
℄ SURVEY AVIATION BLVD.
N 1205426.651
E 849077.893

CURVE DATA
△=40° 15'02" (LT.)
R=455.73'
L=320.15'
CB= N 49° 15'37" E

98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113

30 387 32nd STREET 31

386 385 384 383 382 381

390 389 388

+22.59 (℄ U.S. 1)
34.91' (RT.)
FND. 1/2" IP

+14.55 (℄ U.S. 1)
35.39' (RT.)
FND. X CUT IN
MAST ARM BASE

+85.98 (℄ U.S. 1)
66.25' (LT.)
FND PK & DISK TBE
AERIAL TARGET
"TBE LB6668"

+70.26 (℄ U.S. 1)
32.45' (RT.)
FND. NAIL & WASHER
"LB 7040 MORGAN"

+14.08 (℄ U.S. 1)
34.98' (RT.)
FND. 1/2" IP

FEC RAILROAD

℄ SURVEY N 13° 16' 45" W S.R. S (U.S. 1)

50' 50' 35' 35'

DETAIL SHEET

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE

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	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

RIGHT OF WAY CONTROL SURVEY
AVIATION BOULEVARD
FROM 43rd AVE. EAST TO EAST OF U.S. 1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

SHEET 10 OF 12

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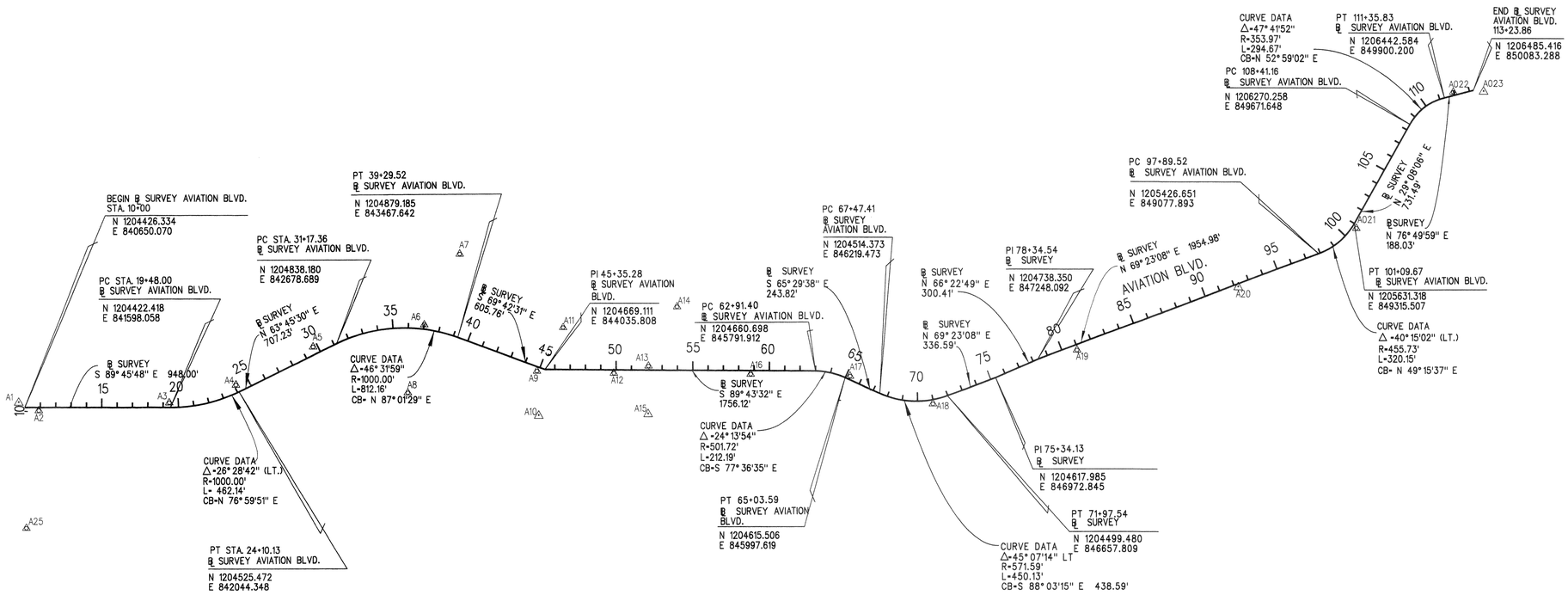
PROJECT NETWORK CONTROL
AVIATION BLVD.
FROM 43RD AVE EAST TO EAST OF US-1
PREPARED FOR: THE CITY OF VERO BEACH, FL
TRAVERSING THROUGH SECTIONS 34 & 35 TOWNSHIP 32 SOUTH RANGE 39 EAST & SECTIONS 2 & 3 TOWNSHIP 33 SOUTH RANGE 39 EAST

400 200 0 400
GRAPHIC SCALE IN FEET
SCALE: 1" = 400'



LIMITS: AVIATION BLVD. FROM 43RD AVE EAST TO EAST OF US1

ABBREVIATIONS

IRC	IRON ROD AND CAP
LT	LEFT
NL	NAIL
PK	PARKER KALON
RT	RIGHT

BEARINGS AND COORDINATES ARE RELATIVE TO THE STATE PLANE COORDINATES, FLORIDA EAST ZONE, NORTH AMERICAN DATUM (NAD) OF 1983 (1999) ADJUSTMENT
A BEARING OF S 84 59 14 E HAS BEEN ESTABLISHED BETWEEN MONUMENTS
A5 A 5/8" IRC SET IN CONCRETE LB 6449 TO
A12 A 5/8" IRC SET IN CONCRETE LB 6449
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SURVEYOR'S CERTIFICATION

I HEREBY CERTIFY THIS SPECIFIC PURPOSE SURVEY WAS MADE FOR THE PURPOSE OF SURVEYING, REFERENCING, DESCRIBING AND MAPPING THE PRIMARY NETWORK CONTROL OR BASELINE FOR THE TRANSPORTATION FACILITY DEPICTED HEREON AND THAT SAID SURVEY WAS DONE UNDER MY RESPONSIBLE CHARGE AND MEETS THE MINIMUM TECHNICAL STANDARDS SET FORTH BY THE FLORIDA BOARD OF PROFESSIONAL SURVEYORS AND MAPPERS IN CHAPTER 61 G 17 FLORIDA ADMINISTRATIVE CODE PURSUANT TO SECTION 472.027 FLORIDA STATUTES. THIS MAP CONSISTING OF SHEETS 11 THROUGH 12 IS A TRUE, ACCURATE AND COMPLETE DEPICTION OF THE RESULTS OF A FIELD SURVEY PERFORMED UNDER MY DIRECTION AND COMPLETED ON AUGUST 4, 2006

SURVEYOR G. MARTIN BURDETTE
PROFESSIONAL SURVEYOR & MAPPER #4136
BURDETTE & ASSOCIATES, INC.
LB 6449
1680 STONEWALL DRIVE
VERO BEACH, FL 32966
772-299-4488
DATE:

NOT VALID UNLESS SIGNED AND EMBOSSED WITH SURVEYOR'S SEAL

BURDETTE & ASSOCIATES, INC.
1680 STONEWALL DRIVE
VERO BEACH, FLORIDA 32966
(772) 299-4488

CITY OF VERO BEACH
DEPARTMENT OF PUBLIC WORKS

APPROVED BY DATE

REVISION	BY	DATE	REVISION	BY	DATE

	BY	DATE
PRELIM	CASASUS	AUG. 2006
FINAL	GMB	AUG. 2006
CHECKED	JBC	AUG. 2006

SPECIFIC PURPOSE SURVEY
AVIATION BOULEVARD
FROM 43RD AVENUE EAST TO EAST OF US-1

MAPS PREPARED BY: BURDETTE & ASSOCIATES, INC.
FIELD BOOK NO.'S
SCALE: AS SHOWN
SHEET 11 OF 12

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PROJECT NETWORK CONTROL TABULATION SHEET DETAILS

POINT NAME	(X) EASTING	(Y) NORTHING	SCALE FACTOR	LATITUDE	LONGITUDE	BASELINE STATION	OFFSET	(Z) ELEVATION	DESCRIPTION
A1	840609.224	1204461.947	0.999980	27° 38'45.88672185	80° 25'48.99948606			24.335'	SET PK NL & DISK IN DRILL HOLE LB 6449
A2	840740.250	1204405.095	0.999980	27° 38'45.31777548	80° 25'47.54545166	10+90.27	20.87' (RT)	24.618'	SET 5/8" IRC LB 6449
A3	841590.124	1204453.031	0.999981	27° 38'45.75349522	80° 25'38.09277700	19+39.94	30.58' (LT)	24.857'	SET 5/8" IRC LB 6449
A4	842024.251	1204570.515	0.999981	27° 38'46.89687552	80° 25'33.25941030	24+12.02	49.29' (LT)	23.862'	SET 5/8" IRC LB 6449
A5	842526.019	1204817.237	0.999981	27° 38'49.31681149	80° 25'27.66718371	29+71.17	48.72' (LT)	23.846'	SET 5/8" IRC IN CONCRETE LB 6449
A6	843249.815	1204962.512	0.999981	27° 38'50.72186575	80° 25'19.61127616	37+00.98	29.38' (LT)	23.978'	SET 5/8" IRC LB 6449
A7	843480.510	1205419.431	0.999981	27° 38'55.23562626	80° 25'17.02221540	38+14.04	521.31' (LT)	22.871'	SET 5/8" IRC LB 6449
A8	843143.158	1204517.262	0.999981	27° 38'46.31788686	80° 25'20.82042658	36+14.08	423.55' (RT)	24.782'	SET 5/8" IRC LB 6449
A9	843983.620	1204658.413	0.999982	27° 38'47.67656680	80° 25'11.46750213	44+90.04	28.13' (RT)	21.799'	SET 5/8" IRC LB 6449
A10	843996.167	1204370.018	0.999982	27° 38'44.82026767	80° 25'11.34305292			24.134'	SET PK NL & DISK LB 6449
A11	844154.058	1204943.511	0.999982	27° 38'50.49170595	80° 25'9.55739216	46+52.21	274.96' (LT)	21.282'	SET 5/8" IRC LB 6449
A12	844486.342	1204645.294	0.999982	27° 38'47.52323928	80° 25'5.87812440	49+85.92	21.66' (RT)	21.073'	SET 5/8" IRC IN CONCRETE LB 6449
A13	844711.667	1204692.732	0.999982	27° 38'47.98245471	80° 25'3.37011683	52+11.01	26.86' (LT)	21.480'	SET 5/8" IRC LB 6449
A14	844897.565	1205079.003	0.999982	27° 38'51.79867171	80° 25'1.28273759	53+95.06	414.02' (LT)	21.585'	SET 5/8" IRC LB 6449
A15	844710.325	1204381.109	0.999982	27° 38'44.89679705	80° 25'3.40138748	52+11.17	284.77' (RT)	22.433'	SET PK NL & DISK LB 6449
A16	845378.548	1204639.137	0.999982	27° 38'47.42055399	80° 24'55.95750839	58+78.14	23.54' (RT)	19.912'	SET 5/8" IRC LB 6449
A17	846026.235	1204626.205	0.999983	27° 38'47.26208838	80° 24'48.75619967	65+25.19	21.60' (LT)	21.529'	SET 5/8" IRC LB 6449
A18	846564.769	1204444.614	0.999983	27° 38'45.43859081	80° 24'42.77755997	70+95.59	28.11' (RT)	20.831'	SET 5/8" IRC IN CONCRETE LB 6449
A19	847503.370	1204796.474	0.999983	27° 38'48.87836563	80° 24'32.32205037	80+93.94	35.48' (RT)	18.804'	SET 5/8" IRC LB 6449
A20	848555.044	1205211.743	0.999984	27° 38'52.94041087	80° 24'20.60565221	92+24.48	17.06' (RT)	20.433'	SET PK NL & DISK LB 6449
A21	849323.793	1205591.390	0.999984	27° 38'56.66299274	80° 24'12.03699838	100+80.57	27.66' (RT)	19.485'	SET 5/8" IRC LB 6449
A22	849954.860	1206477.471	0.999984	27° 39'5.40678182	80° 24'4.97188813	111+97.00	21.52' (LT)	17.260'	SET 5/8" IRC IN CONCRETE LB 6449
A23	850151.698	1206484.712	0.999984	27° 39'5.46902675	80° 24'2.78264208			14.348'	FD PK NL & DISK "LB 6668 TBE"
A24	840658.798	1205310.547	0.999980	27° 38'54.28739795	80° 25'48.40468406	10+05.08	884.24' (LT)	24.086'	SET 5/8" IRC LB 6449
A25	840659.266	1203639.082	0.999980	27° 38'37.73632030	80° 25'48.48526628	10+12.45	787.21' (RT)	23.251'	SET 5/8" IRC LB 6449

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CITY OF VERO BEACH
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APPROVED BY _____ DATE _____

REVISION	BY	DATE

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	BY	DATE
PRELIM	CASASUS	AUG. 2006
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CHECKED	JBC	AUG. 2006

SPECIFIC PURPOSE SURVEY
AVIATION BOULEVARD
FROM 43RD AVENUE EAST TO EAST OF US-1

MAPS PREPARED BY
BURDETTE & ASSOCIATES, INC.

FIELD BOOK NO.'S

SCALE: AS SHOWN

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VRB RUNWAY 30L-ALTERNATIVE RUNWAY PROTECTION ZONE – ALTERNATIVE ANALYSIS
VERO BEACH REGIONAL AIRPORT

BACKGROUND

1. AIRPORT:	2. LOCATION (CITY, STATE):	3. LOC ID:
VERO BEACH REGIONAL AIRPORT	VERO BEACH, FLORIDA	VRB

4. EFFECTED RUNWAY:	5. APPROACH RPZ DIMENSION:	6. DEPARTURE RPZ DIMENSION:
30L APPROACH 12R DEPARTURE	LENGTH: 1,700 FEET INNER WIDTH: 1,000 FEET OUTER WIDTH: 1,510 FEET ACRES: 48.978	LENGTH: 1,700 FEET INNER WIDTH: 500 FEET OUTER WITH: 1,010 FEET ACRES: 29.463

7. DESIGN AIRCRAFT OF RUNWAY:
Boeing 737-800W (ARC D-III) or Airbus A320 (ARC C-III)

8. DATE OF LATEST FAA SIGNED ALP:
October 20, 2016

9. TRIGGERING EVENT (i.e. what event caused the new or modified land use in the RPZ)

	An airfield project (e.g. runway extension, runway shift)
	A change in the critical design aircraft which increases the RPZ dimensions
	A new or revised instrument approach procedure that increases the RPZ dimensions
X	A local development proposal in the RPZ (either new or reconfigured)
	Other (please describe):

10. SELECT TYPE OF INCOMPATABLE LAND USE IN RPZ:

	Buildings and structures (Examples include, but are not limited to: residences, schools, churches, hospitals or other medical care facilities, commercial/industrial buildings, etc.)
	Recreational land use (Examples include, but are not limited to: golf courses, sports fields, amusement parks, other places of public assembly, etc.)
X	Transportation Facilities. (Examples include, but are not limited to: rail facilities (light or heavy, passenger or freight), public roads/highways, vehicular parking facilities) ROAD IMPROVEMENTS/LANE ADDITIONS OR WIDENING
	Fuel storage facilities (above and below ground)
	Hazardous material storage (above and below ground)
	Wastewater treatment facilities
	Above-ground utility infrastructure (i.e. electrical substations), including any type of solar panel installations.

Does the Airport Sponsor own or control the area where the above incompatible land uses is located? Yes_X____ No_____

ALTERNATIVES ANALYSIS

11. PROVIDE A DESCRIPTION OF EACH ALTERNATIVE INCLUDE A NARRAITIVE DISCUSSION AND EXHIBITS OR FIGURES DEPICTING THE ALTERNATIVE:

Aviation Blvd. currently traverses the Runway 30L RPZ. It is a public-use perimeter road located on Section 163 relevant land owned by the Vero Beach Regional Airport. The proposed project would construct improvements to the intersection of Aviation Blvd., U.S. 1, and Florida East Coast Railroad (FEC RR). This intersection is located off airport property, but the project would include the widening and/or addition of lanes to Aviation Blvd. on Airport property including within the Runway 30L RPZ. The FDOT, the sponsor of the intersection project, has proposed eight alternatives to the intersection. AVCON, INC. on behalf of the FDOT has proposed an additional six alternatives. All alternatives are illustrated at the end of this report.

ALTERNATIVE 1(Figure 2); Conventional intersection with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator and two west bound lanes. Access to Airport N. Drive is provided at grade.

ALTERNATIVE 2 (Figure 3): Twin Intersections with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator, and two westbound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. This alternative would have a similar footprint on airport property as Alternative 1, except for the shared use path along the south side of Aviation Blvd.

ALTERNATIVE 3 (Figure 4): U.S. 1 Overpass Alternative with an expanded Aviation Blvd. and railroad grade crossing to provide four east bound lanes, a median separator, and two west bound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. This alternative will have a similar footprint on airport property at Alternative 1.

ALTERNATIVE 4 (Figure 5): Aviation Blvd. Overpass (eliminated railroad grade crossing) would provide a four-lane overpass to move all Aviation Blvd. traffic over the railroad and U.S. 1 without a signalized intersection and without crossing the FEC RR. Access to Airport N. Drive is provided at grade. The Aviation Blvd. embankment created by the overpass is within the Runway 30L RPZ.

ALTERNATIVE 5 (Figure 6): Aviation Blvd. Underpass (without railroad grade crossing) would depress Aviation Blvd. under the FEC RR tracks and U.S. 1 with two eastbound and two westbound lanes. The existing railroad grade crossing would be removed. This alternative would have an open-cut section within the RPZ. Access to Airport N. Drive may require a re-route to the east to cross over the depressed roadway and connect back to Aviation Blvd. from the south side at a location west of the existing Airport N. Drive Intersection. This alternative would operate in free flow traffic conditions within the RPZ.

ALTERNATIVE 6 (Figure 7): Aviation Blvd. Overpass (with railroad crossing) would carry the Aviation Blvd. east-west lanes over U.S. 1 and the FEC RR tracks with an at grade railroad crossing for turning movements and a signalized intersection at U.S. 1. The access to Airport N. Drive is modified to a westbound right turn, southbound right turn access with a U-turn below the overpass to access Airport N. Drive from the west. The Aviation Blvd. overpass embankment is within the RPZ.

ALTERNATIVE 7 (Figure 8): Aviation Blvd. Conventional intersection with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator and two west bound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. Would provide a railroad crossing at grade. Would provide for two west bound turning lanes onto Aviation Blvd. and one dedicated east bound turning lane onto Aviation Blvd. All other changes would occur south of the Aviation Blvd./FEC RR/U.S. 1 intersection.

ALTERNATIVE 8 (Figure 9): Aviation Blvd. Conventional intersection with an expanded Aviation Blvd. and railroad grade crossing to provide four eastbound lanes, a median separator and two west bound lanes. A shared use path would be along the south side of Aviation Blvd. Access to Airport N. Drive is provided at grade. Would provide a railroad crossing at grade. Would provide for two west bound turning lanes onto Aviation Blvd. and one dedicated east bound turning lane onto Aviation Blvd. All other changes would occur south of the Aviation Blvd./FEC RR/U.S. 1 intersection.

ALTERNATIVE 9 Figure 10): Re-route Aviation Blvd. around the existing Runway 30L RPZ. Aviation Blvd. would be closed between 27th Street and U.S. 1. Vehicles approaching 27th Street would be obliged to travel south on 27th Street, transition to 20th Ave. and south to 26th Street. The vehicles would travel east on 26th Street to U.S. 1. U.S. 1 can be traversed north to 32nd street if that is the ultimate direction. Aviation Blvd. south of 33rd Street would remain open as a private road to Airport traffic only. Airport N. Drive would be rerouted to hug the northern edge of the RPZ and would access Aviation Blvd. closer to the intersection with U.S. 1 and the FEC RR.

ALTERNATIVE 10 (Figure 11): Shorten Runway 30L by 1,100 feet, making Runway 12R/30L a total of 6,214 feet in length. Both the approach and departure RPZs would then be brought north of Aviation Blvd. Aviation Blvd. to remain in its current location and the preferred alternative from Alternatives 1 through 8 would be applied to Aviation Blvd. without further issues.

ALTERNATIVE 11 (Figure 12): Shorten Runway 30L by 810 feet and place a displaced threshold 290 feet north of the new threshold. This would make the shortened Runway 30L 6,504 feet long. The approach and departure RPZs would be offset 290 feet and both RPZs would be north of Aviation Blvd. Airport N. Drive would be re-routed north and east of the re-positioned approach and departure RPZs.

ALTERNATIVE 12 (Figure13): Relocate Runway 12R/30L 1,100 feet northwest along its centerline to provide enough area to accommodate both the Runway 30L RPZs and Aviation Blvd. Extend Runway 12R by 1,100 feet to the northwest and re-route 43rd Avenue to the northwest around the RPZs for Runway 12R. All extensions and re-routing will be on currently owned Airport land.

ALTERNATIVE 13 (Figure 14): Shorten Runway 10L by 370 feet and depress Aviation Blvd. a minimum of 15 feet the full width of the approach RPZ for Runway 30L. The approach/departure road sloping down to each end of the clear-cut portion would need to be 453 feet long on each end as the current speed on Aviation Blvd. is posted at 40 miles per hour (mph), except for the curved portion of Aviation Blvd. where the speed limit is 25 mph. The clear-cut portions would need to be approximately 48 feet wide to allow for two lanes of traffic and pull-off areas. Where the Aviation Blvd. widens as it reaches the FEC RR, the roadway would widen to as much as 94 feet to accommodate up to seven lanes of traffic, two medians, and a shared use path. Runway 10L would be shortened by 370 feet for a total length of Runway 12R/30L of 6,944 feet. This would bring the approach RPZ to Runway 30L to the northwest enough to avoid conflict with the ascending Aviation Blvd. as it approaches the FEC RR and U.S. 1 intersection. Two new traffic lanes would be provided at grade adjacent to and south of Aviation Blvd. to allow access to 27th Street.

ALTERNATIVE 14 (Figure 15): Close Aviation Blvd. at the northeast side of the intersection of Aviation Blvd and 27th Street and again on the western side of the intersection of Aviation Blvd., FEC RR, and U.S. 1. Re-route Airport N. Drive south of 33rd Street to hug the northern edge of the RPZ and intersect with Aviation Blvd. closer to the intersection of U.S. 1 and the FEC RR. No improvements to the intersection of Aviation Blvd., the FEC RR, and U.S. 1. This alternative would not provide an alternative route through or around the Airport.

12. PROVIDE FULL COST ESTIMATES ASSOCIATED WITH EACH ALTERNATIVE REGARDLESS OF POTENTIAL FUNDING SOURCES: These are Order of Magnitude Cost Estimates. Alternatives 1 through 8 only address the issues associated directly with the intersection of Aviation Blvd., U.S. 1, and the FEC RR. Alternatives 9 through 14 only address the issues of Aviation Blvd. and its presence in the RPZ of Runway 30L of the Vero Beach Regional Airport. Therefore, the costs of Alternative 1 were added to the cost estimates of Alternatives 9 through 14 where applicable, to achieve a total cost for Alternatives 9 through 14.
Alternative 1: $14,701,000
Alternative 2: $21,357,000

Alternative 3: $44,872,000
Alternative 4: $41,893,000
Alternative 5: $34,975,000
Alternative 6: $29,461,000
Alternative 7: $23,687,000
Alternative 8: $24,666,000
Alternative 9: $22,117,000
Alternative 10: $20,095,000
Alternative 11: $19,823,000
Alternative 12: $32,665,000
Alternative 13: $26,224,000
Alternative 14: $16,878,000

13. PROVIDE A PRACTICABILITY ASSESSMENT BASED ON THE FEASIBILITY OF THE ALTERNATIVE IN TERMS OF COST, CONSTRUCTABILITY AND OTHER FACTORS:

FDOT proposed improvements, currently being studied by WGI Inc., on behalf of the FDOT are proposed at the intersection of Aviation Blvd., U.S. 1, and the FEC RR. This intersection is located northeast of VRB Airport, where Aviation Blvd. traverses the RPZ for Runway 30L, the primary runway of the Airport. Currently, traffic at the intersection backs up along Aviation Blvd. into the RPZ and this backup is forecast to increase over the coming years. The purpose of the project is to relieve the congestion at this intersection and prevent the traffic from backing up into the Runway 30L RPZ. WGI Inc. has proposed eight alternatives that address the congestion caused by the intersection at Aviation Blvd., U.S. 1, and the FEC RR. These are Alternatives 1 through 8. None of these alternatives directly address the situation of Aviation Blvd. in the RPZ of Runway 30L. Therefore, AVCON, INC., on behalf of the FDOT has created an additional six alternatives that more specifically address the issue as it relates to Aviation Blvd. in the Runway 30L RPZ. These are Alternatives 9 through 14.

EXISTING CONDITIONS (Figure 1)

ALTERNATIVE 1 (Figure 2)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Most cost effective of the alternatives at $14,701,000.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.

ALTERNATIVE 2 (Figure 3)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Among the top third of lower-cost alternatives

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.

ALTERNATIVE 3 (Figure 4)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Has the least amount of impact to the RPZ of the intersection only alternatives.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.
- Most costly alternative at $44,872,000.

ALTERNATIVE 4 (Figure 5)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.
- Higher end of cost range at $41,893,000.
- Has the highest amount of overall impact to the RPZ of all the alternatives at 127,209 square feet or 2.92 acres.

ALTERNATIVE 5 (Figure 6)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Provides a declining ramp to an underpass at the intersection. A portion of the ramp within the RPZ is still above ground level for much of the RPZ.
- Potentially blocks the intersection of Airport N. Road and Aviation Blvd.
- Adds two additional lanes, a median, and retaining walls to the existing road in the RPZ.
- Higher end of cost range at $34,975,000.
- Higher end of the amount of RPZ impact at 102,875 square feet or 2.36 acres.

ALTERNATIVE 6 (Figure 7)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- At the lower end of impact to the RPZ of the intersection only alternatives at 99,200 square feet or 2.28 acres

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.

- Adds an elevating ramp structure, two additional lanes, a median, and adjacent sidewalks along both sides of the ramp, as well as an additional non-structural median to an additional portion of the existing road within the RPZ.
- Potentially blocks the intersection of Airport N. Road and Aviation Blvd.
- Widens the existing Aviation Blvd. from two lanes to four lanes and adds a median between the two sets of lanes as well as the ascending ramp structure within the RPZ.
- Higher end of cost range at $29,461,000.

ALTERNATIVE 7 (Figure 8)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.
- Second lowest impact to the RPZ of the intersection only alternatives at 97,265 square feet or 2.23 acres.

DISADVANTAGES

- Does not address the existing issue of a road in the RPZ.
- Adds four additional lanes, a median, and a 12-foot-wide shared use path onto a portion of the existing road in the RPZ.

ALTERNATIVE 8 (Figure 9)

ADVANTAGES

- Meets the intersection objective of clearing the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection and back through the RPZ.

DISADVANTAGES

- Does not address the existing issue of a public road in the RPZ.
- Adds a wide median, three additional lanes, and a 10-foot-wide shared use path on the south side of Aviation Blvd. in the RPZ.
- Second highest impact to the RPZ of all alternatives at 122,100 square feet or 2.8 acres.

ALTERNATIVE 9 (Figure 10)

ADVANTAGES

- Would prevent congestion from the intersection building up in the RPZ.
- Eliminates all public roads traveling through the RPZ thereby severely reducing the impact of these roads on the RPZ.
- Middle portion of the cost range at $22,117,000.

DISADVANTAGES

- Moves the congestion at the Aviation Blvd./FEC RR/U.S. 1 intersection to the intersection of U.S. 1/FEC RR/26th Street.
- The intersection of Aviation Blvd. and Airport N. Drive is too closer to the intersection of Aviation Blvd./FEC RR/U.S. 1, which would no longer be congested due to the closure of Aviation Blvd. to public traffic.
- Unidentified city streets would need widening to accommodate increased traffic.

ALTERNATIVE 10 (Figure 11)

ADVANTAGES

- Eliminates the conflict between Aviation Blvd. and Airport N. Road and the Runway 30L RPZ.
- Lower end of cost range at $20,095,000.

DISADVANTAGES

- Runway 12R/30L would be shortened by 1,100 feet from 7,314 feet to 6,214 feet. The existing design aircraft for the Runway is an AAC C and an ADG of III, per the 2016 VRB Master Plan. Many of these aircraft require a runway length of about 5,385 feet and 6,250. Reducing the length of the runway could restrict some of the current design aircraft from landing at the Airport. The future design aircraft; an AAC of D and an ADG of III; would require an even longer runway of about 6,735 feet.
- Airport N. Road would need to be re-routed.

ALTERNATIVE 11 (Figure 12)

ADVANTAGES

- There would no longer be a conflict between the Runway 30L RPZ and Aviation Blvd. or Airport N. Road.
- Lower end of cost range at $19,823,000

DISADVANTAGES

- There would be a displaced threshold on Runway 30L.
- Runway 12R/30L would be shortened by 810 feet from 7,314 feet to 6,504 feet. Most of the current design aircraft could use this runway, but a few would require a longer runway or would have to take a penalty by reducing their load. The future design aircraft would likely not be able to use the runway.
- Airport N. Road would need to be re-routed.

ALTERNATIVE 12 (Figure 13)

ADVANTAGES

- There would no longer be a conflict between the Runway 12R/30L RPZ, Aviation Blvd., and Airport N. Road
- Runway 12R/30L would remain at 7,314 feet in length.
- Also corrects the presence of 43rd Ave. in the Runway 12R RPZ.

DISADVANTAGES

- 43rd Ave. would need to be re-routed around the Runway 12R RPZ.
- Airport N. Road would need to be re-routed around the relocated Runway 30L RPZ.
- Could restrict some future lengthening of Runway 12R/30L.
- Higher end of cost range at $32,665,000.

ALTERNATIVE 13 (Figure 14)

ADVANTAGES

- Would eliminate the conflict between the Runway 30L RPZ, Aviation Blvd., and Airport N. Road.

DISADVANTAGES

- Would shorten Runway 30L by 370 feet to 6,944 to accommodate the decent from the Aviation Blvd./FEC RR/U.S. 1 intersection to the depressed portion of Aviation Blvd. to allow the entire descent to be outside of the RPZ.

ALTERNATIVE 14 (Figure 15)

ADVANTAGES

- Would eliminate the conflict between Aviation Blvd., the Runway 30L RPZ, and Airport N. Road.
- Second lowest alternative cost at $16,878,000.

DISADVANTAGES

- Would not solve the issue of traffic, would only move it off the Airport.

- The intersection of Aviation Blvd. and Airport N. Drive is too close to the intersection of Aviation Blvd./FEC RR/U.S. 1, which would no longer be congested due to the closure of Aviation Blvd. to public traffic.
- Does not direct where the public traffic should move.

14. DESCRIBE THE PREFERRED ALTERNATIVE THAT WOULD MEET THE PROJECT PURPOSE AND NEED WHILE MINIMIZING RISK ASSOCIATED WITH THE LOCATION WITHIN THE RPZ:
The proposed action is to construct intersection improvements with as few modifications within the Runway 30L RPZ as possible. Alternative 1 would provide an at-grade solution that would provide sufficient capacity at the intersection of Aviation Blvd., the FEC RR, and Route 1 to alleviate the congestion that currently builds along Aviation Blvd. and within the Runway 30L RPZ. Currently, Aviation Blvd. affects 69,333 square feet or 1.59 acres within the RPZ (about 3.2 percent of the RPZ), all of it outside the RSA and the Runway Object Free Area. Alternative 1 would affect another 31,215 square feet or 0.7 acres of RPZ land (about 1.5 percent of the RPZ) still outside the RSA and the Runway Object Free Area for a total of 100,548 square feet or 2.31 acres of affected land within the RPZ or about 4.7 percent of the RPZ. Alternative 1 would significantly reduce the number of cars queuing for the intersection within the RPZ and would maintain the current length and utility of Runway 12R/30L.

15. IDENTIFY ALL FEDERAL, STATE AND LOCAL TRANSPORTATION AGENCIES INVOLVED OR INTERESTED IN THE ISSUE:
The City of Vero Beach, Florida; Indian River County, Florida; the Florida Department of Transportation, and the Federal Aviation Administration.

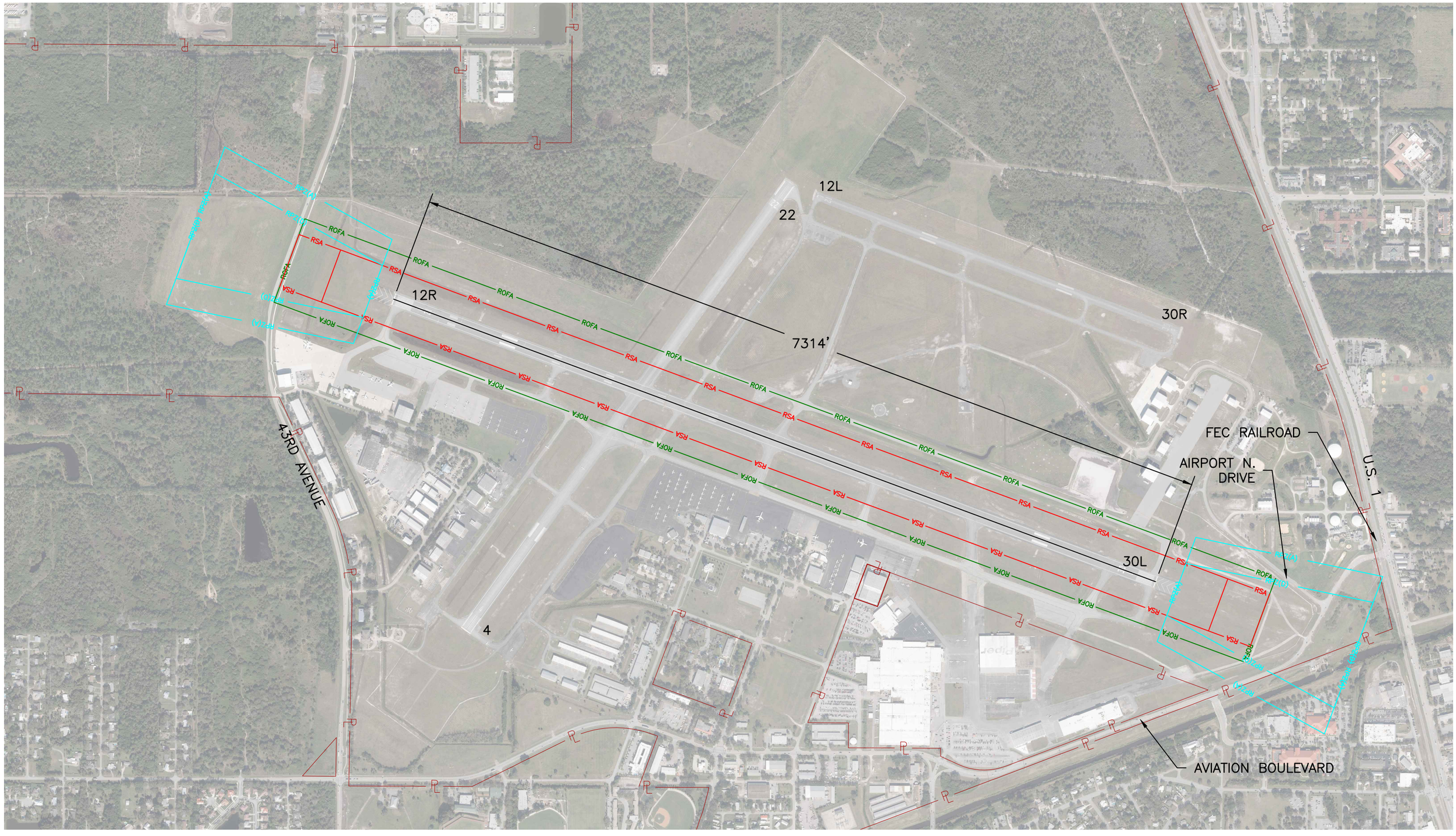
16. PROVIDE AN ANALYSIS OF THE SPECIFIC PORTION(S) AND PERCENTAGES OF THE RPZ AFFECTED, DRAWING A CLEAR DISTINCTION BETWEEN THE CENTRAL PORTION OF THE RPZ VERSUS THE CONTROLLED ACTIVITY AREA, AND CLEARLY DELINEATING THE DISTANCE FROM THE RUNWAY END AND RUNWAY LANDING THRESHOLD.
The existing Aviation Blvd. is located outside of the existing RSA and ROFA for Runway 30L. The areas and percentages of the RPZ of additional roadwork, as well as the total impact of either Airport N. Road or Aviation Blvd. to the Runway 30L RPZ was calculated along with the distances of either road to the runway end and/or the runway threshold. The results of these calculations are shown in tabular form in Figure 16.

17. PROVIDE AN ANALYSIS OF (AND ISSUES AFFECTING) SPONSOR CONTROL OF THE LAND WITHIN THE RPZ.
Aviation Blvd. is located on Airport property and a portion of the right-of way travels through the RPZ of Runway 30L. Aviation Blvd. is located outside of the RSA and the Runway Object Free Area. It appears from the Airport's Exhibit "A" that the land upon which Aviation Blvd. is located on Airport property was acquired through the Surplus Property Act of 1944. Additionally, the FAA has approval authority over any property that "i. Materially impacts the safety and efficient operation of aircraft at, to, or from the airport, and ii. adversely affects the safety of people or property on the ground adjacent to the airport as a result of aircraft operations" within the Airport property line through Section 163 of the FAA Reauthorization Act of 2018. Portions of the RPZ, not associated with Aviation Blvd. or Airport N. Road, are associated with land that is not owned by the Airport.

18. ANY OTHER RELEVANT FACTORS FOR HEADQUARTERS CONSIDERATION:
The proposed upgrades to the intersection of Aviation Blvd., the FEC R.R., and Route 1 have City of Vero Beach and Airport support if the upgrades remain at grade. These would be representative of Alternatives 1, 2, 7, and 8. There does not appear to be a great deal of support for the intersection alternatives that include bridges or underpasses at the intersection. It is doubtful that anyone in the community would support an RPZ alternative that would include making Aviation Blvd. into a private Airport road forcing the re-routing of traffic to other areas of the community, such as Alternatives 9 and 14.

