



October 18, 2021  
Review

EXHIBIT A  
SCOPE OF SERVICES  
FOR  
Financial Project ID: 445216-1-32-01  
FDOT District 5  
***FLAGLER***

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## SCOPE OF SERVICES FOR CONSULTING ENGINEERING SERVICES

### HIGHWAY AND BRIDGE/STRUCTURAL DESIGN

This Exhibit forms an integral part of the agreement between the State of Florida Department of Transportation (hereinafter referred to as the DEPARTMENT or FDOT) and **TBD** (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: 445216-1-32-01

Related Financial Project ID(s): *N/A*

Federal Aid Project No.:

Roadway:

RoadwayId: 73010000 Begin milepost: 10.867 End milepost: 16.833

Project Description: SR 5/US 1 FROM WOODLAND AVE TO NORTH OF PALM COAST PARKWAY

Bridge No(s).:

- 730068 SR 20/100 over SR 5, 21.3-ft vertical clearance
- 730006 SR 5 SB over St Joe Canal
- 730043 SR 5 NB over St Joe Canal

Railroad Crossing No.: *N/A*

Context Classification:

- ***C3C-Suburban Commercial Mostly non-residential uses with large building footprints and large parking lots within large blocks and a disconnected or sparse roadway network.***
- ***C2-Rural Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.***

***C3C from MP 10.870 to MP 13.116, C2 t north of MP 13.116***

## 1 PURPOSE

The purpose of this Exhibit is to describe the scope of work and the responsibilities of the CONSULTANT and the DEPARTMENT in connection with the design and preparation of a

complete set of construction contract documents and incidental engineering services, as necessary, for improvements to the transportation facility described herein.

- Major work mix includes:
  - **0012 - RESURFACING**
- Major work groups include:
  - **3.1 - Minor Highway Design**
- Minor work groups include:
  - **4.1.1 - Miscellaneous Structures**
  - **6.2 - Traffic Signal Timing**
  - **7.1 - Signing, Pavement Marking and Channelization**
  - **7.2 - Lighting**
  - **7.3 - Signalization**
  - **8.1 - Control Surveying**
  - **8.2 - Design, Right of Way & Construction Surveying**
  - **8.3 - Photogrammetric Mapping**
  - **9.1 - Soil Exploration**
  - **9.2 - Geotechnical Classification Laboratory Testing**
  - **9.4.1 - Standard Foundation Studies**

Known alternative contracting methods include: *N/A*  
*N/A*

The general objective is for the CONSULTANT to prepare a set of contract documents including plans, specifications, supporting engineering analysis, calculations and other technical documents in accordance with FDOT policy, procedures and requirements. These Contract documents will be used by the contractor to build the project and test the project components. These Contract documents will be used by the DEPARTMENT or its Construction Engineering Inspection (CEI) representatives for inspection and final acceptance of the project. The CONSULTANT shall follow a systems engineering process to ensure that all required project components are included in the development of the Contract documents and the project can be built as designed and to specifications.

The Scope of Services establishes which items of work in the FDOT Design Manual and other pertinent manuals are specifically prescribed to accomplish the work included in this contract, and also indicate which items of work will be the responsibility of the CONSULTANT and/or the DEPARTMENT.

The CONSULTANT shall be aware that as a project is developed, certain modifications and/or improvements to the original concepts may be required. The CONSULTANT shall incorporate these refinements into the design and consider such refinements to be an anticipated and integral part of the work. This shall not be a basis for any supplemental fee request(s).

The CONSULTANT shall demonstrate good project management practices while working on this project. These include communication with the DEPARTMENT and others as necessary, management of time and resources, and documentation. The CONSULTANT shall set up and maintain throughout the design of the project a contract file in accordance with DEPARTMENT procedures. CONSULTANTS are expected to know the laws and rules governing their professions and are expected to provide services in accordance with current regulations, codes and ordinances and recognized standards applicable to such professional services. The CONSULTANT shall provide qualified technical and professional personnel to perform to Department standards and procedures, the duties and responsibilities assigned under the terms of this agreement. The CONSULTANT shall minimize to the maximum extent possible the DEPARTMENT's need to apply its own resources to assignments authorized by the Department.

The DEPARTMENT will provide contract administration, management services, and technical reviews of all work associated with the development and preparation of contract documents, including Construction documents. The DEPARTMENT's technical reviews are for high-level conformance and are not meant to be comprehensive reviews. The CONSULTANT shall be fully responsible for all work performed and work products developed under this Scope of Services. The DEPARTMENT may provide job-specific information and/or functions as outlined in this contract, if favorable.

## **2 PROJECT DESCRIPTION**

The CONSULTANT shall investigate the status of the project and become familiar with concepts and commitments (typical sections, alignments, etc.) developed from prior studies and/or activities. If a Preliminary Engineering Report is available from a prior or current Project Development and Environment (PD&E) study, the CONSULTANT shall use the approved concepts as a basis for the design unless otherwise directed by the DEPARTMENT.

### ***SR 5/US 1 FROM WOODLAND AVE TO NORTH OF PALM COAST PARKWAY***

***This is a resurfacing project with limits from begin MP 10.867 to End MP 16.833 for a project length of 5.966 miles. The purpose of the project is to rehabilitate the asphalt pavement to extend the service life of the existing roadway, including necessary roadside improvements, in accordance with FDOT Design Manual Section 114. Work will also include the following elements: Drainage improvements, signal upgrades, lighting, sidewalk construction and other pedestrian upgrades, permitting, expansion joint replacement for St Joe Canal and Hulett Branch bridges, survey, and geotechnical services.***

#### **2.1 Project General and Roadway (Activities 3, 4, and 5)**

Public Involvement:

CAP Level: 2

***Potential Public meeting and local stakeholder coordination.***

Other Agency Presentations/Meetings:

<b>Agency</b>	<b>Number of Meetings</b>
Flagler County	1
City of Bunnell	1
City of Palm Coast	1

Joint Project Agreements: *N/A*

*N/A*

Specifications Package Preparation:

***Standard Specifications***

Estimated Quantities Report Preparation:

***Standard***

Value Engineering: *N/A*

*N/A*

Risk Assessment Workshop: *N/A*

***Risk Assessment Memo***

Plan Type:

***Plan/Profile***

Typical Section:

Number of Typical Sections: **3**

***Typical 1 - MP 10.867 to MP 11.070: Four 12-ft travel lanes (two per direction), 12-ft outside shoulders (4-ft paved), 18-ft curbed and vegetated median, and 5-ft sidewalk (NB). Proposed changes include the addition of 6-ft sidewalk on the SB side.***

***Typical 2 - MP 11.070 to MP 14.315, MP 15.939 to MP 16.833: Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 6-ft inside shoulders, and a 40-ft depressed grassed median. Proposed changes include the construction of 4-ft inside paved shoulders.***

***Typical 3 - MP 14.315 to MP 15.939: Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 8-ft inside shoulders (4-ft paved), and a 40-ft depressed grassed median. No changes are proposed***

Pavement Designs:

Number of Pavement Designs: **4**

***1) milling and resurfacing the travel lanes, turn lanes, and median crossovers***

- 2) *milling and resurfacing the shoulders*
- 3) *new paved shoulders*
- 4) *bridge deck overlays*

Pavement Type Selection Report(s): *N/A*  
*N/A*

Cross-Slope Correction:  
***Please reference the Candidate Project Technical Scope for details***

Access Management Classification:  

- *Access Class 3*

***designated evacuation route per the Florida Division of Emergency Management***  
***Urban principal arterial***

Transit Route Features: *N/A*  
*N/A*

Major Intersections and Interchanges:  
Number of Major Intersections and Interchanges: **3**  
***MP 12.757 - Royal Palms Parkway/Education Way***  
***MP 14.533 - White View Parkway***  
***MP 16.643 - Palm Coast Parkway***

Roadway Alternative Analysis: *N/A*  
*N/A*

Level of Temporary Traffic Control Plan (TTCP): ***1***  
***Please reference the Candidate Project Technical Scope for details***

Temporary Lighting: *N/A*  
*N/A*

Temporary Signals: *N/A*  
*N/A*

Temporary Drainage: *N/A*  
*N/A*

Design Variations:

- *Others*

Others: *Access Management Classification, Lateral Offset, Turn Lane Length*

*Please reference the Candidate Project Technical Scope for details*

Design Exceptions:

- *Superelevation*
- *Shoulder Width*

*Please reference the Candidate Project Technical Scope for details*

Back of Sidewalk Profiles:

Number of Back of Sidewalk Profiles: *TBD*

*If needed for sidewalk additions*

Selective Clearing and Grubbing: *N/A*

*N/A*

## **2.2 Drainage (Activities 6a and 6b)**

Drainage System Type:

*Please reference the Candidate Project Technical Scope for details*

Number of stormwater management facility sites: *N/A*

Number of cross drains: [*Number*]

## **2.3 Utilities Coordination (Activity 7)**

The CONSULTANT is responsible to certify that all necessary arrangements for utility work on this project have been made and will not conflict with the physical construction schedule. The CONSULTANT should coordinate with DEPARTMENT personnel to coordinate transmittals to Utility Companies and meet production schedules.

The CONSULTANT shall ensure FDOT standards, policies, procedures, practices, and design criteria are followed concerning utility coordination.

The CONSULTANT may employ more than one individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. This person shall be contractually referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal. The Utility Coordination Manager shall be required

to satisfactorily demonstrate to the FDOT District Utilities Administrator that they have the following knowledge, skills, and expertise:

- A minimum of 4 years of experience performing utility coordination in accordance with FDOT, Federal Highway Administration (FHWA), and American Association of State Highway and Transportation Officials (AASHTO) standards, policies, and procedures.
- A thorough knowledge of the FDOT plans production process and District utility coordination process.
- A thorough knowledge of FDOT agreements, standards, policies, and procedures.

The Utility Coordination Manager shall be responsible for managing all utility coordination, including the following:

- Assuring that Utility Coordination and accommodation is in accordance to the FDOT, FHWA, and AASHTO standards, policies, procedures, and design criteria.
- Assisting the engineer of record in identifying all existing utilities and coordinating any new installations. Assisting the Engineer of Record with resolving utility conflicts.
- Scheduling and performing utility coordination meetings, keeping and distribution of minutes/action items of all utility meetings, and ensuring expedient follow-up on all unresolved issues.
- Distributing all plans, conflict matrixes and changes to affected utility owners and making sure this information is properly coordinated and documented.
- Identifying and coordinating the completion of any FDOT or utility owner agreement that is required for reimbursement, or accommodation of the utility facilities associated with the project.
- Review and certify to the District Utilities Administrator that all Utility Work Schedules are correct and in accordance with the DEPARTMENT's standards, policies, and procedures.
- Prepare, review and process all utility related reimbursable paperwork inclusive of betterment and salvage determination.

The CONSULTANT's utility coordination work shall be performed and directed by the Utility Coordination Manager that was identified and approved by FDOT's Project Manager. Any proposed change of the approved Utility Coordination Manager shall be subject to review and approval by FDOT's Project Manager prior to any change being made in this contract.

Expected Utilities:

AT&T Florida, CenturyLink, Charter Communications, City of Bunnell- Electric, City of Bunnell- Gas, City of Bunnell- Sewer, City of Bunnell- Water, City of Palm Coast- Non-Potable Water, City of Palm Coast- Sewer, City of Palm Coast- Water, Crown Castle, Florida Power & Light- Distribution, Florida Power & Light- Transmission, MCI, Resurgence Infrastructure Group, LLC, Sprint, TECO People's Gas, Uniti Fiber

## 2.4 Environmental Permits and Environmental Clearances (Activity 8)

Expected Permits:

- *List expected permits, e.g., USCG, USACE, WMD, etc.*

The DEPARTMENT will provide compensatory wetland mitigation in accordance with Section 373.4137, Florida Statutes.

*Please reference the Candidate Project Technical Scope for details*

## 2.5 Structures (Activities 9 - 18)

Bridge:

**No. Bridge Number Length Description**

Type of Bridge Structure Work

- BDR (Activity 10): *N/A*
- Temporary Bridge (Activity 11): *N/A*
- Short Span Concrete (Activity 12): *N/A*
- Medium Span Concrete (Activity 13): *N/A*
- Structural Steel (Activity 14): *N/A*
- Segmental Concrete (Activity 15): *N/A*
- Movable Span (Activity 16): *N/A*

Miscellaneous Structures:

- *Strain Poles*
- *Mast Arms*
- *Other Structures*

*Please reference the Candidate Project Technical Scope for details*

## 2.6 Signing and Pavement Markings (Activities 19 & 20)

Sign Structures:

**No. Type Number Location**

*Please reference the Candidate Project Technical Scope for details*

## 2.7 Signalization (Activities 21 & 22)

Intersections:

*Please reference the Candidate Project Technical Scope for details*

Traffic Monitoring Sites:

***11.195 - 730004, PTMS Remove site***

***14.199 730005, PTMS Restore detection - reconstruct cabinet with pedestal mount.***

## **2.8 Lighting (Activities 23 & 24)**

Limits and Proposed Type of Lighting:

### **Type Limit**

***Please reference the Candidate Project Technical Scope for details.***

## **2.9 Landscape (Activities 25 & 26) (N/A)**

## **2.10 Survey (Activity 27)**

Design Survey:

***Obtain Design Survey, collecting data for the areas and locations shown on the Concept. Total survey area is 4.25 AC.***

***Complete design survey is not anticipated for proposed inside paved shoulder construction. Obtain 1000-ft cross sections, within the limits of proposed shoulder only, for verification of median slopes and earthwork calculations only. Total of 3.7 miles, 20 sections from the median centerline to both NB and SB inside lane centerlines.***

***Obtain Level 2 Survey in accordance with FDM 114.2.2.1 for areas where cross slope correction is recommended, including the pavement surfaces, unpaved shoulders and front slopes of ditches. Lengths listed are for curve, include additional transition lengths.***

***Please reference the Candidate Project Technical Scope for details.***

Subsurface Utility Exploration:

***Locate utilities as Quality Level B "QL B" and surface features including valve covers, meter boxes, manholes, etc. within the limits of survey locations shown on the Concept. Quality Level A "QL A" utility information is anticipated to include 40 Vvh's.***

***Locate existing drainage structures within the limits of survey locations shown on the Concept plus the nearest connecting structure beyond those limits. Pipe sizes, flow lines, material type, etc. are required.***

Right of Way Survey: *N/A*

Vegetation Survey: *N/A*

### **2.11 Photogrammetry (Activity 28)**

*As Directed*

### **2.12 Mapping (Activity 29) (N/A)**

### **2.13 Terrestrial Mobile LiDAR (Activity 30) (N/A)**

### **2.14 Architecture (Activity 31) (N/A)**

### **2.15 Noise Barriers (Activity 32) (N/A)**

### **2.16 Intelligent Transportation Systems (Activities 33 & 34)**

*Please reference the Candidate Project Technical Scope for details*

The Federal Highway Administration issued Rule 940 entitled Intelligent Transportation Systems (ITS) Architecture and Standards to ensure new projects conform to the National ITS Architecture and standards as well as with a regional ITS architecture developed to reflect the local needs, issues, problems, and objectives for implementation.

For all projects with ITS activities, the CONSULTANT shall follow the Rule 940 requirements and use a Systems Engineering approach for determining the requirements for the project. The CONSULTANT shall develop all necessary documents to support the Rule 940 requirements like Concept of Operations (ConOPS), Systems Engineering Management Plan (SEMP), Requirements Traceability Verification Matrix (RTVM) and others as deemed necessary by the Department.

*[Describe the hardware configuration analysis and design including system architecture, interfaces, communications, equipment, devices and computers.]*

*[If relevant, mention any prior reports done such as concept reports, etc.]*

The ITS shall operate from the *[Name]* TMC located at *[Location]* using the SunGuide® (SunGuide) Software, or if SunGuide is not in use at *[Name]* TMC, using the appropriate *[Name Software Package]*.

Geographical Information System (GIS) Requirements: CONSULTANT shall include in the design the GIS data collection requirements and deliverables for integration with SunGuide software and other Department GIS based asset management applications like ITS FM software.

All design efforts shall be based on deploying "open architecture" subsystems, while remaining fully compatible with previous designs (as applicable) and the FDOT ITS Specifications. All ITS field devices and support systems shall be designed and located outside of the clear zone, or behind protective barrier, within the right of way. This includes cabinets, poles, and support hardware. Utility conflicts shall be identified and resolved during the design phase. The location of design elements will be coordinated with the District Landscape Architect to optimize landscape opportunities. The design shall minimize theft and vandalism. The CONSULTANT shall include in the design vandal resistant mechanisms to minimize theft. The CONSULTANT shall provide additional redundant power and communications systems to minimize system downtime due to vandalism.

The CONSULTANT shall design the project subsystems such that they will be monitored and controlled from the FDOT's TMC facilities located at *[Location(s)]*. The CONSULTANT shall ensure that all ITS field devices and ancillary components comply with the FDOT's Approved Product List (APL) and are supported within the SunGuide software or other specified software, unless otherwise approved by the DEPARTMENT.

The CONSULTANT shall include in the design any required upgrade to the TMC central hardware, equipment racks, and equipment wiring, as directed by the FDOT project manager, to make the subsystems fully operations from the TMC facilities.

For projects with existing ITS, the CONSULTANT shall include in the design any required upgrade to existing ITS equipment to meet the latest FDOT standards, NEC requirements or as directed by the FDOT project manager and to make the subsystems fully operations from the TMC facilities.

ITS coordination with Landscape Architecture shall include both underground conflicts and above-ground impacts to existing and/or proposed Landscaping. The CONSULTANT shall closely coordinate with the Landscape Architect to ensure that all conflicts are identified, addressed and mitigated in the Contract Documents.

## **2.17 Geotechnical (Activity 35)**

*Please reference the Candidate Project Technical Scope for details [List types of borings and unique lab tests]*

## **2.18 3D Modeling (Activity 36)**

*As directed*

## **2.19 Project Schedule**

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production Date. The schedule shall be based upon the [*District Schedule Information*]. The current production date is **August 01, 2023**. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a **4** week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

All fees and price proposals are to be based on the negotiated schedule of **18** months for final construction contract documents. However, the contract deadline is **18** months from the Notice to Proceed.

Periodically, throughout the life of the contract, the project schedule and payout and fiscal progress curves shall be reviewed and, with the approval of the DEPARTMENT, adjusted as necessary to incorporate changes in the Scope of Services and progress to date.

The approved schedule and schedule status report, along with progress and payout curves, shall be submitted with the monthly progress report.

The schedule shall be submitted in an FDOT system-compatible format.

## **2.20 Submittals**

The CONSULTANT shall furnish construction contract documents as required by the DEPARTMENT to adequately control, coordinate, and approve the work concepts. The CONSULTANT shall distribute submittals as directed by the DEPARTMENT. The DEPARTMENT will determine the specific number of copies required prior to each submittal.

### *Standard Submittals*

## **2.21 Provisions for Work**

All work shall be prepared with English units in accordance with the latest editions of standards and requirements utilized by the DEPARTMENT which include, but are not limited to, publications such as:

### **General:**

- *Title 29, Part 1910, Standard 1910.1001, Code of Federal Regulations (29 C.F.R. 1910.1001) - Asbestos Standard for Industry, U.S. Occupational Safety and Health Administration (OSHA)*
- *29 C.F.R. 1926.1101 - Asbestos Standard for Construction, OSHA*
- *40 C.F.R. 61, Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP), Environmental Protection Agency (EPA)*
- *40 C.F.R. 763, Subpart E - Asbestos-Containing Materials in Schools, EPA*
- *40 C.F.R. 763, Subpart G - Asbestos Worker Protection, EPA*
- *Americans with Disabilities Act (ADA) Standards for Accessible Design*
- *AASHTO - A Policy on Design Standards Interstate System*
- *AASHTO - Roadside Design Guide*
- *AASHTO - Roadway Lighting Design Guide*
- *AASHTO - A Policy for Geometric Design of Highways and Streets*
- *AASHTO - Highway Safety Manual*
- *Rule Chapter 5J-17, Florida Administrative Code (F.A.C.), Standards of Practice for Professional Surveyors and Mappers*
- *Chapter 469, Florida Statutes (F.S.) - Asbestos Abatement*
- *Rule Chapter 62-257, F.A.C., Asbestos Program*
- *Rule Chapter 62-302, F.A.C., Surface Water Quality Standards*
- *Code of Federal Regulations (C.F.R.)*
- *Florida Administrative Codes (F.A.C.)*
- *Chapters 20, 120, 215, 455, Florida Statutes (F.S.) - Florida Department of Business & Professional Regulations Rules*
- *Florida Department of Environmental Protection Rules*
- *FDOT Basis of Estimates Manual*
- *FDOT Computer Aided Design and Drafting (CADD) Manual*
- *FDOT Standard Plans*
- *FDOT Flexible Pavement Design Manual*
- *FDOT - Florida Roundabout Guide*
- *FDOT Handbook for Preparation of Specifications Package*
- *FDOT Standard Plans Instructions*
- *FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways ("Florida Greenbook")*
- *FDOT Materials Manual*
- *FDOT Pavement Type Selection Manual*
- *FDOT Design Manual*
- *FDOT Procedures and Policies*
- *FDOT Procurement Procedure 001-375-030, Compensation for Consultant Travel Time on Professional Services Agreements*
- *FDOT Project Development and Environment Manual*
- *FDOT Project Traffic Forecasting Handbook*

- *FDOT Public Involvement Handbook*
- *FDOT Rigid Pavement Design Manual*
- *FDOT Standard Specifications for Road and Bridge Construction*
- *FDOT Utility Accommodation Manual*
- *Manual on Speed Zoning for Highways, Roads, and Streets in Florida*
- *Federal Highway Administration (FHWA) - Manual on Uniform Traffic Control Devices (MUTCD)*
- *FHWA - National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide*
- *FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook*
- *Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 2005*
- *Florida Statutes (F.S.)*
- *Florida's Level of Service Standards and Guidelines Manual for Planning*
- *Model Guide Specifications - Asbestos Abatement and Management in Buildings, National Institute for Building Sciences (NIBS)*
- *Quality Assurance Guidelines*
- *Safety Standards*
- *Any special instructions from the DEPARTMENT*

**Roadway:**

- *FDOT - Florida Intersection Design Guide*
- *FDOT - Project Traffic Forecasting Handbook*
- *FDOT - Quality/Level of Service Handbook*
- *Florida's Level of Service Standards and Highway Capacity Analysis for the SHS*
- *Transportation Research Board (TRB) - Highway Capacity Manual*

**Permits:**

- *Chapter 373, F.S. - Water Resources*
- *US Fish and Wildlife Service Endangered Species Programs*
- *Florida Fish and Wildlife Conservation Commission Protected Wildlife Permits*
- *Bridge Permit Application Guide, COMDTPUB P16591.3C*
- *Building Permit*

**Drainage:**

- *FDOT Drainage Design Guide*
- *FDOT Drainage Manual*
- *Florida Erosion and Sediment Control Manual*
- *FDOT Drainage Connection Permit Handbook*
- *FDOT Bridge Scour Manual*

### **Survey and Mapping:**

- *All applicable Florida Statutes and Administrative Codes*
- *Applicable Rules, Guidelines Codes and authorities of other Municipal, County, State and Federal Agencies.*
- *FDOT Aerial Surveying Standards for Transportation Projects Topic 550-020-002*
- *FDOT Right of Way Mapping Handbook*
- *FDOT Surveying Procedure Topic 550-030-101*
- *Florida Department of Transportation Right of Way Procedures Manual*
- *Florida Department of Transportation Surveying Handbook*
- *Right of Way Mapping Procedure 550-030-015*

### **Traffic Engineering and Operations and ITS:**

- *AASHTO - An Information Guide for Highway Lighting*
- *AASHTO - Guide for Development of Bicycle Facilities*
- *FHWA Standard Highway Signs Manual*
- *FDOT Manual on Uniform Traffic Studies (MUTS)*
- *FDOT Median Handbook*
- *FDOT Traffic Engineering Manual*
- *National Electric Safety Code*
- *National Electrical Code*

### **Florida's Turnpike Enterprise:**

- *Florida's Turnpike Design Handbook (TDH)*
- *Florida's Turnpike Lane Closure Policy*
- *Florida's Turnpike Drainage Manual Supplement*
- *Rigid Pavement Design Guide for Toll Locations with Electronic Toll Collection*
- *Flexible Pavement Design Guide for Toll Locations with Electronic Toll Collection*
- *Florida's Turnpike General Tolling Requirements (GTR)*
- *Additional Florida's Turnpike Enterprise standards, guides, and policies for design and construction can be found on the FTE Design Website:  
<https://floridasturnpike.com/business-opportunities/design/>*

### **Traffic Monitoring:**

- *American Institute of Steel Construction (AISC) Manual of Steel Construction, referred to as "AISC Specifications"*
- *American National Standards Institute (ANSI) RP-8-00 Recommended Practice for Roadway Lighting*
- *AASHTO AWS D1.1/ANSI Structural Welding Code - Steel*
- *AASHTO D1.5/AWS D1.5 Bridge Welding Code*
- *FHWA Traffic Detector Handbook*

- *FDOT General Interest Roadway Data Procedure*
- *FHWA Traffic Monitoring Guide*
- *FDOT's Traffic/Polling Equipment Procedures*

**Structures:**

- *AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims*
- *AASHTO LRFD Movable Highway Bridge Design Specifications and Interims*
- *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and Interims*
- *AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code*
- *AASHTO Guide Specifications for Structural Design of Sound Barriers*
- *AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges*
- *FDOT Bridge Load Rating Manual*
- *FDOT Structures Manual*
- *FDOT Structures Design Bulletins (available on FDOT Structures web site only)*
- *Geotechnical*
- *FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications*
- *Manual of Florida Sampling and Testing Methods*
- *Soils and Foundation Handbook*

**Landscape Architecture:**

- *Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants*

**Architectural:**

- *Building Codes*
- *Florida Accessibility Code for Building Construction*
- *Rule Chapter 60D, F.A.C., Division of Building Construction*
- *Chapter 553, F.S. - Building Construction Standards*
- *ANSI A117.1 2003 Accessible and Usable Building and Facilities*
- *Titles II and III, Americans With Disabilities Act (ADA), Public Law 101-336; and the ADA Accessibility Guidelines (ADAAG)*
- *Florida Building Code:*
  - *Building*
  - *Fuel Gas*
  - *Mechanical*
  - *Plumbing*
  - *Existing Building*

#### **Architectural - Fire Codes and Rules:**

- *National Fire Protection Association (NFPA) - Life Safety Code*
- *NFPA 70 - National Electrical Code*
- *NFPA 101 - Life Safety Code*
- *NFPA 10 - Standard for Portable Fire Extinguishers*
- *NFPA 11 - Standard for Low-Expansion Foam Systems*
- *NFPA 11A - Standard for High- and Medium-Expansion Foam Systems*
- *NFPA 12 - Standard for Carbon Dioxide Extinguishing Systems*
- *NFPA 13 - Installation of Sprinkler Systems*
- *NFPA 30 - Flammable and Combustible Liquids Code*
- *NFPA 54 - National Gas Fuel Code*
- *NFPA 58 - LP-Gas Code*
- *Florida Fire Prevention Code as adopted by the State Fire Marshal - Consult with the Florida State Fire Marshal's office for other frequently used codes*

#### **Architectural - Extinguishing Systems:**

- *NFPA 10 - Fire Extinguishers*
- *NFPA 13 - Sprinkler*
- *NFPA 14 - Standpipe and Hose System*
- *NFPA 17 - Dry Chemical*
- *NFPA 20 - Centrifugal Fire Pump*
- *NFPA 24 - Private Fire Service Mains*
- *NFPA 200 - Standard on Clean Agent Fire Extinguishing Systems*

#### **Architectural - Detection and Fire Alarm Systems:**

- *NFPA 70 - Electrical Code*
- *NFPA 72 - Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems*
- *NFPA 72E - Automatic Fire Detectors*
- *NFPA 72G - Installation, Maintenance, and Use of Notification Appliances*
- *NFPA 72H - Testing Procedures for Remote Station and Proprietary Systems*
- *NFPA 74 - Household Fire Warning Equipment*
- *NFPA 75 - Protection of Electronic Computer Equipment*

#### **Architectural - Mechanical Systems:**

- *NFPA 90A - Air Conditioning and Ventilating Systems*
- *NFPA 92A - Smoke Control Systems*

- *NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment*
- *NFPA 204M - Smoke and Heating Venting*

**Architectural - Miscellaneous Systems:**

- *NFPA 45 - Laboratories Using Chemicals*
- *NFPA 80 - Fire Doors and Windows*
- *NFPA 88A - Parking Structures*
- *NFPA 105- Smoke and Draft-control Door Assemblies*
- *NFPA 110 - Emergency and Standby Power Systems*
- *NFPA 220 - Types of Building Construction*
- *NFPA 241 - Safeguard Construction, Alteration, and Operations*
- *Rule Chapter 69A-47, F.A.C., Uniform Fire Safety For Elevators*
- *Rule Chapter 69A-51, F.A.C., Boiler Safety*

**Architectural - Energy Conservation:**

- *Rule Chapter 60D-4, F.A.C., Rules For Construction and Leasing of State Buildings To Insure Energy Conservation*
- *Section 255.255, F.S., Life-Cycle Costs*

**Architectural - Elevators:**

- *Rule Chapter 61C-5, F.A.C., Florida Elevator Safety Code*
- *ASME A-17.1, Safety Code for Elevators and Escalators*
- *Architectural - Floodplain Management Criteria*
- *Section 255.25, F.S., Approval Required Prior to Construction or Lease of Buildings*
- *Rules of the Federal Emergency Management Agency (FEMA)*

**Architectural - Other:**

- *Rule Chapter 64E-6, F.A.C., Standards for On Site Sewage Disposal Systems (Septic Tanks)*
- *Rule Chapter 62-600, F.A.C., Domestic Wastewater Facilities*
- *Rule Chapter 62-761, F.A.C., Underground Storage Tank Systems*
- *American Concrete Institute*
- *American Institute of Architects - Architect's Handbook of Professional Practice*
- *American Society for Testing and Materials - ASTM Standards*
- *Brick Institute of America*
- *DMS - Standards for Design of State Facilities*
- *Florida Concrete Products Association*
- *FDOT - ADA/Accessibility Procedure*
- *FDOT - Building Code Compliance Procedure*

- *FDOT - Design Build Procurement and Administration*
- *LEED (Leadership in Energy and Environmental Design) Green Building Rating System*
- *National Concrete Masonry Association*
- *National Electrical Code*
- *Portland Cement Association - Concrete Masonry Handbook*
- *United State Green Building Council (USGBC)*

## **2.22 Services to be Performed by the DEPARTMENT**

When appropriate or available, the DEPARTMENT will provide project data including:

- *Numbers for field books*
- *Preliminary Horizontal Network Control*
- *Access for the CONSULTANT to utilize the DEPARTMENT's Information Technology Resources*
- *All Department agreements with Utility Agency Owner (UAO)*
- *All certifications necessary for project letting*
- *Building Construction Permit Coordination (Turnpike)*
- *All information that may come to the DEPARTMENT pertaining to future improvements*
- *All future information that may come to the DEPARTMENT during the term of the CONSULTANT's Agreement, which in the opinion of the DEPARTMENT is necessary for the prosecution of the work*
- *Available traffic and planning data*
- *All approved utility relocations*
- *Project utility certification to the DEPARTMENT's Central Office*
- *Any necessary title searches*
- *Engineering standards review services*
- *All available information in the possession of the DEPARTMENT pertaining to utility companies whose facilities may be affected by the proposed construction*
- *All future information that may come to the DEPARTMENT pertaining to subdivision plans so that the CONSULTANT may take advantage of additional areas that can be utilized as part of the existing right of way*
- *Systems traffic for Projected Design Year, with K, D, and T factors*
- *Previously constructed Highway Beautification or Landscape Construction Plans*
- *Landscape Opportunity Plan(s)*
- *Existing right of way maps*
- *Existing pavement evaluation report for all RRR projects*
- *PD&E Documents*
- *Design Reports*

- *Letters of authorization designating the CONSULTANT as an agent of the DEPARTMENT in accordance with F.S. 337.274*
- *Phase reviews of plans and engineering documents*
- *Regarding Environmental Permitting Services:*
  - *Approved Permit Document when available*
  - *Approval of all contacts with environmental agencies*
  - *General philosophies and guidelines of the DEPARTMENT to be used in the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the Project Manager.*
  - *Appropriate signatures on application forms*

### **3 PROJECT COMMON AND PROJECT GENERAL TASKS**

#### **Project Common Tasks**

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, 4 (Roadway Analysis) through 36 (3D Modeling). These tasks are to be included in the project scope in each applicable activity when the described work is to be performed by the CONSULTANT.

Cost Estimates: The CONSULTANT is responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to 60% plans or completion of quantities, the DEPARTMENT's Long-Range Estimate (LRE) system will be used to produce a conceptual estimate, according to District policy. Once the quantities have been developed (beginning at 60% plans and no later than 90% plans) the CONSULTANT shall be responsible for inputting the pay items and quantities into AASHTOWare Project Preconstruction through the use of the DEPARTMENT's Designer Interface.

Technical Special Provisions: The CONSULTANT shall provide Technical Special Provisions for all items of work not covered by the Standard Specifications for Road and Bridge Construction and the workbook of implemented modifications.

A Technical Special Provision shall not modify the Standard Specifications and implemented modifications in any way.

The Technical Special Provisions shall provide a description of work, materials, equipment and specific requirements, method of measurement and basis of payment. Proposed Technical Special Provisions will be submitted to the District Specifications Office for initial review at the time of the Phase III plans review submission to the DEPARTMENT's Project Manager. This timing will allow for adequate processing time prior to final

submittal. The Technical Special Provisions will be reviewed for suitability in accordance with the Handbook for Preparation of Specification Packages. The District Specifications Office will forward the Technical Special Provisions to the District Legal Office for their review and comment. All comments will be returned to the CONSULTANT for correction and resolution. Final Technical Special Provisions shall be digitally signed and sealed in accordance with applicable Florida Statutes.

The CONSULTANT shall contact the appropriate District Specifications Office for details of the current format to be used before starting preparations of Technical Special Provisions.

Modified Special Provisions: The CONSULTANT shall provide Modified Special Provisions as required by the project. Modified Special Provisions are defined in the Specifications Handbook.

A Modified Special Provision shall not modify the first nine sections of the Standard Specifications and implemented modifications in any way. All modifications to other sections must be justified to the appropriate District and Central Specifications Offices to be included in the project's specifications package.

Field Reviews: The CONSULTANT shall make as many trips to the project site as required to obtain necessary data for all elements of the project.

Technical Meetings: The CONSULTANT shall attend all technical meetings necessary to execute the Scope of Services of this contract. This includes meetings with DEPARTMENT and/or Agency staff, between disciplines and subconsultants, such as access management meetings, pavement design meetings, local governments, railroads, airports, progress review meetings (phase review), and miscellaneous meetings. The CONSULTANT shall prepare, and submit to the DEPARTMENT's Project Manager for review, the meeting minutes for all meetings attended by them. The meeting minutes are due within five (5) working days of attending the meeting.

Quality Assurance/Quality Control: It is the intention of the DEPARTMENT that design CONSULTANTS, including their subconsultant(s), are held responsible for their work, including plans review. The purpose of CONSULTANT plan reviews is to ensure that CONSULTANT plans follow the plan preparation procedures outlined in the FDOT Design Manual, that state and federal design criteria are followed with the DEPARTMENT concept, and that the CONSULTANT submittals are complete. All subconsultant document submittals shall be submitted by the subconsultant directly to the CONSULTANT for their independent Quality Assurance/Quality Control review and subsequent submittal to the DEPARTMENT.

It is the CONSULTANT'S responsibility to independently and continually QC their plans and other deliverables. The CONSULTANT should regularly communicate with the

DEPARTMENT's Design Project Manager to discuss and resolve issues or solicit opinions from those within designated areas of expertise.

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of all surveys, designs, drawings, specifications and other services furnished by the CONSULTANT and their subconsultant(s) under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all maps, design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan shall be one specifically designed for this project. The CONSULTANT shall submit a Quality Control Plan for approval within twenty (20) business days of the written Notice to Proceed and it shall be signed by the CONSULTANT's Project Manager and the CONSULTANT QC Manager. The Quality Control Plan shall include the names of the CONSULTANT's staff that will perform the quality control reviews. The Quality Control reviewer shall be a Florida Licensed Professional Engineer fully prequalified under F.A.C. 14-75 in the work type being reviewed. A marked up set of prints from a Quality Control Review indicating the reviewers for each component (structures, roadway, drainage, signals, geotechnical, signing and marking, lighting, landscape, surveys, etc.) and a written resolution of comments on a point-by-point basis will be required, if requested by the DEPARTMENT, with each phase submittal. The responsible Professional Engineer, Landscape Architect, or Professional Surveyor & Mapper that performed the Quality Control review will sign a statement certifying that the review was conducted and found to meet required specifications.

The CONSULTANT shall, without additional compensation, correct all errors or deficiencies in the designs, maps, drawings, specifications and/or other products and services.

Independent Peer Review: When directed by the DEPARTMENT, a subconsultant may perform Independent Peer Reviews.

Independent Peer Review and a Constructability/Bidability Review for design Phase Plans document submittals are required on this project. These separate reviews shall be completed by someone who has not worked on the plan component that is being reviewed. These could include, but are not limited to a separate office under the Prime's umbrella, a subconsultant that is qualified in the work group being reviewed, or a CEI. It does not include persons who have knowledge of the day to day design efforts. The Constructability/Bidability Review shall be performed by a person with experience working on Department construction projects (CEI, Contractor, etc.).

The Independent Peer Review for design Phase Plans submittals shall ensure the plans meet the FDM, Standard Plans and FDOT CADD Manual. The Constructability/Bidability

Review shall ensure the project can be constructed and paid for as designed. Constructability/Bidability Reviews should be conducted prior to the Phase III and Phase IV submittals, using the Phase Review Checklist (Guidance Document 1-1-A) from the Construction Project Administration Manual (CPAM) as a minimum guideline. The CONSULTANT shall submit this checklist, as well as the "marked-up" set of plans during this review, and review comments and comment responses from any previous Constructability/Bidability reviews. These items will be reviewed by District Design and District Construction.

Supervision: The CONSULTANT shall supervise all technical design activities.

Coordination: The CONSULTANT shall coordinate with all disciplines of the project to produce a final set of construction documents.

### Project General Tasks

Project General Tasks, described in Sections 3.1 through 3.7 below, represent work efforts that are applicable to the project as a whole and not to any one or more specific project activity. The work described in these tasks shall be performed by the CONSULTANT when included in the project scope.

## **3.1 Public Involvement**

Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of the project. The CONSULTANT shall provide to the DEPARTMENT drafts of all Public Involvement documents (e.g., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least [*Number*] business days prior to printing and / or distribution.

### **3.1.1 Community Awareness Plan**

Prepare a Community Awareness Plan (CAP) for review and approval by the DEPARTMENT within 30 calendar days after receiving Notice to Proceed. The objective of the plan is to notify local governments, affected property owners, tenants, and the public of the DEPARTMENT'S proposed construction and the anticipated impact of that construction. The CAP shall address timeframes for each review and shall include tentative dates for each public involvement requirement for the project. The CAP will also document all public involvement activities conducted throughout the project's duration. In addition to the benefits of advance notification, the process should allow the DEPARTMENT to resolve controversial issues during the design phase. This item shall be reviewed and updated periodically as directed by the DEPARTMENT throughout the life of the project.

### **3.1.2 Notifications**

In addition to public involvement data collection, the CONSULTANT shall assist the DEPARTMENT or prepare notifications, flyers, and/or letters to elected officials and other public officials, private property owners, and tenants at intervals during plans production

as identified by the DEPARTMENT. All letters and notices shall be reviewed by the DEPARTMENT to ensure that they are addressed to the correct and current public officials.

### **3.1.3 Preparing Mailing Lists**

At the beginning of the project, The CONSULTANT shall identify all impacted property owners and tenants (within a minimum of 300 feet of the project corridor) The CONSULTANT shall prepare a mailing list of all such entities and shall update the mailing list as needed during the life of the project.

### **3.1.4 Median Modification Letters**

The CONSULTANT shall prepare a median modification letter to be sent to property owners along the corridor. In addition, the CONSULTANT shall prepare a sketch of each proposed median modification for inclusion in the letter. The letters will be sent on DEPARTMENT letterhead by the CONSULTANT.

### **3.1.5 Driveway Modification Letters**

The CONSULTANT shall prepare a driveway modification letter to be sent to property owners along the corridor. In addition, the CONSULTANT shall prepare a sketch of each proposed driveway modification for inclusion in the letter. The letters will be sent on DEPARTMENT letterhead.

### **3.1.6 Newsletters**

The CONSULTANT shall prepare newsletters for distribution to elected officials, public officials, property owners along the corridor and other interested parties. The letters will be sent by the CONSULTANT.

### **3.1.7 Renderings and Fly-Throughs**

The CONSULTANT shall prepare renderings and fly-throughs for use in public meetings.

### **3.1.8 PowerPoint Presentations**

The CONSULTANT shall prepare PowerPoint presentations for use in public meetings.

### **3.1.9 Public Meeting Preparations**

The CONSULTANT shall prepare the necessary materials for use in public meetings.

The CONSULTANT will investigate potential meeting sites to advise the DEPARTMENT on their suitability. The CONSULTANT will pay all costs for meeting site rents and insurance. No DEPARTMENT meetings will be held on public school system properties.

### **3.1.10 Public Meeting Attendance and Follow-up**

The CONSULTANT shall attend public meeting(s), assist with meeting setup and take down. The CONSULTANT shall also prepare a summary of the public meeting that includes all copies of all materials shown or provided at the public meeting. The summary shall also include a listing of all written comments made during or after the meeting and responses to those written comments.

The CONSULTANT will attend the meetings with an appropriate number of personnel to assist the DEPARTMENT'S Project Manager.

It is estimated for this project there will be ONE Public meetings during the design.

### **3.1.11 Other Agency Meetings**

In addition to scheduled public meetings the CONSULTANT may be required to participate in meetings with local governing authorities and/or Metropolitan Planning Organization (MPO). The CONSULTANT's participation may include, but not be limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file. It is estimated for this project there will be 3 meetings (as indicated in Section 2.1 above) with local governing authorities and/or MPOs during the design.

### **3.1.12 Web Site**

The CONSULTANT shall create and/or maintain a web site for the project.

## **3.2 Joint Project Agreements (N/A)**

## **3.3 Specifications & Estimates**

### **3.3.1 Specifications Package Preparation**

The CONSULTANT shall prepare and provide a specifications package in accordance with the DEPARTMENT'S Procedure Topic No. 630-010-005 Specifications Package Preparation and the Specifications Handbook. The CONSULTANT shall provide the DEPARTMENT names of at least two team members who have successfully completed the Specifications Package Preparation Training and will be responsible for preparing the Specifications Package for the project. The Specifications Package shall be prepared using the DEPARTMENT's Specs on the Web application. The CONSULTANT shall be able to document that the procedure defined in the Handbook for the Preparation of Specifications Packages is followed, which includes the quality assurance/quality control procedures. The specifications package shall address all items and areas of work and include any Mandatory Specifications, Modified Special Provisions, and Technical Special Provisions.

The specifications package must be submitted for review to the District Specifications Office at least 30 days prior to the contract package to Tallahassee or District due date, or sooner if required by the District Specifications Office. This submittal does not require signing and sealing and shall be coordinated through the District's Project Manager. The

CONSULTANT shall coordinate with the DEPARTMENT on the submittal requirements, but at a minimum shall consist of (1) the complete specifications package, (2) a copy of the marked-up workbook used to prepare the package, and (3) a copy of the final project plans.

Final submittal of the specifications package must occur at least 10 working days prior to the contract package to Tallahassee due date. This submittal shall be digitally signed, dated, and sealed in accordance with applicable Florida Statutes.

### **3.3.2 Estimated Quantities Report Preparation**

The CONSULTANT shall prepare an Estimated Quantities (EQ) Report in accordance with FDM 902. Includes loading quantities into Designer Interface for AASHTOWare Project Preconstruction (PrP), QA/QC efforts associated with AASHTOWare PrP and the EQ Report.

### **3.4 Contract Maintenance and Project Documentation**

Contract maintenance includes project management effort for complete setup and maintenance of files, electronic folders and documents, developing technical monthly progress reports and schedule updates. Project documentation includes the compilation and delivery of final documents, reports or calculations that support the development of the contract plans; includes uploading files to Electronic Document Management System (EDMS) or Project Suite Enterprise Edition (PSEE).

### **3.5 Value Engineering (Multi-Discipline Team) Review (N/A)**

### **3.6 Prime Consultant Project Manager Meetings**

Includes only the Prime Consultant Project Manager's time for travel and attendance at Activity Technical Meetings and other meetings listed in the meeting summary for Task 3.6 on tab 3 Project General Task of the staff hour forms. Staff hours for other personnel attending Activity Technical Meetings are included in the meeting task for that specific Activity.

### **3.7 Plans Update**

The effort needed for Plans Update services will vary from project to project, depending on size and complexity of the project, as well as the duration of time spent "on the shelf".

Specific services will be negotiated as necessary as a contract amendment.

### **3.8 Post-Design Services**

Post-Design Services may include, but not limited to, meetings, construction assistance, plans revisions, shop drawing review, survey services, as-built drawings, and load ratings. Specific services will be negotiated as necessary as a contract amendment.

Post-Design Services are not intended for instances of CONSULTANT errors or omissions.

### **3.9 Digital Delivery**

The CONSULTANT shall deliver final contract plans and documents in digital format. The final contract plans and documents shall be digitally signed and sealed files delivered to the DEPARTMENT on acceptable electronic media, as determined by the DEPARTMENT.

### **3.10 Risk Assessment Workshop (N/A)**

### **3.11 Railroad, Transit and/or Airport Coordination**

Please reference the Candidate Project Technical Scope for details

#### **3.11.1 Aeronautical Evaluation**

The Consultant shall be responsible for complying with the requirements of Title 14 of the Code of Federal Regulations Part 77 (14 CFR Part 77), and for determining whether it is necessary to file any Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the Federal Aviation Administration (FAA), utilizing the FAA Notice Criteria Tool. Place a copy of all pertinent documentation in the Project Documentation folder structure; e.g., Notice Criteria Tool inquiries and responses; FAA Form 7460-1 filed with the FAA; Letters of Determination (along with the records demonstrating compliance with the conditions and deadlines). Report any Letters of Determination, designated other than "Does Not Exceed", to the Central Office (Aviation Office, Airspace and Land Use Manager).

### **3.12 Landscape and Existing Vegetation Coordination**

Coordinate to ensure preservation and protection of existing vegetation. Relocation of existing vegetation may be necessary in some cases. Space for proposed landscape should be preserved and conflicts with drainage, utilities, ITS, and signage should be minimized. Coordination with the District Landscape Architect may be necessary as defined in 4.12. Additionally, coordination with the Florida Scenic Highways program should be included to ensure any requirements of the FSH program are met.

### **3.13 Other Project General Tasks**

Contract Time Memo

## **4 ROADWAY ANALYSIS**

The CONSULTANT shall analyze and document Roadway Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

### **4.1 Typical Section Package**

The CONSULTANT shall provide an approved Typical Section Package prior to the first plans submittal.

#### **4.2 Pavement Type Selection Report (N/A)**

#### **4.3 Pavement Design Package**

The CONSULTANT shall provide an approved Pavement Design Package prior to the Phase II plans submittal date.

#### **4.4 Cross-Slope Correction**

The CONSULTANT shall coordinate with the DEPARTMENT to obtain existing cross slope data, determine roadway limits where cross slope is potentially out of tolerance and determine a resolution.

#### **4.5 Horizontal/Vertical Master Design Files**

The CONSULTANT shall design the geometrics using the Standard Plans that are most appropriate with proper consideration given to the design traffic volumes, design speed, capacity and levels of service, functional classification, adjacent land use, design consistency and driver expectancy, aesthetics, existing vegetation to be preserved, pedestrian and bicycle concerns, ADA requirements, Safe Mobility For Life Program, access management, PD&E documents and scope of work. The CONSULTANT shall also develop utility conflict information to be provided to project Utility Coordinator in the format requested by the DEPARTMENT.

Note: When the project includes a 3D Model deliverable, also include Activity 36 3D Modeling.

#### **4.6 Access Management**

The CONSULTANT shall incorporate access management standards for each project in coordination with DEPARTMENT staff. The CONSULTANT shall review adopted access management standards and the existing access conditions (interchange spacing, signalized intersection spacing, median opening spacing, and connection spacing). Median openings that will be closed, relocated, or substantially altered shall be shown on plan sheets and submitted with supporting documentation for review with the first plans submittal.

The DEPARTMENT shall provide access management classification information and information derived from PD&E studies and public hearings to be used by the CONSULTANT.

#### **4.7 Roundabout Evaluation**

The CONSULTANT shall analyze and document Roundabout Evaluation Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall perform a Roundabout Screening for assessment of potential site impacts such as utility adjustments or relocations, right of way takes, environmental mitigation, and access management.

The CONSULTANT shall perform a Roundabout Benefit-Cost Evaluation comparing a roundabout with a traditional intersection (stop controlled or signal controlled). The benefit-cost analysis considers safety benefits associated with reduced crashes, delay, life cycle costs including right of way, utilities, construction, operation, and maintenance.

The CONSULTANT shall perform a Geometric and Operation Analysis to establish the roundabout alignment, geometry and lane requirements. Roundabout geometric and operational analysis must be documented in a preliminary report including data collection, conceptual layout, crash analysis, traffic counts, traffic forecast, and future design and opening year analysis.

The CONSULTANT shall perform all efforts required for traffic data collection and required design elements for all the above steps accordingly, including crash reports, 24-hour machine counts, peak hour turning movement counts, existing geometrics, pedestrian and bicycle volumes, posted speed limits, delay counts, design vehicle, access management, transit operations and physical and right of way limitations.

#### **4.8 Roundabout Final Design Analysis**

The CONSULTANT shall finalize the design of the roundabout in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall perform a final roundabout operational analysis that recommends a functional geometric layout that is cost effective, safe and meets the needs of the community. A final roundabout design will be recommended for implementation, and all geometric and operational analysis will be documented in a final roundabout report.

#### **4.9 Cross Section Design Files**

The CONSULTANT shall establish and develop cross section design files in accordance with the FDOT CADD Manual.

Note: If the Cross Sections are prepared using a 3D model, use Task 36.5 instead of Task 4.9 for the Cross Section Design Files.

#### **4.10 Temporary Traffic Control Plan (TTCP) Analysis**

The CONSULTANT shall design a safe and effective TTCP to move vehicular and pedestrian traffic during all phases of construction. The design shall include construction phasing of roadways ingress and egress to existing property owners and businesses, routing, signing and pavement markings, and detour quantity tabulations, roadway pavement, drainage structures, ditches, front slopes, back slopes, drop offs within clear zone, transit stops, and traffic

monitoring sites. Special consideration shall be given to the construction of the drainage system when developing the construction phases. Positive drainage must be maintained at all times. The design shall include construction phasing of roadways to accommodate the construction or relocation of utilities when the contract includes Joint Project Agreements (JPAs).