19. SIGNATURE OF ORIGINATOR	20. PRINTED NAME OF ORIGINATOR	21. DATE
Mary Soderstrum	Mary Soderstrum, AIA, NCARB	19 June 2023
22. ORIGINATOR'S TITLE	**23. TELEPHONE**	**24. E-MAIL**
Senior Airport Planner	(407) 599-1122	MSoderstrum@avconinc.com

FIGURE 01 - EXISTING CONDITIONS



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0 400 800 1600
GRAPHIC SCALE (FT)

N

FIGURE 2 - ALTERNATIVE 1
CONVENTIONAL INTERSECTION
DRAFT – SUBJECT TO REVISION 1/25/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760

RUNWAY 30L PROTECTION ZONE (RPZ)

RUNWAY 30L

AVIATION BLVD

CONNECT TO EXISTING ROADWAY

AIRPORT NORTH DRIVE

STORMWATER POND

RPZ (30L)

EXISTING FENCE

PROPOSED R/W

EXISTING R/W

EXISTING FENCE

WATER TREATMENT PLANT (CITY OF VERO BEACH)

RPZ (30R)

DESIGN SPEED = 30 MPH
R = 335'
e = .032

EXISTING R/W

FEC RAILROAD

FEC R/W

FEC R/W

FEC R/W

FEC RAILROAD

EXISTING SR5 R/W

SR 5 / US 1

BEGIN PROJECT

PROPOSED R/W

CLOSE 31ST ST

SHARED USE PATH

MAIN CANAL

28TH ST

29TH ST

30TH ST

31ST ST

32ND ST

33RD ST

AVIATION BLVD

13TH AVE

EXISTING SR5 R/W

END PROJECT

SHARED USE PATH

PROPOSED R/W

DESIGN SPEED = 30 MPH
R = 1065'
e = NC

PAVEMENT FOR INDIAN RIVER COUNTY ALIGNMENT

DESIGN SPEED = 30 MPH
R = 375'
e = .024

DESIGN SPEED = 30 MPH
R = 520'
e = NC

AVIATION BLVD. EXTENSION AND LOCAL STREET LAYOUT TO BE COMPLETED BY INDIAN RIVER COUNTY

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

CONNECT TO 13TH AVE

110' PROPOSED R/W

POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

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FIGURE 3 - ALTERNATIVE 2
TWIN INTERSECTIONS
DRAFT – SUBJECT TO REVISION 1/25/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760

RUNWAY 30L PROTECTION ZONE (RPZ)

RUNWAY 30L

AVIATION BLVD

CONNECT TO EXISTING ROADWAY

AIRPORT NORTH DRIVE

STORMWATER POND

EXISTING FENCE

PROPOSED R/W

EXISTING R/W

RPZ (30L)

WATER TREATMENT PLANT (CITY OF VERO BEACH)

RPZ (30R)

EXISTING FENCE

EXISTING R/W

FEC RAILROAD

FEC R/W

FEC RAILROAD

EXISTING SR5 R/W

SR 5 / US 1

BEGIN PROJECT

MAIN CANAL

30TH ST

PROPOSED R/W

EXISTING SR5 R/W

END PROJECT

29TH ST

31ST ST

32ND ST

33RD ST

PROPOSED R/W

AVIATION BLVD

13TH AVE

PROPOSED R/W

AVIATION BLVD. EXTENSION AND LOCAL STREET LAYOUT TO BE COMPLETED BY INDIAN RIVER COUNTY

NOTE (FOR ALL OF SR 5/US 1):
DESIGN SPEED = 35 MPH
e = RC

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FIGURE 4 - ALTERNATIVE 3
US 1 OVERPASS
DRAFT – SUBJECT TO REVISION 1/25/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760
RUNWAY 30L PROTECTION ZONE (RPZ)
RUNWAY 30L
AVIATION BLVD
AIRPORT NORTH DRIVE
CONNECT TO EXISTING ROADWAY
RPZ (30L)
STORMWATER POND
EXISTING FENCE
WATER TREATMENT PLANT (CITY OF VERO BEACH)
RPZ (30R)
EXISTING FENCE
PROPOSED R/W
EXISTING R/W
DESIGN SPEED = 30 MPH
R = 335'
e = .032
EXISTING R/W
FEC RAILROAD
FEC R/W
FEC R/W
FEC R/W
FEC RAILROAD
EXISTING SR5 R/W
SR 5 / US 1
BEGIN PROJECT
END PROJECT
EXISTING SR5 R/W
SHARED USE PATH
SHARED USE PATH
PROPOSED R/W
PROPOSED R/W
28TH ST
29TH ST
30TH ST
31ST ST
32ND ST
33RD ST
MAIN CANAL
13TH AVE
PAVEMENT FOR INDIAN RIVER COUNTY ALIGNMENT
DESIGN SPEED = 30 MPH
R = 375'
e = .024
DESIGN SPEED = 30 MPH
R = 520'
e = NC
DESIGN SPEED = 30 MPH
R = 910'
e = NC
AVIATION BLVD. EXTENSION AND LOCAL STREET LAYOUT TO BE COMPLETED BY INDIAN RIVER COUNTY
NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC
CONNECT TO 13TH AVE
110' PROPOSED R/W
POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

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FIGURE 5 - ALTERNATIVE 4
AVIATION BOULEVARD FOUR-LANE OVERPASS
DRAFT – SUBJECT TO REVISION 1/25/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

RUNWAY 30L
AVIATION BLVD
AIRPORT NORTH DRIVE
CANAL STRUCTURE #D40F88000-01760
OVERPASS TIE-IN TO EXISTING GRADE
RUNWAY 30L PROTECTION ZONE (RPZ)
EXISTING FENCE
WATER TREATMENT PLANT (CITY OF VERO BEACH)
RPZ (30R)
EXISTING FENCE
PROPOSED R/W
DESIGN SPEED = 30 MPH
R = 341'
e = .031
EXISTING R/W
END PROJECT
BEGIN PROJECT
FEC R/W
FEC R/W
FEC R/W
FEC RAILROAD
EXISTING SR5 R/W
SR 5 / US 1
PROPOSED R/W
PROPOSED R/W
TEXAS U-TURN UNDER THE BRIDGE ACCESS TO 32ND ST EASTBOUND ONLY
28TH ST
29TH ST
MAIN CANAL
30TH ST
31ST ST
32ND ST
33RD ST
13TH AVE
DESIGN SPEED = 30 MPH
R = 820'
e = NC
PAVEMENT FOR INDIAN RIVER COUNTY ALIGNMENT
PROPOSED R/W
DESIGN SPEED = 35 MPH
R = 775'
e = RC
OVERPASS TIE-IN TO EXISTING GRADE
PROPOSED R/W
QUADRANT ROAD
POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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FIGURE 6 - ALTERNATIVE 5
AVIATION BOULEVARD UNDERPASS
DRAFT – SUBJECT TO REVISION 1/25/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760

RUNWAY 30L

AVIATION BLVD

AIRPORT NORTH DRIVE

UNDERPASS TIE-IN TO EXISTING GRADE

WATER TREATMENT PLANT (CITY OF VERO BEACH)

RUNWAY 30L PROTECTION ZONE (RPZ)

EXISTING FENCE

EXISTING FENCE

RPZ (30R)

DESIGN SPEED = 30 MPH
R = 341'
e = .031

EXISTING R/W

EXISTING R/W

FEC R/W

FEC R/W

FEC R/W

FEC RAILROAD

EXISTING SR5 R/W

SR 5 / US 1

PROPOSED R/W

MAIN CANAL

30TH ST

BRIDGE FOR FEC

BRIDGE FOR US-1

31ST ST

32ND ST

33RD ST

DESIGN SPEED = 30 MPH
R = 825'
e = NC

PAVEMENT FOR INDIAN RIVER COUNTY ALIGNMENT

13TH AVE

DESIGN SPEED = 35 MPH
R = 775'
e = RC

UNDERPASS TIE-IN TO EXISTING GRADE

QUADRANT ROAD

POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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FIGURE 7 - ALTERNATIVE 6
AVIATION BOULEVARD OVERPASS
DRAFT – SUBJECT TO REVISION 1/25/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760

RUNWAY 30L PROTECTION ZONE (RPZ)

RUNWAY 30L

AVIATION BLVD

AIRPORT NORTH DRIVE

RPZ (30L)

RPZ (30R)

STORMWATER POND

EXISTING FENCE

APPROXIMATE POINT OF TIE-IN

WATER TREATMENT PLANT (CITY OF VERO BEACH)

EXISTING FENCE

DESIGN SPEED = 30 MPH
R = 409'
e = RC

EXISTING R/W

TEXAS U-TURN UNDER THE BRIDGE

EXISTING R/W

FEC RAILROAD

FEC R/W

FEC R/W

FEC R/W

FEC RAILROAD

EXISTING SR5 R/W

SR 5 / US 1

MAIN CANAL

29TH ST

30TH ST

31ST ST

32ND ST

33RD ST

13TH AVE

TEXAS U-TURN UNDER THE BRIDGE
ACCESS TO 32ND ST EASTBOUND ONLY

DESIGN SPEED = 30 MPH
R = 409'
e = RC

APPROXIMATE POINT OF TIE-IN

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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FIGURE 8 - ALTERNATIVE 7
DISPLACED LEFT TURN INTERSECTION
DRAFT – SUBJECT TO REVISION 05/10/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760
RUNWAY 30L PROTECTION ZONE (RPZ)
RUNWAY 30L
AVIATION BLVD
CONNECT TO EXISTING ROADWAY
AIRPORT NORTH DRIVE
EXISTING STORMWATER POND
EXISTING FENCE
RPZ (30L)
14' BORDER WIDTH
EXISTING FENCE
PROPOSED R/W
EXISTING R/W
WATER TREATMENT PLANT (CITY OF VERO BEACH)
RPZ (30R)
DESIGN SPEED = 30 MPH
R = 327'
e = .035
DESIGN SPEED = 45 MPH
R = 5334'
e = NC
14' BORDER WIDTH
MAIN CANAL BRIDGE
12' SHARED USE PATH
EXISTING R/W
FEC RAILROAD
FEC R/W
FEC R/W
FEC R/W
FEC RAILROAD
EXISTING SR5 R/W
6' SIDEWALK
SR 5 / US 1
BEGIN PROJECT
END PROJECT
EXISTING SR5 R/W
6' SIDEWALK
12' SHARED USE PATH
PROPOSED R/W
DESIGN SPEED = 45 MPH
R = 3804'
e = NC
PROPOSED R/W
28TH ST
29TH ST
MAIN CANAL
CLOSE 31ST ST
12' SHARED USE PATH
30TH ST
31ST ST
33RD ST
DESIGN SPEED = 30 MPH
R = 375'
e = 0.024
12' SHARED USE PATH
32ND ST
DESIGN SPEED = 30 MPH
R = 520'
e = NC
13TH AVE
CONNECT TO 13TH AVE
AVIATION BLVD. EXTENSION AND LOCAL STREET LAYOUT TO BE COMPLETED BY INDIAN RIVER COUNTY
110' PROPOSED R/W
POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT

NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC

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FIGURE 9 - ALTERNATIVE 8
MEDIAN U-TURN W/ ROUNDABOUT
DRAFT – SUBJECT TO REVISION 05/10/2023
STATE ROAD (SR) 5/US 1 AT AVIATION BOULEVARD
PD&E STUDY
INDIAN RIVER COUNTY, FLORIDA
FPID: 441693-1-22-02
ETDM NUMBER: 14475

CANAL STRUCTURE #D40F88000-01760
RUNWAY 30L PROTECTION ZONE (RPZ)
CONNECT TO EXISTING ROADWAY
RUNWAY 30L
AIRPORT NORTH DRIVE
AVIATION BLVD
RPZ (30L)
EXISTING STORMWATER POND
EXISTING FENCE
PROPOSED R/W
EXISTING R/W
10' SHARED USE PATH
WATER TREATMENT PLANT (CITY OF VERO BEACH)
EXISTING FENCE
DESIGN SPEED = 30 MPH
R = 341'
e = .032
EXISTING R/W
14' BORDER WIDTH
FEC RAILROAD
MAIN CANAL BRIDGE
FEC R/W
FEC R/W
FEC R/W
FEC RAILROAD
EXISTING SR5 R/W
SR 5 / US 1
BEGIN PROJECT
PROPOSED R/W
CLOSE 31ST ST
12' SHARED USE PATH
28TH ST
29TH ST
MAIN CANAL
30TH ST
31ST ST
13TH AVE
32ND ST
33RD ST
8' SIDEWALK
12' SHARED USE PATH
PROPOSED R/W
EXISTING SR5 R/W
END PROJECT
DESIGN SPEED = 30 MPH
R = 425.70'
e = NC
DESIGN SPEED = 30 MPH
R = 410'
e = RC
8' SIDEWALK
1100' WBR STORAGE PROVIDED
DESIGN SPEED = 30 MPH
ICD = 181'
e = NC
100' PROPOSED R/W
POINT OF CONNECTION TO INDIAN RIVER COUNTY ALIGNMENT
NOTE:
SR 5 / US 1
DESIGN SPEED = 45 MPH
e = NC
AVIATION BLVD. EXTENSION AND LOCAL STREET LAYOUT TO BE COMPLETED BY INDIAN RIVER COUNTY

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FIGURE 10 - ALTERNATIVE 9 - RE-ROUTE AVIATION BOULEVARD

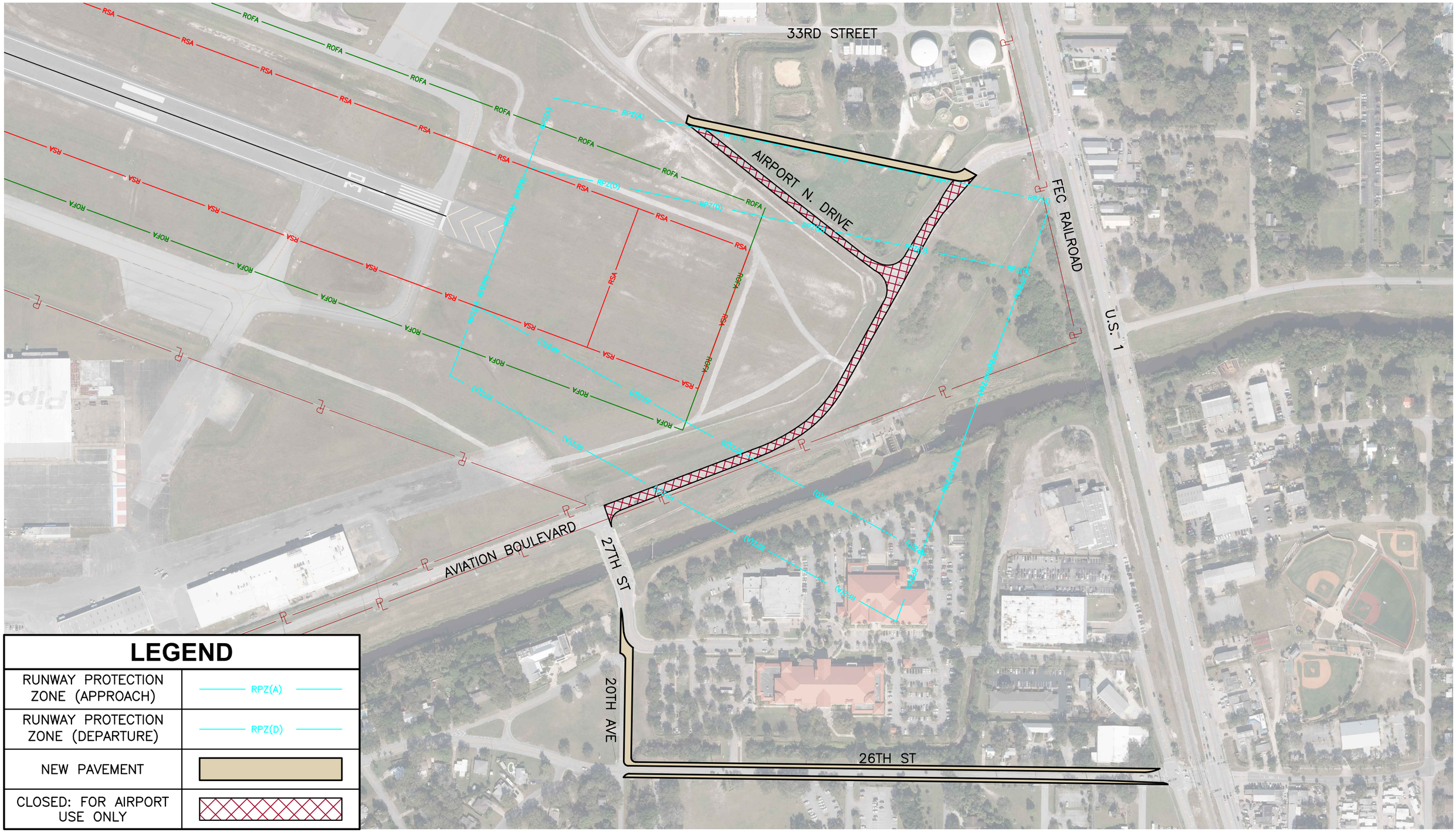

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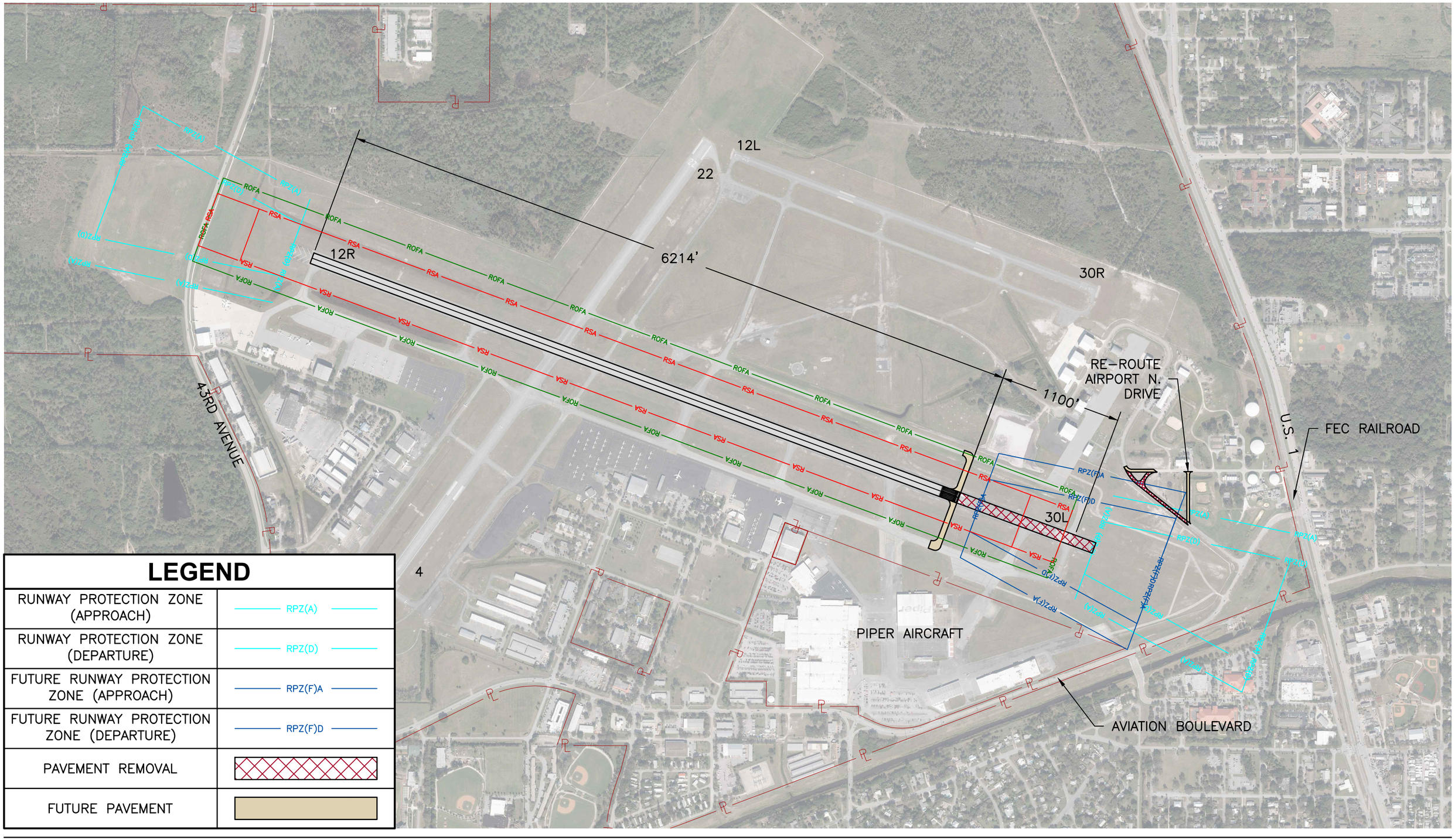
FIGURE 11 - ALTERNATIVE 10 - SHORTENED RUNWAY



LEGEND

RUNWAY PROTECTION ZONE (APPROACH)	RPZ(A)
RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(D)
FUTURE RUNWAY PROTECTION ZONE (APPROACH)	RPZ(F)A
FUTURE RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(F)D
PAVEMENT REMOVAL	
FUTURE PAVEMENT	

0 400 800 1600
GRAPHIC SCALE (FT)

N

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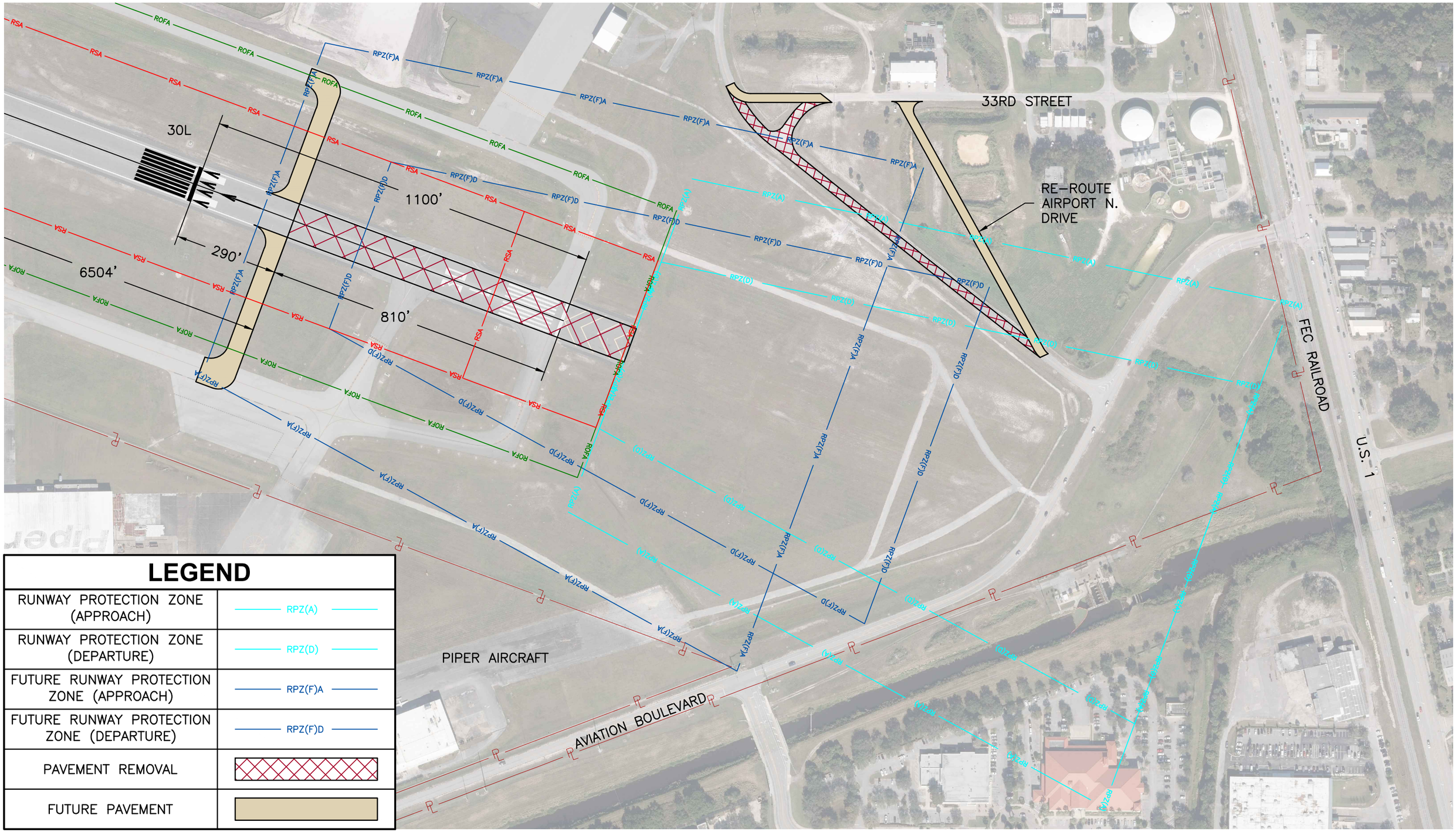
FIGURE 12 - ALTERNATIVE 11 - DISPLACED THRESHOLD AND SHORTENED RUNWAY



LEGEND

RUNWAY PROTECTION ZONE (APPROACH)	RPZ(A)
RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(D)
FUTURE RUNWAY PROTECTION ZONE (APPROACH)	RPZ(F)A
FUTURE RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(F)D
PAVEMENT REMOVAL	
FUTURE PAVEMENT	

0 125 250 500
GRAPHIC SCALE (FT)

N

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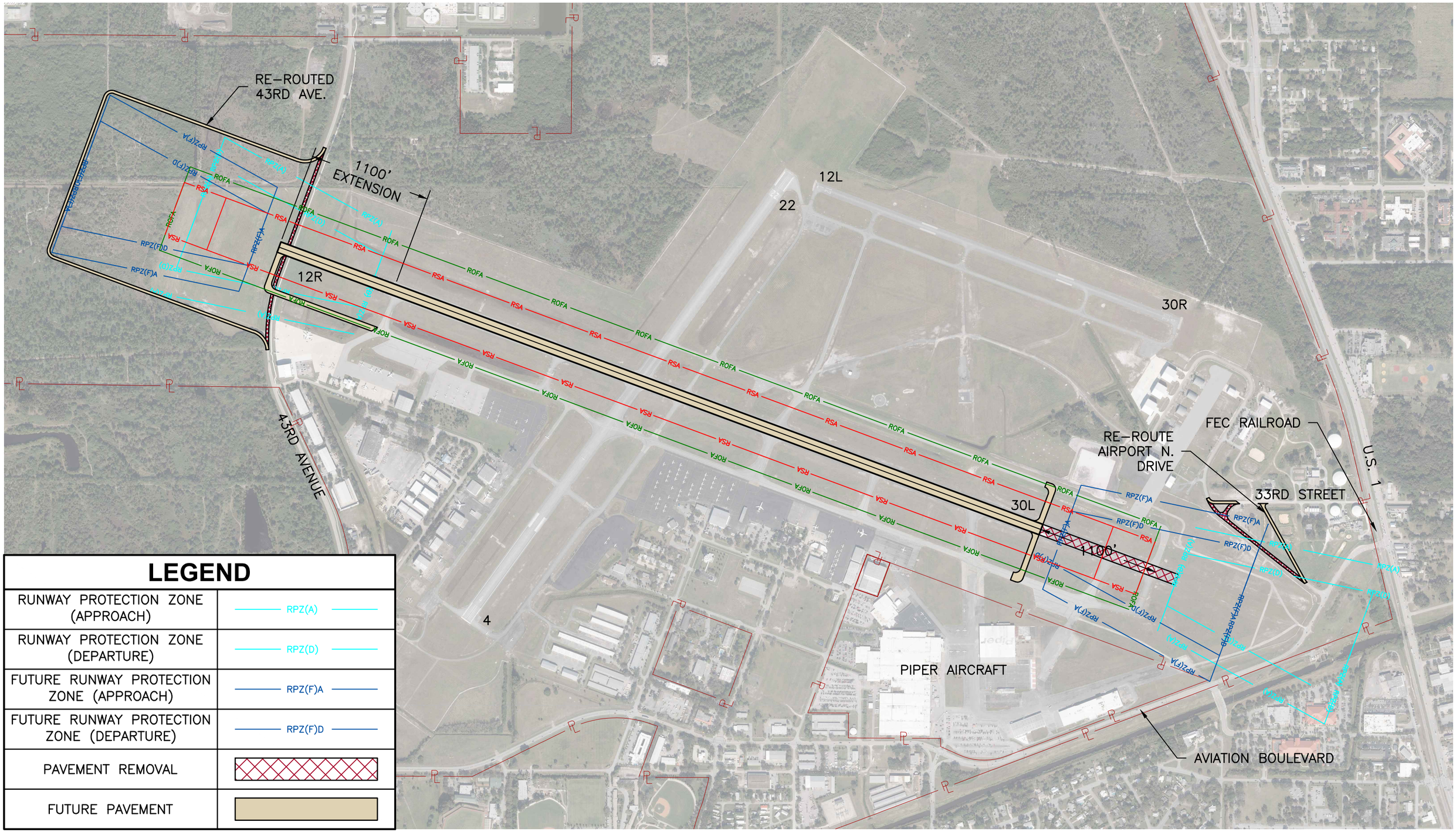
FIGURE 13 - ALTERNATIVE 12 - RELOCATED RUNWAY



LEGEND

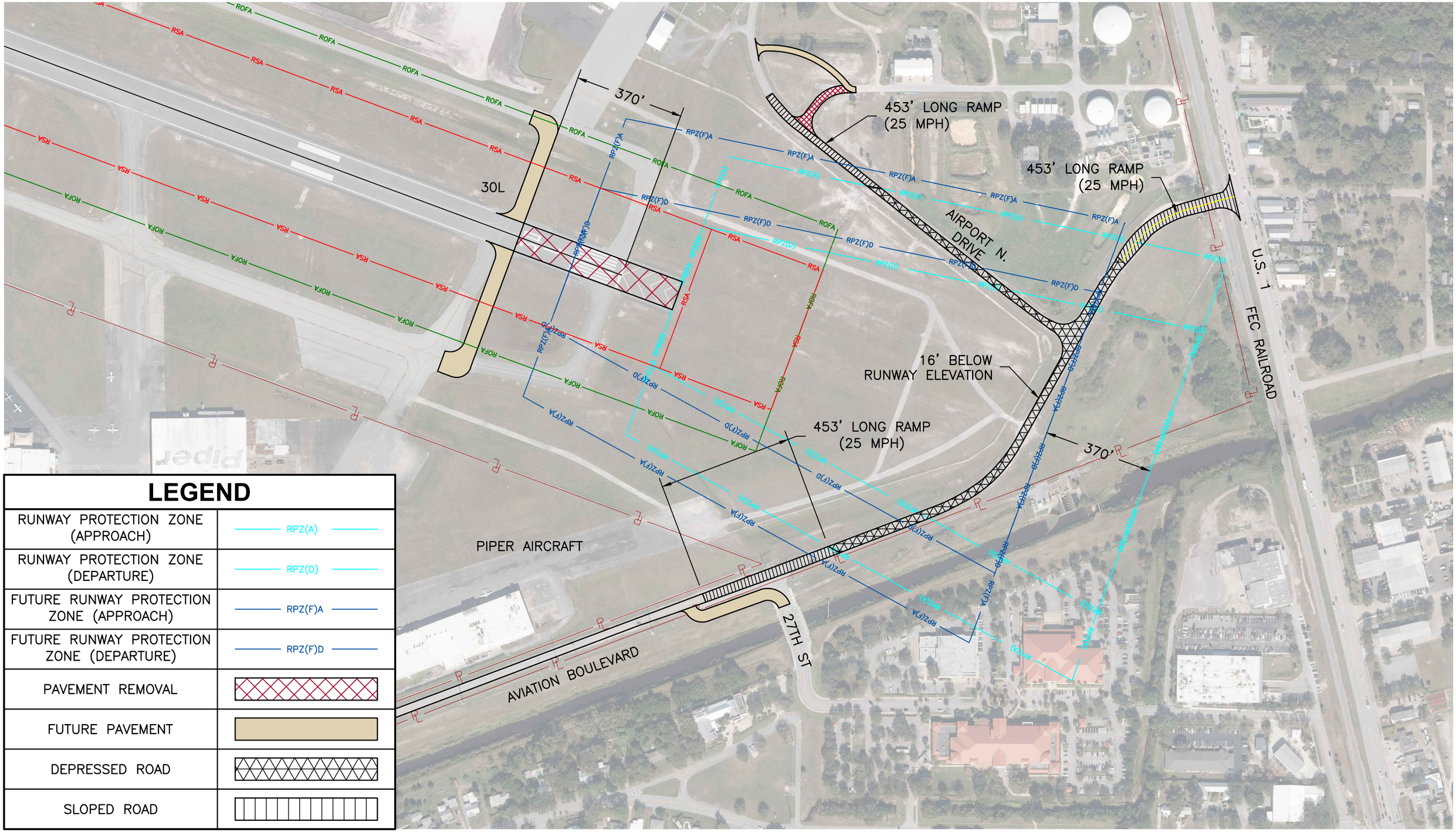
RUNWAY PROTECTION ZONE (APPROACH)	RPZ(A)
RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(D)
FUTURE RUNWAY PROTECTION ZONE (APPROACH)	RPZ(F)A
FUTURE RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(F)D
PAVEMENT REMOVAL	
FUTURE PAVEMENT	

0 400 800 1600
GRAPHIC SCALE (FT)

N

V:\2023\2023.303.01 - FDOT D4 VRB RPZ Alternatives Analysis\CAD\2330301_Exhibit11.dwg May 24 2023-12:49

FIGURE 14 - ALTERNATIVE 13 - DEPRESS AVIATION BOULEVARD AND SHORTEN RUNWAY



LEGEND

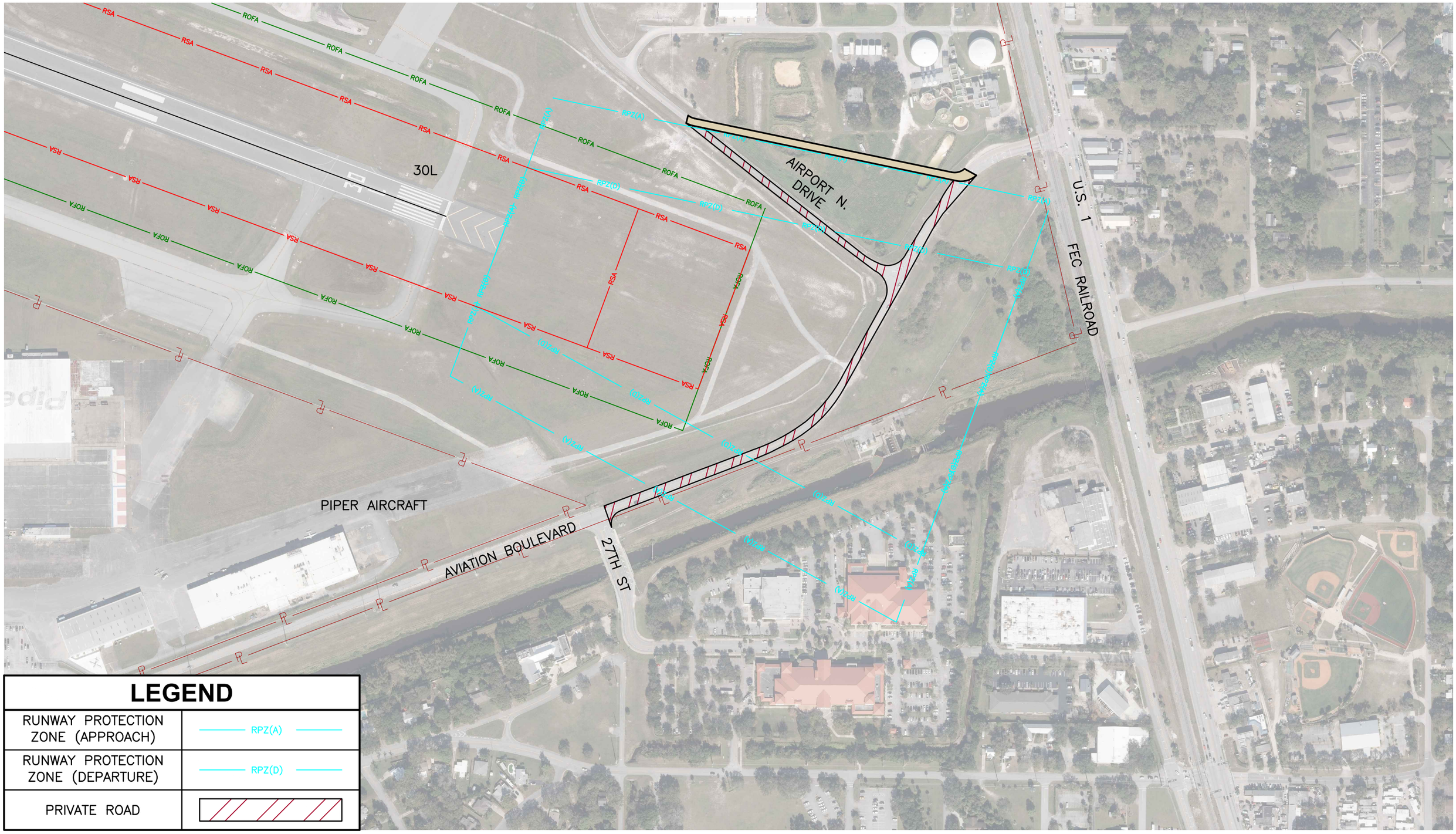
RUNWAY PROTECTION ZONE (APPROACH)	RPZ(A)
RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(D)
FUTURE RUNWAY PROTECTION ZONE (APPROACH)	RPZ(F)A
FUTURE RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(F)D
PAVEMENT REMOVAL	
FUTURE PAVEMENT	
DEPRESSED ROAD	
SLOPED ROAD	

0 150 300 600
GRAPHIC SCALE (FT)

N

V:\2023\2023.303.01 - FDOT D4 VRB RPZ Alternatives Analysis\CAD\2330301_Exhibit12.dwg May 24 2023-12:55

FIGURE 15 - ALTERNATIVE 14 - CLOSE AVIATION BOULEVARD TO ALL BUT AIRPORT TRAFFIC



LEGEND

RUNWAY PROTECTION ZONE (APPROACH)	RPZ(A)
RUNWAY PROTECTION ZONE (DEPARTURE)	RPZ(D)
PRIVATE ROAD	

0 150 300 600
GRAPHIC SCALE (FT)

N

V:\2023\2023.303.01 - FDOT D4 VRB RPZ Alternatives Analysis\CAD\2330301_Exhibit13.dwg June 16 2023–11:07

Figure 16 VRB RUNWAY 30L RUNWAY PROTECTION ZONE IMPACTS BY ALTERNATIVE

Alternative	New Area of Impact in the Central Portion of the RPZ (Square Feet)	New Area of Impact in the Controlled Activity Area (Square Feet)	New Area of Impact within the Entire RPZ (Square Feet)	Total Area of Impact in the Central Portion of the RPZ (Square Feet)	Total Area of Impact in the Controlled Activity Area (Square Feet)	Total Area of Impact within the Entire RPZ (Square Feet)	Distance of Airport N. Road from Runway End (feet)	Distance of Aviation Blvd. from Runway End (feet)	Distance of Airport N. Road from Threshold (feet)	Distance of Aviation Blvd. from Threshold (feet)
Existing	0	0	0	33,184	36,149	69,333	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.0%	0.0%	0.0%	1.6%	1.7%	3.2%				
Alternative 1	8,724	22,491	31,215	41,908	58,640	100,548	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.4%	1.1%	1.5%	2.0%	2.7%	4.7%				
Alternative 2	9,050	20,821	29,871	42,233	56,970	99,204	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.4%	1.0%	1.4%	2.0%	2.7%	4.6%				
Alternative 3	1,768	20,055	21,823	34,952	56,204	91,156	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.1%	0.9%	1.0%	1.6%	2.6%	4.3%				
Alternative 4	34,958	22,918	57,876	68,142	59,067	127,209	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	1.6%	1.1%	2.7%	3.2%	2.8%	6.0%				
Alternative 5	10,527	23,015	33,543	43,711	59,164	102,875	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.5%	1.1%	1.6%	2.0%	2.8%	4.8%				
Alternative 6	11,451	18,417	29,868	44,635	54,566	99,200	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.5%	0.9%	1.4%	2.1%	2.6%	4.6%				
Alternative 7	8,448	19,484	27,932	41,632	55,633	97,265	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	0.4%	0.9%	1.3%	2.0%	2.6%	4.6%				
Alternative 8	30,997	21,770	52,767	64,181	57,919	122,100	879-1,519	1,150-1,713	879-1,519	1,150-1,713
Percentage of RPZ	1.5%	1.0%	2.5%	3.0%	2.7%	5.7%				
Alternative 9	0	0	0	0	0	0	Private Airport Road	Private Airport Road	Private Airport Road	Private Airport Road
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 10	0	0	0	0	0	0	Outside RPZ	Outside RPZ	Outside RPZ	Outside RPZ
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 11	0	0	0	0	0	0	Outside RPZ	Outside RPZ	Outside RPZ	Outside RPZ
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 12	0	0	0	0	0	0	Outside RPZ	Outside RPZ	Outside RPZ	Outside RPZ
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 13	0	0	0	0	0	0	Suppressed Below Runway Elevation	Suppressed Below Runway Elevation	Suppressed Below Runway Elevation	Suppressed Below Runway Elevation
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				
Alternative 14	0	0	0	0	0	0	Private Airport Road	Private Airport Road	Private Airport Road	Private Airport Road
Percentage of RPZ	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%				

GoLine
getting you there

1 Route 1	8 Route 8
2 Route 2	9 Route 9
3 Route 3	10 Route 10
4 Route 4	12 Route 12
5 Route 5	13 Route 13
6 Route 6	14 Route 14
7 Route 7	15 Route 15

– – – – – special bus route
Riders must call for pick up at special stops.