The CONSULTANT shall investigate the need for temporary traffic signals, temporary highway lighting, detours, diversions, lane shifts, and the use of materials such as sheet piling in the analysis. The Traffic Control Plan shall be prepared by a certified designer who has completed training as required by the DEPARTMENT. Before proceeding with the TTCP, the CONSULTANT shall meet with the appropriate DEPARTMENT personnel. The purpose of this meeting is to provide information to the CONSULTANT that will better coordinate the Preliminary and Final TTCP efforts.

The CONSULTANT shall consider the local impact of any lane closures or alternate routes. When the need to close a road is identified during this analysis, the CONSULTANT shall notify the DEPARTMENT's Project Manager as soon as possible. Proposed road closings must be reviewed and approved by the DEPARTMENT. Diligence shall be used to minimize negative impacts by appropriate specifications, recommendations or plans development. Local impacts to consider will be local events, holidays, peak seasons, detour route deterioration and other eventualities. CONSULTANT shall be responsible to obtain local authorities permission for use of detour routes not on state highways.

#### **4.11 Master TTCP Design Files**

The CONSULTANT shall develop master TTCP files showing each phase of the TTCP. This includes all work necessary for designing lane configurations, diversions, lane shifts, signing and pavement markings, temporary traffic control devices, and temporary pedestrian ways.

#### **4.12 Selective Clearing and Grubbing (N/A)**

#### **4.13 Tree Disposition Plans (N/A)**

#### **4.14 Design Variations and Exceptions**

If available, the DEPARTMENT shall furnish the Variation/Exception Report. The CONSULTANT shall prepare the documentation necessary to gain DEPARTMENT approval of all appropriate Design Variations and/or Design Exceptions before the first submittal.

#### **4.15 Design Report**

The CONSULTANT shall prepare all applicable report(s) as listed in the Project Description section of this scope. Reports are to be delivered as a signed and sealed pdf file.

#### **4.16 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation, including construction days when required.

#### **4.17 Cost Estimate**

#### **4.18 Technical Special Provisions and Modified Special Provisions**

#### **4.19 Other Roadway Analyses**

#### **4.20 Field Reviews**

#### **4.21 Monitor Existing Structures**

The CONSULTANT shall perform field observations to visually identify existing structures within the project limits which may require settlement, vibration or groundwater monitoring by the contractor during construction in accordance with FDM Chapter 307. The CONSULTANT shall identify the necessary pay items to be included in the bid documents to monitor existing structures.

Optional Services (may be negotiated at a later date if needed): The CONSULTANT shall coordinate with and assist the geotechnical engineer and/or structural engineer to develop mitigation strategies (when applicable).

#### **4.22 Technical Meetings**

#### **4.23 Quality Assurance/Quality Control**

#### **4.24 Independent Peer Review**

#### **4.25 Supervision**

#### **4.26 Coordination**

### **5 ROADWAY PLANS**

The CONSULTANT shall prepare Roadway, TTCP, Utility Adjustment Sheets, plan sheets, notes, and details. The plans shall include the following sheets necessary to convey the intent and scope of the project for the purposes of construction.

- 5.1 Key Sheet**
- 5.2 Typical Section Sheets**
  - 5.2.1 Typical Sections**
  - 5.2.2 Typical Section Details**
- 5.3 General Notes/Pay Item Notes**
- 5.4 Project Layout**
- 5.5 Plan/Profile Sheet**
- 5.6 Profile Sheet**
- 5.7 Plan Sheet**
- 5.8 Special Profile**
- 5.9 Back-of-Sidewalk Profile Sheet**
- 5.10 Interchange Layout Sheet**
- 5.11 Ramp Terminal Details (Plan View)**
- 5.12 Intersection Layout Details**
- 5.13 Special Details**
- 5.14 Cross-Section Pattern Sheets**
- 5.15 Roadway Soil Survey Sheets**
- 5.16 Cross Sections**
- 5.17 Temporary Traffic Control Plan Sheets**
- 5.18 Temporary Traffic Control Cross Section Sheets**
- 5.19 Temporary Traffic Control Detail Sheets**
- 5.20 Utility Adjustment Sheets**
- 5.21 Selective Clearing and Grubbing Sheets (N/A)**
- 5.22 Tree Disposition Plan Sheets (N/A)**
- 5.23 Project Control Sheets**
- 5.24 Environmental Detail Sheets**

Preparation of detail sheets for potential environmental issues such as, underground fuel tanks and monitoring wells, septic tanks within the proposed right of way. All piping and pumps in association with the above referenced issues shall also be located and identified by the survey.

The CONSULTANT shall relay to the DEPARTMENT any findings of contaminated soil, monitoring wells, or any features (particularly springs or sinks) relating to contamination or hazardous material.

Coordination with Permits/Environmental staff and preparing Dredge & Fill Detail sheets where applicable.

#### **5.25 Utility Verification Sheets (SUE Data)**

#### **5.26 Quality Assurance/Quality Control**

#### **5.27 Supervision**

### **6a DRAINAGE ANALYSIS**

The CONSULTANT shall analyze and document Drainage Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall be responsible for designing a drainage and stormwater management system. All design work shall comply with the requirements of the appropriate regulatory agencies and the DEPARTMENT's Drainage Manual.

The CONSULTANT shall coordinate fully with the appropriate permitting agencies and the DEPARTMENT's staff. All activities and submittals should be coordinated through the DEPARTMENT's Project Manager. The work will include the engineering analyses for any or all of the following:

#### **6a.1 Drainage Map Hydrology**

Create a (pre- and/or post-condition) working drainage basin map to be used in defining the system hydrology. This map shall incorporate drainage basin boundaries, existing survey and/or LiDAR and field observations, as necessary, to define the system. Basin delineations shall also include any existing collection systems in a logical manner to aid in the development of the hydraulic model. Include coordination hours needed to convey drainage hydrologic features onto produced drainage maps.

#### **6a.2 Base Clearance Calculations**

Analyze, determine, and document high water elevations per basin which will be used to set roadway profile grade and roadway materials. Determine surface water elevations at cross drains, floodplains, outfalls and adjacent stormwater ponds. Determine groundwater elevations at intervals between the above-mentioned surface waters. Document findings in a Base Clearance Report.

### **6a.3 Pond Siting Analysis and Report**

Evaluate pond sites using a preliminary hydrologic analysis. Document the results and coordination for all the project's pond site analyses. The Drainage Manual provides specific documentation requirements.

### **6a.4 Design of Cross Drains**

Analyze the hydraulic design and performance of cross drains. Check existing cross drains to determine if they are structurally sound and can be extended. Document the design as required. Determine and provide flood data as required.

### **6a.5 Design of Ditches**

Design roadway conveyance and outfall ditches. This task includes capacity calculations, longitudinal grade adjustments, flow changes, additional adjustments for ditch convergences, selection of suitable channel lining, design of side drain pipes, and documentation. (Design of linear stormwater management facilities in separate task.)

### **6a.6 Design of Stormwater Management Facility (Offsite or Infield Pond)**

Design stormwater management facilities to meet requirements for stormwater quality treatment, attenuation and aesthetics. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tie-ins, aesthetics, etc.), perform routing, pollutant/nutrient loading calculations, recovery calculations, design the outlet control structure and buoyancy calculations for pond liners when necessary.

### **6a.7 Design of Stormwater Management Facility (Roadside Treatment Swales and Linear Ponds)**

Design stormwater management facilities to meet requirements for stormwater quality treatment, attenuation and aesthetics. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tie-ins, aesthetics, etc.), perform routing, pollutant/nutrient loading calculations, recovery calculations and design the outlet control structure.

### **6a.8 Design of Floodplain Compensation**

Determine floodplain encroachments, coordinate with regulatory agencies, and develop proposed compensation area layout (shape, contours, slopes, volumes, etc.). Document the design following the requirements of the regulatory agency.

### **6a.9 Design of Storm Drains**

Delineate contributing drainage areas, determine runoff, inlet locations, and spread. Calculate hydraulic losses (friction, utility conflict and, if necessary, minor losses). Determine design tailwater and, if necessary, outlet scour protection.

### **6a.10 Optional Culvert Material**

Determine acceptable options for pipe materials using the Culvert Service Life Estimator.

### **6a.11 French Drain Systems**

Design French Drain Systems to provide stormwater treatment and attenuation. Identify location for percolation tests and review these, determine the size and length of French Drains, design the control structure/weir, and model the system of inlets, conveyances, French Drains, and other outfalls using a routing program.

#### **6a.11.1 Existing French Drain Systems**

Include this task if French Drains are proposed and the existing systems must be analyzed for a pre- versus post comparison of the peak stages and/or discharges.

### **6a.12 Drainage Wells**

Design the discharge into deep wells to comply with regulatory requirements. Identify the location of the well, design the control structure/weir, and model the system using a routing program.

### **6a.13 Drainage Design Documentation Report**

Compile drainage design documentation into report format. Include documentation for all the drainage design tasks and associated meetings and decisions, except for stand-alone reports, such as the Pond Siting Analysis Report and Bridge Hydraulics Report.

### **6a.14 Bridge Hydraulic Report**

Calculate hydrology, hydraulics, deck drainage, scour, and appropriate counter measures. Prepare report and the information for the Bridge Hydraulics Recommendation Sheet.

### **6a.15 Temporary Drainage Analysis (N/A)**

### **6a.16 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **6a.17 Cost Estimate**

Prepare cost estimates for the drainage components, except bridges and earthwork for stormwater management and flood compensation sites.

### **6a.18 Technical Special Provisions / Modified Special Provisions**

### **6a.19 Hydroplaning Analysis**

Perform a hydroplaning analysis to assist in the determination of the appropriate roadway geometry for all necessary locations (both typical sections and critical cross sections) as

needed. See the FDOT Hydroplaning Guidance and FDOT Design Manual (FDM) Chapters 210 and 211 for more information.

#### **6a.20 Existing Permit Analysis**

Data gathering including desktop analysis of local, state and federal Drainage permits.

#### **6a.21 Other Drainage Analysis**

Includes all efforts for a drainage task not covered by an existing defined task.

#### **6a.22 Noise Barrier Evaluation**

Evaluate the capacity of drainage openings in noise barriers and locate them to ensure flows are accommodated.

#### **6a.23 Field Reviews**

#### **6a.24 Technical Meetings**

Meetings with Department staff, regulatory agencies, local governments such as meetings with District Drainage Engineer, the Water Management District, FDEP, etc.

#### **6a.25 Environmental Look-Around Meetings**

Convene a meeting with Department staff, regulatory agencies, local governments and other stakeholders to explore watershed wide stormwater needs and alternative permitting approaches.

#### **6a.26 Quality Assurance/Quality Control**

#### **6a.27 Independent Peer Review**

#### **6a.28 Supervision**

#### **6a.29 Coordination**

### **6b DRAINAGE PLANS**

The CONSULTANT shall prepare Drainage plan sheets, notes, and details. The plans shall include the following sheets necessary to convey the intent and scope of the project for the purposes of construction.

- 6b.1 Drainage Map (Including Interchanges)**
- 6b.2 Bridge Hydraulics Recommendation Sheets**
- 6b.3 Drainage Structures**
- 6b.4 Lateral Ditch Plan/Profile**
- 6b.5 Lateral Ditch Cross Sections**
- 6b.6 Retention/Detention Pond Detail Sheets**
- 6b.7 Retention Pond Cross Sections**
- 6b.8 Erosion Control Plan Sheets**
- 6b.9 SWPPP Sheets**
- 6b.10 Quality Assurance/Quality Control**
- 6b.11 Supervision**

## **7 UTILITIES**

The CONSULTANT shall identify utility facilities and secure agreements, utility work schedules, and plans from the Utility Agency Owners (UAO) ensuring all conflicts that exist between utility facilities and the DEPARTMENT's construction project are addressed. The CONSULTANT shall certify all utility negotiations have been completed and that arrangements have been made for utility work to be undertaken.

### **7.1 Utility Kickoff Meeting**

Before any contact with the UAO(s), the CONSULTANT shall meet with the District Utility Office (DUO) to receive guidance, as may be required, to assure that all necessary coordination will be accomplished in accordance with DEPARTMENT procedures. CONSULTANT shall bring a copy of the design project work schedule reflecting utility activities.

### **7.2 Identify Existing Utility Agency Owner(s)**

The Consultant shall identify all utilities within and adjacent to the project limits that may be impacted by the project.

### **7.3 Make Utility Contacts**

First Contact: The CONSULTANT shall send letters and two sets of plans to each utility, one set for the utility office, and one set to the DEPARTMENT Offices as required by the District. Includes contact by phone for meeting coordination. Request type, size, location, easements, and cost for relocation if reimbursement is claimed. Request the voltage level for power lines in the project area. Send UAO requests for reimbursement to FDOT for a legal opinion. Include

the meeting schedule (if applicable) and the design schedule. Include typical meeting agenda. If scheduling a meeting, give a 4-week notice.

Second Contact: At a minimum of 4 weeks prior to the meeting, the CONSULTANT shall transmit two complete sets of Phase II plans and the utility conflict information (when applicable and in the format requested by the DEPARTMENT) to each UAO having facilities located within the project limits, and one set to the DEPARTMENT Offices as required by the District.

Third Contact: Identify agreements and assemble packages. The CONSULTANT shall send agreements, letters, the utility conflict information (when applicable and in the format requested by the DEPARTMENT) and two sets of plans to the UAO(s) including all component sets, one set for the utility office, one set to construction and maintenance if required. Include the design schedule.

Not all projects will have all contacts as described above.

#### **7.4 Exception Processing**

The CONSULTANT shall be responsible for transmitting/coordinating the appropriate design reports including, but not limited to, the Resurfacing, Restoration and Rehabilitation (RRR) report, Preliminary Engineering Report, Project Scope and/or the Concept Report (if applicable) to each UAO to identify any condition that may require a Utility Exception. The CONSULTANT shall identify and communicate to the UAO any facilities in conflict with their location or project schedule. The CONSULTANT shall assist with the processing of design exceptions involving Utilities with the UAO and the DEPARTMENT. Assist with processing per the UAM.

#### **7.5 Preliminary Utility Meeting**

The CONSULTANT shall schedule (time and place), notify participants, and conduct a preliminary utility meeting with all UAO(s) having facilities located within the project limits for the purpose of presenting the project, review the current design schedule, evaluate the utility information collected, provide follow-up information on compensable property rights from the FDOT Legal Office, discuss the utility work by highway contractor option with each utility, and discuss any future design issues that may impact utilities. This is also an opportunity for the UAO(s) to present proposed facilities. The CONSULTANT shall keep accurate minutes and distribute a copy to all attendees.

#### **7.6 Individual/Field Meetings**

The CONSULTANT shall meet with each UAO as necessary, separately or together, throughout the project design duration to provide guidance in the interpretation of plans, review changes to the plans and schedules, standard or selective clearing and grubbing work, and assist in the development of the UAO(s) plans and work schedules. The CONSULTANT

is responsible for motivating the UAO to complete and return the necessary documents after each Utility Contact or Meeting.

### **7.7 Collect and Review Plans and Data from UAO(s)**

The CONSULTANT shall review utility marked plans and data individually as they are received for content. Ensure information from the UAO (utility type, material and size) is sent to the designer for inclusion in the plans. Forward all requests for utility reimbursement and supporting documentation to the DUO.

### **7.8 Subordination of Easements Coordination**

The CONSULTANT, if requested by the DEPARTMENT, shall transmit to and secure from the UAO the executed subordination agreements prepared by the appropriate DEPARTMENT office. The CONSULTANT shall coordinate with the DUO the programming of the necessary work program funds to compensate the UAO.

### **7.9 Utility Design Meeting**

The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s). The CONSULTANT shall be prepared to discuss impacts to existing trees/vegetation and proposed landscape, drainage, traffic signalization, temporary traffic control plans (TTCP) (construction phasing), review the current design schedule and letting date, evaluate the utility information collected, provide follow-up information on compensable property rights from FDOT Legal Office, discuss with each UAO the utility work by highway contractor option, discuss any future design issues that may impact utilities, etc., to the extent that they may have an effect on existing or proposed utility facilities with particular emphasis on drainage and TTCP with each UAO. The intent of this meeting shall be to assist the UAOs in identifying and resolving conflicts between utilities and proposed construction before completion of the plans, including utility adjustment details. Also, to work with the UAOs to recommend potential resolution between known utility conflicts with proposed construction plans as may be deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.9 (Cross Section Design Files) for utility conflict location identification and adjustments.

### **7.10 Review Utility Markups & Work Schedules and Processing of Schedules & Agreements**

The CONSULTANT shall review utility marked up plans and work schedules as they are received for content and coordinate review with the designer. Send color markups and schedules to the appropriate DEPARTMENT office(s) such as survey, geotechnical, drainage, structures, lighting, roadway, signals, utilities, landscape architecture, municipalities, maintaining agency, and District Traffic Operations for review and comment if required by the District. Coordinate with the District for execution. Distribute Executed Final Documents.

Prepare Work Order for UAO(s). The CONSULTANT shall coordinate with the DUO the programming of necessary Work Program funds.

### **7.11 Utility Coordination/Follow-up**

The CONSULTANT shall provide utility coordination and follow up. This includes follow-up, interpreting plans, and assisting the UAOs with completion of their work schedules and agreements. Includes phone calls, face-to-face meetings, etc., to motivate and ensure the UAO(s) complete and return the required documents in accordance with the project schedule. Ensure the resolution of all known conflicts. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees. This task can be applied to all phases of the project.

### **7.12 Utility Constructability Review**

The CONSULTANT shall review utility schedules against construction contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the construction office. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.9 (Cross Section Design Files) for utility conflict identification and adjustments.

### **7.13 Additional Utility Services**

The CONSULTANT shall provide additional utility services. Additional services will be determined when the services are required and requested. This item is not usually included in the scope at the time of negotiation. It is normally added as a supplemental agreement when the need is identified.

### **7.14 Processing Utility Work by Highway Contractor (UWHC)**

This includes coordination of utility design effort between the DEPARTMENT and the UAO(s). The CONSULTANT shall conduct additional coordination meetings, prepare and process the agreements, review tabulation of quantities, perform UWHC constructability and bidability review, review pay items, cost estimates and Technical Special Provisions (TSP) or Modified Special Provision (MSP) prepared by the UAO. This does not include utility the utility design effort. This item is not usually included in the scope at the time of negotiation. It is normally added as a supplemental agreement when the need is identified. Effort for the EOR is not included in this task, see Roadway Analysis Task Group 4.

### **7.15 Contract Plans to UAO(s)**

If requested by the District, the CONSULTANT shall transmit the contract plans as processed for letting to the UAO(s). Transmittals to UAO(s) may be by certified mail, return receipt requested.

### **7.16 Certification/Close-Out**

This includes hours for transmitting utility files to the DUO and preparation of the Utility Certification Letter. The CONSULTANT shall certify to the appropriate DEPARTMENT representative the following:

All utility negotiations (Full execution of each agreement, approved Utility Work Schedules, Technical Special Provisions or Modified Special Provisions written, etc.) have been completed with arrangements made for utility work to be undertaken and completed as required for proper coordination with the physical construction schedule.

OR

An on-site inspection was made and no utility work will be involved.

OR

Plans were sent to the Utility Companies/Agencies and no utility work is required.

### **7.17 Other Utilities**

The CONSULTANT shall provide other utility services. This includes all efforts for a utility task not covered by an existing defined task. Required work will be defined in the scope and negotiated on a case-by-case basis.

## **8 ENVIRONMENTAL PERMITS and ENVIRONMENTAL CLEARANCES**

The CONSULTANT shall notify the DEPARTMENT Project Manager, Environmental Permit Coordinator, and other appropriate DEPARTMENT personnel in advance of all scheduled meetings with the regulatory agencies to allow a DEPARTMENT representative to attend. The CONSULTANT shall copy in the Project Manager and the Environmental Permit Coordinator on all permit related correspondence and meetings. The Consultant shall use current regulatory guidelines and policies for all permits required as identified in Section 2.4.

### **8.1 Preliminary Project Research**

The CONSULTANT shall perform preliminary project research and shall be responsible for regulatory agency coordination to assure that design efforts are properly directed toward permit requirements. The research shall include but should not be limited to a review of the project's PD&E documents including the Environmental Document, Natural Resources Evaluation Report, and Cultural Resources Assessment Survey Report.

The CONSULTANT shall research any existing easements or other restrictions that may exist both within or adjacent to the proposed project boundary. Project research may include but should not be limited to review of available: federal, state, and local permit files and databases; and local government information including county and property appraiser data. The CONSULTANT shall determine if any Sovereign Submerged Lands easements need to be modified or acquired. Any applicable information will be shown on the plans as appropriate.

## **8.2 Field Work**

### **8.2.1 Pond Site Alternatives:**

The CONSULTANT shall review alternative pond sites as directed by the DEPARTMENT and information shall be included in the Pond Siting Report.

### **8.2.2 Establish Wetland Jurisdictional Lines and Assessments:**

The CONSULTANT shall be responsible for, but not limited to, the following activities:

- Determine landward extent of wetlands and other surface waters as detailed in Rule Chapter 62-340, F.A.C., as ratified in Section 373.4211, F.S.; United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Technical Report Y-87-1); Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (ERD/EL TR-10-20).
- Collect all data and information necessary to determine the jurisdictional boundaries of wetlands and other surface waters as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Set seasonal high-water levels in adjacent wetlands with biological indicators
- Obtain a jurisdictional determination as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Prepare aerial maps showing the jurisdictional boundaries of wetlands and other surface waters. Aerial maps shall be reproducible, of a scale of 1"=400' or more detailed and be recent photography. The maps shall show the jurisdictional boundaries of each agency. Photo copies of aerials are not acceptable. When necessary, a wetland specific survey will be prepared by a registered surveyor and mapper. All surveyed jurisdictional boundaries are to be tied to the project's baseline of survey.
- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form which includes the ID number for each wetland (and other surface water, if necessary) impacted, size of wetland to be impacted, type of impact, and identify any wetland (by ID number and size) within the project limits that will not be impacted by the project.
- Prepare appropriate agency forms to obtain required permits. Forms may include but are not limited to the USACE "Wetland Determination Data Form - Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; Uniform Mitigation Assessment Method forms and/or project specific data forms.

### **8.2.3 Species Surveys:**

The CONSULTANT shall conduct wildlife surveys as defined by rules or regulations of any permitting agency, or commenting agency that is processing a DEPARTMENT permit.

### **8.3 Agency Verification of Wetland Data**

The CONSULTANT shall be responsible for verification of wetland and other surface water data identified in Section 8.2 and coordinating regulatory agency field reviews, including finalization of assessments and jurisdictional determinations with applicable agencies.

### **8.4 Complete and Submit All Required Permit Applications**

The CONSULTANT shall collect the data and information necessary to prepare the permit applications and obtain the environmental permits required to construct the project as identified in the Project Description and as described in 8.4.1, 8.4.2, and 8.12 (Other Permits). The CONSULTANT shall prepare each permit application in accordance with the rules and/or regulations of the regulatory agency responsible for issuing a specific permit and/or authorization to perform work. The permit application packages must be approved by the DEPARTMENT prior to submittal to regulatory agencies.

The CONSULTANT will submit all permit applications, as directed by the DEPARTMENT, and be responsible for payment of all permit and public noticing fees.

#### **8.4.1 Complete and Submit all Required Wetland Permit Applications:**

The CONSULTANT shall prepare, complete, and submit required wetland permit (i.e. ERP, Section 404) application packages to the appropriate regulatory agencies. This includes, but is not limited to, applications submitted to WMDs and/or DEP, and USACE. The application package may include but is not limited to attachments (e.g. project location map, aerials, affidavit of ownership, pictures, additional technical analysis, etc.), a cover letter with project description as well as completion of applicable agency forms. The CONSULTANT shall prepare and respond to agency Requests for Additional Information (RAIs), including necessary revisions to the application package. All responses and completed application packages must be approved by the District Permit Coordinator prior to submittal to the regulatory agencies. Geotechnical permitting should also be prepared, submitted, and obtained.

#### **8.4.2 Complete and Submit all Required Species Permit Applications:**

The CONSULTANT shall prepare, complete and submit required species permit applications to the appropriate agencies. This includes federal and state protected species permit application packages as required. The work includes completion of application package (e.g. project location map, aerials, affidavit of ownership, pictures, additional technical analysis, etc.), and cover letter with project description as well as completion of applicable forms. The CONSULTANT shall respond to agency RAIs, including necessary revisions to the application package. All responses and completed applications must be approved by the District Permit Coordinator prior to submittal to the regulatory agency.

### **8.5 Coordinate and Review Dredge and Fill Sketches**

The CONSULTANT shall review Dredge and Fill Detail sheets to ensure information on the sketch(es) meet the requirements of the regulatory agencies and are appropriate for environmental permit application submittal and acquisition. The CONSULTANT will also provide environmental data/information as needed to support the preparation of the Dredge and Fill sketches.

### **8.6 Prepare USCG Permit Application**

### **8.7 Prepare Water Management District or Local Water Control District Right of Way Occupancy Permit Application**

The CONSULTANT shall be responsible for the preparation of the ROW Occupancy permit application in accordance with the regulatory agency requirements. The CONSULTANT shall be responsible for acquiring the ROW Occupancy permit.

### **8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application**

The CONSULTANT shall be responsible for the preparation of the CCCL permit application and acquire the final "Notice to Proceed" authorization from the Florida Department of Environmental Protection (FDEP). Legal advertisements shall be published one time in a newspaper that meets the notification requirements of the FDEP.

### **8.9 Prepare USACE Section 408 Application to Alter a Civil Works Project**

The CONSULTANT shall be responsible for the preparation of the Section 408 (33 USC 408) application and obtaining Section 408 permission.

### **8.10 Compensatory Mitigation Plan**

If impacts cannot be avoided, the CONSULTANT shall prepare a mitigation plan to be included as a part of the application(s).

Prior to the development of mitigation alternatives, the CONSULTANT shall meet with the Project Manager and Environmental Permit Coordinator to determine the DEPARTMENT's policies in proposing mitigation. The CONSULTANT shall develop a mitigation plan based upon the general guidelines provided by the DEPARTMENT.

The CONSULTANT will be directed by the DEPARTMENT to investigate the mitigation options that meet federal and state requirements in accordance with section 373.4137, F.S. Below are mitigation options:

- Purchase of mitigation credits from a mitigation bank
- Payment to DEP/WMD for mitigation services
- Monetary participation in offsite regional mitigation plans

- Creation/restoration of wetlands

In the event that physical creation or restoration is the only feasible alternative to offset wetland impacts, the CONSULTANT shall collect all of the data and information necessary to prepare mitigation plans acceptable to all permitting agencies and commenting agencies who are processing or reviewing a permit application for a DEPARTMENT project.

Prior to selection of a final creation/restoration mitigation site, the CONSULTANT will provide the following services in the development of a mitigation plan:

- Preliminary jurisdictional determination for each proposed site
- Selection of alternative sites
- Coordination of alternative sites with the DEPARTMENT/all environmental agencies
- Written narrative listing potential sites with justifications for both recommended and non-recommended sites.

### **8.11 Mitigation Coordination and Meetings**

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or commenting agencies. Once a mitigation plan has been reviewed and approved by the DEPARTMENT, the CONSULTANT will be responsible for coordinating the proposed mitigation plan with the environmental agencies. The CONSULTANT will provide mitigation information needed to update the FDOT Environmental Impact Inventory.

### **8.12 Other Environmental Permits**

Environmental Clearances, Re-evaluations, and Technical Support

### **8.13 Technical Support to the DEPARTMENT for Environmental Clearances and Re-evaluations (use when CONSULTANT provides technical support only)**

The CONSULTANT shall provide engineering and environmental support for the DEPARTMENT to obtain environmental clearances for all changes to the project after the PD&E study was approved. These changes include but are not limited to pond or mitigation sites identified, land use or environmental changes, and major design changes.

#### **8.13.1 NEPA or SEIR Re-evaluation**

During the development of the final design plans, the CONSULTANT shall be responsible for coordinating with the District Project Manager to provide necessary engineering information required in the preparation of the re-evaluation by the DEPARTMENT. The preparation of environmental re-evaluations includes those as listed in Part 1, Chapter 13 of the DEPARTMENT's PD&E Manual: Right of Way, Design Change, and Construction Advertisement.

Re-evaluations will be completed in accordance with Part 1, Chapter 13 of the PD&E Manual. The CONSULTANT shall provide information to update the Project Commitment Record for incorporation into the re-evaluation.

It is the responsibility of the CONSULTANT to provide the District Project Manager with engineering information on major design changes including changes in typical section, roadway alignment, pond site selection, right of way requirements, bridge to box culvert, drainage, and traffic volumes that may affect noise models.

### **8.13.2 Archaeological and Historical Resources**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to all cultural and historical resources due to changes in the project in accordance with Part 2, Chapter 8 of the PD&E Manual.

### **8.13.3 Wetland Impact Analysis**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to wetlands and other surface waters in accordance with Part 2, Chapter 9 of the PD&E Manual due to changes in the project.

### **8.13.4 Essential Fish Habitat Impact Analysis**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to essential fish habitat in accordance Part 2, Chapter 17 of the PD&E Manual due to changes in the project.

### **8.13.5 Protected Species and Habitat Impact Analysis**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to all protected species and habitat in accordance with Part 2, Chapter 16 of the PD&E Manual due to changes in the project. The CONSULTANT shall perform the necessary analysis to complete agency consultation in accordance with Section 7 or Section 10 of the Endangered Species Act.

## **8.14 Preparation of Environmental Clearances and Re-evaluations (use when CONSULTANT prepares all documents associated with a re-evaluation)**

The CONSULTANT shall prepare reports and clearances for all the changes to the project that occurred after the PD&E study was approved. These changes could include but are not limited to pond and/or mitigation sites identified, land use or environmental changes, and major design changes.

### **8.14.1 NEPA or SEIR Re-evaluation**

During the development of the final design plans, the CONSULTANT shall be responsible for collecting the data and preparing a re-evaluation in accordance with Part 1, Chapter 13 of the PD&E Manual.

#### **8.14.2 Archaeological and Historical Resources**

The CONSULTANT shall collect data necessary to completely analyze the impacts, due to changes in the project or project area, to all cultural and historic resources, and prepare a Cultural Resource Assessment Survey Report, in accordance with Part 2, Chapter 8 of the PD&E Manual.

#### **8.14.3 Wetland Impact Analysis**

The CONSULTANT shall analyze the impacts to wetlands due to changes to the project and complete the wetlands section of a Natural Resources Evaluation Report, in accordance with Part 2, Chapter 9 of the PD&E Manual.

#### **8.14.4 Essential Fish Habitat Impact Analysis**

The CONSULTANT shall analyze the impacts to essential fish habitat due to changes to the project and complete the Essential Fish Habitat section of a Natural Resources Evaluation Report, in accordance with Part 2, Chapter 17 of the PD&E Manual.

#### **8.14.5 Protected Species and Habitat Impact Analysis**

The CONSULTANT shall collect data necessary to prepare the protected species and habitat section of the Natural Resources Evaluation Report, and analyze the impacts to protected species and habitat by the changes to the project, in accordance with Part 2, Chapter 16 of the PD&E Manual. The CONSULTANT shall perform the necessary analysis to complete agency consultation in accordance with Section 7 or Section 10 of the Endangered Species Act.

### **8.15 Contamination Impact Analysis**

The CONSULTANT shall prepare Contamination Screening Evaluation for the project limits including stormwater ponds and floodplain compensation sites as described in Part 2, Chapter 20, of the PD&E Manual. The appropriate level of analysis and deliverable type will be approved by the DEPARTMENT's Project Manager and District Contamination Impact Coordinator. The draft Level 1 Contamination Screening Evaluation document shall be submitted to the DEPARTMENT's Project Manager and District Contamination Impact Coordinator for review and final approval. The CONSULTANT shall include an evaluation of any new contamination impacts due to changes to the project from the PD&E design concept, if applicable, and any new discharges or new potential contamination impacts not evaluated in any previously completed Contamination Screening Evaluation. The project impacts, conclusions and recommendations, figures, tables and appendices will be provided in a Level I Contamination Screening Evaluation Report.

The DEPARTMENT will provide Level II assessment services. If contamination is identified within the limits of construction, the CONSULTANT shall coordinate with the District Contamination Impact Coordinator to properly mark identified contamination areas in the plans and develop specifications as appropriate.

### **8.16 Asbestos Survey**

The Department will provide asbestos and metal based coatings survey services.

If asbestos or metal based coatings above threshold levels are found on the bridge(s), the CONSULTANT shall coordinate with the District Contamination Impact Coordinator to obtain plan notes, general notes, specifications, pay item notes, and Operation and Maintenance (O&M) plan for any asbestos to remain in place.

### **8.17 Technical Meetings**

### **8.18 Quality Assurance/Quality Control**

### **8.19 Supervision**

### **8.20 Coordination**

## **9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS**

The CONSULTANT shall analyze, design, and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.19, Provisions for Work. Individual tasks identified in Sections 9 through 18 are defined in the Staff Hour Estimation Handbook and within the provision defined in Section 2. 20, Provisions for Work. Contract documents shall display economical solutions for the given conditions.

The CONSULTANT shall provide Design Documentation to the DEPARTMENT with each submittal consisting of structural design calculations and other supporting documentation developed during the development of the plans. The design calculations submitted shall adequately address the complete design of all structural elements. These calculations shall be neatly and logically presented on digital media or, at the DEPARTMENT's request, on 8 ½"x11" paper and all sheets shall be numbered. The final design calculations shall be signed and sealed by a Florida-licensed professional engineer. A cover sheet indexing the contents of the calculations shall be included and the engineer shall sign and seal that sheet. All computer programs and parameters used in the design calculations shall include sufficient backup information to facilitate the review task.

- 9.1 Key Sheet and Index of Drawings**
- 9.2 Project Layout**
- 9.3 General Notes and Bid Item Notes**
- 9.4 Miscellaneous Common Details**
- 9.5 Incorporate Report of Core Borings**
- 9.6 Standard Plans- Bridges**
- 9.7 Existing Bridge Plans**
- 9.8 Quantities for EQ Report**
- 9.9 Cost Estimate**
- 9.10 Technical Special Provisions and Modified Special Provisions**
- 9.11 Field Reviews**
- 9.12 Technical Meetings**
- 9.13 Quality Assurance/Quality Control**
- 9.14 Independent Peer Review**
- 9.15 Supervision**
- 9.16 Coordination**

**10 STRUCTURES - BRIDGE DEVELOPMENT REPORT (N/A)**

*N/A*

**11 STRUCTURES - TEMPORARY BRIDGE (N/A)**

*N/A*

**12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE (N/A)**

*N/A*

**13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE (N/A)**

*N/A*

**14 STRUCTURES - STRUCTURAL STEEL BRIDGE (N/A)**

*N/A*

**15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE (N/A)**

*N/A*

**16 STRUCTURES - MOVABLE SPAN (N/A)**

*N/A*

**17 STRUCTURES - RETAINING WALLS**

The CONSULTANT shall prepare plans for Retaining Wall(s) as specified in Section 2.5.

General Requirements

**17.1 Key Sheet**

**17.2 Horizontal Wall Geometry**

Permanent Proprietary Walls

**17.3 Vertical Wall Geometry**

**17.4 Semi-Standard Drawings**

**17.5 Wall Plan and Elevations (Control Drawings)**

**17.6 Details**

Temporary Proprietary Walls

**17.7 Vertical Wall Geometry**

**17.8 Semi-Standard Drawings**

**17.9 Wall Plan and Elevations (Control Drawings)**

**17.10 Details**

Cast-In-Place Retaining Walls

**17.11 Design**

**17.12 Vertical Wall Geometry**

**17.13 General Notes**

**17.14 Wall Plan and Elevations (Control Drawings)**

**17.15 Sections and Details**

**17.16 Reinforcing Bar List**

Other Retaining Walls and Bulkheads

**17.17 Design**

**17.18 Vertical Wall Geometry**

**17.19 General Notes, Tables and Miscellaneous Details**

**17.20 Wall Plan and Elevations**

**17.21 Details**

## **18 STRUCTURES - MISCELLANEOUS**

The CONSULTANT shall prepare plans for Miscellaneous Structure(s) as specified in Section 2.5.

Concrete Box Culverts

**18.1 Concrete Box Culverts**

**18.2 Concrete Box Culverts Extensions**

**18.3 Concrete Box Culvert Data Table Plan Sheets**

**18.4 Concrete Box Culvert Special Details Plan Sheets**

Strain Poles

**18.5 Steel Strain Poles**

**18.6 Concrete Strain Poles**

**18.7 Strain Pole Data Table Plan Sheets**

**18.8 Strain Pole Special Details Plan Sheets**

Mast Arms

**18.9 Mast Arms**

**18.10 Mast Arms Data Table Plan Sheets**

**18.11 Mast Arms Special Details Plan Sheets**

Overhead/Cantilever Sign Structure

**18.12 Cantilever Sign Structures**

**18.13 Overhead Span Sign Structures**

**18.14 Special (Long Span) Overhead Sign Structures**

**18.15 Monotube Overhead Sign Structure**

**18.16 Bridge Mounted Signs (Attached to Superstructure)**

**18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets**

**18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets**

High Mast Lighting

**18.19 Non-Standard High Mast Lighting Structures**

**18.20 High Mast Lighting Special Details Plan Sheets**

Noise Barrier Walls (Ground Mount)

**18.21 Horizontal Wall Geometry**

**18.22 Vertical Wall Geometry**

### **18.23 Summary of Quantities - Aesthetic Requirements**

### **18.24 Control Drawings**

### **18.25 Design of Noise Barrier Walls Covered by Standards**

### **18.26 Design of Noise Barrier Walls not Covered by Standards**

### **18.27 Aesthetic Details**

Special Structures

### **18.28 Fender System**

### **18.29 Fender System Access**

### **18.30 Special Structures**

### **18.31 Other Structures**

### **18.32 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles**

### **18.33 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles (No As built or Design Plans Available)**

### **18.34 Analytical Evaluation of Signal and Sign Structures, and High Mast Light Poles**

### **18.35 Ancillary Structures Report**

## **19 SIGNING AND PAVEMENT MARKING ANALYSIS**

The CONSULTANT shall analyze and document Signing and Pavement Markings Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

### **19.1 Traffic Data Analysis**

The CONSULTANT shall review the approved preliminary engineering report, typical section package, traffic technical memorandum and proposed geometric design alignment to identify proposed sign placements and roadway markings. Perform queue analysis.

### **19.2 No Passing Zone Study**

The CONSULTANT shall perform all effort required for field data collection, and investigation in accordance with the DEPARTMENT's Manual on Uniform Traffic Studies.

The CONSULTANT shall submit the signed and sealed report to the DEPARTMENT for review and approval.

### **19.3 Signing and Pavement Marking Master Design File**

The CONSULTANT shall prepare the Signing & Marking Design file to include all necessary design elements and all associated reference files.

### **19.4 Multi-Post Sign Support Calculations**

The CONSULTANT shall determine the appropriate column size from the DEPARTMENT's Multi-Post Sign Program(s).

### **19.5 Sign Panel Design Analysis**

Establish sign layout, letter size and series for non-standard signs.

### **19.6 Sign Lighting/Electrical Calculations**

The CONSULTANT shall analyze and document Lighting/Electrical Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall prepare a photometric analysis to be submitted as part of the Lighting Design Analysis Report. An analysis shall be provided for each new and/or modified sign panel which requires lighting.

The Consultant shall submit voltage drop calculations and load analysis for each new and/or modified sign panel which requires lighting.

### **19.7 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **19.8 Cost Estimate**

### **19.9 Technical Special Provisions and Modified Special Provisions**

### **19.10 Other Signing and Pavement Marking Analysis**

### **19.11 Field Reviews**

### **19.12 Technical Meetings**

### **19.13 Quality Assurance/Quality Control**

### **19.14 Independent Peer Review**

### **19.15 Supervision**

### **19.16 Coordination**

## **20 SIGNING AND PAVEMENT MARKING PLANS**

The CONSULTANT shall prepare a set of Signing and Pavement Marking Plans in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums that includes the following.

### **20.1 Key Sheet**

### **20.2 General Notes/Pay Item Notes**

### **20.3 Project Layout**

### **20.4 Plan Sheet**

### **20.5 Typical Details**

### **20.6 Guide Sign Work Sheets**

### **20.7 Traffic Monitoring Site**

### **20.8 Cross Sections**

### **20.9 Special Service Point Details**

### **20.10 Special Details**

### **20.11 Interim Standards**

### **20.12 Quality Assurance/Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of traffic design drawings, specifications and other services furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

### **20.13 Supervision**

## **21 SIGNALIZATION ANALYSIS**

The CONSULTANT shall analyze and document Signalization Analysis Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

### **21.1 Traffic Data Collection**

### **21.2 Traffic Data Analysis**

The CONSULTANT shall determine signal operation plan, intersection geometry, local signal timings, pre-emption phasing & timings, forecasting traffic, and intersection analysis run.

### **21.3 Signal Warrant Study**

### **21.4 Systems Timings**

The CONSULTANT shall determine proper coordination timing plans including splits, force offs, offsets, and preparation of Time Space Diagram.

### **21.5 Reference and Master Signalization Design File**

The CONSULTANT shall prepare the Signalization Design file to include all necessary design elements and all associated reference files.

### **21.6 Reference and Master Interconnect Communication Design File**

The CONSULTANT shall prepare the Interconnect Communication Design file to include all necessary design elements and all associated reference files.

### **21.7 Overhead Street Name Sign Design**

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

### **21.8 Pole Elevation Analysis**

### **21.9 Traffic Signal Operation Report**

*[As defined by the District]*

### **21.10 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **21.11 Cost Estimate**

### **21.12 Technical Special Provisions and Modified Special Provisions**

### **21.13 Other Signalization Analysis**

### **21.14 Field Reviews**

The CONSULTANT shall collect information from the maintaining agencies and conduct a field review. The review should include, but is not limited to, the following:

- Existing Signal and Pedestrian Phasing
- Controller Make, Model, Capabilities and Condition/Age
- Condition of Signal Structure(s)

- Type of Detection as Compared with Current District Standards
- Interconnect Media
- Controller Timing Data

### **21.15 Technical Meetings**

### **21.16 Quality Assurance/Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of traffic design drawings, specifications and other services furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

### **21.17 Independent Peer Review**

### **21.18 Supervision**

### **21.19 Coordination**

## **22 SIGNALIZATION PLANS**

The CONSULTANT shall prepare a set of Signalization Plans in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums, which includes the following:

- 22.1 Key Sheet**
- 22.2 General Notes/Pay Item Notes**
- 22.3 Plan Sheet**
- 22.4 Interconnect Plans**
- 22.5 Traffic Monitoring Site**
- 22.6 Guide Sign Worksheet**
- 22.7 Special Details**
- 22.8 Special Service Point Details**
- 22.9 Mast Arm/Monotube Tabulation Sheet**
- 22.10 Strain Pole Schedule**
- 22.11 TTCP Signal (Temporary) (N/A)**
- 22.12 Temporary Detection Sheet**
- 22.13 Utility Conflict Sheet**
- 22.14 Interim Standards**
- 22.15 Quality Assurance/Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of traffic design drawings, specifications and other services furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

- 22.16 Supervision**

## **23 LIGHTING ANALYSIS**

The CONSULTANT shall analyze and document Lighting Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

### **23.1 Lighting Justification Report**

The CONSULTANT shall prepare a Lighting Justification Report. The report shall be submitted under a separate cover with the Phase I plans submittal, titled Lighting Justification Report. The report shall provide analyses for mainlines, interchanges, and arterial roads and shall include all back-up data such that the report stands on its own. Back up data shall include current ADT's, general crash data average cost from the Florida Highway Safety Improvement Manual, crash details data from the last three years, and preliminary lighting calculations.

The report shall address warrants to determine if lighting warrants are met, and shall include a benefit-cost analysis to determine if lighting is justified. The report shall include calculations for the night-to-day crash ratio as well as a table summarizing the day-time and the night-time crashes. The report shall follow the procedures outlined in the FDOT Manual on Uniform Traffic Studies (MUTS) manual which utilize ADT, Three Year Crash Data, night/day crash ratio, percentage of night ADT, etc.

### **23.2 Lighting Design Analysis Report (LDAR)**

The CONSULTANT shall prepare a Preliminary Lighting Design Analysis Report in accordance with the requirements of the FDOT Design Manual. The report shall be submitted under a separate cover with the Phase II plans submittal. After approval of the preliminary report, the CONSULTANT shall submit a revised report for each submittal.

### **23.3 Voltage Drop Calculations**

The CONSULTANT shall submit voltage drop calculations showing the equation or equations used along with the number of luminaries per circuit, the length of each circuit, the size conductor or conductors used and their ohm resistance values. The voltage drop incurred on each circuit (total volts and percentage of drop) shall be calculated, and all work necessary to calculate the voltage drop values for each circuit should be presented in such a manner as to be duplicated by the District.

The Voltage Drop Calculations shall be submitted as part of the Lighting Design Analysis Report.

### **23.4 FDEP Coordination and Report**

### **23.5 Reference and Master Design Files**

The CONSULTANT shall prepare the Lighting Design file to include all necessary design elements and all associated reference files.

### **23.6 Temporary Highway Lighting (N/A)**

### **23.7 Design Documentation**

The CONSULTANT shall submit a Design Documentation with each plans submittal under a separate cover and not part of the roadway documentation book. At a minimum, the design documentation shall include:

- Phase submittal checklist.
- Structural calculations for special conventional pole concrete foundations.
- Correspondence with the power company concerning new electrical service.

### **23.8 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **23.9 Cost Estimate**

### **23.10 Technical Special Provisions and Modified Special Provisions**

### **23.11 Other Lighting Analysis**

### **23.12 Field Reviews**

The CONSULTANT shall collect information from the maintaining agencies and conduct a field review. The review should include but is not limited to the following:

- Existing Lighting Equipment
- Load Center, Capabilities and Condition/Age
- Condition of Lighting Structure(s)
- Verification of horizontal clearances
- Verification of breakaway requirements

### **23.13 Technical Meetings**

### **23.14 Quality Assurance/Quality Control**

### **23.15 Independent Peer Review**

### **23.16 Supervision**

### **23.17 Coordination**

## **24 LIGHTING PLANS**

The CONSULTANT shall prepare a set of Lighting Plans in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

### **24.1 Key Sheet**

### **24.2 General Notes/Pay Item Notes**

### **24.3 Pole Data, Legend & Criteria**

### **24.4 Service Point Details**

### **24.5 Project Layout**

### **24.6 Plan Sheet**

### **24.7 Special Details**

### **24.8 Temporary Highway Lighting Detail Sheets (N/A)**

### **24.9 Temporary Highway Lighting Plan Sheets**

### **24.10 Interim Standards**

### **24.11 Quality Assurance/Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of traffic design drawings, specifications and other services furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

### **24.12 Supervision**

## **25 LANDSCAPE ANALYSIS (N/A)**

*N/A*

## **26 LANDSCAPE PLANS (N/A)**

*N/A*

## **27 SURVEY**

The CONSULTANT shall perform survey tasks in accordance with all applicable statutes, manuals, guidelines, standards, handbooks, procedures, and current design memoranda.

The CONSULTANT shall submit all survey notes and computations to document the surveys. All field survey work shall be recorded in approved media and submitted to the DEPARTMENT. Field books submitted to the DEPARTMENT must be of an approved type. The field books shall be certified by the surveyor in responsible charge of work being performed before the final product is submitted.

The survey notes shall include documentation of decisions reached from meetings, telephone conversations or site visits. All like work (such as bench lines, reference points, etc.) shall be recorded contiguously. The DEPARTMENT may not accept field survey radial locations of section corners, platted subdivision lot and block corners, alignment control points, alignment control reference points and certified section corner references. The DEPARTMENT may instead require that these points be surveyed by true line, traverse or parallel offset.

### **27.1 Horizontal Project Control (HPC)**

Establish or recover HPC, for the purpose of establishing horizontal control on the Florida State Plane Coordinate System or datum approved by the District Surveyor (DS) or District Location Surveyor (DLS); may include primary or secondary control points. Includes analysis and processing of all field collected data, and preparation of forms.

### **27.2 Vertical Project Control (VPC)**

Establish or recover VPC, for the purpose of establishing vertical control on datum approved by the District Surveyor (DS) or the District Location Surveyor (DLS).; may include primary or secondary vertical control points. Includes analysis and processing of all field collected data, and preparation of forms.

### **27.3 Alignment and/or Existing Right of Way (R/W) Lines**

Establish, recover or re-establish project alignment. Also includes analysis and processing of all field collected data, existing maps, and/or reports for identifying mainline, ramp, offset, or secondary alignments. Depict alignment and/or existing R/W lines (in required format) per DEPARTMENT R/W Maps, platted or dedicated rights of way.

### **27.4 Aerial Targets**

Place, locate, and maintain required aerial targets and/or photo identifiable points. Includes analysis and processing of all field collected data, existing maps, and/or reports. Placement of the targets will be at the discretion of the aerial firm.

### **27.5 Reference Points**

Reference Horizontal Project Control (HPC) points, project alignment, vertical control points, section, ¼ section, center of section corners and General Land Office (G.L.O.) corners as required.

### **27.6 Topography/Digital Terrain Model (DTM) (3D)**

Locate all above ground features and improvements for the limits of the project by collecting the required data for the purpose of creating a DTM with sufficient density. Shoot all break lines, high and low points. Effort includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.7 Planimetric (2D)**

Locate all above ground features and improvements. Deliver in appropriate electronic format. Effort includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.8 Roadway Cross Sections/Profiles**

Perform cross sections or profiles. May include analysis and processing of all field-collected data for comparison with DTM.

### **27.9 Side Street Surveys**

Refer to tasks of this document as applicable.

### **27.10 Underground Utilities**

Designation includes 2-dimensional collection of existing utilities and selected 3-dimensional verification as needed for designation. Location includes non-destructive excavation to determine size, type and location of existing utility, as necessary for final 3-dimensional verification. Survey includes collection of data on points as needed for designates and locates. Includes analysis and processing of all field collected data, and delivery of all appropriate electronic files.

### **27.11 Outfall Survey**

Locate all above ground features and improvements for the limits of the project by collecting the required data for the purpose of a DTM. Survey with sufficient density of shots. Shoot all break lines, high and low points. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.12 Drainage Survey**

Locate underground data (XYZ, pipe size, type, condition and flow line) that relates to above ground data. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.13 Bridge Survey (Minor/Major)**

Locate required above ground features and improvements for the limits of the bridge. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.14 Channel Survey**

Locate all topographic features and improvements for the limits of the project by collecting the required data. Includes field edits, analysis and processing of all field collected data, maps, and/or reports.

### **27.15 Pond Site Survey**

Refer to tasks of this document as applicable.

### **27.16 Mitigation Survey**

Refer to tasks of this document as applicable.

### **27.17 Jurisdiction Line Survey**

Perform field location (2-dimensional) of jurisdiction limits as defined by respective authorities, also includes field edits, analysis and processing of all field collected data, preparation of reports.