772-569-0903
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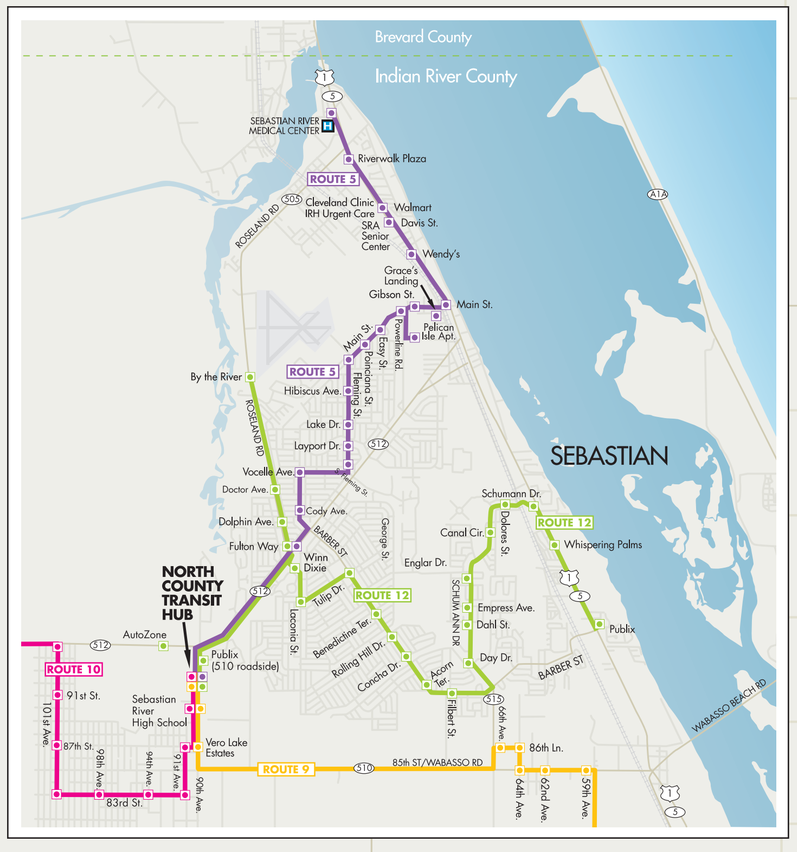
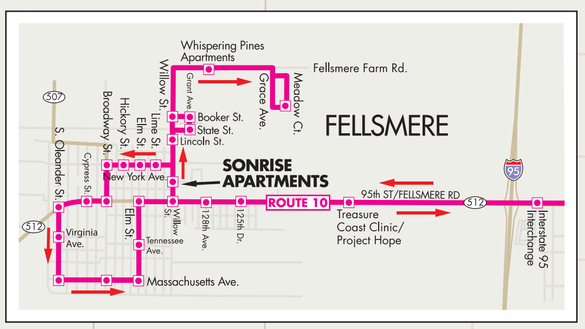
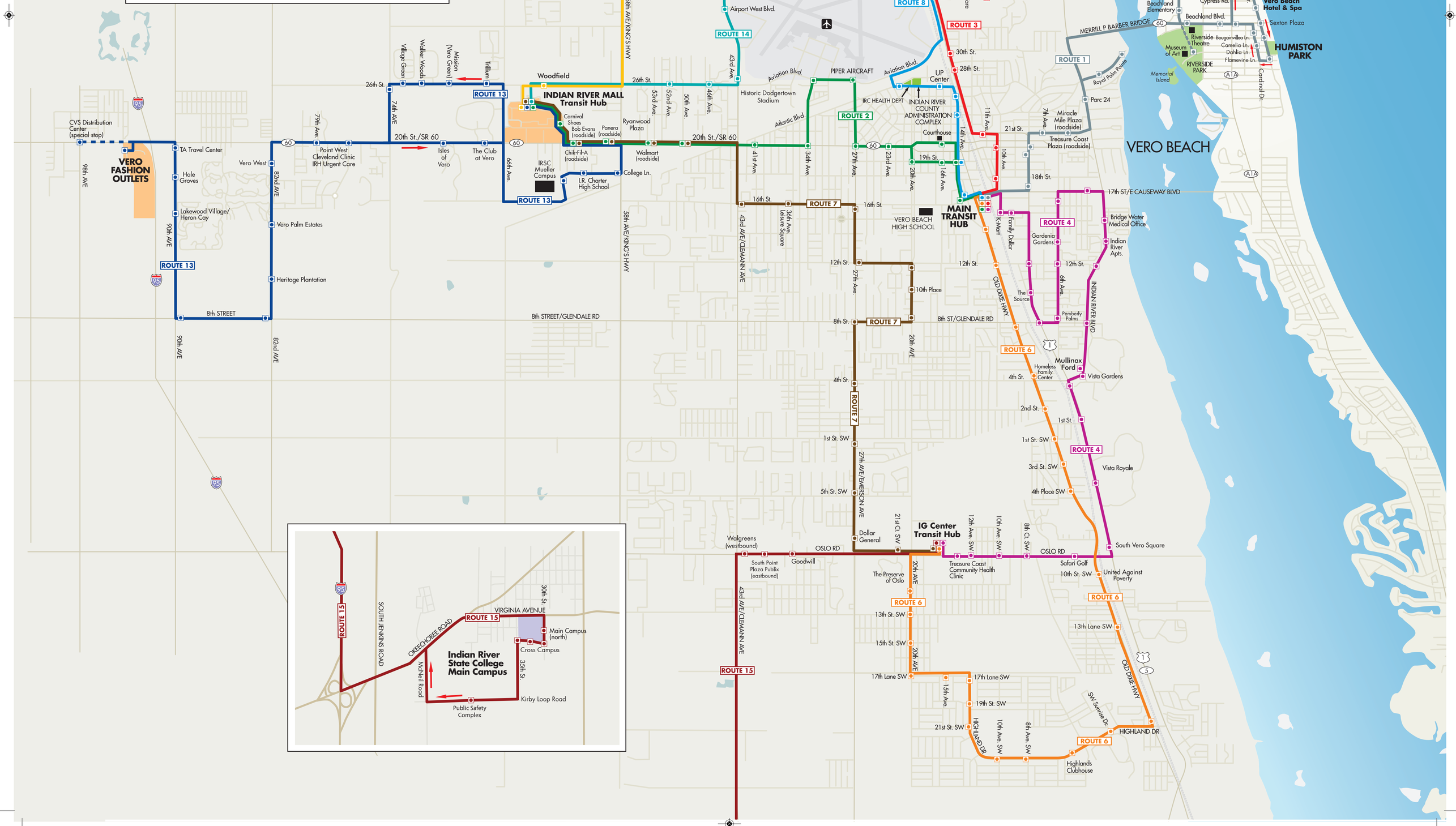
The free **TransLoc** smart phone application provides real-time bus arrival/departure information. Get information based on route, address or current location.







1 Beachside to Main Transit Hub

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

Beachside to Main Transit Hub

Conn Way & Ocean Dr	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
South End of Boardwalk		*	*	*	*	*	*	*	*	*	*	*	*
Vero Beach Hotel & Spa		*	*	*	*	*	*	*	*	*	*	*	*
Sexton Plaza		*	*	■	*	*	*	*	*	*	*	*	*
Costa d'Este		*	*	■	*	*	*	*	*	*	*	*	*
Humiston Park		*	*	■■	*	*	*	*	*	*	*	*	*
Cardinal & Camelia		*	■	*	*	*	*	*	*	*	*	*	*
Casey's		*	*	*	■■	*	*	*	*	*	*	*	*
Beachland & A1A		*	*	■	*	*	*	*	*	*	*	*	*
Across from Wells Fargo		■■	*	*	*	*	*	*	*	*	*	*	*
Vero Beach City Marina		S	S	S	S	S	S	S	S	S	S	S	S
Parc 24			*	*	*	■■	*	*	*	*	*	*	*
Miracle Mile Plaza (roadside)		■■	*	*	*	*	*	*	*	*	*	*	*
21 St & 7 Ave		*	*	■■	*	*	*	*	*	*	*	*	*
US 1 & 20 St		*	*	■	*	*	*	*	*	*	*	*	*
US 1 & 17 St (Walgreens)		■	*	*	*	*	*	*	*	*	*	*	*

Main Transit Hub to Beachside

Main Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
US 1 & 17 St (Walmart Market)	*	*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 19 Pl		*	*	■	*	*	*	*	*	*	*	*	*
21 St & 7 Ave		*	*	■■	*	*	*	*	*	*	*	*	*
Treasure Coast Plaza (roadside)	*	*	*	*	*	*	*	*	*	*	*	*	*
Parc 24		*	*	*	■■	*	*	*	*	*	*	*	*
Royal Palm Pointe A		*	■	*	*	*	*	*	*	*	*	*	*
Royal Palm Pointe B		*	■	*	*	*	*	*	*	*	*	*	*
Riverside Park Dr & Beachland Blvd	S	S	S	S	S	S	S	S	S	S	S	S	S
E Indian River Dr & Beachland Elem	*	*	*	*	*	*	*	*	*	*	*	*	*
Vero Beach City Marina		*	*	*	*	*	*	*	*	*	*	*	*
E Indian River Dr & Beachland Elem	*	*	*	*	*	*	*	*	*	*	*	*	*
Wells Fargo		*	*	■■	*	*	*	*	*	*	*	*	*
Conn Way & Ocean Dr.	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

s = Special stop (– – – – –)

Riders must call for pick up at special stops.

2 Indian River Mall to Main Transit Hub

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

Indian River Mall to Main Transit Hub

Indian River Mall (food court)	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
Shoe Carnival			*	*	*	*	*	*	*	*	*	*	*
Chik-Fil-A Route 60 (roadside)		*	*	*	*	*	*	*	*	*	*	*	*
Walmart (roadside)		*	*	*	*	*	*	*	*	*	*	*	*
20 St & 50 Ave			*	*	■■	*	*	*	*	*	*	*	*
20 St & 41 Ave			*	■■	*	*	*	*	*	*	*	*	*
34 Av & 20 St			*	*	■	*	*	*	*	*	*	*	*
Aviation Blvd & Airport Dr		■■	*	*	*	*	*	*	*	*	*	*	*
Aviation Blvd & Piper			*	*	■	*	*	*	*	*	*	*	*
Aviation Blvd & 27 Ave			■■	*	*	*	*	*	*	*	*	*	*
20 St & 27 Ave			*	■■	*	*	*	*	*	*	*	*	*
20 St & 23 Ave			*	■■	*	*	*	*	*	*	*	*	*
19 St & 20 Ave			*	■■	*	*	*	*	*	*	*	*	*
19 St & 16 Ave			*	■■	*	*	*	*	*	*	*	*	*
14 Ave & 16 St			*	■■	*	*	*	*	*	*	*	*	*

Main Transit Hub to Indian River Mall

Main Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
14 Ave & 16 ST			*	■■	*	*	*	*	*	*	*	*	*
14 Ave & 19 St			*	■■	*	*	*	*	*	*	*	*	*
20 St & 17 Ave			*	■■	*	*	*	*	*	*	*	*	*
20 St & De Leon Ave			*	■	*	*	*	*	*	*	*	*	*
20 St & 27 Ave			*	■■	*	*	*	*	*	*	*	*	*
Aviation Blvd & 27 Ave			■■	*	*	*	*	*	*	*	*	*	*
Aviation Blvd & Piper			*	*	■	*	*	*	*	*	*	*	*
Aviation Blvd & Airport Dr			■■	*	*	*	*	*	*	*	*	*	*
34 Ave & 20 St			*	■■	*	*	*	*	*	*	*	*	*
20 St & 37 Ave			*	■■	*	*	*	*	*	*	*	*	*
20 St & 41 Ave			*	■■	*	*	*	*	*	*	*	*	*
20 St & 53 Ave (Walmart)			■■	*	*	*	*	*	*	*	*	*	*
20 St Panera (roadside)		*	*	*	*	*	*	*	*	*	*	*	*
20 St Bob Evans (roadside)		*	*	*	*	*	*	*	*	*	*	*	*
Shoe Carnival			*	*	*	*	*	*	*	*	*	*	*
Indian River Mall (food court)	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

3 Gifford Health Center to Main Transit Hub

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

Gifford Health Center to Main Transit Hub

Gifford Health Center	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
US 1 & 45 St			*	*	*	*	*	*	*	*	*	*	*
Orchard Grove & 45 St			*	*	*	*	*	*	*	*	*	*	*
45 St & Indian River Blvd			■■	*	*	*	*	*	*	*	*	*	*
41 St & Indian River Blvd			■■	*	*	*	*	*	*	*	*	*	*
7 Terr & 37 St (777 Building)		*	*	*	*	*	*	*	*	*	*	*	*
35 Lane & 11th Ct (VOVN Bldg)		*	*	*	*	*	*	*	*	*	*	*	*
Cleveland Clinic IRH Hlth/Wellness	*		*	*	*	*	*	*	*	*	*	*	*
Cleveland Clinic IRH Main Entrance	*		*	*	*	*	*	*	*	*	*	*	*
37 St & 11 Dr			*	*	*	*	*	*	*	*	*	*	*
37 St & 15 Ave			*	*	*	*	*	*	*	*	*	*	*
37 St & 17 Ave			*	*	*	*	*	*	*	*	*	*	*
US 1 & 11 Ave			*	*	*	*	*	*	*	*	*	*	*
10 Ave & 20 Pl			*	*	*	*	*	*	*	*	*	*	*
10 Ave & 18 St			*	*	*	*	*	*	*	*	*	*	*

Main Transit Hub to Gifford Health Center

Main Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30	10
10 Ave & 18 St		*	*	*	*	*	*	*	*	*	*	*	*	*
10 Ave & 20 Pl		*	*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 11 Ave		*	*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 28 St		*	*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 30 St		*	*	*	■■	*	*	*	*	*	*	*	*	*
37 St & 17 Ave		*	*	*	*	*	*	*	*	*	*	*	*	*
37 St & 15 Ave		*	*	*	*	*	*	*	*	*	*	*	*	*
37 St & 11 Dr		*	*	*	*	*	*	*	*	*	*	*	*	*
35 Lane & 11 Ct (VOVN Bldg)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cleveland Clinic IRH Hlth/Wellness	*	*	*	*	*	*	*	*	*	*	*	*	*	*
Cleveland Clinic IRH Main Entrance	*	*	*	*	*	*	*	*	*	*	*	*	*	*
7 Terr & 37 St (777 Building)	*	*	*	*	*	*	*	*	*	*	*	*	*	*
41 St & Indian River Blvd		■■	*	*	*	*	*	*	*	*	*	*	*	*
45 St & Indian River Blvd		■■	*	*	*	*	*	*	*	*	*	*	*	*
Orchard Grove & 45 St		*	*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 45 St		*	*	■■	*	*	*	*	*	*	*	*	*	*
Gifford Health Center	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

4 IG Center to Main Transit Hub

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

IG Center to Main Transit Hub

IG Center	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
Oslo Rd & TCCH			*	*	*	*	*	*	*	*	*	*	*
Oslo Rd & 12 Ave SW			*	■■	*	*	*	*	*	*	*	*	*
Oslo Rd & 10 Ave SW			*	■■	*	*	*	*	*	*	*	*	*
Oslo Rd & 8 Ct SW			*	■■	*	*	*	*	*	*	*	*	*
Oslo Rd & Safari Golf			*	■■	*	*	*	*	*	*	*	*	*
S Vero Plaza (McDonalds roadside)	*		*	*	*	*	*	*	*	*	*	*	*
Vista Royale (roadside)			*	■■	*	*	*	*	*	*	*	*	*
US 1 & 1 St			*	*	■■	*	*	*	*	*	*	*	*
US 1 & 4 St			*	*	■■	*	*	*	*	*	*	*	*
IR Blvd & Vista Gardens			*	*	■	*	*	*	*	*	*	*	*
IR Blvd & 8 St			*	■	*	*	*	*	*	*	*	*	*
IR Blvd & 12 St			*	*	■■	*	*	*	*	*	*	*	*
IR Blvd & Indian River Apts			■■	*	*	*	*	*	*	*	*	*	*
IR Blvd & Bridgewater Medical			*	*	■	*	*	*	*	*	*	*	*
17 St & 3 Ct			*	*	■■	*	*	*	*	*	*	*	*
6 Ave & 16 St			*	*	■■	*	*	*	*	*	*	*	*
Gardenia Gardens			*	*	*	*	*	*	*	*	*	*	*
6 Ave & 12 St			*	*	■■	*	*	*	*	*	*	*	*
6 Ave & 8 St			*	*	■	*	*	*	*	*	*	*	*
US 1 & 8 St			*	*	■■	*	*	*	*	*	*	*	*
US 1 & 12 St			*	*	■	*	*	*	*	*	*	*	*
IR Plaza - Dollar Store			*	■■	*	*	*	*	*	*	*	*	*
Kmart			*	*	*	■	*	*	*	*	*	*	*

Main Transit Hub to IG Center

Main Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
Kmart		*	*	*	*	■	*	*	*	*	*	*	*
IR Plaza - Dollar Store		*	■■	*	*	*	*	*	*	*	*	*	*
US 1 & 12 St		*	*	■	*	*	*	*	*	*	*	*	*
US 1 & 10 St (The Source)		■■	*	*	*	*	*	*	*	*	*	*	*
US 1 & 8 St		*	*	■■	*	*	*	*	*	*	*	*	*
6 Ave & 8 St		*	*	■	*	*	*	*	*	*	*	*	*
6 Ave & 12 St		*	*	■■	*	*	*	*	*	*	*	*	*
Gardenia Gardens		*	*	*	*	*	*	*	*	*	*	*	*
6 Ave & 16 St		*	*	■■	*	*	*	*	*	*	*	*	*
17 St & 3 Ct		*	*	■■	*	*	*	*	*	*	*	*	*
IR Blvd & Bridgewater Medical		*	*	*	*	*	*	*	*	*	*	*	*
IR Blvd & Indian River Apts		■■	*	*	*	*	*	*	*	*	*	*	*
IR Blvd & 12 St		*	*	■■	*	*	*	*	*	*	*	*	*
IR Blvd & 8 St		*	*	■	*	*	*	*	*	*	*	*	*
IR Blvd & Velde Ford		*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 1 St		*	*	■■	*	*	*	*	*	*	*	*	*
Vista Royale (roadside)		*	■■	*	*	*	*	*	*	*	*	*	*
Oslo Rd & US 1		*	*	■■	*	*	*	*	*	*	*	*	*
Oslo Rd & Safari Golf		*	■■	*	*	*	*	*	*	*	*	*	*
Oslo Rd & 8 Ct SW		*	■■	*	*	*	*	*	*	*	*	*	*
Oslo Rd & 10 Ave SW		*	■■	*	*	*	*	*	*	*	*	*	*
Oslo Rd & 12 Ave SW		*	■■	*	*	*	*	*	*	*	*	*	*
Oslo Rd & TCCH		*	*	■■	*	*	*	*	*	*	*	*	*
IG Center	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

5 Sebastian (North Area)

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

Sebastian River Medical Center to North County Transit Hub

Sebastian River Medical Center	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
Riverwalk Plaza (roadside US 1)		*	*	*	*	*	*	*	*	*	*	*	*
Walmart (north end of parking lot)	*	*	*	*	*	*	*	*	*	*	*	*	*
US 1 & Davis St			*	*	■	*	*	*	*	*	*	*	*
US 1 & Wendy's			*	*	■	*	*	*	*	*	*	*	*
US 1 & Main St			*	*	■■	*	*	*	*	*	*	*	*
Grace's Landing			*	*	■	*	*	*	*	*	*	*	*
Main St & Gibson St			*	■	*	*	*	*	*	*	*	*	*
Main St & Powerline Rd			*	*	*	*	*	*	*	*	*	*	*
Pelican Isle Apartments			*	*	*	*	*	*	*	*	*	*	*
Main St & Easy St			*	*	■■	*	*	*	*	*	*	*	*
Main St & Poinciana St			*	■■	*	*	*	*	*	*	*	*	*
Main St & Fleming St			*	■■	*	*	*	*	*	*	*	*	*
Fleming St & Hibiscus Ave			■■	*	*	*	*	*	*	*	*	*	*
Fleming St & Lake Dr			*	■■	*	*	*	*	*	*	*	*	*
Fleming St & Layport Dr			*	*	*	*	*	*	*	*	*	*	*
Fleming St & Vocelle Ave			*	■■	*	*	*	*	*	*	*	*	*
Vocelle Ave & Barber St			*	■■	*	*	*	*	*	*	*	*	*
Barber St & Cody			*	*	■	*	*	*	*	*	*	*	*
SR 512 & Roseland Rd			*	■■	*	*	*	*	*	*	*	*	*

North County Transit Hub to Sebastian River Medical Center

North County Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
Barber St & Cody		*	*	*	*	*	*	*	*	*	*	*	*
Vocelle Ave & Barber St		*	*	*	*	*	*	*	*	*	*	*	*
Fleming St & Vocelle Ave		■■	*	*	*	*	*	*	*	*	*	*	*
Fleming St & Layport Dr		*	*	*	*	*	*	*	*	*	*	*	*
Fleming St & Lake Dr		*	■■	*	*	*	*	*	*	*	*	*	*
Fleming St & Hibiscus Ave		■■	*	*	*	*	*	*	*	*	*	*	*
Main St & Fleming St		*	■■	*	*	*	*	*	*	*	*	*	*
Main St & Poinciana St		*	*	■	*	*	*	*	*	*	*	*	*
Main St & Easy St		*	*	■■	*	*	*	*	*	*	*	*	*
Pelican Isle Apartments		*	*	*	*	*	*	*	*	*	*	*	*
Main St & Powerline Rd		*	*	*	*	*	*	*	*	*	*	*	*
Main St & Gibson St		*	■	*	*	*	*	*	*	*	*	*	*
Grace's Landing		*	*	■■	*	*	*	*	*	*	*	*	*
US 1 & Main St		*	*	■■	*	*	*	*	*	*	*	*	*
US 1 & Wendy's		*	*	■■	*	*	*	*	*	*	*	*	*
US 1 & Davis St		*	*	■■	*	*	*	*	*	*	*	*	*
Roseland Plaza		*	*	■■	*	*	*	*	*	*	*	*	*
Sebastian River Medical Center	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

6 IG Center to Main Transit Hub

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

IG Center to Main Transit Hub

IG Center	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
The Preserve at Oslo			■■	*	*	*	*	*	*	*	*	*	*
13 Pl & 20 Ave SW			*	*	*	*	*	*	*	*	*	*	*
15 St & 20 Ave SW			*	*	*	*	*	*	*	*	*	*	*
17 Lane SW & 20 Ave SW			*	*	*	*	*	*	*	*	*	*	*
17 Lane SW & 15 Ave SW			*	*	*	*	*	*	*	*	*	*	*
17 Lane SW & Highland Dr			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 19 St SW			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 21 St SW			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 10 Ave SW			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 8 Ave SW			*	*	*	*	*	*	*	*	*	*	*
Highlands Clubhouse			■■	*	*	*	*	*	*	*	*	*	*
Highland Dr & Sunrise Dr SW	*		*	*	*	*	*	*	*	*	*	*	*
Highland Dr & Old Dixie Hwy	*		*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 13 Lane SW	*		*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 10 St SW (UP)*			*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 4 Pl SW			*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 3 St SW			*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 1 St SW			*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 2 St			■■	*	*	*	*	*	*	*	*	*	*
Homeless Family Ctr & 4 St		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 8 St			■■	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 12 St			*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 14 Ave			*	*	*	*	*	*	*	*	*	*	*

Main Transit Hub to IG Center

Main Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
Old Dixie Hwy & 14 Ave		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 12 St		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 8 St			■■	*	*	*	*	*	*	*	*	*	*
Homeless Family Ctr & 4 St		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 2 St			■■	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 1 St SW		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 3 St SW		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 4 Pl SW		*	*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 10 St SW (UP)*			*	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 13 Lane SW	*		*	*	*	*	*	*	*	*	*	*	*
Highland Dr & Old Dixie Hwy	*		*	*	*	*	*	*	*	*	*	*	*
Highland Dr & Sunrise Dr SW	*		*	*	*	*	*	*	*	*	*	*	*
Highlands Clubhouse			■■	*	*	*	*	*	*	*	*	*	*
Highland Dr & 8 Ave SW			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 10 Ave SW			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 21 St SW			*	*	*	*	*	*	*	*	*	*	*
Highland Dr & 19 St SW			*	*	*	*	*	*	*	*	*	*	*
17 Lane SW & Highland Dr	*		*	*	*	*	*	*	*	*	*	*	*
17 Lane SW & 15 Ave SW	*		*	*	*	*	*	*	*	*	*	*	*
17 Lane SW & 20 Ave SW	*		*	*	*	*	*	*	*	*	*	*	*
15 St SW & 20 Ave SW			*	*	*	*	*	*	*	*	*	*	*
13 Pl SW & 20 Ave SW			*	*	*	*	*	*	*	*	*	*	*
The Preserve at Oslo	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

7 IG Center to Indian River Mall

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

IG Center to Indian River Mall

IG Center	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
The Preserve at Oslo (Oslo Rd)	*	*	*	*	*	*	*	*	*	*	*	*	*
Oslo Rd & 27 Ave (Dollar General)	*	*	*	*	*	*	*	*	*	*	*	*	*
27 Ave & 5 St SW		*	*	*	*	*	*	*	*	*	*	*	*
27 Ave & 1 St SW		*	*	*	*	*	*	*	*	*	*	*	*
27 Ave & 4 St		*	■	*	*	*	*	*	*	*	*	*	*
27 Ave & 8 St		*	■	*	*	*	*	*	*	*	*	*	*
20 Ave & 8 St		*	■	*	*	*	*	*	*	*	*	*	*
20 Ave & 10 Pl		*	■■	*	*	*	*	*	*	*	*	*	*
20 Ave & 12 St		*	■■	*	*	*	*	*	*	*	*	*	*
27 Ave & 12 St		*	■■	*	*	*	*	*	*	*	*	*	*
27 Ave & 16 St		*	■■	*	*	*	*	*	*	*	*	*	*
Leisure Square & 16 St		■■	*	*	*	*	*	*	*	*	*	*	*
43 Ave & 16 St		*	■■	*	*	*	*	*	*	*	*	*	*
20 St & 50 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
20 St & 53 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
20 St Panera (roadside)		■■	*	*	*	*	*	*	*	*	*	*	*
20 St Bob Evans (roadside)		*	*	*	*	*	*	*	*	*	*	*	*

Indian River Mall to IG Center

Indian River Mall	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
Chik-Fil-A (roadside)		■■	*	*	*	*	*	*	*	*	*	*	*
Walmart (SR 60)		*	■■	*	*	*	*	*	*	*	*	*	*
SR 60 & 50 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
43 Ave & 16 St		*	■■	*	*	*	*	*	*	*	*	*	*
Leisure Square & 16 St		■■	*	*	*	*	*	*	*	*	*	*	*
27 Ave & 16 St		*	■■	*	*	*	*	*	*	*	*	*	*
27 Ave & 12 St		*	■■	*	*	*	*	*	*	*	*	*	*
20 Ave & 12 St		*	■■	*	*	*	*	*	*	*	*	*	*
20 Ave & 10 Pl		*	■■	*	*	*	*	*	*	*	*	*	*
20 Ave & 8 St		*	■	*	*	*	*	*	*	*	*	*	*
27 Ave & 8 St		*	■	*	*	*	*	*	*	*	*	*	*
27 Ave & 4 St		*	■	*	*	*	*	*	*	*	*	*	*
27 Ave & 1 St SW		*	*	*	*	*	*	*	*	*	*	*	*
27 Ave & 5 St SW		*	*	*	*	*	*	*	*	*	*	*	*
Oslo Rd & 27 Ave (Dollar General)	*	*	*	*	*	*	*	*	*	*	*	*	*
The Preserve at Oslo		■■	*	*	*	*	*	*	*	*	*	*	*
IG Center	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

8 Gifford Health Center to Main Transit Hub

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

Gifford Health Center to Main Transit Hub

Gifford Health Center	6:00	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00
45 St & 30 Ave			*	■■	*	*	*	*	*	*	*	*	*
45 St & 33 Ave			*	■■	*	*	*	*	*	*	*	*	*
35 Ave & 44 St			*	■■	*	*	*	*	*	*	*	*	*
43 St & 33 Ave			*	■■	*	*	*	*	*	*	*	*	*
43 St & 31 Ave			*	■■	*	*	*	*	*	*	*	*	*
43 St & 28 Ave			*	■■	*	*	*	*	*	*	*	*	*
43 St & 26 Ave			*	■■	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 41 Ave		■■	*	*	*	*	*	*	*	*	*	*	*
US 1 & 38 Lane			*	■■	*	*	*	*	*	*	*	*	*
Health Department		*	*	*	*	*	*	*	*	*	*	*	*
27 St & UP Center		*	*	*	*	*	*	*	*	*	*	*	*
26 St & St Lucie Ave		■■	*	*	*	*	*	*	*	*	*	*	*
14 Ave & 23 St			*	■■	*	*	*	*	*	*	*	*	*
19 St & 20 Ave			*	■■	*	*	*	*	*	*	*	*	*
19 St & 16 Ave			*	■■	*	*	*	*	*	*	*	*	*
14 Ave & 16 St			*	■■	*	*	*	*	*	*	*	*	*

Main Transit Hub to Gifford Health Center

Main Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30
14 Ave & 16 St		*	■■	*	*	*	*	*	*	*	*	*	*
14 Ave & 19 St		*	■■	*	*	*	*	*	*	*	*	*	*
14 Ave & 23 St		*	■■	*	*	*	*	*	*	*	*	*	*
26 St & St Lucie Ave		■■	*	*	*	*	*	*	*	*	*	*	*
27 St & UP Center		*	*	*	*	*	*	*	*	*	*	*	*
Health Department		*	*	*	*	*	*	*	*	*	*	*	*
US 1 & 38 Lane		*	■■	*	*	*	*	*	*	*	*	*	*
Old Dixie Hwy & 41 Ave		■■	*	*	*	*	*	*	*	*	*	*	*
43 St & 26 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
43 St & 28 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
43 St & 31 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
43 St & 33 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
35 Ave & 44 St		*	■■	*	*	*	*	*	*	*	*	*	*
45 St & 33 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
45 St & 30 Ave		*	■■	*	*	*	*	*	*	*	*	*	*
Gifford Health Center	7:00		8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00

9 North County Transit Hub to Indian River Mall

- Saturday hours of operation 8:00 a.m. – 5:00 p.m.
- Holiday hours of operation follow regular schedule.

North County Transit Hub to Indian River Mall

North County Transit Hub	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30
Sebastian River High School		■■	*	*	*	*	*	*	*	*	*	*
CR 510 & Vero Lake Estates		*	*	*	*	*	*	*	*	*	*	*
86 Lane & 66 Ave	*		*	*	*	*	*	*	*	*	*	*
86 Lane & 64 Ave	*		*	*	*	*	*	*	*	*	*	*
64 Ave & 85 St			*	*	*	*	*	*	*	*	*	*
85 St & 62 Ave			*	*	*	*	*	*	*	*	*	*
85 St & 59 Ave			*	*	*	*	*	*	*	*	*	*
58 Ave & 81 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 77 St			*	*	*	*	*	*	*	*	*	*
58 Ave & Syngenta			*	■■	*	*	*	*	*	*	*	*
58 Ave & 69 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 65 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 57 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 49 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 45 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 41 St			*	*	*	*	*	*	*	*	*	*
58 Ave & 37 St			*	*	*	*	*	*	*	*	*	*
26 St & Woodfield Blvd			*	*	*	*	*	*	*	*	*	*

Indian River Mall to North County Transit Hub

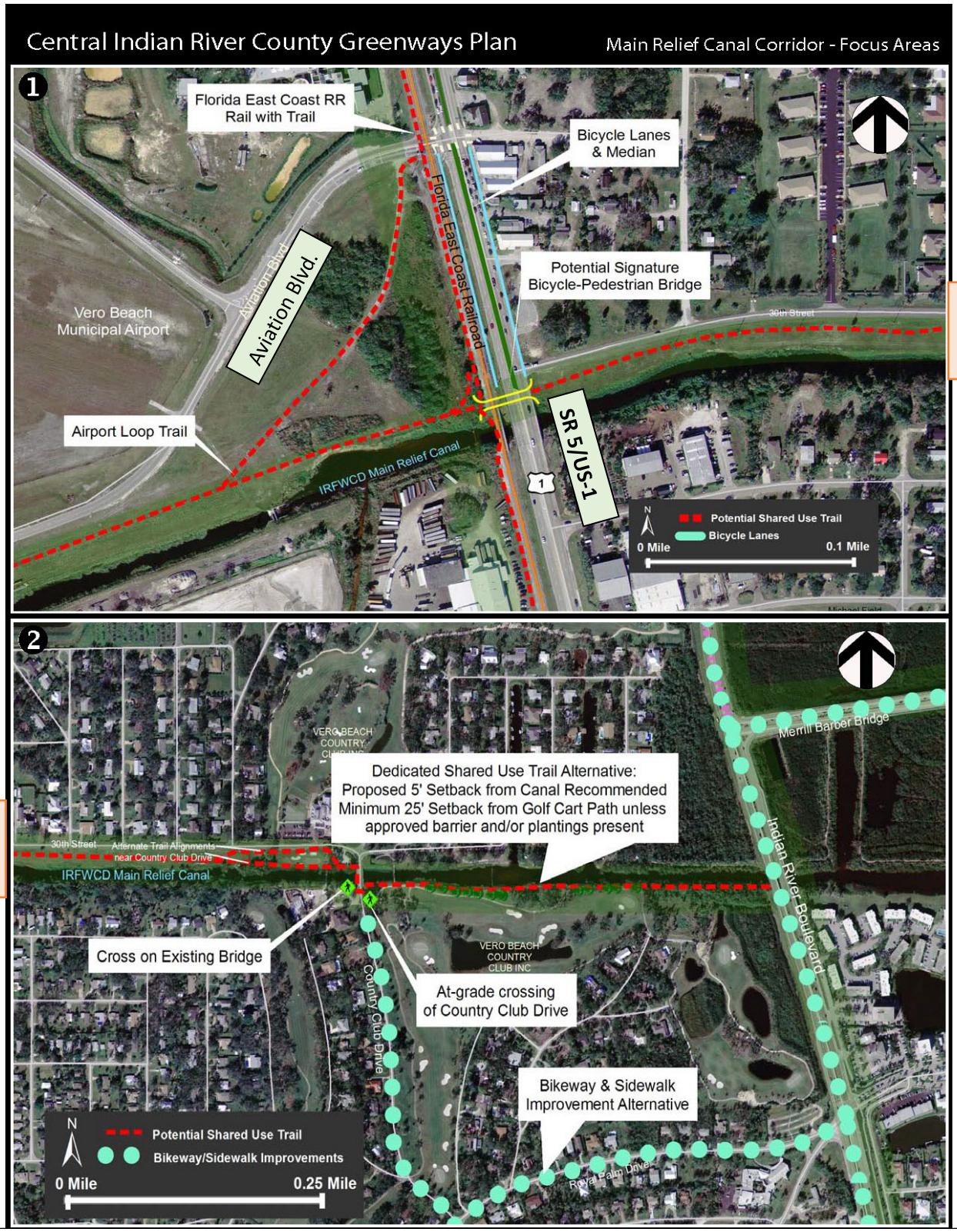
| Indian River Mall | 6:00 | 7:00 | 8:00 |

SR 5/US 1 - Pavement Summary Report

Test Date	Dist	loadway Id	SR	US	Sys	Rdwy	Type	Lane	Rated Lane	BMP	EMP	NLetn	IRI	RN	LRsurt	MRaunt	PAT	RAV	DCWd	DCOd	CW	CO	RCrake	RRaute	RRideet	TCrke	Remarks
6/5/2023	4	88010000	5	1	1	3	1	2	R2	4.058	4.779	0.704	132	3.32	0.10				3	1.5	G	G	5.5	9	6.3	C	DEP BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	4.779	5.845	1.060	129	3.25	0.18				2	1	F	F	7	9	6.4	C	BW DEP BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	5.845	7.268	1.360	105	3.73	0.17				1	0.5	B	B	8.5	9	7.0	C	BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	7.268	7.930	0.628	98	3.87	0.25				1	1	B	F	8	8	7.2	C	RIP DEP BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	7.930	13.625	5.647	66	4.01	0.12			L1	1	0.5	I	B	8.5	9	8.1	C	RAV BLD SCR
6/1/2023	4	88010000	5	1	1	3	1	2	R2	13.625	14.860	1.230	94	3.72	0.15				1	0.5	B	B	8.5	9	7.3	C	DEP BLD COR
6/1/2023	4	88010000	5	1	1	3	1	2	R2	14.860	18.770	3.910	67	3.83	0.11			L1	2.5	1	J	J	6.5	9	8.0	C	RAV BLD
6/1/2023	4	88010000	5	1	1	3	1	2	R2	18.770	19.940	1.112	113	3.24	0.16				2.5	1	J	F	6.5	9	6.8	C	BW DEP BLD DEL SPL
6/1/2023	4	88010000	5	1	1	3	1	2	R2	19.940	22.269	2.305	91	3.58	0.08				2.5	1	J	F	6.5	9	7.4	C	RIP DEP DEL
6/1/2023	4	88010000	5	1	1	2	1	2	L2	19.940	22.269	2.311	87	3.62	0.09				2.5	1	J	F	6.5	9	7.5	C	RIP DEP DEL
6/1/2023	4	88010000	5	1	1	2	1	2	L2	18.770	19.940	1.160	116	3.35	0.17				3	1	G	F	6	9	6.7	C	BW DEP
6/1/2023	4	88010000	5	1	1	2	1	2	L2	14.860	18.770	3.899	78	3.71	0.11			L1	4.5	1	K	J	4.5	9	7.8	C	RAV MH RIP DEP BLD
6/5/2023	4	88010000	5	1	1	2	1	2	L2	13.625	14.860	1.228	84	3.88	0.16				1	0.5	B	B	8.5	9	7.6	C	BLD
6/5/2023	4	88010000	5	1	1	2	1	2	L2	7.930	13.625	5.645	64	4.02	0.13			L1	1	0.5	I	B	8.5	9	8.1	C	RAV BLD SCR
6/5/2023	4	88010000	5	1	1	2	1	2	L2	7.268	7.930	0.657	90	3.95	0.28				1	0.5	B	B	8.5	8	7.4	C	
6/5/2023	4	88010000	5	1	1	2	1	2	L2	5.845	7.268	1.379	91	3.57	0.11				1	0.5	B	B	8.5	9	7.4	C	
6/5/2023	4	88010000	5	1	1	2	1	2	L2	4.779	5.845	1.037	130	3.39	0.20				2	1	F	F	7	8	6.3	C	BW
6/5/2023	4	88010000	5	1	1	2	1	2	L2	4.058	4.779	0.669	123	3.35	0.12				3	1.5	G	G	5.5	9	6.5	C	
6/5/2023	4	88010000	5	1	1	2	1	3	L2	1.829	4.058	2.171	72	3.85	0.11				1	0.5	B	B	8.5	9	7.9	C	DEP BLD

Appendix C – Environmental

Central Indian River County Greenways Plan Map



Michael Field Complex Map

Official with Jurisdiction, City of Vero Beach

Appendix D – Value Engineering

Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEMORANDUM

DATE: April 22, 2024

TO: Kadian McLean, District Value Engineering Administrator

FROM: John P. Krane, P.E., Director of Transportation Development

COPIES: John Olson, P.E., Anson Sonnett, P.E., Vandana Nagole, P.E., VE Team Members

SUBJECT: **Value Engineering Study Responses**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County, Florida
FPID: 441693-1-22-02
ETDM Number: 14475

This memorandum is in response to the Value Engineering (VE) study conducted the week of December 4 through December 8, 2023. The VE Team generated 13 recommendations that were considered by the PD&E team and attendees at the VE Resolution meeting. Responses to the VE recommendations are provided in this memorandum. Four VE recommendations were accepted and two VE recommendations are partially accepted. Refer to Table 1 on page 6.

Recommendation RD 1: Roadway
One southbound (SB) right turn lane with longer storage to westbound (WB) Aviation Boulevard. Possible cost avoidance of $768,000.

Response: Not accepted. Reducing the SR 5 southbound dual right turn to westbound Aviation Boulevard to a single lane degrades the traffic operations to Level of Service (LOS) to "F" on the southbound SR 5 through movement and northbound SR 5 left turn. The overall intersection delay increases to near the LOS D/E threshold. The single SB right turn lane carries 566 vph and requires 660 foot of storage, taper and deceleration distance. The RD-1 turn lane taper location would result in the same location as the proposed PD&E curb line due to the curvature of the SB alignment which ties to existing curb line. Therefore, the through lanes would not shift and right of way impacts would not be reduced.

This right turn movement crosses the FEC railroad tracks and has the potential to experience large queues during closure of the railroad gates. Providing dual right turn lanes provides storage and keeps the SR 5 southbound lanes clear and will assist in clearing the queued cars faster after the railroad gates open. Due to these geometric and operational issues, and negligible cost savings RD-1 is not accepted.

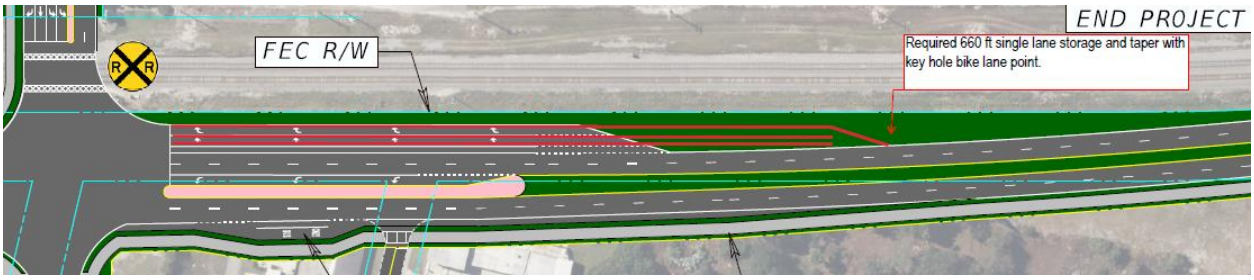


Figure 1: RD-1 Condition with Single Right Turn

Recommendation RD 2: Roadway

One northbound (NB) left turn lane with longer storage to WB Aviation Boulevard. If the recommendation can be implemented, there is a possible cost avoidance of $768,000.