### **27.18 Geotechnical Support**

Perform 3-dimensional (X,Y,Z) field location, or stakeout, of boring sites established by geotechnical engineer. Includes field edits, analysis and processing of all field collected data and/or reports.

### **27.19 Sectional/Grant Survey**

Perform field location/placement of section corners, 1/4 section corners, and fractional corners where pertinent. Includes analysis and processing of all field-collected data and/or reports.

### **27.20 Subdivision Location**

Survey all existing recorded subdivision/condominium boundaries, tracts, units, phases, blocks, street R/W lines, common areas. Includes analysis and processing of all field collected data and/or reports. If unrecorded subdivision is on file in the public records of the subject county, tie existing monumentation of the beginning and end of unrecorded subdivision.

### **27.21 Maintained R/W**

Perform field location (2-dimensional) of maintained R/W limits as defined by respective authorities, if needed. Also includes field edits, analysis and processing of all field collected data, preparation of reports.

### **27.22 Boundary Survey**

Perform boundary survey as defined by DEPARTMENT standards. Includes analysis and processing of all field-collected data, preparation of reports.

### **27.23 Water Boundary Survey**

Perform Mean High Water, Ordinary High Water and Safe Upland Line surveys as required by DEPARTMENT standards.

### **27.24 Right of Way Staking, Parcel / Right of Way Line**

Perform field staking and calculations of existing/proposed R/W lines for on-site review purposes.

### **27.25 Right of Way Monumentation**

Set R/W monumentation as depicted on final R/W maps for corridor and water retention areas.

### **27.26 Line Cutting**

Perform all efforts required to clear vegetation from the line of sight.

### **27.27 Work Zone Safety**

Provide work zone as required by DEPARTMENT standards.

### **27.28 Vegetation Survey (N/A)**

### **27.29 Tree Survey**

Locate individual trees or palms within the project limits.

### **27.30 Miscellaneous Surveys**

Refer to tasks of this document, as applicable, to perform surveys not described herein. The percent for Supplemental will be determined at negotiations. This item can only be used if authorized in writing by the District Surveyor (DS), District Location Surveyor (DLS) or their representative.

### **27.31 Supplemental Surveys**

Supplemental survey days and hours are to be approved in advance by DS or DLS. Refer to tasks of this document, as applicable, to perform surveys not described herein.

### **27.32 Document Research**

Perform research of documentation to support field and office efforts involving surveying and mapping.

### **27.33 Field Review**

Perform verification of the field conditions as related to the collected survey data.

### **27.34 Technical Meetings**

Attend meetings as required and negotiated by the Surveying and Mapping Department.

### **27.35 Quality Assurance/Quality Control (QA/QC)**

Establish and implement a QA/QC plan. Also includes subconsultant review, response to comments and any resolution meetings if required, preparation of submittals for review, etc.

### **27.36 Supervision**

Perform all activities required to supervise and coordinate project. These activities must be performed by the project supervisor, a Florida P.S.M. or their delegate as approved by the District Surveying Office.

### **27.37 Coordination**

Coordinate survey activities with other disciplines. These activities must be performed by the project supervisor, a Florida P.S.M. or their delegate as approved by the District Surveying Office.

## **28 PHOTOGRAMMETRY**

The CONSULTANT shall perform photogrammetric tasks in accordance with all applicable statutes, manuals, guidelines, standards, handbooks, procedures, and current design memoranda.

In addition to the maps and photographic products, the CONSULTANT shall submit all computations to document the mapping. This will include documentation of all decisions reached from meetings, telephone conversations, and site visits.

### **28.1 Flight Preparation**

Review record data, create target diagrams, and plan the mission.

### **28.2 Control Point Coordination**

Determine photo identifiable control points, and mark contact prints.

### **28.3 Mobilization**

Perform pre- and post-flight aircraft inspection; prepare the aircraft and camera for the mission.

### **28.4 Flight Operations**

Operate the aircraft, aerial camera, and other instruments to obtain aerial photography.

### **28.5 Film Processing**

Process, check, and annotate the aerial film.

## **28.6 Photo Products**

Prepare contact prints, contact diapositives, and photo enlargements.

## **28.7 Scanning**

Scan photographic images.

## **28.8 LiDAR**

Includes data acquisition, post processing of LiDAR data to XYZ coordinates for "bare earth" classification.

## **28.9 Aerial Triangulation**

Measure and adjust control within aerial images.

## **28.10 Surfaces**

Includes collection of break lines and spot elevations.

## **28.11 Ortho Generation**

Includes creation of final images.

## **28.12 Rectified Digital Imagery (Georeferenced)**

Create the rectified digital image.

## **28.13 Mosaicking**

Create the mosaic.

## **28.14 Sheet Clipping**

Create plot files for sheets from the database.

## **28.15 Topographics (3D)**

Prepare topographic maps including surface and planimetrics. (Photogrammetrist will not propose hours for Surfaces and Topographics.)

## **28.16 Planimetrics (2D)**

Prepare 2D planimetric map.

## **28.17 Drainage Basin**

Includes preparing drainage basin maps in clipped "sheet" format.

### **28.18 CADD Edit**

Perform final edit of graphics for delivery of required Microstation design files (.dgn), CADD, and Geopak files.

### **28.19 Data Merging**

Merge photogrammetric files, field survey files, and data from other sources.

### **28.20 Miscellaneous**

Other tasks not specifically addressed in this document.

### **28.21 Field Review**

Perform on site review of maps.

### **28.22 Technical Meetings**

Attend meetings as required.

### **28.23 Quality Assurance/Quality Control**

Establish and implement a QA/QC plan.

### **28.24 Supervision**

Supervise all photogrammetric activities. This task must be performed by the project supervisor, a Florida P.S.M.

### **28.25 Coordination**

Coordinate with all elements of the project to produce a final photogrammetric product.

## **29 MAPPING (N/A)**

*N/A*

## **30 TERRESTRIAL MOBILE LiDAR (N/A)**

*N/A*

## **31 ARCHITECTURE DEVELOPMENT (N/A)**

*N/A*

## **32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE (N/A)**

*N/A*

### **33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS**

The CONSULTANT shall analyze and document Intelligent Transportation System (ITS) Analysis Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, existing ITS standard operating procedures, strategic plans, Florida's SEMP guidelines, National and regional ITS architectures, and current design memoranda.

ITS work includes the application of sensor, computer, electronics and communication technologies and management strategies, in an integrated manner, to improve the safety and efficiency of the surface transportation system. ITS includes, but is not limited to, Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Advanced Rural Transportation Systems (ARTS), Advanced Public Transportation Systems (APTS), Advanced Highway Systems (AHS), Commercial Vehicle Operation (CVO) and Electronic Toll Collection (ETC) Systems.

In instances where the CONSULTANT performs analysis or prepares the design packages for the deployment of ITS, the CONSULTANT will not be allowed to compete as a proposing firm, or participate as a subconsultant to a proposing firm during subsequent advertisements involving work performed under this contract.

#### **33.1 ITS Analysis**

The CONSULTANT shall review the approved preliminary engineering report, typical section package, traffic technical memorandum and proposed geometric design alignment to identify impacts to existing ITS components (if applicable) and proposed ITS field device placements. The CONSULTANT shall review all related District ITS plans and documentation for the project corridor to ensure all cited ITS elements are included in this project, and develop a Concept of Operations (ConOps), Project Systems Engineering Management Plan (PSEMP), RTVM, and other documents as necessary for conformance with Federal Highway Administration (FHWA) requirements. The CONSULTANT shall use applicable DEPARTMENT requirements and guidelines, including, but not limited to, the FDM, Standard Plans, and Standard Specifications for Road and Bridge Construction in the design of ITS. The CONSULTANT design is expected to include the following attributes, facilities, infrastructure, ITS devices, systems, and associated work: **[Associated Work]**

CCTV camera system shall provide 100 percent coverage of all mainline lanes, entrance and exit ramps, interchanges (includes view of crossing arterials), blind spots (such as those caused due to existing and proposed bridges, existing and proposed signage, vegetation, and horizontal and vertical curvatures). Cameras shall be spaced to meet the Project requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

Vehicle detection devices shall be spaced as required to meet the Project requirements (speed, volume, and occupancy detection), guidance from the ConOps and as approved by the DEPARTMENT.

Both expressway and arterial dynamic message signs (DMS) shall be located to meet the Project requirements, guidance from the ConOps, and as approved by the DEPARTMENT. All FDOT FDM requirements shall be met for DMS locations. DMS locations shall be designed in conjunction with the Project's master signing design.

The CONSULTANT shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the Project. The CONSULTANT shall coordinate with District's Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures (If desired by the District).

All ITS devices shall be compatible with the latest version of the National Transportation Communications for ITS Protocol (NTCIP) and compatible with SunGuide software platform.

The CONSULTANT shall design the project such that all ITS field devices and ancillary components comply with FDOT's Approved Product List (APL) and are supported within the SunGuide software or other software approved by the DEPARTMENT.

#### Closed Circuit Television (CCTV) Camera Assembly

The CONSULTANT shall be responsible for the design and exact field locations for the camera assemblies. The camera subsystem shall provide overlapping coverage to overcome visual blockage. Camera assemblies may include a camera lowering device (CLD).

The camera subsystem shall be designed to provide additional benefits such as the monitoring of DMS operations and security surveillance of critical infrastructure elements. A stand-alone DMS confirmation camera shall be designed and installed to support TMC operations to verify and confirm the posted DMS messages (if desired by the DEPARTMENT). The position, height, and design of each camera pole shall be finalized during the design phase of the project. Each site shall be designed for overall monitoring capability, as well as designed to provide safe and effective maintenance conditions.

The camera assembly deployment shall be designed to provide fields of view that give the required corridor coverage. The CONSULTANT shall determine the camera location by performing a videography study at each proposed camera site. The study shall include video at the proposed camera location and elevation with respect to the roadway elevation. The CONSULTANT shall identify the final number and locations of the camera assemblies based on the videography study.

The camera system design shall ensure that the video quality is not degraded due to wind or vibration. The CONSULTANT shall be responsible for the design of the poles and foundations to minimize the potential for vibration. The CONSULTANT shall prepare cross section plan sheets showing details of horizontal and vertical clearances of the proposed equipment with identified utilities.

The CONSULTANT shall be responsible for the design of the grounding and lightning protection system based on FDOT criteria

The CCTV camera assembly shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 682.

#### Vehicle Detection Subsystem

The CONSULTANT shall select vehicle detection technology to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall be responsible for the design of a non-intrusive vehicle detection subsystem for the roadway facilities. The detectors shall be positioned near other ITS field device infrastructure including the fiber-optic splice vaults when feasible to reduce cost. Final detection station locations shall be based on a number of location variables identified during the design phase.

The vehicle detection subsystem shall collect and process volume, speed and occupancy data on a lane-by-lane basis for the corridor mainlines, in both directions of travel. The data will be used by the TMC for functions including detecting incidents, determining travel times, estimating traffic conditions for dissemination to travelers, sharing information with other agencies, and data archiving for transportation planning and historical data analysis. The vehicle detection subsystem shall allow for connectivity to the TMC.

Vehicle detectors must meet the Project requirements under all environmental and traffic conditions expected for the corridors. The detection system shall produce accurate volume, speed and occupancy data for all corridor traffic operation conditions. The CONSULTANT design must limit the likelihood of occlusions, other blocking of vehicles and adjacent lanes detection that degrade the detection system performance below specified accuracy. Design the system so that signs, walls, guardrails, and other physical elements do not degrade detection performance.

The system shall allow remote configuration, calibration, monitoring, and diagnostic of real-time traffic activities from a remote location, such as the TMC, using the FDOT SunGuide central software and software provided by the detection system vendor.

The CONSULTANT shall determine the exact location of the field devices to meet the desired coverage and functional requirements of vehicle detectors. The detector and associated cabinet locations shall be identified by the CONSULTANT. The CONSULTANT will coordinate and perform a detailed site survey with a factory trained and certified representative of the detection system manufacturer being proposed in their design. The site survey must confirm that the design does not exceed the operational capabilities of the proposed detection technology or device.

The CONSULTANT shall be responsible for the design of a vehicle detection system that allows travel times to be automatically calculated for roadway facilities. The travel time system

may utilize a variety of vehicle detection systems, including loop, video, microwave, wireless magnetometer, and Automatic Vehicle Identification (AVI) systems. The system shall utilize the project communications backbone in order to collect and distribute travel time data to the TMCs.

When utilizing transponders, they will be read by AVI reader equipment placed at checkpoints along the roadway. As a transponder passes a checkpoint, its data shall be acquired by the AVI system. The AVI system shall automatically add the time, date, transponder reading antenna number, and the antenna location to the transponder identification code and store the data.

Systems that rely upon transponders shall utilize supplemental toll tag readers placed at appropriate existing device locations as applicable, as well as interchanges and at intermediate locations throughout the project as required to provide the required coverage to satisfy travel time measurement requirements. Using the designed communications, the transponder information shall be forwarded to the TMC for further processing.

The CONSULTANT shall coordinate all design efforts for use of SunPass AVI transponders with the Florida's Turnpike Enterprise (FTE) Tolls group.

The vehicle detection system utilized shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Specification 660.

#### Dynamic Message Sign Subsystem

The CONSULTANT shall be responsible for the design of the DMS subsystem for the roadway facilities.

The position of each DMS shall be finalized during the design phase of the project. The CONSULTANT shall select DMS technology, type, and display to meet the Project requirements and ConOps requirements.

The CONSULTANT shall locate the DMS to satisfy the required sign functionality and to provide the required visibility of the signs. The project communications system shall enable full control of the DMS from the TMC facilities. All DMS hardware, software and related infrastructure components shall be fully compatible with SunGuide software. All DMS shall include a dedicated confirmation camera that allows for visual verification of the messages posted on the DMS by a TMC Operator (if desired by the District).

The CONSULTANT shall design support structures to accommodate the specified DMS to meet the design functional, operational, and maintenance requirements.

The DMS shall be designed in accordance with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 700.

All Highway Signing, including Dynamic Message Signs, shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Specification 700.

## Roadway Weather Information Systems (RWIS)

The CONSULTANT shall develop Technical Special Provisions or Modified Special Provisions for RWIS based upon the unique needs of the project. The CONSULTANT shall ensure that, each RWIS site consists of a remote processing unit (RPU), communication hardware, and determine the site-specific components as required from below:

Fog/Smoke Detection sensor;

Classifying Precipitation;

Precipitation Occurrence Sensor;

Air Temperature/Relative Humidity Sensor;

Wind Speed and Direction Sensor;

RWIS Tower/Pole Structure, foundation, base, and cabinet with electrical service, and lightning protection & grounding assembly; and,

Communication hardware.

The RWIS subsystem shall include all hardware, software, and licenses to operate, including SQL database for the TMC and RWIS Central Hardware for TMC.

### **33.2 Communications**

The CONSULTANT shall be responsible for the development of a communications plan to determine the optimal communications medium for the project corridor. The plan shall be developed prior to submittal of Phase I plans. The plan shall identify communications media alternatives and provide a cost estimate that includes initial, operations and maintenance cost for the life cycle of the communications network. The plan shall ensure that video, voice, and data will be communicated in real-time between center to-field and center-to-center (C2C) nodes as applicable. The communications system design must utilize non-proprietary, open-architecture, standards-based, robust, scalable, and proven technology. The communication plan analysis shall address communication and connections between field devices, communications and connections between field devices and the TMC, center-to-center communications between TMCs, and any other communication links or connections required to meet project goals. The plan must include bandwidth analysis and recommendations, needs assessment, and provide recommendations regarding minimum requirements, media, network devices, protocols, network topology, communication redundancy, future needs, spare capacity, and any communications or data sharing with other agencies.

After approval of the plan, the CONSULTANT shall submit a revised plan including a detailed design analysis for each submittal. The CONSULTANT's communications design shall include multiple redundant paths for each location, which allows for automatic switching of

communications path onto a secondary path, if the primary path is impacted (if desired by the District).

The communications system components shall be in accordance with Sections 630, 633, and 635 of the latest FDOT Standard Specifications for Road and Bridge Construction (online edition).

### **33.3 Grounding and Lightning Protection**

The CONSULTANT shall be responsible for a complete and reliable grounding and lightning protection design to provide personnel and equipment protection against faults, surge currents and lightning transients.

The grounding and lightning protection system shall be designed in accordance with the latest version of the FDOT Standard Specifications for Road and Bridge Construction, Specification 620.

### **33.4 Power Subsystem**

The CONSULTANT shall be responsible for an electrical design in accordance with all NEC requirements. No solar power should be utilized as a power solution for the Project unless otherwise approved by the DEPARTMENT. To enhance power reliability, the CONSULTANT shall design a power distribution and backup system consisting of, at a minimum, underground power conduits and conductors, transformers, generators, automatic transfer switches, UPS, and all associated equipment. The power backup system shall supply electrical power in event of commercial power supply failure for all system components. Power equipment shall be installed in areas to avoid wet locations. All connections and equipment shall be protected from moisture and water intrusion. The CONSULTANT shall ensure that vandal resistant mechanisms for all electrical infrastructure shall be included as part of the Design.

The CONSULTANT shall submit the power system design and voltage drop calculations for the power distribution system as part of phase II, III, and IV design submittals. The CONSULTANT shall conduct a short circuit and protection coordination study for the designed power system and document the study as part of the power system design report.

### **33.5 Voltage Drop Calculations**

The electrical design shall address allowable voltage drops per the NEC. The CONSULTANT shall submit voltage drop calculations for any electrical circuit providing power to the ITS field devices beyond the electric utility service point. The calculations shall document the length of each circuit, its load, the size conductor or conductors used and their ohm resistance values and the required voltages from the service point to the respective ITS devices to maintain voltage drops with allowable limits. The voltage drop incurred on each circuit (total volts and percentage of drop) shall be calculated, and all work necessary to calculate the voltage drop values for each circuit should be presented in such a manner as to be duplicated by the District.

Load analysis calculations shall be submitted. All voltage drop calculations shall allow for future expansion of ITS infrastructure, if identified in the Project ConOps.

### **33.6 Design Documentation**

The CONSULTANT shall submit a Design Documentation Book with each plan submittal under separate cover and not part of the roadway documentation book. At a minimum, the design documentation book shall include:

- Computation books for all applicable items on plans.
- Phase submittal checklist.
- Three-way quantity check list
- Structural calculations for all structures
- Voltage drop calculations.
- Load analysis calculations.

### **33.7 Existing ITS**

The CONSULTANT shall research any required legacy system or system components that may be impacted by new work, such as: existing communications; existing types, numbers, locations, models, manufacturers, and age of ITS devices; as-built plans; existing operating software; existing center-to-field devices; and C2C communications and capabilities.

### **33.8 Queue Analysis**

The CONSULTANT shall perform a queue analysis at high volume interchanges and high frequency conflict / crash locations to determine optimal placement of DMS using project forecasted traffic volumes. This analysis shall be performed prior to submittal of the Phase I plans. The Consultant shall perform other traffic engineering analysis as necessary to ensure that the DMS locations are selected based on optimum message delivery to the motorists.

### **33.9 Reference and Master ITS Design File**

The CONSULTANT shall prepare the ITS design file to include all necessary design elements and the reference files for topo, R/W roadway, utilities files, etc. This effort includes the design and layout of proposed ITS devices, including but not limited to: CCTV / Detection poles, DMS, detection devices, advanced traffic controllers, conduit, cabinet-related pull boxes, service points, fiber optic sizing, and communications hubs. All existing ITS infrastructure shall be referenced to the new ITS plan sheets (if applicable).

### **33.10 Reference and Master Communications Design File**

The CONSULTANT shall prepare the communication design file to include all necessary design elements and all associated reference files as well as reference files of topo, R/W, roadway, utilities files, existing ITS communications infrastructure, etc. This effort includes

design and layout of proposed communications conduit, cabinet, pull boxes, splice boxes, standard route markers, communications plan overview, fiber optic splicing, connections, communications hubs, etc.

### **33.11 Pole Elevation Analysis**

The CONSULTANT shall evaluate pole elevation requirements and design pole heights to meet the Project requirements including field of view; elimination of occlusion; site access for maintenance vehicles and personnel; access to pole mounted equipment, such as CCTV cameras, traffic detectors, and cabinets; and probability of lightning strike.

### **33.12 Sign Panel Design Analysis**

The CONSULTANT shall design all ITS signing in conjunction with the Roadway Master Signing. This includes any static sign panel that includes changeable message elements. Expressway and arterial full size DMS shall not be co-located with other static signs. [If desired by the District].

### **33.13 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **33.14 Cost Estimate**

The CONSULTANT shall prepare an engineer's cost estimate for the project using historical data from the FDOT or from other Industry sources. The CONSULTANT shall also load the pay items and quantities into AASHTOWare Project Preconstruction.

### **33.15 Technical Special Provisions and Modified Special Provisions**

The CONSULTANT shall develop Technical Special Provisions (TSP) and Modified Special Provisions (MSP) for the specific items or conditions of the project that are not addressed in the FDOT's Standard Specifications, Supplemental Specifications and Special Provisions.

### **33.16 Other ITS Analyses**

*[Add detailed project needs for any other ITS-related analyses]*

### **33.17 Field Reviews**

The CONSULTANT shall conduct a field review for the required phase submittals. The review shall identify necessary data for all elements of the project including, but not limited to, the following:

- Existing ITS Field Devices as compared with the latest FDOT standards and District requirements
- Device Make, Model, Capabilities, Condition / Age, Existence of SunGuide Software Driver

- Condition of Structure(s), cabinets, and other above-ground infrastructure and devices
- Type of Detection as Compared with Current District Standards
- Underground Infrastructure
- Proximity of other utilities
- Traffic Operations
- Any other field reconnaissance as necessary to develop a complete ITS design package

### **33.18 Technical Meetings**

The CONSULTANT shall attend meetings as necessary support the project.

### **33.19 Quality Assurance / Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of designs, drawings, specifications, and other services and work furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or may be one specifically designed for this project. The CONSULTANT shall utilize the District's quality control checklist. The responsible Professional Engineer that performed the Quality Control review shall sign a statement certifying that the review was conducted.

The CONSULTANT shall, without additional compensation, correct all errors or deficiencies in their works.

### **33.20 Supervision**

The CONSULTANT shall provide all efforts required to supervise all technical design activities.

### **33.21 Coordination**

The CONSULTANT shall coordinate with Survey, Geotech, Drainage, Structures, Lighting, Roadway Design, Utilities, municipalities, maintaining agencies and Traffic Operations to produce a final set of construction contract documents and to ensure that a high degree of accuracy for the design plans is achieved.

## **34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS**

The CONSULTANT shall prepare a set of ITS Plans in accordance with the FDOT Design Manual that includes the following:

### **34.1 Key Sheet**

The CONSULTANT shall prepare the key sheet in accordance with the latest format depicted in the FDOT Design Manual.

MUTCD

Standard Specs

Standard Plans

### **34.2 General Notes / Pay Item Notes**

The CONSULTANT shall include all pertinent general notes and pay item notes as deemed fit and as established by the District.

### **34.3 Project Layout**

The CONSULTANT shall prepare plan sheet(s) with an overview of the entire project that include stations and offsets, project limits, intersection locations, devices, device identification using SunGuide nomenclature, and plan sheet coverage.

### **34.4 Typical and Special Details**

The CONSULTANT shall prepare typical and / or special details for conditions in the project not addressed by the DEPARTMENT's Standard Plans for Design, Construction, Maintenance, and Utility Operations on the State Highway System. The CONSULTANT shall prepare special details not addressed by FDOT Standard Plans, including block diagrams, hub cabinets, wiring diagrams, solar power service, and special mounting details.

### **34.5 Plan Sheet**

The CONSULTANT shall prepare the ITS plan sheets utilizing the Design file to include all necessary information related to the project design elements and all associated reference files. The plan sheets shall include general and pay item notes and pay items. The plans shall depict the location of pull boxes, splice boxes, conduit runs and device locations with setbacks from the travel way. Devices shall be located by station and offset.

### **34.6 ITS Communications Plans**

The CONSULTANT shall prepare plans for the communications network. These plans shall consist of block diagrams, splicing diagrams, port assignments, wiring diagrams, and all other information necessary to convey the design concept to the contractor. These plans shall be included in the ITS plan set and be prepared in a manner consistent with immediately adjacent ITS project installations (planned or installed).

The communication system shall be an open-architecture, non-proprietary, real-time, multimedia communications network. The communication system design must be compatible and completely interoperable with the existing systems.

[Discuss any needs or allowance for temporary communication connectivity options]

The CONSULTANT's design shall include protecting and maintaining the existing ITS infrastructure. For locations where existing ITS infrastructure is impacted, the CONSULTANT's design shall include mitigation to minimize the downtime of existing system as per the District's requirements.

The CONSULTANT is responsible for the design of the communication infrastructure and its integration with the DEPARTMENT's communication system. Additionally, the CONSULTANT shall determine the most cost effective, best performing, communication connectivity option. The communication system must allow command and control as well as data and video transmission between the field devices and the TMCs at [Location].

Conduit paths shall be selected to provide a continuous duct system on one side of the road unless otherwise requested by the FDOT. The various components of ITS deployment will be located on both sides of the freeway and therefore under pavement bore and lateral conduits will be necessary to access equipment locations.

The CONSULTANT shall produce fiber optic cable splicing diagrams to show the connectivity of the fiber optic cable from its termini at field devices to the TMC. The diagrams shall denote new and existing fiber routes, splices, and terminations involved in the work. The diagrams shall identify cables by size, tube color / number and stand colors / numbers. All cables shall be identified either by numbering system identified either by numbering system identified on the plans or by bounding devices. The diagrams shall denote the types of connectors in the patch panels.

### **34.7 Fiber Optic Splice Diagrams**

The CONSULTANT shall produce fiber optic cable splicing diagrams to show the connectivity of the fiber optic cable from its termini at field devices to the TMC. The diagrams shall denote new and existing fiber routes, splices, and terminations involved in the work. The diagrams shall identify cables by size, tube color / number and stand colors / numbers. All cables shall be identified either by numbering system identified either by numbering system identified on the plans or by bounding devices. The diagrams shall denote the types of connectors in the patch panels.

### **34.8 Grounding and Lightning Protection Plans**

The CONSULTANT shall include efforts to design a complete and reliable lightning protection design for each pole and associated devices, ITS device installation, as well as device cabinets and communications hubs, etc. if not already addressed in the FDOT's Standard Plans for Design, Construction, Maintenance and Utility Operations on the State Highway System.

### **34.9 Cross Sections**

The CONSULTANT shall prepare cross sections for ITS devices.

### **34.10 Guide Sign Work Sheets**

The CONSULTANT shall prepare the guide sign work sheets to include all necessary information related to the design of the static and dynamic message signs in the project corridor.

### **34.11 Special Service Point Details**

The CONSULTANT shall design any special service point and electrical distribution system beyond the electric utility company's service point. The plan shall depict with pay items, general and plan notes the locations of transformers, switches, disconnects, conduits, pull boxes and power conductors. The plans shall identify the location of underground and overhead service points with identifying pole and transformer numbers.

### **34.12 Strain Pole Schedule**

The CONSULTANT shall incorporate the schedule detail chart for concrete or steel strain poles in the plan set.

### **34.13 Overhead / Cantilever Sign Structure**

For overhead truss and cantilever mounted devices, the CONSULTANT shall evaluate pertinent data and information to develop the layout for locating and mounting devices to the horizontal element of the structure, and coordinate the design of the structures with the roadway and structural engineers.

The CONSULTANT shall be responsible for determining the overhead/cantilever structure requirements for proper installation of the DMS, viewing angle and site distance requirement as per Chapter 2e - Guide Signs-Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and Florida Department of Transportation FDOT Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

### **34.14 Other Overhead Sign Structures (Long Span, Monotube, etc.)**

For other overhead sign structures, the CONSULTANT shall evaluate pertinent data and information to develop layout for locating and mounting device to the horizontal element of the structure, and coordinate the design of the structures with the roadway and structural engineers.

The CONSULTANT shall be responsible for determining the requirements for other type of structures (long span, monotube, etc) used as part of the project for proper installation of the DMS, viewing angle and site distance requirement as per Chapter 2e - Guide Signs-Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and Florida Department of Transportation FDOT Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

### **34.15 Temporary Traffic Control Plans**

The CONSULTANT shall prepare Temporary Traffic Control Plans (TTCP) to minimize impact to traffic during the construction of ITS field devices and associated communications infrastructure that will be deployed along the project corridor.

The TTCP shall strive to maintain and sustain center-to-field device connectivity and operability to the ITS field devices previously deployed along the project corridor. The TTCP effort shall consider and mitigate the impacts of the project's various construction phases so as to sustain center-to-field devices connectivity and operability, maintaining operational quality as a minimum at the level provided prior to construction start and minimizing down time as much as possible. The CONSULTANT shall develop the TTCP sheets for the project, providing temporary communications as necessary, notes, details, and direction applicable to the ITS elements and associated communications for inclusion in the TTCP.

The CONSULTANT shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the Project. The CONSULTANT shall coordinate with District's Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures. [If desired by the District]

### **34.16 Interim Standards**

The CONSULTANT shall adhere to all Department's Interim Standards for ITS applications.

### **34.17 GIS Data and Asset Management Requirements**

The CONSULTANT is responsible for providing Geographic Information System (GIS), spatial data, for the ITS components design. This information is required to integrate ITS components to the SunGuide software. A coordinate point compatible with the Florida State Plane System or FDOT's current coordinate plane system shall be collected for all ITS components part of the Project design. All GIS information provided shall be compatible with the FDOT's ITS FM asset management software.

The information shall be transferred to the as-built plans and submitted to the District in electronic format along with the as-built plans.

The Global Positioning System (GPS) unit shall be provided by the CONSULTANT and used to collect data with a minimum accuracy of three (3) meters when differentially corrected. The CONSULTANT shall collect spatial data points and physical address location for:

- DMS location (mainline and arterial)
- Vehicle detection pole location
- CCTV camera pole location
- Ground mounted cabinets
- Fiber optic cable path (fiber backbone)

- Communications hubs
- Standard route markers
- Lateral fiber optic cable connections
- Lateral power cable connections
- Pull boxes (power and fiber)
- Splice boxes
- Power drops (service point and cable path)

### **34.18 Quality Assurance / Quality Control**

The CONSULTANT shall utilize the District's quality control checklist for traffic design drawings in addition to the QC effort described in section three.

### **34.19 Supervision**

The CONSULTANT shall supervise all technical design activities.

## **35 GEOTECHNICAL**

The CONSULTANT shall, for each project, be responsible for a complete geotechnical investigation. All work performed by the CONSULTANT shall be in accordance with DEPARTMENT standards, or as otherwise directed by the District Geotechnical Engineer. The District Geotechnical Engineer will make interpretations and changes regarding geotechnical standards, policies and procedures and provide guidance to the CONSULTANT.

Before beginning each phase of investigation and after the Notice to Proceed is given, the CONSULTANT shall submit an investigation plan for approval and meet with the DEPARTMENT's Geotechnical Engineer or representative to review the project scope and DEPARTMENT requirements. The investigation plan shall include, but not be limited to, the proposed boring locations and depths, and all existing geotechnical information from available sources to generally describe the surface and subsurface conditions of the project site. Additional meetings may be required to plan any additional field efforts, review plans, resolve plans/report comments, resolve responses to comments, and/or any other meetings necessary to facilitate the project.

The CONSULTANT shall notify the DEPARTMENT in adequate time to schedule a representative to attend all related meetings and field activities.

### **35.1 Document Collection and Review**

CONSULTANT will review printed literature including topographic maps, county agricultural maps, aerial photography (including historic photos), ground water resources, geology bulletins, potentiometric maps, pile driving records, historic construction records and other geotechnical related resources. Prior to field reconnaissance, CONSULTANT shall review

U.S.G.S., S.C.S. and potentiometric maps, and identify areas with problematic soil and groundwater conditions.

#### Roadway

The CONSULTANT shall be responsible for coordination of all geotechnical related field work activities. The CONSULTANT shall retain all samples until acceptance of Phase IV plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

Obtain pavement cores as directed in writing by the District Geotechnical Engineer.

If required by the District Geotechnical Engineer, a preliminary roadway exploration shall be performed before the Phase I plans submittal. The preliminary roadway exploration will be performed and results provided to the Engineer of Record to assist in setting roadway grades and locating potential problem areas. The preliminary roadway exploration shall be performed as directed in writing by the District Geotechnical Engineer.

CONSULTANT shall perform specialized field-testing as required by project needs and as directed in writing by the District Geotechnical Engineer.

All laboratory testing and classification will be performed in accordance with applicable DEPARTMENT standards, ASTM Standards or AASHTO Standards, unless otherwise specified in the Contract Documents.

### **35.2 Develop Detailed Boring Location Plan**

Develop a detailed boring location plan. Meet with DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program expects to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

### **35.3 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

### **35.4 Muck Probing**

Probe standing water and surficial muck in a detailed pattern sufficient for determining removal limits to be shown in the Plans.

### **35.5 Coordinate and Develop TTCP for Field Investigation**

Coordinate and develop Temporary Traffic Control Plan (TTCP). All work zone traffic control will be performed in accordance with the DEPARTMENT's Standard Plans Index 102 series.

### **35.6 Drilling Access Permits**

Obtain all State, County, City, and Water Management District permits for performing geotechnical borings, as needed.

### **35.7 Property Clearances**

Notify property tenants in person of drilling and field activities, if applicable. Written notification to property owners/tenants is the responsibility of the DEPARTMENT's Project Manager.

### **35.8 Groundwater Monitoring**

Monitor groundwater, using piezometers.

### **35.9 LBR / Resilient Modulus Sampling**

Collect appropriate samples for Limerock Bearing Ratio (LBR) testing. Deliver Resilient Modulus samples to the District Materials Office or the State Materials Office in Gainesville, as directed by the DEPARTMENT.

### **35.10 Coordination of Field Work**

Coordinate all field work required to provide geotechnical data for the project.

### **35.11 Soil and Rock Classification - Roadway**

Refine soil profiles recorded in the field, based on results of laboratory testing.

### **35.12 Design LBR**

Determine design LBR values from the 90% and mean methods when LBR testing is required by the DEPARTMENT.

### **35.13 Laboratory Data**

Tabulate laboratory test results for inclusion in the geotechnical report, the report of tests sheet (Roadway Soil Survey Sheet), and for any necessary calculations and analyses.

### **35.14 Seasonal High Water Table**

Review the encountered ground water levels and estimate seasonal high ground water levels. Estimate seasonal low ground water levels, if requested.

### **35.15 Parameters for Water Retention Areas**

Calculate parameters for water retention areas, exfiltration trenches, and/or swales.

### **35.16 Delineate Limits of Unsuitable Material**

Delineate limits of unsuitable material(s) in both horizontal and vertical directions. Assist the Engineer of Record with detailing these limits on the cross-sections. If requested, prepare a plan view of the limits of unsuitable material.

### **35.17 Electronic Files for Cross-Sections**

Create electronic files of boring data for cross-sections.

### **35.18 Embankment Settlement and Stability**

Estimate the total magnitude and time rate of embankment settlements. Calculate the factor of safety against slope stability failure.

### **35.19 Monitor Existing Structures**

Provide Roadway EOR guidance on the radius to review existing structures for monitoring.

Optional services (may be negotiated at a later date if needed): Identify existing structures in need of settlement, vibration and/or groundwater monitoring by the contractor during construction and coordinate with the EOR and structural engineer (when applicable) to develop mitigation strategies. When there is risk of damage to the structure or facility, provide recommendations in the geotechnical report addressing project specific needs and coordinate those locations with the EOR. See FDM Chapter 307 and Chapter 9 of the Soils and Foundations Handbook.

### **35.20 Stormwater Volume Recovery and/or Background Seepage Analysis**

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

### **35.21 Geotechnical Recommendations**

Provide geotechnical recommendations regarding the proposed roadway construction project including the following: description of the site/alignment, design recommendations and discussion of any special considerations (e.g. removal of unsuitable material, consolidation of weak soils, estimated settlement time/amount, groundwater control, high groundwater conditions relative to pavement base, etc.) Evaluate and recommend types of geosynthetics and properties for various applications, as required.

### **35.22 Pavement Condition Survey and Pavement Evaluation Report**

If a pavement evaluation is performed, submit the report in accordance with Section 3.2 of the Materials Manual: Flexible Pavement Coring and Evaluation. Enter all core information into the Pavement Coring and Reporting (PCR) system.

### **35.23 Preliminary Roadway Report**

If a preliminary roadway investigation is performed, submit a preliminary roadway report before the Phase I plans submittal. The purpose of the preliminary roadway report will be to assist in setting road grades and locating potential problems.

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.

- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

### **35.24 Final Report**

The Final Roadway Report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

### **35.25 Auger Boring Drafting**

Draft auger borings as directed by the DEPARTMENT.

### **35.26 SPT Boring Drafting**

Draft SPT borings as directed by the DEPARTMENT.

#### **Structures**

The CONSULTANT shall be responsible for coordination of all geotechnical related fieldwork activities. The CONSULTANT shall retain all samples until acceptance of Phase IV plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

CONSULTANT shall perform specialized field-testing as required by needs of project and as directed in writing by the District Geotechnical Engineer.

All laboratory testing and classification will be performed in accordance with applicable DEPARTMENT standards, ASTM Standards or AASHTO Standards, unless otherwise specified in the Contract Documents.

The staff hour tasks for high embankment fills and structural foundations for bridges, box culverts, walls, high-mast lighting, overhead signs, mast arm signals, strain poles, buildings, and other structures include the following:

**35.27 Develop Detailed Boring Location Plan**

Develop a detailed boring location plan. Meet with DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program expects to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

**35.28 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

**35.29 Coordinate and Develop TTCP for Field Investigation**

Coordinate and develop TTCP plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Standard Plans Index 102 series.

**35.30 Drilling Access Permits**

Obtain all State, County, City, and Water Management District permits for performing geotechnical borings, as needed.

**35.31 Property Clearances**

Notify property tenants in person of drilling and field activities, if applicable. Written notification to property owners/tenants is the responsibility of the DEPARTMENT's Project Manager.

**35.32 Collection of Corrosion Samples**

Collect corrosion samples for determination of environmental classifications.

**35.33 Coordination of Field Work**

Coordinate all field work required to provide geotechnical data for the project.

**35.34 Soil and Rock Classification - Structures**

Soil profiles recorded in the field should be refined based on the results of laboratory testing.

**35.35 Tabulation of Laboratory Data**

Laboratory test results should be tabulated for inclusion in the geotechnical report and for the necessary calculations and analyses.

### **35.36 Estimate Design Groundwater Level for Structures**

Review encountered groundwater levels, estimate seasonal high groundwater levels, and evaluate groundwater levels for structure design.

### **35.37 Selection of Foundation Alternatives (BDR)**

Evaluation and selection of foundation alternative, including the following:

- GRS-IBS
- Spread footings
- Prestressed concrete piling - various sizes
- Steel H- piles
- Steel pipe piles
- Drilled shafts
- Foundation analyses shall be performed using approved DEPARTMENT methods. Assist in selection of the most economical, feasible foundation alternative.

### **35.38 Detailed Analysis of Selected Foundation Alternate(s)**

Detailed analysis and basis for the selected foundation alternative. Foundation analyses shall be performed using approved DEPARTMENT methods and shall include:

- GRS-IBS (including the parameters identified in the Instructions for Developmental Design Standard D6025 to be provided by the Geotechnical Engineer)
- Spread footings (including soil bearing capacity, minimum footing width, and minimum embedment depth).
- For pile and drilled shaft foundations, provide graphs of ultimate axial soil resistance versus tip elevations. Calculate scour resistance and/or downdrag (negative skin friction), if applicable.
- CONSULTANT shall assist the Engineer of Record in preparing the Pile Data Table (including test pile lengths, scour resistance, downdrag, minimum tip elevation, etc.)
- Provide the design soil profile(s), which include the soil model/type of each layer and all soil-engineering properties required for the Engineer of Record to run the FBPIer computer program. Review lateral analysis of selected foundation for geotechnical compatibility.
- Estimated maximum driving resistance anticipated for pile foundations.
- Provide settlement analysis.

### **35.39 Bridge Construction and Testing Recommendations**

Provide construction and testing recommendations including potential constructability problems.

### **35.40 Lateral Load Analysis (Optional)**

Perform lateral load analyses as directed by the DEPARTMENT.

### **35.41 Walls**

Provide the design soil profile(s), which include the soil model/type of each layer and all soil engineering properties required by the Engineer of Record for conventional wall analyses and recommendations. Review wall design for geotechnical compatibility and constructability.

Evaluate the external stability of conventional retaining walls and retained earth wall systems. For retained earth wall systems, calculate and provide minimum soil reinforcement lengths versus wall heights, and soil parameters assumed in analysis. Estimate differential and total (long term and short term) settlements.

Provide wall construction recommendations.

### **35.42 Sheet Pile Wall Analysis (Optional)**

Analyze sheet pile walls as directed by the DEPARTMENT.

### **35.43 Design Soil Parameters for Signs, Signals, High Mast Lights, and Strain Poles and Geotechnical Recommendations**

- Provide the design soil profile(s) that include the soil model/type of each layer and all soil properties required by the Engineer of Record for foundation design. Review design for geotechnical compatibility and constructability.

### **35.44 Box Culvert Analysis**

- Provide the design soil profile(s) that include the soil model/type of each layer and all soil properties required by the Engineer of Record for foundation design. Review design for geotechnical compatibility and constructability.
- Provide lateral earth pressure coefficients.
- Provide box culvert construction and design recommendations.
- Estimate differential and total (long term and short term) settlements.
- Evaluate wingwall stability.

### **35.45 Preliminary Report - BDR**

The preliminary structures report shall contain the following discussions as appropriate for the assigned project:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis).
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

### **35.46 Final Report - Bridge and Associated Walls**

The final structures report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

### **35.47 Final Reports - Signs, Signals, Box Culvert, Walls, and High Mast Lights**

The final reports shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.

- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis).
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

Final reports will incorporate comments from the DEPARTMENT and contain any additional field or laboratory test results, recommended foundation alternatives along with design parameters and special provisions for the contract plans. These reports will be submitted to the District Geotechnical Engineer for review prior to project completion. After review by the District Geotechnical Engineer, the reports will be submitted to the District Geotechnical Engineer in final form and will include the following:

- All original plan sheets (11" x 17")
- One set of all plan and specification documents, in electronic format, according to DEPARTMENT requirements
- Two sets of record prints
- Six sets of any special provisions
- All reference and support documentation used in preparation of contract plans package

Additional final reports (up to four), aside from stated above, may be needed and requested for the DEPARTMENT's Project Manager and other disciplines.

The final reports, special provisions, as well as record prints, will be signed and sealed by a Professional Engineer licensed in the State of Florida.

Draft the detailed boring/sounding standard sheet, including environmental classification, results of laboratory testing, and specialized construction requirements, for inclusion in final plans.

### **35.48 SPT Boring Drafting**

Prepare a complete set of drawings to include all SPT borings, auger borings and other pertinent soils information in the plans. Include these drawings in the Final Geotechnical Report. Draft borings, location map, S.C.S. map and U.S.D.A. map as directed by the DEPARTMENT. Soil symbols must be consistent with those presented in the latest Florida Department of Transportation Soils and Foundations Handbook.

### **35.49 Other Geotechnical**

Other geotechnical effort specifically required for the project as determined by the Department, and included in the geotechnical upset limit.

### **35.50 Technical Special Provisions and Modified Special Provisions**

#### **35.51 Field Reviews**

Identify and note surface soil and rock conditions, surface water conditions and locations, and preliminary utility conflicts. Observe and note nearby structures and foundation types.

#### **35.52 Technical Meetings**

#### **35.53 Quality Assurance/Quality Control**

#### **35.54 Supervision**

#### **35.55 Coordination**

## **36 3D MODELING**

The CONSULTANT shall analyze and document Roadway Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall deliver all master design files, 3D surface design models, and all supporting digital files for the development of plans as required in the FDOT CADD Manual.

The CONSULTANT shall prepare a 3D model using the latest FDOT software in accordance with the FDOT CADD Manual. Includes all efforts required for developing files for 3D deliverables supporting automated machine guidance for design models. This includes importing survey data and creation of existing 3D surface features and models, and developing proposed corridor models with necessary detail of features to depict the proposed project in 3D to comply with the FDOT CADD Manual.

The CONSULTANT shall add detail to the corridor and design model for 3D design. Includes many elements that contribute to this including but not limited to slope transitions, typical section transitions, changes in pavement depth, berms, swales/ditches, and other feature transitions. Extra corridor structure leads to extra assemblies, extra targeting, etc.

The CONSULTANT shall create an accurate roadway design model which includes modeling the intersections.

The CONSULTANT shall submit .dgn files associated with the 3D Model and their respective components.

### **36.1 Phase I 3D Design Model**

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase I 3D interactive model, comprised of, but not limited to: Existing features (pavement, shoulders, sidewalk, curb/gutter, utilities-if required per scope, drainage - if required per scope) and proposed corridor(s).

### **36.2 Phase II 3D Design Model**

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase II 3D model, comprised of, but not limited to: Modification of the Phase I model to update the model to comply with changes based on the Phase I review comments and to include the addition of ponds, floodplain compensation sites, retaining walls, barrier walls, guardrail terminals, cross overs, gore areas, side street connections, roundabouts, and driveways.

[List optional services to be included, e.g. Curb Ramps, Closed Drainage Network, Bridge Modeling, Bridge Abutment, Overhead sign post/structures with foundation, Toll gantry and overhead DMS structures with foundation, proposed utilities (pressure pipe/gravity), etc.].

### **36.3 Phase III 3D Design Model**

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase III 3D model and deliverables files for review, comprised of, but not limited to: Modification of the Phase II model to update the model to comply with changes based on the Phase II review comments and to further refine areas of transition between templates, detailed grading areas, bridge approaches and end bents, median noses, shoulder transition areas, retaining walls, barrier walls and guardrail.

### **36.4 Final 3D Model Design**

The CONSULTANT shall prepare for approval by DEPARTMENT, the Phase IV 3D model, comprised of, but not limited to: Modification of the Phase III model to update the model to comply with changes based on the phase III review comments and to accurately generate, export and otherwise prepare the final 3D deliverable files as described in the FDOT CADD Manual.

### **36.5 Cross Section Design Files**

The CONSULTANT shall establish and develop cross section design files in accordance with the FDOT CADD manual and FDOT Design Manual. Includes all work required to establish and utilize intelligent/automated methods for creating cross sections including determining the locations for which all cross sections will be shown, existing and proposed features, cross section refinement, placement of utilities and drainage, soil boxes, R/W lines, earthwork calculations, and other required labeling.

### **36.6 Template and Assembly Development (Optional)**

The CONSULTANT shall prepare for approval by DEPARTMENT, project specific templates/assemblies needed to develop the features required to deliver the 3D model.

### **36.7 Quality Assurance/Quality Control**

### **36.8 Supervision**

### **36.9 Coordination**

## **37 PROJECT REQUIREMENTS**

### **37.1 Liaison Office**

The DEPARTMENT and the CONSULTANT will designate a Liaison Office and a Project Manager who shall be the representative of their respective organizations for the Project. While it is expected the CONSULTANT shall seek and receive advice from various state, regional, and local agencies, the final direction on all matters of this project remain with the DEPARTMENT Project Manager.

### **37.2 Key Personnel**

The CONSULTANT's work shall be performed and directed by the key personnel identified in the proposal presentations by the CONSULTANT. Any changes in the indicated personnel shall be subject to review and approval by DEPARTMENT.

### **37.3 Progress Reporting**

The CONSULTANT shall meet with the DEPARTMENT as required and shall provide a written monthly progress report with approved schedule, schedule status, and payout curve or by using the earned value method that describe the work performed on each task. The report will include assessing project risk through monthly documentation of identifying and updating the risk category and approach for monitoring those tasks. Invoices shall be submitted after the DEPARTMENT approves the monthly progress report and the payout curve or with earned value analysis. The Project Manager will make judgment on whether work of sufficient quality and quantity has been accomplished by comparing the reported percent complete against actual work accomplished.

### **37.4 Correspondence**

Copies of all written correspondence between the CONSULTANT and any party pertaining specifically to this contract shall be provided to the DEPARTMENT for their records within one (1) week of the receipt or mailing of said correspondence.

### **37.5 Professional Endorsement**

The CONSULTANT shall have a Licensed Professional Engineer in the State of Florida sign and seal all reports, documents, Technical Special Provisions and Modified Special Provisions, and plans as required by DEPARTMENT standards.

### **37.6 Computer Automation**

The project will be developed utilizing Computer Aided Drafting and Design (CADD) systems. The DEPARTMENT makes available software to help assure quality and conformance with policy and procedures regarding CADD. It is the responsibility of the CONSULTANT to meet the requirements in the FDOT CADD Manual. The CONSULTANT shall submit final documents and files as described therein.

### **37.7 Coordination with Other Consultants**

The CONSULTANT is to coordinate his work with any and all adjacent and integral consultants so as to effect complete and homogenous plans and specifications for the project(s) described herein.

### **37.8 Optional Services**

At the DEPARTMENT's option, the CONSULTANT may be requested to provide optional services. The fee for these services shall be negotiated in accordance with the terms detailed in Exhibit B, Method of Compensation, for a fair, competitive and reasonable cost, considering the scope and complexity of the project(s). Additional services may be authorized by Letter of Authorization or supplemental amendment in accordance with paragraph 2.00 of the Standard Consultant Agreement. The additional services may include Construction Assistance, Review of Shop Drawings, Final Bridge Load Rating, update (Category II) bridge plans electronically (CADD) for the Final "As-Built" conditions, based on documents provided by the DEPARTMENT (CADD Services Only) or other Services as required.

## **38 INVOICING LIMITS**

Payment for the work accomplished shall be in accordance with Method of Compensation of this contract. Invoices shall be submitted to the DEPARTMENT, in a format prescribed by the DEPARTMENT. The DEPARTMENT Project Manager and the CONSULTANT shall monitor the cumulative invoiced billings to ensure the reasonableness of the billings compared to the project schedule and the work accomplished and accepted by the DEPARTMENT.

The CONSULTANT shall provide a list of key events and the associated total percentage of work considered to be complete at each event. This list shall be used to control invoicing. Payments will not be made that exceed the percentage of work for any event until those events have actually occurred and the results are acceptable to the DEPARTMENT.



**FINAL**  
**Candidate Project Technical Scope**

**445216-1, SR 5 (US 1) Resurfacing**  
**From Woodland Ave to north of Palm Coast Parkway**  
Section 73010-000, MP 10.867 to MP 16.833  
Flagler County

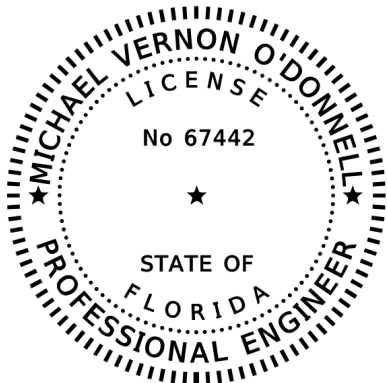
Prepared for:  
**THE FLORIDA DEPARTMENT OF TRANSPORTATION**  
**PROGRAM MANAGEMENT**  
719 South Woodland Boulevard  
DeLand, Florida 32720



General Engineering Consultant (GEC) Services  
Financial Project ID: 436094-1-32-01  
Contract No.: C-9L04  
HNTB No.: 54854-PL-172

Prepared by:  
**HNTB Corporation**  
610 Crescent Executive Court, Suite 400  
Lake Mary, Florida 32746  
Certificate of Authorization 6500  
407-805-0355

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Collision Diagram	Pages 1-12
MPSV Analysis	Pages 1-20



This item has been digitally signed and sealed by Michael Vernon O'Donnell, P.E on the date adjacent to the seal.

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

**Candidate Resurfacing Project Technical Scope**

May 25, 2020

To: Amir Asgarinik  
 From: Michael O'Donnell

**RE: SR 5 (US 1) Resurfacing from Woodland Ave to North of Palm Coast Parkway**

State Road Number: 5  
 Section Number: 73010-000  
 County: Flagler  
 Project Limits: From Woodland Ave to Bridges 730006 and 730043  
 Begin MP/End MP: 10.867 to 16.833 (Length 5.966 MI)  
 FM: 445216-1

This scope was revised in 2020 to split into 2 projects, removing all work north of MP 16.833, which is to be completed under 445216-2.

1. Existing R/W Map Project Numbers:	7301-105 (1953); MP 10.333 to MP 16.833, Var, 50-ft LT & RT Min 7301-49A (1941); MP 10.333 to MP 16.833, Var, 50-ft LT & RT Min
2. Old Construction Project Numbers:	428603-1 (2013); MP 0.000 to MP 16.833, SAPM & Med Shldr 422001-1 (2011); MP 9.657 to MP 10.870, Mill & Resurface 426536-1 (2010); MP 12.605 to MP 12.898, Intersection Imp 413571-1 (2006); MP 10.870 to MP 16.833, Mill & Resurface 73010-3522 (1995); MP 10.867 to MP 12.608, Mill & Resurface 73010-3520 (1989); MP 12.690 to MP 13.673, Mill & Resurface 73010-3518 (1985); MP 9.657 to MP 10.863, Mill & Resurface 73010-8508 (1969); MP 14.967 to MP 15.313, Se Correction 73010-3901 (1967); MP 12.194 to MP 16.833, Se Correction 73010-9504 (1962); MP 12.693 to MP 12.635, Resurfacing 7301-801 (1956); MP 12.191 to MP 16.833, Resurfacing 7301-276 (1956); MP 4.884 to MP 12.191, Widening 7301-275 (1955); MP 12.191 to MP 16.833, Widening 7301-103 (1947); MP 5.010 to MP 16.833, Bridge Replacement
3. Additional R/W Required?	No.
4. Level of Community Awareness Plan:	Level 2.
5. Agreements Required?	Yes. Coordinate removal/relocation of median trees with City of Bunnell.
6. Are there any bridges within the limits?	730068 SR 20/100 over SR 5, 21.3-ft vertical clearance 730006 SR 5 SB over St Joe Canal 730043 SR 5 NB over St Joe Canal
7. Are there any RR Crossings within the project limits or in the vicinity?	The FEC RR runs approximately 300-ft to 5,000-ft parallel to the west of SR 5 but does not cross.
8. Are there any Airports within 5-miles?	Yes.
9. Storm Water Management Jurisdiction:	SJRWMD.
10. Is the Project within CCCL ( <i>Coastal Construction Control Line</i> )?	No.
11. Is the project near a significant archaeological site?	This scope has been reviewed by EMO and no concerns were noted.
12. Existing Utilities per Sunshine One Call: 18	AT&T Florida CenturyLink Charter Communications City of Bunnell- Electric City of Bunnell- Gas City of Bunnell- Sewer City of Bunnell- Water City of Palm Coast- Non-Potable Water City of Palm Coast- Sewer City of Palm Coast- Water Crown Castle Florida Power & Light- Distribution Florida Power & Light- Transmission

**Candidate Resurfacing Project Technical Scope**

Existing Utilities Cont'd	MCI Resurgence Infrastructure Group, LLC Sprint TECO People's Gas Uniti Fiber															
13. Any Special MOT concerns?	Lane closures to consider adjacent and parallel railroad. Flagging may be required at the CR 13 crossing.															
14. Any Construction Concerns?	None.															
15. Posted/Design Speed Limits:	<table border="1"> <thead> <tr> <th><u>Milepost Range</u></th> <th><u>Design Speed</u></th> <th><u>Posted Speed</u></th> </tr> </thead> <tbody> <tr> <td>MP 10.867 to MP 11.144</td> <td>60 mph</td> <td>45 mph</td> </tr> <tr> <td>MP 11.144 to MP 12.949</td> <td>60 mph</td> <td>55 mph</td> </tr> <tr> <td>MP 12.949 to MP 16.384</td> <td>60 mph</td> <td>60 mph</td> </tr> <tr> <td>MP 16.384 to MP 16.833</td> <td>60 mph</td> <td>55 mph</td> </tr> </tbody> </table>	<u>Milepost Range</u>	<u>Design Speed</u>	<u>Posted Speed</u>	MP 10.867 to MP 11.144	60 mph	45 mph	MP 11.144 to MP 12.949	60 mph	55 mph	MP 12.949 to MP 16.384	60 mph	60 mph	MP 16.384 to MP 16.833	60 mph	55 mph
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MP 12.949 to MP 16.384	60 mph	60 mph														
MP 16.384 to MP 16.833	60 mph	55 mph														
16. Design Criteria and Highway System:	SHS, FDM (2020), RRR, context classification;															
	<table border="1"> <thead> <tr> <th><u>Milepost Range</u></th> <th><u>Context Classification</u></th> </tr> </thead> <tbody> <tr> <td>MP 10.870 to MP 13.716</td> <td>C3C "Suburban Commercial"</td> </tr> <tr> <td>MP 13.716 to MP 16.833</td> <td>C2 "Rural"</td> </tr> </tbody> </table>	<u>Milepost Range</u>	<u>Context Classification</u>	MP 10.870 to MP 13.716	C3C "Suburban Commercial"	MP 13.716 to MP 16.833	C2 "Rural"									
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MP 10.870 to MP 13.716	C3C "Suburban Commercial"															
MP 13.716 to MP 16.833	C2 "Rural"															
17. Lump Sum or Pay Item?	Pay Item.															
18. Proposed Design Schedule:	18-24 months.															

**Local Government Contacts:**

FDOT met with Flagler County staff in April 2019 to review this draft proposed Scope. Attendees were Amir Asgarinik (FDOT), Dennis Leap, Faith Alkhatib, and Richard Gordon (Flagler County). County staff noted the need to coordinate with the City of Bunnell regarding landscaping as modifications are proposed in this Scope. Additionally, the County requested a trail along the east side of SR 5, which is not included. The County was advised to complete a study to identify the feasibility and related costs to address environmental, permitting, and Right of Way impacts.

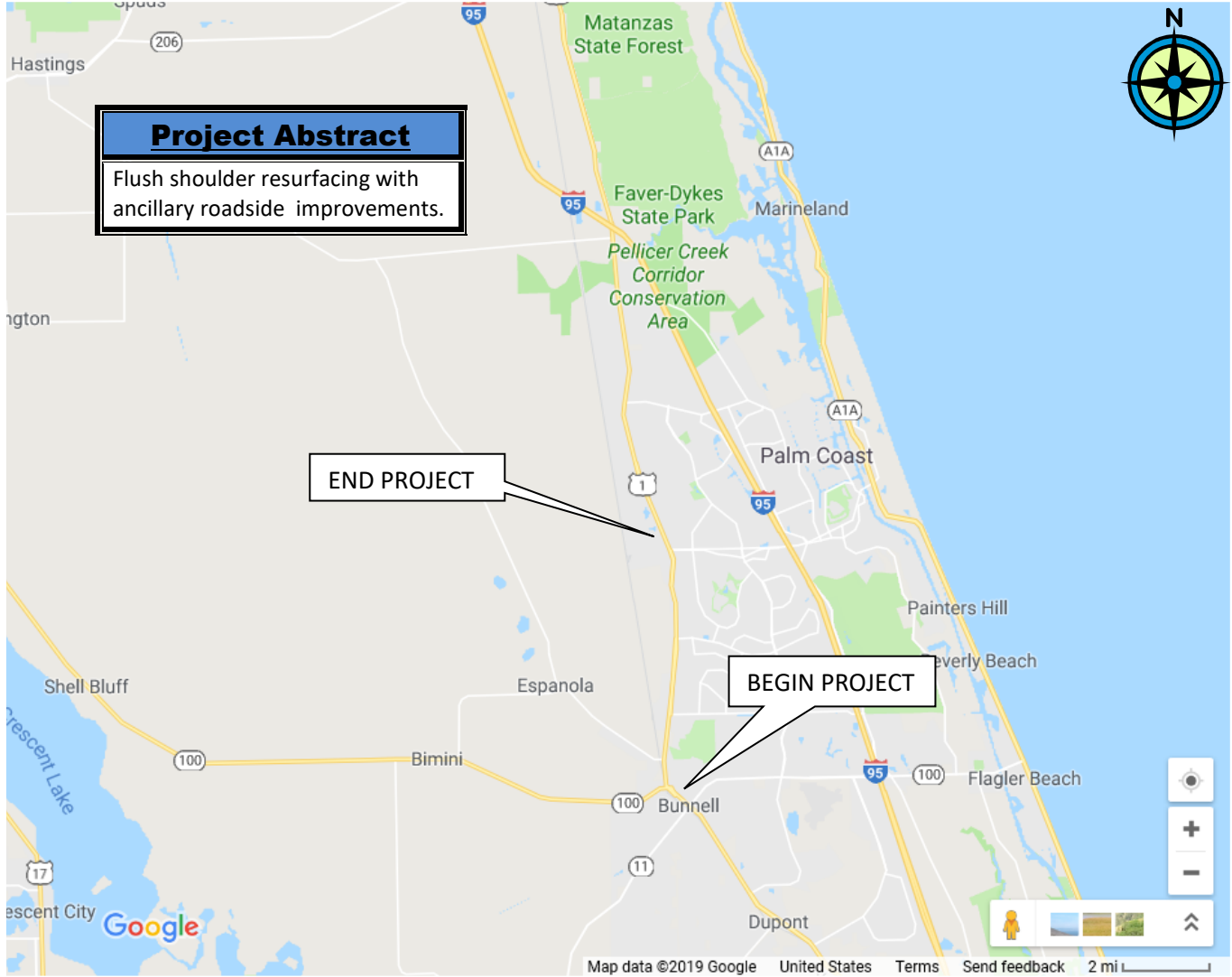
FDOT met with City of Bunnell staff May 13, 2019 to review this draft proposed Scope. Attendees were Amir Asgarinik (FDOT), Dustin Vost, Deb Blair, and Darrell Jones. The City staff noted a drainage issue at the cross-over in front of "Builders First Source". This issue has been addressed in the Drainage Scope Items. The City also requested coordination during the design phase regarding the proposed landscape modifications.

FDOT met with City of Palm Coast in Summer 2019 to review this draft proposed Scope. Elements requested by the City that have been incorporated include intersection lighting, advanced vehicle detection. The City also indicated a desire for a Lehigh Trail connection which is not included because a Study is not available to support the addition.

**Agreements Required:**

Coordinate the removal/relocation of median trees proposed in the Landscaping Scope Items with the City of Bunnell, the maintaining agency for the landscaped medians within city limits.

**Project Location Map:**



The Engineer is responsible for verifying all items in the proposed scope and shall review the project for conformance with all applicable criteria and standards. This Technical Scope has been presented to FDOT Department Heads and received final concurrence through the Technical Review Meeting process. The project scope, schedule, and budget have been established based on this Technical Scope and approved to enter the work program.

**Intent and Nature of Project:**

The purpose of the project is to rehabilitate the asphalt pavement to extend the service life of the existing roadway, including necessary roadside improvements, in accordance with FDOT Design Manual Section 114. The nature of the project is asphalt resurfacing and associated safety and functional improvements. The project is based on a request from the FDOT District 5 Pavement Management\Maintenance Office for a RRR review of Roadway 73010-000 from MP 10.867 to MP 23.673, initially completed for FY 2023 but not programmed. The project is being updated for FY24 consideration with reduced limits to MP 16.833, north of Palm Coast Parkway.

**Project Description:**

- Project is in northern Flagler County, west of I-95, from the city of Bunnell north to the St Joes Canal bridge and is within the Palm Coast-Daytona Beach-Port Orange Urban Area boundary from MP 10.867 to MP 16.833.
- SR 5 (US 1) is a designated evacuation route per the Florida Division of Emergency Management and is classified as an urban principal arterial (MP 10.867 to MP 16.833) with access classification 03.
- The following projects have been identified within the vicinity of this resurfacing project:
  - 445216-2: Resurfacing and shoulder work from MP 16.833 to MP 23.673 is not programmed. The FDOT Project Manager is Amir Asgarinik. This is a candidate for FY25 construction.

**Candidate Resurfacing Project Technical Scope**

- 435778-1: Corridor study completed in 2013 to address future projected traffic in Bunnell, including SR 100 from US 1 to Belle Terre Parkway. None of the alternatives were recommended to move forward. The FDOT Project Manager is Judy Pizzo.

**Typical Sections:**

- The project includes 3 typical sections:
  - 1) MP 10.867 to MP 11.070: Four 12-ft travel lanes (two per direction), 12-ft outside shoulders (4-ft paved), 18-ft curbed and vegetated median, and 5-ft sidewalk (NB). Proposed changes include the addition of 6-ft sidewalk on the SB side.
  - 2) MP 11.070 to MP 14.315, MP 15.939 to MP 16.833: Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 6-ft inside shoulders, and a 40-ft depressed grassed median. Proposed changes include the construction of 4-ft inside paved shoulders.
  - 3) MP 14.315 to MP 15.939: Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 8-ft inside shoulders (4-ft paved), and a 40-ft depressed grassed median. No changes are proposed.

- Based on 2019 Traffic Data:

MP	TMS Site No.	AADT	T%
11.195	730004	17,500	9.9
14.199	730005	17,800	10.9

**Roadway Scope Items:**

- A Pavement Condition Assessment was completed by FDOT on February 15, 2019. The pavement is in fair condition with light to moderate longitudinal cracking in the wheelpaths, isolated asphalt bleeding, moderate tire rim gouging, minor friction course raveling, centerline rippling, and isolated areas of end-of-load segregation of the friction course. Prepare four pavement designs; 1) milling and resurfacing the travel lanes, turn lanes, and median crossovers 2) milling and resurfacing the shoulders, 3) new paved shoulders, and 4) bridge deck overlays.
- Existing bridge deck overlay thicknesses are to be maintained and not increased. A Bridge Load Rating analysis is not required. Replace bridge joint seals on overlaid decks. Include milling details to address work across the bridge and interfaces with roadway approaches.
- The existing unpaved shoulder is generally in fair to good condition with isolated locations of poor condition that is readily correctible utilizing Standard Plans Index 570-010 Option I and II. For LRE purposes, 5% of the unpaved shoulder is assumed to require correction.
- Begin milling and resurfacing at the existing pavement joint north of Woodland Ave. End milling and resurfacing on the north side of St. Joe Canal bridges. Limits of connecting side streets will be to the existing visible pavement joint unless otherwise noted on the Concept. Mill and resurface the travel and auxiliary lanes, paved shoulders, all other pavement features.
- MPSV data was collected by FDOT on March 5, 2019 and analyzed for cross slope correction. See separate Van Data Analysis for additional information, including justification for cross slope correction of curves. Cross slope measurements were generally found to be within the allowable range of 1.5% to 4.0% per FDM Table 210.2.3. Crash history does not warrant correction of tangent locations that were found to be deficient. Match existing cross slopes. The northbound and southbound roadways were each originally constructed as normal crown sections, which are to be maintained.
- Superelevation of the following curves was found to be deficient and is to be corrected.

PI MP	Radius (FT)	FDM Superelevation (%)	AASHTO 6% Superelevation (%)	AASHTO 12% Superelevation (%)	Lanes Requiring Correction	Average Measured Superelevation
11.015	1,408	9.3	6.0	10.6	L1, L2, R1	5.4
11.752	2,865	5.5	4.6	5.8	L2, R1	2.8
12.298	2,865	5.5	4.6	5.8	L1, R2	2.5
13.887	5,730	3.0	2.8	3.2	R1, R2	3.3
15.847	1,910	7.7	5.6	8.2	L1, L2	9.3
16.427	1,910	7.7	5.6	8.2	L1, L2	9.4

- Concrete turnout aprons extend through the paved shoulder to the edge of travel. Sawcut and remove the concrete from the shoulder and reconstruct paved shoulder. Reconstruct a portion of the concrete turnout to provide a smooth transition;
  - MP 10.900 LT, edge of paved shoulder
  - MP 10.934 LT, edge of paved shoulder
  - MP 11.308 RT, edge of paved shoulder

## Candidate Resurfacing Project Technical Scope

- MP 11.371 RT, edge of travel
- MP 11.414 LT, edge of travel
- MP 11.455 LT, edge of travel
- MP 12.450 LT, edge of travel
- MP 12.490 RT, edge of paved shoulder
- MP 12.550 RT, edge of travel
- MP 13.321 LT, edge of travel
- MP 13.450 LT, edge of paved shoulder
- MP 15.205 RT, edge of paved shoulder
- MP 15.600 LT, edge of paved shoulder
- MP 16.640 RT, Palm Coast Parkway westbound approach
- MP 10.987 to MP 11.031 MED: Gutter pans are paved over on the southbound inside lane under the bridge. Include plan notes or details.
- Mill and resurface existing paved asphalt turnouts. Accelerated degradation and raveling of the existing turnouts was noted during field review at the following locations:
  - MP 11.764 RT (Reclamation Center)
  - MP 15.725 LT (Christ the King Lutheran School)
- Loose aggregate and sediment is being deposited on the paved shoulder and outside travel lane from the unpaved turnouts. Construct an additional 5-ft asphalt apron to reduce debris collection on the paved shoulder and bicycle facility at the following locations:
  - MP 12.025 LT
  - MP 14.875 LT
  - MP 15.338 LT
  - MP 15.355 LT
  - MP 15.357 RT
- Provide 4-ft inside paved shoulders adjacent to through lanes at the request of the Maintenance Office. The existing unpaved median shoulder is to be utilized, limiting clearing and earthwork to only that necessary for construction of base and paving to avoid modifications to landscaping and median drainage. Crash history includes run off the road and out of control crashes throughout the corridor. Median shoulders for portions of the project limits were constructed in 2013 (428603-1). The remaining gaps in median shoulders, listed below, are to be constructed as part of this resurfacing project. The inside paved shoulders will help to mitigate the inability of errant vehicles to recover.
  - MP 11.070 to MP 14.315
  - MP 15.939 to MP 16.833
- Several mailboxes do not meet the Standard Plans and are considered roadside hazards within the clear zone. Coordinate with the following property owners to relocate or remove and replace with an appropriate type. Offsets noted are from the edge of travel;
  - MP 11.784 LT, 3.5-in PVC pipe, 31.0-ft (within 36-ft control zone)
  - MP 12.460 LT, 6-in x 6-in timber post, 12-ft
  - MP 15.769 LT, double 1-in x 1-in metal posts, 5-ft
- Widen the medians at the following locations to accommodate proposed pedestrian crosswalks:
  - MP 12.757 (Royal Palms Pkwy/Education Way); north
  - MP 14.533 (White View Pkwy); north and south
  - MP 16.643 (Palm Coast Pkwy); north and south
- MP 11.450 RT (Builder's First Source): Modify north driveway to provide one-way exit per existing signage. Remove asphalt pavement, extend sidewalk, reconstruct unpaved shoulder. Gas line noted in proximity to this location.
- MP 11.581 LT: Provide U-turn apron. Evidence noted during field review suggests frequent vehicles make U-turns at this location. Unpaved shoulder is damaged as a result, exhibiting an approximate 4-in drop adjacent to the paved shoulder.
- MP 12.118 LT: Concrete cap at utility crossing is flush with pavement the surface. Accommodate through milling and resurfacing or reconstruct with asphalt pavement.
- MP 12.560 RT: Remove pedestrian handrail, drop-off hazard is not present. Handrail is within the clear zone and presents a roadside hazard.
- MP 16.643 RT: Construct type E curb and raised concrete traffic island to accommodate proposed pedestrian crosswalks. Reconstruct median on Palm Coast Parkway to accommodate the proposed crosswalk.

## Candidate Resurfacing Project Technical Scope

- MP 16.758 to MP 16.815 MED: Install rub rail on double faced w-beam guardrail installations in the median per FDM 215.4.6.4.

### Drainage Scope Items:

- Based on field observations the existing roadside drainage system appears to be functioning properly except as noted below:
  - Median crossovers are improperly draining, resulting in significant ponding (See Photo 1). Construct type E curb and gutter median flumes at the following locations to ensure proper drainage to the grassed medians.
    - MP 11.420, south and north
    - MP 11.595, south
    - MP 11.778, south and north
    - MP 11.913, south
    - MP 12.068, south and north
  - MP 11.199 MED: Existing front slope is 1:2.5 and offset 14-ft at median MES location. Regrade around median drain to provide front slope of 1:4 or better.
  - MP 12.200 RT: Provide DBI and short length of pipe under sidewalk to mitigate and provide permanent solution to accelerated erosion at this location. Reconstruct sidewalk as necessary.
  - MP 16.801 MED and MP 16.831 RT: Significant erosion noted under approach slab and around end bents. Provide permanent erosion mitigation solution including grout injection.



PHOTO 1: MP 11.420

### Utility Scope Items:

- Utility coordination will be required to determine adjustments so there are no conflicts with the proposed construction.
  - Adjust all valve covers, utility pull boxes, fire hydrants, and utility manholes to be flush with proposed sidewalk, ramps, roadside, and roadway pavement as necessary to complete the proposed improvements.
- Quality Level A "QL A" utility information is anticipated. Construction activities that involve underground work in proximity to noted utilities include drainage work, sidewalk construction, asphalt removal.

### Multimodal Scope Items:

- The Engineer shall include a project-specific pedestrian/bicyclist temporary traffic control plan.

#### Transit

- There are no transit routes within the project limits.

#### Bicycles

- The existing 4-ft paved outside shoulders serve as the bicycle facility through the flush shoulder sections. Keyhole lanes shall be provided per FDM 223.2.1.3 (per upcoming revision per Central Office). Existing total turn lane and paved shoulder widths listed below, overbuild, remove and reconstruct, or widen paved shoulders to shift the right turn lane for a 5-ft bicycle keyhole.
  - MP 10.920 RT – Allen Ln: 4-ft keyhole, 16-ft lane and paved shoulder
  - MP 11.585 RT – Business: 15-ft
  - MP 12.055 RT – Grand Reserve Dr: 17-ft
  - MP 12.230 LT – Self Storage: 16-ft
  - MP 12.740 RT – Royal Palms Parkway: 5-ft keyhole, 16-ft lane and paved shoulder
  - MP 12.755 LT – Education Way: 5-ft keyhole, 16-ft lane and paved shoulder
  - MP 13.710 LT – Otis Stone Hunter Rd: 16-ft
  - MP 14.510 RT – White View Parkway: 5-ft keyhole, 16-ft lane and paved shoulder
  - MP 14.780 LT – Enterprise Dr (South): 16-ft
  - MP 15.080 LT – Enterprise Dr (North): 16-ft
  - MP 15.725 LT Lutheran School: 4-ft keyhole, 16-ft lane and paved shoulder
  - MP 16.475 RT – Commerce Blvd: 15-ft

**Candidate Resurfacing Project Technical Scope**

- MP 16.620 RT – Palm Coast Parkway: 15-ft
- Restripe gore area at Palm Coast Parkway to provide guide striping for NB bicycle continuity.

Pedestrians

- This project includes gaps in the sidewalk connectivity, with the following missing segments identified by the District. Construction of 6-ft sidewalk to fill a portion of gap Flagler-003, MP 10.867 to MP 11.125, is included as shown on the Concept for a total proposed sidewalk length of 1,360-ft. The remaining gaps are not included in this project due to Right of Way constraints, high water table, wetland impacts, low District priority rankings, and lack of pedestrian generators throughout the remainder of the corridor.

Gap ID	Begin MP	End MP	Side	County Ranking	District Ranking	Filled
Flagler-003	10.869	12.764	LT	11	676	Yes, partial
Flagler-004	12.764	16.657	Both	6	525	No
Flagler-005	16.657	16.833	LT	27	903	No

- Reconstruct sidewalk curb ramps as shown on the Concept.
  - 1 curb ramps require reconstruction due to excessive longitudinal and/or cross slope but can be reconstructed in-place to flatter slopes with no additional work to meet ADA requirements.
  - 9 existing curb ramps meet criteria however lack the required detectable warning surface.
- Provide pedestrian crosswalks and sidewalk landings as shown on the Concept.
  - MP 10.923 (Allen Ln); reconstruct sidewalk landings to better align crossing and provide crosswalk pavement markings as directed by the District Bike/Ped Coordinator.
  - MP 12.757 (Royal Palms Parkway/Education Way)
  - MP 14.533 (White View Parkway)
  - MP 16.643 (Palm Coast Parkway)

**Permitting Scope Items:**

- Coordinate with FDOT, submitting a permit determination letter to the Environmental Permits Office, Attention District Five Permits Coordinator, for review and concurrence during the design process, considering the below descriptions of work and conditions.
  - This project is anticipated to exceed one acre of soil disturbing activities and will require NPDES coverage under the FDEP Generic Permit for Stormwater Discharge from Large and Small Construction Activities.
- Complete an environmental assessment:
  - Records indicate that rare species or suitable habitat may exist within or near the project limits. The following species were noted as potentially or likely occurring that may require additional environmental surveys; Atlantic Sturgeon, Gopher Tortoise, Florida Sandhill Crane, Wood Stork, Florida Black Bear, and Eastern Indigo Snake.
    - This project falls within the Core Foraging Area of a known Wood Stork rookery (Matanzas Marsh). Coordination with USFWS is expected.
  - Wetlands were noted within and adjacent to the Right of Way throughout the project limits and are to be identified by an environmental assessment. The apparent wetland lines shown on the Concept are from the Florida Geographic Data Library and are for informational purposes only. Wetlands are not to be impacted.
  - The following locations have been identified as contamination sites. Proposed work as shown in the concept should not interact with these sites. If work requiring excavation, dewatering, etc., is added to the project, a Contamination Assessment will be required. Coordinate proposed work with the FDOT Contamination Impact Coordinator;
    - MP 11.875 RT: DEP Site #BF181001001, Site #COM\_136519 (Mobile Lube Equipment and Sales)
    - MP 11.975 LT: DEP Site # BF180601001
    - MP 12.100 LT: DEP Site #COM\_18776

**Structural Scope Items:**

- Complete analysis for the modification to existing signalized intersections as described in the Traffic Design Scope Items. Preliminary structural analysis indicates the structures can accommodate the proposed loading;
  - MP 16.643 – Palm Coast Parkway, signal head changes and addition of backplates.
- Provide details for expansion joint replacement on the following bridges:
  - Bridges 730006, 730043 (St Joe Canal)

**Candidate Resurfacing Project Technical Scope**

- Provide permanent erosion solution including grout injection to restore structural integrity of the approach slab. Note that bridge 730006 does not have an approach slab. An asset maintenance contractor will be repairing the washouts, scope is to include a permanent solution. See Drainage Scope Items.

**Traffic Design (Includes Signing, Signals, ITS) Scope Items:**

Signing and Pavement Markings

- Signing and Pavement Marking shall be completed for the project limits. Inventory all signing within the project limits including evaluation for compliance with FDOT Specifications, FDM, Standard Plans, MUTCD, FHWA, etc. criteria. Any existing signs or pavement markings that conflict with the proposed signs or pavement markings, or non-compliant signs or pavement markings, shall be addressed in the plans. Existing overhead sign assemblies are to remain.
  - Non-standard multi-post signs were noted without the proper aluminum I-beam and breakaway base construction. Replace the multi-post signs at the following locations:
    - MP 11.650 RT
    - MP 11.709 LT
  - MP 12.675 RT: Replace multi-post sign and relocate to beginning of turn lane.
  - Bridge shoulder widths are less than standard, provide narrow bridge shoulder warning treatment per FDM 210.4.5.
- This project qualifies for lane departure mitigation thru application of Audible and Vibratory Treatment based on the posted speed equal or greater than 50 mph and flush shoulder typical section, see Usage Criteria per FDM Section 210.4.6.

Signals

- All features added or modified should be designed “Accessible Pedestrian Signal Ready” to permit future upgrades without reconstructing curb ramps or relocating pedestrian poles to meet spacing requirements.
- The project includes 3 signalized intersections; the City of Palm Coast requests providing Dilemma Zone detection if not present, to be incorporated with advance detection methods.

<b>MP 12.757 – Royal Palms Parkway/Education Way (Mast Arms)</b>	
Detection	Video Detection
Backplates	Existing all approaches, non-reflectorized, replace with reflectorized.
Left Turns	EB and WB permissive, NB and SB protected only.
Pedestrian Signals	Construct 7 new assemblies, standard.
Other	Modify signal timing for proposed crosswalks.

<b>MP 14.533 – White View Parkway (Mast Arms)</b>	
Detection	Advanced loops and left turn loop (SB); advanced loops (NB); approach loops (WB)
Backplates	Existing all approaches, reflectorized. No change.
Left Turns	Protected/permissive with 4-section FYA SB, protected only WB.
Pedestrian Signals	6 new assemblies for proposed crosswalks and sidewalk landings.
Other	Modify signal timing for proposed crosswalks.

<b>MP 16.643 – Palm Coast Parkway (Diagonal Span)</b>	
Detection	Advanced loops (NB, SB) and left turn loop (SB)
Backplates	None. Provide reflectorized, all approaches.
Left Turns	Protected only SB and WB.
Pedestrian Signals	8 new assemblies for proposed crosswalk and sidewalk landings.
Other	Confirm need and remove one redundant signal head (westbound) to provide additional capacity for backplates. Existing signal structure is to remain. Modify signal timing for proposed crosswalks.

- The Engineer shall design all the signalized intersections to include advanced detection and to be smart signal compatible with the districtwide ATSPM database and future compatibility for CV including enhanced detection. The smart signal design shall include:
  - Provide plan sheets that include:
    - Stop bar detection for all lanes of the intersection which will provide 1-min batch Turning Movement Counts.

**Candidate Resurfacing Project Technical Scope**

- Advance detection for all lanes of the intersection (including turn lanes) with consideration of Bluetooth and/or computer vision.
    - Communication between the controller and ATSPM system.
    - ATC controller that are compatible with the maintaining agencies ATMS software, capable of high-resolution data logging and are forward compatible with CV and ICM expansion efforts.
    - Upgrade the existing cabinet to Type 6, TS-2, Type 1 if it is not already of this type
  - The Engineer shall determine if the intersections have Adaptive Signal Control. If Adaptive Signal Control is present the Engineer shall provide advanced detection on all approaches using the Adaptive Signal components. No need to update to ATC controllers and Type 6 cabinets.
  - Provide any MSP/TSP's necessary to require submission of the signal field information form prior to Final Acceptance of construction for approval of the Department and entry into the ATSPM system. (A copy of this form can be found online: [http://www.cflsmartrroads.com/projects/technical\\_docs.html](http://www.cflsmartrroads.com/projects/technical_docs.html))
  - The Engineer is not to use plan notes to ensure compatibility with existing ATMS. Proprietary Product Certification process shall be used.
- Traffic Monitoring Sites within the project limits have been reviewed and the following recommendations coordinated with the Data Collection Manager;

MP	TMS Site No & Type.	Recommendation
11.195	730004, PTMS	Remove site.
14.199	730005, PTMS	Restore detection, reconstruct cabinet with pedestal mount.

**Intelligent Transportation Systems (ITS)**

- Any ITS items within the project limits shall be shown on plan sheets that are necessary for other work. Plan sheets are not necessary solely to show ITS elements. ITS Certification Memo will be required at Production. See District Design Memo 09-02.
  - ITS facilities were researched through map and field review and none identified at the time of scoping. The Engineer is to confirm if any ITS facilities exist during design.

**Lighting Scope Items:**

- Lighting is utility pole mounted on both sides of the road within the City Limits of Bunnell. This existing lighting is to remain.
- Intersection Lighting Retrofit per FDM 231.3.2.1. has been evaluated and is recommended at the following signalized intersections. Existing lighting may require removal or relocations. Orient lighting for approaches per FHWA improved crosswalk lighting scheme Figure 14, as directed by the District Safety Office. See <https://www.fhwa.dot.gov/publications/research/safety/08053/> for additional information. Note FDM 231.1 states that light poles are permitted in the median only when lighting from the outside cannot meet FDM Table 231.2.1 criteria without being supplemented by median lighting.
  - MP 12.757 – Royal Palms Pkwy/Education Way
  - MP 14.533 – White View Parkway
  - MP 16.650 – Palm Coast Parkway

**Landscaping:**

- Landscaped trees in the irrigated medians follow a staggered planting pattern with varying offsets but are within the 18-ft clear zone. Average diameter of the trees at the base is approximately 6-in. Identify the areas and trees that are within the clear zone and to be removed or relocated outside the clear zone and provide to the City of Bunnell. Landscaping work is to be completed by others and not be included in the plans. Include clearing and grubbing of trees not removed or relocated by the City.
  - MP 11.118 to MP 11.195; Left and Right offsets varying 12-ft to 13-ft
  - MP 11.488 to MP 11.543; Left and Right offsets varying 12-ft to 15-ft
  - MP 12.275 to MP 12.590; Left and Right offset 12-ft

**Survey Required:**

- Obtain Design Survey, collecting data for the areas and locations shown on the Concept. Total survey area is 4.25 AC.
  - Complete design survey is not anticipated for proposed inside paved shoulder construction. Obtain 1000-ft cross sections, within the limits of proposed shoulder only, for verification of median slopes and earthwork calculations only. Total of 3.7 miles, 20 sections from the median centerline to both NB and SB inside lane centerlines.

### Candidate Resurfacing Project Technical Scope

- Locate utilities as Quality Level B “QL B” and surface features including valve covers, meter boxes, manholes, etc. within the limits of survey locations shown on the Concept. Quality Level A “QL A” utility information is anticipated to include 40 Vvh’s.
- Locate existing drainage structures within the limits of survey locations shown on the Concept plus the nearest connecting structure beyond those limits. Pipe sizes, flow lines, material type, etc. are required.
- Include items identified by the environmental assessment.
- Include locations for the multi-post signs.
- Obtain Level 2 Survey in accordance with FDM 114.2.2.1 for areas where cross slope correction is recommended, including the pavement surfaces, unpaved shoulders and front slopes of ditches. Lengths listed are for curve, include additional transition lengths. These areas are in addition to the total survey area described above.
  - MP 10.913 to MP 11.105: 1,014-ft horizontal curve, all lanes and median
  - MP 11.657 to MP 11.846: 998-ft horizontal curve, all lanes and median
  - MP 12.242 to MP 12.353: 586-ft horizontal curve, all lanes and median
  - MP 13.827 to MP 13.946: 625-ft horizontal curve, NB lanes
  - MP 15.784 to MP 15.909: 657-ft horizontal curve, SB lanes
  - MP 16.333 to MP 16.517: 970-ft horizontal curve, SB lanes

#### Right-of-Way and Mapping Scope Items:

- Establish the existing Rights of Way by existing Maps or Record Subdivision Plats and the field monumentation, within the survey areas that overlap the Right of Way identified on the Concept only. Right of Way depicted on the Concept is an approximation based on record maps or plats best fit to the aerial, no survey has been performed.
  - MP 11.45 RT
  - MP 12.20 RT
  - MP 14.52 LT & RT

#### Geotechnical Scope Items:

- Pavement Coring Report and Resilient Modulus values to be provided by the FDOT District Materials Office.
- ESAL calculations to be provided by the FDOT District Planning Office.
- Perform and obtain the necessary geotechnical information as directed by the Geotechnical Office:
  - Complete optional materials analysis for proposed drainage work.
  - Soil borings necessary to support the Widening/Reconstruction of the roadway.
  - Identify seasonal and design high water elevations and soil percolation rates for drainage designs. Groundwater elevations are required for areas where dewatering for pipe installation may affect a contaminated site.

#### Design Documentation:

- The design documentation items noted below are necessary to implement the proposed improvements. The Engineer is responsible for verifying all items in the proposed scope and design conform with all applicable criteria and standards, including the identification of any required Exceptions and Variations.
- Design Variation Memorandum
  - Access Management Classification: Per FDM Table 201.4 the full and directional median opening spacing for access classification 03 is 2,640-ft and 1,320-ft respectively. Existing full median opening spacings vary from 500-ft to 3,000-ft and are to remain. Access management modifications are not a component of this resurfacing project.
  - Lateral Offset: Per FDM 215.2.6.1 (1) existing front slopes steeper than 1:3 within the clear zone may remain and should be evaluated for shielding. The existing concrete ditch pavement in the median has side slopes of 1:2 and is within the clear zone. Ditch bottom width is 6-ft. Per FDM Figure 215.2.15 the ditch pavement does not meet cross sectional slope criteria. Per FDM Table 215.2.1 the required lateral offset for the 60-mph design speed is 18-ft. Shielding the median limits recoverable terrain and poses a potentially greater roadside hazard. The median ditch pavement is in good to fair condition and is to remain.
    - MP 12.590 to MP 12.735; minimum lateral offset approximately 6.5-ft
  - Turn Lane Length: The following turn lanes do not meet the minimum deceleration lengths per FDM Exhibit 212-1 plus the 50-ft minimum queue per FDM 212.14.2 for low volume intersections in rural context classifications. There is no documented crash history solely attributable to the deficient lengths, the existing turn lanes are to remain;

**Candidate Resurfacing Project Technical Scope**

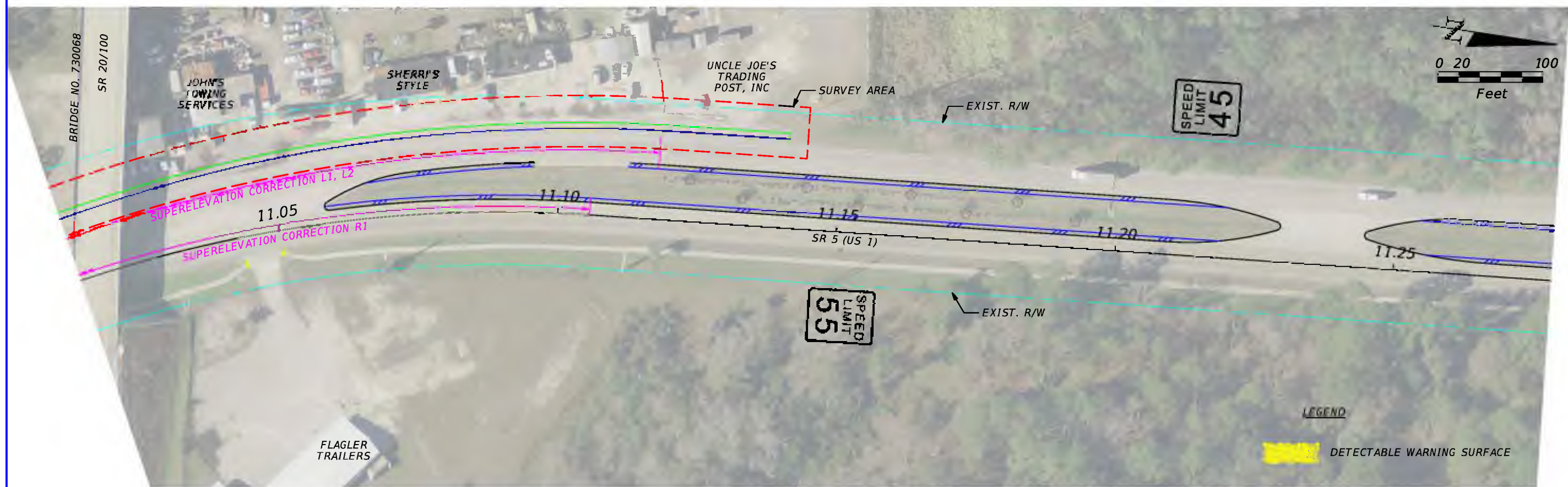
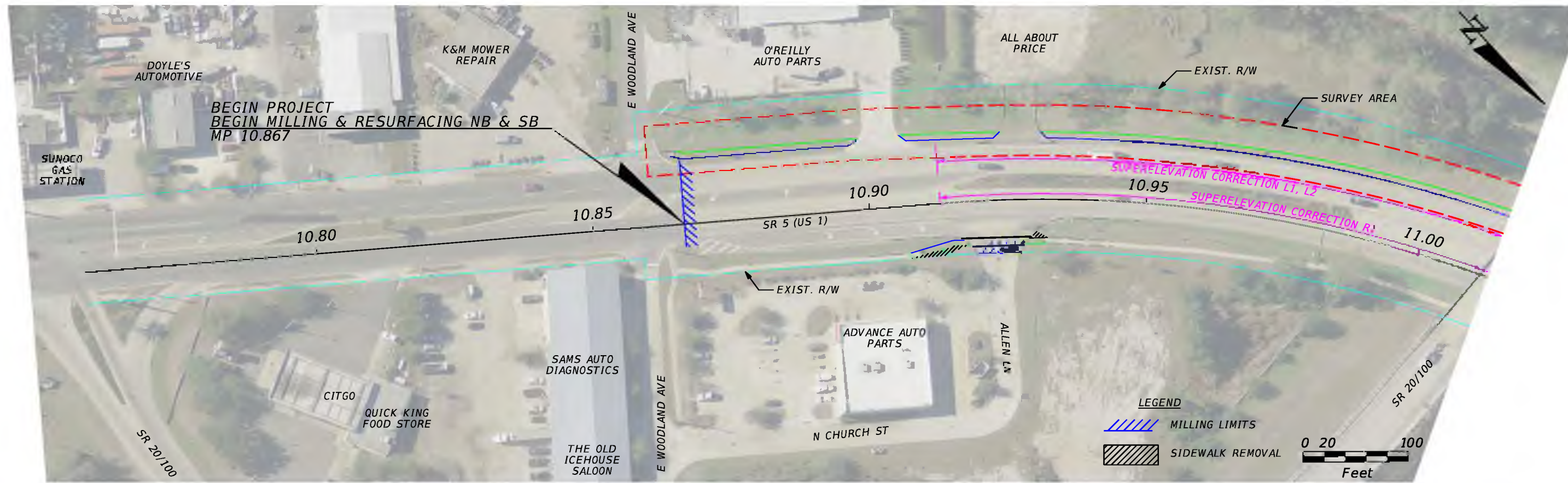
Location, Turn Lane Type	Design Speed (mph)	Posted Speed (mph)	Total Length Provided (FT)	Required Length (FT) for Design Speed	Required Length (FT) for Posted Speed
10.900, SB Left Turn	60	45	300	455	235
10.900 NB, Right Turn	60	45	300	455	235
11.450 SB, Left Turn	60	55	220	455	455
11.550 NB, Right Turn	60	55	365	455	400
11.650 SB, Left Turn	60	55	345	455	400
12.050 NB, Left Turn	60	55	415	455	400
12.050 NB, Right Turn	60	55	450	455	400
12.700 NB, Right Turn	60	55	450	455	400
12.800 SB, Left Turn	60	55	430	455	400
15.100 SB, Right Turn	60	60	445	455	455
15.400 SB, Left Turn	60	60	300	455	455
16.500 SB, Left Turn	60	55	395	455	400

- Design Variation
  - Lateral Offset:
    - MP 16.390 RT: The median drain headwall is offset 32.0-ft within a control zone. Per FDM 215.2.4 and 215.2.5, new construction lateral offset criteria is required within the control zone. The requirement for the 60 mph design speed is 36-ft. There is no crash history associated with the deficient lateral offset and the item is to remain.
- Design Exception
  - Bridge Shoulder Width: Per FDM Table 260.9.1 the minimum shoulder widths for existing bridges on divided roadways is 2.5-ft for the median and 4.0-ft for the outside. The bridge sets over St. Joe Canal have 2-ft inside and outside shoulders and are to remain. Narrow shoulder approach treatment is proposed.
  - Superelevation: Per FDM 122.2.1 superelevation is a controlling element of design for high speed roadways. The below highlighted curves at PI MP 14.342 (SB), have substandard slopes for the 60 and 70 mph design speed. The superelevation does not meet Table 210.9.1 and does not meet either the AASHTO 6% or 12% values. FDM 210.9.2 requires that the superelevation be corrected on high speed roadways unless there is no history of crashes and the superelevation is between the AASHTO 6% and 12% tables. The superelevation is above design values however there is no crash history and it is to remain.

PI MP	Radius (FT)	FDM S <sub>e</sub> (%)	AASHTO 6% S <sub>e</sub> (%)	AASHTO 12% S <sub>e</sub> (%)	Average Measured S <sub>e</sub> NB (%)	Average Measured S <sub>e</sub> SB (%)
14.342	2,865	5.5	4.6	5.8	-4.6	7.6

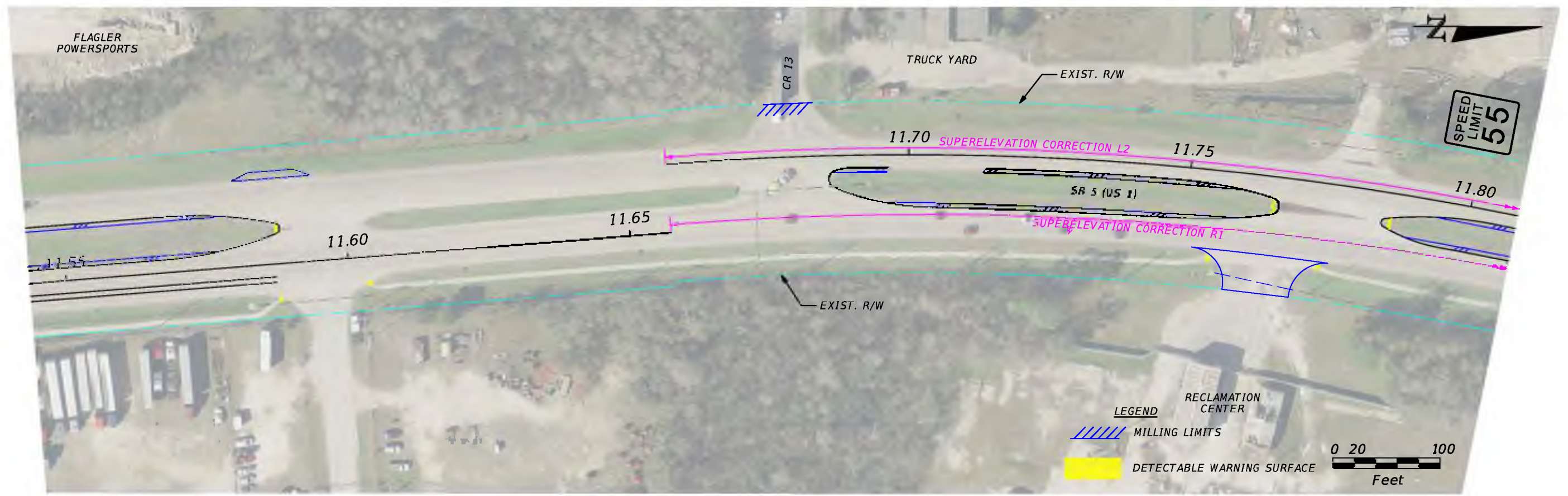
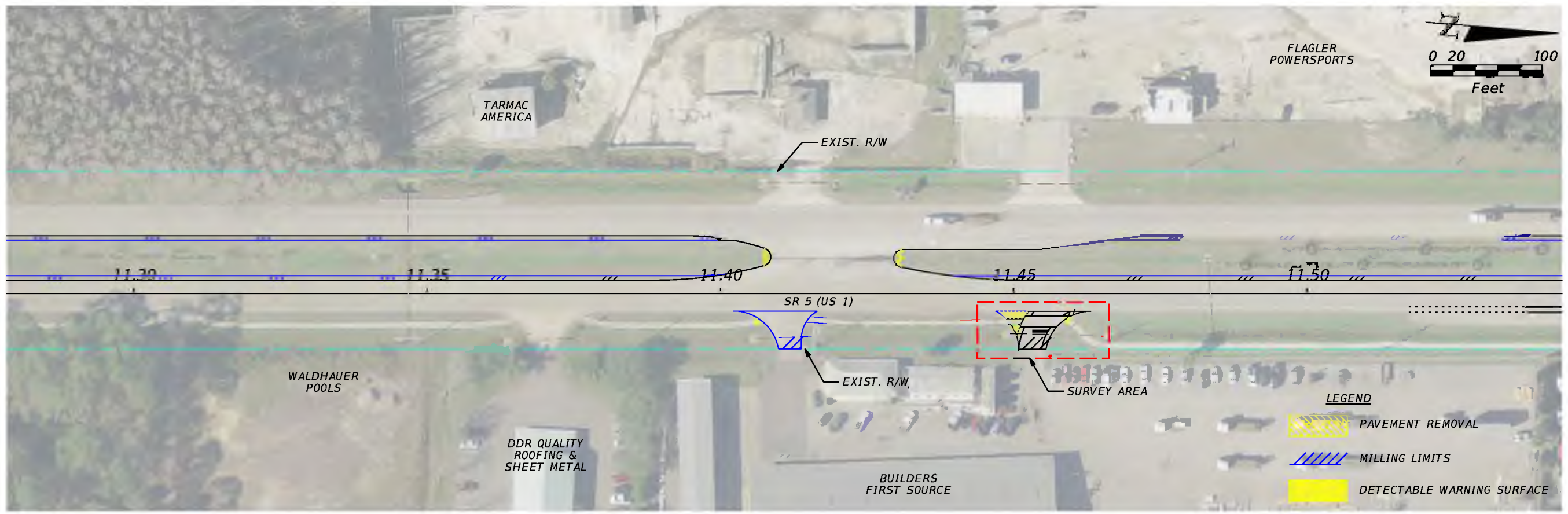
**Candidate Project Development Considerations (items not to be included in final design):**

- Overtracking was noted in the northwest return of Otis Stone Hunter Rd intersection. Increasing the radius at this was considered but not proposed due to the proximity of the cross-drain headwall, extension need and shielding requirements. The existing condition is to remain.
- Turn lane entrance tapers in the flush shoulder section are typically 200-ft and not squared per current criteria. Deceleration and minimum queue lengths are met under the current condition except as noted in the Project Documentation above. The extended turn lane entrance tapers are to remain.
- A high-water table was observed during field review and noted by adjacent property owners. Remediation is beyond the scope of this RRR project. Mitigating improvements to be included in this project are limited to what has been noted in the Scope and shown on the Concept.