Response: Not accepted. Reducing the northbound SR 5 to westbound Aviation Boulevard left turn lane to a single lane degrades the traffic operations to Level of Service (LOS) to "F" on the southbound SR 5 through movement and northbound SR 5 left turn. The overall intersection delay increases and reaches the LOS D/E threshold.

The SB traffic separator location controls the NB edge of pavement. Elimination of one NB left turn lane shifts the through lanes creating a three-degree deflection of the NB through lanes across the intersection. The three-degree deflection is the maximum deflection allowed through an intersection per FDM Table 212.7.1. If one left turn lane was removed per RD-2 the proposed right of way line would pass through all the same buildings, the same number of parcels are affected and the 93 foot width of impact is reduced to 82 ft. The acquisition of the business buildings would remain the same as the original alternative.

This left turn movement crosses the FEC railroad tracks and has the potential to experience larger queues during closure of the railroad gates. Providing dual left turn lanes increases storage to reduce queue spill over into the through lanes and assist in clearing the queued cars faster after the railroad gates open. Due to these operational issues, the recommendation is not accepted.

Recommendation RD 3: Roadway

Continuation of the bike lanes north of Aviation Boulevard. If the recommendation can be implemented, there is a possible cost addition of $18,000.

Response: Accept. This recommendation is to continue the bike lanes further north on SR 5 and provide a northbound connection to the shared use path on the east side. RD-3 is accepted.

Figure 2: RD-3 Implementation

Recommendation RD 4: Roadway

Reconfigure SR 5 and Aviation Boulevard intersection per Alternative 9. This alternative was developed as an additional attempt to avoid Camp Haven Rehabilitation Center and was evaluated by the multidiscipline team during the VE Study. This alternative would have a possible cost addition of $2,525,000. The VE Study recommended this alternative be dropped from consideration due to the low functional score and increased right of way impacts.

Response: Dropped. Alternative 9 proposed a bifurcated US 1, similar to Alternative 2, but only provided an eastbound movement for Aviation Boulevard between the bifurcated intersections on SR 5. Westbound Aviation Boulevard movements are re-routed to a new signalized intersection north of Aviation Boulevard and then U-turn to travel south on SR 5 and then travel westbound on Aviation Boulevard. This alternative received a low functional score of -17 during the VE Study with increased right of way impacts and a cost increase of $2,525,000, therefore RD-4 was dropped during the VE Study.

Recommendation RD 5: Roadway

One NB left turn lane and one SB right turn lane on SR 5. If the recommendation can be implemented, there is a possible cost avoidance of $1,535,000.

Response: Not accepted. This recommendation combined recommendations RD 1 and RD 2. RD 1 and RD 2 are not accepted due to operational concerns; therefore RD 5 is not accepted.

Recommendation RD 6: Roadway

Reconstruct 13th Avenue between 30th Street and 33rd Street. If the recommendation can be implemented, there is a possible cost addition of $117,000.

Response: Not accepted. This recommendation called for the local side street of 13th Avenue to be reconstructed from 30th Street to 33rd Street. This recommendation is not accepted as 13th Avenue is a local city street, under the jurisdiction of the City of Vero Beach and will be updated when the area redevelops. RD 6 is not accepted.

Recommendation RD 7: Roadway

Reconfigure 13th Avenue and 33rd Street to create a right-angle intersection with Aviation Boulevard. If the recommendation can be implemented, there is a cost addition of $710,000.

Response: Not Accepted. This recommendation proposed realigning 13th Avenue and 33rd Street to create a perpendicular connection with Aviation Boulevard. These two streets are under the jurisdiction of the City of Vero Beach and RD-7 would increase right of way cost and impacts.

This connection should be evaluated during the SR 5 design phase to be consistent with the county's design phase of Aviation Boulevard extension project. RD 7 should be forwarded to the design phase. Modifications to 13th Avenue and 33rd Street connections should not be included in the PD&E project and would be best addressed by the county in the extension project.

Recommendation RD 8: Roadway

Tie Aviation Boulevard into 32nd Street. If the recommendation can be implemented, there is a possible cost avoidance of $3,628,000.

Response: Not Accepted. This recommendation proposes a tangent alignment for Aviation Boulevard parallel to 32nd Street. The VE alignment requires a new 32nd Avenue alignment located north of the existing alignment. This would require additional R/W acquisition and abandoning the existing 32nd Street as surplus property. RD 8 would be discarded once the county's Aviation Blvd extension project is built. The county extension project was a two-lane roadway not a four-lane roadway and the PD&E Aviation Boulevard connection to 33rd Street was a two-lane roadway. Coordination with FDOT OEM on January 16, 2023, concluded the Preferred Alternative with the connection to 33rd Street met the purpose and need, therefore it would move forward to design phase. Therefore RD 8 is not accepted.

Recommendation RD 9: Roadway

Provide two through lanes and one right turn lane at the intersection of Aviation Boulevard and Airport N Drive. If the recommendation can be implemented, there is a possible cost addition of $85,000.

Response: Accept. The VE team recommended extending the two westbound through lanes on Aviation Boulevard at Airport N Drive and providing a dedicated right turn lane onto Airport N Drive. The project team accepts this recommendation to provide additional capacity through the intersection and improve operations.

Figure 3: RD-9 Implementation

Recommendation RD 10: Roadway

Provide SB left turn lane to 28th Street. If the recommendation can be implemented, there is a possible cost avoidance that is negligible.

Response: Accept. This recommendation proposes to add a southbound left turn lane from SR 5 to 28th Street. There is an existing southbound to eastbound left turn provided at this location. RD 10 is accepted.

Figure 4: RD-10 Implementation

Recommendation RD 11: Roadway

Incorporate shared use path around pond. If the recommendation can be implemented, there is a possible cost addition of $99,000.

Response: Partially Accepted. The VE team recommended adding a shared use path around one of the proposed pond locations. This recommendation will be coordinated with the city, county, and MPO to see if the path would support future trails and if it is a desired community feature. Support is needed from the local community prior to implementation. The evaluation in the design phase would determine pond slopes, depth, right of way, safety and maintenance needs related to the walkway. RD 11 is partially accepted.

Recommendation RD 12: Roadway

Add bike lane NB SR 5 on bridge. If the recommendation can be implemented, there is a possible cost addition of $271,000.

Response: Accepted. This recommendation adds a northbound on-street bike lane on the SR 5 bridge over Main Canal for future compatibility with on-street bike lanes south of the project. The bridge replacement will have a 70 year life-span and should not preclude future bike lanes. The preferred alternative includes bike lanes from the bridge to north of Aviation Boulevard. A 12-foot-wide shared use path is proposed across the bridge and located adjacent to the northbound side of SR 5. The northbound bike lane will begin at 28th Street and continue north across the bridge on a 8 ft 4 in shoulder. Adding the bike lane will add a minor amount of right of way acquisition in two parcels south of the bridge. RD 12 was accepted.

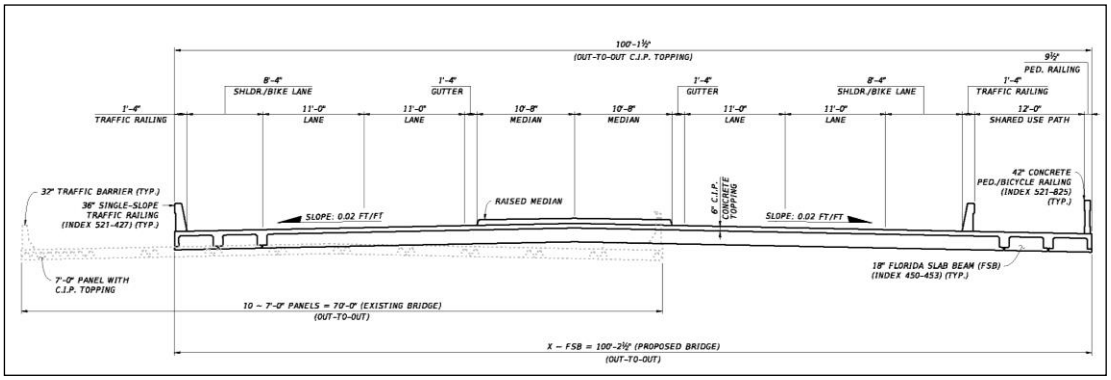


Figure 5: RD-12 Implementation NB Bike Lane on Main Canal Bridge

Recommendation RD 13: Roadway

Add pedestrian lighting for the sharded use path on the east side of US 1. If the recommendation can be implemented, there is a possible cost increase of $159,000.

Response: Partially Accepted. The VE team recommended adding pedestrian lighting for the shared use path on the east side of SR 5. RD 13 requires a lighting analysis study during the design phase and coordination with the airport and FAA regarding street lighting. This recommendation should be further discussed with the local maintaining agency to see if there is local support for pedestrian lighting, cost participation and maintenance. If local support is identified during the PD&E study RD 13 should be evaluated in the design phase when the lighting analysis is conducted. RD 13 is partially accepted.

Table 1 Value Engineering Recommendation Decision

Item	Value Engineering Recommendation	Functional Score	VE Cost Avoidance (Addition)	Decision
RD-1	One right turn lane with longer storage SB US-1 to WB Aviation Blvd	2	$768,000	Not Accepted
RD-2	One left turn lane with longer storage NB US-1 to WB Aviation Blvd	2	$698,000	Not Accepted
RD-3	Continuation of bike lanes north of Aviation Blvd	4	($18,000)	Accepted
RD-4	Reconfigure US-1 and Aviation Blvd intersection per Alternative 9	-17	($2,525,000)	Dropped
RD-5	One left turn lane NB US-1 and one right turn lane SB US-1 to WB Aviation Blvd	2	$1,535,000	Not Accepted
RD-6	Reconstruct 13th Ave between 30th St & 33rd St	5	($117,000)	Not Accepted
RD-7	Reconfigure 13th Ave and 33rd St to create a right-angle intersection with Aviation Blvd	9	($710,000)	Not Accepted
RD-8	Tie Aviation Boulevard into 32nd St	7	$3,628,000	Not Accepted
RD-9	Provide two through lanes and one right turn lane at the intersection Airport N. Drive	6	($85,000)	Accepted
RD-10	Provide left turn lane SB US-1 to EB 28th St	2	Negligible	Accepted
RD-11	Incorporate shared use path around pond	1	($99,000)	Partially Accepted
RD-12	Add bike lane NB US-1 on bridge	9	($271,000)	Accepted
RD-13	Add pedestrian lighting for the shared use path on the east side of US-1	2	($159,000)	Partially Accepted

Appendix E - Coordination

Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

DATE: October 28, 2022

TO: Attendees on sign-in sheet below

FROM: Vandana Nagole, PE, FDOT Project Manger

COPIES: n/a

SUBJECT: Meeting Notes – Local Coordination Meeting on 10/25/22

Summary of Meeting:

The purpose of the meeting was to coordinate the FDOT PD&E study with the IRC Aviation Boulevard extension project. The group was informed about the ongoing Public Kick-off Meeting activities and encouraged to attend the meeting on 10/27/22. An overview presentation covered the project's purpose and need, potential alternatives, and schedule.

The Aviation Boulevard discussion below focused on the segment from Airport Road to 13th Ave and the US-1 intersection.

1. The county desires the following features to be studied for the build typical sections:
    a. Two lane roadway (1-lane in each direction) with curb and gutter.
    b. 7 ft on-street bike lanes and/or
    c. One shared use path along the south side of Aviation Blvd if possible.

2. The horizontal alignment criteria was discussed.
    a. The existing right of way for Aviation Blvd is typically 74.5 feet and is set by agreement between the City/Airport and Federal Aviation Agency (FAA). The City noted the FAA is strict within the Runway Protection Zone (RPZ), and will not likely to support expanding the roadway right of way within the RPZ.
    b. The alignment for Aviation Blvd at the railroad crossing should minimize the skew to the railroad to the extent that is practical.
    c. The design speed of Aviation Blvd will be 30 mph. Horizontal curvature will likely require some superelevation to provide a minimum skew crossing and stay within the existing roadway right of way west of the FEC railroad R/W.

3. Railroad crossing discussion:
    a. The city requested the crossing to meet quiet zone requirements and incorporate sealed corridor features, and/or medians.
    b. The city is the leasee on the active railroad crossing agreement with FEC that will require modification to be consistent with the selected PD&E build alternatives. The city requested cost sharing with the FDOT for the proposed wider crossing.

4. Potential build alternatives
    a. Conventional intersection improvement
    b. Bifurcated or one-way pair
    c. US 1 overpass over Aviation Blvd

5. The city noted, they are not in favor of an overpass alternative.

6. The county noted, it is a good time to look at multiple alternatives and requested two additional Aviation Blvd alternatives to consider during alternatives analysis
    a. An overpass with Aviation Blvd elevated over US 1
    b. An underpass with Aviation Blvd under US 1
    c. These were briefly discussed on eliminating the at grade railroad crossing and using a quadrant intersection to the east and/or roundabout to handle the turning movements
    d. The FDOT will discuss the request for two additional alternatives with District 4 management.

7. The County provided an update on the Aviation Boulevard extension project
    a. The alignments are being developed and will be ready for coordination again round the Thanksgiving holiday.
    b. The FDOT will coordinate with the county where the two projects connect.
    c. The county anticipates having their project advance to construction ahead of the FDOT project.

8. The city provided an update on the Airport Master Plan update.
    a. The master plan update is in the 5 year update. Included is the potential development of the northern portion of airport property along 41st Street with industrial type of development.
    b. The relocation of the wastewater treatment plant to the water treatment property is still planned and not anticipated to affect the roadway project.

9. The next joint FDOT/City/County meeting will be held the last week of November or first week of December 2022.

The group is encouraged to contact the FDOT at any time with any questions or updates on the various projects, so the projects may move forward successfully.

The project meeting attendance report follows on the next page.

1. Summary			
Meeting title	**Technical Meeting 441693-1 SR5/US1 at Aviation Blvd PD&E Study**		
Attended participants	**15**		
Start time	10/25/22, 1:22:43 PM		
End time	10/25/22, 3:00:53 PM		
Meeting duration	1h 38m 10s		
Average attendance time	59m 43s		
2. Participants			
Name	**First join**	**In-meeting duration**	**Email**
William Evans	10/25/22, 1:22:49 PM	1h 16m 14s	William.Evans@wginc.com
Robert Winslow	10/25/22, 1:23:30 PM	1h 15m 22s	Robert.Winslow@wginc.com
Matthew Mitts (COVB) (Guest)	10/25/22, 1:27:04 PM	1h 11m 33s	mmitts@covb.org
John Thompson	10/25/22, 1:29:01 PM	1h 9m 44s	JThompson@hanson-inc.com
Jason Jeffries (Guest)	10/25/22, 1:29:41 PM	1h 9m 2s	jjeffries@covb.org
Julieta Rivero-Manso	10/25/22, 1:30:42 PM	1h 8m 3s	JManso@hanson-inc.com
Nagole, Vandana	10/25/22, 1:31:15 PM	1h 7m 31s	Vandana.Nagole@dot.state.fl.us
Godfrey Lamptey	10/25/22, 1:32:46 PM	1h 1m 9s	godfrey.lamptey@goalassociates.com
Blake Swafford	10/25/22, 1:33:09 PM	1h 5m 33s	BSwafford@hanson-inc.com
James W. Ennis - IRC PW (Guest)	10/25/22, 1:34:44 PM	1h 3m 54s	jennis@ircgov.com
Phil Matson	10/25/22, 1:35:37 PM	1h 6m 3s	pmatson@ircgov.com
Brian Freeman (Guest)	10/25/22, 1:37:00 PM	1h 23m 52s	bfreeman@ircgov.com
Rich Szpyrka - IRC PW (Guest)	10/25/22, 1:49:30 PM	25m 24s	rszpyrka@ircgov.com

WE:we

Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

MEETING DATE: March 28, 2023 at 10:00 AM via TEAMS call

SUBJECT: Local Coordination Meeting with Vero Beach Regional Airport and FAA
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Meeting Purpose and Summary:

The purpose of the meeting was to clarify the action items related to the FDOT PD&E build alternatives presented to the Vero Beach Regional Airport and Federal Aviation Administration in a prior coordination memorandum. The range of PD&E build alternatives have modifications either at the existing ground level, elevated and/or depressed roadway sections. All alternatives require some adjustment to the existing right of way along Aviation Boulevard.

The meeting started with a recap of the ongoing coordination between FDOT, Federal Aviation Administration (FAA) and the Vero Beach Regional Airport (VRB).

1. **Runway Protection Zone** (RPZ)
    a. **RPZ analysis need:** Discussion on relocating the Aviation Boulevard crossing at the FEC Railroad to another location outside of the RPZ was previously found not viable in prior VRB studies and correspondence. Therefore, the parties concurred that relocating the Aviation Boulevard was not possible and an RPZ analysis was required to evaluate the PD&E Alternative(s).

    b. **RPZ / PD&E Alternatives:** FAA noted the runway protection zone (RPZ) analysis is to determine and document that there is no other alternative available other than a proposed build alternative. The FAA noted that all PD&E alternatives that are under consideration should be reviewed in the RPZ analysis. The VRB stated the airport and City Council are opposed to an overpass alternative and however the city and VRB are in support of Alternative 1 which has an at-grade railroad crossing. FDOT noted the PD&E process includes the public comments into the decision making process and technical RPZ analysis as well.

    c. **Responsible party:** The VRB and FAA noted that since this was an FDOT initiated project, the FDOT should fund and conduct the RPZ analysis. FDOT concurred that the FDOT would fund and conduct the RPZ analysis. The VRB requested an opportunity to review the draft RPZ scope of work prior to issuing the work order.
        i. **Action item:** FDOT to send draft scope to VRB and initiate a work order to conduct the RPZ with the FDOT Aviation consultant through the District 4 Aviation office.

d. **Timeline and review process:** Three months is anticipated to complete the RPZ analysis and review process. The FDOT will prepare the RPZ analysis, VRB reviews or comments then issues a recommendation to FAA, and then FAA finalizes the recommendation with a response to VRB and FDOT.
e. **Contact person:** William Howard (VRB) and John Thompson (VRB/Hanson), and Laurie McDermont (FDOT).

2. Environmental:

a. VRB asked FAA if an environmental review would be required such as a Cat Ex or 153 Application. FAA responded a minor environmental review would be required and Amy Reed would be the reviewer.
b. Expansion of existing stormwater ponds within the RPZ was discussed. FDOT noted there are existing drainage ditches and existing ponds within the RPZ, however due to the archeological zone, those pond expansions may have cultural impacts. FAA noted that expansion of the existing stormwater ponds in the RPZ or archeological zone are not desired and would not be approved.
c. FDOT brought up the Vero Beach Ice Age Archeological Zone which is loosely defined as being located between Aviation Boulevard, the Main Canal to the south and FEC Railroad to the east. FDOT has Janus Research conducting the cultural resource analysis and report (CRAS) and has initiated the archeological testing for the project. FAA noted Amy Reed would be interested in the findings of the CRAS.

3. Airspace Analysis (AA) and Obstruction Evaluation (OE)

a. **Airspace Analysis:** AA submittal is mandatory during the design phase to review and approve the project. However, a preliminary AA can be prepared during the PD&E phase with the preferred alternative or a limited number of viable alternatives. FAA noted not to overwhelm the system with all eight alternatives. A separate AA case or form submittal is required for each PD&E alternative and a separate FAA response would be given for each AA case or alternative that is submitted.
b. **Obstruction Evaluation:** The OE is to be completed in the design phase when 60% design plans are being prepared for construction and not during PD&E.
c. **AA/OE submittal:** These evaluations require submittal of a PD&E alternative in plan view showing the elevation of select ground, roadway, and above ground project features such as lighting, bridges, signs, signals. Prior to construction, a submittal for temporary construction activities is also required to identify crane, piling and/or other construction actions that are in or around the runway flight path or RPZ.
d. Approving authority: FAA receives recommendation from VRB. FAA is the approving authority. The AA/OE reviews for projects on airport property are completed by the FAA Orlando Regional office, and off airport property projects are reviewed in FAA Atlanta office.
e. Contact persons: William Howard (VRB) and John Thompson (VRB/Hanson), and Laurie McDermont (FDOT), and Bill Farris (FAA).

---continued---

4. Future Aviation Boulevard right of way needs:

f. VRB noted the FAA provided funding to extend the Aviation Boulevard roadway from 27th Avenue/20th Street/County Admin Road to SR 5/US-1.
g. FDOT would like to know the process to adjust/modify the right-of-way width and associated legal R/W or easement documents for the preferred PD&E build alternative.
h. The project involves widening Aviation Boulevard to add through and turn lanes at US-1 then taper back to the existing two-lane Aviation Boulevard roadway. A shared use pathway is being proposed on the south side of Aviation Blvd. The project may have curb and gutter and/or paved shoulders.
i. FDOT asked if there was any potential fatal flaw with the wider proposed right of way, at this time, VRB and FAA did not anticipate any fatal flaws. However, the FAA was interested in reviewing the cultural resource findings when they are available as it relates to the widening of the right of way.
j. **Action item:** FAA will research the right of way or easement agreements for Aviation Blvd and get back to FDOT and VRB.
k. **Action item:** FDOT will provide the cultural resource assessment report (CRAS) to the FAA for review.

The meeting concluded at 10:58AM.

Attendance Report

1. Summary	**441693-1-22-02 SR 5/US-1 at Aviation Blvd PD&E Study**
Meeting title	**VRB Airport, FAA and FDOT Coordination Meeting**
Attended participants	7
Start time	3/28/23, 9:54:22 AM
Meeting duration	58 minutes

2. Participants

Name	First Join	Email
William Evans	3/28/23, 9:57:17 AM	William.Evans@wginc.com
John Thompson	3/28/23, 9:57:22 AM	JThompson@hanson-inc.com
Will KVRB (Guest)	3/28/23, 9:58:03 AM	whoward@covb.org
McDermott, Laurie	3/28/23, 9:59:17 AM	Laurie.McDermott@dot.state.fl.us
Farris, Bill (FAA)	3/28/23, 10:00:27 AM	Bill.Farris@faa.gov
Wilson, Stephen (FAA)	3/28/23, 10:00:37 AM	Stephen.Wilson@faa.gov
Nagole, Vandana	3/28/23, 10:00:55 AM	Vandana.Nagole@dot.state.fl.us

MEETING NOTES
ALTERNATIVES SCREENING EVALUATION MATRIX MEETING

May 23, 2023

Project Name: SR 5 / US-1 at Aviation Blvd PD&E Study **WGI Project:** 02217003.00

Client Name: FDOT District 4 **Client Contract:** CAI127 **FDOT FM:** 441693-1-22-02

MEETING DISCUSSION

The attendees were briefed on the objective of this meeting which was to conduct a planning level comparison of the eight project alternatives, identify the best alternatives to move forward through the PD&E process, and to identify the alternatives to drop from further investigation.

Discussion Topics

1. A brief overview of the major factors influencing the alignments was provided. Those factors included the county extension of Aviation Blvd., FEC RR, narrow exist R/W, and runway protection zone (RPZ). The notable environmental factors are archeological, noise, aesthetics and local support either for or against an overpass.
2. A brief overview was provided of the previously reviewed Alternatives 1 through 6.
3. The two new Alternatives 7 and 8 were fully explained.
4. Alternative 7 Deflected Left Turn discussion:
    a. The DLT movement was developed for the northbound US-1 movement only.
    b. The team asked why the DLT for SB US-1 is not included. The PD&E team considered a southbound DLT and concluded not to advance the concept since that traffic movement was a very low volume and the second DLT signalized intersection pushes impacts into the golf driving range business and further constrains available queue storage between US-1 and 30th Street along Aviation Blvd. Adding the SB DLT would increase the number of lanes across US-1, increasing pedestrian crossing times and right of way needs. This could potentially push the 33rd Street connection further northeast and require a new quadrant road to be developed to relocated turns, provide storage and provide logical termini. It was concurred upon that the southbound DLT would not be advanced unless the DLT alternative was selected to move forward after the public alternatives workshop.
    c. Alternative 7 operates at LOS D.
    d. Discussion about increased driver task loading and potential for eastbound to southbound right turning vehicles needing to negotiate the railroad tracks, DLT lanes and southbound US-1 lanes could be challenging. Pedestrians would also have an additional traffic separator to cross.
        i. Also mentioned that DLT for Aviation Blvd. EB would have been an improvement due to the volume; however, the challenges over the railroad make this too complicated.

5. The crosswalks on the northside were discussed. The west side of Aviation Blvd does not have pedestrian features along the north right of way line and a shared use pathway is along the south side. This is consistent with the county's plan for Aviation Blvd.
6. A shared use pathway provides for bicycle use and connectivity to future planned shared use trails. On street bicycle lanes are not provided on either US-1 or Aviation Blvd. This is due to the existing conditions beyond the PD&E project that do not facility on street bicycle lanes. The existing US-1 right of way is constrained at 70 ft and airport operations to control pedestrian activity within the airport property along Aviation Blvd.
7. The screening criteria (1st column of matrix) and scoring value (1 to 4) was reviewed and concurred upon.
8. The team conducted the evaluation matrix review. The activity's objective was to identify the differentiators between the alternatives. Each row of the matrix was reviewed along with the initial factors and scoring value assigned to each alternative. Minor adjustments were noted in the matrix.
9. The scores were tallied, and the alternatives were ranked:
    a. The alternatives that were chosen for further investigation through the PD&E process were the four at-grade alternatives, which ranked the highest:
        i. Alternative 1 Conventional
        ii. Alternative 2 On-Way Pair / Twin Intersections
        iii. Alternative 7 Deflected Left Turn
        iv. Alternative 8 Median U-Turn with Roundabout
    b. The four alternatives that were dropped from further investigation were:
        i. Alternative 3 US-1 Overpass which had substantial effects to future property access along US-1 and is not desirable by either the county or city.
        ii. Alternative 4 Aviation Blvd Overpass had the highest number of property impacts and potential business and residential relocations; and was opposed by the city.
        iii. Alternative 5 Aviation Blvd Underpass has very complex construction, railroad track detour and bridge work that found this alternative not viable due to constructability.
        iv. Alternative 6 was dropped from further consideration based on similar factors plus it does not have independent utility without the extension of Aviation Blvd being constructed first.
10. It was concurred upon that the four viable alternatives will be presented in detail at the Public Alternatives Workshop and the four alternatives that were dropped will be presented in lesser detail as alternatives considered and dropped from further consideration.
11. The next local coordination date was discussed and concurred that it could occur during the month of June. It was noted that it should occur after the Runway Protection Zone (RPZ) analysis is completed and ready for discussion.
    a. After the screening meeting finished, the RPZ analysis engineer was contacted and the report should be ready by June 9th. The city, county, airport and MPO were notified and a meeting was set for June 16th.

The meeting concluded at 12:03 PM. The attendance table is below.
Attachments: Updated Screening Evaluation Matrix

Attendance Table

1. Summary			
Meeting title	**Screening Evaluation Matrix Meeting 4416931-SR 5 at Aviation Blvd PD&E Study**		
Attended participants			
Start time	5/23/23, 10:00 AM		
End time	5/10/23, 12:03 PM		
Meeting duration	2h 3m		
2. Participants			
Name		**Email**	
William Evans		William.Evans@wginc.com	
Lynn Zolezzi		Lynn.Zolezzi@wginc.com	
Robert Winslow		Robert.Winslow@wginc.com	
Rick Joseph		Rick.Joseph@wginc.com	
James Hughes		James.Hughes@dot.state.fl.us	
Nagole, Vandana		Vandana.Nagole@dot.state.fl.us	
Martinez, Cesar		Cesar.Martinez@dot.state.fl.us	
LopezLandaverde, Dina		Dina.LopezLandaverde@dot.state.fl.us	
Phan, Trang		Trang.Phan@dot.state.fl.us	
Victor Ramos		Victor.Ramos@dot.state.fl.us	
Godfrey Lamptey		godfrey.lamptey@goalassociates.com	

Florida Department of Transportation

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3400 West Commercial Boulevard
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JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

DATE: June 16, 2023 at 9:30 AM via TEAMS call

TO: Rich Szpyrka, William Howard, Jason Jefferies, John Thompson, Jim Mann, Laurie McDermott, Mary Soderstrum

FROM: Vandana Nagole

COPIES: Bill Evans, Jim Hughes, Brian Freeman, Matthew Mitts

SUBJECT: **Local Coordination Meeting**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Agenda Topics:

The purpose of the meeting is to present the FDOT SR 5 PD&E build alternatives, screening evaluation matrix, and gain input from the local public works and planning departments. The meeting was attended by Indian River County, City of Vero Beach, Vero Beach Regional Airport and Indian River County MPO public works and/or planning managers.

Meeting Notes:

1. An update was provided by Jason Jefferies, City Planning, regarding the May 16th City Council Meeting and resolution.
    a. Resolution was tabled and will be reconsidered when the RPZ analysis is complete.
    b. The alternative that was mentioned during the Council meeting isn't feasible as it goes through the archaeological site.
2. Rich Szpyrka, IRC County Public Works, provided an update on the status of the Aviation Blvd extension project.
    a. The Aviation Blvd extension Project is moving ahead and property is being appraised and purchased. ROW is being coordinated with FDOT District 4 ROW office to ensure county acquired property is according to FDOT regulations.
    b. The county will adjust their project as needed to match the outcome of the PD&E study. Construction start dates will be better known when ROW is finalized and design is complete. Design is currently at 30-45%.

3. Mary Soderstrum (FDOT aviation consultant) provided an update on the findings of the Runway Protection Zone analysis that FDOT District 4 conducted.
    a. FDOT conducted the study at the request of the FAA and the Vero Beach Airport.
    b. RPZ analysis considered the 8 PD&E alternatives and another 6 RPZ alternatives. The RPZ alternatives were developed to evaluate options to move either the RPZ or Aviation Blvd from occupying the same space and clear the RPZ area.
    The RPZ analysis recommends Alternative 1 (at grade) due to the least impact to the existing RPZ, cost and need to service the airport.
    c. Jason Jefferies noted the city and airport master plans require Aviation Blvd to be in place to provide mobility for the planned growth and relocating Aviation Blvd traffic to the south via 26th Street is not feasible due to probable impacts and existing traffic congestion on the other roadways.
    d. The Vero Beach Airport reviewed and commented on the RPZ report.
    e. The RPZ report will be updated and sent to FAA with copies sent to the Airport, city and county public works. The RPZ report will be sent to FAA the week of 6/19/23.
    f. FAA will offer a formal response after their review which is anticipated to conclude the RPZ analysis process.
4. The discussion of the eight (8) PD&E alternatives and the screening evaluation matrix was led by Bill Evans. Two new alternatives were presented as a recommendation from the Intersection Control Evaluation (ICE) analysis. The two new concepts are Alternative 7 (displaced left turn) and Alternative 8 (median u-turn and roundabout).
5. The screening evaluation matrix was presented and the following comments obtained.
    a. The local government and public support criteria and ratings were discussed.
        i. Rich Szpyrka, IRC disagreed with the lack of independent utility as a negative factor for Alternative 6 (Aviation Blvd overpass) since the roadway is in the design phase. Bill Evans noted the main factors for the elimination of Alternative 6 were conflicts within the airport RPZ due to the elevated roadway, impacts to access and splitting of the properties east of SR 5, city and public opposition to an overpass, and the overpass did not have an existing connecting road, hence no independent utility.
    b. Bill Evans stated that all participants review the local support item and provide positions on the alternatives if they are different than shown on the matrix.
        i. Following the meeting, Jason Jeffries, City of Vero Beach, provided a response from the City Manager regarding the city's support:
            - Alternative 1, at grade, City Supports
            - Alternative 2, twin intersections, City Opposed, due to impacts to adjacent properties and property owner opposition
            - Alternative 7, deflective left turn, City Neutral, need property owner input prior to offering City position

- Alternative 8, median u-turn roundabout, City Neutral, need property owner input prior to offering City position
- City Opposed to any overpass alternative.

c. FEC RR criteria: IRC noted the FEC RR is asking for lane-per-lane closure to match any intersection expansions and asked what city street was being proposed for closure for the Aviation Blvd expansion, since Aviation Blvd is a city street at the railroad crossing. Bill Evans noted the FEC had identified 14th Avenue as a potential crossing closure candidate. The city noted it may have reviewed that crossing in the past and it may have needs to access downtown. It was agreed that the FDOT will reach out to FEC again to obtain clarification.

d. Right of way criteria: The portion of Aviation Blvd within the airport property is under the regulations of the federal Surplus Property Act of 1944 and Section 163 of the FAA Reauthorization Act of 2018 that provides FAA approval authority on improvements. The FDOT ROW office will be reviewing the ROW requirements for the alternatives and follow-up coordination with the airport is anticipated.

e. An additional right of way amount of 2 acres is being considered for potential pond sites. The city will be contacted as the pond sitting process is conducted.

f. The city and county requested copies of the ROW acquisition sheets that will be utilized for the ROW acquisition estimates.

6. The four viable alternatives to advance into detailed PD&E analysis are:
   a. Alternative 1: Conventional Intersection
   b. Alternative 2: Twin Intersections or One-way Pairs
   c. Alternative 7: Displaced Left Turn
   d. Alternative 8: Median U-turn with Roundabout
7. Coordination dates with City Council, County Commission, MPO Board prior to workshop was discussed.
   a. The county noted the best way to coordinate with the county officials is through the MPO Board meeting. The September 13th MPO Board meeting and August 25th MPO TAC meetings will be scheduled.
   b. The City will get back to FDOT on whether the city council needs to be briefed prior to the public meeting.
8. Tentative Public Alternatives Workshop
   a. November 14th (virtual)
   b. November 15th (in person) at City Community Center in Pocahontas Park

The attendance report follows on the next page.

Attendance Report:

Meeting title	**Project Alternatives Call - 441693-1 SR 5 at Aviation Blvd**	
Attended participants	**10**	
Start time	6/16/23, 9:19:57 AM	
End time	6/16/23, 11:52:45 AM	
Average attendance time	1h 16m 33s	
2. Participants		
Name	**First Join**	**Email**
William Evans	6/16/23, 9:26:19 AM	William.Evans@wginc.com
Rick Joseph	6/16/23, 9:26:32 AM	Rick.Joseph@wginc.com
Soderstrum, Mary	6/16/23, 9:28:21 AM	msoderstrum@avconinc.com
Rich Szpyrka (Guest)	6/16/23, 9:28:21 AM	rszpyrka@ircgov.com
Will KVRB (Guest)	6/16/23, 9:28:21 AM	whoward@covb.org
McDermott, Laurie	6/16/23, 9:29:11 AM	Laurie.McDermott@dot.state.fl.us
Jim Mann	6/16/23, 9:29:11 AM	jmann@ircgov.com
John Thompson	6/16/23, 9:30:49 AM	JThompson@hanson-inc.com
Nagole, Vandana	6/16/23, 9:31:17 AM	Vandana.Nagole@dot.state.fl.us
Jason Jeffries (Guest)	6/16/23, 9:31:21 AM	jjeffries@covb.org

Vn:wte

From:	McDermott, Laurie
To:	Soderstrum, Mary; William Evans; William Howard; John Thompson; Todd Scher; Nagole, Vandana; Brandon Dambeck
Subject:	[EXTERNAL] RE: VRB Runway 30L RPZ Analysis
Date:	Tuesday, June 27, 2023 5:29:04 PM
Attachments:	image001.png image002.png image003.png image004.png

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Thank you!

Laurie McDermott
Aviation Coordinator/Office of Modal Development
Florida Department of Transportation, District 4
3400 West Commercial Blvd
Fort Lauderdale, FL 33309
Tel: (954)777-4497
Laurie.McDermott@dot.state.fl.us

From: Soderstrum, Mary <msoderstrum@avconinc.com>
Sent: Tuesday, June 27, 2023 5:08 PM
To: McDermott, Laurie <Laurie.McDermott@dot.state.fl.us>; William Evans <William.Evans@wginc.com>; William Howard <WHoward@covb.org>; John Thompson <jthompson@hanson-inc.com>; Todd Scher <TScher@covb.org>; Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>; Brandon Dambeck <BDambeck@covb.org>
Subject: Fwd: VRB Runway 30L RPZ Analysis

EXTERNAL SENDER: Use caution with links and attachments.

Laurie,

It looks like we are all clear with the FAA on the VRB RPZ Analysis. They do ask that any light poles associated with the project be submitted to the FAA OE/AAA at least 45 days prior to construction.

Mary

Begin forwarded message:

From: "Wilson, Stephen (FAA)" <Stephen.Wilson@faa.gov>
Date: June 27, 2023 at 4:39:26 PM EDT
To: "Soderstrum, Mary" <msoderstrum@avconinc.com>
Cc: "Farris, Bill (FAA)" <Bill.Farris@faa.gov>, "Reed, Amy M (FAA)" <amy.m.reed@faa.gov>, "McDermott, Laurie" <Laurie.McDermott@dot.state.fl.us>, "Howard, William" <WHoward@covb.org>
Subject: RE: VRB Runway 30L RPZ Analysis

Mary,

Per the email below, we do not object to the VRB 30L RPZ Analysis.
Although we maintain approval authority, the nature of the proposal doesn't warrant a formal 163 determination.

Any street lighting associated with the proposal should be coordinated in OEAAA for review and comment.

Let us know if you have any questions.

Thank you

From: Soderstrum, Mary <msoderstrum@avconinc.com>
Sent: Monday, June 26, 2023 2:53 PM
To: Wilson, Stephen (FAA) <Stephen.Wilson@faa.gov>
Subject: RE: VRB Runway 30L RPZ Analysis

Stephen,

Understood. I will let all the interested parties know.

BTW. How is your review of the ISM Master Plan Update coming?

MARY SODERSTRUM, AIA, NCARB
SENIOR AVIATION PLANNER | AVCON, INC.

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From: Wilson, Stephen (FAA) <Stephen.Wilson@faa.gov>
Sent: Monday, June 26, 2023 2:51 PM
To: Soderstrum, Mary <msoderstrum@avconinc.com>; Farris, Bill (FAA) <Bill.Farris@faa.gov>
Cc: McDermott, Laurie <Laurie.McDermott@dot.state.fl.us>; rszpyrka@irc.com; Reed, Amy M (FAA) <amy.m.reed@faa.gov>
Subject: RE: VRB Runway 30L RPZ Analysis

Mary,

I reviewed the VRB RW 30L RPZ Analysis and do not object to the proposal.
I'll need to issue the 163 approval however, I need to speak to Amy first regarding NEPA.

Thanks

From: Soderstrum, Mary <msoderstrum@avconinc.com>
Sent: Monday, June 19, 2023 12:20 PM
To: Wilson, Stephen (FAA) <Stephen.Wilson@faa.gov>; Farris, Bill (FAA) <Bill.Farris@faa.gov>
Cc: McDermott, Laurie <Laurie.McDermott@dot.state.fl.us>; rszpyrka@irc.com
Subject: FW: VRB Runway 30L RPZ Analysis

Stephen and Bill,

I tried to send you the email below earlier this morning. Unfortunately, the attached file was too large. I have reduced the size of the file and I am attempting it again.

MARY SODERSTRUM, AIA, NCARB
SENIOR AVIATION PLANNER | AVCON, INC.

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From: Soderstrum, Mary

Sent: Monday, June 19, 2023 11:58 AM
To: Stephen.Wilson@faa.gov; Farris, Bill (FAA) <Bill.Farris@faa.gov>
Cc: McDermott, Laurie <Laurie.McDermott@dot.state.fl.us>; Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>; William.Evans@wginc.com; Howard, William <WHoward@covb.org>; John Thompson <JThompson@hanson-inc.com>; 'rszpyrka@ircgov.co' <rszpyrka@ircgov.com>
Subject: VRB Runway 30L RPZ Analysis

Stephen and Bill,

As you know, FDOT District 4 has been considering alternatives to an intersection of Aviation Blvd., the Florida East Coast Railroad, and Route 1 in Vero Beach, FL. Aviation Blvd. currently travels through the RPZ of Runway 30L at VRB and the existing intersection causes traffic to build up along Aviation Blvd. within the RPZ. FDOT asked AVCON to review the alternatives and to write an RPZ alternatives analysis of the alternatives to the intersection that have been produced. Please find attached the resulting RPZ Analysis that was completed for the VRB Runway 30L RPZ on behalf of the FDOT District 4. The draft of this report has been reviewed by the Airport, FDOT, and the persons copied on this email as well as a few others.