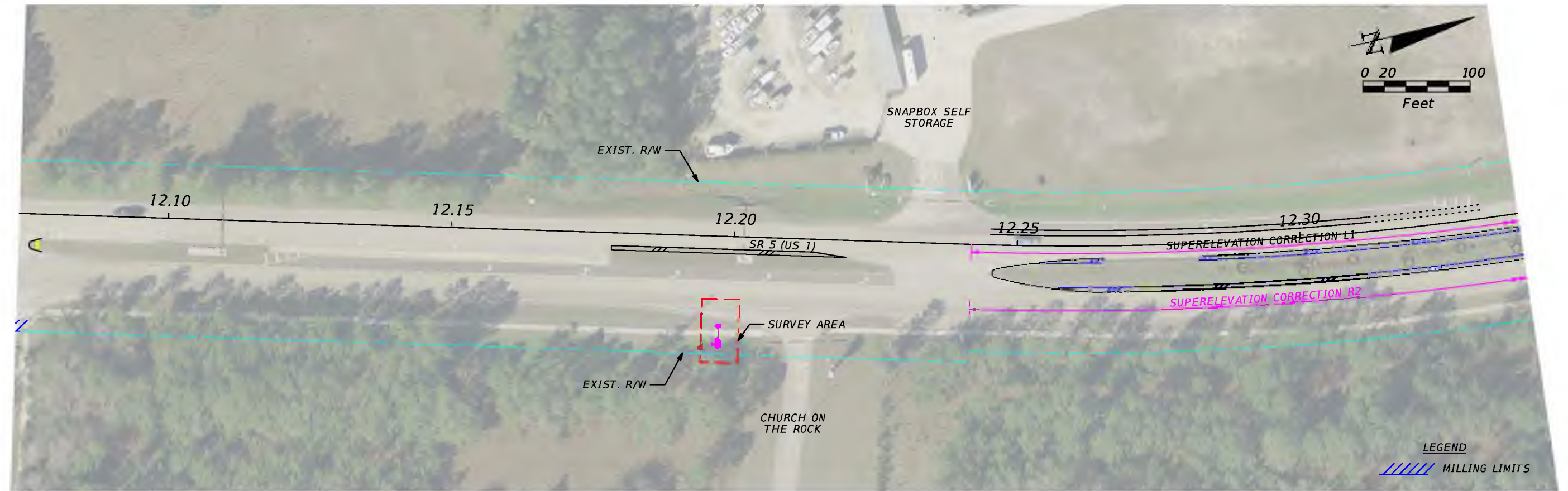


REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.  1
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
				5	FLAGLER	445216-1	

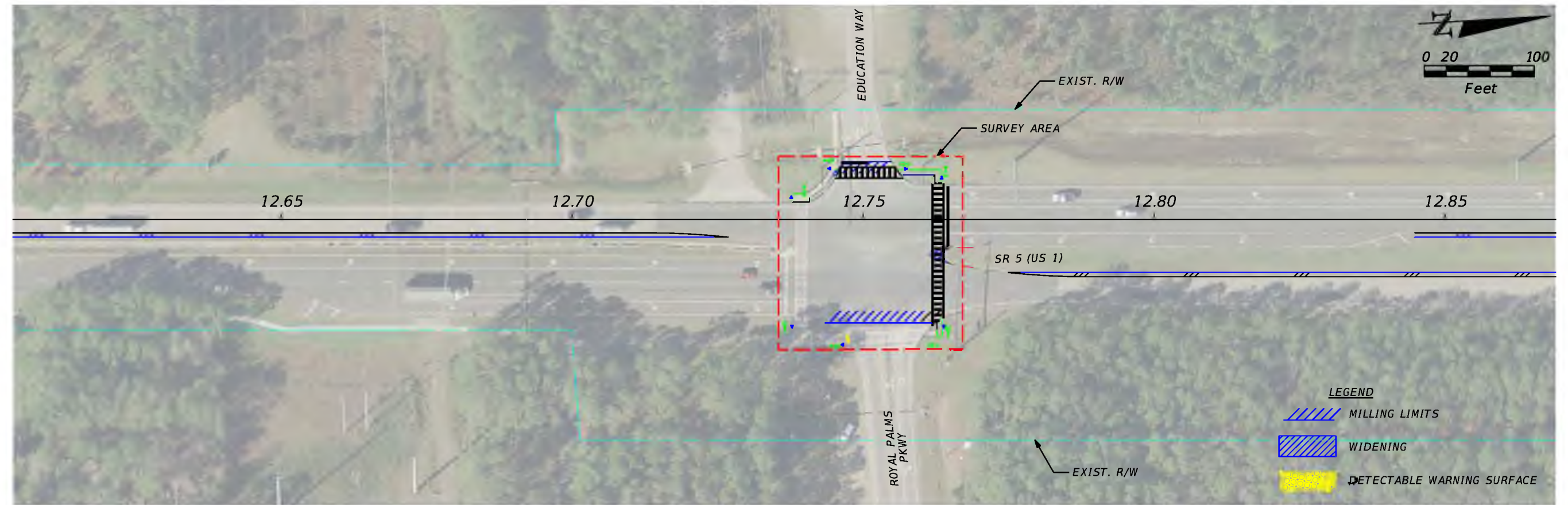
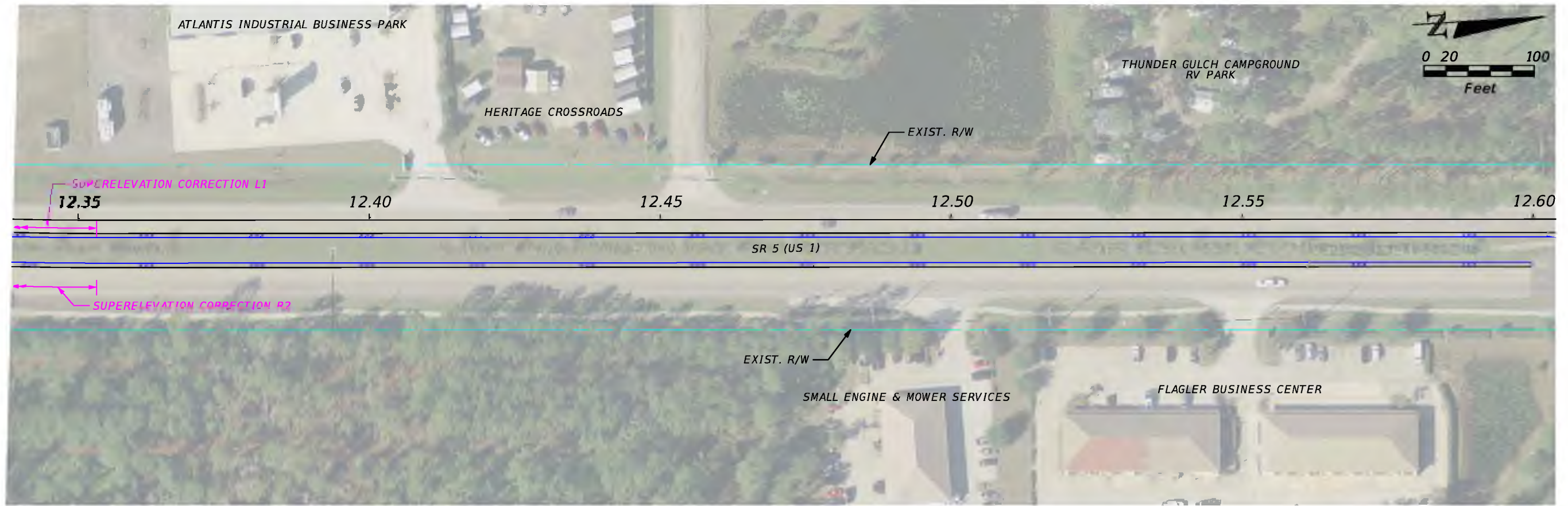
**CONCEPT PLANS**



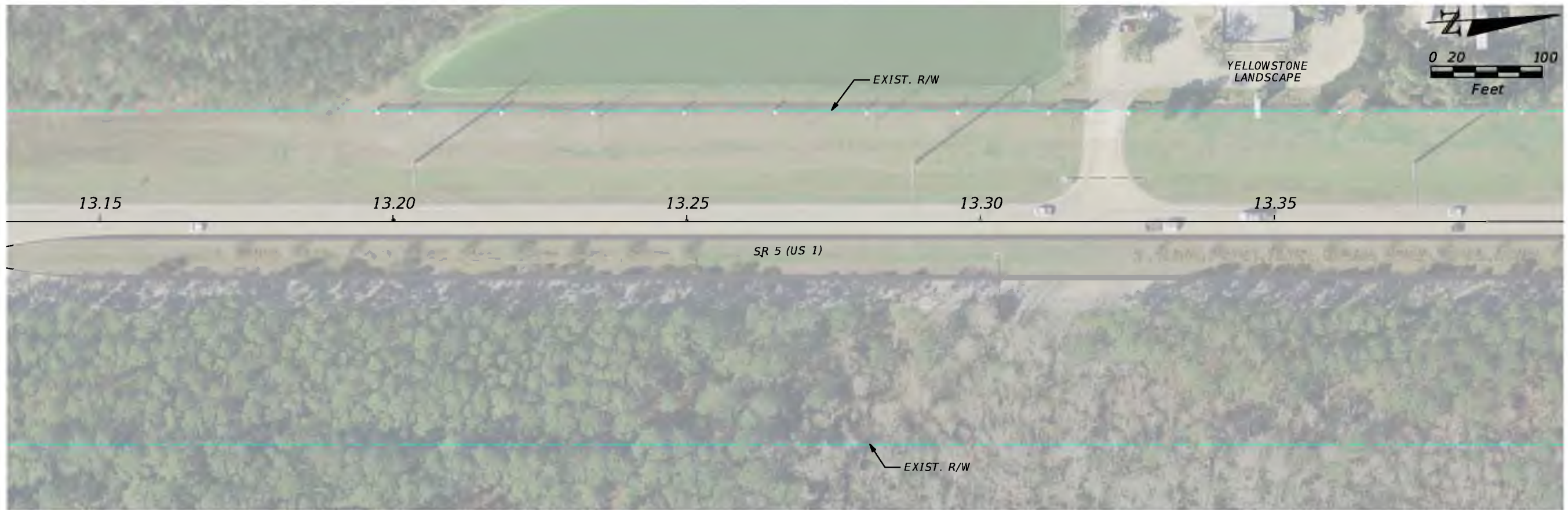
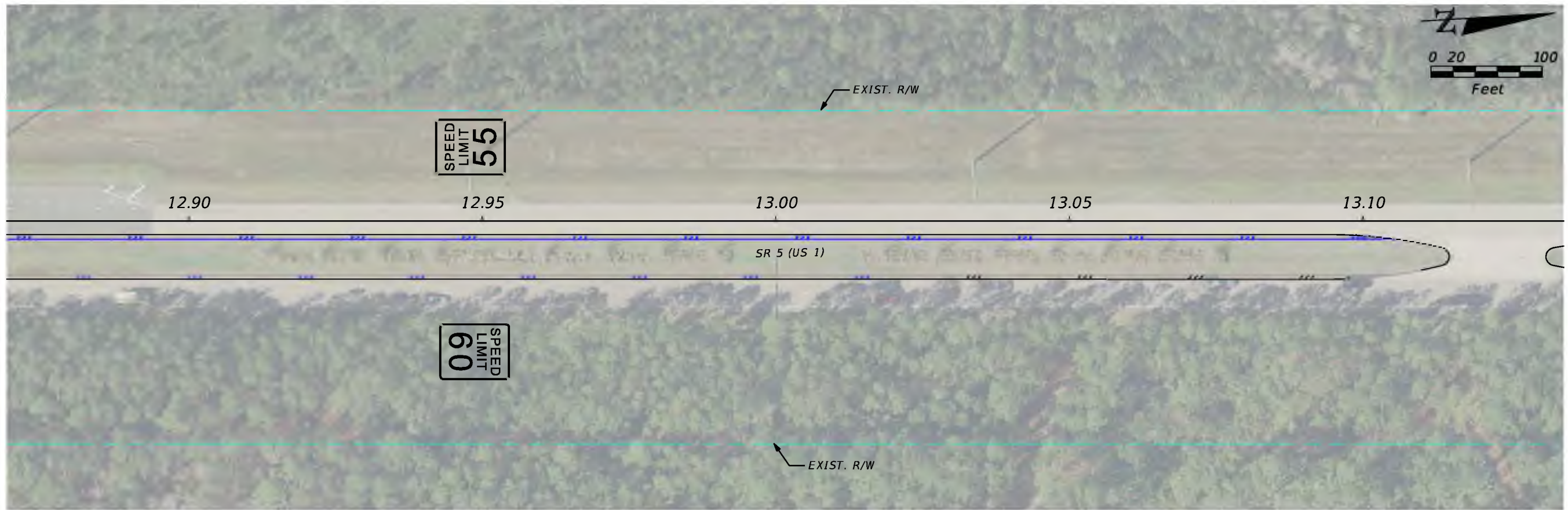
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DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
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<b>CONCEPT PLANS</b>							2



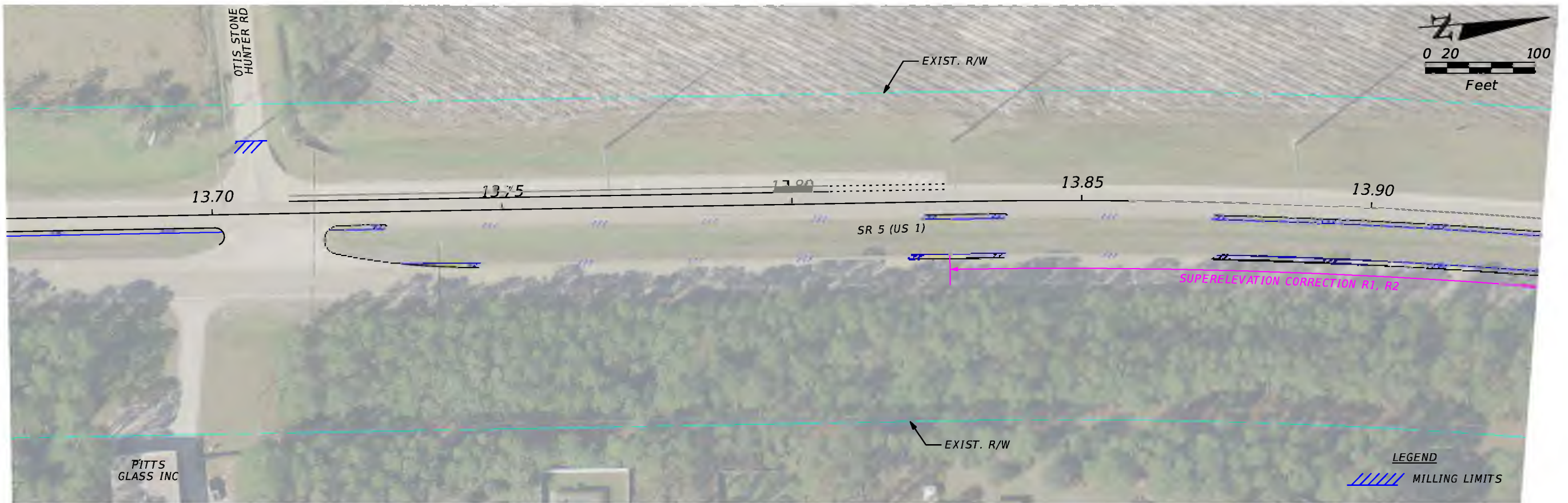
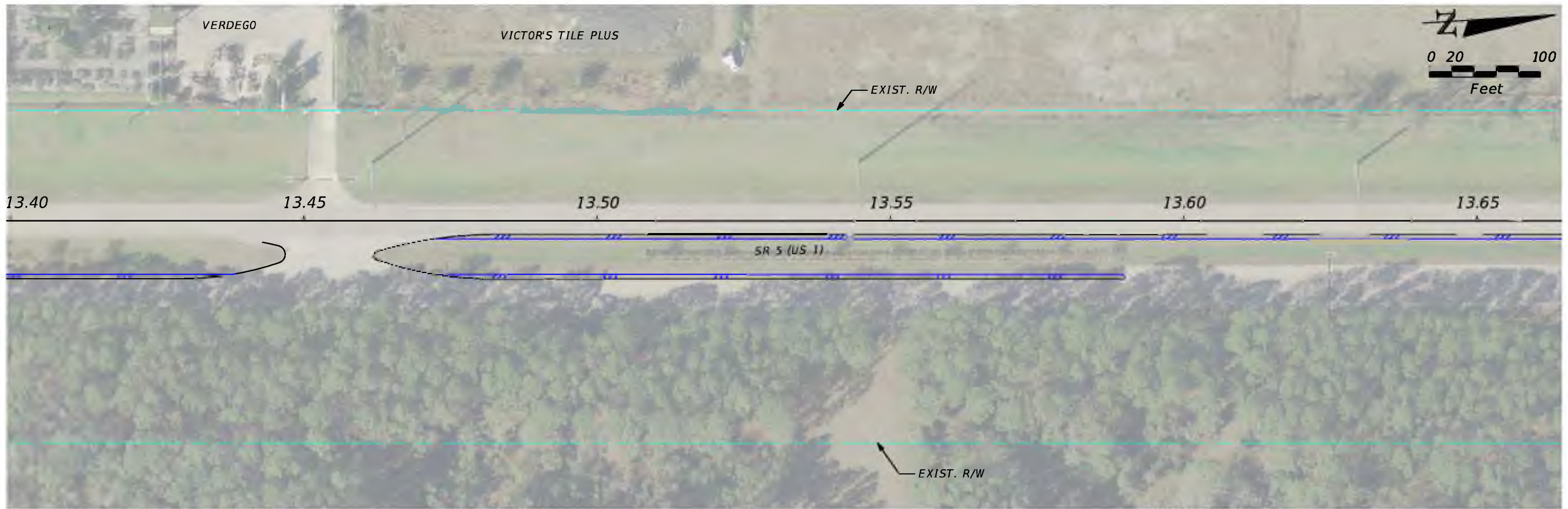
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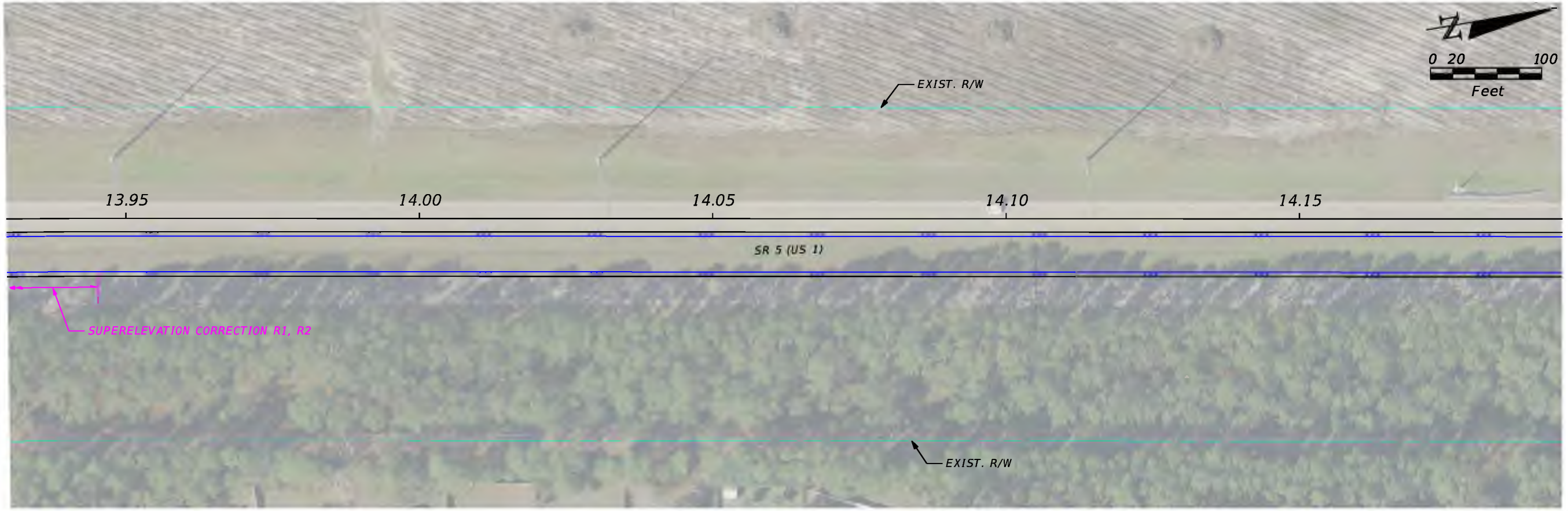
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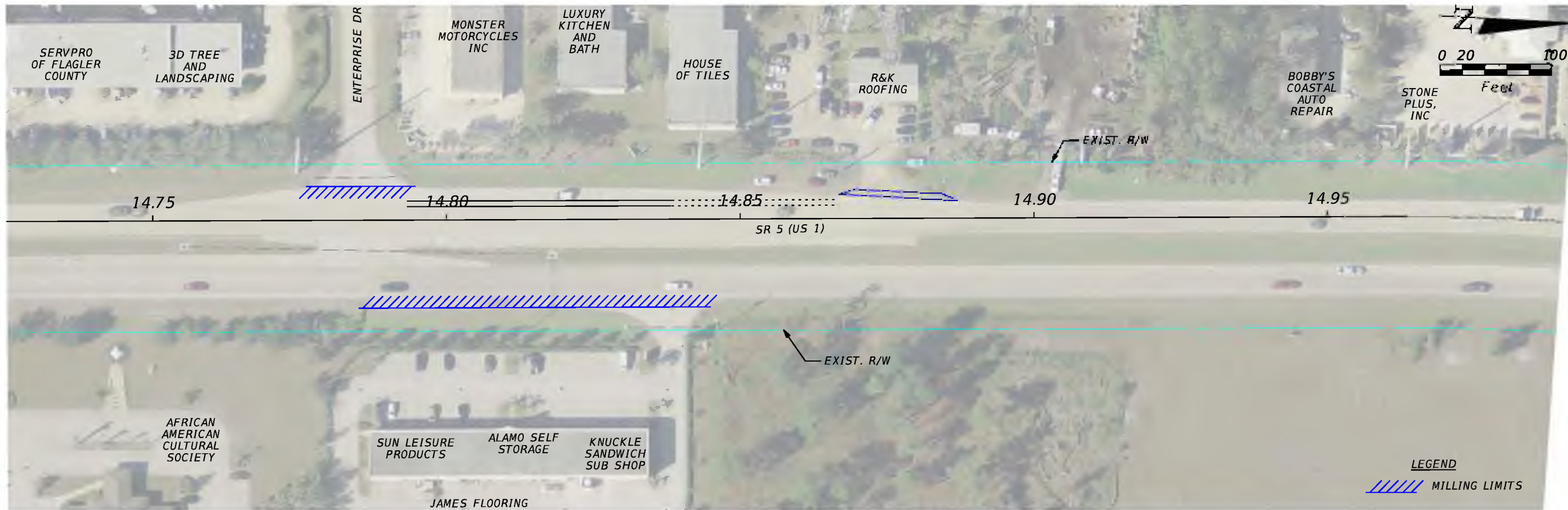
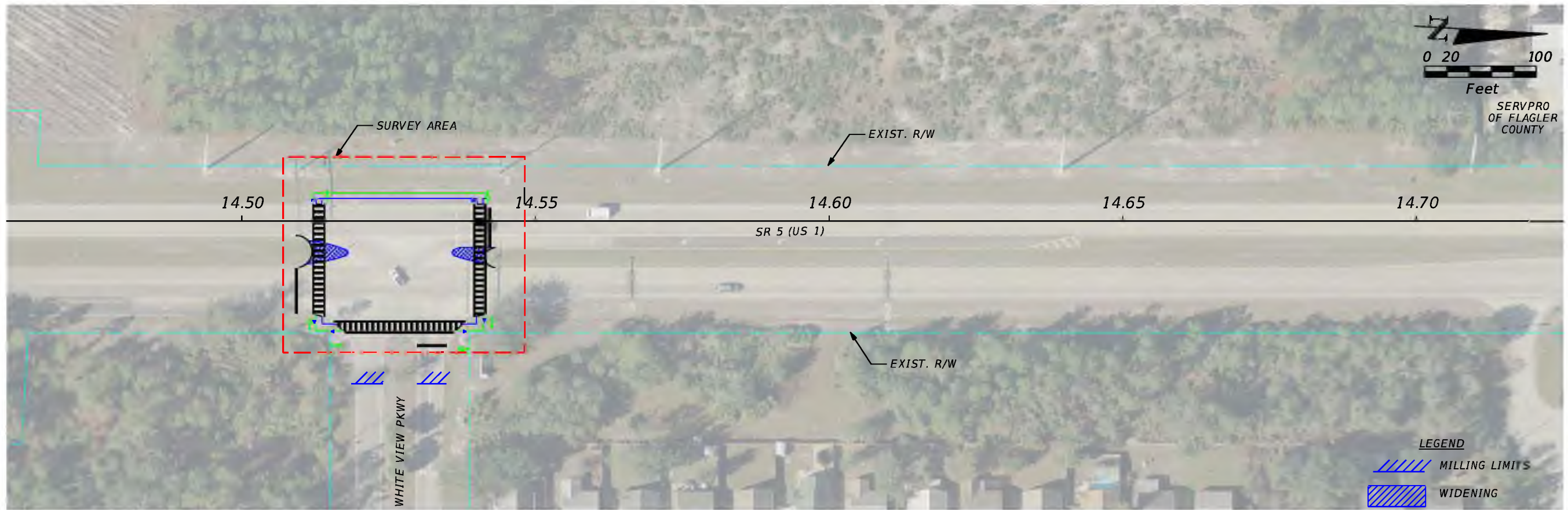
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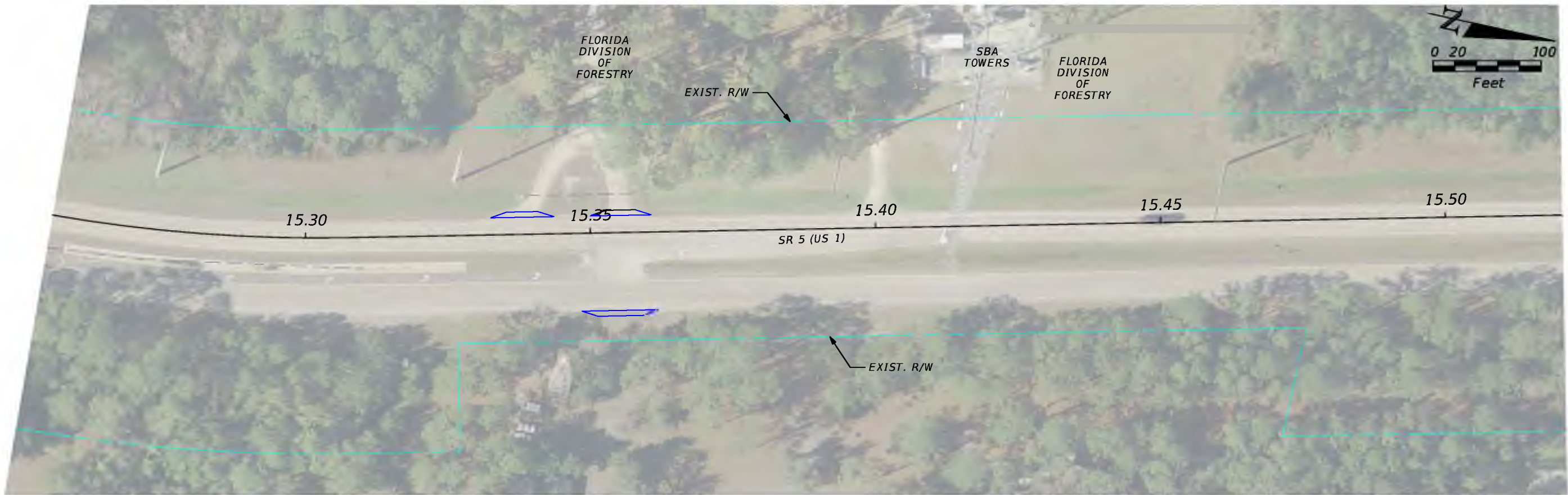
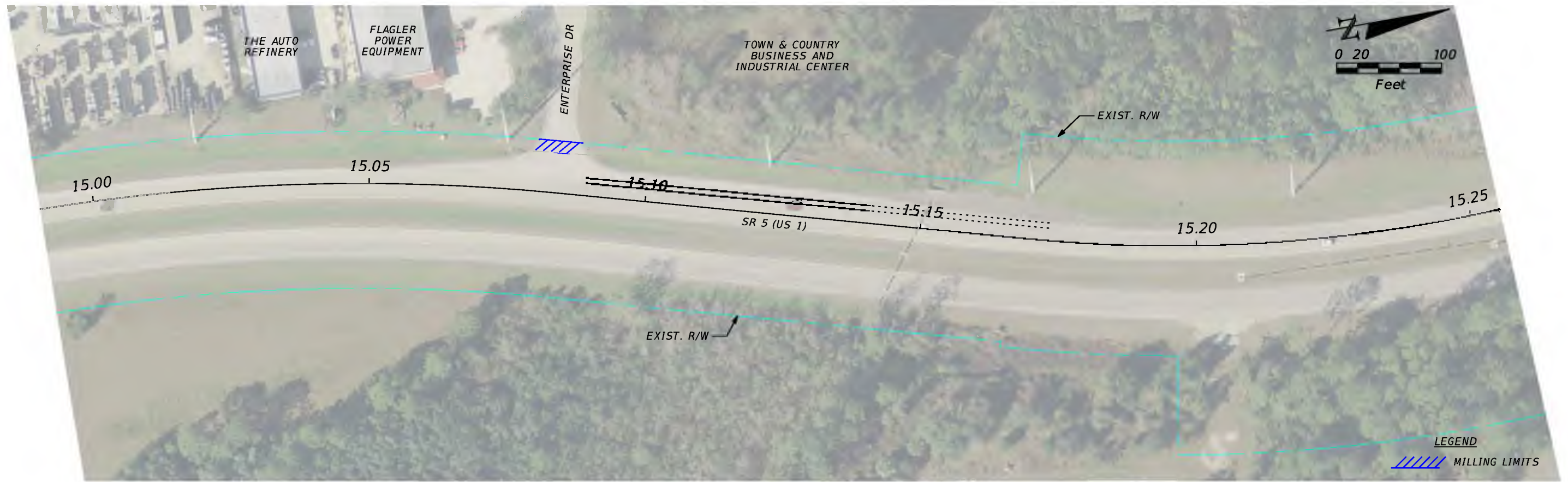
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REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			CONCEPT PLANS	SHEET NO.
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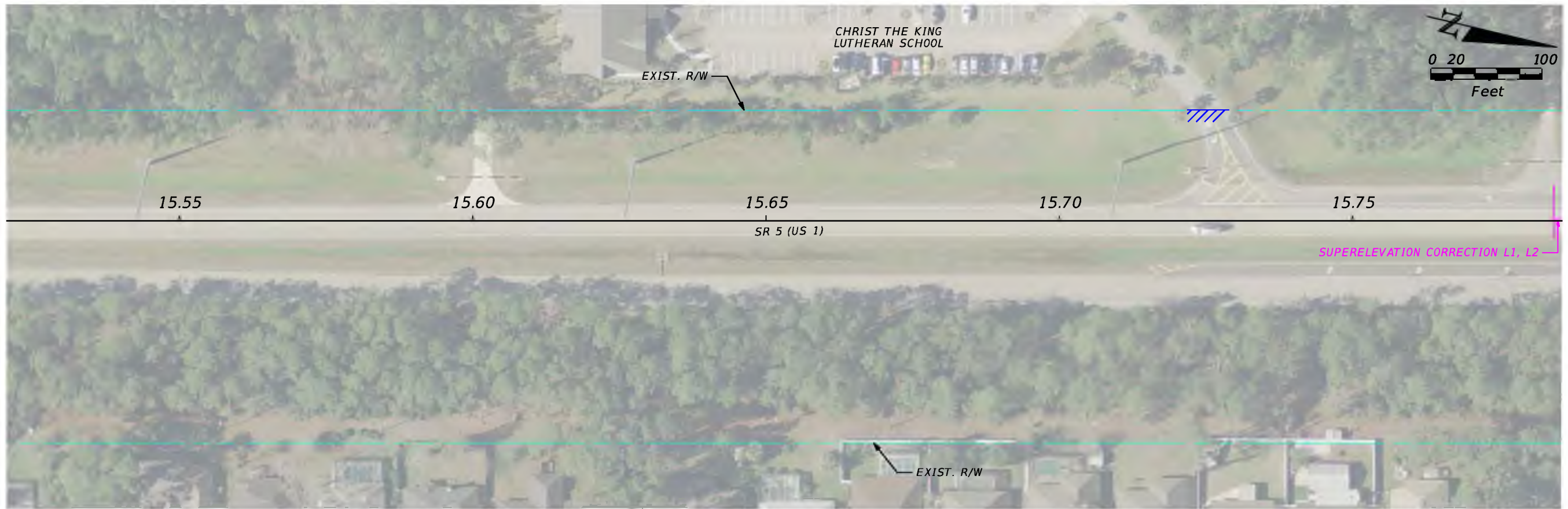


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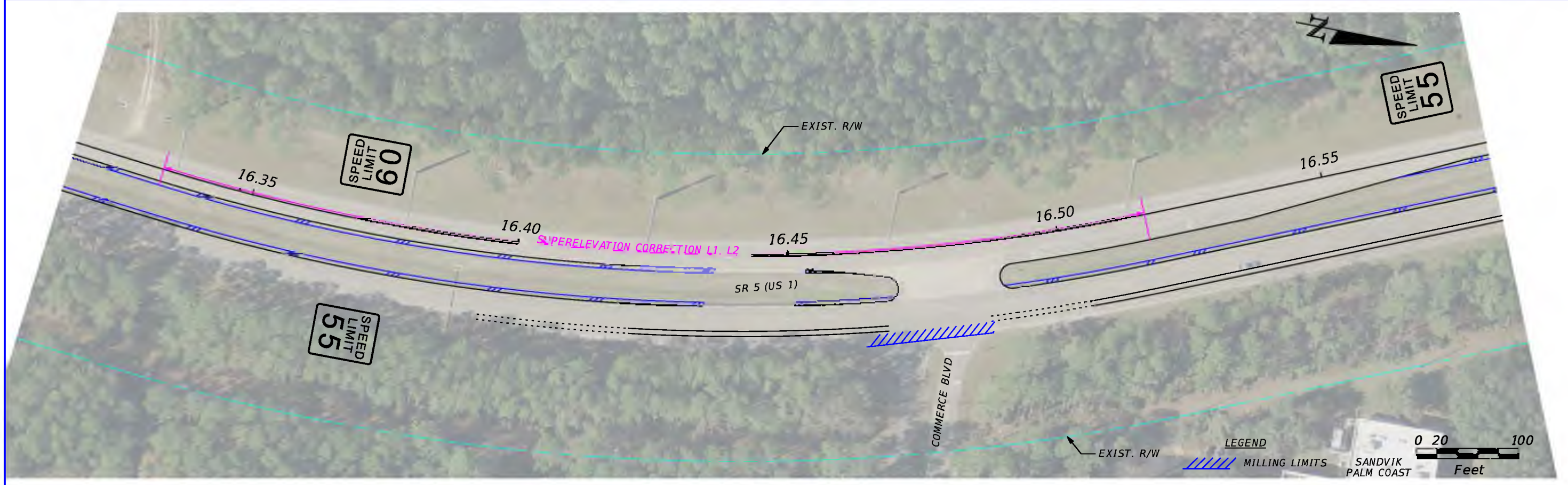
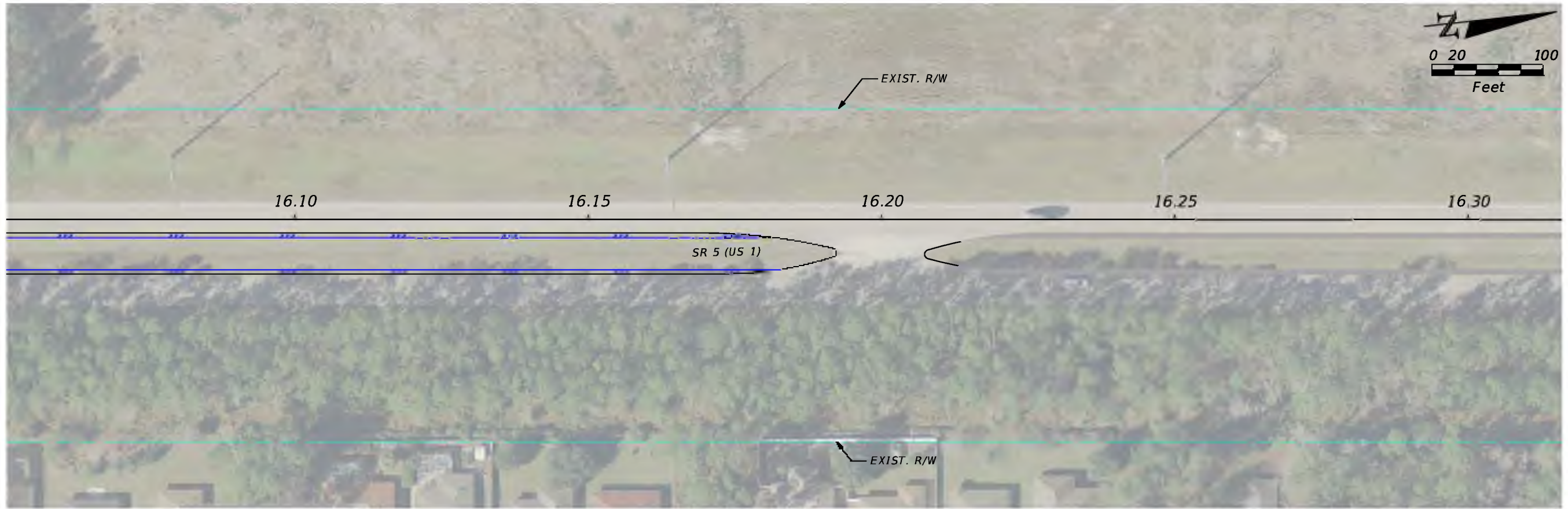


REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID	
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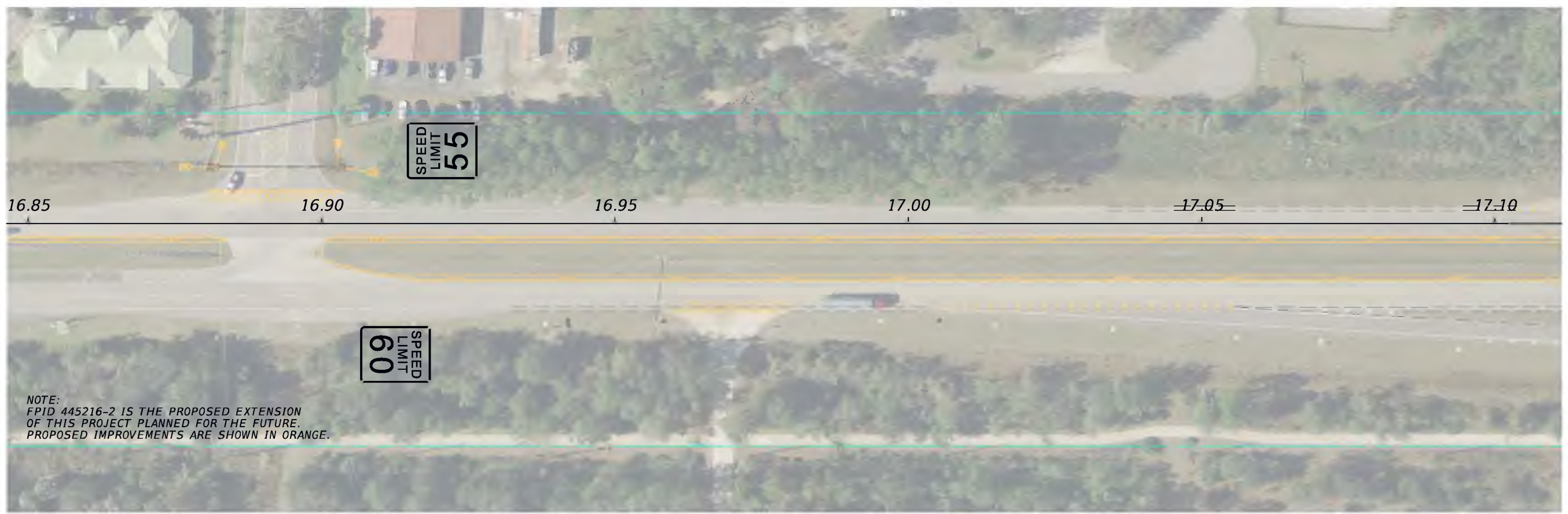
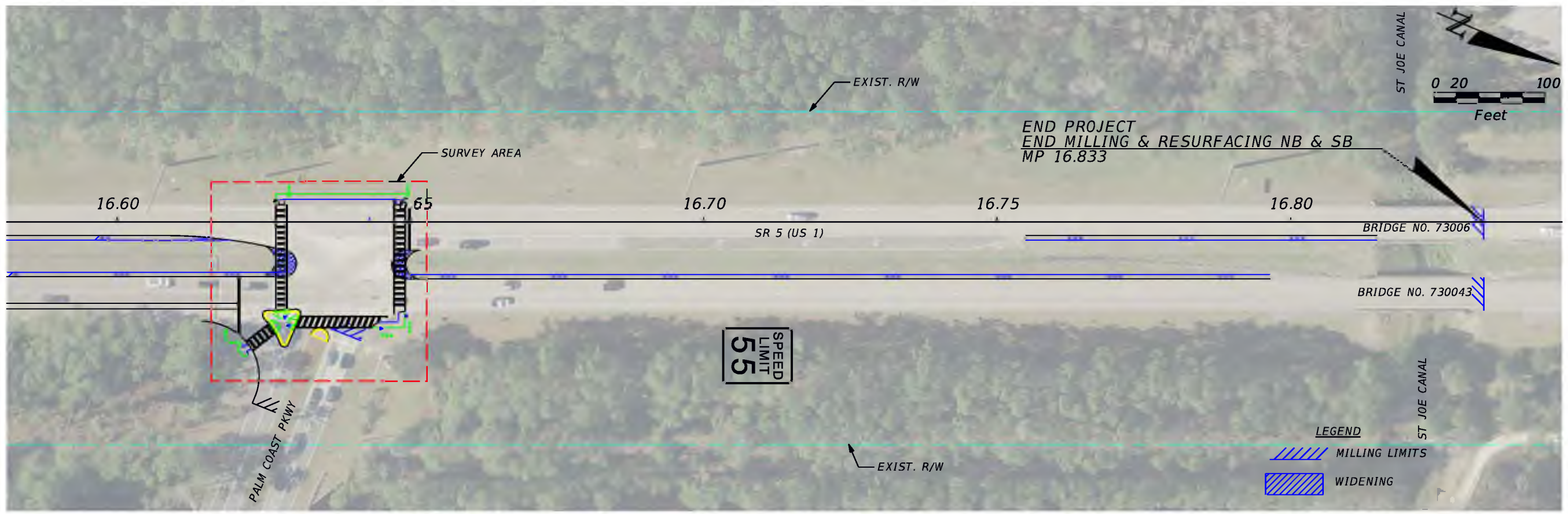
**CONCEPT PLANS**



REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			CONCEPT PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				5	FLAGLER	445216-1		10



REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			CONCEPT PLANS	SHEET NO. 11
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
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REVISIONS				STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION			CONCEPT PLANS	SHEET NO.
DATE	DESCRIPTION	DATE	DESCRIPTION	ROAD NO.	COUNTY	FINANCIAL PROJECT ID		
				5	FLAGLER	445216-1		12

Date: 5/20/2020 2:00:35 PM

## FDOT Long Range Estimating System - Production

### R3: Project Details by Sequence Report

Project: 445216-1-52-01

Letting Date: 01/2099

**Description:** Section 73010000 MP 10.867 to MP 16.833. SR 5 from E Woodland Ave to St Joes Canal Bridge.

**District:** 05      **County:** 73 FLAGLER      **Market Area:** 07      **Units:** English

**Contract Class:** Lump Sum Project: N      **Design/Build:** N      **Project Length:** 5.966 MI

Project Manager: AAA/HNTB-MO

**Version 1-P Project Grand Total****\$12,691,095.22**

**Description:** Section 73010000 MP 10.867 to MP 16.833. SR 5 from E Woodland Ave to St Joes Canal Bridge.

**Sequence:** 1 RSD - Resurfacing, Divided

**Net Length:** 0.203 MI  
1,072 LF

**Description:** MP 10.867 to MP 11.070.

**Special** 18-ft curbed and vegetated median.

**Conditions:**

#### EARTHWORK COMPONENT

**User Input Data**

Description	Value
Standard Clearing and Grubbing Limits L/R	5.34 / 5.34
Incidental Clearing and Grubbing Area	0.00

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	0.26 AC	\$12,000.00	\$3,120.00
<b>Earthwork Component Total</b>				<b>\$3,120.00</b>

#### ROADWAY COMPONENT

**User Input Data**

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	24.00 / 24.00
Structural Spread Rate	220
Friction Course Spread Rate	80

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-15	MILLING EXIST ASPH PAVT,2 3/4" AVG DEPTH	5,716.48 SY	\$3.71	\$21,208.14
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	628.81 TN	\$128.70	\$80,927.85
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	228.66 TN	\$160.28	\$36,649.62

**X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-15	MILLING EXIST ASPH PAVT,2 3/4" AVG DEPTH <b>Comment:</b> turn lanes/crossovers	1,475.40	SY	\$3.71	\$5,473.73
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C <b>Comment:</b> overbuild for superelevation (2205.4 TN) plus turn lanes from QNTY (162.3).	2,368.00	TN	\$128.70	\$304,761.60
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22 <b>Comment:</b> turn lanes	60.00	TN	\$160.28	\$9,616.80
701-18-101	PROFILED THER,STANDARD- ASPHALT, WH SO 6	0.41	GM	\$5,542.86	\$2,272.57
701-18-201	PROFILED THER,STANDARD- ASPHALT, YE SO 6	0.41	GM	\$5,898.16	\$2,418.25
710-11-123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	115.00	LF	\$1.73	\$198.95
710-11-125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	16.00	LF	\$2.11	\$33.76
711-11-123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	115.00	LF	\$2.57	\$295.55
711-11-125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	16.00	LF	\$6.19	\$99.04
711-11-170	THERMOPLASTIC, STD, WHITE, ARROW	6.00	EA	\$66.40	\$398.40

**Pavement Marking Subcomponent**

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	2

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE/RAISED PAVEMENT MARKERS	82.00	EA	\$4.60	\$377.20
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.41	GM	\$1,109.96	\$455.08
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	0.41	GM	\$503.80	\$206.56
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	0.41	GM	\$1,612.89	\$661.28
<b>Roadway Component Total</b>					<b>\$466,054.38</b>

**SHOULDER COMPONENT****User Input Data**

Description	Value
Total Outside Shoulder Width L/R	12.00 / 12.00

Total Outside Shoulder Perf. Turf Width L/R	2.67 / 2.67
Paved Outside Shoulder Width L/R	4.00 / 4.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-11	MILLING EXIST ASPH PAVT,2 1/4" AVG DEPTH	952.75 SY	\$4.32	\$4,115.88
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	78.60 TN	\$128.70	\$10,115.82
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	38.11 TN	\$160.28	\$6,108.27
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	0.41 GM	\$1,975.21	\$809.84
570-1-2	PERFORMANCE TURF, SOD	635.96 SY	\$3.76	\$2,391.21

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	760.00 SY	\$47.42	\$36,039.20
527-2	DETECTABLE WARNINGS	60.00 SF	\$29.29	\$1,757.40
570-1-2	PERFORMANCE TURF, SOD	453.00 SY	\$3.76	\$1,703.28

**Erosion Control****Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	2,144.00 LF	\$1.85	\$3,966.40
104-18	INLET PROTECTION SYSTEM	2.00 EA	\$151.06	\$302.12
107-1	LITTER REMOVAL	1.48 AC	\$39.32	\$58.19
107-2	MOWING	1.48 AC	\$64.25	\$95.09
<b>Shoulder Component Total</b>				<b>\$67,462.70</b>

**MEDIAN COMPONENT****User Input Data**

Description	Value
Total Median Width	18.00
Performance Turf Width	5.34
Total Median Shoulder Width L/R	8.00 / 8.00
Paved Median Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\frac{1}{2}$ No. of Sides	0

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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570-1-2	PERFORMANCE TURF, SOD	635.96 SY	\$3.76	\$2,391.21
<b>Median Component Total</b>				<b>\$2,391.21</b>

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**SIGNING COMPONENT**

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	\$358.94	\$717.88
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	2.00	AS	\$1,358.35	\$2,716.70
700-1-50	SINGLE POST SIGN, RELOCATE	1.00	AS	\$252.58	\$252.58
700-1-60	SINGLE POST SIGN, REMOVE	2.00	AS	\$28.21	\$56.42
<b>Signing Component Total</b>					<b>\$3,743.58</b>

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<b>Sequence 1 Total</b>				<b>\$542,771.87</b>
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**Sequence:** 2 WDR - Widen/Resurface, Divided, Rural**Net Length:** 3.245 MI  
17,134 LF**Description:** MP 11.070 to MP 14.315**Special** No existing paved inside shoulders.**Conditions:****EARTHWORK COMPONENT****User Input Data**

<b>Description</b>	<b>Value</b>
Standard Clearing and Grubbing Limits L/R	5.34 / 5.34
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	3.245
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Median Slope L/R	6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R	5.00 % / 5.00 %
Existing Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Front Slope L/R	6 to 1 / 6 to 1
Median Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	5.00 % / 5.00 %
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
110-1-1	CLEARING & GRUBBING	4.20	AC	\$12,000.00	\$50,400.00
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	3,782.08	CY	\$44.05	\$166,600.62

**Earthwork Component Total**

\$217,000.62

**ROADWAY COMPONENT****User Input Data**

<b>Description</b>	<b>Value</b>
Number of Lanes	4
Existing Roadway Pavement Width L/R	24.00 / 24.00
Structural Spread Rate	220
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	0.00 / 0.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	0
Widened Friction Course Spread Rate	80

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
327-70-15	MILLING EXIST ASPH PAVT, 2 3/4" AVG DEPTH	91,379.20	SY	\$3.71	\$339,016.83
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	10,051.71	TN	\$128.70	\$1,293,655.08
337-7-25		3,655.17	TN	\$160.28	\$585,850.65

ASPH CONC FC,INC  
BIT,FC-5,PG76-22

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-15	MILLING EXIST ASPH PAVT,2 3/4" AVG DEPTH <b>Comment:</b> turn lanes/crossovers	18,130.00 SY	\$3.71	\$67,262.30
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C <b>Comment:</b> overbuild for superelevation correction (1155 TN) plus turn lanes from QNTY (2004.2)	3,160.00 TN	\$128.70	\$406,692.00
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22 <b>Comment:</b> turn lanes.	470.00 TN	\$160.28	\$75,331.60
701-18-101	PROFILED THER,STANDARD- ASPHALT, WH SO 6	6.49 GM	\$5,542.86	\$35,973.16
701-18-201	PROFILED THER,STANDARD- ASPHALT, YE SO 6	6.49 GM	\$5,898.16	\$38,279.06
710-11-123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	650.00 LF	\$1.73	\$1,124.50
710-11-125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	680.00 LF	\$2.11	\$1,434.80
711-11-123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	650.00 LF	\$2.57	\$1,670.50
711-11-125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	680.00 LF	\$6.19	\$4,209.20
711-11-170	THERMOPLASTIC, STD, WHITE, ARROW	55.00 EA	\$66.40	\$3,652.00