Please review this report and let those copied know at your earliest convenience your thoughts on the report and how the project should best proceed. If at any point during your review the report is unclear and you have questions, please contact me. We look forward to hearing from you.

MARY SODERSTRUM, AIA, NCARB
SENIOR AVIATION PLANNER | AVCON, INC.

Transforming Today's Ideas into Tomorrow's Reality for the Past 35 Years

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Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

TELEPHONE CALL NOTES

DATE: July 27, 2023

TO: George Simons, IRFWCD Consultant

FROM: Bill Evans (WGI)

COPIES: Vandana Nagole (FDOT), David Gunter (IRWCD), Attendees

SUBJECT: **Pond Sites and Main Canal Bridge**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Attendees: George Simons, Bill Evans, Robert Carballo, Jerry Saval

Purpose:
The purpose of the call was to identify the best method of coordination and introduce the FDOT SR 5/US-1 PD&E Study and build alternatives and gain input related to the design requirements of IRFWCD related to the project pond sites and widening or replacement of the low level bridge over the Main Canal.

Notes:
The project alternatives, pond sites and bridge were briefly presented to George Simons, Consultant for Indian River Farms Water Control District (IRFWCD).

1. Permit Application and Review:
    a. Mr. Simons mentioned that general information can be provided, but that any detailed reviews would require a permit application and associated review fees. It was discussed that the detailed reviews typically happened with final design and what the study team was looking for at this time is clarity on design and permitting requirements as well as identifications of fatal flaw opinions on the concepts.

2. Pond Sites
    a. Three pond sites per PD&E roadway alternative were presented. Each pond will be a dry pond due to the nearby aviation runway located just west of the railroad. The roadway alternative would require one pond that may range in size from 1.6 acres to 2.8 acres depending on the alternative.

b. IRCWCD noted typically the ponds are required to outfall to a sub-lateral canal to allow for spillage to be contained outside of the main lateral connections. In the case of this project, there are no sublateral canals in proximity to the proposed improvements. The outfalls would need to be directly connect to the Main Canal. The use of oil separators were discussed to assist in controlling contamination from entering the canal. It was agreed that his would be a practical approach combined with the use of dry detention swales.

3. The main canal and bridge was discussed. It is anticipated the existing four span bridge will be replaced with potentially a three span bridge.
   a. IRFWCD noted the bridge requirements are discussed on a case-by-case basis. David Gunter will provide input on the maintenance requirements and historical major storm observations. A follow up meeting was scheduled for a later date.
   b. Downstream or east of the bridge is a salinity weir structure.
   c. Upstream or west of the bridge is a county owned water control structure that collects floating debris and plant material prior to reach the Indian River Lagoon.
   d. The IRFWCD has model information that can be provided for the peak stage elevation, tailwater elevation and clearance above high water. It was mentioned that the department typically seeks to obtain stage and flow information for the 10, 25, 50 and 100-year recurrence events. Mr. Simmons indicated that they have information on all events except the 50-yr.
   e. The IRFWCD requires a minimum of 25 ft horizontal clearance between the central spans which is consistent with what the design team is proposing with the three-span structure. Robert Carballo indicated that the three-span concept places a new line of pile 5-ft from the existing intermediate bents on either side of the channel thus creating a larger center span than the 25-ft minimum in the permanent condition. He did mention that during construction the separation between the new intermediate bents and the existing center bent (to be removed) would be less than 25-ft.
   f. IRFWCD noted, if during construction, clearance is reduced for end bent construction or slope stabilization, sheet pile cofferdams have been allowed one foot above the ~~high~~ water elevation. The top elevation of the cofferdams must be low enough to allow water to flow over the top during the large storm events that result in the higher water levels. This allows better flow and reduces upstream flood levels.
   g. It was mentioned that IRFWCD will accept rip-rap for bank protection, but does not want it placed along the bottom of the canal beyond the toe of slope since this impacts their ability to dredge sediment build-up. Riprap up and downstream of the bridge will be required, keep the center canal bottom clear of riprap to facilitate maintenance operations, and no riprap placement under the center bridge span.

LOW water

h. Further discussion is needed to identify the IRFWCD bridge maintenance access requirements. Access is open along the north canal bank. Access is available from 12th Avenue to the south canal bank.
i. The Main Canal right of way (ROW) is approximately 300 ft wide east of the bridge and 30th Street pavement is shown within the IRFWCD right of way. A right of way permit will be required for work on 30th Street. There is some current encroachments into the canal ROW along the south bank.
j. The two US-1 outfalls are located adjacent to the Main Canal Bridge along the east side of the bridge. Two new outfalls will be constructed, one on each bank of the canal, east of the new bridge.

4. Public Alternatives Workshop dates:
    a. October 10th (virtual) at 5:30 PM
    b. October 11th (in person) at 5:30 PM in the Vero Beach Community Center
    c. A meeting announcement will be sent to the IRFWCD.

WE:wte

Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

DATE: August 04, 2023

TO: Attendees

FROM: Bill Evans, Project Manager (WGI)

COPIES: Vandana Nagole, Project Manager (FDOT)

SUBJECT: **Pond Sites and Main Canal Bridge**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Attendees:
IRFWCD: George Simons, David Gunter, Ward Gunter
WGI FDOT PD&E Team: Bill Evans, Robert Carballo, Jerry Saval

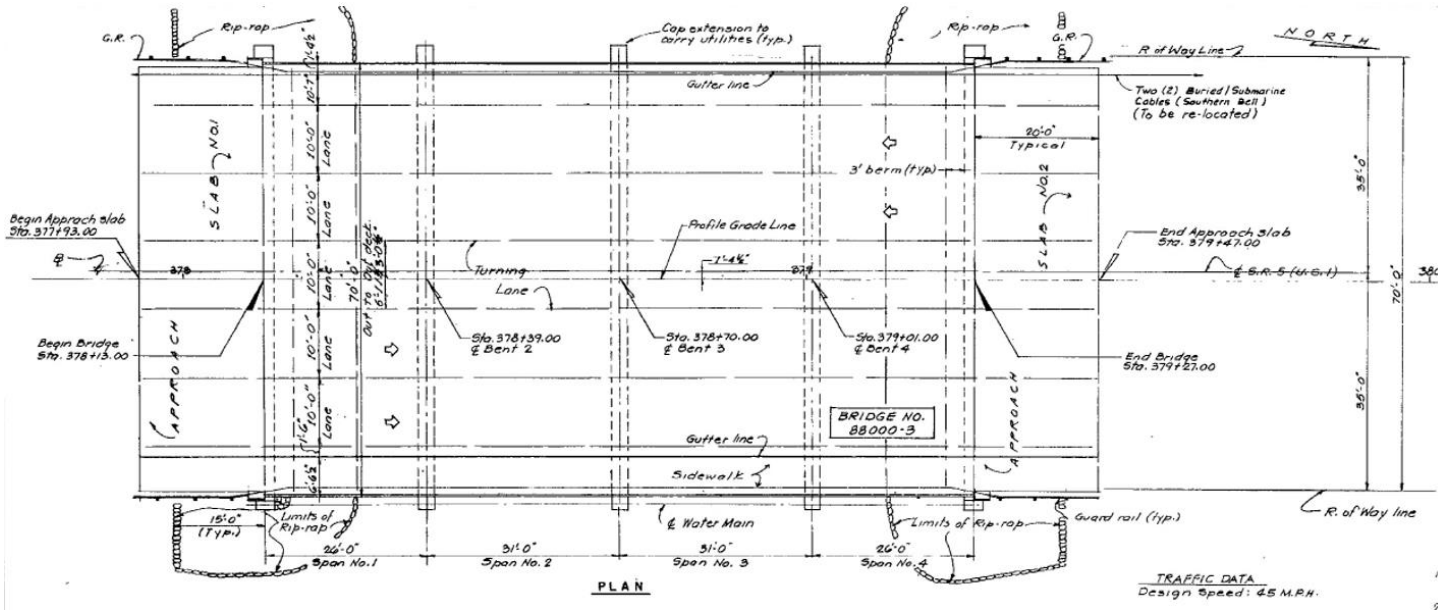
Purpose:
The purpose of the teleconference meeting was to introduce the FDOT SR 5/US-1 PD&E Study build alternatives (Alt. 1, 2, 7 and 8, attached), preliminary pond sites, and bridge replacement concepts to gain input from the Indian River Farms Water Control District (IRFWCD) design requirements.

Notes:
The project alternatives, pond sites and bridge were presented to Indian River Farms Water Control District (IRFWCD).

1. Ponds site discussion:
    a. Each roadway alternative contained three pond site alternatives A, B, and C. One pond (A, B or C) is required for a roadway alternative.
    b. IRFWCD noted there is a shallow hard pan layer that is deeper on the west side of US-1 and shallower on the east side of US-1. Pond site “B” and “C” locations may encounter the hard pan layer and may need underdrain to dry the ponds in 72 hours. Typically, the underdrains have one foot of cover and one foot of good drainage below the pond. Pond sites “A” are located where the prior natural creek flowed from near the main canal bridge, to the northeast, towards the existing pond site and Indian River Lagoon. Pond sites “A” are more likely to have less hard pan and some soils suitable for fill than sites “B” and “C”.

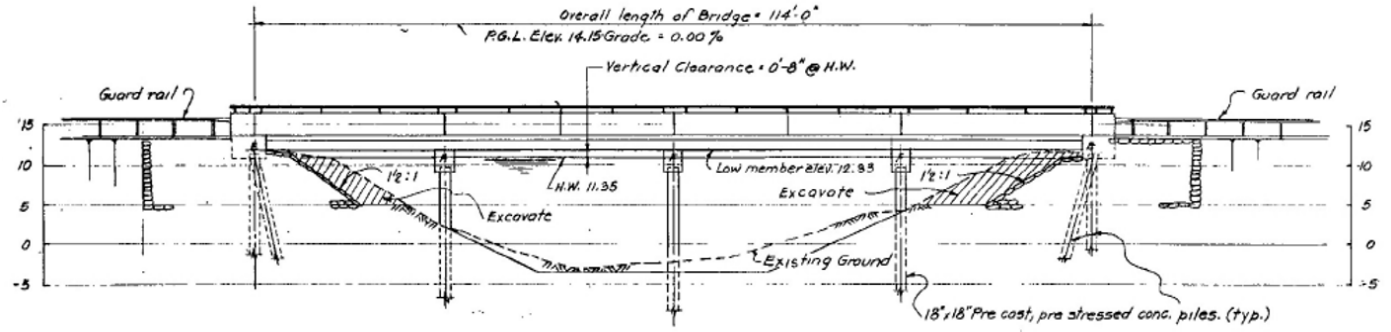
c. Dry ponds are to recover within 72 hours per Saint John's Water Management District (SJRWMD) permitting requirements.
d. IRFWCD suggested providing underdrains within the dry ponds to ensure timely storage recovery period and to include the cost in the PD&E alternatives. If during final design a more detailed geotechnical investigation determines that they are not needed then they could be removed at that time from the project. This approach ensures the initial budget accounts for the possible need for an underdrain system.
e. The petroleum skimmer located just prior to the outfall is preferred by IRFWCD.

2. Main Canal and Bridge
   a. The study team provided a brief overview of the existing bridge configuration as seen below. Reference: FDOT Plans 88010-3510, The existing bridge consists of 4 spans (26ft, 31ft, 31ft, 26ft).



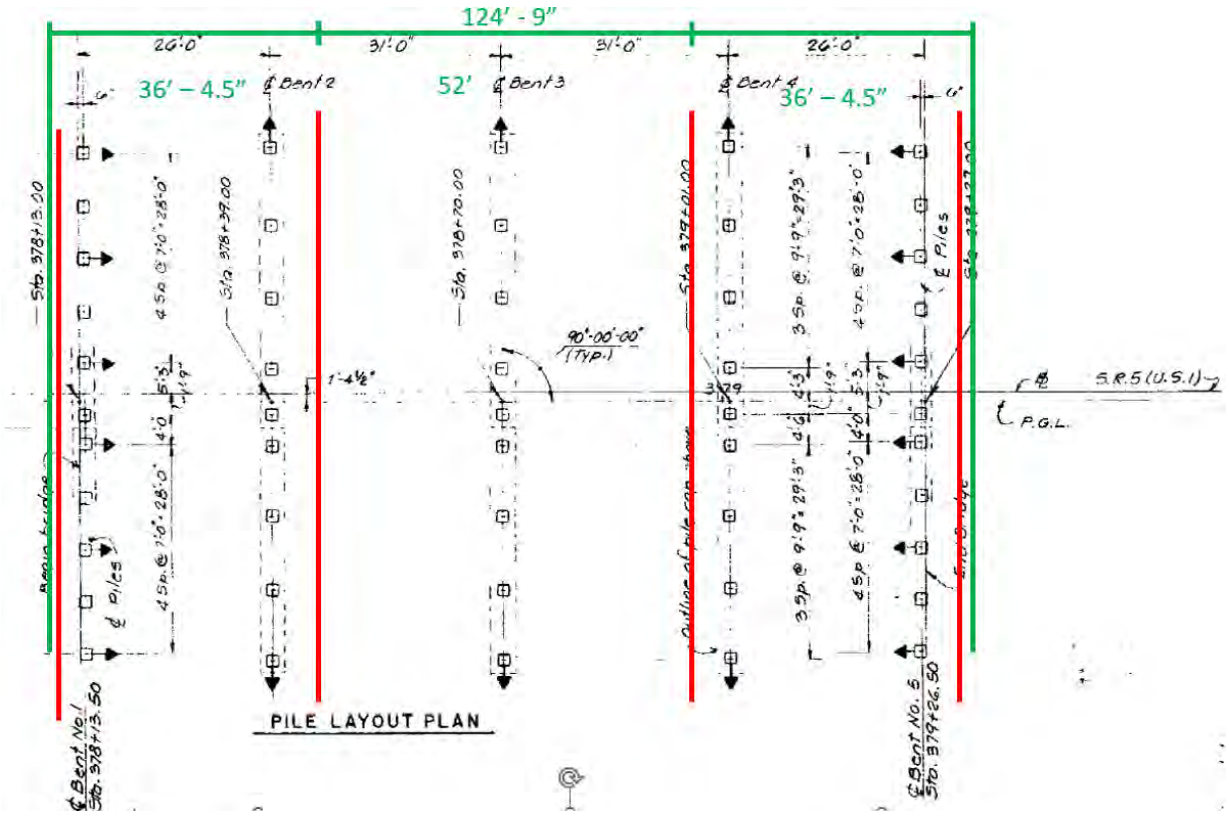
b. The existing bridge elevation reflects a low member elevation of 12.33-ft NGVD and a highwater elevation of 11.35-ft NGVD. See Bridge Elevation View below.

c. The study team mentioned that the existing 4 span bridge is anticipated to be replaced with a new 3 span bridge with a 52 ft center span and 36 ft 4.5-inch end spans. The proposed piles would be located approximately five feet away from existing piles. See layout presented during the meeting of the existing bridge pile locations and the proposed new center of pile lines depicted in RED.

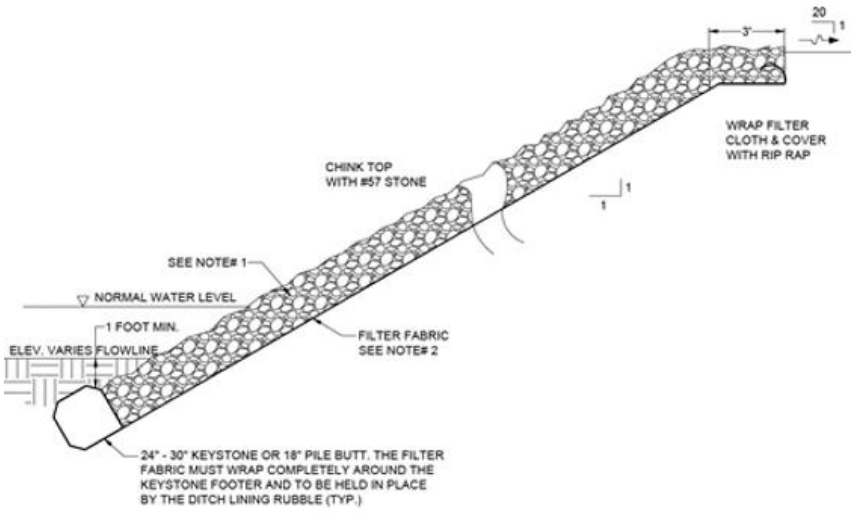


NOTE: Drive one unloaded test pile 46 Ft. long (18") in each Bent 1 and 5, and one unloaded test pile 50 Ft. long (18") in Bent No. 3, in the position of a permanent plumb pile located as directed by the Engineer.

ELEVATION



d. The study team inquired about IRFWCD minimum horizontal clearance requirements for the bridge main span. IRFWCD noted the minimum horizontal clearance should be at least 25 ft.
e. IRFWCD noted the center of the bridge should be located on the center of the canal cross section. The study team explained that to facilitate construction and maximize the horizontal opening for the main span over the channel a three-span arrangement is being incorporated into the concepts. This would remove the existing center pier. The team also explained that the bridge would need to be constructed in phases to accommodate traffic along SR 5 / US-1. During construction of the first phase of the bridge the new intermediate pier locations will reduce the spacing between the center line of the proposed piles and the existing center intermediate bent piles from 31-ft to 26-ft. Given that the intermediate bent caps are approximately 4-ft in width this would temporarily reduce the horizontal opening between caps to approximately 22-ft during construction. IRFWCD indicated that they could work with the department given that this was a temporary condition during construction and the permanent horizontal opening would be greater the 25-ft (currently estimated to be 48-ft (52-ft minus 4-ft for caps) between front face of intermediate bent to front face of intermediate bent assuming 18-inch prestressed precast concrete piling.
f. IRFWCD indicated that a sacrificial pile located upstream of the intermediate piers is desired to avoid damaging the bridge structure during debris removal maintenance.
g. IRFWCD asked if the existing piles would be extracted. The study team indicated that once the bridge is removed the existing intermediate and end bent piles would be cut and removed 2 ft below permanent canal bottom grade.
h. IRFWCD does not want any soil bench under the deck along the embankment slopes into the water as depicted in the existing bridge cross section above. They indicated that a sloped riprap is preferred with a pile cap and liner and presented the detail below during the meeting. IRFWCD will provide canal riprap armor and liner detail sheet.



RUBBLE RIPRAP ALONG IRFWCD CANAL
N.T.S.

i. The study team asked about the design water elevations for the bridge crossing and reviewed the existing bridge elevations and the bridge hydraulics sheet information from the 88010-3510 plans. The study team indicated that there appeared to be discrepancies between the information on IRFWCD's website data, FEMA Maps and the BHRS information. IRFWCD reviewed their model information during the meeting and noted the following elevations below. They confirmed that they do not have data on the 50 yr storm event.

	Storm	NGVD	NAVD
ii.	100 yr.	9.8	8.3
iii.	25 yr.	8.7	7.2
iv.	10 yr.	7.9	6.4

j. The highwater elevation of 11.35-ft NGVD noted on the existing bridge elevations was discussed with the assumption that it accounted for potential effects of storm surge. IRFWCD will run the flood model to evaluate storm surge to assist with determining the low member elevations. It was agreed that the existing low member elevation of 12.33-ft NGVD should be maintained. They indicated that they have not seen elevations in the canal reach those levels in the past.

k. The study team asked when IRFWCD could complete their modeling analysis of the water elevations since the study team had an upcoming Alternatives Workshop with the Public on October 10 and 11, 2023. IRFWCD indicated that they would try an have some results by the end of September.

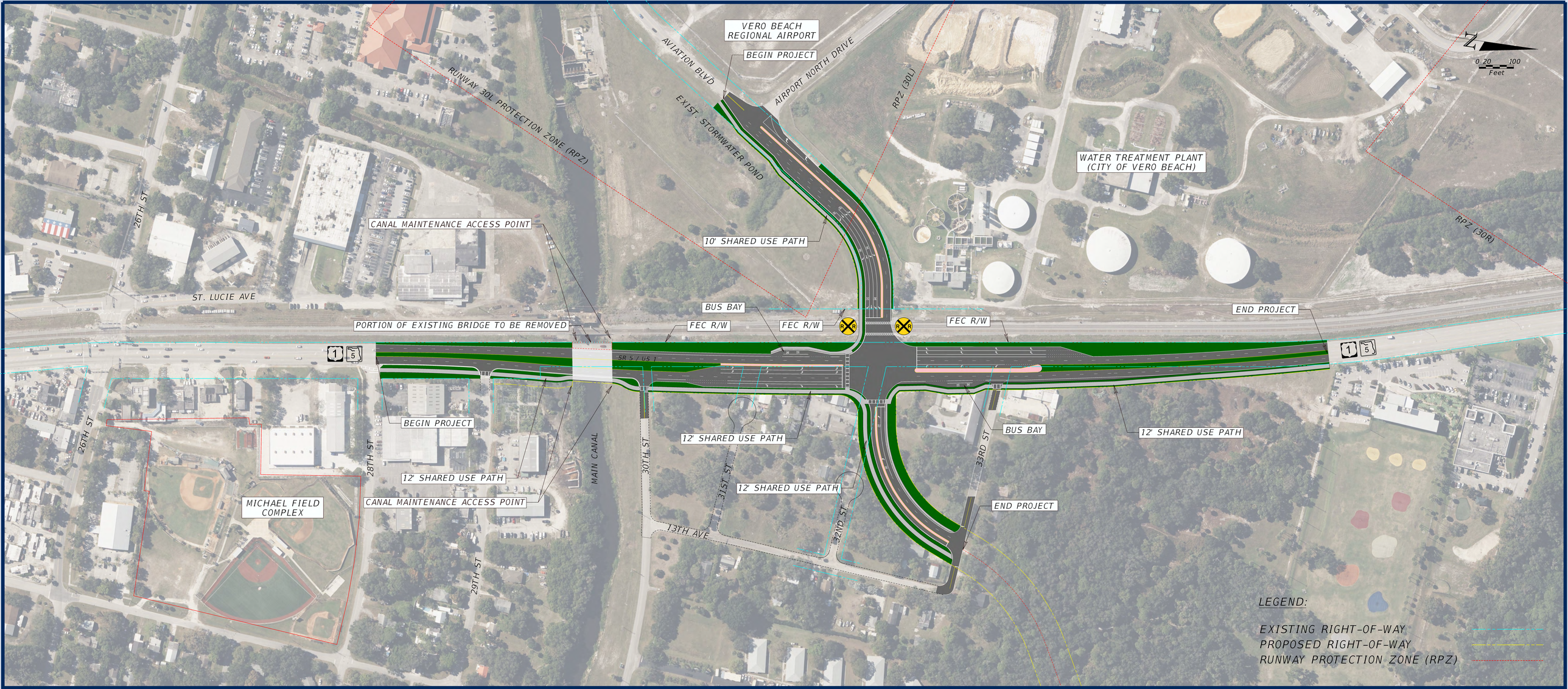
l. IRFWCD indicated that the salinity weir located in the main canal approximately 4000 feet east of US-1 has a top elevation of approximately 1.5 NGVD or 0.0 NAVD.

m. The potential construction sequencing of the bridge was discussed along with the implications of the existing 12-inch watermain on the east side of the structure. IRFWCD concurred that the existing bridge mounted utilities should be removed and a new utility lines horizontally directional drilled under the canal to facilitate construction of the bridge and associated sequencing.

n. IRFWCD desires access to each quadrant of the bridge for maintenance. A width of 15 feet is desired. Along the northbound US-1 approach to the canal, a 15 ft wide access was requested to access the canal. Details of this access will be discussed further after the preferred alternative has been selected.

3. Right of Way (ROW)
   a. The existing canal right of way is approximately 300 feet wide and has the existing pavement of 30th Street located within a portion of canal ROW. IRFWCD noted this ROW condition should be investigated for ownership or existing agreements. They suggested reaching out to Richard Glass (Glass Land Acquisition) who they have coordinated with in the past.

WE:wte



Alternative 1 - Conventional Intersection

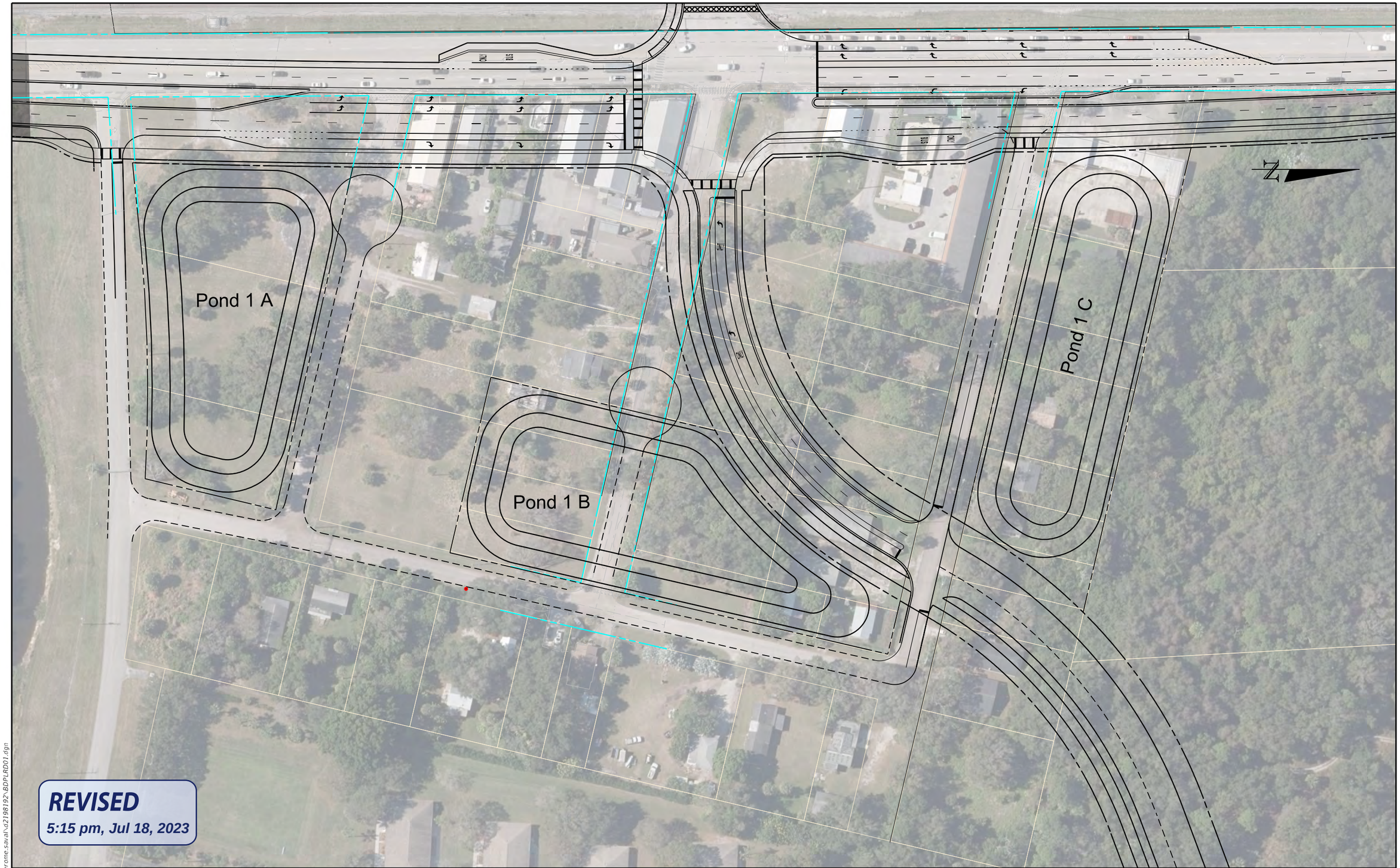
SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

Draft Alternative

June 6th, 2023



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	INDIAN RIVER	

ALTERNATIVE 1

SHEET NO.

7/18/2023 3:42:54 PM Jerome.Saval
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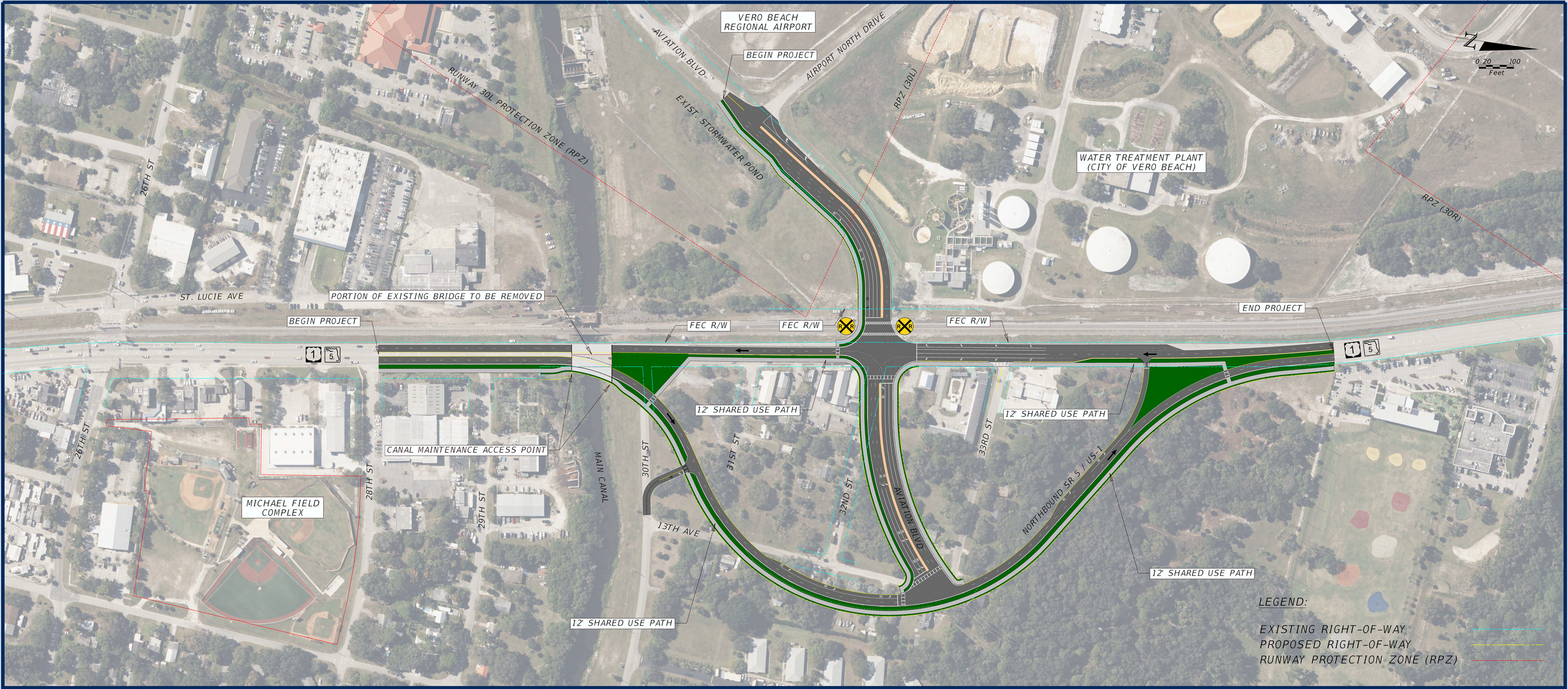
THE OFFICIAL RECORD OF THIS SHEET IS THE ELECTRONIC FILE DIGITALLY SIGNED AND SEALED UNDER RULE 61G15-23.004, F.A.C.



Alternative 2 - One-Way Pair

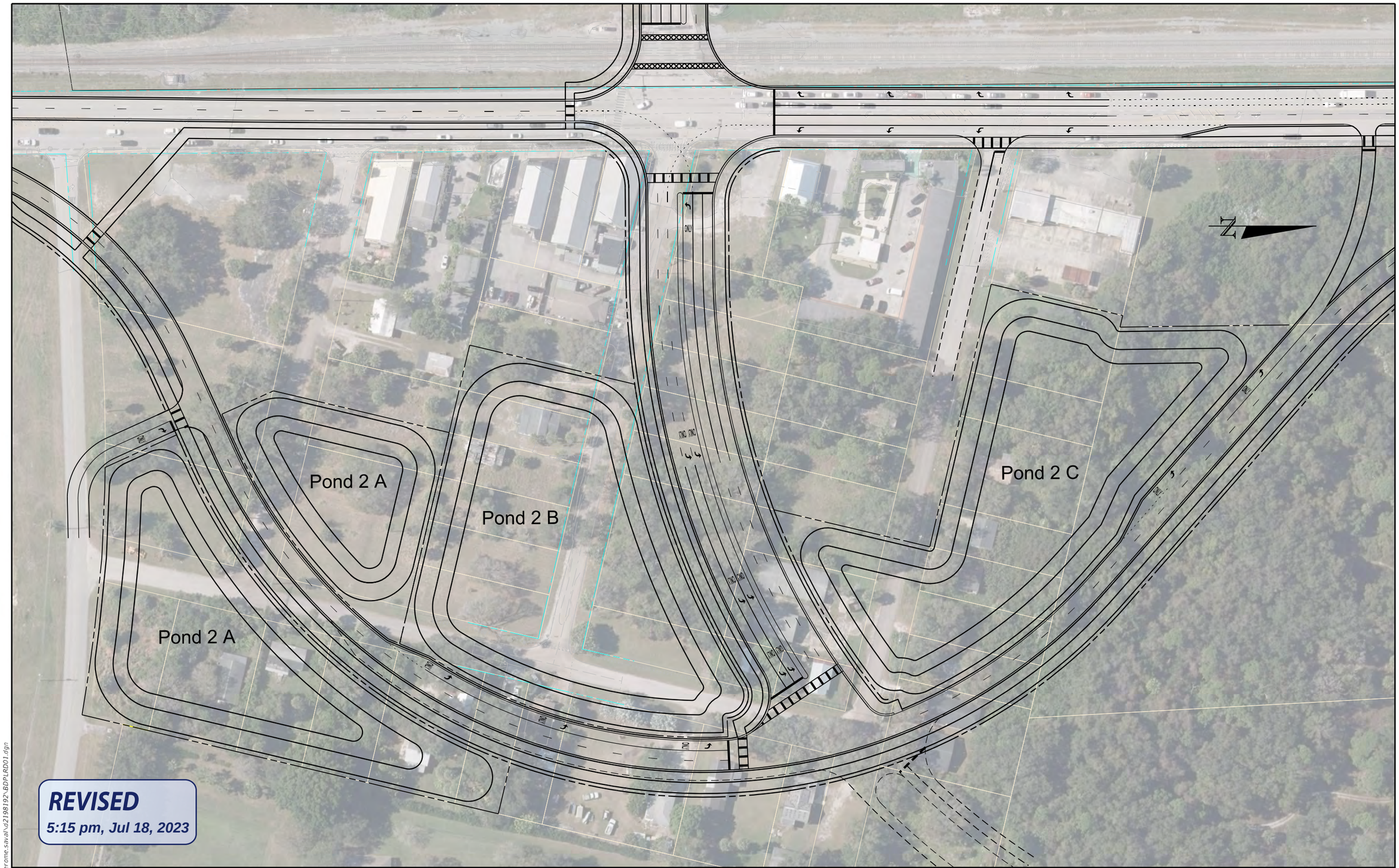
SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

Draft Alternative

June 6th, 2023



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5:15 pm, Jul 18, 2023

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	INDIAN RIVER	

ALTERNATIVE 2

SHEET NO.

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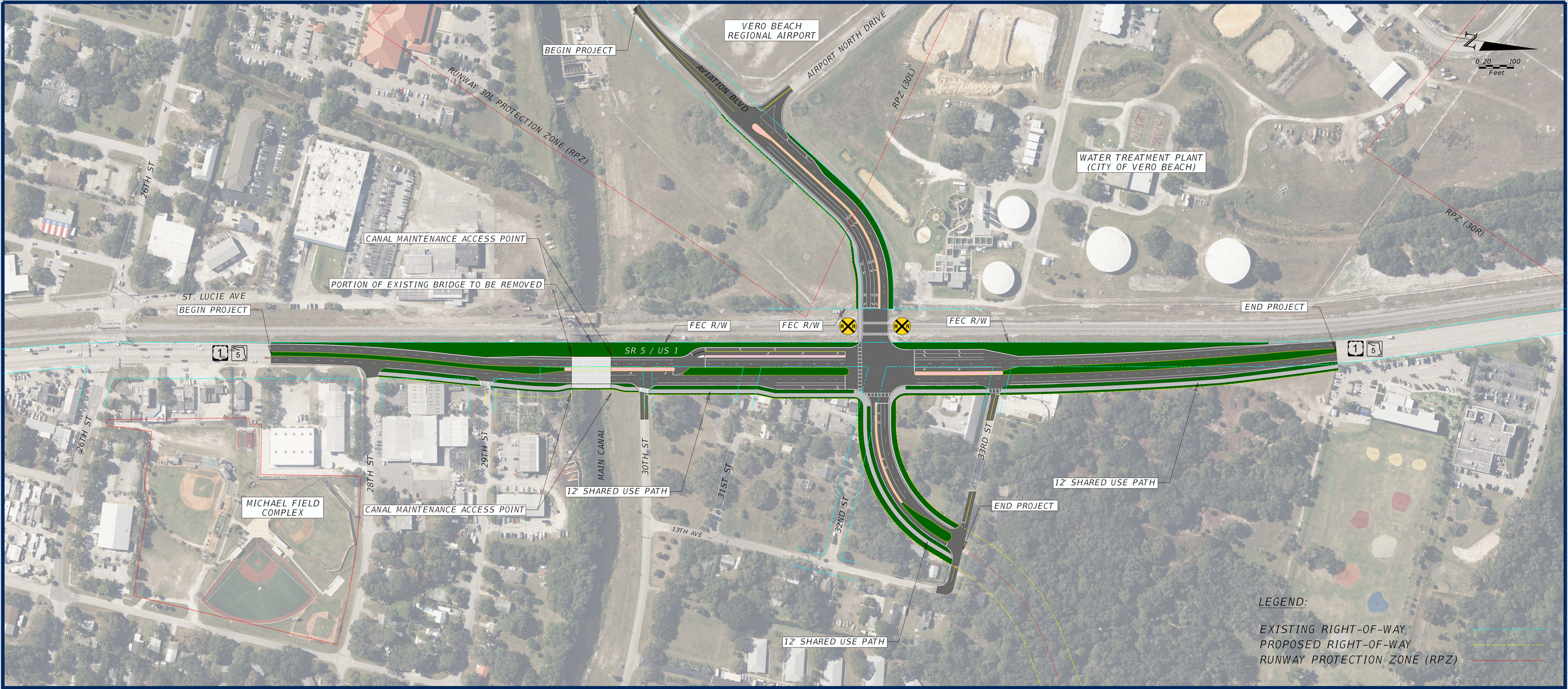

Alternative 7 - Displaced Left Turn Intersection
SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
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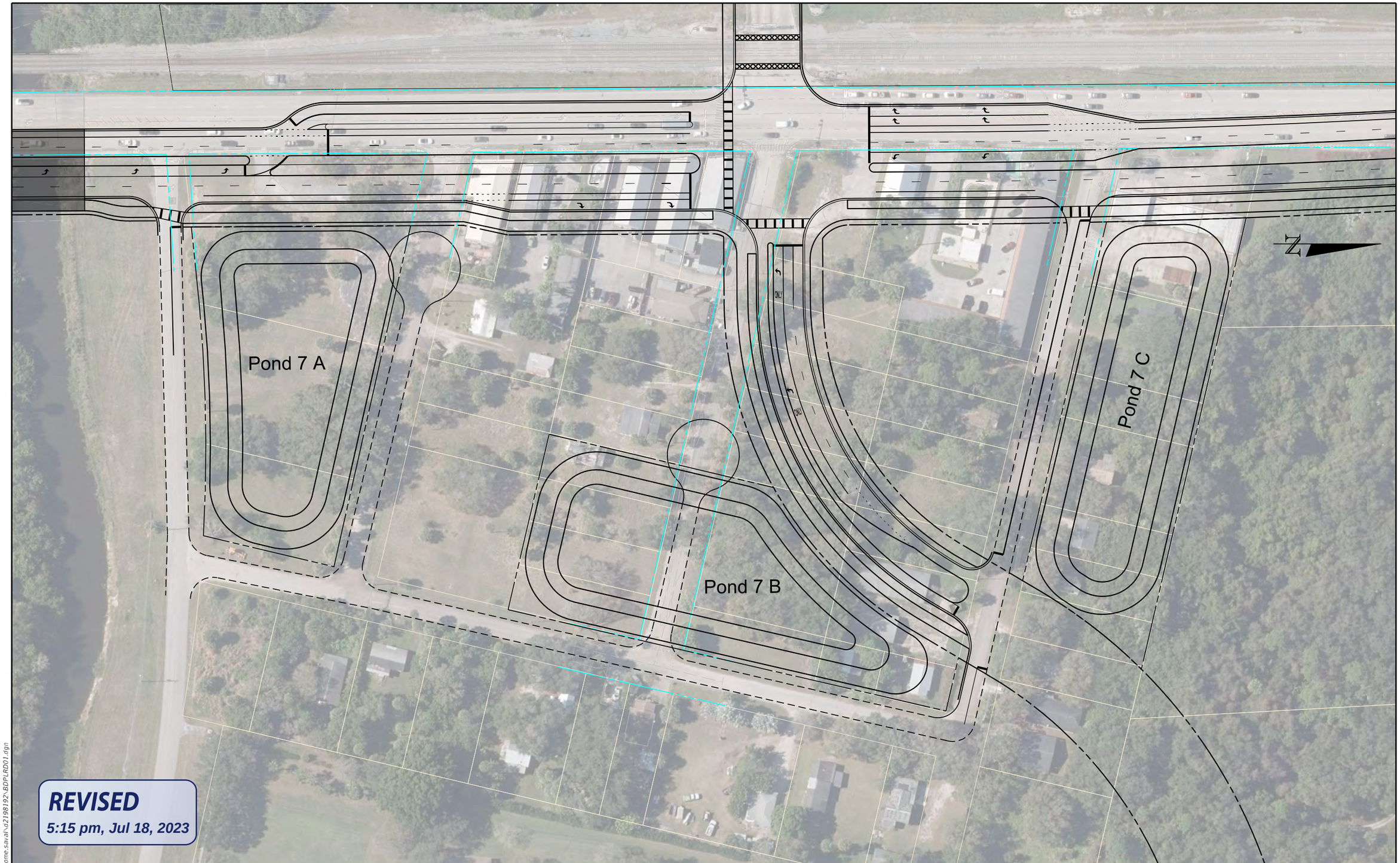

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REVISIONS			
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STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	INDIAN RIVER	

ALTERNATIVE 7

SHEET NO.