**Pavement Marking Subcomponent**

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE/RAISED PAVEMENT MARKERS	1,314.00 EA	\$4.60	\$6,044.40
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	6.49 GM	\$1,109.96	\$7,203.64
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	6.49 GM	\$503.80	\$3,269.66
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	6.49 GM	\$1,612.89	\$10,467.66
<b>Roadway Component Total</b>				<b>\$2,881,137.04</b>

**SHOULDER COMPONENT****User Input Data**

Description	Value
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Existing Total Outside Shoulder Width L/R	8.00 / 8.00
New Total Outside Shoulder Width L/R	8.00 / 8.00
Total Outside Shoulder Perf. Turf Width L/R	2.67 / 2.67
Existing Paved Outside Shoulder Width L/R	4.00 / 4.00
New Paved Outside Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-11	MILLING EXIST ASPH PAVT, 2 1/4" AVG DEPTH	15,229.87	SY	\$4.32	\$65,793.04
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,256.46	TN	\$128.70	\$161,706.40
337-7-25	ASPH CONC FC, INC BIT, FC-5, PG76-22	609.19	TN	\$160.28	\$97,640.97
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	6.49	GM	\$1,975.21	\$12,819.11
570-1-2	PERFORMANCE TURF, SOD	10,165.94	SY	\$3.76	\$38,223.93

**X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION <b>Comment:</b> 3.245mi*2*8ft=30460SY (new inside shoulders)+91.9 (aprons, widening)	30,552.00	SY	\$8.20	\$250,526.40
285-702	OPTIONAL BASE, BASE GROUP 02	73.00	SY	\$24.93	\$1,819.89
285-709	OPTIONAL BASE, BASE GROUP 09	19.00	SY	\$34.38	\$653.22
522-1	CONCRETE SIDEWALK AND DRIVEWAYS, 4"	257.00	SY	\$47.42	\$12,186.94
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	48.00	SY	\$59.37	\$2,849.76
527-2	DETECTABLE WARNINGS	200.00	SF	\$29.29	\$5,858.00

**Erosion Control****Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	39,407.28	LF	\$1.85	\$72,903.47
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	324.50	LF	\$7.02	\$2,277.99
104-18	INLET PROTECTION SYSTEM	18.00	EA	\$151.06	\$2,719.08
107-1	LITTER REMOVAL	23.59	AC	\$39.32	\$927.56
107-2	MOWING	23.59	AC	\$64.25	\$1,515.66

**Shoulder Component Total**

\$730,421.42

**MEDIAN COMPONENT****User Input Data**

Description	Value
Total Median Width	40.00
Performance Turf Width	8.00
New Total Median Shoulder Width L/R	8.00 / 8.00
New Paved Median Shoulder Width L/R	4.00 / 4.00

Existing Total Median Shoulder Width L/R	6.00 / 6.00
Existing Paved Median Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\bar{i}$ $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
285-701	OPTIONAL BASE,BASE GROUP 01	16,486.33 SY	\$25.08	\$413,477.16
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	837.64 TN	\$128.70	\$107,804.27
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	609.19 TN	\$160.28	\$97,640.97
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	6.00 GM	\$1,975.21	\$11,851.26
570-1-2	PERFORMANCE TURF, SOD	15,229.87 SY	\$3.76	\$57,264.31

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
520-1-7	CONCRETE CURB & GUTTER, TYPE E	180.00 LF	\$25.81	\$4,645.80

**Median Component Total**

\$692,683.77

**DRAINAGE COMPONENT****X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-521	INLETS, DT BOT, TYPE C, <10'	1.00 EA	\$3,543.81	\$3,543.81
430-175-118	PIPE CULV, OPT MATL, ROUND, 18"S/CD	16.00 LF	\$119.43	\$1,910.88
430-982-125	MITERED END SECT, OPTIONAL RD, 18" CD	1.00 EA	\$1,679.75	\$1,679.75

**Drainage Component Total**

\$7,134.44

**SIGNING COMPONENT****Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	3.00 AS	\$358.94	\$1,076.82
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	30.00 AS	\$1,358.35	\$40,750.50
700-1-50	SINGLE POST SIGN, RELOCATE	3.00 AS	\$252.58	\$757.74
700-1-60	SINGLE POST SIGN, REMOVE	30.00 AS	\$28.21	\$846.30
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00 AS	\$4,662.87	\$4,662.87
700-2-60	MULTI- POST SIGN, REMOVE	1.00 AS	\$625.35	\$625.35

**Signing Component Total**

\$48,719.58

**SIGNALIZATIONS COMPONENT****Signalization 1**

<b>Description</b>	<b>Value</b>
Type	Miscellaneous
Multiplier	1
Description	

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	175.00 LF	\$8.48	\$1,484.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	7.00 EA	\$761.64	\$5,331.48
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	7.00 EA	\$1,378.82	\$9,651.74
650-2-102	VEHIC SIGNAL AUX, REP/RETROFIT- F&I, BAC	10.00 EA	\$328.91	\$3,289.10
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	7.00 AS	\$654.58	\$4,582.06
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	7.00 EA	\$248.21	\$1,737.47

**Traffic Monitoring 1**

<b>Description</b>	<b>Value</b>
Lanes	4
Multiplier	1

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
695-7-600	TMS CABINET, REMOVE	1.00 EA	\$502.36	\$502.36

**Traffic Monitoring 2**

<b>Description</b>	<b>Value</b>
Lanes	4
Multiplier	1

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	150.00 LF	\$8.48	\$1,272.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	40.00 LF	\$22.04	\$881.60
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	2.00 EA	\$761.64	\$1,523.28
695-1-1	TMS VEH SNSR-NON-WEIGHT, F&I,	4.00 EA	\$1,565.58	\$6,262.32
695-6-12	TMS IND LOOP ASSEMBLY	4.00 EA	\$1,232.75	\$4,931.00
695-7-132	TMS CABINET, F&I , TYP 3 PEDESTAL	1.00 EA	\$4,429.51	\$4,429.51

**Signalizations Component Total** \$45,877.92

**LIGHTING COMPONENT**

**Rural Lighting Subcomponent**

<b>Description</b>	<b>Value</b>
Multiplier (Number of Poles)	7

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
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630-2-11	CONDUIT, F& I, OPEN TRENCH	1,400.00 LF	\$8.48	\$11,872.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	7.00 EA	\$761.64	\$5,331.48
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	4,200.00 LF	\$2.21	\$9,282.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	7.00 EA	\$6,352.14	\$44,464.98
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	7.00 EA	\$635.76	\$4,450.32
	<b>Subcomponent Total</b>			\$75,400.78

**X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-7-11	LOAD CENTER, F&I, SECONDARY VOLTAGE	1.00	EA	\$15,855.52	\$15,855.52
	<b>Lighting Component Total</b>				\$91,256.30

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**Sequence 2 Total** \$4,714,231.09

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**Sequence:** 3 RSD - Resurfacing, Divided**Net Length:** 1.624 MI  
8,575 LF**Description:** MP 14.315 to MP 15.939.**EARTHWORK COMPONENT****User Input Data**

Description	Value
Standard Clearing and Grubbing Limits L/R	5.34 / 5.34
Incidental Clearing and Grubbing Area	0.00

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-1-1	CLEARING & GRUBBING	2.10	AC	\$12,000.00	\$25,200.00
<b>Earthwork Component Total</b>					<b>\$25,200.00</b>

**ROADWAY COMPONENT****User Input Data**

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	24.00 / 24.00
Structural Spread Rate	220
Friction Course Spread Rate	80

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-15	MILLING EXIST ASPH PAVT,2 3/4" AVG DEPTH	45,731.84	SY	\$3.71	\$169,665.13
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	5,030.50	TN	\$128.70	\$647,425.35
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	1,829.27	TN	\$160.28	\$293,195.40

**X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-15	MILLING EXIST ASPH PAVT,2 3/4" AVG DEPTH <b>Comment:</b> turn lanes/crossovers	10,191.30	SY	\$3.71	\$37,809.72
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C <b>Comment:</b> turn lanes from QNTY (1145) plus overbuild for superelevation correction (260.2 TN)	1,406.00	TN	\$128.70	\$180,952.20
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22 <b>Comment:</b> turn lanes.	345.00	TN	\$160.28	\$55,296.60
701-18-101	PROFILED THER,STANDARD- ASPHALT, WH SO 6	3.25	GM	\$5,542.86	\$18,014.29
701-18-201	PROFILED THER,STANDARD- ASPHALT, YE SO 6	3.25	GM	\$5,898.16	\$19,169.02
710-11-123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	616.00	LF	\$1.73	\$1,065.68
710-11-125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	720.00	LF	\$2.11	\$1,519.20
710-11-160	PAINTED PAVT MARK,STD,WHITE, MESSAGE	1.00	EA	\$71.58	\$71.58

710-11-170	PAINTED PAVT MARK,STD,WHITE, ARROWS	33.00 EA	\$39.83	\$1,314.39
710-11-201	PAINTED PAVT MARK,STD,YELLOW,SOLID,6"	0.09 GM	\$1,104.66	\$99.42
710-11-224	PAINTED PAVT MARK,STD,YELLOW,SOLID,18"	130.00 LF	\$1.43	\$185.90
711-11-123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	616.00 LF	\$2.57	\$1,583.12
711-11-125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	720.00 LF	\$6.19	\$4,456.80
711-11-160	THERMOPLASTIC, STD, WHITE, MESSAGE	1.00 EA	\$161.54	\$161.54
711-11-170	THERMOPLASTIC, STD, WHITE, ARROW	33.00 EA	\$66.40	\$2,191.20
711-11-224	THERMOPLASTIC, STD, YELLOW, SOLID, 18"	130.00 LF	\$4.25	\$552.50
711-15-201	THERMOPLASTIC, STD-OP,YELLOW, SOLID, 6"	0.09 GM	\$5,267.02	\$474.03

**Pavement Marking Subcomponent**

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	2
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	2

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
706-3	RETRO-REFLECTIVE/RAISED PAVEMENT MARKERS	658.00	EA	\$4.60	\$3,026.80
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	3.25	GM	\$1,109.96	\$3,607.37
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	3.25	GM	\$503.80	\$1,637.35
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	3.25	GM	\$1,612.89	\$5,241.89
<b>Roadway Component Total</b>					<b>\$1,448,716.49</b>

**SHOULDER COMPONENT****User Input Data**

Description	Value
Total Outside Shoulder Width L/R	8.00 / 8.00
Total Outside Shoulder Perf. Turf Width L/R	2.67 / 2.67
Paved Outside Shoulder Width L/R	4.00 / 4.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\bar{i}$ $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
327-70-11		7,621.97	SY	\$4.32	\$32,926.91

	MILLING EXIST ASPH PAVT,2 1/4" AVG DEPTH			
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	628.81 TN	\$128.70	\$80,927.85
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	304.88 TN	\$160.28	\$48,866.17
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	3.25 GM	\$1,975.21	\$6,419.43
570-1-2	PERFORMANCE TURF, SOD	5,087.67 SY	\$3.76	\$19,129.64

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	220.00 SY	\$8.20	\$1,804.00
285-702	OPTIONAL BASE,BASE GROUP 02	132.00 SY	\$24.93	\$3,290.76
285-709	OPTIONAL BASE,BASE GROUP 09	87.00 SY	\$34.38	\$2,991.06
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6"	54.00 SY	\$59.37	\$3,205.98
527-2	DETECTABLE WARNINGS	60.00 SF	\$29.29	\$1,757.40

**Erosion Control****Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	8,575.00 LF	\$1.85	\$15,863.75
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	162.40 LF	\$7.02	\$1,140.05
104-18	INLET PROTECTION SYSTEM	7.00 EA	\$151.06	\$1,057.42
107-1	LITTER REMOVAL	11.81 AC	\$39.32	\$464.37
107-2	MOWING	11.81 AC	\$64.25	\$758.79

**Shoulder Component Total**

\$220,603.58

**MEDIAN COMPONENT****User Input Data**

Description	Value
Total Median Width	40.00
Performance Turf Width	5.34
Total Median Shoulder Width L/R	8.00 / 8.00
Paved Median Shoulder Width L/R	4.00 / 4.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\bar{i}$ $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-11	MILLING EXIST ASPH PAVT,2 1/4" AVG DEPTH	7,621.97 SY	\$4.32	\$32,926.91
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	628.81 TN	\$128.70	\$80,927.85
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	304.88 TN	\$160.28	\$48,866.17
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	3.00 GM	\$1,975.21	\$5,925.63
570-1-2	PERFORMANCE TURF, SOD	5,087.67 SY	\$3.76	\$19,129.64

**Median Component Total**

\$187,776.20

**SIGNING COMPONENT****Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	15.00	AS	\$358.94	\$5,384.10
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	15.00	AS	\$1,358.35	\$20,375.25
700-1-50	SINGLE POST SIGN, RELOCATE	2.00	AS	\$252.58	\$505.16
700-1-60	SINGLE POST SIGN, REMOVE	14.00	AS	\$28.21	\$394.94

**Signing Component Total**

\$26,659.45

**SIGNALIZATIONS COMPONENT****Signalization 1**

Description	Value
Type	Miscellaneous
Multiplier	1
Description	

**X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	150.00	LF	\$8.48	\$1,272.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	12.00	EA	\$761.64	\$9,139.68
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	6.00	EA	\$1,378.82	\$8,272.92
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	6.00	AS	\$654.58	\$3,927.48
660-2-102	LOOP ASSEMBLY, F&I, TYPE B	4.00	AS	\$903.79	\$3,615.16
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	3.00	AS	\$1,018.08	\$3,054.24
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	6.00	EA	\$248.21	\$1,489.26

**Signalizations Component Total**

\$30,770.74

**LIGHTING COMPONENT****Rural Lighting Subcomponent**

Description	Value
Multiplier (Number of Poles)	6

**Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,200.00	LF	\$8.48	\$10,176.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	6.00	EA	\$761.64	\$4,569.84
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	3,600.00	LF	\$2.21	\$7,956.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	6.00	EA	\$6,352.14	\$38,112.84
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	6.00	EA	\$635.76	\$3,814.56

**Subcomponent Total** \$64,629.24

**X-Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
715-7-11	LOAD CENTER, F&I, SECONDARY VOLTAGE	1.00	EA	\$15,855.52	\$15,855.52

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**Lighting Component Total** \$80,484.76

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**Sequence 3 Total** \$2,020,211.22

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**Sequence:** 4 WDR - Widen/Resurface, Divided, Rural**Net Length:** 0.894 MI  
4,720 LF**Description:** MP 15.939 to MP 16.833**EARTHWORK COMPONENT****User Input Data**

<b>Description</b>	<b>Value</b>
Standard Clearing and Grubbing Limits L/R	5.34 / 5.34
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	3.911
Top of Structural Course For Begin Section	102.00
Top of Structural Course For End Section	102.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Existing Front Slope L/R	6 to 1 / 6 to 1
Existing Median Slope L/R	6 to 1 / 6 to 1
Existing Median Shoulder Cross Slope L/R	5.00 % / 5.00 %
Existing Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Front Slope L/R	6 to 1 / 6 to 1
Median Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	5.00 % / 5.00 %
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
Roadway Cross Slope L/R	2.00 % / 2.00 %

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
110-1-1	CLEARING & GRUBBING	1.16	AC	\$12,000.00	\$13,920.00
120-2-2	BORROW EXCAVATION, TRUCK MEASURE	4,282.98	CY	\$44.05	\$188,665.27
<b>Earthwork Component Total</b>					<b>\$202,585.27</b>

**ROADWAY COMPONENT****User Input Data**

<b>Description</b>	<b>Value</b>
Number of Lanes	4
Existing Roadway Pavement Width L/R	24.00 / 24.00
Structural Spread Rate	220
Friction Course Spread Rate	80
Widened Outside Pavement Width L/R	0.00 / 0.00
Widened Inside Pavement Width L/R	0.00 / 0.00
Widened Structural Spread Rate	330
Widened Friction Course Spread Rate	80

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
327-70-15	MILLING EXIST ASPH PAVT, 2 3/4" AVG DEPTH	25,175.04	SY	\$3.71	\$93,399.40
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,769.25	TN	\$128.70	\$356,402.48
337-7-25	ASPH CONC FC, INC BIT, FC-5, PG76-22	1,007.00	TN	\$160.28	\$161,401.96

**X-Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
160-4	TYPE B STABILIZATION	80.00 SY	\$8.20	\$656.00
285-709	OPTIONAL BASE,BASE GROUP 09	91.00 SY	\$34.38	\$3,128.58
	<b>Comment:</b> Median widening at MP 16.63 and MP 16.62			
327-70-15	MILLING EXIST ASPH PAVT,2 3/4" AVG DEPTH	3,711.00 SY	\$3.71	\$13,767.81
	<b>Comment:</b> turn lanes - 1650' x 12' = 2200 SY Crossovers - 340' x 12' = 1511 SY Total 3711			
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	2,619.00 TN	\$128.70	\$337,065.30
	<b>Comment:</b> overbuild for superelevation correction (1991.7 TN) plus turn lanes 612.3) plus widening (15.0) total			
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	152.00 TN	\$160.28	\$24,362.56
	<b>Comment:</b> turn lanes/crossovers (148.4)and widening (3.6)			
701-18-101	PROFILED THER,STANDARD- ASPHALT, WH SO 6	0.89 GM	\$5,542.86	\$4,933.15
701-18-201	PROFILED THER,STANDARD- ASPHALT, YE SO 6	0.89 GM	\$5,898.16	\$5,249.36
710-11-123	PAINTED PAVT MARK,STD,WHITE,SOLID, 12"	570.00 LF	\$1.73	\$986.10
	<b>Comment:</b> Crosswalks at Palm Coast Pkwy			
710-11-125	PAINTED PAVT MARK,STD,WHITE,SOLID,24"	614.00 LF	\$2.11	\$1,295.54
	<b>Comment:</b> Palm Coast Pkwy			
711-11-123	THERMOPLASTIC, STD, WHITE, SOLID, 12"	570.00 LF	\$2.57	\$1,464.90
	<b>Comment:</b> Crosswalks at Palm Coast Pkwy			
711-11-124	THERMOPLASTIC, STD, WHITE, SOLID, 18"	22.00 LF	\$4.35	\$95.70
	<b>Comment:</b> Lt turn lane into Palm Coast Pkwy			
711-11-125	THERMOPLASTIC, STD, WHITE, SOLID, 24"	614.00 LF	\$6.19	\$3,800.66
	<b>Comment:</b> Palm Coast Pkwy			
711-11-170	THERMOPLASTIC, STD, WHITE, ARROW	24.00 EA	\$66.40	\$1,593.60
	<b>Comment:</b> Palm Coast Pkwy			

**Pavement Marking Subcomponent**

<b>Description</b>	<b>Value</b>
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	1
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	2

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
706-3	RETRO-REFLECTIVE/RAISED PAVEMENT MARKERS	362.00 EA	\$4.60	\$1,665.20
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	0.89 GM	\$1,109.96	\$987.86

710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	1.79 GM	\$503.80	\$901.80
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	1.79 GM	\$1,612.89	\$2,887.07
<b>Roadway Component Total</b>				<b>\$1,016,045.04</b>

**SHOULDER COMPONENT****User Input Data**

Description	Value
Existing Total Outside Shoulder Width L/R	8.00 / 8.00
New Total Outside Shoulder Width L/R	8.00 / 8.00
Total Outside Shoulder Perf. Turf Width L/R	2.67 / 2.67
Existing Paved Outside Shoulder Width L/R	4.00 / 4.00
New Paved Outside Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips 1/2No. of Sides	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
327-70-11	MILLING EXIST ASPH PAVT,2 1/4" AVG DEPTH	4,195.84 SY	\$4.32	\$18,126.03
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	346.16 TN	\$128.70	\$44,550.79
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	167.83 TN	\$160.28	\$26,899.79
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	1.79 GM	\$1,975.21	\$3,535.63
570-1-2	PERFORMANCE TURF, SOD	2,800.72 SY	\$3.76	\$10,530.71

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION <b>Comment:</b> 0.894mi*2*4ft=4195SY (new inside shoulders)	4,195.00 SY	\$8.20	\$34,399.00
522-2	CONCRETE SIDEWALK AND DRIVEWAYS, 6" <b>Comment:</b> QNTY file (32) plus raised traffic island (136)	168.00 SY	\$59.37	\$9,974.16
527-2	DETECTABLE WARNINGS <b>Comment:</b> Palm Coast Parkway	80.00 SF	\$29.29	\$2,343.20

**Erosion Control****Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	10,856.74 LF	\$1.85	\$20,084.97
104-11	FLOATING TURBIDITY BARRIER	89.40 LF	\$11.60	\$1,037.04
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	89.40 LF	\$7.02	\$627.59
104-15	SOIL TRACKING PREVENTION DEVICE	1.00 EA	\$3,118.00	\$3,118.00
107-1	LITTER REMOVAL	6.50 AC	\$39.32	\$255.58
107-2	MOWING	6.50 AC	\$64.25	\$417.62

**Shoulder Component Total**

\$175,900.12

**MEDIAN COMPONENT****User Input Data**

<b>Description</b>	<b>Value</b>
Total Median Width	40.00
Performance Turf Width	8.00
New Total Median Shoulder Width L/R	8.00 / 8.00
New Paved Median Shoulder Width L/R	4.00 / 4.00
Existing Total Median Shoulder Width L/R	6.00 / 6.00
Existing Paved Median Shoulder Width L/R	0.00 / 0.00
Structural Spread Rate	110
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips 1/2 No. of Sides	2

**Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
285-701	OPTIONAL BASE,BASE GROUP 01	4,542.00	SY	\$25.08	\$113,913.36
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	230.77	TN	\$128.70	\$29,700.10
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	167.83	TN	\$160.28	\$26,899.79
546-72-2	GROUND-IN RUMBLE STRIPS, 8" CYL	2.00	GM	\$1,975.21	\$3,950.42
570-1-2	PERFORMANCE TURF, SOD	4,195.84	SY	\$3.76	\$15,776.36
<b>Median Component Total</b>					<b>\$190,240.03</b>

**DRAINAGE COMPONENT****Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
400-2-2	CONC CLASS II, ENDWALLS	16.09	CY	\$1,501.49	\$24,158.97
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	720.00	LF	\$98.07	\$70,610.40
430-175-136	PIPE CULV, OPT MATL, ROUND, 36"S/CD	72.00	LF	\$150.20	\$10,814.40
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	36.00	EA	\$1,691.68	\$60,900.48
570-1-1	PERFORMANCE TURF	629.38	SY	\$1.82	\$1,145.47
<b>Drainage Component Total</b>					<b>\$167,629.72</b>

**SIGNING COMPONENT****Pay Items**

<b>Pay item</b>	<b>Description</b>	<b>Quantity</b>	<b>Unit</b>	<b>Unit Price</b>	<b>Extended Amount</b>
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	2.00	AS	\$358.94	\$717.88
700-1-12	SINGLE POST SIGN, F&I GM, 12-20 SF	22.00	AS	\$1,358.35	\$29,883.70
700-1-50	SINGLE POST SIGN, RELOCATE	2.00	AS	\$252.58	\$505.16
700-1-60	SINGLE POST SIGN, REMOVE	22.00	AS	\$28.21	\$620.62

700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	2.00 AS	\$4,662.87	\$9,325.74
700-2-60	MULTI- POST SIGN, REMOVE	2.00 AS	\$625.35	\$1,250.70
<b>Signing Component Total</b>				<b>\$42,303.80</b>

### SIGNALIZATIONS COMPONENT

#### Signalization 1

<b>Description</b>	<b>Value</b>
Type	Miscellaneous
Multiplier	1
Description	

#### X-Items

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	200.00 LF	\$8.48	\$1,696.00
630-2-12	CONDUIT, F& I, DIRECTIONAL BORE	200.00 LF	\$22.04	\$4,408.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	8.00 EA	\$761.64	\$6,093.12
646-1-11	ALUMINUM SIGNALS POLE, PEDESTAL	8.00 EA	\$1,378.82	\$11,030.56
650-1-60	VEH TRAF SIGNAL, REMOVE-POLES TO REMAIN	1.00 AS	\$108.25	\$108.25
650-2-102	VEHIC SIGNAL AUX, REP/RETROFIT- F&I, BAC	7.00 EA	\$328.91	\$2,302.37
653-1-11	PEDESTRIAN SIGNAL, F&I LED COUNT, 1 WAY	8.00 AS	\$654.58	\$5,236.64
660-2-102	LOOP ASSEMBLY, F&I, TYPE B	4.00 AS	\$903.79	\$3,615.16
660-2-106	LOOP ASSEMBLY, F&I, TYPE F	1.00 AS	\$1,018.08	\$1,018.08
665-1-11	PEDESTRIAN DETECTOR, F&I, STANDARD	8.00 EA	\$248.21	\$1,985.68
670-5-111	TRAF CNTL ASSEM, F&I, NEMA, 1 PREEMPT	1.00 AS	\$28,829.47	\$28,829.47
<b>Signalizations Component Total</b>				<b>\$66,323.33</b>

### LIGHTING COMPONENT

#### Rural Lighting Subcomponent

<b>Description</b>	<b>Value</b>			
Multiplier (Number of Poles)	6			
<b>Pay Items</b>				
Pay item	Description	Quantity Unit	Unit Price	Extended Amount
630-2-11	CONDUIT, F& I, OPEN TRENCH	1,500.00 LF	\$8.48	\$12,720.00
635-2-11	PULL & SPLICE BOX, F&I, 13" x 24"	6.00 EA	\$761.64	\$4,569.84
715-1-13	LIGHTING CONDUCTORS, F&I, INSUL, NO.4-2	3,600.00 LF	\$2.21	\$7,956.00
715-4-14	LIGHT POLE COMPLETE, F&I-STD, 45'	6.00 EA	\$6,352.14	\$38,112.84
715-500-1	POLE CABLE DIST SYS, CONVENTIONAL	6.00 EA	\$635.76	\$3,814.56
<b>Subcomponent Total</b>				<b>\$67,173.24</b>

**X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
715-7-11	LOAD CENTER, F&I, SECONDARY VOLTAGE	1.00	EA	\$15,855.52	\$15,855.52
<b>Lighting Component Total</b>					<b>\$83,028.76</b>

**BRIDGES COMPONENT****Bridge 730043**

Description	Value
Estimate Type	SF Estimate
Primary Estimate	YES
Type	Misc/Rehab
Structure No.	
Description	

**Bridge X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-153	NON SHRINK GROUT, F&I, MISCELLANEOUS- RE <b>Comment:</b> Bridge 730043	500.00	CF	\$382.73	\$191,365.00
458-1-21	BRIDGE DECK EXPANSION JNT, REHAB,POURED <b>Comment:</b> Bridges 730043, 730006	280.00	LF	\$64.47	\$18,051.60
530-3-3	RIPRAP- RUBBLE, BANK AND SHORE <b>Comment:</b> 1000ft 3 * 2.3 * 62.4 * 0.9 = 64.6 TN	64.60	TN	\$153.48	\$9,914.81
<b>Bridge 730043 Total</b>					<b>\$219,331.41</b>
<b>Bridges Component Total</b>					<b>\$219,331.41</b>

<b>Sequence 4 Total</b>					<b>\$2,163,387.48</b>
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Date: 5/20/2020 2:00:37 PM

## FDOT Long Range Estimating System - Production

### R3: Project Details by Sequence Report

Project: 445216-1-52-01

Letting Date: 01/2099

**Description:** Section 73010000 MP 10.867 to MP 16.833. SR 5 from E Woodland Ave to St Joes Canal Bridge.

District: 05 County: 73 FLAGLER

Market Area: 07 Units: English

Contract Class: Lump Sum Project: N

Design/Build: N Project Length: 5.966 MI

Project Manager: AAA/HNTB-MO

**Version 1-P Project Grand Total****\$12,691,095.22**

**Description:** Section 73010000 MP 10.867 to MP 16.833. SR 5 from E Woodland Ave to St Joes Canal Bridge.

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<b>Project Sequences Subtotal</b>		<b>\$9,440,601.66</b>
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102-1	Maintenance of Traffic	10.00 %	\$944,060.17
101-1	Mobilization	10.00 %	\$1,038,466.18

<b>Project Sequences Total</b>		<b>\$11,423,128.01</b>
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Project Unknowns	10.00 %	\$1,142,312.80
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**Justification for high %:** Standard percentages for MOT, MOB. 10% Unknowns for drainage work, ditch grading, superelevation/cross slope correction, paved shoulder construction.

Design/Build	0.00 %	\$0.00
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**Non-Bid Components:**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	\$125,654.41	\$125,654.41

<b>Project Non-Bid Subtotal</b>		<b>\$125,654.41</b>
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**Version 1-P Project Grand Total****\$12,691,095.22**

**SR 5 (445216-1) Collision Summary**  
**MP 10.867 to MP 16.833**  
**Analysis Period 2013-2017**

Summary Of Data								
Total # of Crashes	Fatal	Injuries	Most Common Type of Crash	Occurred at Night	Wet Roadway	Pedestrian	Bicycle	Angle
156	4	81	Rear End	47	32	2	1	11
100%	3%	52%	25%	30%	21%	1%	1%	7%
Animal	Head On	Left Turn	Out Of Control	Other	Rear End	Right Turn	Rollover	Sideswipe
10	2	15	23	24	39	0	18	11
6%	1%	10%	15%	15%	25%	0%	12%	7%

Summary Of Fatalites						
No.	HSMV Report Number	Location MP	Crash Date	Crash Type	Alcohol Related?	Drug Related?
32	838794230	12.248	7/10/2016	Pedestrian	No	No
34	838790010	12.292	1/13/2013	Out of Control	No	No
85	832638750	13.884	5/18/2013	Out of Control	No	Yes
114	855723550	15.529	12/22/2017	Hit Tree	Yes	Yes

Summary Of Bike & Peds						
No.	HSMV Report Number	Location MP	Crash Date	Crash Type	Alcohol Related?	Drug Related?
17	838793460	11.677	12/11/2015	Bicycle	No	No
32	838794230	12.248	7/10/2016	Pedestrian	No	No
149	859292740	16.655	6/28/2015	Pedestrian	No	No

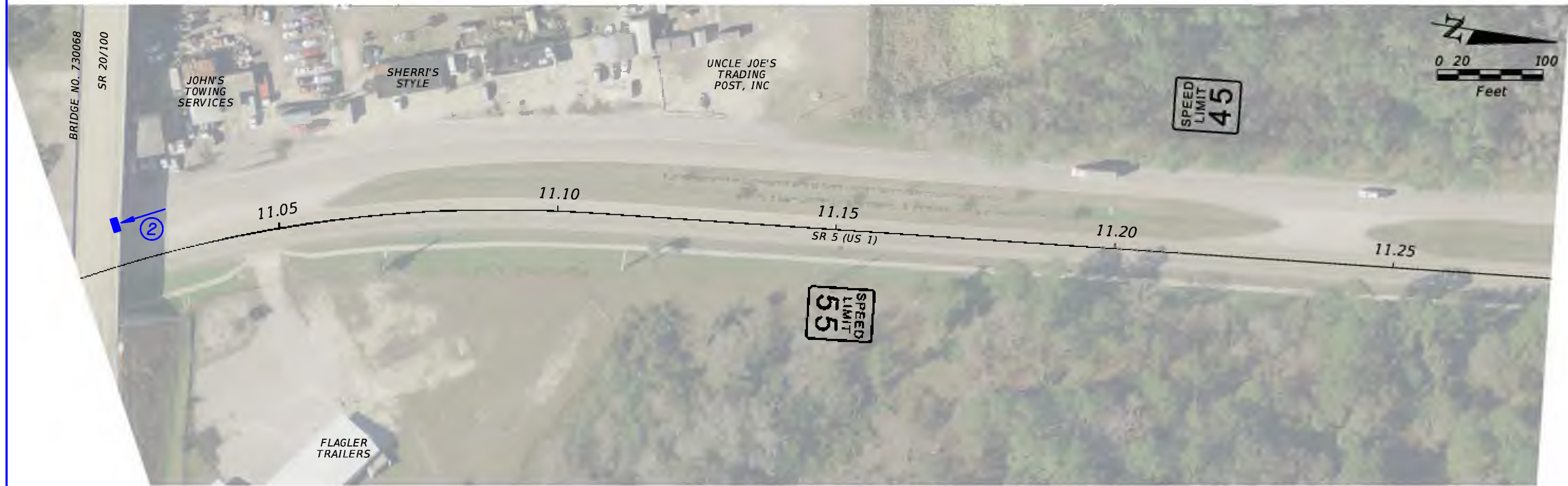
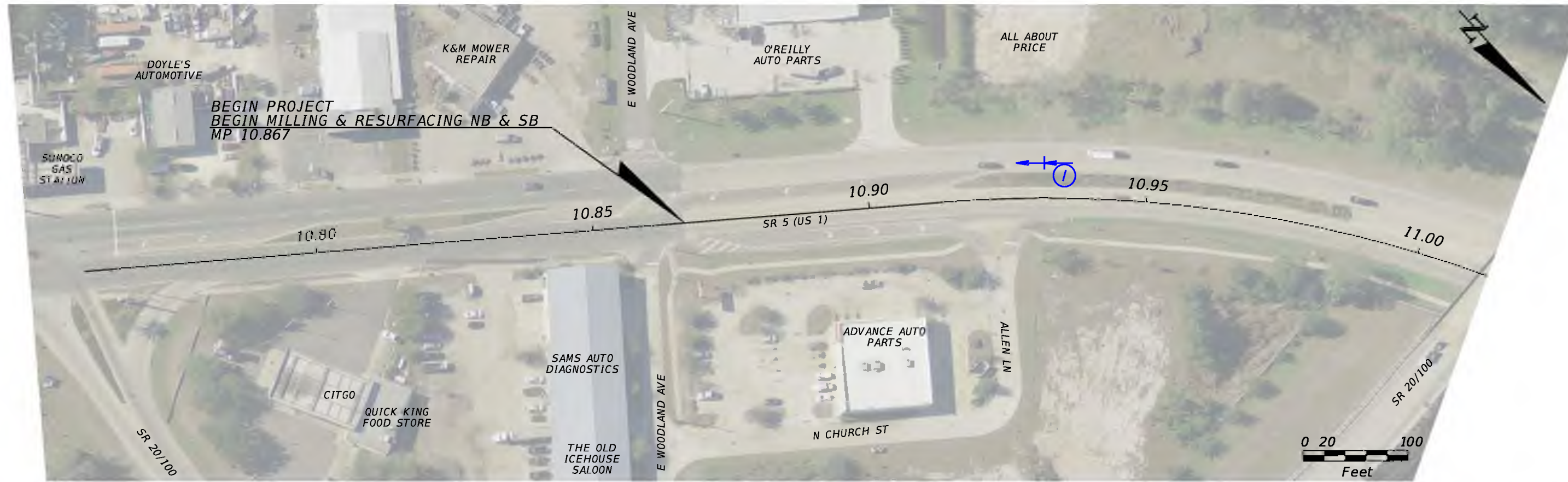
**SR 5 (445216-1) Collision Summary**  
**MP 10.867 to MP 16.833**  
**Analysis Period 2013-2017**

No.	HSMV Number	Location MP	Date	Severity		Crash Type	Day/Night	Wet/Dry
				Fatal	Injuries			
1	838794340	10.932	8/15/2016	0	0	Rear End	Day	Dry
2	838790750	11.023	9/7/2013	0	0	Hit Rock	Day	Dry
3	838794460	11.307	9/11/2016	0	1	Angle	Night	Dry
4	838792040	11.338	9/12/2014	0	1	Rollover	Day	Dry
5	838792660	11.355	4/22/2015	0	1	Rear End	Day	Dry
6	838793170	11.355	9/18/2015	0	0	Rear End	Day	Wet
7	838792300	11.358	12/25/2014	0	0	Out of Control	Night	Dry
8	838791370	11.403	3/12/2014	0	2	Rear End	Night	Wet
9	838790660	11.451	8/17/2013	0	2	Hydroplane	Night	Wet
10	838793670	11.549	2/2/2016	0	0	Hit Tree	Night	Dry
11	868001580	11.585	11/10/2016	0	1	Rear End	Day	Dry
12	869216910	11.591	2/28/2017	0	0	Out of Control	Night	Dry
13	838794390	11.648	8/18/2016	0	0	Sideswipe	Day	Dry
14	838794080	11.672	4/26/2016	0	1	Angle	Day	Dry
15	838793150	11.673	9/12/2015	0	2	Angle	Night	Dry
16	838790740	11.673	9/6/2013	0	1	Angle	Day	Wet
17	838793460	11.677	12/11/2015	0	1	Bicycle	Day	Dry
18	838792470	11.685	3/10/2015	0	1	Angle	Day	Dry
19	838792610	11.691	4/9/2015	0	0	Rear End	Day	Dry
20	838790770	11.697	9/10/2013	0	1	Out of Control	Night	Dry
21	838792280	11.701	12/19/2014	0	0	Rear End	Night	Dry
22	838792370	11.701	1/27/2015	0	1	Rear End	Day	Dry
23	838791230	11.715	1/30/2014	0	0	Out of Control	Night	Wet
24	838793890	11.795	3/26/2016	0	0	Out of Control	Night	Wet
25	838793540	11.973	12/28/2015	0	0	Rear End	Day	Dry
26	823517570	12.049	3/24/2014	0	1	Rear End	Night	Dry
27	838791910	12.052	7/27/2014	0	1	Out of Control	Day	Dry
28	838792070	12.055	9/23/2014	0	0	Sideswipe	Day	Dry
29	838792220	12.088	12/6/2014	0	0	Out of Control	Night	Dry
30	838794530	12.156	9/18/2016	0	0	Hit Tree	Night	Dry
31	838792440	12.183	3/6/2015	0	0	Rear End	Night	Wet
32	838794230	12.248	7/10/2016	1	2	Pedestrian	Day	Dry
33	838791960	12.261	8/22/2014	0	2	Rear End	Day	Dry
34	838790010	12.292	1/13/2013	1	0	Out of Control	Day	Dry
35	823484950	12.412	4/18/2013	0	1	Animal	Night	Dry
36	838794430	12.427	9/7/2016	0	0	Out of Control	Day	Dry
37	838792980	12.442	7/24/2015	0	1	Rollover	Night	Unknown
38	838793780	12.457	3/11/2016	0	1	Out of Control	Day	Mud, Dirt, Gravel
39	863398990	12.528	1/26/2016	0	0	Rollover	Day	Dry
40	838792990	12.538	7/28/2015	0	0	Rollover	Day	Wet
41	838793880	12.588	3/25/2016	0	0	Hit Tree	Day	Wet
42	838791900	12.588	7/25/2014	0	0	Hit Tree	Day	Dry
43	838791120	12.645	12/24/2013	0	1	Rear End	Day	Dry

No.	HSMV Number	Location MP	Date	Severity		Crash Type	Day/Night	Wet/Dry
				Fatal	Injuries			
44	828944300	12.723	5/9/2013	0	3	Rear End	Day	Dry
45	850199880	12.737	10/2/2014	0	0	Backed Into	Day	Dry
46	845772400	12.738	6/12/2014	0	0	Rear End	Day	Dry
47	850203200	12.738	11/16/2014	0	0	Rear End	Day	Dry
48	859305590	12.738	11/13/2015	0	1	Rear End	Day	Dry
49	838794000	12.738	4/15/2016	0	1	Rear End	Night	Wet
50	863407840	12.739	4/25/2016	0	0	Out of Control	Day	Dry
51	840183220	12.749	9/7/2013	0	1	Left Turn	Night	Dry
52	840194350	12.749	12/31/2013	0	0	Left Turn	Night	Dry
53	838792290	12.749	12/23/2014	0	0	Left Turn	Day	Dry
54	845770850	12.749	5/19/2014	0	1	Left Turn	Day	Dry
55	851655250	12.749	9/28/2015	0	0	Left Turn	Day	Dry
56	859287640	12.749	4/23/2015	0	2	Left Turn	Night	Dry
57	859299860	12.749	9/10/2015	0	1	Left Turn	Night	Dry
58	859300290	12.749	9/14/2015	0	2	Left Turn	Day	Dry
59	863420560	12.749	9/27/2016	0	0	Left Turn	Day	Dry
60	868001670	12.749	12/23/2016	0	2	Left Turn	Night	Dry
61	828863950	12.762	2/19/2013	0	0	Hit Control Box	Night	Dry
62	869214810	12.762	1/13/2017	0	1	Hit Pole	Night	Wet
63	838793980	12.771	4/7/2016	0	0	Rear End	Day	Dry
64	838217580	12.788	5/24/2015	0	3	Sideswipe	Day	Dry
65	845775130	12.799	7/11/2014	0	1	Out of Control	Day	Dry
66	845773310	12.802	6/22/2014	0	0	Hit Tree	Day	Wet
67	859292140	12.819	6/19/2015	0	0	Hit Metal	Day	Dry
68	838790390	12.907	5/20/2013	0	0	Head On	Night	Wet
69	859287830	12.922	4/30/2015	0	0	Animal	Day	Wet
70	840182390	12.945	7/14/2013	0	1	Animal	Night	Dry
71	850198480	12.995	9/23/2014	0	0	Hit Tree	Night	Wet
72	850198660	13.241	9/24/2014	0	0	Animal	Day	Dry
73	838790970	13.451	11/7/2013	0	2	Angle	Day	Dry
74	838792880	13.472	6/26/2015	0	0	Sideswipe	Day	Wet
75	838793850	13.486	3/24/2016	0	0	Out of Control	Night	Dry
76	863416470	13.578	8/13/2016	0	0	Out of Control	Day	Dry
77	836648250	13.588	9/1/2013	0	1	Hit Tree	Day	Dry
78	853658040	13.615	11/7/2016	0	1	Rear End	Night	Dry
79	851714090	13.689	8/8/2016	0	2	Rear End	Day	Dry
80	863397550	13.701	1/2/2016	0	0	Animal	Day	Dry
81	868001590	13.709	11/21/2016	0	0	Angle	Night	Dry
82	863414280	13.723	7/12/2016	0	0	Out of Control	Night	Dry
83	823484670	13.758	4/8/2013	0	0	Rollover	Night	Dry
84	863421240	13.758	10/5/2016	0	3	Rollover	Day	Wet
85	832638750	13.884	5/18/2013	1	0	Out of Control	Night	Dry
86	863420860	14.127	10/4/2016	0	0	Rollover	Day	Dry
87	845524240	14.392	4/8/2016	0	1	Rollover	Day	Dry
88	851713640	14.449	9/2/2015	0	0	Hit Tree	Day	Wet
89	863409050	14.449	5/6/2016	0	0	Hit Tree	Day	Dry
90	869214150	14.505	12/29/2016	0	0	Rear End	Day	Wet

No.	HSMV Number	Location MP	Date	Severity		Crash Type	Day/Night	Wet/Dry
				Fatal	Injuries			
91	869214970	14.505	1/20/2017	0	2	Rear End	Night	Dry
92	859290480	14.523	6/1/2015	0	3	Left Turn	Day	Dry
93	859295850	14.523	7/24/2015	0	3	Left Turn	Day	Dry
94	863411720	14.523	6/6/2016	0	1	Left Turn	Night	Wet
95	859303180	14.533	10/13/2015	0	2	Angle	Night	Dry
96	863408870	14.535	5/7/2016	0	0	Out of Control	Night	Dry
97	823518850	14.537	12/16/2013	0	1	Rear End	Day	Dry
98	863396930	14.539	12/24/2015	0	0	Sideswipe	Night	Dry
99	848600090	14.541	8/17/2015	0	3	Rear End	Day	Wet
100	863420850	14.571	10/4/2016	0	1	Sideswipe	Day	Dry
101	854364600	14.595	10/8/2017	0	2	Head On	Night	Wet
102	838217280	14.775	11/9/2014	0	1	Sideswipe	Night	Dry
103	863415110	14.776	7/25/2016	0	1	Hit Pole	Night	Dry
104	850197540	14.787	9/12/2014	0	1	Rear End	Day	Dry
105	853015890	14.788	6/16/2016	0	2	Left Turn	Day	Dry
106	845768380	14.788	4/23/2014	0	2	Left Turn	Day	Dry
107	859302400	14.791	9/23/2015	0	0	Sideswipe	Day	Dry
108	836484010	14.838	11/26/2013	0	1	Rollover	Night	Wet
109	823492440	14.884	4/12/2013	0	1	Rollover	Day	Dry
110	840181720	15.009	6/6/2013	0	0	Rollover	Day	Dry
111	833399960	15.022	7/9/2013	0	1	Hit Pole	Night	Dry
112	853119600	15.036	6/4/2016	0	1	Rollover	Night	Dry
113	863407960	15.069	4/21/2016	0	0	Hit Mower	Day	Dry
114	855723550	15.529	12/22/2017	1	0	Hit Tree	Day	Dry
115	850137470	15.629	9/5/2014	0	0	Animal	Night	Wet
116	851312510	15.633	6/21/2015	0	3	Rear End	Night	Dry
117	840183330	15.678	8/9/2013	0	1	Out of Control	Day	Dry
118	863411830	15.789	6/12/2016	0	1	Rollover	Night	Dry
119	840180120	15.869	8/15/2013	0	0	Rollover	Day	Dry
120	832754560	15.874	6/13/2013	0	1	Rollover	Day	Dry
121	840184520	15.968	12/19/2013	0	0	Animal	Night	Dry
122	838040140	16.238	6/4/2014	0	1	Hit Tree	Day	Dry
123	863396010	16.425	12/17/2015	0	1	Rollover	Day	Wet
124	850204630	16.448	12/5/2014	0	1	Rear End	Day	Dry
125	840197720	16.455	2/4/2015	0	0	Out of Control	Night	Dry
126	863397560	16.479	1/5/2016	0	1	Angle	Day	Dry
127	836235800	16.479	2/5/2013	0	2	Angle	Day	Dry
128	850199930	16.482	10/8/2014	0	0	Rear End	Day	Dry
129	833056340	16.502	2/9/2014	0	1	Sideswipe	Day	Dry
130	845765980	16.524	3/7/2014	0	1	Hit Tree	Day	Dry
131	845776130	16.587	7/20/2014	0	1	Rollover	Night	Dry
132	833056550	16.587	7/26/2014	0	0	Rollover	Day	Wet
133	863410490	16.607	5/17/2016	0	2	Rear End	Day	Wet
134	823518490	16.614	10/18/2013	0	4	Rear End	Day	Dry
135	863398300	16.614	1/15/2016	0	0	Rear End	Day	Wet
136	833056140	16.619	9/5/2013	0	0	Out of Control	Night	Dry
137	863422250	16.637	10/30/2016	0	0	Animal	Day	Dry

No.	HSMV Number	Location MP	Date	Severity		Crash Type	Day/Night	Wet/Dry
				Fatal	Injuries			
138	852497510	16.639	3/10/2016	0	0	Animal	Night	Dry
139	840194590	16.640	1/13/2014	0	1	Out of Control	Night	Wet
140	823492600	16.641	5/29/2013	0	1	Rear End	Night	Dry
141	833063850	16.641	3/27/2014	0	3	Rear End	Night	Dry
142	840195720	16.641	4/6/2014	0	0	Rear End	Day	Dry
143	850203360	16.641	11/13/2014	0	0	Rear End	Day	Dry
144	863421500	16.641	8/29/2016	0	1	Rear End	Day	Dry
145	845166470	16.642	9/17/2015	0	2	Hit Tree	Day	Wet
146	851655240	16.643	9/28/2015	0	1	Angle	Day	Dry
147	850203740	16.648	11/22/2014	0	1	Overturn	Day	Wet
148	863402450	16.649	3/1/2016	0	0	Backed Into	Day	Dry
149	859292740	16.655	6/28/2015	0	1	Pedestrian	Night	Dry
150	850214650	16.656	4/6/2015	0	0	Sideswipe	Day	Dry
151	840186180	16.657	5/13/2014	0	0	Rear End	Day	Dry
152	859293470	16.667	7/3/2015	0	0	Rear End	Day	Dry
153	840195240	16.674	3/15/2014	0	1	Out of Control	Day	Dry
154	863395010	16.722	12/5/2015	0	0	Animal	Night	Wet
155	836236430	16.733	2/21/2013	0	0	Sideswipe	Day	Dry
156	840196240	16.734	6/6/2014	0	0	Out of Control	Day	Dry



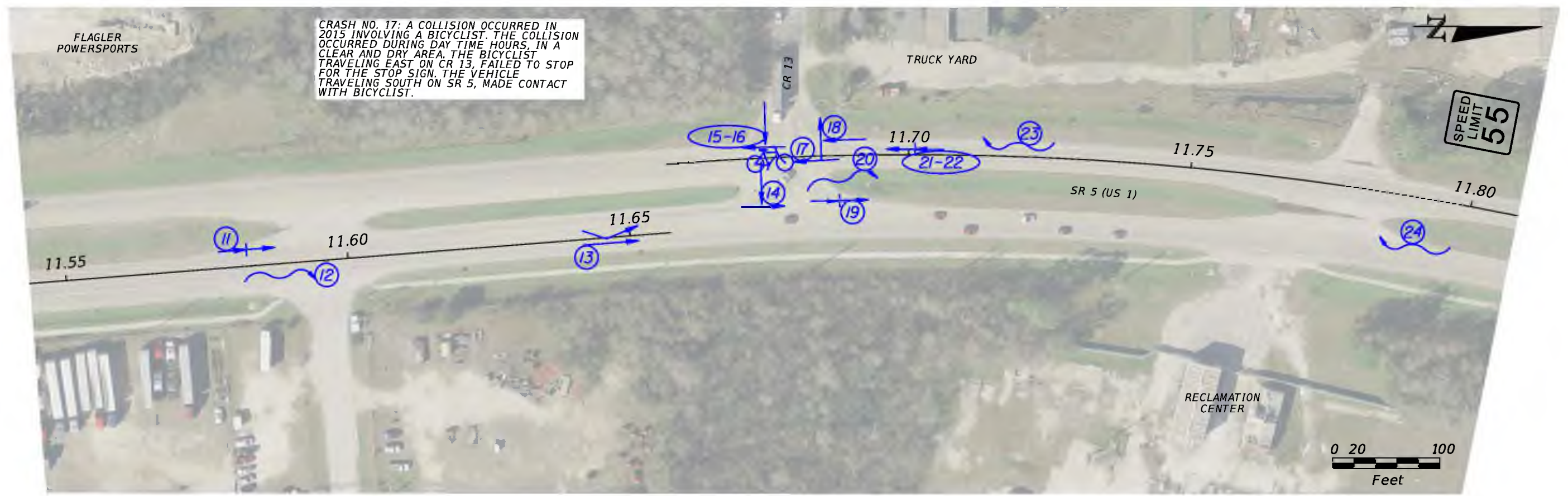
**COLLISION DIAGRAM LEGEND**

FATALITY CRASH	COLLISION W/ PED.	OVERTURNED VEHICLE	HIT SIGN COLLISION
REAR-END COLLISION	RIGHT ANGLE COLLISION	HIT BIKE COLLISION	RIGHT TURN COLLISION
SIDE SWIPE	LEFT TURN COLLISION	HIT MOVEABLE OBJECT COLLISION	HIT OTHER FIXED OBJECTS COLLISION
OUT OF CONTROL	BACKED INTO COLLISION	OTHER FIXED OBJECTS	

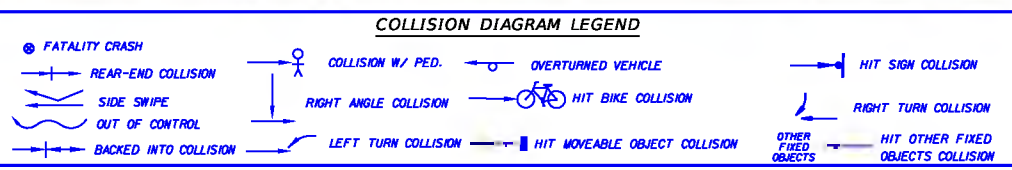
STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	FLAGLER	445216-1

**COLLISION DIAGRAM**

SHEET NO.  
1



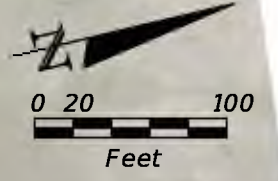
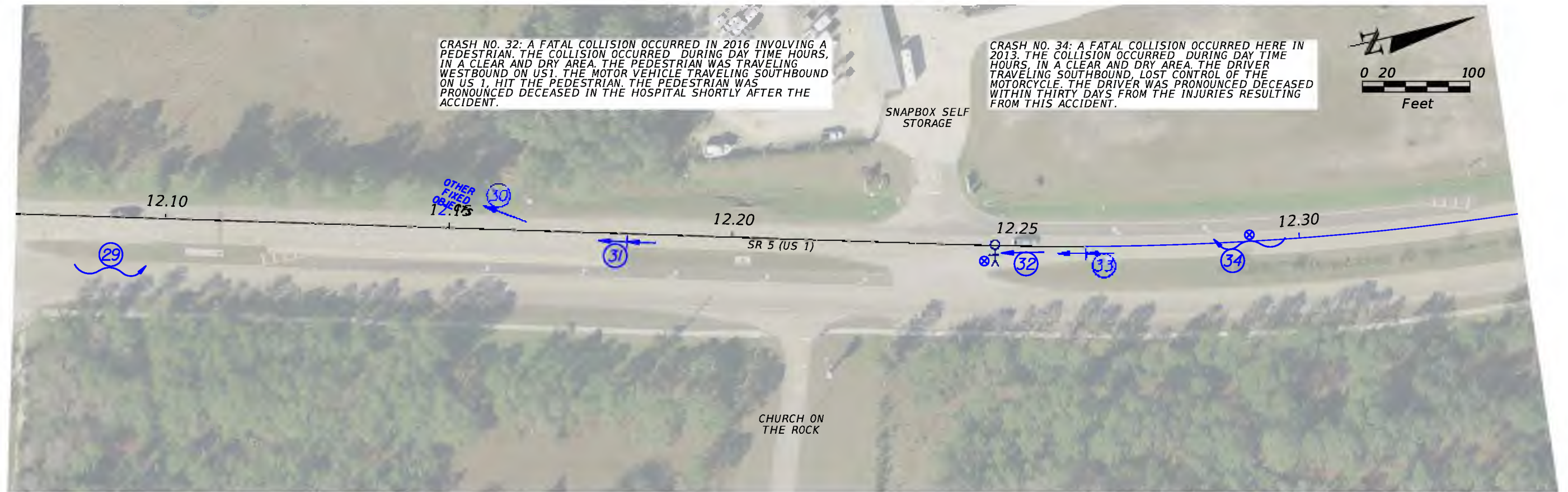
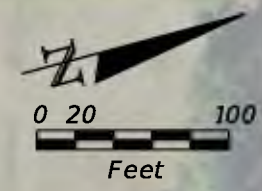
CRASH NO. 17: A COLLISION OCCURRED IN 2015 INVOLVING A BICYCLIST. THE COLLISION OCCURRED DURING DAY TIME HOURS, IN A CLEAR AND DRY AREA. THE BICYCLIST TRAVELING EAST ON CR 13, FAILED TO STOP FOR THE STOP SIGN. THE VEHICLE TRAVELING SOUTH ON SR 5, MADE CONTACT WITH BICYCLIST.