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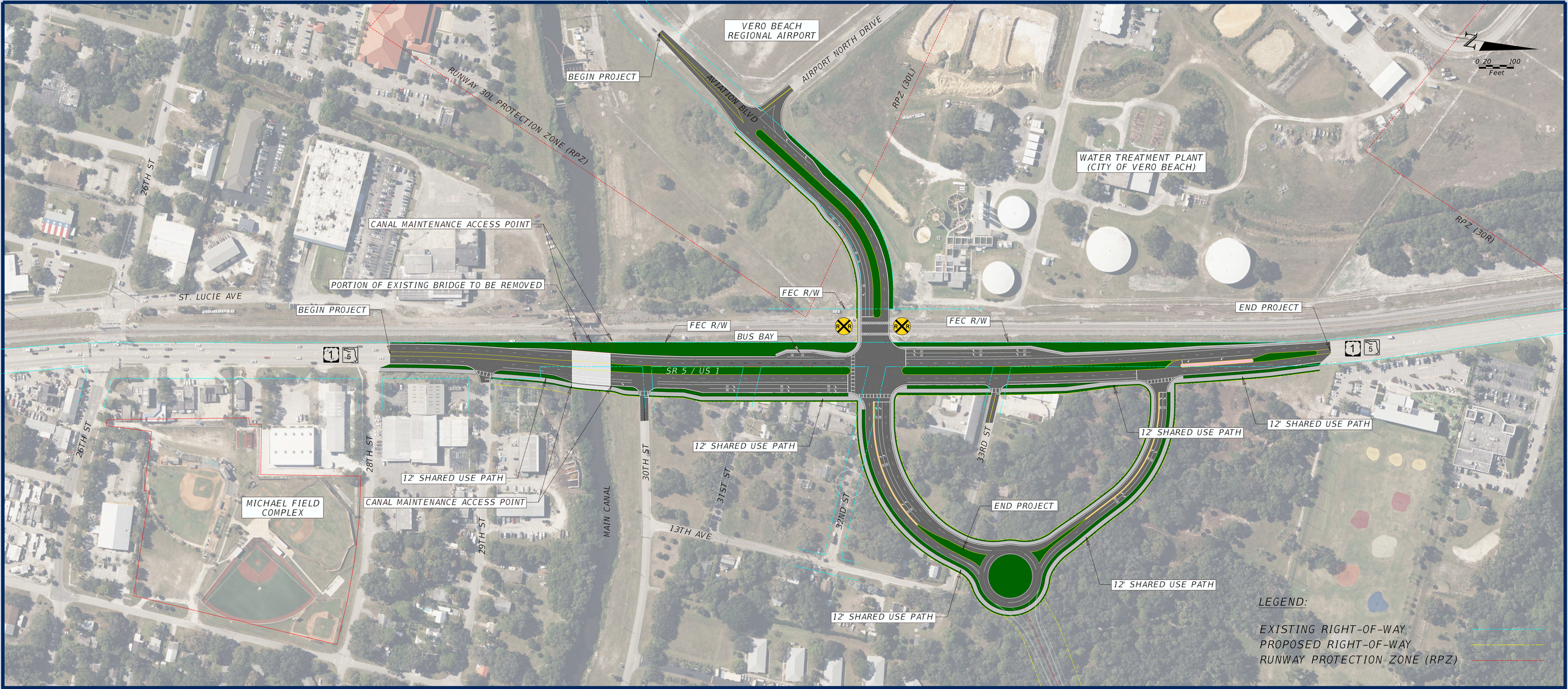

Alternative 8 - Median U-Turn with Roundabout SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study
Indian River County, Florida
Financial Project ID: 441693-1-22-02
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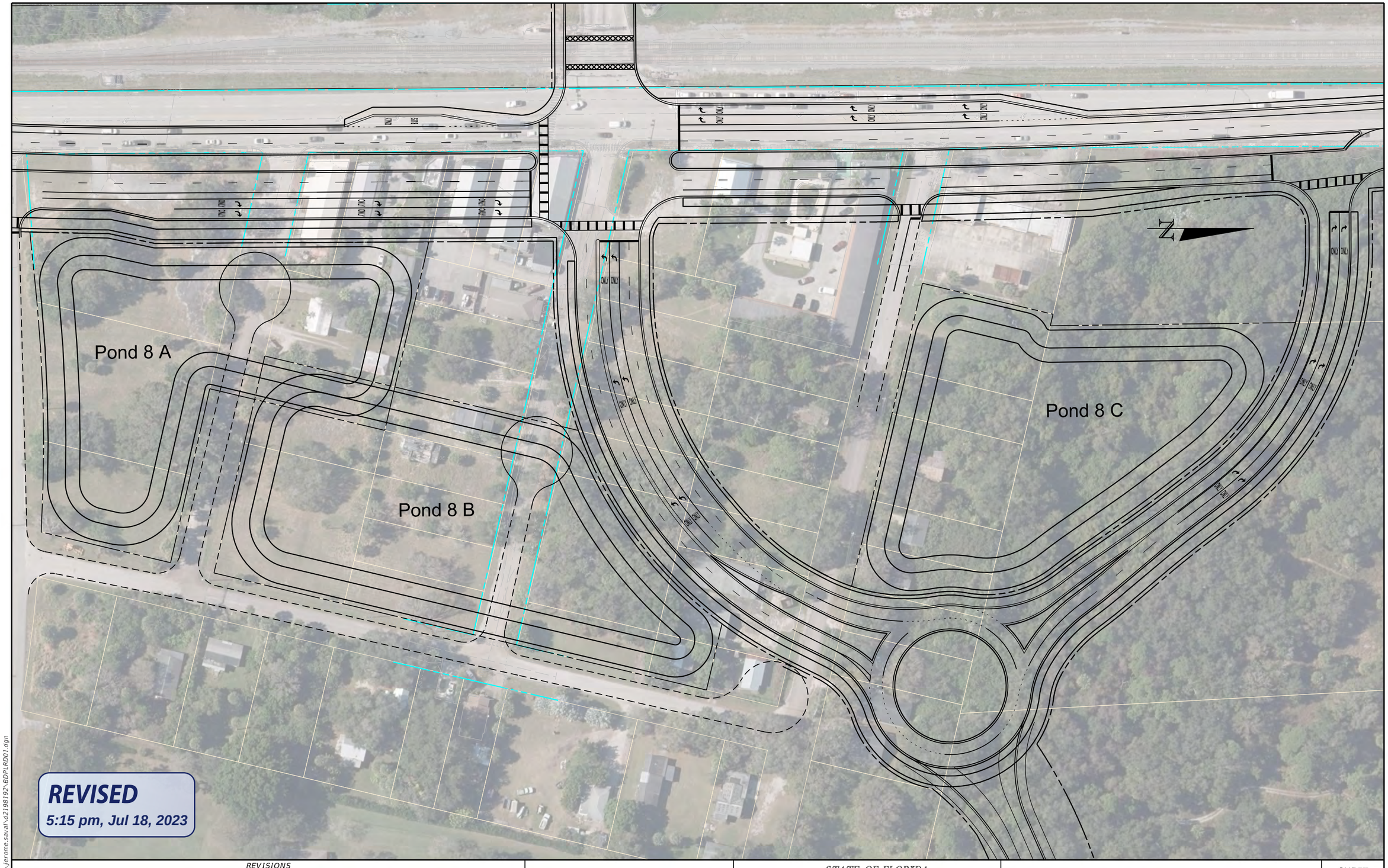
Draft Alternative

June 6th, 2023



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	INDIAN RIVER	

ALTERNATIVE 8

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Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

MEETING DATE: August 18, 2023

TO: Project File

FROM: Bill Evans (WGI)

COPIES: Vandana Nagole (FDOT)

SUBJECT: **FEC Railroad Coordination Meeting**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Invitees:
FDOT: Ana Quero, Vandana Nagole, Maria Formoso, Eugene Jules, Jessie Smiley, Yanique Kelly, Efrain.Bernal, Birgit Olkuch, Binod Basnet, John Krane, Kelli Phillips
FEC Railroad: Nicole Radford, Dan Fetahovic, Robert Ledoux
Indian River County: Richard Szpyrka
City of Vero Beach: Matthew Mitts
FDOT Consultants: William Evans (WGI) Julieta Rivero-Manso (Hanson)

Purpose:
A meeting was organized by the District 4 Railroad office and held in Vero Beach, Florida at the Indian River County Public Works building on August 18, 2023. The purpose of the meeting was to discuss the PD&E alternatives and Florida East Coast Railway requirements related to the FDOT SR 5/US-1 PD&E Study build Alternatives 1, 2, 7, and 8. (See Attached). The CR 510 PD&E study immediately preceded the SR 5 presentation but is not detailed in these notes.

The discussion that related to both the SR 5 and CR 510 PD&E studies are as follows.

1. FEC noted the grant and Federal Rail funding is available for the crossing improvements if there is a closure associated with the crossing improvements.
    a. Matching funds can be 80% FRA and 20% local, or 50/50 depending on the type of project and closures included.
    b. The CR 510 and SR 5 project could be bundled together, which is preferred for the funding and rail process.

c. The commitment to close a crossing and allow the widening of an existing crossing would occur with the approval of the railroad crossing closure application.
d. The formal agreement that links the railroad crossing closure and the PD&E study together is the SOP – Stipulation of Parties.

The discussion related to SR 5 at Aviation Boulevard is noted below:

2. The grade separated overpass and underpass alternatives were eliminated from further study due to the Federal Aviation Administration requirements of the Runway Protection Zone (RPZ). The FAA required an analysis of the RPZ which identified the best alternative was an At-grade roadway crossing to best meet the aviation safety and operations requirements. Also the public was noted as opposed to an overpass as well as the City of Vero Beach was opposed to an overpass. The detailed discussion continued for the four at-grade alternatives.
3. FEC noted that a shared use path width of eight feet is preferred with some type of divider to prevent motorized four wheeled vehicles from using the shared use path for crossing the tracks.
4. FEC inquired whether an elevated pedestrian bridge could be provided. The team responded that the project is minimizing below grade work to avoid potential involvement with the Vero Ice Age archeological site.
5. The project team inquired about the design plans for the crossing and main canal bridge construction project. FEC will review and reply with the bridge plans. Brightline may have more advanced crossing plans than the permit plans that are online.
6. The SR 5 project had several benefits that reduced risk such as:
    a. Moving SR 5 further away from the FEC R/W especially where there may be pedestrians walking.
    b. Raised median on Aviation Blvd.
    c. Some alternatives removed turning movements from the railroad crossing.
    d. Profile grade improvements to remove the crossing hump.
    e. The bus bay was considered a pedestrian attractor which was not desired by the FEC RR however the need for multimodal was important and the bus bay would likely be allowed.
    f. The Main Canal bridge is shifted away from the FEC R/W which provides maintenance area inside of the SR 5 R/W so the water control district does not need to be on FEC R/W for canal maintenance at the bridge.
7. Discussion continued about whether a crossing closure at another location would be required.
    a. The SR 5 project had provide a set of alternatives early in 2023 and at that time the FEC responded that an overpass and crossing closure was the preferred alternative.
    b. It was not determined that closure is required for the SR 5 Aviation Blvd project however including a crossing closure would greatly assist in obtaining FEC approval.

8. The potential closure of 14th Avenue was discussed.
    a. Aerial photos and ground photos of the recent construction improvements were reviewed.
    b. The crossing is a one-lane, one-direction skewed crossing from SR 5 to 14th Avenue and operates as a right turn off of SR 5.
    c. It was noted that if a SR 5 southbound right turn lane was constructed at 23rd Street the SR 5 R/W is only 70 ft wide and widening would require acquisition of businesses on the east side of SR 5. If the right turn lane was further north at 26th Street, some business relocations would occur but not as many since the SR 5 R/W is 100 ft wide north of 26th Street.
    d. FDOT Central Railroad Office noted that on the statewide FEC track safety review, not part of the SR 5 PD&E study, it was noted that 14th Avenue should be a candidate for closure due to the skew and roadway connections.
9. The meeting concluded with the following summary:
    a. The PD&E studies are presenting at-grade bicycle and pedestrian crossings.
    b. The SR 5 project will submit the alternatives to SR 5 for formal comment by the FEC.
    c. The required preliminary engineering and environmental analysis by FDOT consultants will be determined at a following meeting.
    d. Phase 27 funding will be allocated for the FEC to review the PD&E study alternatives.

SR 5 / US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study

Indian River County, Florida

Financial Project ID: 441693-1-22-02
Efficient Transportation Decision Making (ETDM) Number: 14475

Florida Department of Transportation, District Four

Florida East Coast Railroad Coordination Meeting

FEC RR Crossing Number: 273047Y

August 18, 2023

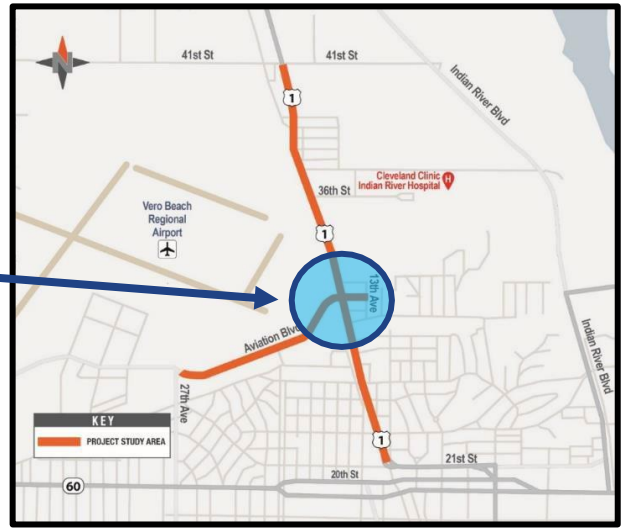
441693-1-02 | SR 5/US 1 at Aviation Boulevard PD&E Study

FEC RR Crossing Number: 273047Y

Location: City of Vero Beach, Indian River County

Purpose and Need: Evaluate Intersection to improve safety, address travel demand, improve multimodal features

Project Location



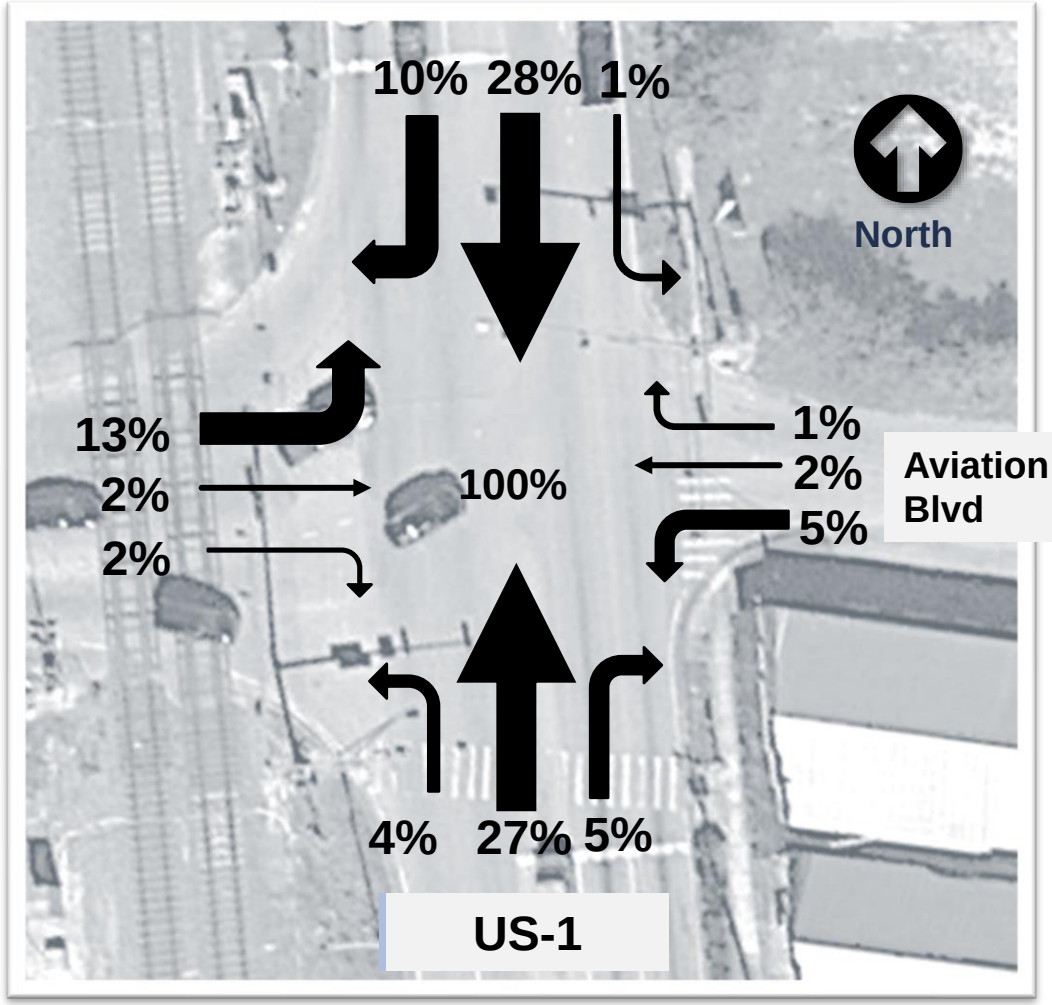
Daily Traffic Volumes, Growth and Comparison

Daily Traffic Volume (AADT)

	Year 2021	Year 2045	Total Growth
SR 5 US 1	34,200	55,000	61%
Aviation Boulevard	12,000	19,300	61%

Traffic Movement Volume Comparison

(Year 2045 AM Peak Hour)



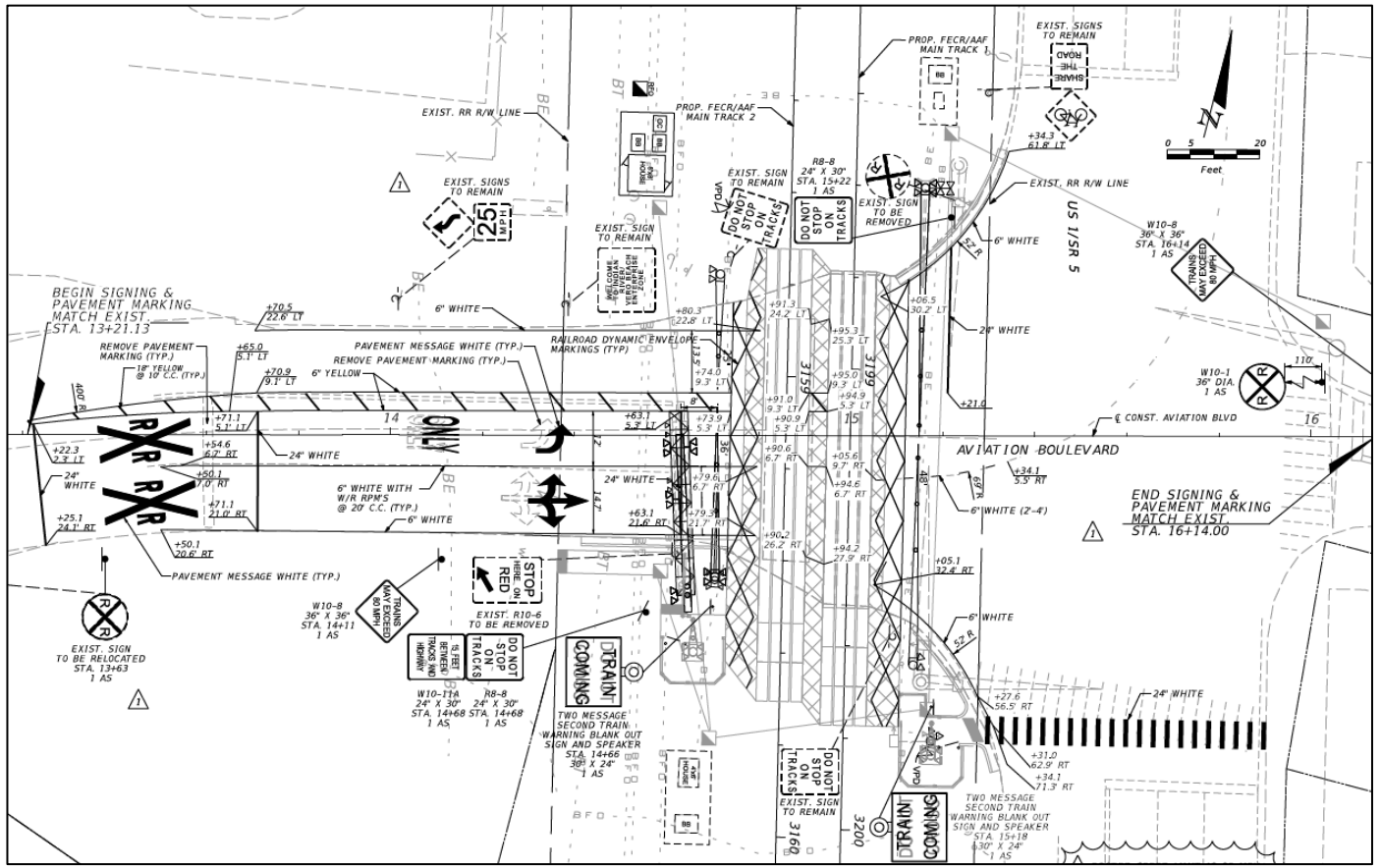
FEC Railroad Crossing Construction @ Aviation Blvd

FEC Crossing Project

- FEC Double Track
- RR Signal System
- SR 5 Mast Arms
- Main Canal Bridge

Aviation Blvd

- 2 Lanes Eastbound
- 1 Lane Westbound
- Pedestrian crossing on south side
- Painted median buffer
- Rural typical section



SR 5 and Aviation Blvd Pedestrian Crossing Construction

SR 5 Crosswalk – Looking East

Crosswalk at Crossing – Looking West

Aviation Blvd - Looking East

FEC RR Crossing – Looking West

Alternatives Considered, Coordination, and Screening

Alternatives Considered

- Alternative 1 – Conventional Intersection
- Alternative 2 – One-way Pair
- Alternative 3 – US 1 Overpass
- Alternative 4 – Aviation Blvd Overpass
- Alternative 5 – Aviation Blvd Underpass
- Alternative 6 – Aviation Blvd Overpass (with railroad crossing)
- Alternative 7 – Displaced Left Turn
- Alternative 8 – Median U-Turn with Roundabout

Coordination Meetings

- Property Owners
- City of Vero Beach Public Works
- IRC Public Works
- IRC Metropolitan Planning Organization (MPO)
- IR Farms Water Control District (IRFWCD)
- Florida East Coast Railroad (FEC RR)
- Federal Aviation Administration (FAA)

Federal Aviation Administration (FAA)

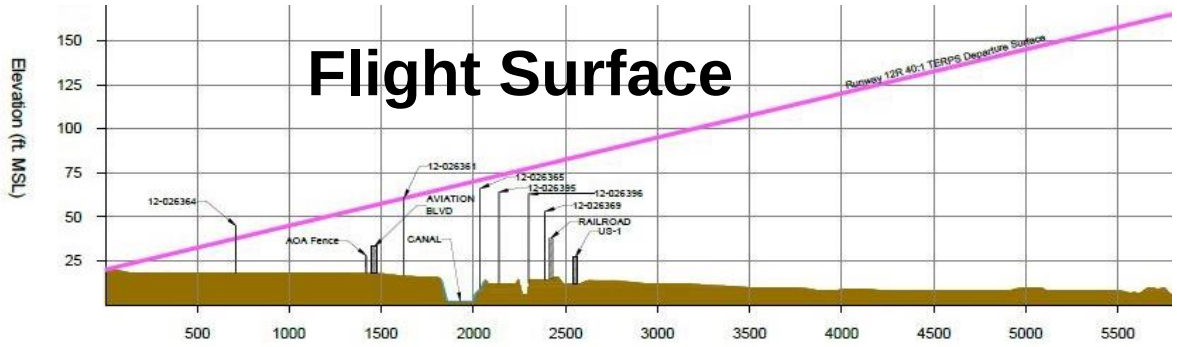
Runway and Aviation Regulations

Runway 30L and the land within the airport property is controlled by the Federal Aviation Administration (FAA) and Vero Beach Airport regulations.

The Runway Protection Zone (RPZ), shown as , controls the ground surface to minimize ground hazards to aircraft.

The Flight Surface controls the airspace to keep the aircraft flight space clear.

The FAA concurred with the Runway Protection Zone analysis that concluded the at-grade roadway alternative was the best solution for improvements within the Vero Beach Airport (VRB) Runway 30L RPZ.



Alternatives Eliminated and Alternatives Advancing Forward

Alternatives Eliminated:

Based on the FAA and airport runway protection zone regulations, screening evaluation, coordination with the city, county, and public, the four (4) alternatives with an overpass or underpass were eliminated from further consideration.

- **Alternative 3** – US 1 Overpass
- **Alternative 4** – Aviation Blvd Overpass
- **Alternative 5** – Aviation Blvd Underpass
- **Alternative 6** – Aviation Blvd Overpass (with railroad crossing)

Alternatives Advancing Forward:

The four (4) alternatives without an overpass or underpass are the best alternatives for further study that will benefit the community, enhance safety, enhance multi-modal features, and improve existing and future traffic congestion.

- **Alternative 1** – Conventional Intersection
- **Alternative 2** – One-Way Pair
- **Alternative 7** – Displaced Left Turn
- **Alternative 8** – Median U-turn with Roundabout

Common Features of the Alternatives Moving Forward

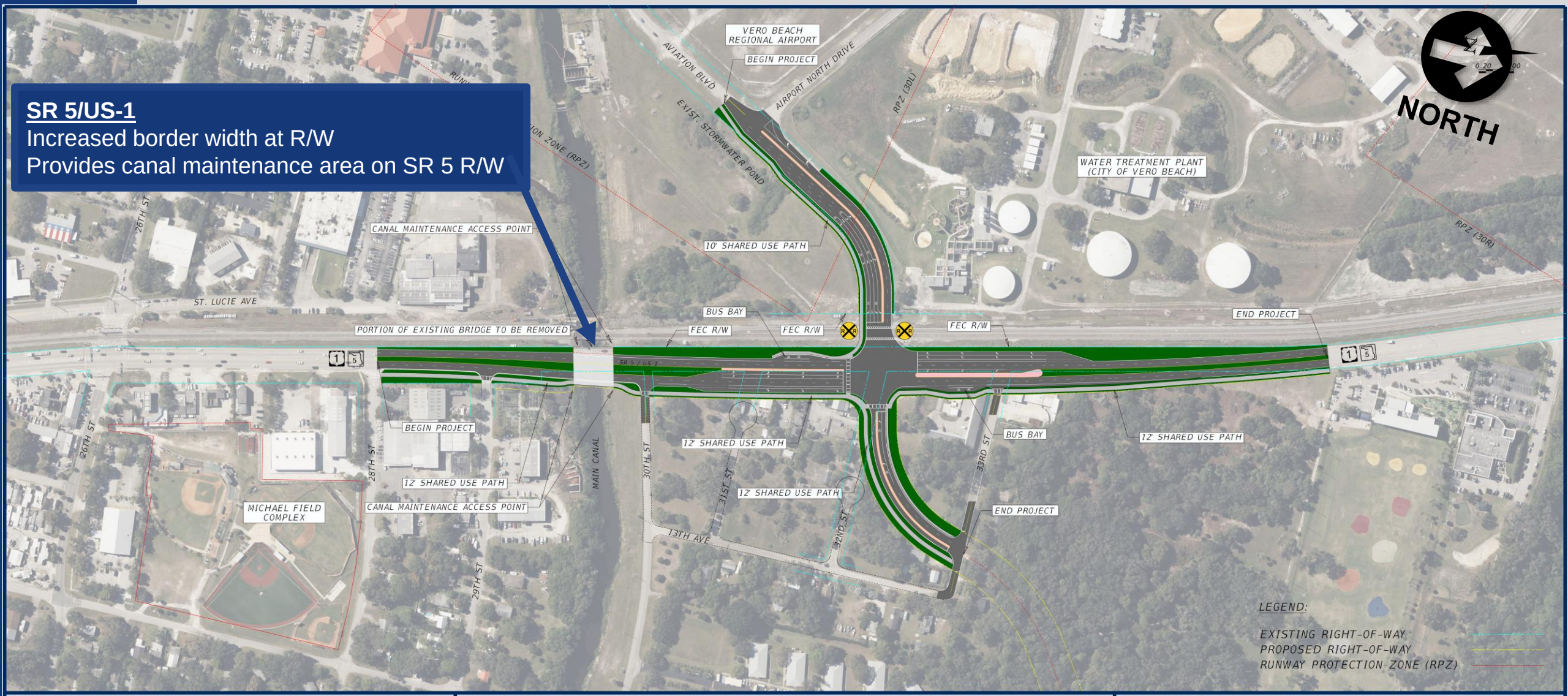
Common Railroad Crossing Features

- Raised median separator on Aviation Blvd at railroad crossing
- Profile grade improvements with reconstruction of SR 5/US-1
- Shared use path on southside of Aviation Blvd
- Single crosswalk across US-1

Common Roadway Features

- Reconstruction of the roadway, drainage, traffic signals and street lighting.
- Increased roadside border between FEC RR right of way and SR 5/US-1 roadway
- Increased maintenance areas outside of FEC R/W for canal maintenance
- Widen or replacement of the US-1 bridge over the Main Canal
- Shared use path

ALTERNATIVE 1 - Conventional Intersection



Alternative 1 - Conventional Intersection

SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

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Indian River County, Florida
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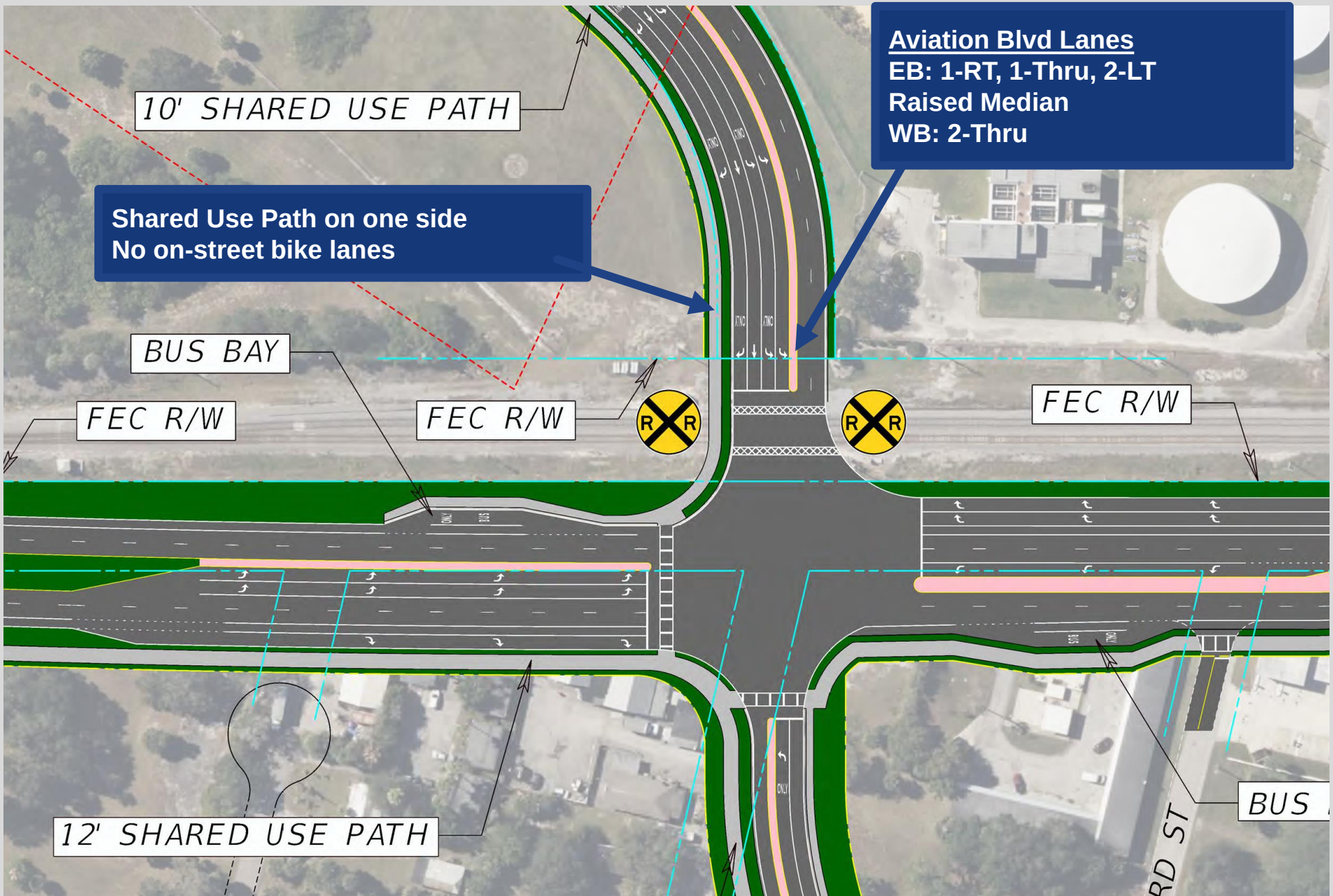
Draft Alternative

June 6th, 2023

ALTERNATIVE 1 - Conventional Intersection



ALTERNATIVE 2 – One-Way Pair

Alternative 2 - One-Way Pair

SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

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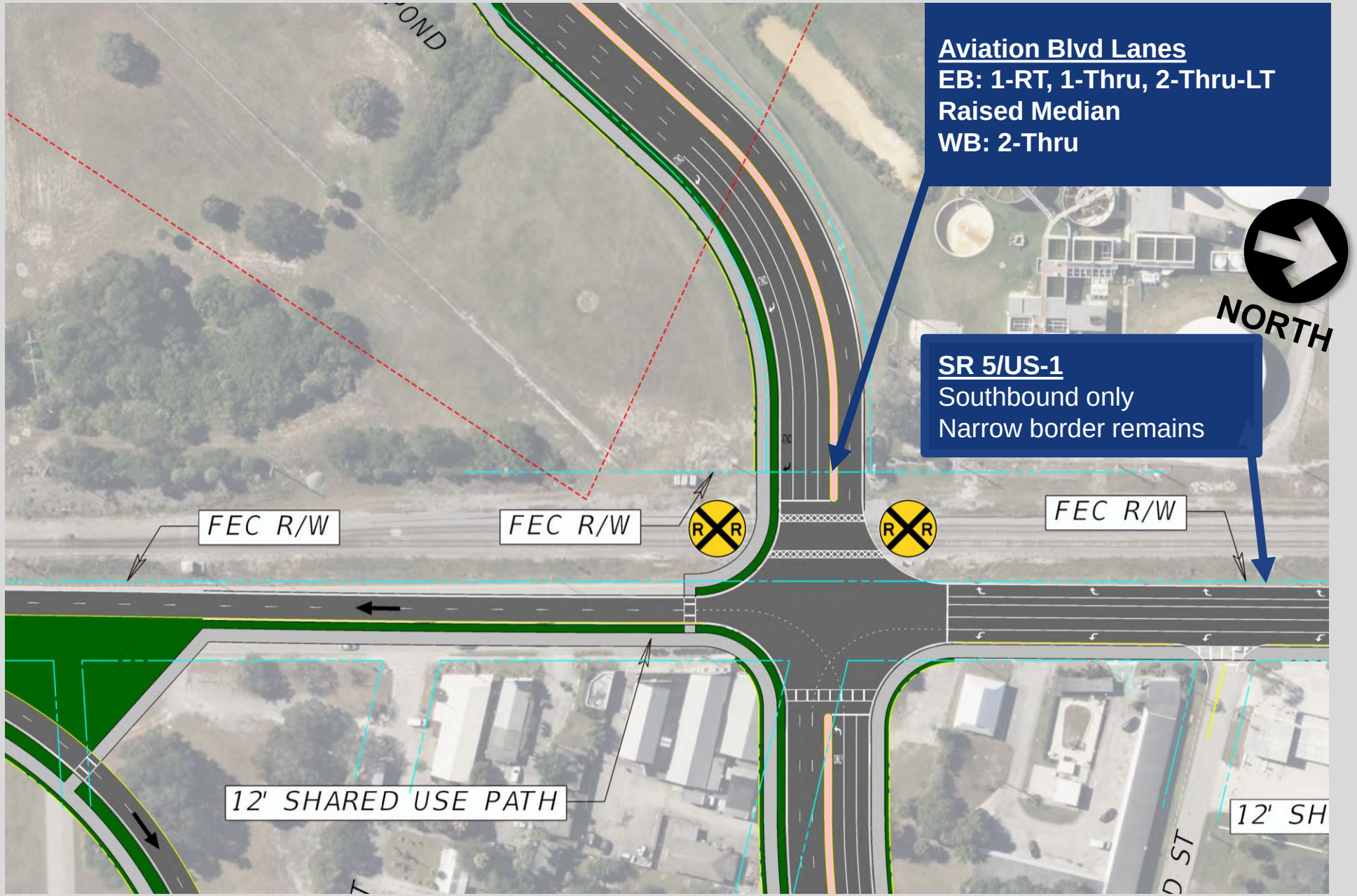
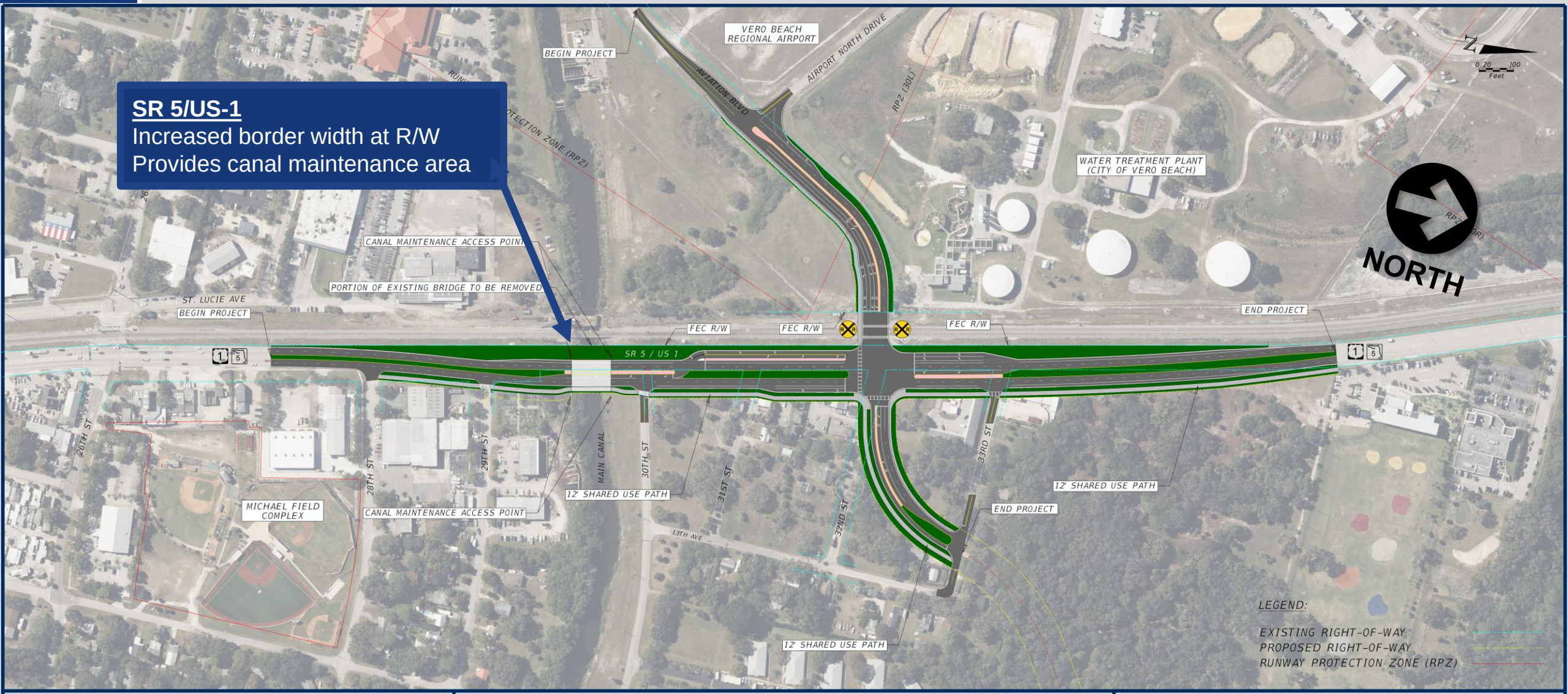
Draft Alternative

June 6th, 2023

ALTERNATIVE 2 – One-Way Pair



ALTERNATIVE 7 – Displaced Left Turn



Alternative 7 - Displaced Left Turn Intersection
SR 5 at Aviation Boulevard

State Road (SR) 5/US 1 at Aviation Boulevard

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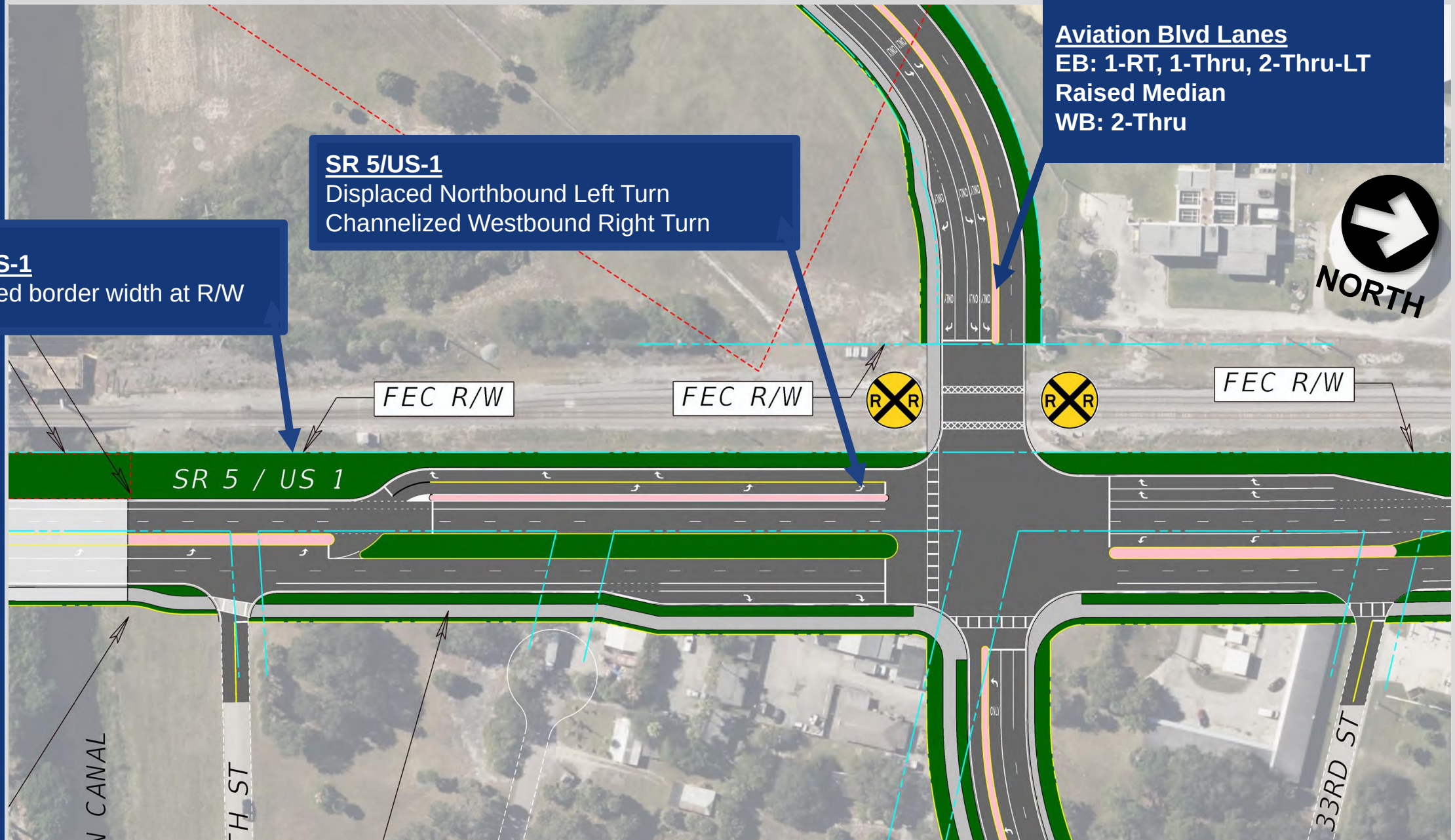
ALTERNATIVE 7 – Displaced Left Turn



ALTERNATIVE 8 – Median U-turn with Roundabout

Alternative 8 - Median U-Turn with Roundabout
SR 5 at Aviation Boulevard

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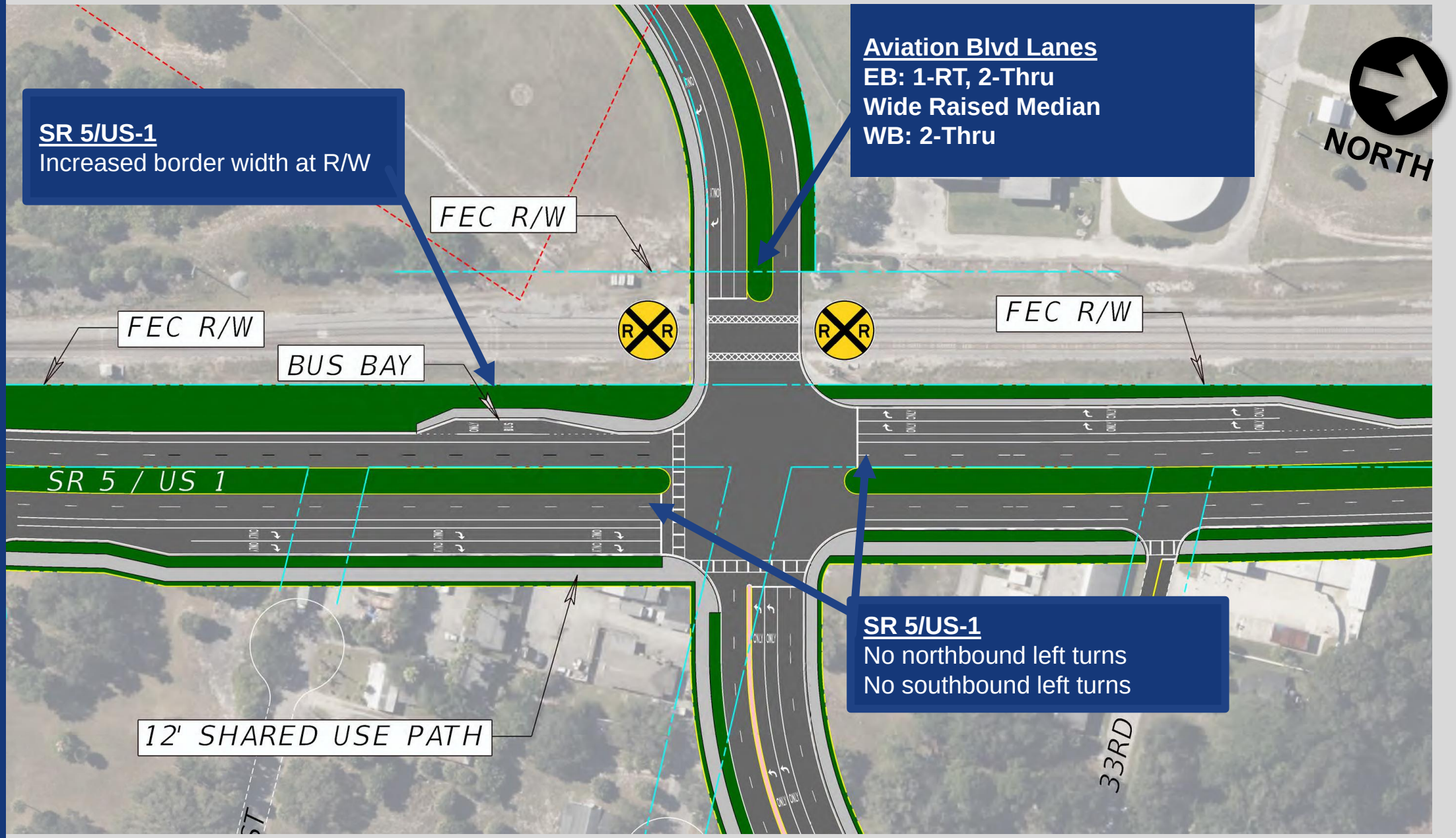
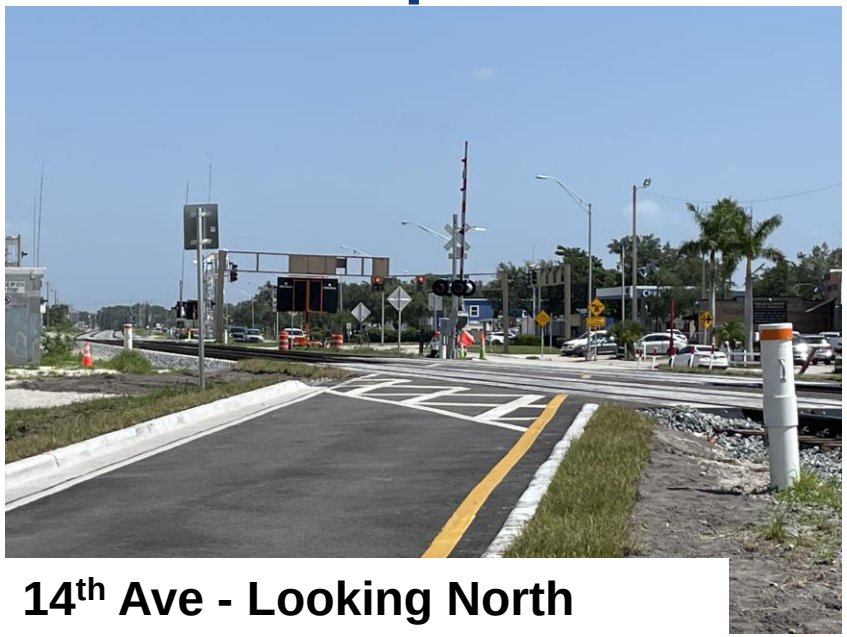
ALTERNATIVE 8 – Median U-turn with Roundabout



Discussion of Crossing Closure Requirement

Discussion of Crossing Closure Requirement

14th Ave – Looking South



14th Ave - Looking North

SR 5 at 14th Ave – Looking South

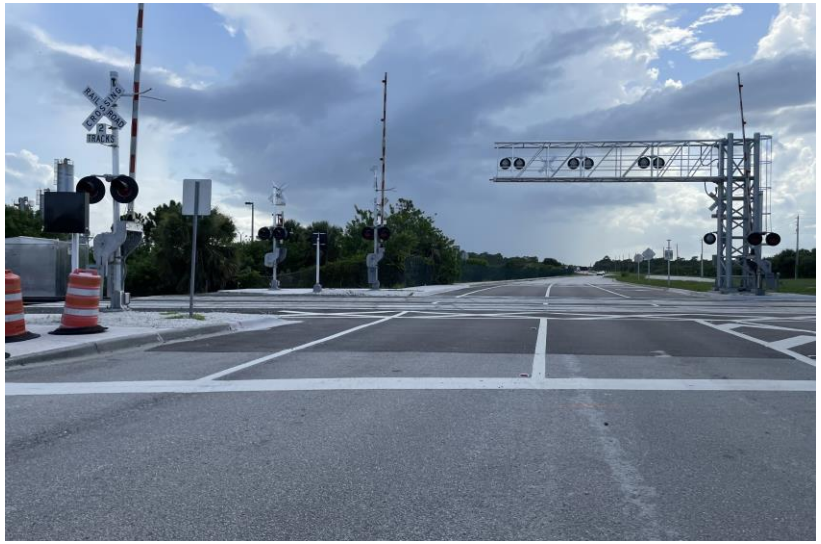
14th Ave – Looking North

Railroad Crossing Countermeasures at Other Crossings

Active Message Signs

Raised Median

Pedestrian Crossing Gates

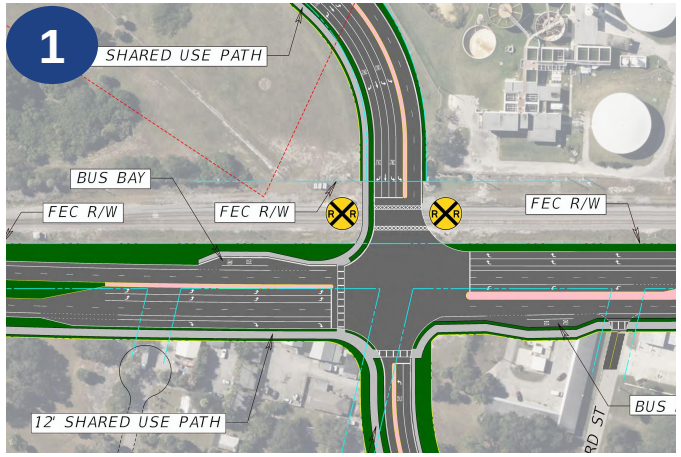


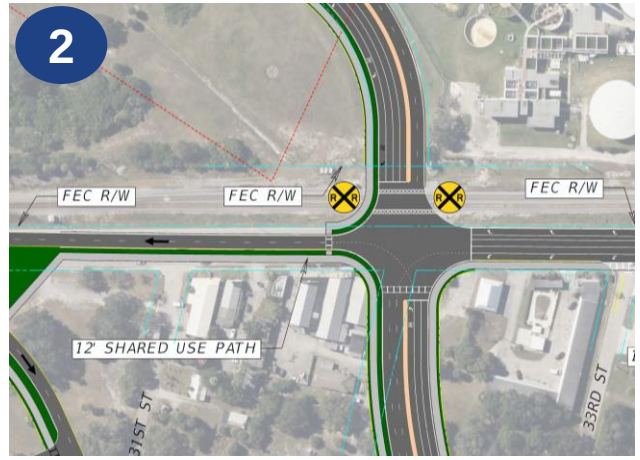
Profile Hump Correction

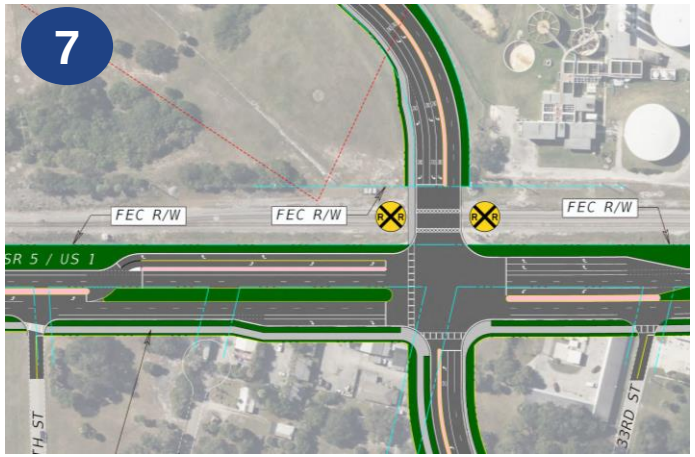
Summary

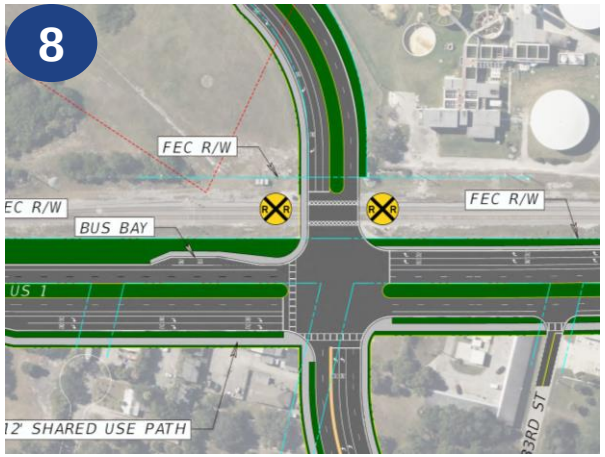
PD&E Build Alternatives
Measures to Reduce Railroad Risk

- Dynamic Envelope
- Raised median at railroad crossing
- Single shared use path for bicycles and pedestrians
- No on-street bike lanes across railroad tracks
- Increased border width between SR 5/US-1 travel lanes and FEC RR right of way
- Crossing profile hump correction with SR 5/US-1 reconstruction
- Highway lighting on crossing and SR 5/US-1
- Elimination or reduction in number of left turn lanes across railroad crossing, or left turn movements onto the railroad crossing



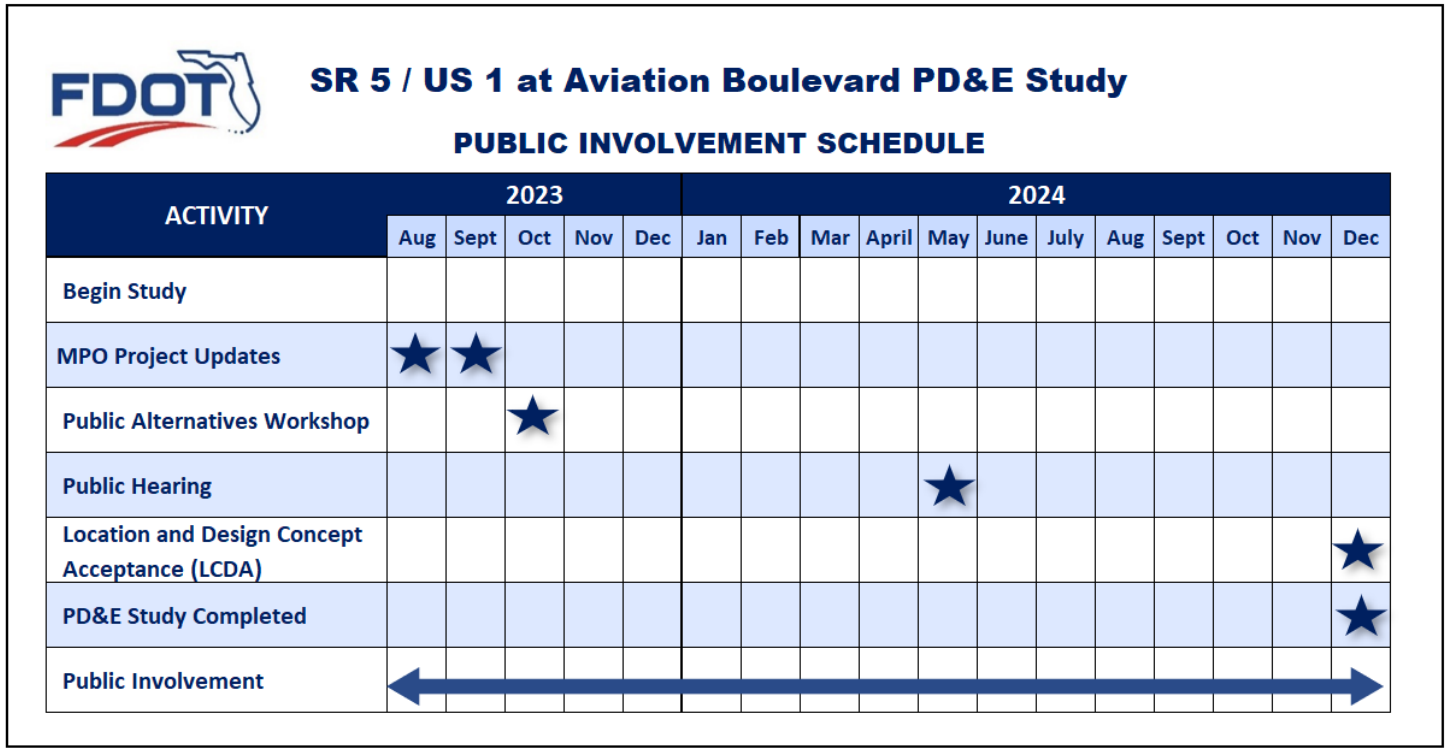






Schedule and Funds Programmed

Schedule



Funds Programmed

Item	Funded in Fiscal Year 2025	Funded in Fiscal Year 2026
Right of Way (RW)	---	---
Design or Preliminary Engineering (PE)	$2,503,603	$700,000
Construction (CST)	---	---
Construction Engineering	---	---
Total Funds	$2,503,603	$700,000

Public Involvement

Attend Public Meetings

- Public Alternatives Workshop:
  - October 10, 2023 at 5:30 PM (Webinar online)
  - October 11, 2023 at 5:30 PM (In-person)
    - Vero Beach Community Center
    - 2266 14th Avenue, Vero Beach, FL 32960
- Public Hearing: May/June 2024 (tentative)

- **Contact Project Manager:**
  - Vandana Nagole, PE
  - Email: Vandana.Nagole@dot.state.fl.us
  - Project Website: https://www.fdot.gov/projects/SR5AviationBlvdPDE

Stay Informed!

Use telephone camera to scan image

Public comments and questions are always welcome!

Safety Message

Thank You

SR 5 / US 1 at Aviation Boulevard

Project Development and Environment (PD&E) Study

MEETING NOTES
POND SITING MEETING 3
Identify Preferred Pond Alternatives

August 30, 2023

Project Name: SR 5 / US-1 at Aviation Blvd PD&E Study **WGI Project:** 02217003.00

Client Name: FDOT District 4 **Client Contract:** CAI127 **FDOT FM:** 441693-1-22-02

Attendees: Vandana Nagole, Cesar Martinez, Bill Evans, Robert Winslow, Linda Hess, Fernando Ascanio, James Hughes, Jerome Saval, Jim Pepe, Daniel Marwood, Lynn Kelley, James Poole, Victor Ramos, Ann Broadwell, Christina Brown, Robert Vater

The purpose of the meeting was to discuss the pond sites, evaluation matrix and determine the preferred pond location. The proposed ponds for Alternatives 1, 2, 7 and 8 were reviewed. Each alternative had 3 proposed pond sites (A, B and C) evaluated and only one pond site is needed per alternative. The sites are dry ponds that must dry in the required 72 hours. The following topics were discussed.

General Comments:

- The evaluation matrix did consider getting water from the ponds to the outfall location. The number of property owners per pond site could be challenging when purchasing the right of way for the ponds. Indian River County does own 3 parcels off of US 1. The intent for the public alternatives workshop is to show 1 pond site per alternative.

Pond Site A for Alternatives 1 and 7

- The Indian River Farms Water Control District (IRFWCD) did like Pond A the best since the site is located closest to the outfall site. The outfall canal is maintained by IRFWCD.
- Despite the cultural resource findings within Pond Site A 1, the evaluation matrix rated the site highest.
- The cultural resources related to the Old Vero Site 8IR9 and the historic structures were discussed and preliminary graphics of the cultural resource investigation were reviewed. The Old Vero Site (8IR9) has an area that includes portions of Pond Site A. Cultural resource consultant, Janus Research, explained that the Site 8IR9 boundary is an extrapolation from findings in other areas west and south of Pond Site A. No archeological testing was conducted in the area of pond site A during the Site 8IR9 investigation.
- Pond Site 1A and 7A are recommended and the team advised that interval testing should be conducted to determine the archeological determination. The archeological testing would be conducted at 25 meter intervals along with auger drills.
- It was noted that the pond site would be shallow since they are dry ponds. If archeological resources were found in Pond Site 1A or 7A, they could be deep as previously found on the Vero Site at other locations. Therefore, it is possible that the pond will not impact the cultural resource, if they were located deep enough.
- There has been a lot of interest in the Vero Man Site so it could be a concern of the local community.
- **Pond 1A and 7A are the recommended** pond sites and complete additional testing to clear the site. If testing can't be completed to clear Pond A before the public workshop Pond C will also be shown.

Pond Site B

- Pond Sites 1B and 7B is comprised of two smaller ponds that are split by a local road. Pond B sites that were split will be renamed #B South and #B north.
- **Pond Site 2B was recommended for Alternative 2.**
- Pond site 8B was discussed to be reshaped to utilize the 3 parcels between US 1 and the proposed pond site. After the meeting the size of the parcels along US 1 did not have sufficient acreage to hold the revised Pond B, therefore Pond B was not revised.

Pond Site C

- Pond C has existing old cabin structures that are mostly abandoned. Janus, the cultural resource consultant, noted the structures lack building integrity and likely would not be found significant by the SHPO due to poor structural condition. FDOT noted the SHPO did not allow abandoned homes to be removed on another project.
- Pond 1C and 7C were the second choice, if Pond A did not move forward.
- **Pond 8C was recommended for Alternative 8.**

Public Workshop Exhibit

The pond sites would be shown on a separate exhibit with the four alternatives with ponds shown on one exhibit board.

- Alternative 1 – Pond 1A
- Alternative 2 – Pond 2B
- Alternative 7 - Pond 7A
- Alternative 8 – Pond 8C

If the archeological investigation is not conclusive, the exhibit could show 2 pond sites for Alternatives 1 and 7, with notes on the graphic that only pond site A or C is needed.

Pond Siting Evaluation Matrix

Item	Weight Factor*	Factor	Score**	Weighted Score	Score**	Weighted Score	Score**	Weighted Score
	1 to 5	**PD&E Build Alternative 1 Conventional Intersecion**	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number	**1-A**		**1-B**		**1-C**	
		Brief Description of Pond Alternative	Utilizes 1 full block between 30th and 31st St.		Closes 32nd Street		North of 33rd Street	
		Number of parcels effected	3		9		6	
		Existing property use	vacant parcel		vacant with 2 active residential units impacted by pond		Abondonded houses and a commercial business (roadway widening acquires the commercial structure)	
		Pond Size (Acres)	1.61		1.81		1.81	
	*	** Weight factors are 1 for least critical and 5 for most critical* *** Score factors are 1 for most negative effect and 5 for most positive effect*	**		**		**	
1	4	**Right of Way (number of properties required)**	4	16	1	4	2	8
2	4	**Right of Way (number of relocations)**	5	20	1	4	2	8
3	2	**Economic Development**	3	6	1	2	4	8
4	2	**Right-of-Way Costs**	5	10	1	2	3	6
5	3	**Drainage Considerations**	5	15	4	12	3	9
6	2	**FEMA Flood Zone**	3	6	3	6	3	6
7	3	**Contamination/Hazardous Materials**	4	12	3	9	1	3
8	3	**Utilities**	4	12	4	12	4	12
9	4	**Threatened/Endangered Species**	4	16	4	16	3	12
10	4	**Wetlands/Protected Uplands**	5	20	5	20	5	20
11	5	**Cultural Resources Involvement**	1	5	5	25	3	15
12	5	**Section 4(f)**	5	25	5	25	5	25
13	4	**Public Wellfield**	5	20	5	20	4	16
14	3	**Construction**	5	15	3	9	5	15
15	3	**Maintenance**	5	15	3	9	5	15
16	3	**Aesthetics**	4	12	4	12	4	12
17	4	**Public Opinion/Adjacent Residency Concerns**	3	12	3	12	3	12
18	1	**Other**	3	3	3	3	3	3
		Score	240		202		205	
		Ranking	**1**		3		2	
Note: Rankings are from 1-5, with 5 being the highest or most desired score.								

Pond Siting Evaluation Matrix

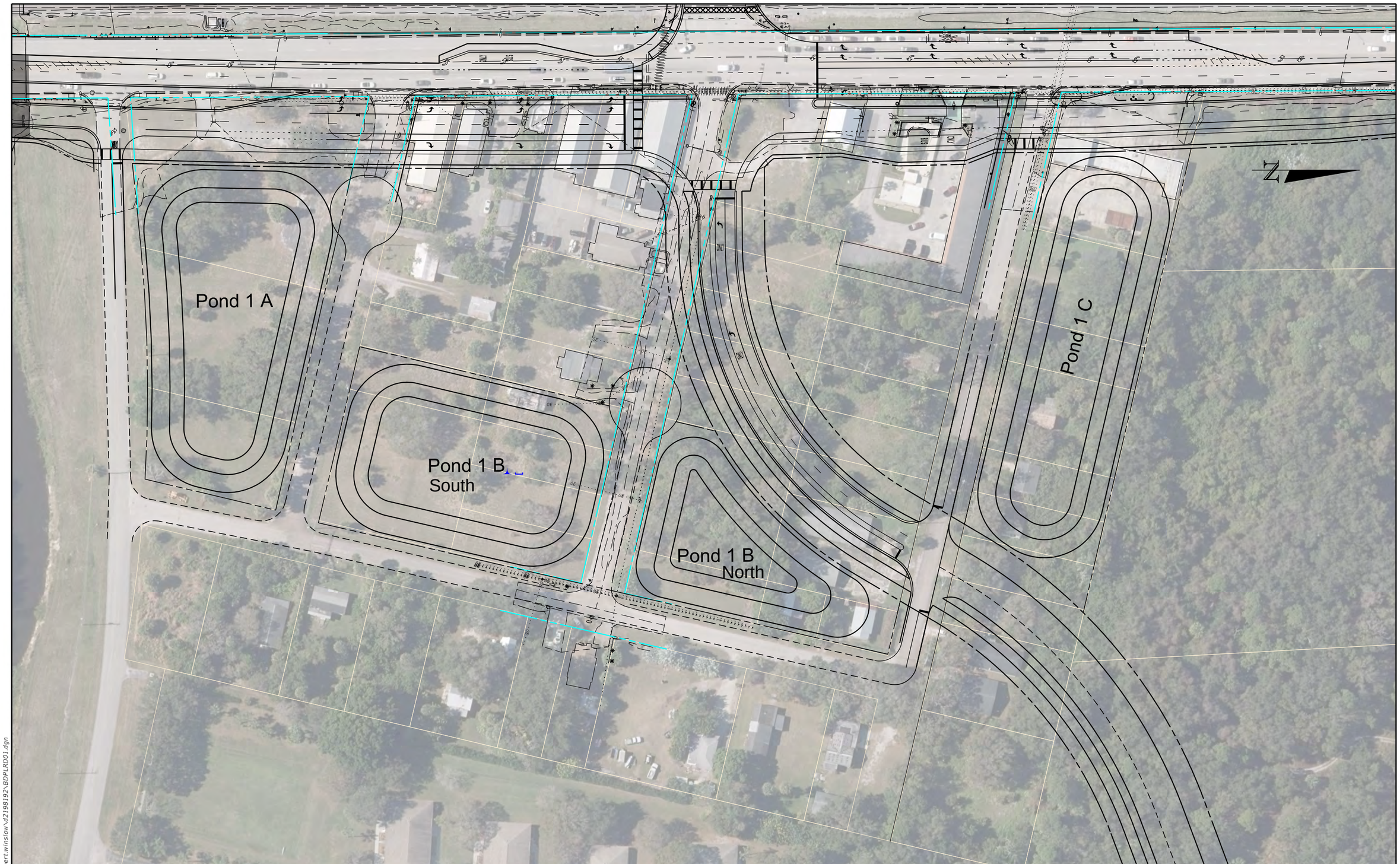
Item	Weight Factor*	Factor	Score**	Weighted Score	Score**	Weighted Score	Score**	Weighted Score
	1 to 5	**PD&E Build Alternative 2 One Way Pairs**	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number	**2-A**		**2-B**		**2-C**	
		Brief Description of Pond Alternative	Two pond cells around 30th St and 15th Ave.		Closes 32nd Street		North of 33rd Street	
		Number of parcels effected	10 (6 parcels are part of roadway r/w)		14 (6 parcels are part of roadway r/w)		10 (5 parcels are part of roadway r/w)	
		Existing property use	vacant land with 3 residential units impacted by pond		vacant land with 2 residential units impacted by pond		vacant and forested land with 3 abandoned residential units impacted by pond	
		Pond Size (Acres)	1.86		2.49		2.54	
	*	** Weight factors are 1 for least critical and 5 for most critical* *** Score factors are 1 for most negative effect and 5 for most positive effect*	**		**		**	
1	4	**Right of Way (number of properties required)**	2	8	1	4	2	8
2	4	**Right of Way (number of relocations)**	1	4	2	8	3	12
3	2	**Economic Development**	4	8	3	6	4	8
4	2	**Right-of-Way Costs**	2	4	3	6	5	10
5	3	**Drainage Considerations**	5	15	4	12	3	9
6	2	**FEMA Flood Zone**	3	6	3	6	3	6
7	3	**Contamination/Hazardous Materials**	4	12	3	9	2	6
8	3	**Utilities**	3	9	3	9	4	12
9	4	**Threatened/Endangered Species**	4	16	4	16	3	12
10	4	**Wetlands/Protected Uplands**	5	20	5	20	5	20
11	5	**Cultural Resources Involvement**	1	5	5	25	3	15
12	5	**Section 4(f)**	5	25	5	25	5	25
13	4	**Public Wellfield**	5	20	5	20	4	16
14	3	**Construction**	3	9	5	15	4	12
15	3	**Maintenance**	3	9	5	15	4	12
16	3	**Aesthetics**	4	12	4	12	3	9
17	4	**Public Opinion/Adjacent Residency Concerns**	2	8	3	12	3	12
18	1	**Other**	3	3	3	3	3	3
		Score	193		223		207	
		Ranking	3		1		2	
Note: Rankings are from 1-5, with 5 being the highest or most desired score.								

Pond Siting Evaluation Matrix

Item	Weight Factor*	Factor	Score**	Weighted Score	Score**	Weighted Score	Score**	Weighted Score
	1 to 5	**PD&E Build Alternative 7 Displaced Left Turn**	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number	**7-A**		**7-B**		**7-C**	
		Brief Description of Pond Alternative	Utilizes 1 full block between 30th and 31st St.		Closes 32nd Street		North of 33rd Street	
		Number of parcels effected	3		9		6	
		Existing property use	vacant parcel		vacant with 2 active residential units impacted by pond		Abondonded houses and a commercial business (roadway widening acquires the building structure)	
		Pond Size (Acres)	1.59		1.81		1.58	
	*	** Weight factors are 1 for least critical and 5 for most critical* *** Score factors are 1 for most negative effect and 5 for most positive effect*	**		**		**	
1	4	**Right of Way (number of properties required)**	4	16	1	4	2	8
2	4	**Right of Way (number of relocations)**	5	20	1	4	2	8
3	2	**Economic Development**	3	6	1	2	4	8
4	2	**Right-of-Way Costs**	5	10	1	2	3	6
5	3	**Drainage Considerations**	5	15	4	12	3	9
6	2	**FEMA Flood Zone**	3	6	3	6	3	6
7	3	**Contamination/Hazardous Materials**	4	12	3	9	1	3
8	3	**Utilities**	4	12	4	12	4	12
9	4	**Threatened/Endangered Species**	4	16	4	16	3	12
10	4	**Wetlands/Protected Uplands**	5	20	5	20	5	20
11	5	**Cultural Resources Involvement**	1	5	5	25	3	15
12	5	**Section 4(f)**	5	25	5	25	5	25
13	4	**Public Wellfield**	5	20	5	20	4	16
14	3	**Construction**	5	15	3	9	5	15
15	3	**Maintenance**	5	15	3	9	5	15
16	3	**Aesthetics**	4	12	4	12	4	12
17	4	**Public Opinion/Adjacent Residency Concerns**	3	12	3	12	3	12
18	1	**Other**	3	3	3	3	3	3
		Score	240		202		205	
		Ranking	**1**		3		2	
Note: Rankings are from 1-5, with 5 being the highest or most desired score.								

Pond Siting Evaluation Matrix

Item	Weight Factor*	Factor	Score	Weighted Score	Score	Weighted Score	Score	Weighted Score
	1 to 5	**PD&E Build Alternative 8 Median U-turn with Roundabout**	1 to 5		1 to 5		1 to 5	
		Pond Alternative Number	**8-A**		**8-B**		**8-C**	
		Brief Description of Pond Alternative	Utilizes 1.5 full blocks between 30th and 32nd St.		Utilizes 1.5 full blocks between 31st and 33rd St.		North of 33rd Street	
		Number of parcels effected	5		11 (3 parcels are part of roadway r/w)		6 (2 parcels are part of roadway r/w)	
		Existing property use	vacant parcels with 2 businesses (includes multi-unit apts.)		vacant parcels with 1 businesses and 2 residential units		Vacant land with abondonded houses	
		Pond Size (Acres)	2.40		2.77		2.49	
	*	** Weight factors are 1 for least critical and 5 for most critical* *** Score factors are 1 for most negative effect and 5 for most positive effect*	**		**		**	
1	4	**Right of Way (number of properties required)**	4	16	1	4	2	8
2	4	**Right of Way (number of relocations)**	1	4	2	8	4	16
3	2	**Economic Development**	3	6	2	4	2	4
4	2	**Right-of-Way Costs**	3	6	1	2	5	10
5	3	**Drainage Considerations**	5	15	4	12	3	9
6	2	**FEMA Flood Zone**	3	6	3	6	3	6
7	3	**Contamination/Hazardous Materials**	4	12	3	9	2	6
8	3	**Utilities**	3	9	3	9	4	12
9	4	**Threatened/Endangered Species**	4	16	4	16	3	12
10	4	**Wetlands/Protected Uplands**	5	20	5	20	5	20
11	5	**Cultural Resources Involvement**	1	5	5	25	3	15
12	5	**Section 4(f)**	5	25	5	25	5	25
13	4	**Public Wellfield**	5	20	5	20	4	16
14	3	**Construction**	4	12	5	15	5	15
15	3	**Maintenance**	4	12	5	15	5	15
16	3	**Aesthetics**	3	9	4	12	4	12
17	4	**Public Opinion/Adjacent Residency Concerns**	3	12	3	12	4	16
18	1	**Other**	3	3	3	3	3	3
		Score	208		217		220	
		Ranking	**3**		**2**		**1**	
Note: Rankings are from 1-5, with 5 being the highest or most desired score.								



REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	441693-1-22-02

ALTERNATIVE 1

SHEET NO.