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**COLLISION DIAGRAM**

SHEET NO.  
2



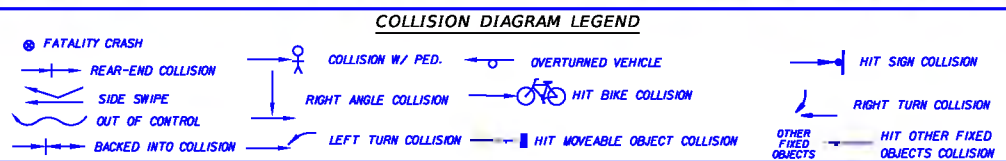
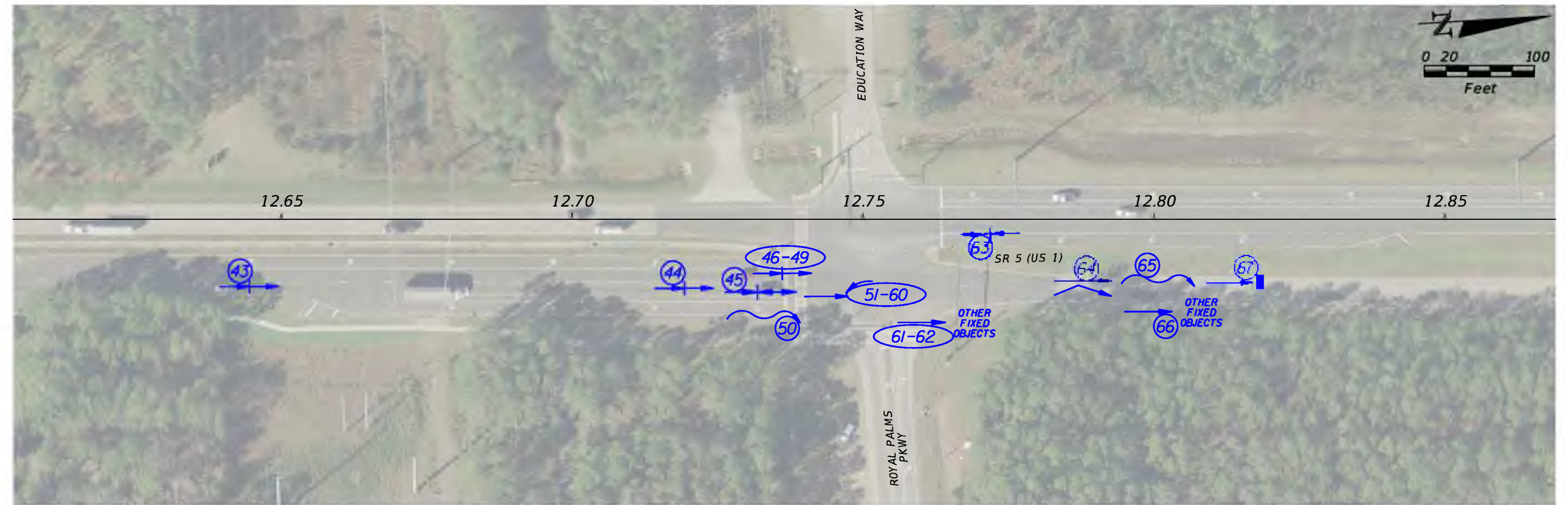
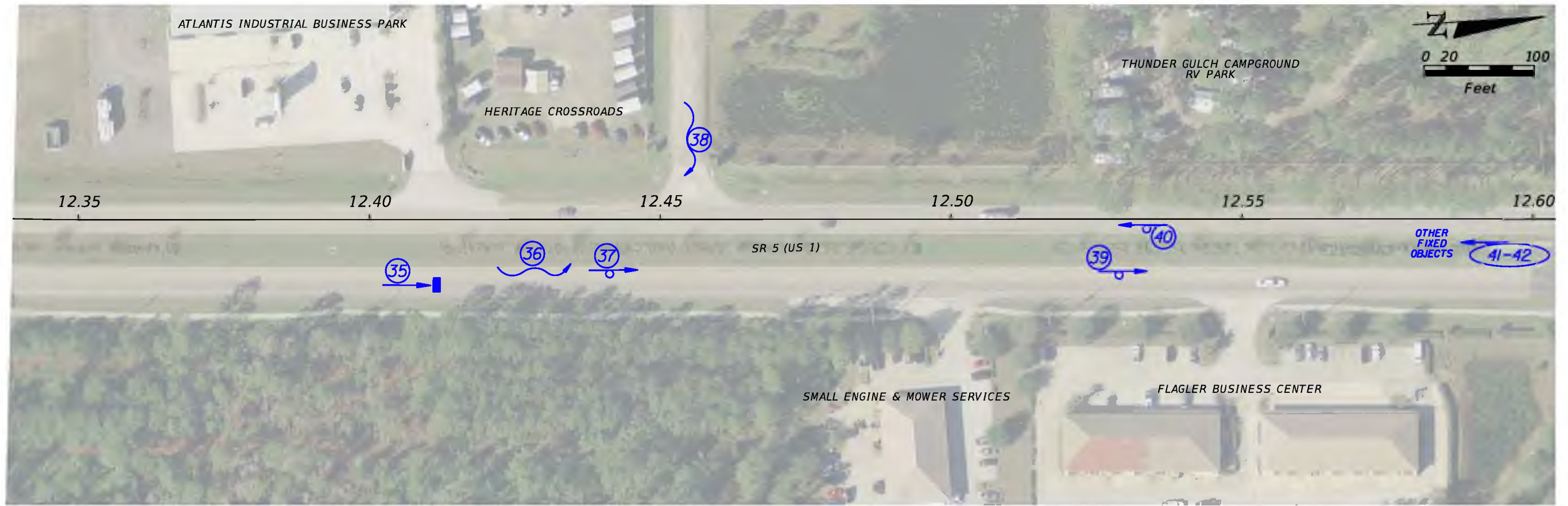
**COLLISION DIAGRAM LEGEND**

● FATALITY CRASH	—+— COLLISION W/ PED.	—○— OVERTURNED VEHICLE	—+— HIT SIGN COLLISION
—+— REAR-END COLLISION	—+— RIGHT ANGLE COLLISION	—○— HIT BIKE COLLISION	—+— RIGHT TURN COLLISION
—+— SIDE SWIPE	—+— LEFT TURN COLLISION	—+— HIT MOVEABLE OBJECT COLLISION	—+— HIT OTHER FIXED OBJECTS COLLISION
—+— OUT OF CONTROL	—+— BACKED INTO COLLISION		

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**COLLISION DIAGRAM**

SHEET NO.
3

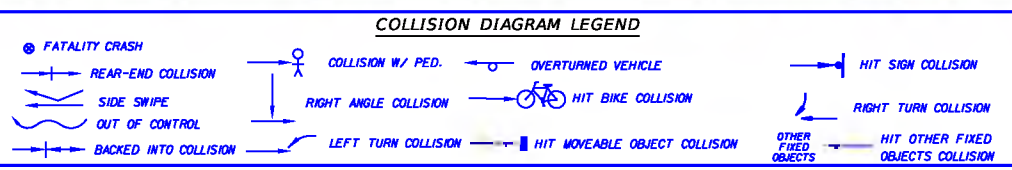
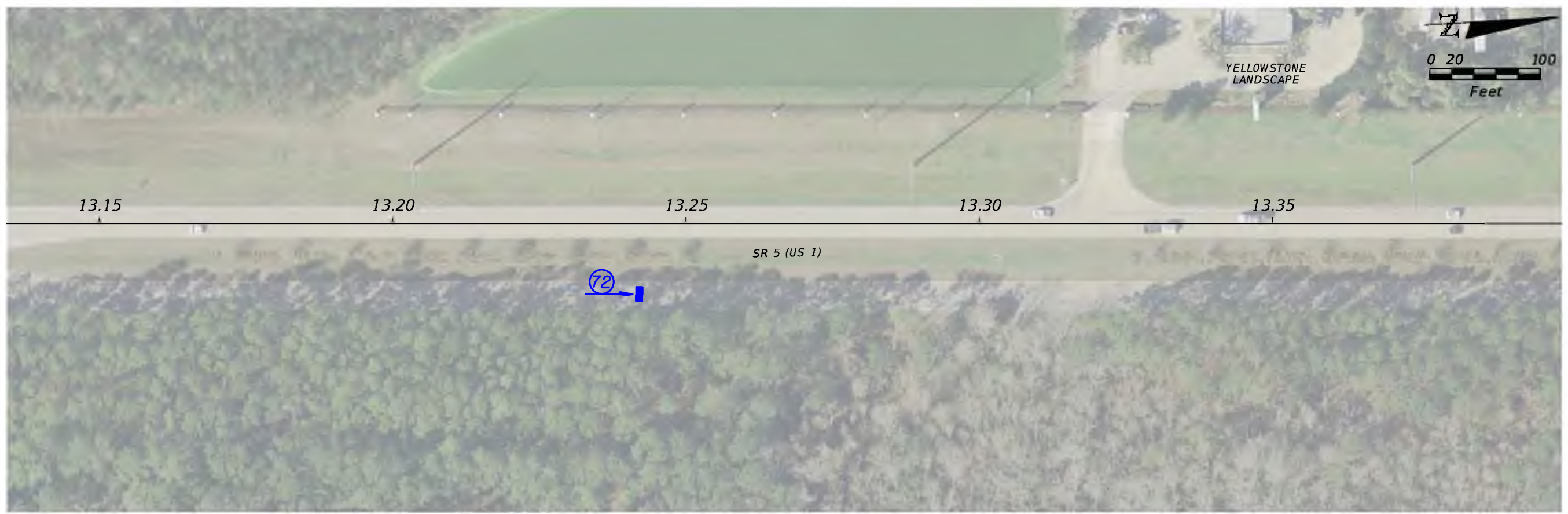


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ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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**COLLISION DIAGRAM**

SHEET NO.  
4

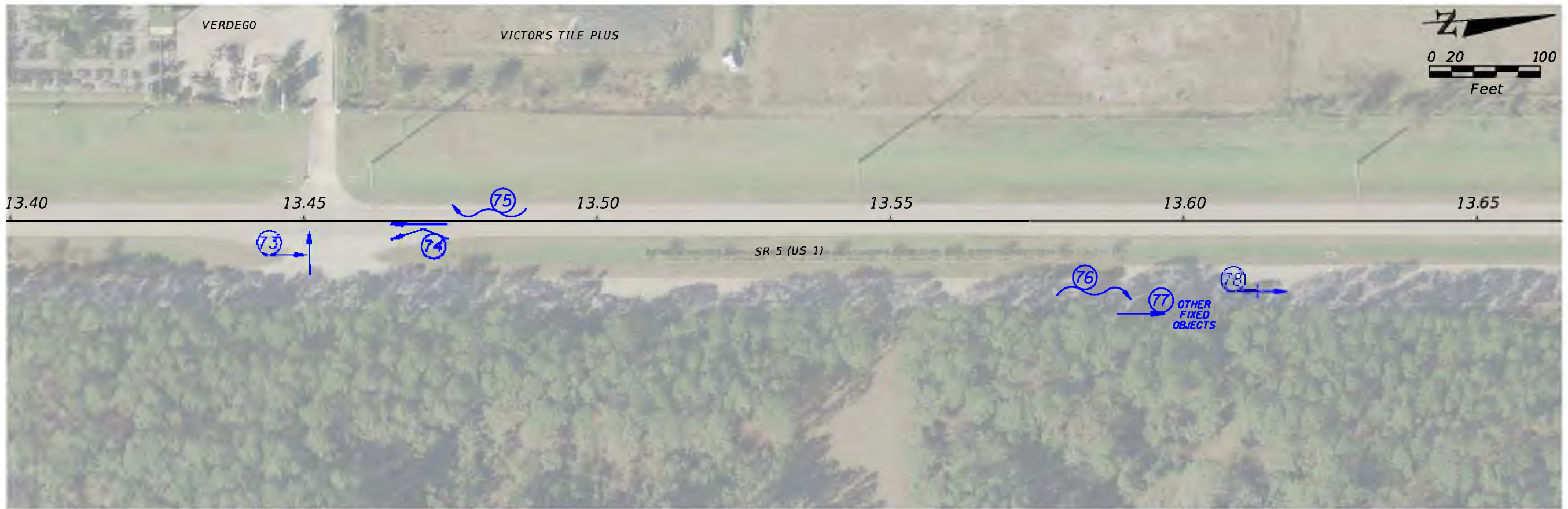
5:48:01 PM 5/24/2020 ddean



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
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**COLLISION DIAGRAM**

SHEET NO.  
5



CRASH NO. 85: A FATAL COLLISION OCCURRED HERE IN 2013 DURING NIGHT TIME HOURS, IN A CLEAR AND DRY AREA. THE VEHICLE TRAVELING NORTHBOUND ON US1, LOST CONTROL AND OVER-TURNED. THE PASSENGER WAS EJECTED FROM THE VEHICLE AND PRONOUNCED DECEASED AT THE SCENE. THE DRIVER WAS FOUND TO BE UNDER THE INFLUENCE.

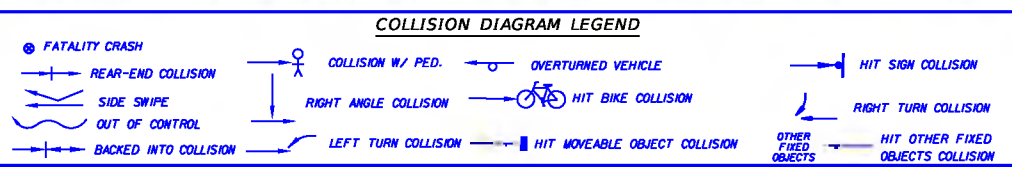
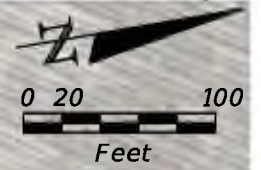
**COLLISION DIAGRAM LEGEND**

- FATALITY CRASH
- + REAR-END COLLISION
- SIDE SWIPE
- OUT OF CONTROL
- BACKED INTO COLLISION
- COLLISION W/ PED.
- RIGHT ANGLE COLLISION
- LEFT TURN COLLISION
- OVERTURNED VEHICLE
- HIT BIKE COLLISION
- HIT MOVEABLE OBJECT COLLISION
- HIT SIGN COLLISION
- RIGHT TURN COLLISION
- HIT OTHER FIXED OBJECTS COLLISION

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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**COLLISION DIAGRAM**

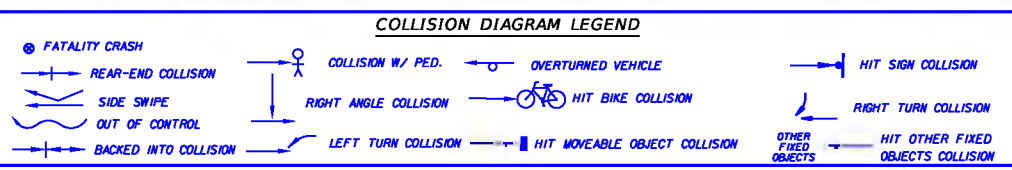
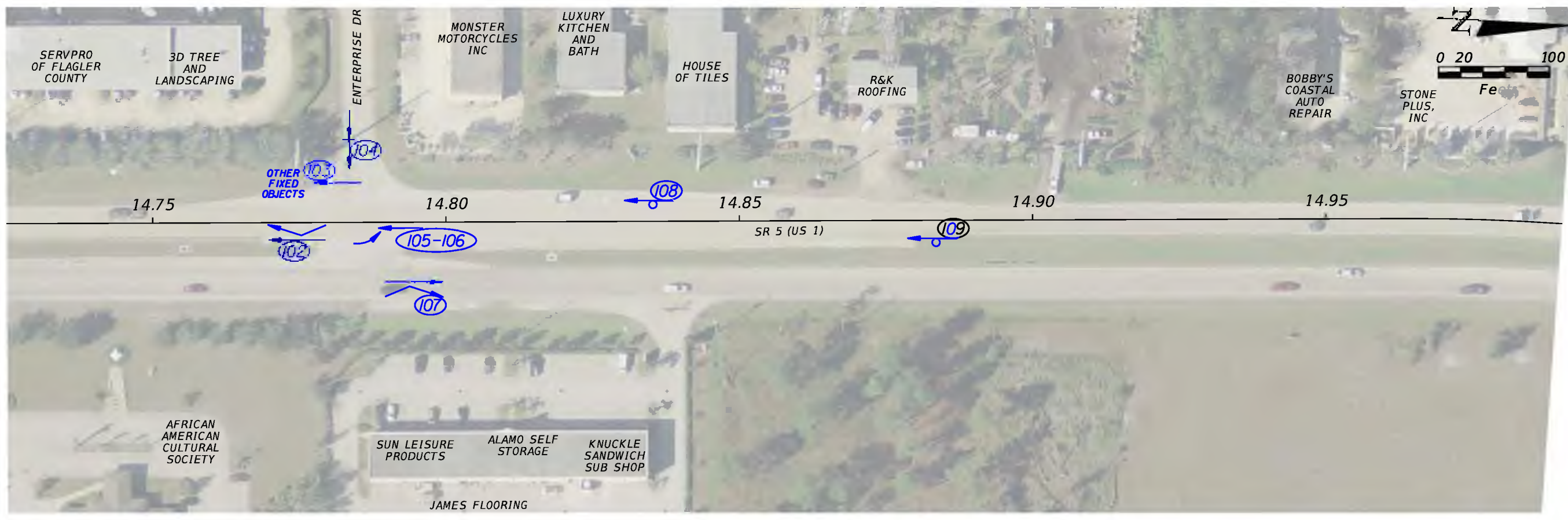
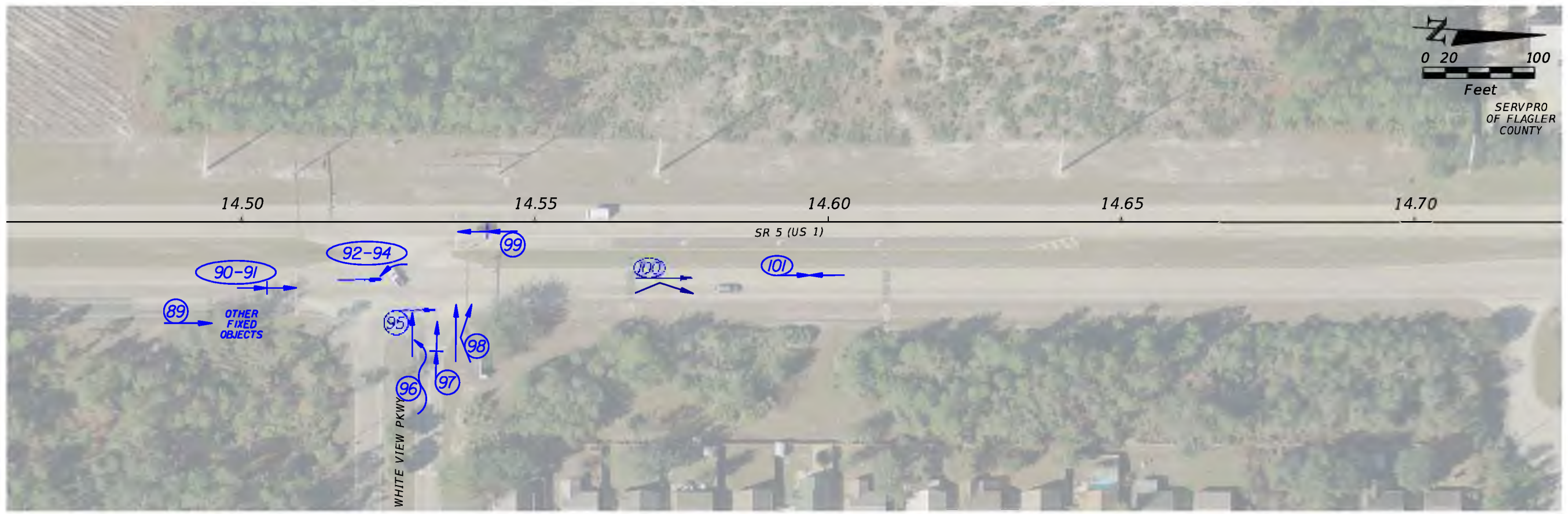
SHEET NO.  
6



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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**COLLISION DIAGRAM**

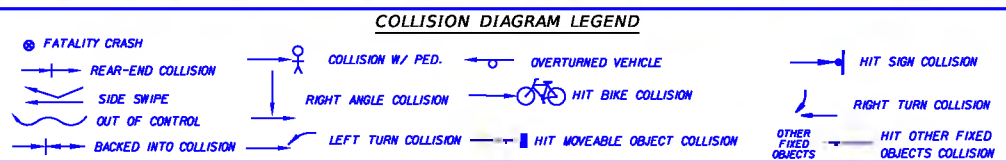
SHEET NO.  
7



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	FLAGLER	445216-1

**COLLISION DIAGRAM**

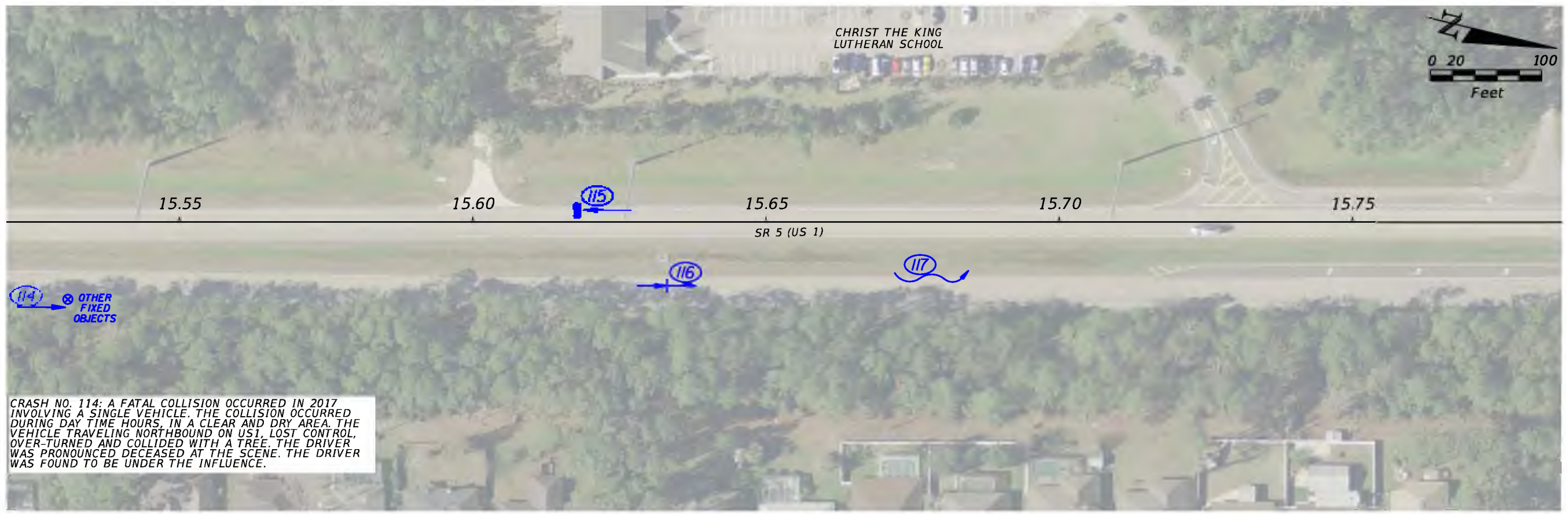
SHEET NO.  
8



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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**COLLISION DIAGRAM**

SHEET NO.  
**9**



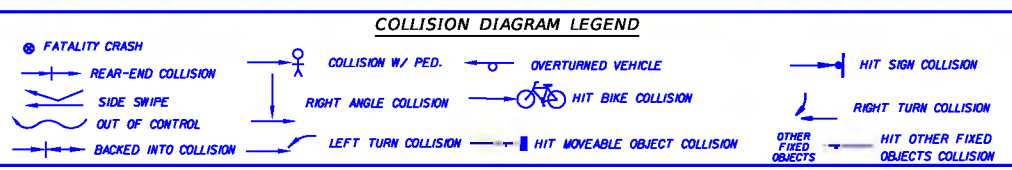
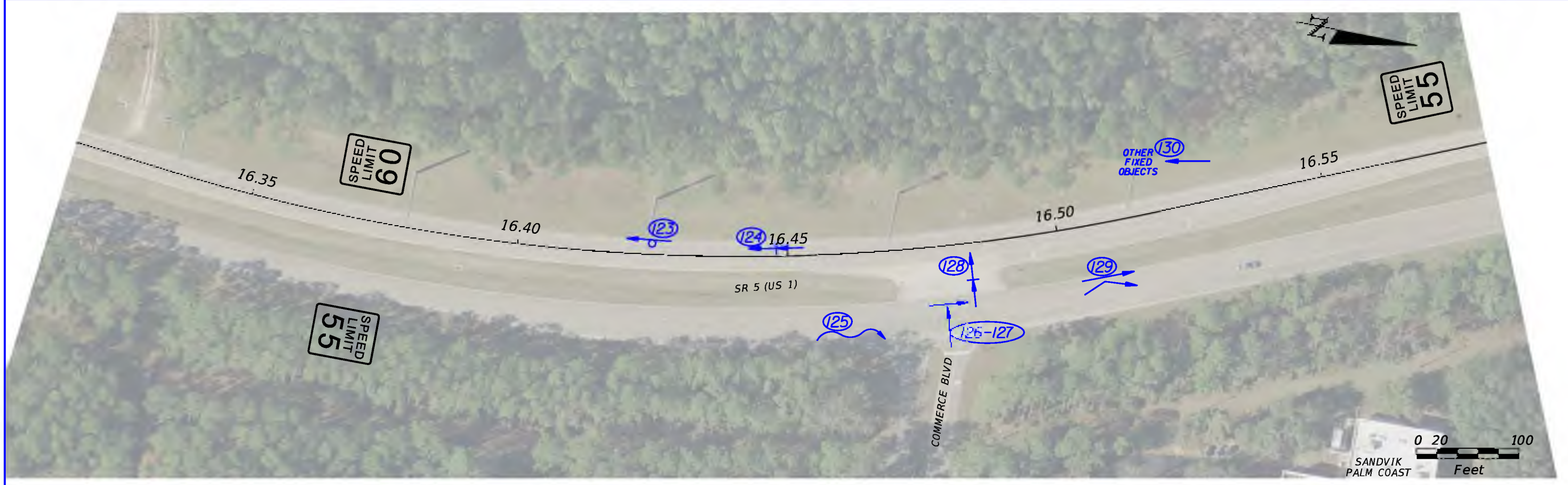
**COLLISION DIAGRAM LEGEND**

● FATALITY CRASH	—+— REAR-END COLLISION	—+— COLLISION W/ PED.	—+— OVERTURNED VEHICLE	—+— HIT SIGN COLLISION
—+— SIDE SWIPE	—+— RIGHT ANGLE COLLISION	—+— HIT BIKE COLLISION	—+— RIGHT TURN COLLISION	
—+— OUT OF CONTROL	—+— LEFT TURN COLLISION	—+— HIT MOVEABLE OBJECT COLLISION	—+— HIT OTHER FIXED OBJECTS COLLISION	
—+— BACKED INTO COLLISION				

STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
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**COLLISION DIAGRAM**

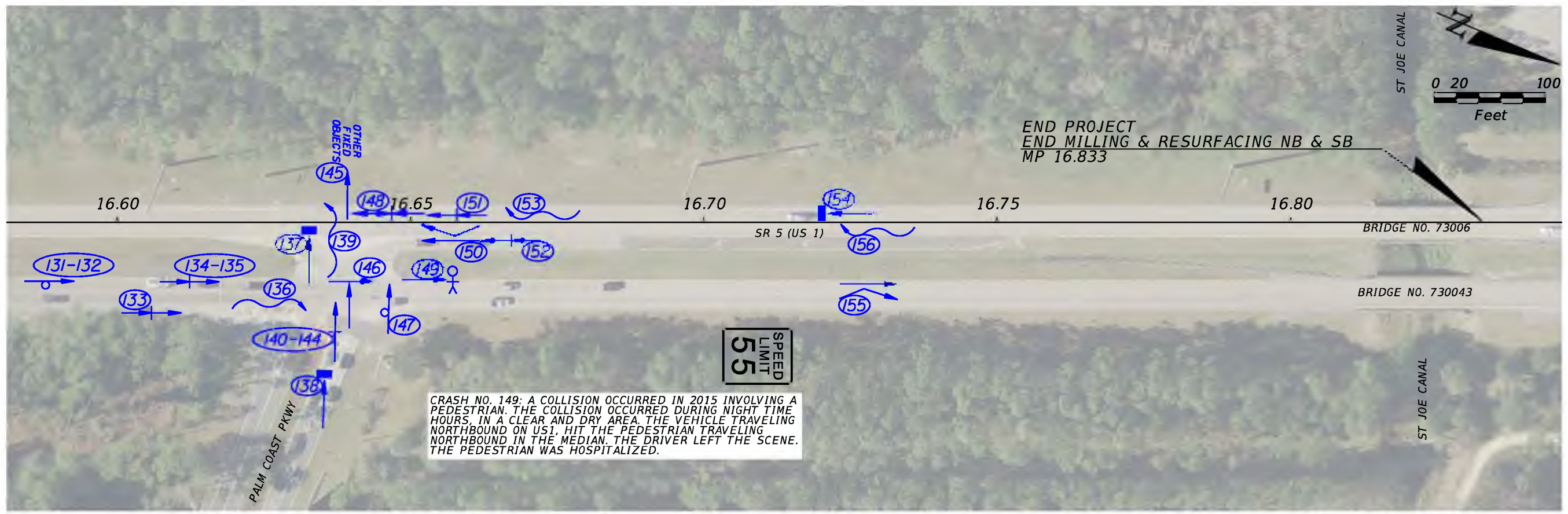
SHEET NO.  
10



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	FLAGLER	445216-1

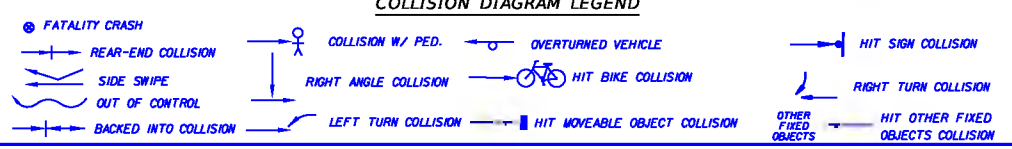
**COLLISION DIAGRAM**

SHEET NO.  
11



CRASH NO. 149: A COLLISION OCCURRED IN 2015 INVOLVING A PEDESTRIAN. THE COLLISION OCCURRED DURING NIGHT TIME HOURS, IN A CLEAR AND DRY AREA. THE VEHICLE TRAVELING NORTHBOUND ON US1, HIT THE PEDESTRIAN TRAVELING NORTHBOUND IN THE MEDIAN. THE DRIVER LEFT THE SCENE. THE PEDESTRIAN WAS HOSPITALIZED.

SPEED  
LIMIT  
55



STATE OF FLORIDA DEPARTMENT OF TRANSPORTATION		
ROAD NO.	COUNTY	FINANCIAL PROJECT ID
5	FLAGLER	445216-1

**COLLISION DIAGRAM**

SHEET  
NO.  
12

Milepost	L1	L2	L1 Minimum	L1 Maximum	L2 Minimum	L2 Maximum	Alignment Data	Correction Notes
10.870	-1.73	1.62	-4.00	-1.50	1.500	4.000		
10.889	-5.42	-2.16	-4.00	-1.50	1.500	4.000		
10.908	-8.34	-4.80	-10.600	-6.000	-10.600	-6.000	PC=10.913, PT= 11.105, PI=11.015	Begin Correction L1, L2
10.927	-8.01	-5.33	-10.600	-6.000	-10.600	-6.000	R= 1408' (RT), DS= 60 MPH	
10.946	-7.26	-5.03	-10.600	-6.000	-10.600	-6.000	e(FDM)= 9.3%	
10.965	-7.71	-5.19	-10.600	-6.000	-10.600	-6.000	e(6%)= 6.0%, e(12%)= 10.6%	
10.984	-6.98	-4.00	-10.600	-6.000	-10.600	-6.000		
11.003	-7.06	-4.63	-10.600	-6.000	-10.600	-6.000		
11.022	-6.01	-4.21	-10.600	-6.000	-10.600	-6.000		MP 11.022 - SR 20/SR 100
11.040	-3.49	-2.51	-10.600	-6.000	-10.600	-6.000		
11.059	-4.45	-3.79	-10.600	-6.000	-10.600	-6.000		
11.078	-4.65	-3.42	-10.600	-6.000	-10.600	-6.000		
11.097	-4.82	-3.56	-10.600	-6.000	-10.600	-6.000		
11.116	-4.44	-3.00	-10.600	-6.000	-10.600	-6.000		
11.135	-3.28	0.19	-10.600	-6.000	-10.600	-6.000		End Correction L1, L2
11.154	-2.29	0.89	-4.00	-1.50	1.500	4.000		
11.173	-1.71	0.63	-4.00	-1.50	1.500	4.000		
11.192	-2.44	1.03	-4.00	-1.50	1.500	4.000		
11.211	-1.75	1.75	-4.00	-1.50	1.500	4.000		
11.230	-1.83	2.57	-4.00	-1.50	1.500	4.000		
11.249	-2.25	2.97	-4.00	-1.50	1.500	4.000		
11.268	-2.50	2.15	-4.00	-1.50	1.500	4.000		
11.287	-1.47	1.85	-4.00	-1.50	1.500	4.000		
11.306	-1.45	2.74	-4.00	-1.50	1.500	4.000		
11.325	-2.81	0.70	-4.00	-1.50	1.500	4.000		
11.343	-2.30	1.22	-4.00	-1.50	1.500	4.000		
11.362	-3.63	1.80	-4.00	-1.50	1.500	4.000		
11.381	-2.37	1.78	-4.00	-1.50	1.500	4.000		
11.400	-1.89	1.52	-4.00	-1.50	1.500	4.000		
11.419	-2.72	1.06	-4.00	-1.50	1.500	4.000		
11.438	-2.55	0.58	-4.00	-1.50	1.500	4.000		
11.457	-3.44	0.14	-4.00	-1.50	1.500	4.000		
11.476	-3.11	0.82	-4.00	-1.50	1.500	4.000		
11.495	-2.95	1.20	-4.00	-1.50	1.500	4.000		
11.514	-2.92	1.45	-4.00	-1.50	1.500	4.000		
11.533	-3.04	2.44	-4.00	-1.50	1.500	4.000		
11.552	-2.48	2.13	-4.00	-1.50	1.500	4.000		
11.571	-1.76	2.01	-4.00	-1.50	1.500	4.000		
11.590	-1.92	1.69	-4.00	-1.50	1.500	4.000		
11.609	-2.20	2.06	-4.00	-1.50	1.500	4.000		
11.628	-3.63	0.82	-4.00	-1.50	1.500	4.000		
11.647	-5.89	-2.57	-5.800	-4.600	-5.800	-4.600	PC=11.657, PT= 11.846, PI=11.752	Begin Correction L2
11.665	-6.40	-3.54	-5.800	-4.600	-5.800	-4.600	R= 2865' (RT), DS= 60 MPH	
11.684	-6.68	-4.24	-5.800	-4.600	-5.800	-4.600	e(FDM)= 5.5%	MP 11.681 - CR 13
11.703	-6.61	-3.93	-5.800	-4.600	-5.800	-4.600	e(6%)= 4.6%, e(12%)= 5.8%	
11.722	-6.62	-3.77	-5.800	-4.600	-5.800	-4.600		
11.741	-5.91	-3.46	-5.800	-4.600	-5.800	-4.600		
11.760	-5.28	-2.22	-5.800	-4.600	-5.800	-4.600		
11.779	-5.38	-2.44	-5.800	-4.600	-5.800	-4.600		
11.798	-6.29	-2.46	-5.800	-4.600	-5.800	-4.600		
11.817	-6.12	-2.36	-5.800	-4.600	-5.800	-4.600		
11.836	-5.64	-2.29	-5.800	-4.600	-5.800	-4.600		End Correction L2
11.855	-4.33	-0.56	-4.00	-1.50	1.500	4.000		
11.874	-3.11	1.57	-4.00	-1.50	1.500	4.000		
11.893	-2.58	2.39	-4.00	-1.50	1.500	4.000		
11.912	-3.16	2.04	-4.00	-1.50	1.500	4.000		
11.931	-3.09	2.06	-4.00	-1.50	1.500	4.000		
11.950	-3.06	2.09	-4.00	-1.50	1.500	4.000		
11.968	-4.03	1.26	-4.00	-1.50	1.500	4.000		
11.987	-3.32	2.16	-4.00	-1.50	1.500	4.000		
12.006	-3.32	2.15	-4.00	-1.50	1.500	4.000		
12.025	-3.28	3.37	-4.00	-1.50	1.500	4.000		
12.044	-3.51	1.71	-4.00	-1.50	1.500	4.000		
12.063	-2.46	1.17	-4.00	-1.50	1.500	4.000		MP 12.070 - Grand Reserve Dr.
12.082	-2.11	1.19	-4.00	-1.50	1.500	4.000		
12.101	-2.97	1.41	-4.00	-1.50	1.500	4.000		
12.120	-3.79	0.49	-4.00	-1.50	1.500	4.000		
12.139	-3.30	0.72	-4.00	-1.50	1.500	4.000		
12.158	-3.32	0.86	-4.00	-1.50	1.500	4.000		
12.177	-1.82	0.59	-4.00	-1.50	1.500	4.000		
12.196	-2.64	1.26	-4.00	-1.50	1.500	4.000		
12.215	-1.12	2.46	-4.00	-1.50	1.500	4.000		
12.234	0.63	4.28	4.600	5.800	4.600	5.800	PC=12.242, PT= 12.353, PI=12.298	Begin Correction L1

Milepost	L1	L2	L1 Minimum	L1 Maximum	L2 Minimum	L2 Maximum	Alignment Data	Correction Notes
12.253	2.02	5.03	4.600	5.800	4.600	5.800	R= 2865' (LT), DS= 60 MPH	
12.272	2.01	5.50	4.600	5.800	4.600	5.800	e(FDM)= 5.5%	
12.290	1.57	4.68	4.600	5.800	4.600	5.800	e(6%)= 4.6%, e(12%)= 5.8%	
12.309	1.41	4.63	4.600	5.800	4.600	5.800		
12.328	1.29	4.66	4.600	5.800	4.600	5.800		
12.347	2.29	4.35	4.600	5.800	4.600	5.800		End Correction L1
12.366	1.13	4.09	-4.00	-1.50	1.500	4.000		
12.385	-1.50	3.20	-4.00	-1.50	1.500	4.000		
12.404	-1.47	3.28	-4.00	-1.50	1.500	4.000		
12.423	-0.54	3.67	-4.00	-1.50	1.500	4.000		
12.442	-0.94	2.71	-4.00	-1.50	1.500	4.000		
12.461	-1.41	3.93	-4.00	-1.50	1.500	4.000		
12.480	-1.69	2.65	-4.00	-1.50	1.500	4.000		
12.499	-2.08	2.43	-4.00	-1.50	1.500	4.000		
12.518	-0.82	3.51	-4.00	-1.50	1.500	4.000		
12.537	-0.52	4.05	-4.00	-1.50	1.500	4.000		
12.556	-1.55	3.91	-4.00	-1.50	1.500	4.000		
12.575	-0.44	3.02	-4.00	-1.50	1.500	4.000		
12.593	0.68	3.39	-4.00	-1.50	1.500	4.000		
12.612	-0.37	3.51	-4.00	-1.50	1.500	4.000		
12.631	-1.05	2.65	-4.00	-1.50	1.500	4.000		
12.650	-0.61	1.59	-4.00	-1.50	1.500	4.000		
12.669	-1.85	0.40	-4.00	-1.50	1.500	4.000		
12.688	-1.45	0.63	-4.00	-1.50	1.500	4.000		
12.707	-1.12	1.55	-4.00	-1.50	1.500	4.000		
12.726	-1.87	2.18	-4.00	-1.50	1.500	4.000		
12.745	-1.66	1.85	-4.00	-1.50	1.500	4.000		MP 12.757 - Royal Palms Pkwy
12.764	-1.62	2.36	-4.00	-1.50	1.500	4.000		
12.783	-1.57	2.62	-4.00	-1.50	1.500	4.000		
12.802	-1.36	3.33	-4.00	-1.50	1.500	4.000		
12.821	-1.45	3.13	-4.00	-1.50	1.500	4.000		
12.840	-0.65	4.03	-4.00	-1.50	1.500	4.000		
12.859	-0.99	4.02	-4.00	-1.50	1.500	4.000		
12.878	-1.29	3.39	-4.00	-1.50	1.500	4.000		
12.897	-1.29	5.29	-4.00	-1.50	1.500	4.000		
12.915	-1.57	3.67	-4.00	-1.50	1.500	4.000		
12.934	-1.59	3.33	-4.00	-1.50	1.500	4.000		
12.953	-2.22	1.76	-4.00	-1.50	1.500	4.000		
12.972	-1.76	1.99	-4.00	-1.50	1.500	4.000		
12.991	-2.22	1.92	-4.00	-1.50	1.500	4.000		
13.010	-1.17	2.13	-4.00	-1.50	1.500	4.000		
13.029	-1.43	2.22	-4.00	-1.50	1.500	4.000		
13.048	-1.92	1.92	-4.00	-1.50	1.500	4.000		
13.067	-1.20	2.06	-4.00	-1.50	1.500	4.000		
13.086	-1.31	2.76	-4.00	-1.50	1.500	4.000		
13.105	-1.89	1.76	-4.00	-1.50	1.500	4.000		
13.124	-1.38	2.04	-4.00	-1.50	1.500	4.000		
13.143	-0.61	3.37	-4.00	-1.50	1.500	4.000		
13.162	-1.47	2.02	-4.00	-1.50	1.500	4.000		
13.181	-1.38	2.04	-4.00	-1.50	1.500	4.000		
13.200	-2.16	2.18	-4.00	-1.50	1.500	4.000		
13.218	-2.27	2.29	-4.00	-1.50	1.500	4.000		
13.237	-1.55	2.95	-4.00	-1.50	1.500	4.000		
13.256	-1.31	3.13	-4.00	-1.50	1.500	4.000		
13.275	-1.26	3.63	-4.00	-1.50	1.500	4.000		
13.294	-1.38	4.56	-4.00	-1.50	1.500	4.000		
13.313	-1.12	2.76	-4.00	-1.50	1.500	4.000		
13.332	-1.38	3.26	-4.00	-1.50	1.500	4.000		
13.351	-1.99	2.71	-4.00	-1.50	1.500	4.000		
13.370	-2.74	2.36	-4.00	-1.50	1.500	4.000		
13.389	-2.29	1.90	-4.00	-1.50	1.500	4.000		
13.408	-1.20	2.62	-4.00	-1.50	1.500	4.000		
13.427	-1.55	2.44	-4.00	-1.50	1.500	4.000		
13.446	-1.10	2.06	-4.00	-1.50	1.500	4.000		
13.465	0.03	2.44	-4.00	-1.50	1.500	4.000		
13.484	-1.03	1.94	-4.00	-1.50	1.500	4.000		
13.503	-0.66	2.32	-4.00	-1.50	1.500	4.000		
13.522	-1.66	2.57	-4.00	-1.50	1.500	4.000		
13.540	-0.93	1.96	-4.00	-1.50	1.500	4.000		
13.559	-0.94	2.90	-4.00	-1.50	1.500	4.000		
13.578	-2.02	2.27	-4.00	-1.50	1.500	4.000		
13.597	-1.78	2.16	-4.00	-1.50	1.500	4.000		
13.616	-2.95	1.59	-4.00	-1.50	1.500	4.000		
13.635	-2.32	1.87	-4.00	-1.50	1.500	4.000		
13.654	-2.22	2.04	-4.00	-1.50	1.500	4.000		

Milepost	L1	L2	L1 Minimum	L1 Maximum	L2 Minimum	L2 Maximum	Alignment Data	Correction Notes
13.673	-1.92	1.57	-4.00	-1.50	1.500	4.000		
13.692	-1.78	1.66	-4.00	-1.50	1.500	4.000		
13.711	-1.94	1.40	-4.00	-1.50	1.500	4.000		MP 13.715 - Otis Stone Hunter Rd.
13.730	-1.38	2.27	-4.00	-1.50	1.500	4.000		
13.749	-1.55	2.46	-4.00	-1.50	1.500	4.000		
13.768	-1.36	2.64	-4.00	-1.50	1.500	4.000		
13.787	-1.03	2.72	-4.00	-1.50	1.500	4.000		
13.806	-1.08	0.56	-4.00	-1.50	1.500	4.000		
13.825	-2.92	-2.16	-3.200	-2.800	-3.200	-2.800	PC=13.827, PT= 13.946, PI=13.887	
13.843	-3.60	-3.49	-3.200	-2.800	-3.200	-2.800	R= 5730' (RT), DS= 60 MPH	
13.862	-3.98	-3.35	-3.200	-2.800	-3.200	-2.800	e(FDM)= 3.0%	
13.881	-3.56	-2.74	-3.200	-2.800	-3.200	-2.800	e(6%)= 2.8%, e(12%)= 3.2%	
13.900	-3.30	-2.39	-3.200	-2.800	-3.200	-2.800		
13.919	-3.33	-2.29	-3.200	-2.800	-3.200	-2.800		
13.938	-3.13	-1.75	-3.200	-2.800	-3.200	-2.800		
13.957	-1.80	0.33	-4.00	-1.50	1.500	4.000		
13.976	-1.48	3.00	-4.00	-1.50	1.500	4.000		
13.995	-0.99	3.60	-4.00	-1.50	1.500	4.000		
14.014	-1.05	3.11	-4.00	-1.50	1.500	4.000		
14.033	-0.63	4.30	-4.00	-1.50	1.500	4.000		
14.052	-0.98	2.83	-4.00	-1.50	1.500	4.000		
14.071	-1.29	3.47	-4.00	-1.50	1.500	4.000		
14.090	-1.29	2.97	-4.00	-1.50	1.500	4.000		
14.109	-1.92	2.79	-4.00	-1.50	1.500	4.000		
14.128	-1.40	3.46	-4.00	-1.50	1.500	4.000		
14.147	-0.89	2.85	-4.00	-1.50	1.500	4.000		
14.165	-0.73	2.34	-4.00	-1.50	1.500	4.000		
14.184	-0.82	1.76	-4.00	-1.50	1.500	4.000		
14.203	-0.09	1.73	-4.00	-1.50	1.500	4.000		
14.222	1.87	3.16	-4.00	-1.50	1.500	4.000		
14.241	2.55	4.51	-4.00	-1.50	1.500	4.000		
14.260	4.49	5.26	-4.00	-1.50	1.500	4.000		
14.279	6.08	7.85	4.600	5.800	4.600	5.800	PC=14.280, PT= 14.403, PI=14.342	
14.298	6.27	8.54	4.600	5.800	4.600	5.800	R= 2865' (LT), DS= 60 MPH	
14.317	7.66	8.57	4.600	5.800	4.600	5.800	e(FDM)= 5.5%	
14.336	6.94	9.56	4.600	5.800	4.600	5.800	e(6%)= 4.6%, e(12%)= 5.8%	
14.355	6.59	9.07	4.600	5.800	4.600	5.800		
14.374	6.31	8.56	4.600	5.800	4.600	5.800		
14.393	6.08	8.87	4.600	5.800	4.600	5.800		
14.412	4.03	6.57	-4.00	-1.50	1.500	4.000		
14.431	1.48	4.19	-4.00	-1.50	1.500	4.000		
14.450	-1.57	3.96	-4.00	-1.50	1.500	4.000		
14.468	-1.73	3.72	-4.00	-1.50	1.500	4.000		
14.487	-1.87	2.78	-4.00	-1.50	1.500	4.000		
14.506	-0.51	2.97	-4.00	-1.50	1.500	4.000		
14.525	-0.16	2.74	-4.00	-1.50	1.500	4.000		MP 14.533 - Whiteview Pkwy
14.544	-0.16	1.85	-4.00	-1.50	1.500	4.000		
14.563	-1.05	1.99	-4.00	-1.50	1.500	4.000		
14.582	-1.34	1.85	-4.00	-1.50	1.500	4.000		
14.601	-1.12	1.29	-4.00	-1.50	1.500	4.000		
14.620	-1.47	2.11	-4.00	-1.50	1.500	4.000		
14.639	-1.69	1.80	-4.00	-1.50	1.500	4.000		
14.658	-1.92	2.20	-4.00	-1.50	1.500	4.000		
14.677	-0.52	2.93	-4.00	-1.50	1.500	4.000		
14.696	-0.42	3.51	-4.00	-1.50	1.500	4.000		
14.715	-1.27	3.89	-4.00	-1.50	1.500	4.000		
14.734	-1.13	2.90	-4.00	-1.50	1.500	4.000		
14.753	-1.22	3.11	-4.00	-1.50	1.500	4.000		
14.772	-0.03	3.13	-4.00	-1.50	1.500	4.000		
14.790	-1.57	2.69	-4.00	-1.50	1.500	4.000		MP 14.788 - Enterprise Dr.
14.809	-0.89	2.36	-4.00	-1.50	1.500	4.000		
14.828	-0.37	2.06	-4.00	-1.50	1.500	4.000		
14.847	-0.63	2.06	-4.00	-1.50	1.500	4.000		
14.866	-2.06	1.20	-4.00	-1.50	1.500	4.000		
14.885	-1.71	1.92	-4.00	-1.50	1.500	4.000		
14.904	-1.38	1.50	-4.00	-1.50	1.500	4.000		
14.923	-2.99	-0.51	-4.00	-1.50	1.500	4.000		
14.942	-4.68	-2.34	-4.00	-1.50	1.500	4.000		
14.961	-6.94	-6.01	-8.200	-5.600	-8.200	-5.600	PC=14.964, PT= 15.084, PI=15.024	
14.980	-7.91	-6.48	-8.200	-5.600	-8.200	-5.600	R= 1910' (RT), DS= 60 MPH	
14.999	-8.61	-6.38	-8.200	-5.600	-8.200	-5.600	e(FDM)= 7.7%	
15.018	-8.70	-6.48	-8.200	-5.600	-8.200	-5.600	e(6%)= 5.6%, e(12%)= 8.2%	
15.037	-8.29	-6.24	-8.200	-5.600	-8.200	-5.600		
15.056	-8.34	-6.96	-8.200	-5.600	-8.200	-5.600		
15.075	-7.59	-6.24	-8.200	-5.600	-8.200	-5.600		MP 15.084 - Enterprise Dr.