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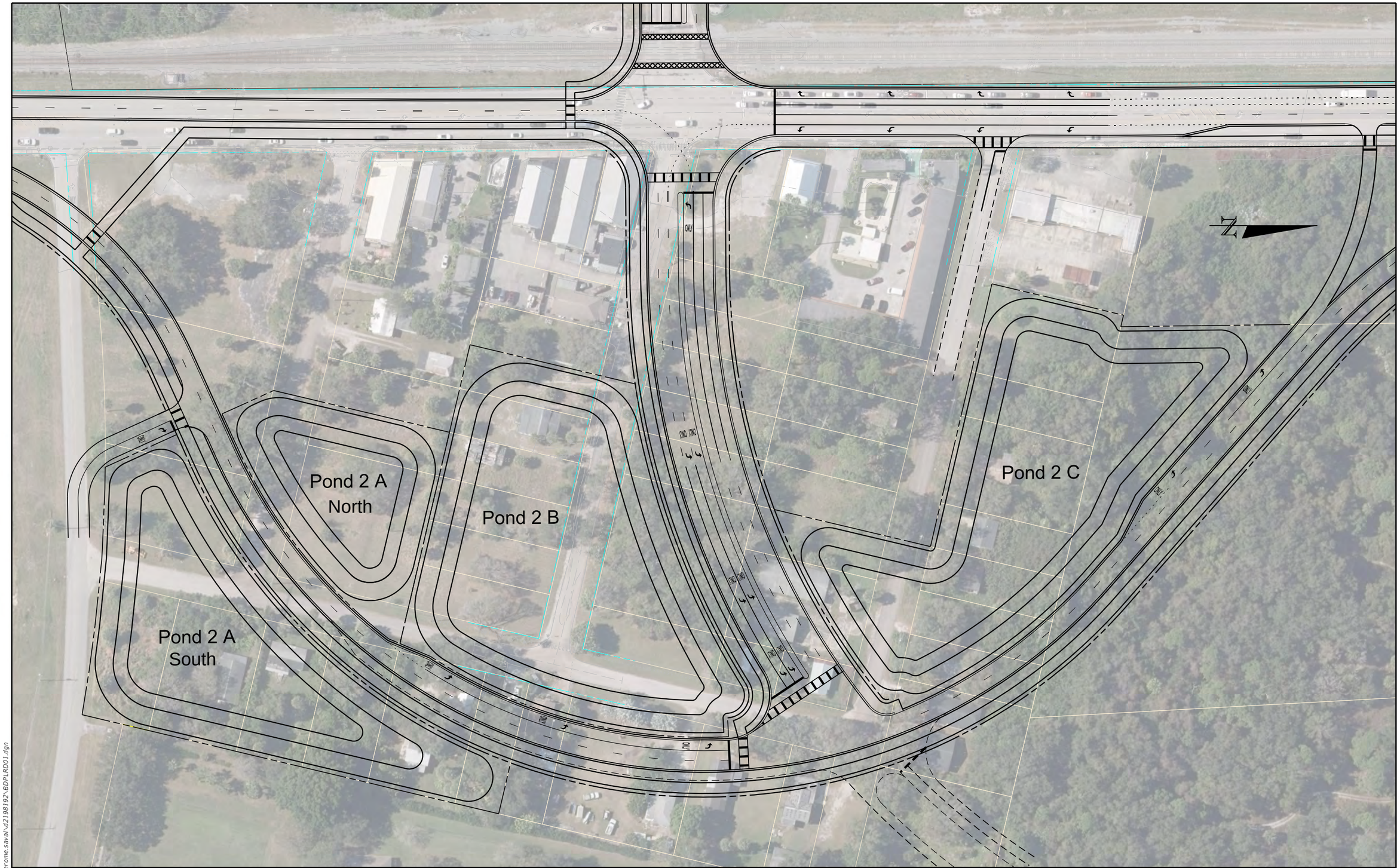

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	INDIAN RIVER	

ALTERNATIVE 2

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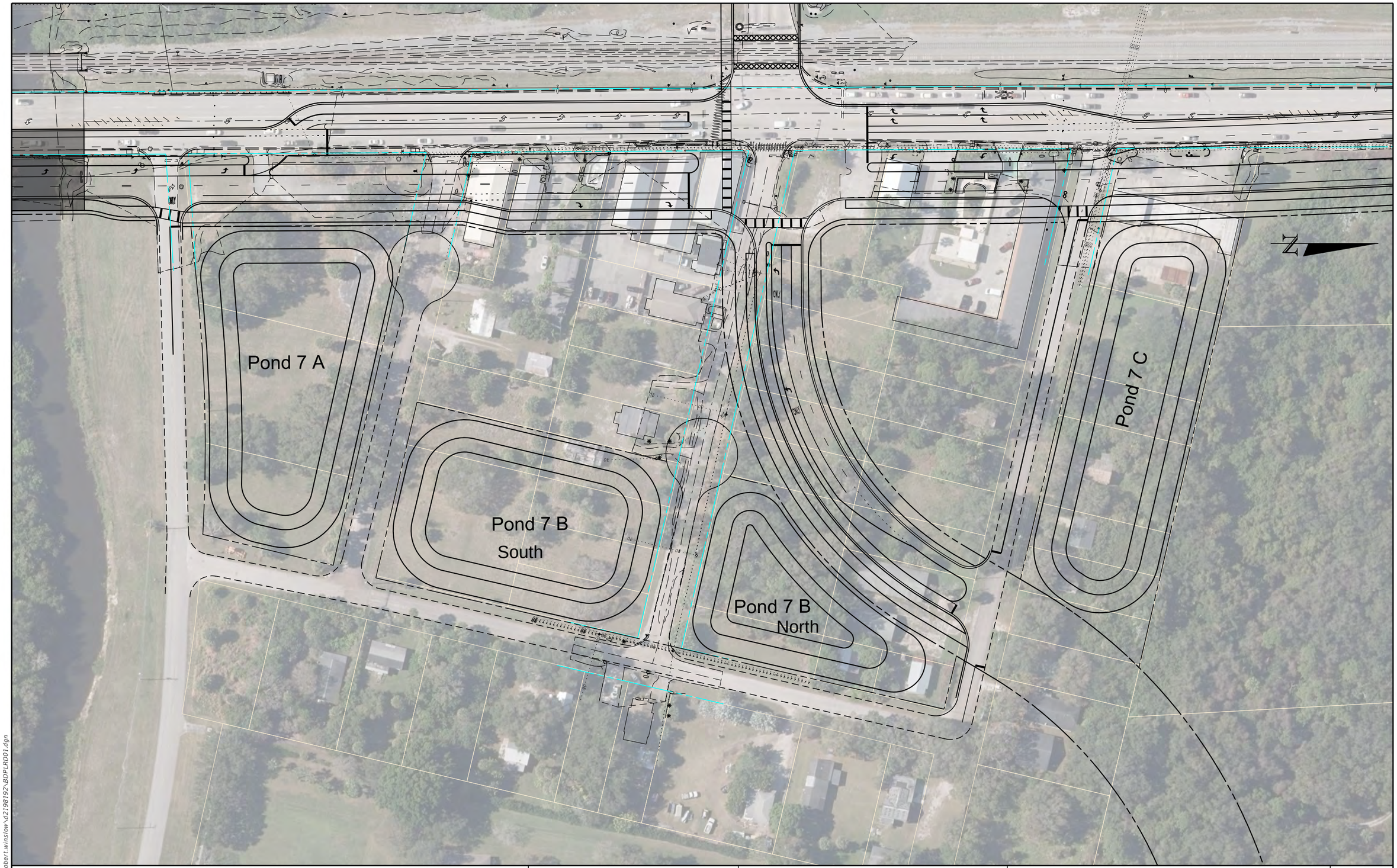

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	INDIAN RIVER	441693-1-22-02

ALTERNATIVE 7

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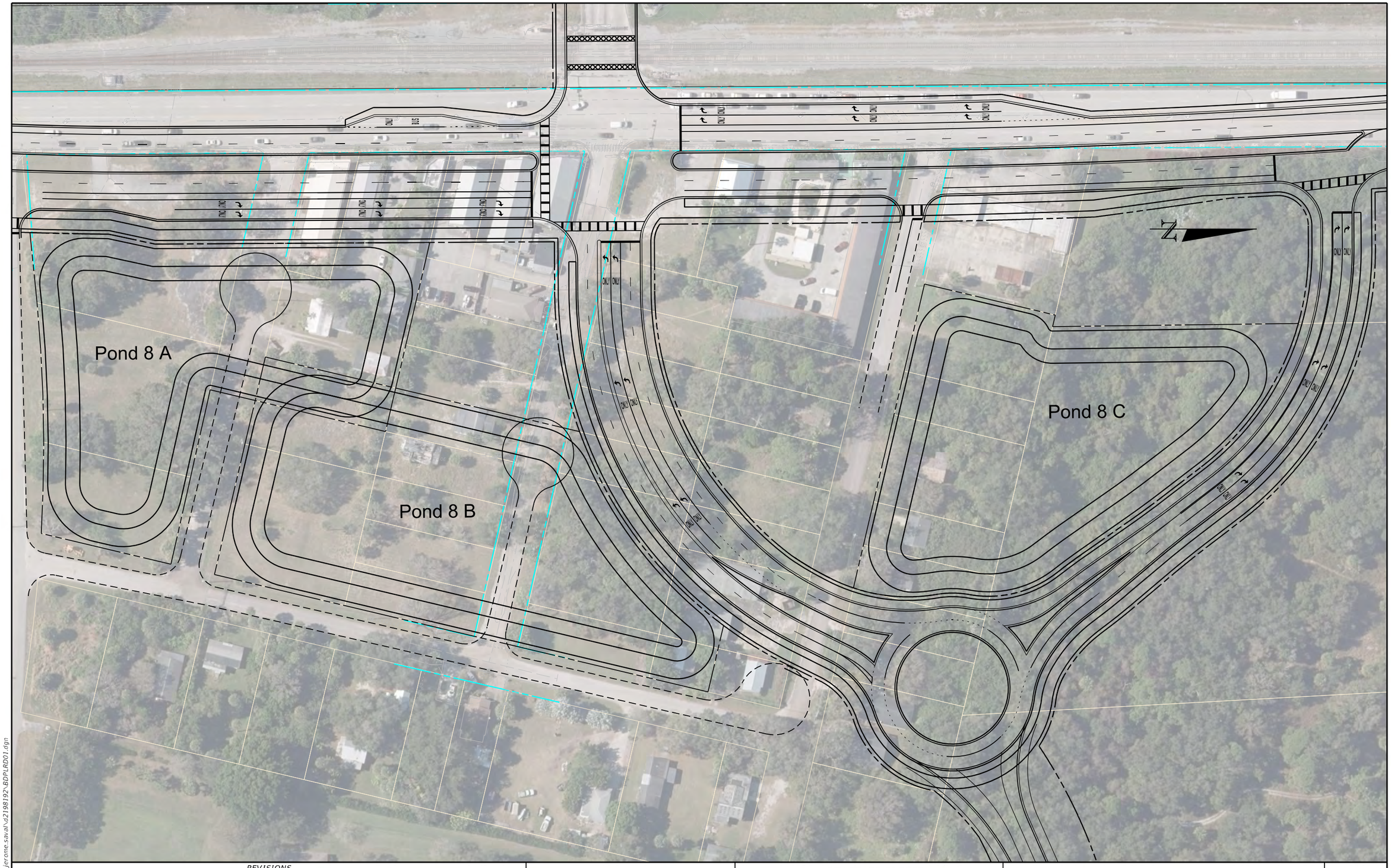

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
	INDIAN RIVER	

ALTERNATIVE 8

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PREFERRED ALTERNATIVE MEETING

November 8, 2023

Project Name: SR 5 / US-1 at Aviation Blvd PD&E Study **WGI Project:** 02217003.00

Client Name: FDOT District 4 **Client Contract:** CAI127 **FDOT FM:** 441693-1-22-02

The purpose of this meeting was to discuss the results of the public alternatives workshop and determine the preferred alternative to advance to the value engineering study.

PUBLIC COMMENTS AND PREFERRED ALTERNATIVE

1. The comments received during the two Public Alternatives Workshops were discussed.
    a. There were three written comments supporting Alternative 1, 25 comments supporting Alternative 2 (due to the alternative's reduced impacts to Camp Haven), and one comment supporting Alternative 8.
    b. The City of Vero Beach submitted an email in support of Alternative 1, noting a resolution would be forthcoming in support of Alternative 1.
2. In response to the support for Alternative 2 which ranked 4th or last in the evaluation matrix, the team prepared a presentation regarding further review of Alternative 2. The presentation discussed the challenges associated with Alternative 2. Alternative 2 scored the lowest on the evaluation matrix and impacts 42 properties with additional cost related to a temporary bridge detour and temporary detour right of way. Alternative 2 requires several design variations for the existing US 1 roadway to remain within the existing right of way. The constructability and detour bridge are needed for the canal bridge, and there are impacts to the nine residential single family homes along 13th Avenue. It is not known, but the homes may have a low income or minority homeownership.
3. Alternative 7, ranked 3rd, and was not desired due to the complex displaced left turn occurring at the railroad crossing.
4. Alternative 8, ranked 2nd, and impacts an additional eight parcels, adding 3.59 acres of property acquisition, with a total cost being $8.66 million greater than Alternative 1.
5. Based on the discussion and scores in the Alternative Evaluation Matrix, the team will move forward to the VE study with Alternative 1 as the preferred alternative.

VALUE ENGINEERING STUDY (VE STUDY)

The group discussed including a second alternative in the VE Study, because Alternative 1 is straight forward and has limited areas to investigate during the VE Study. Based on the next highest ranked alternative, which is Alternative 8, being much more costly with higher impacts, it was determined to only include Alternative 1 in the Value Engineering Study.

RAILROAD CROSSING CLOSURE

District 4 recently discussed with FDOT OEM if the railroad closure needs to be completed before LDCA. The OEM response was that the final outcome of FEC RR coordination did not need to be completed prior to LDCA, but a commitment in the PD&E documents could be added. A suggested commitment would be similar to: Coordination with FEC Railroad will continue into the next phase.

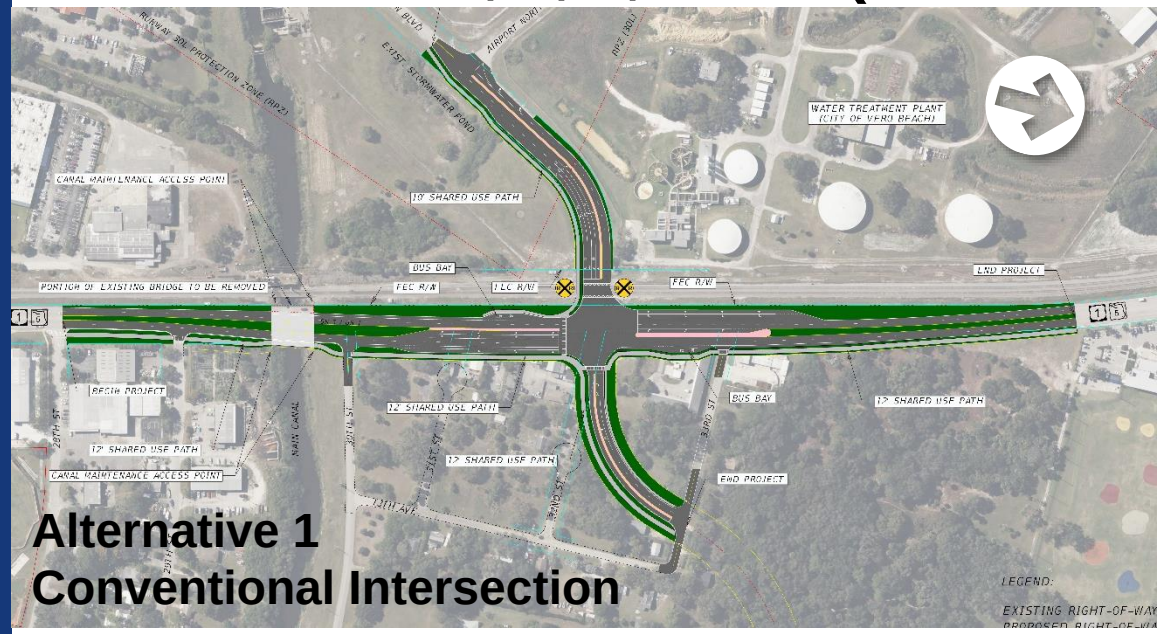
NEXT STEPS

The current supplemental agreement is in process. It will be revised to remove the railroad closure application effort but retain the railroad coordination hours. The supplement will take approximately 4-6 weeks to execute.

For the meeting with Camp Haven, a virtual component will be added to the meeting invitation for FDOT staff that will attend virtually. Staff to include are Cesar, Dan, and John Olson to the meeting invite. FDOT will coordinate with OEM, if any socio-cultural concerns arise.

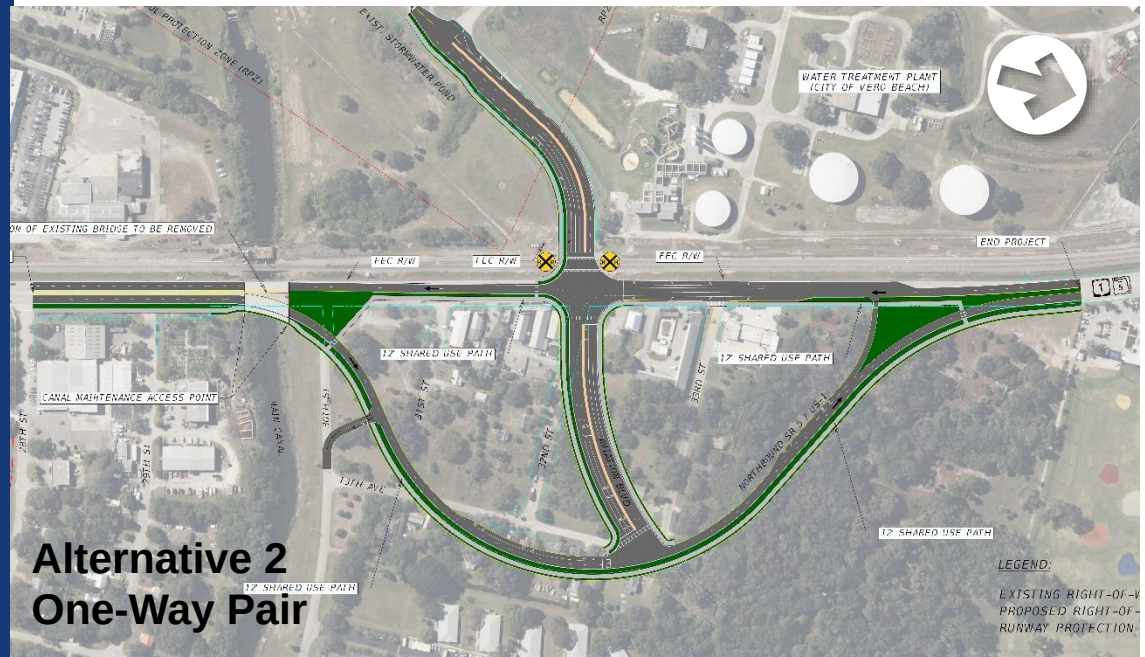
Attendance List		
Meeting Title	**4416931-Progress Meeting - for SR 5 at Aviation Blvd PD&E Study**	
Attended participants	10	
Start time	11/08/23, 1:25:55 PM	
End time	11/08/23, 2:15:08 PM	
Meeting duration	49m 12s	
Average attendance time	40m 22s	
2. Participants		
Name	**In-Meeting Duration**	**Email**
William Evans	48m 55s	William.Evans@wginc.com
LopezLandaverde, Dina	48m 4s	Dina.LopezLandaverde@dot.state.fl.us
Robert Winslow	47m 26s	Robert.Winslow@wginc.com
Phan, Trang	45m 21s	Trang.Phan@dot.state.fl.us
Linda Hess	44m 23s	Linda.Hess@wginc.com
Marwood, Daniel	43m 20s	Dan.Marwood@dot.state.fl.us
Nagole, Vandana	41m 4s	Vandana.Nagole@dot.state.fl.us
Martinez, Cesar	40m 49s	Cesar.Martinez@dot.state.fl.us
Hughes, James	38m 54s	James.Hughes@dot.state.fl.us
Sonnett, Anson	5m 22s	Anson.Sonnett@dot.state.fl.us

Alternatives 1, 2, 7, and 8 (At-Grade Alternatives)

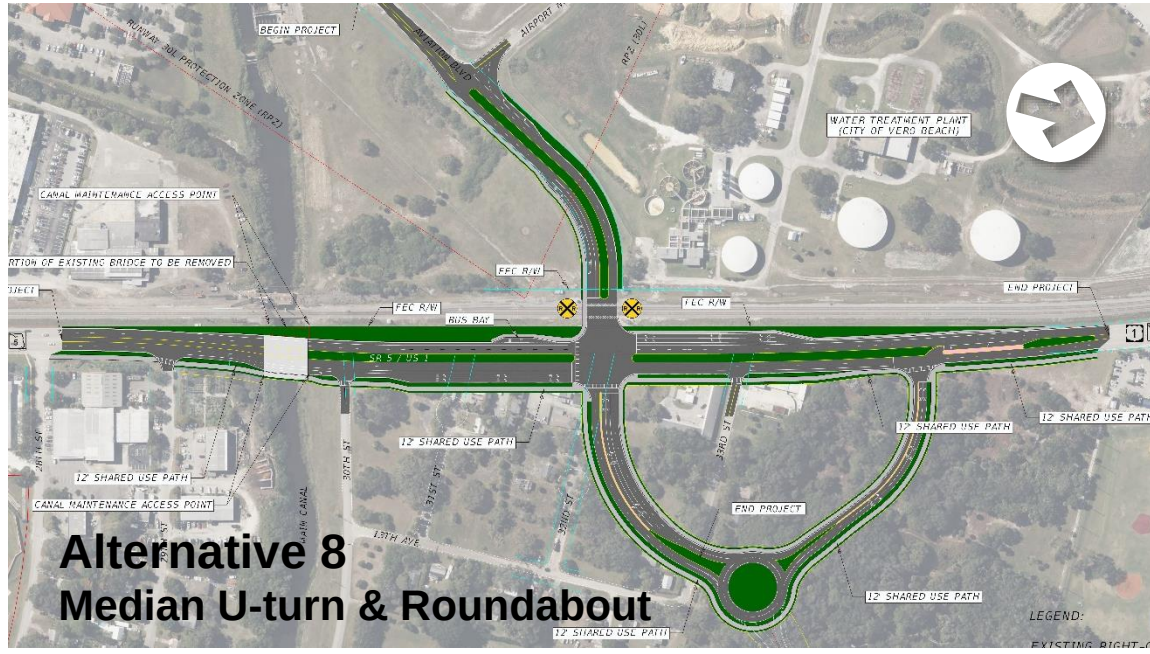


Alternative 1
Conventional Intersection

Alternative 7
Displaced Left Turn



Alternative 2
One-Way Pair



Alternative 8
Median U-turn & Roundabout

ALTERNATIVE EVALUATION MATRIX

SR 5/US-1 at Aviation Boulevard PD&E Study - FPID: 4441693-1-22-02

LEGEND:

Less Desirable — More Desirable

1 point	2 points	3 points	4 points

CRITERIA	NO BUILD	ALTERNATIVE 1 CONVENTIONAL	ALTERNATIVE 2 ONE-WAY PAIR	ALTERNATIVE 7 DISPLACED LEFT TURN	ALTERNATIVE 8 MEDIAN U-TURN ROUNDABOUT
LEVEL OF SERVICE	US 1 & Aviation Blvd LOS F (AM/PM)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D AM/PM (3)	US 1 & Aviation Blvd – LOS D (AM) US 1 & Aviation Blvd – LOS C (PM) (4)	US 1 & Aviation Boulevard – LOS D (AM) Us 1 & Access Rd– LOS C (AM) US 1 & Aviation Boulevard – LOS C (PM) US 1 & Access Rd– LOS B (AM) (4)
SAFETY	Paved median remains. No crash reduction measures (1)	Adds a raised median 72% crash reduction (3)	Adds a raised median 72% crash reduction (3)	Complicated turns movements at railroad crossing. 64% crash reduction (2)	Adds a raised median 80% crash reduction (4)
MOBILITY (TRANSIT, BICYCLE, PEDESTRIAN)	No bicycle facilities and cracked sidewalks	Shared use path for bicyclists and pedestrians. Bus bay provided for transit (4)	Shared use path for bicyclists and pedestrians. Transit stops provided. (3)	Does not provide for transit southbound. Displaced left adds second pedestrian crossing maneuver. (1)	Shared use path for bicyclists and pedestrians. Bus bay provided for transit. (4)
ROADWAY ALIGNMENT	Bridge and curb remain adjacent to railroad right of way	Straight alignment. Roadway is buffered from railroad right of way. (4)	One way pair. Superelevated curved bridge. (1)	Additional deflection and bridge widening for displaced left turn (2)	Redirection of left turns and higher traffic volumes east of SR 5/US-1 (3)
DRAINAGE	Continued drainage problems along sidewalk	Pond 1-C Score 221 (2)	Pond 2A Score 214 (3)	Pond 7C Score 225 (2)	Pond 8-A Score 219 (3)
BRIDGE AND CANAL	Aging bridge and no canal access upstream of the bridge at the railroad.	Canal-Bridge maintenance access provided on all sides (4)	Canal-Bridge maintenance access provided on one side (1)	Canal-Bridge maintenance access provided on all sides (4)	Canal-Bridge maintenance access provided on all sides (4)
RAILROAD	Bridge and roadway remains adjacent to railroad right of way	Raised median provided on Aviation Blvd. Large US 1 rail-roadway buffer. 6 lanes at railroad crossing (3)	Raised median provided on Aviation Blvd. Minimal US 1 rail-roadway buffer. 6 lanes at railroad crossing. (2)	Raised median provided on Aviation Blvd. Moderate US 1 rail-roadway buffer. 6 lanes at railroad crossing. Displaced left turn at rail crossing. (1)	Raised median provided on Aviation Blvd. Large US 1 rail-roadway buffer. 5 lanes at railroad crossing (4)
RIGHT OF WAY PROPERTIES IMPACTED	N/A	27 Parcels, 5.33 Acres (4)	42 Parcels, 7.61 Acres (1)	29 Parcels, 6.03 Acres (3)	35 Parcels, 8.89 Acres (1)
ENVIRONMENTAL	Does not improve water quality (1)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)	Stormwater quality improvements. Minor impacts. (3)	Stormwater quality improvements. Some effects to forested area. (2)
NOISE IMPACTS	N/A	Low (3)	Shifts US-1 travel lanes eastward 500 feet towards homes (1)	Low (3)	Higher traffic levels around roundabout. Road closer to residential. (2)
MAINTENANCE	Increased maintenance as road ages	1 Signal (4)	2 Signals. Additional access road maintenance. (2)	2 Signals (3)	2 Signals. Additional access road maintenance. (2)
CONSTRUCTABILITY	N/A	Roadway and bridge can be construction in phases (3)	Requires temporary bridge and detour (1)	Roadway and bridge can be constructed in phases Increased phase for displaced left turn. (2)	Roadway and bridge can be constructed in phases (3)
TOTAL COST	Maintenance cost	**$37,114,000** **(4)**	**$39,832,000** **(2)**	**$39,810,000** **(3)**	**$45,776,000** **(1)**
SCORE / RANK	N/A	44 points	25 points	33 points	37 points

Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

DATE: November 13, 2023 from 11:00 AM to 12:30 PM

PLACE: City Hall of City of Vero Beach and via TEAMS meeting

TO: Chuck Bradley, Gordon Stewart, Adam Logemann, Matthew Mitts, Jason Jefferies, Jim Hughes, Cesar Martinez, Dan Marwood

FROM: Vandana Nagole, FDOT Project Manager

COPIES: Bill Evans, Linda Hess

SUBJECT: **Local Coordination Meeting with Camp Haven Representatives**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Meeting Summary:

The purpose of the meeting was to facilitate an open and interactive discussion with representatives from the Camp Haven Rehabilitation Center, the City of Vero Beach and FDOT regarding the subject project and right of way impacts to the Camp Haven Rehabilitation Center for Men. 1. The public workshop concepts and right of way maps were available for Alternatives 1 (conventional intersection) and Alternative 2 (one-way pair).

1. Camp Haven representatives provided an overview of the center's goal, facility and operations:
    a. The center is a privately funded non-profit organization that provides counseling, work force training, life skills coaching, meals and housing for men ages 18 to 77, that were previously homeless. Their success rate is 75% which is high for these types of programs. The operating budget is upwards of $750,000 annually.
    b. The comprehensive program is available for men that have successfully completed prior alcohol or addiction treatment. The structured program provides onsite housing for 12 to 24 months and psychological counseling. Men are required to have a job within 30 days. The nearby churches provide meals for the tenants.
    c. The center's location is nearby to several support organizations such as United Against Poverty, The Source, Treasure Coast Homeless Services, St Vincent De Paul Society, Manpower, Cleveland Clinic hospital, and medical care. Local bus service is provided on SR 5/US 1 and the ability to bike or walk to the local services and job opportunities is a benefit.

d. The zoning for the Camp Haven parcel has approval for short term tenants as a motel. Camp Haven is gathering funding for four (4) long-term rental units and has about 60% of the goal achieved.

2. The group discussed the FDOT Right of Way (RW) process, project timeline, and property owner rights.
    a. Once the PD&E is completed and the Design phase reaches approximately 60% complete the FDOT RW office begins the appraisal process. The PD&E is scheduled for completion by December 2024. The Design phase for the project (if it becomes funded) is tentatively scheduled for 2025 and 2026. The R/W phase (if funded) would start about midway through the design phase.
    b. FDOT conducts an appraisal and presents an offer to the landowner to purchase the land and impacted on-site improvements such as parking and buildings. FDOT only purchases the area that is needed for the project.
    c. Properties that have small parcel remainders have an option to sell to FDOT.
    d. The FDOT provides the owner funding for an advisor and/attorney service based on the phase of the RW process, such as appraisal/offer phase and relocation phase.

3. The group discussed the potential options for Camp Haven to relocate or rebuild what is lost to RW acquisition.
    a. Camp Haven stated that is quite difficult to identify available land for relocating to that has the correct zoning, acceptable price, and similar location features that the current site provides.
    b. The City noted:
        i. The Code of Ordinances Sec 64.29 (enclosed below) allows for any original non-conformity to remain but not be enlarged after a RW acquisition occurs.
        ii. Any parcel selected outside the city limits would be under county zoning rules.
        iii. The City's code would allow for relocation in industrial zoned areas such as along the US-1/FEC railroad corridor. The City is conducting a land supply analysis. One potential parcel is the old city nursery on Old Dixie by the cemetery. The City is conducting a new City Master Plan for US 1 south of Main Canal.
        iv. The City noted that the county bought the used furniture building on the southeast corner of US 1 and 32nd Street (Aviation Blvd.).
    c. Camp Haven stated their best option is to stay at the current location
        i. If impacted, would they have the opportunity to replace lost features on adjacent properties?
        ii. The solution would need to identify how the "L" shaped building would be impacted, identify replacement housing and office space with visibility to the remaining site.
        iii. The timing of the impact and construction of the replacement housing is critical to Camp Haven's operation, maintaining housing and services for the on-site residents, and ability to keep financial donors engaged with contributions to the non-profit organization during the process.

4. The group discussed the timing of the impacts, demolition of existing structures and actual relocation date.
    a. The typical R/W process begins with the purchase offer, agreement, and then the relocation process begins.
    b. Camp Haven noted that their ability to accept an offer is in part contingent on the post R/W acquisition conditions of their facility and/or relocation options. Potential timelines may to be need longer than typical durations for zoning changes and or construction of replacement housing due the nature of their social services.
    c. The option of FDOT Advance Acquisition (RWAA) process was discussed. RWAA is the ability to start the appraisal/offer process sooner or earlier in the design phase. Advanced acquisition is subject to funding and approval.

5. Next Steps:
    a. FDOT ROW will look into advanced acquisition, funding status, and the financial requirements of the process.
    b. The FDOT will contact Camp Haven by February 2024 to provide an update.

Attendees:

Camp Haven: Chuck Bradley, Gordon Stewart, Adam Logemann,
City of Vero Beach: Matthew Mitts, Jason Jefferies,
FDOT: Vandana Nagole, Jim Hughes, Cesar Martinez, Dan Marwood
WGI: Bill Evans, Linda Hess

VN:wte

Enclosure: Sec. 64.29 Nonconformities

Sec. 64.29. - Nonconformities resulting from exercise of the power of eminent domain.

Any lot or parcel of land, or structure or other improvement located thereon, that is made nonconforming with the land development regulations of the city, part III of this Code, on or after May 1, 2009, as a result of eminent domain proceedings instituted by the city or other condemning authority, or through voluntary conveyance by such lot or parcel owner in lieu of formal eminent domain proceedings, shall be deemed to be conforming for all purposes under the land development regulations of the city without the necessity for a variance, but only to the extent that such lot, parcel, structure, or other improvement was otherwise conforming to said regulations at the time of such eminent domain or voluntary conveyance and only so long as any such nonconformity is not expanded, increased, or enlarged in any manner. Any structure or site improvement subject to this section may be rebuilt, relocated, reconstructed, expanded or enlarged so long as such rebuilding, relocation, reconstruction, expansion or enlargement does not further expand, increase, or enlarge the nonconformity.

(Ord. No. 2009-16, § 1, 9-15-2009)

Florida Department of Transportation

RON DESANTIS
GOVERNOR

3400 West Commercial Boulevard
Fort Lauderdale, FL 33309

JARED W. PERDUE, P.E.
SECRETARY

MEETING NOTES

DATE: February 29, 2024, at 1:00 PM to 2:30 PM via TEAMS call

TO: Kristin Leiendecker, Matthew Mitts, William Howard, Jason Jefferies, Brian Freeman, Victor Ramos, Dan Marwood, Erik Ferguson

FROM: Vandana Nagole

COPIES: Bill Evans

SUBJECT: **Local Coordination Meeting**
SR 5/US 1 at Aviation Boulevard PD&E Study
Indian River County
FM: 441693-1-22-02
ETDM: 14475

Meeting Notes:
The purpose of the meeting was to present the PD&E preferred alternative to Indian River County and City of Vero Beach Public Works, IR MPO planners, and Vero Beach Airport engineers.

1. FDOT provided an overview of the October public workshop and value engineering study. The preferred alternative was discussed including the geometry, bridge replacement, shared use path, bicycle lanes and pond.
    a. The city, county and MPO requested on-street bicycle lanes to be provided on Aviation Boulevard. FDOT noted that this alternative has been available for review throughout 2023 and the shared use path was presented as the facility to serve bicyclists. Discussion at the meeting and in follow up emails that day concluded FDOT PD&E team will investigate the following:
        i. **West of the FEC RR:** Add a westbound 5 ft to 7 ft on-street bike lane. An on-street bicycle lane is not required eastbound where the shared use path is located.
        ii. **East of the FEC RR:** Add west/eastbound on-street 7 ft bike lanes, remove the shared use path and add 6 ft sidewalks.
        iii. **Railroad crossing:** investigate the railroad gate and potential median gate requirements.
        iv. **Superelevation transition:** This was reviewed after the meeting and meets standards.
        v. Erik Ferguson provided a PDF of comments on the plan sheets via email.

2. The City requested an updated right of way parcel map cadd file once the changes are implemented. No other updates were provided by the City.

3. Extension of Aviation Boulevard to the hospital area.
    a. The County noted they are working with land owners on the extension alignment. A comment noted the County alignment does not match the PD&E alignment. The FDOT responded the county project was developed with a connection to the existing US 1 travel lanes and existing R/W, which does not support the required curvature for the PD&E alignment and widening of US 1. The FDOT noted the county alignment should match the PD&E alignment to avoid reconstruction of the county's extension project.
    b. The County noted there is not a timeline for the extension project as the project has not moved past the current study phase while discussions with land owners continue. The MPO noted the county project was likely funded in the county capital improvement plan.

4. The FDOT R/W process will take 36 months. The FDOT is looking into funds for advancing the R/W appraisal process for Camp Haven. FDOT recommended to the City and County to implement an Eminent Domain Policy in the land codes to address a parcel's "after" condition for non-compliant parcels.

5. Upcoming Coordination Meetings:
    a. Camp Haven on March 4th
    b. MPO Board in April (before SR-5 hearing) or June (after SR-5 hearing)
    c. Public Hearing tentative dates at this time:
        i. Draft documents will be available to the public 21 days prior to the hearing.
        ii. Virtual: June 5th Wednesday at 6:30 PM
        iii. In-Person: June 6th Thursday at 6:30 PM
6. Complete the PD&E study December 2024.

1. Summary	**Meeting Attendance**	
Meeting title	**Preferred Alternative - SR 5/US 1 at Aviation Blvd PD&E 441693-1**	
Attended participants	9	
Start time	2/29/24, 12:57:14 PM	
End time	2/29/24, 2:34:26 PM	
Meeting duration	1h 37m 11s	
2. Participants		
Name	**In-Meeting Duration**	**Email**
William Evans	1h 37m 7s	William.Evans@wginc.com
Kirstin Leiendecker	1h 35m 4s	kleiendecker@indianriver.gov
Brown, Christina	1h 27m 27s	Christina.Brown@dot.state.fl.us
Brian Freeman	1h 34m 7s	bfreeman@indianriver.gov
Nagole, Vandana	1h 33m	Vandana.Nagole@dot.state.fl.us
Matthew Mitts	1h 32m 57s	mmitts@covb.org
Jason Jeffries	1h 31m 32s	jjeffries@covb.org
Marwood, Daniel	7m 33s	Dan.Marwood@dot.state.fl.us
Ramos, Victor	37m 1s	Victor.Ramos@dot.state.fl.us
Erik Ferguson		eferguson@indianriver.gov

Linda Hess

From: Harvey, Carina <Carina.Harvey@dot.state.fl.us>
Sent: Thursday, February 29, 2024 9:28 AM
To: William Evans; Nagole, Vandana
Cc: Keel, Rana; Rodrigues, Nadir; Linda Hess
Subject: RE: [EXTERNAL] RE: Access Management - 441693-1 SR 5 At Aviation Blvd

You're welcome!

Carina Harvey
District Access Management Manager
FDOT District 4 Consultant
3400 West Commercial Blvd.
Fort Lauderdale, FL 33309-3421
Email: D4AccessManagement@dot.state.fl.us
Phone: 954-777-4363

From: William Evans <William.Evans@wginc.com>
Sent: Thursday, February 29, 2024 9:14 AM
To: Harvey, Carina <Carina.Harvey@dot.state.fl.us>; Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>
Cc: Keel, Rana <Rana.Keel@dot.state.fl.us>; Rodrigues, Nadir <Nadir.Rodrigues@dot.state.fl.us>; Linda Hess <Linda.Hess@wginc.com>
Subject: RE: [EXTERNAL] RE: Access Management - 441693-1 SR 5 At Aviation Blvd

Thank you Carina:
We will make a note in the PE Report of the D4 findings.

William Evans, PE, AICP
PD&E Market Leader

2035 Vista Parkway
West Palm Beach, FL 33411
561.687.2220 (office) | **561.209.7774** (direct)

From: Harvey, Carina <Carina.Harvey@dot.state.fl.us>
Sent: Thursday, February 29, 2024 9:04 AM
To: Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>
Cc: Keel, Rana <Rana.Keel@dot.state.fl.us>; Rodrigues, Nadir <Nadir.Rodrigues@dot.state.fl.us>; William Evans <William.Evans@wginc.com>
Subject: [EXTERNAL] RE: Access Management - 441693-1 SR 5 At Aviation Blvd

Good morning Vandana,

Based on our review, an access management reclassification/median opening table will not be required for this project.

Thank you,

Carina Harvey
District Access Management Manager
FDOT District 4 Consultant
3400 West Commercial Blvd.
Fort Lauderdale, FL 33309-3421
Email: D4AccessManagement@dot.state.fl.us
Phone: 954-777-4363

From: Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>
Sent: Thursday, February 22, 2024 9:32 AM
To: Harvey, Carina <Carina.Harvey@dot.state.fl.us>
Cc: Keel, Rana <Rana.Keel@dot.state.fl.us>; Rodrigues, Nadir <Nadir.Rodrigues@dot.state.fl.us>; William Evans <William.Evans@wginc.com>
Subject: FW: Access Management - 441693-1 SR 5 At Aviation Blvd

Good morning Harvey :
The subject project is a PD& E project on SR 5 at Aviation Blvd. The attached document shows the preferred alternative that was determined during the study. Please see the email below and let us know how we can proceed.

Thank You,

Vandana Nagole, P.E., CSM
Project Manager
Consultant Management- Section 4
District 4
3400 West Commercial Blvd.
Fort Lauderdale, FL 33309-3421
Phone: 954-777-4281
Fax: 954-777-4482
Email: vandana.nagole@dot.state.fl.us

From: William Evans <William.Evans@wginc.com>
Sent: Thursday, February 15, 2024 12:24 PM
To: Nagole, Vandana <Vandana.Nagole@dot.state.fl.us>

Cc: Linda Hess <Linda.Hess@wginc.com>
Subject: Access Management - 441693-1 SR 5 At Aviation Blvd

EXTERNAL SENDER: Use caution with links and attachments.

Hello Vandana:
Can you talk to the Access Management coordinator about the project and find out how they want to proceed?

- Is an Access management reclassification required, even though the project is less than a half mile long?
- Is an Access Management median opening table required, even though there is only one signal, no other median openings, and the project returns to a flush paved median at each end of the project?

Project Facts

This is a unique project with only one signal and raised medians on SR 5 and no other openings between the project begin or end termini.
The project limits are 1300 ft north and 1455 ft south of the signalized intersection.

- The existing Access Management Classification is Class 6 Non-Restrictive
- The proposed Access Management Classification will be Class 5 Restrictive

Thank you,
Bill Evans

William Evans, PE, AICP
PD&E Market Leader
2035 Vista Parkway
West Palm Beach, FL 33411
561.687.2220 (office) | **561.209.7774** (direct)