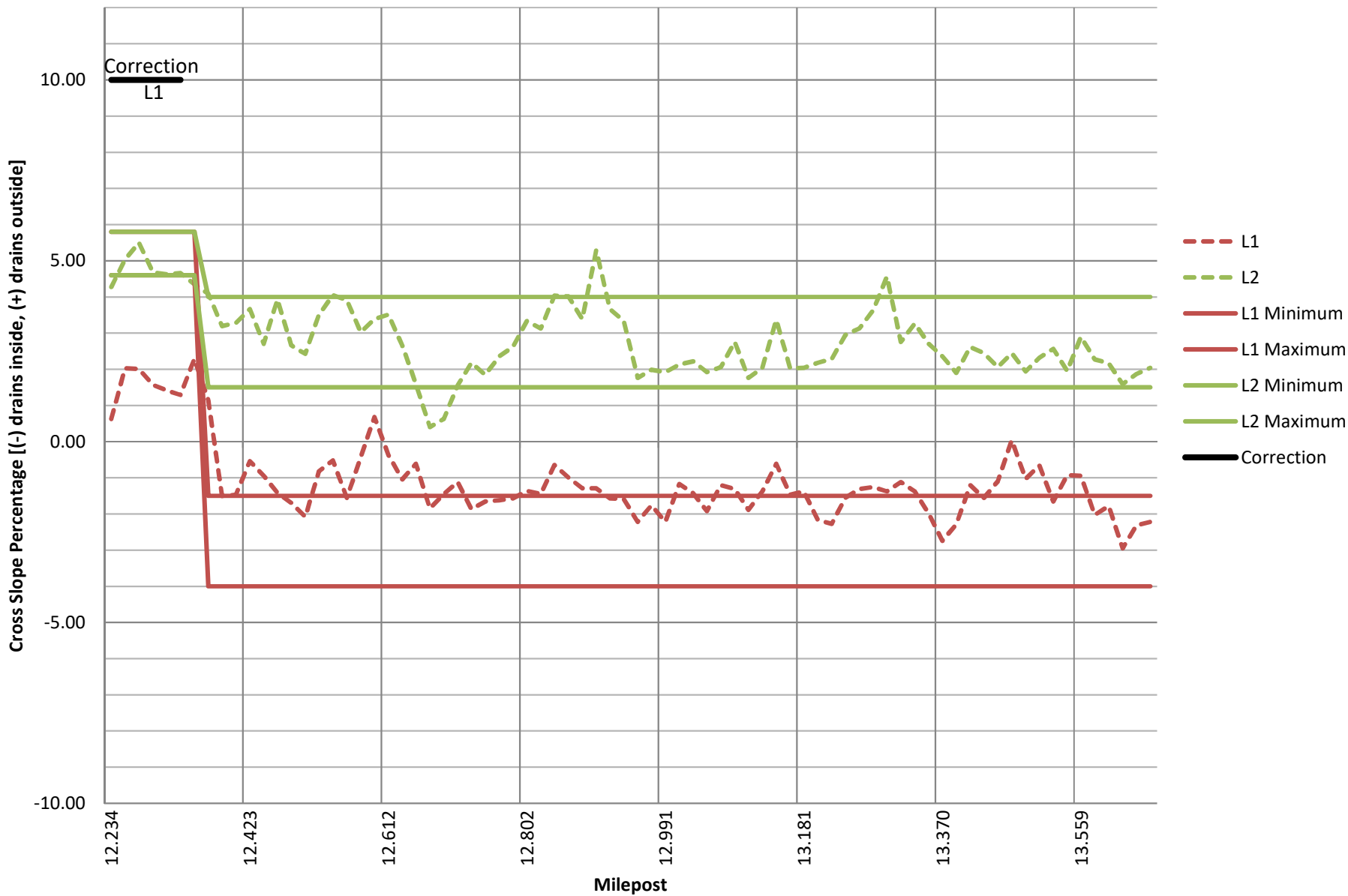
Milepost	L1	L2	L1 Minimum	L1 Maximum	L2 Minimum	L2 Maximum	Alignment Data	Correction Notes
15.093	-4.40	-3.44	-8.200	-5.600	-8.200	-5.600		
15.112	-3.14	-0.61	-4.00	-1.50	1.500	4.000		
15.131	-0.91	2.09	-4.00	-1.50	1.500	4.000		
15.150	2.69	5.00	-4.00	-1.50	1.500	4.000		
15.169	7.05	8.06	6.000	10.400	6.000	10.400	PC=15.169, PT= 15.308, PI=15.240	
15.188	7.91	8.10	6.000	10.400	6.000	10.400	R= 1432' (LT), DS= 60 MPH	
15.207	7.29	8.49	6.000	10.400	6.000	10.400	e(FDM)= 9.3%	
15.226	7.64	9.44	6.000	10.400	6.000	10.400	e(6%)= 6.0%, e(12%)= 10.4%	
15.245	7.33	10.21	6.000	10.400	6.000	10.400		
15.264	7.43	9.75	6.000	10.400	6.000	10.400		
15.283	6.57	8.92	6.000	10.400	6.000	10.400		
15.302	4.54	7.26	6.000	10.400	6.000	10.400		
15.321	1.82	4.94	6.000	10.400	6.000	10.400		
15.340	-0.28	1.83	-4.00	-1.50	1.500	4.000		
15.359	-0.73	1.97	-4.00	-1.50	1.500	4.000		
15.378	-1.40	2.20	-4.00	-1.50	1.500	4.000		
15.397	-1.41	1.92	-4.00	-1.50	1.500	4.000		
15.415	-1.52	2.30	-4.00	-1.50	1.500	4.000		
15.434	-2.51	1.43	-4.00	-1.50	1.500	4.000		
15.453	-2.72	1.69	-4.00	-1.50	1.500	4.000		
15.472	-1.71	2.58	-4.00	-1.50	1.500	4.000		
15.491	-1.34	2.99	-4.00	-1.50	1.500	4.000		
15.510	-1.78	2.92	-4.00	-1.50	1.500	4.000		
15.529	-2.20	2.36	-4.00	-1.50	1.500	4.000		
15.548	-2.30	2.57	-4.00	-1.50	1.500	4.000		
15.567	-1.57	2.99	-4.00	-1.50	1.500	4.000		
15.586	-1.15	3.56	-4.00	-1.50	1.500	4.000		
15.605	-0.80	3.04	-4.00	-1.50	1.500	4.000		
15.624	-1.97	3.37	-4.00	-1.50	1.500	4.000		
15.643	-0.40	3.63	-4.00	-1.50	1.500	4.000		
15.662	-1.17	3.77	-4.00	-1.50	1.500	4.000		
15.681	-1.26	2.23	-4.00	-1.50	1.500	4.000		
15.700	-1.50	1.50	-4.00	-1.50	1.500	4.000		
15.718	-2.37	-1.50	-4.00	-1.50	1.500	4.000		
15.737	-4.28	-2.93	-4.00	-1.50	1.500	4.000		
15.756	-5.64	-5.40	-4.00	-1.50	1.500	4.000		
15.775	-8.31	-6.73	-8.200	-5.600	-8.200	-5.600	PC=15.784, PT= 15.909, PI=15.847	Begin Correction L1, L2
15.794	-9.12	-7.54	-8.200	-5.600	-8.200	-5.600	R= 1910' (RT), DS= 60 MPH	
15.813	-9.12	-9.01	-8.200	-5.600	-8.200	-5.600	e(FDM)= 7.7%	
15.832	-10.60	-9.08	-8.200	-5.600	-8.200	-5.600	e(6%)= 5.6%, e(12%)= 8.2%	
15.851	-11.11	-9.05	-8.200	-5.600	-8.200	-5.600		
15.870	-11.34	-9.54	-8.200	-5.600	-8.200	-5.600		
15.889	-11.78	-8.47	-8.200	-5.600	-8.200	-5.600		
15.908	-9.86	-7.38	-8.200	-5.600	-8.200	-5.600		End Correction L1, L2
15.927	-7.05	-5.21	-4.00	-1.50	1.500	4.000		
15.946	-5.15	-3.35	-4.00	-1.50	1.500	4.000		
15.965	-4.09	-1.64	-4.00	-1.50	1.500	4.000		
15.984	-2.51	0.99	-4.00	-1.50	1.500	4.000		
16.003	-1.76	3.68	-4.00	-1.50	1.500	4.000		
16.022	-1.13	3.65	-4.00	-1.50	1.500	4.000		
16.040	-0.87	4.07	-4.00	-1.50	1.500	4.000		
16.059	-0.44	3.89	-4.00	-1.50	1.500	4.000		
16.078	0.02	4.38	-4.00	-1.50	1.500	4.000		
16.097	-1.05	3.61	-4.00	-1.50	1.500	4.000		
16.116	-2.15	3.09	-4.00	-1.50	1.500	4.000		
16.135	-1.26	3.42	-4.00	-1.50	1.500	4.000		
16.154	-1.80	3.18	-4.00	-1.50	1.500	4.000		
16.173	-1.29	3.26	-4.00	-1.50	1.500	4.000		
16.192	-1.33	3.16	-4.00	-1.50	1.500	4.000		
16.211	-1.64	2.39	-4.00	-1.50	1.500	4.000		
16.230	-0.94	2.06	-4.00	-1.50	1.500	4.000		
16.249	-0.96	1.64	-4.00	-1.50	1.500	4.000		
16.268	0.40	2.86	-4.00	-1.50	1.500	4.000		
16.287	2.18	4.12	-4.00	-1.50	1.500	4.000		
16.306	3.60	5.40	-4.00	-1.50	1.500	4.000		
16.325	6.43	7.40	5.600	8.200	5.600	8.200	PC=16.333, PT= 16.517, PI=16.427	Begin Correction L1, L2
16.343	7.59	8.59	5.600	8.200	5.600	8.200	R= 1910' (LT), DS= 60 MPH	
16.362	8.75	10.44	5.600	8.200	5.600	8.200	e(FDM)= 7.7%	
16.381	9.08	11.31	5.600	8.200	5.600	8.200	e(6%)= 5.6%, e(12%)= 8.2%	
16.400	9.31	11.06	5.600	8.200	5.600	8.200		
16.419	9.47	11.02	5.600	8.200	5.600	8.200		
16.438	9.59	11.94	5.600	8.200	5.600	8.200		
16.457	8.40	10.99	5.600	8.200	5.600	8.200		
16.476	7.73	10.95	5.600	8.200	5.600	8.200		MP 16.482 - Commerce Blvd.
16.495	7.54	11.27	5.600	8.200	5.600	8.200		

Milepost	L1	L2	L1 Minimum	L1 Maximum	L2 Minimum	L2 Maximum	Alignment Data	Correction Notes
16.514	6.83	10.55	5.600	8.200	5.600	8.200		End Correction L1, L2
16.533	4.84	9.73	-4.00	-1.50	1.500	4.000		
16.552	4.80	7.05	-4.00	-1.50	1.500	4.000		
16.571	2.09	4.38	-4.00	-1.50	1.500	4.000		
16.590	-0.38	3.40	-4.00	-1.50	1.500	4.000		
16.609	-2.09	2.55	-4.00	-1.50	1.500	4.000		
16.628	-2.64	2.97	-4.00	-1.50	1.500	4.000		
16.647	-1.61	3.74	-4.00	-1.50	1.500	4.000		MP 16.643 - Palm Coast Pkwy.
16.665	-1.66	3.95	-4.00	-1.50	1.500	4.000		
16.684	-1.68	2.90	-4.00	-1.50	1.500	4.000		
16.703	-3.40	2.53	-4.00	-1.50	1.500	4.000		
16.722	-2.18	2.86	-4.00	-1.50	1.500	4.000		
16.741	-2.60	2.25	-4.00	-1.50	1.500	4.000		
16.760	-2.06	2.23	-4.00	-1.50	1.500	4.000		
16.779	-2.27	1.85	-4.00	-1.50	1.500	4.000		
16.798	-3.20	2.18	-4.00	-1.50	1.500	4.000		
16.817	-1.54	1.82	-4.00	-1.50	1.500	4.000		
16.836	-1.99	1.20	-4.00	-1.50	1.500	4.000		MP 16.828 - St. Joe Canal
16.855	-4.10	1.71	-4.00	-1.50	1.500	4.000		
16.874	-3.04	2.22	-4.00	-1.50	1.500	4.000		
16.893	-1.38	2.60	-4.00	-1.50	1.500	4.000		MP 16.897 - Hargrove Rd.
16.912	-1.80	2.64	-4.00	-1.50	1.500	4.000		
16.931	-2.60	2.04	-4.00	-1.50	1.500	4.000		
16.950	-3.06	1.71	-4.00	-1.50	1.500	4.000		
16.968	-2.18	2.99	-4.00	-1.50	1.500	4.000		
16.987	-2.16	3.56	-4.00	-1.50	1.500	4.000		
17.006	-1.40	3.04	-4.00	-1.50	1.500	4.000		
17.025	-0.87	3.13	-4.00	-1.50	1.500	4.000		
17.044	-0.70	3.06	-4.00	-1.50	1.500	4.000		
17.063	-1.29	3.13	-4.00	-1.50	1.500	4.000		
17.082	-1.55	1.99	-4.00	-1.50	1.500	4.000		
17.101	-1.87	2.71	-4.00	-1.50	1.500	4.000		
17.120	-2.04	1.19	-4.00	-1.50	1.500	4.000		
17.139	-3.37	1.71	-4.00	-1.50	1.500	4.000		MP 17.142 - Weigh Station (RT)
17.158	-2.90	2.20	-4.00	-1.50	1.500	4.000		
17.177	-3.18	1.92	-4.00	-1.50	1.500	4.000		
17.196	-2.23	2.30	-4.00	-1.50	1.500	4.000		MP 17.201 - Weigh Station (LT)
17.215	-2.22	2.46	-4.00	-1.50	1.500	4.000		
17.234	-3.39	2.32	-4.00	-1.50	1.500	4.000		
17.253	-2.16	1.45	-4.00	-1.50	1.500	4.000		
17.272	-2.93	2.32	-4.00	-1.50	1.500	4.000		
17.290	-1.69	4.16	-4.00	-1.50	1.500	4.000		
17.309	-0.98	4.26	-4.00	-1.50	1.500	4.000		
17.328	-2.43	4.10	-4.00	-1.50	1.500	4.000		
17.347	-2.99	3.53	-4.00	-1.50	1.500	4.000		
17.366	-2.51	3.72	-4.00	-1.50	1.500	4.000		
17.385	-2.44	3.26	-4.00	-1.50	1.500	4.000		
17.404	-1.61	2.79	-4.00	-1.50	1.500	4.000		
17.423	-1.89	3.21	-4.00	-1.50	1.500	4.000		MP 17.417 - Wellfield Dr.
17.442	-3.04	3.40	-4.00	-1.50	1.500	4.000		
17.461	-1.69	3.28	-4.00	-1.50	1.500	4.000		
17.480	-1.73	3.51	-4.00	-1.50	1.500	4.000		
17.499	-2.15	3.13	-4.00	-1.50	1.500	4.000		
17.518	-0.99	3.39	-4.00	-1.50	1.500	4.000		
17.537	-1.17	3.06	-4.00	-1.50	1.500	4.000		
17.556	-1.59	3.16	-4.00	-1.50	1.500	4.000		
17.575	-1.90	3.23	-4.00	-1.50	1.500	4.000		
17.593	-1.19	2.50	-4.00	-1.50	1.500	4.000		
17.612	-0.72	3.23	-4.00	-1.50	1.500	4.000		
17.631	-1.64	3.30	-4.00	-1.50	1.500	4.000		
17.650	-1.43	2.88	-4.00	-1.50	1.500	4.000		
17.669	-1.29	2.46	-4.00	-1.50	1.500	4.000		
17.688	-1.40	2.39	-4.00	-1.50	1.500	4.000		
17.707	-2.29	2.34	-4.00	-1.50	1.500	4.000		
17.726	-1.71	2.29	-4.00	-1.50	1.500	4.000		
17.745	-1.90	1.78	-4.00	-1.50	1.500	4.000		
17.764	-1.80	2.37	-4.00	-1.50	1.500	4.000		
17.783	-2.36	2.55	-4.00	-1.50	1.500	4.000		
17.802	-1.57	3.30	-4.00	-1.50	1.500	4.000		
17.821	-1.48	3.65	-4.00	-1.50	1.500	4.000		
17.840	-1.57	3.33	-4.00	-1.50	1.500	4.000		
17.859	-2.20	2.99	-4.00	-1.50	1.500	4.000		
17.878	-2.18	2.79	-4.00	-1.50	1.500	4.000		
17.897	-1.89	2.53	-4.00	-1.50	1.500	4.000		
17.915	-2.74	0.87	-4.00	-1.50	1.500	4.000		

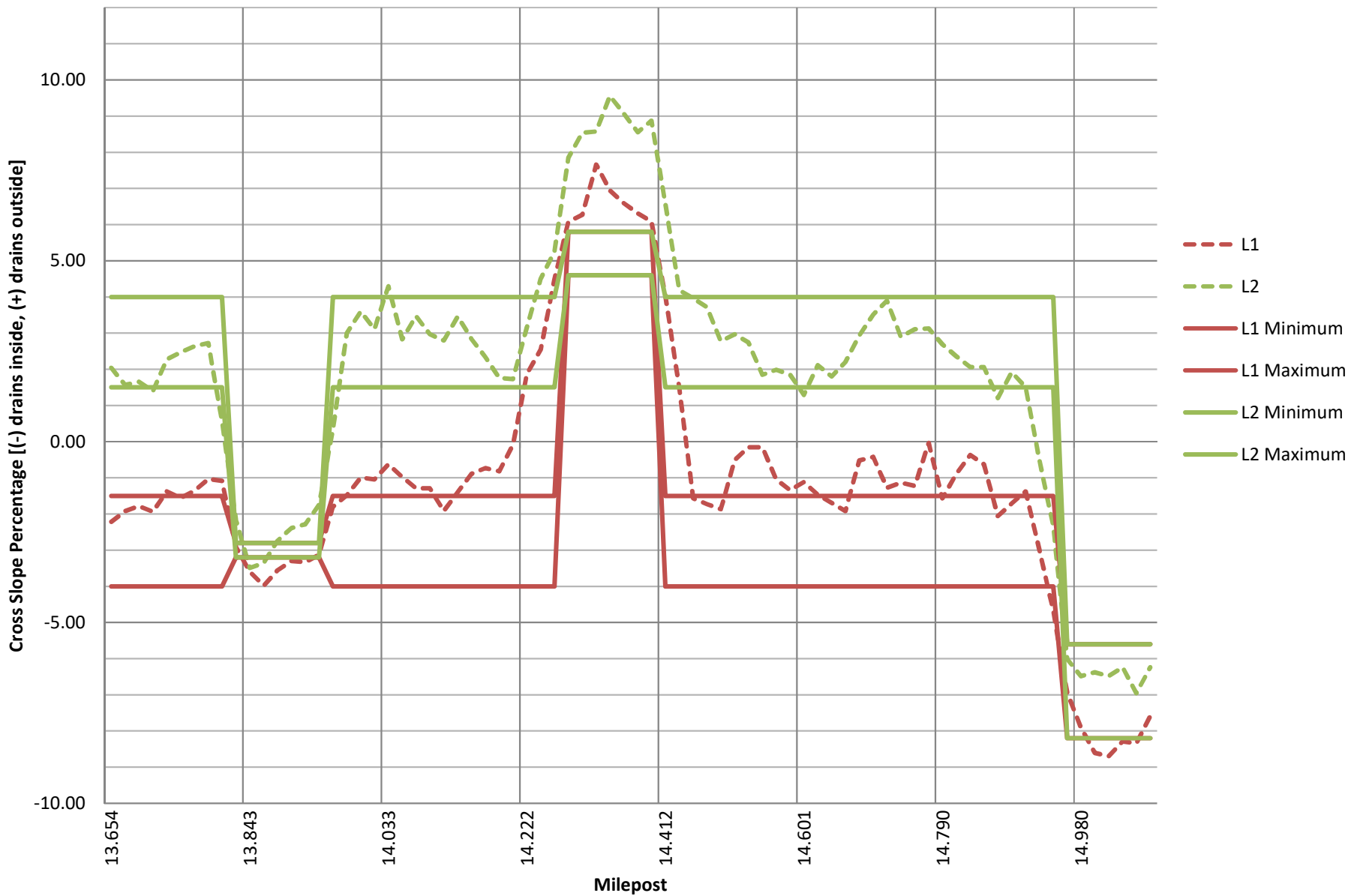
### 445216-1 SR 5 MP 10.870 to 12.234 (LEFT)



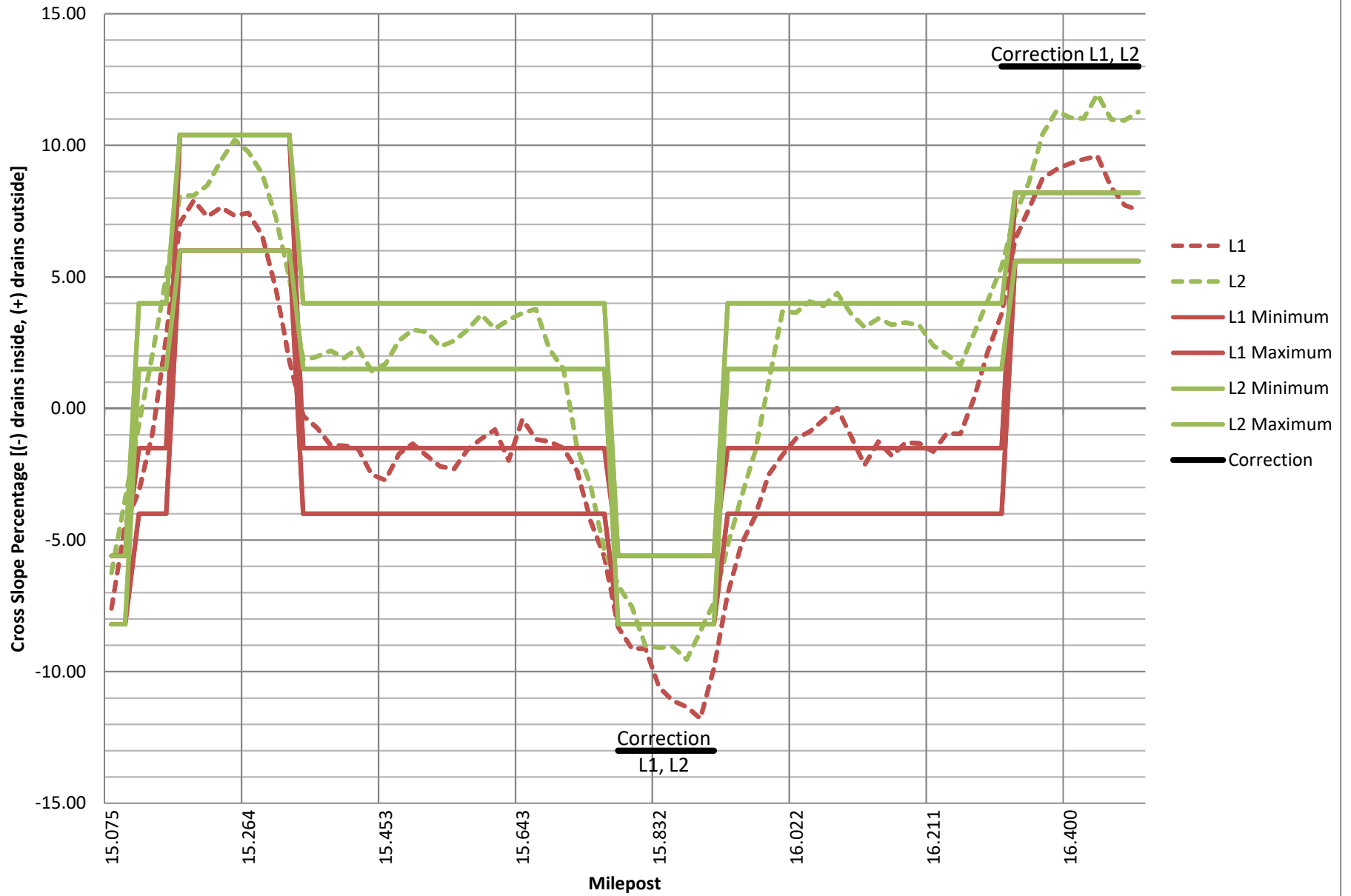
### 445216-1 SR 5 MP 12.234 to 13.654 (LEFT)



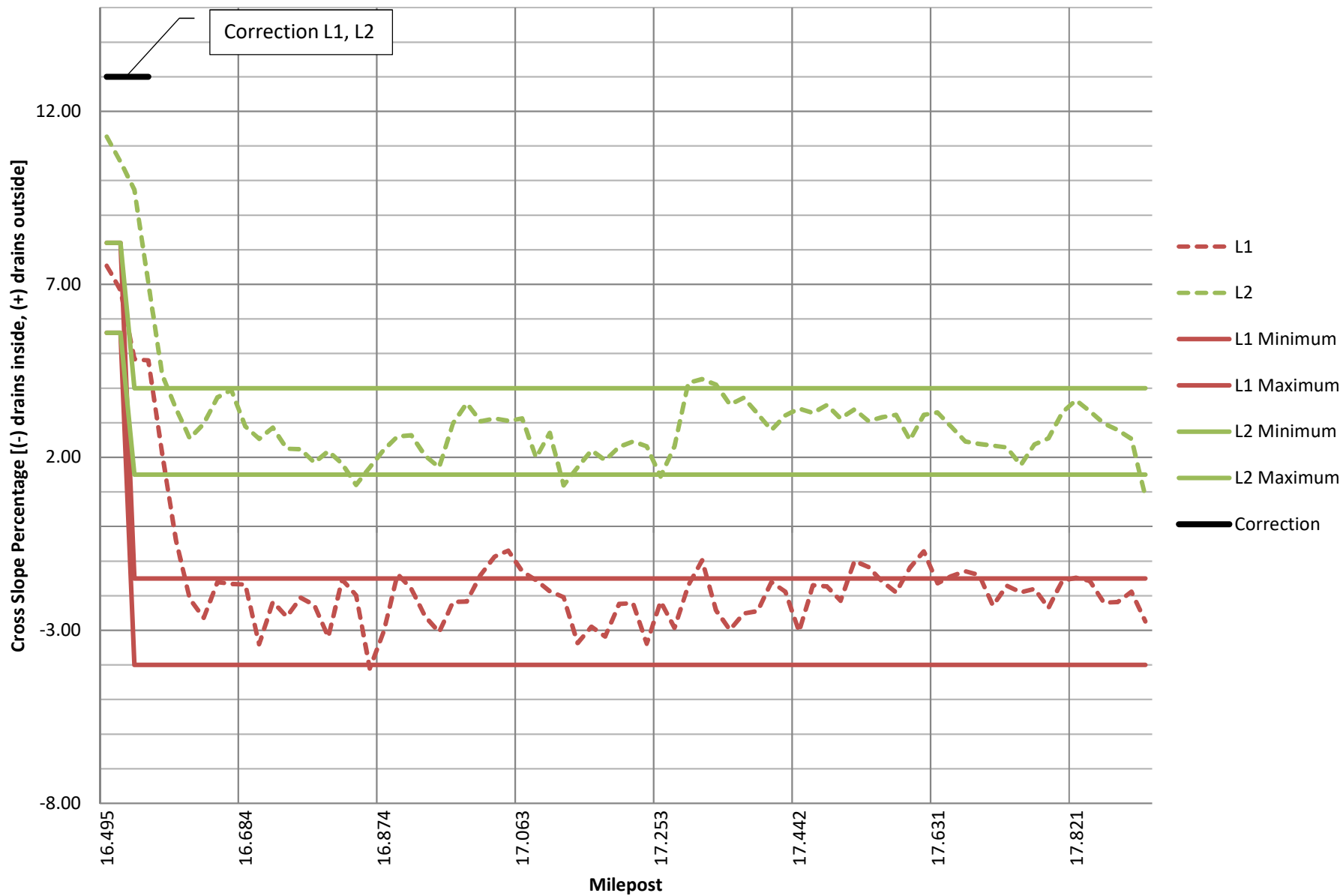
### 445216-1 SR 5 MP 13.654 to 15.075 (LEFT)



### 445216-1 SR 5 MP 15.075 to 16.495 (LEFT)



### 445216-1 SR 5 MP 16.495 to 17.915 (LEFT)



Milepost	R1	R2	R1 Minimum	R1 Maximum	R2 Minimum	R2 Maximum	Alignment Data	Correction Notes
10.870	2.76	3.67	1.50	4.00	1.500	4.000		
10.889	3.95	5.57	1.50	4.00	1.500	4.000		
10.908	5.26	4.86	6.000	10.600	6.000	10.600	PC=10.913, PT= 11.105, PI=11.015	Begin Correction R1
10.927	5.33	6.03	6.000	10.600	6.000	10.600	R= 1408' (RT), DS= 60 MPH	
10.946	5.22	6.22	6.000	10.600	6.000	10.600	e(FDM)= 9.3%	
10.965	5.54	6.76	6.000	10.600	6.000	10.600	e(6%)= 6.0%, e(12%)= 10.6%	
10.984	6.15	7.71	6.000	10.600	6.000	10.600		
11.003	6.69	7.54	6.000	10.600	6.000	10.600		
11.022	6.26	7.73	6.000	10.600	6.000	10.600		MP 11.022 - SR 20/SR 100
11.040	5.38	6.96	6.000	10.600	6.000	10.600		
11.059	4.24	5.35	6.000	10.600	6.000	10.600		
11.078	5.45	7.24	6.000	10.600	6.000	10.600		
11.097	6.47	7.50	6.000	10.600	6.000	10.600		
11.116	4.82	6.20	6.000	10.600	6.000	10.600		End Correction R1
11.135	2.08	4.12	-4.00	-1.50	1.500	4.000		
11.154	0.40	2.88	-4.00	-1.50	1.500	4.000		
11.173	-0.40	1.85	-4.00	-1.50	1.500	4.000		
11.192	-0.45	1.80	-4.00	-1.50	1.500	4.000		
11.211	-0.59	1.61	-4.00	-1.50	1.500	4.000		
11.230	-0.72	1.61	-4.00	-1.50	1.500	4.000		
11.249	-0.94	2.23	-4.00	-1.50	1.500	4.000		
11.268	-1.26	2.97	-4.00	-1.50	1.500	4.000		
11.287	-2.44	2.43	-4.00	-1.50	1.500	4.000		
11.306	-2.46	2.65	-4.00	-1.50	1.500	4.000		
11.325	-2.11	2.79	-4.00	-1.50	1.500	4.000		
11.343	-1.68	2.88	-4.00	-1.50	1.500	4.000		
11.362	-1.83	2.64	-4.00	-1.50	1.500	4.000		
11.381	-0.82	2.46	-4.00	-1.50	1.500	4.000		
11.400	-1.17	3.07	-4.00	-1.50	1.500	4.000		
11.419	-1.20	3.28	-4.00	-1.50	1.500	4.000		
11.438	-1.57	2.65	-4.00	-1.50	1.500	4.000		
11.457	-1.08	2.46	-4.00	-1.50	1.500	4.000		
11.476	-1.05	3.06	-4.00	-1.50	1.500	4.000		
11.495	-1.45	3.13	-4.00	-1.50	1.500	4.000		
11.514	-1.82	3.44	-4.00	-1.50	1.500	4.000		
11.533	-2.16	3.49	-4.00	-1.50	1.500	4.000		
11.552	-2.55	2.99	-4.00	-1.50	1.500	4.000		
11.571	-2.62	2.83	-4.00	-1.50	1.500	4.000		
11.590	-2.22	2.65	-4.00	-1.50	1.500	4.000		
11.609	-2.37	2.20	-4.00	-1.50	1.500	4.000		
11.628	-2.69	3.47	-4.00	-1.50	1.500	4.000		
11.647	-1.29	4.68	4.600	5.800	4.600	5.800	PC=11.657, PT= 11.846, PI=11.752	Begin Correction R1
11.665	0.63	5.78	4.600	5.800	4.600	5.800	R= 2865' (RT), DS= 60 MPH	
11.684	3.35	5.87	4.600	5.800	4.600	5.800	e(FDM)= 5.5%	MP 11.681 - CR 13
11.703	3.47	5.10	4.600	5.800	4.600	5.800	e(6%)= 4.6%, e(12%)= 5.8%	
11.722	4.44	5.59	4.600	5.800	4.600	5.800		
11.741	4.30	5.89	4.600	5.800	4.600	5.800		
11.760	3.42	5.36	4.600	5.800	4.600	5.800		
11.779	2.60	5.14	4.600	5.800	4.600	5.800		
11.798	3.06	4.89	4.600	5.800	4.600	5.800		
11.817	2.11	4.70	4.600	5.800	4.600	5.800		
11.836	1.20	4.44	4.600	5.800	4.600	5.800		End Correction R1
11.855	0.31	4.09	-4.00	-1.50	1.500	4.000		
11.874	-0.63	2.76	-4.00	-1.50	1.500	4.000		
11.893	-1.76	2.41	-4.00	-1.50	1.500	4.000		
11.912	-1.96	2.57	-4.00	-1.50	1.500	4.000		
11.931	-0.93	3.44	-4.00	-1.50	1.500	4.000		
11.950	-0.98	2.81	-4.00	-1.50	1.500	4.000		
11.968	-2.30	2.57	-4.00	-1.50	1.500	4.000		
11.987	-1.97	2.67	-4.00	-1.50	1.500	4.000		
12.006	-2.11	2.60	-4.00	-1.50	1.500	4.000		
12.025	-1.22	3.09	-4.00	-1.50	1.500	4.000		
12.044	-0.72	3.32	-4.00	-1.50	1.500	4.000		
12.063	-0.44	3.65	-4.00	-1.50	1.500	4.000		MP 12.070 - Grand Reserve Dr.
12.082	-0.61	3.82	-4.00	-1.50	1.500	4.000		
12.101	-1.55	2.20	-4.00	-1.50	1.500	4.000		
12.120	-1.90	2.46	-4.00	-1.50	1.500	4.000		
12.139	-0.89	3.09	-4.00	-1.50	1.500	4.000		
12.158	-1.80	2.25	-4.00	-1.50	1.500	4.000		
12.177	-2.34	2.41	-4.00	-1.50	1.500	4.000		
12.196	-2.01	2.62	-4.00	-1.50	1.500	4.000		
12.215	-2.32	1.82	-4.00	-1.50	1.500	4.000		
12.234	-2.76	1.75	-5.800	-4.600	-5.800	-4.600	PC=12.242, PT= 12.353, PI=12.298	Begin Correction R2

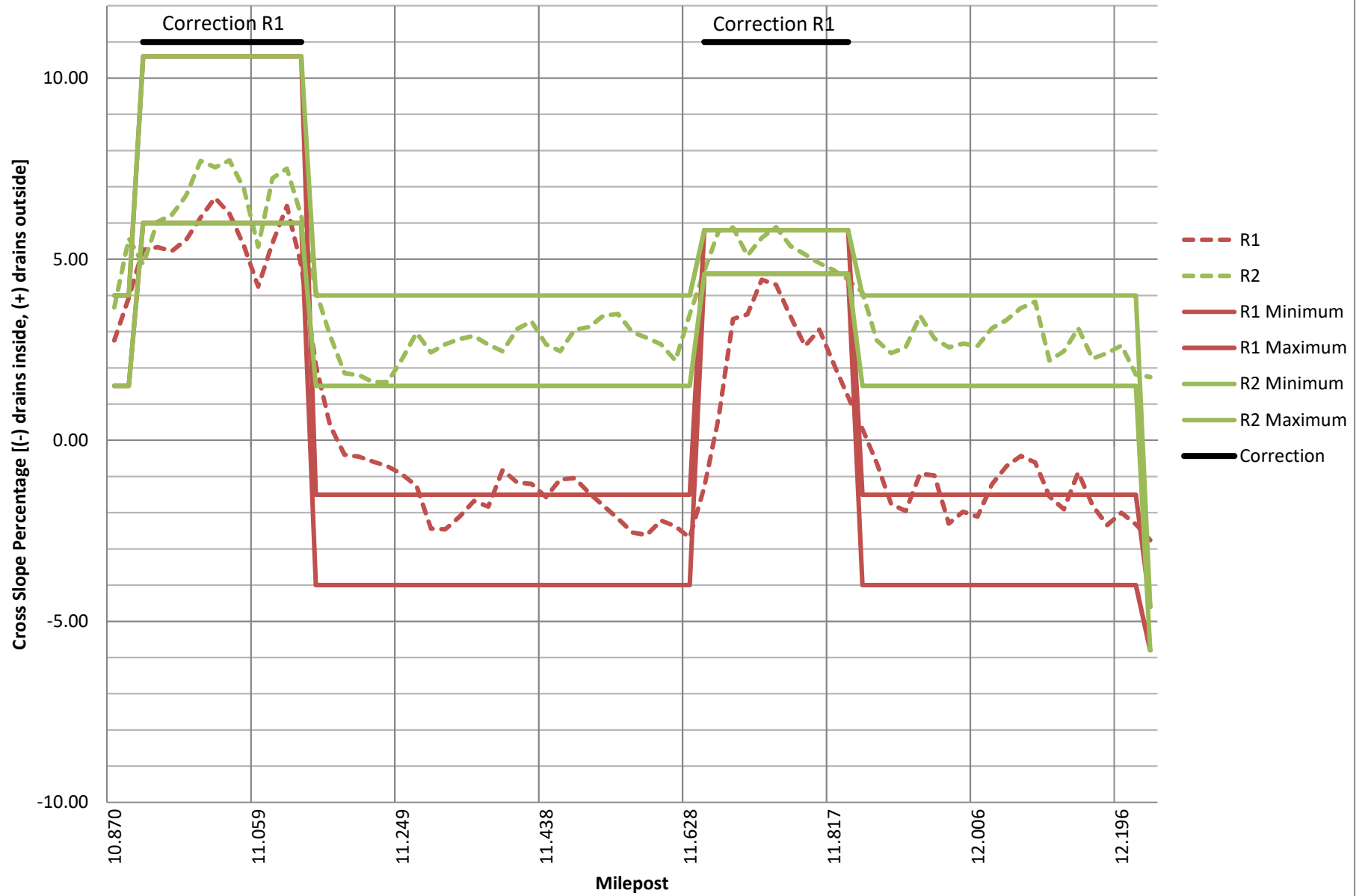
Milepost	R1	R2	R1 Minimum	R1 Maximum	R2 Minimum	R2 Maximum	Alignment Data	Correction Notes
12.253	-4.89	-1.33	-5.800	-4.600	-5.800	-4.600	R= 2865' (LT), DS= 60 MPH	
12.272	-7.38	-3.95	-5.800	-4.600	-5.800	-4.600	e(FDM)= 5.5%	
12.290	-5.78	-3.75	-5.800	-4.600	-5.800	-4.600	e(6%)= 4.6%, e(12%)= 5.8%	
12.309	-5.85	-4.77	-5.800	-4.600	-5.800	-4.600		
12.328	-6.69	-4.68	-5.800	-4.600	-5.800	-4.600		
12.347	-6.22	-3.63	-5.800	-4.600	-5.800	-4.600		End Correction R2
12.366	-5.00	-1.71	-4.00	-1.50	1.500	4.000		
12.385	-3.20	0.75	-4.00	-1.50	1.500	4.000		
12.404	-2.30	1.20	-4.00	-1.50	1.500	4.000		
12.423	-1.01	2.09	-4.00	-1.50	1.500	4.000		
12.442	-1.55	2.25	-4.00	-1.50	1.500	4.000		
12.461	-1.78	2.04	-4.00	-1.50	1.500	4.000		
12.480	-1.87	2.18	-4.00	-1.50	1.500	4.000		
12.499	-2.58	2.22	-4.00	-1.50	1.500	4.000		
12.518	-2.08	1.80	-4.00	-1.50	1.500	4.000		
12.537	-1.78	1.59	-4.00	-1.50	1.500	4.000		
12.556	-2.86	0.98	-4.00	-1.50	1.500	4.000		
12.575	-2.41	1.50	-4.00	-1.50	1.500	4.000		
12.593	-2.43	1.97	-4.00	-1.50	1.500	4.000		
12.612	-2.48	1.87	-4.00	-1.50	1.500	4.000		
12.631	-1.90	1.96	-4.00	-1.50	1.500	4.000		
12.650	-2.04	1.87	-4.00	-1.50	1.500	4.000		
12.669	-0.91	2.83	-4.00	-1.50	1.500	4.000		
12.688	-1.59	1.94	-4.00	-1.50	1.500	4.000		
12.707	-1.87	1.22	-4.00	-1.50	1.500	4.000		
12.726	-2.16	1.62	-4.00	-1.50	1.500	4.000		
12.745	-0.84	1.40	-4.00	-1.50	1.500	4.000		MP 12.757 - Royal Palms Pkwy
12.764	-0.75	1.05	-4.00	-1.50	1.500	4.000		
12.783	-1.47	0.84	-4.00	-1.50	1.500	4.000		
12.802	-0.72	1.78	-4.00	-1.50	1.500	4.000		
12.821	-0.56	1.71	-4.00	-1.50	1.500	4.000		
12.840	-0.49	1.97	-4.00	-1.50	1.500	4.000		
12.859	-0.68	2.16	-4.00	-1.50	1.500	4.000		
12.878	-1.03	1.20	-4.00	-1.50	1.500	4.000		
12.897	-0.61	1.59	-4.00	-1.50	1.500	4.000		
12.915	-0.56	1.15	-4.00	-1.50	1.500	4.000		
12.934	-0.19	1.75	-4.00	-1.50	1.500	4.000		
12.953	-0.33	1.68	-4.00	-1.50	1.500	4.000		
12.972	-0.30	1.75	-4.00	-1.50	1.500	4.000		
12.991	-0.79	1.29	-4.00	-1.50	1.500	4.000		
13.010	-1.10	1.55	-4.00	-1.50	1.500	4.000		
13.029	-1.10	1.52	-4.00	-1.50	1.500	4.000		
13.048	-1.05	1.34	-4.00	-1.50	1.500	4.000		
13.067	-0.84	1.55	-4.00	-1.50	1.500	4.000		
13.086	-0.98	1.62	-4.00	-1.50	1.500	4.000		
13.105	-1.20	1.54	-4.00	-1.50	1.500	4.000		
13.124	-1.24	1.92	-4.00	-1.50	1.500	4.000		
13.143	-0.65	2.01	-4.00	-1.50	1.500	4.000		
13.162	-0.99	1.59	-4.00	-1.50	1.500	4.000		
13.181	-1.06	2.01	-4.00	-1.50	1.500	4.000		
13.200	-1.29	1.20	-4.00	-1.50	1.500	4.000		
13.218	-1.43	1.50	-4.00	-1.50	1.500	4.000		
13.237	-1.50	1.43	-4.00	-1.50	1.500	4.000		
13.256	-1.52	1.64	-4.00	-1.50	1.500	4.000		
13.275	-0.93	1.68	-4.00	-1.50	1.500	4.000		
13.294	-0.61	2.97	-4.00	-1.50	1.500	4.000		
13.313	-0.65	2.36	-4.00	-1.50	1.500	4.000		
13.332	-1.17	2.16	-4.00	-1.50	1.500	4.000		
13.351	-1.17	2.01	-4.00	-1.50	1.500	4.000		
13.370	-1.40	1.75	-4.00	-1.50	1.500	4.000		
13.389	-1.15	1.83	-4.00	-1.50	1.500	4.000		
13.408	-1.31	2.09	-4.00	-1.50	1.500	4.000		
13.427	-1.33	2.02	-4.00	-1.50	1.500	4.000		
13.446	-1.05	1.66	-4.00	-1.50	1.500	4.000		
13.465	-1.06	2.39	-4.00	-1.50	1.500	4.000		
13.484	-2.06	1.41	-4.00	-1.50	1.500	4.000		
13.503	-2.27	1.50	-4.00	-1.50	1.500	4.000		
13.522	-2.02	1.48	-4.00	-1.50	1.500	4.000		
13.540	-1.54	1.57	-4.00	-1.50	1.500	4.000		
13.559	-1.66	1.68	-4.00	-1.50	1.500	4.000		
13.578	-1.22	1.47	-4.00	-1.50	1.500	4.000		
13.597	-1.34	1.43	-4.00	-1.50	1.500	4.000		
13.616	-1.29	1.59	-4.00	-1.50	1.500	4.000		
13.635	-1.43	1.36	-4.00	-1.50	1.500	4.000		
13.654	-1.66	1.41	-4.00	-1.50	1.500	4.000		

Milepost	R1	R2	R1 Minimum	R1 Maximum	R2 Minimum	R2 Maximum	Alignment Data	Correction Notes
13.673	-1.31	1.19	-4.00	-1.50	1.500	4.000		
13.692	-0.77	1.75	-4.00	-1.50	1.500	4.000		
13.711	0.05	2.08	-4.00	-1.50	1.500	4.000		MP 13.715 - Otis Stone Hunter Rd.
13.730	-1.10	2.51	-4.00	-1.50	1.500	4.000		
13.749	-1.69	2.27	-4.00	-1.50	1.500	4.000		
13.768	-1.41	2.41	-4.00	-1.50	1.500	4.000		
13.787	-1.85	1.78	-4.00	-1.50	1.500	4.000		
13.806	-1.76	1.48	-4.00	-1.50	1.500	4.000		
13.825	-0.96	1.55	2.800	3.200	2.800	3.200	PC=13.827, PT= 13.946, PI=13.887	Begin Correction R1, R2
13.843	0.82	2.41	2.800	3.200	2.800	3.200	R= 5730' (RT), DS= 60 MPH	
13.862	2.74	3.60	2.800	3.200	2.800	3.200	e(FDM)= 3.0%	
13.881	3.91	4.80	2.800	3.200	2.800	3.200	e(6%)= 2.8%, e(12%)= 3.2%	
13.900	3.88	5.15	2.800	3.200	2.800	3.200		
13.919	4.16	5.19	2.800	3.200	2.800	3.200		
13.938	4.00	5.40	2.800	3.200	2.800	3.200		End Correction R1, R2
13.957	2.71	4.00	-4.00	-1.50	1.500	4.000		
13.976	0.23	2.41	-4.00	-1.50	1.500	4.000		
13.995	-0.24	2.09	-4.00	-1.50	1.500	4.000		
14.014	-0.05	1.94	-4.00	-1.50	1.500	4.000		
14.033	0.02	2.51	-4.00	-1.50	1.500	4.000		
14.052	-0.33	2.90	-4.00	-1.50	1.500	4.000		
14.071	-0.14	2.88	-4.00	-1.50	1.500	4.000		
14.090	0.02	3.00	-4.00	-1.50	1.500	4.000		
14.109	-0.38	2.85	-4.00	-1.50	1.500	4.000		
14.128	-1.59	1.52	-4.00	-1.50	1.500	4.000		
14.147	-1.45	0.94	-4.00	-1.50	1.500	4.000		
14.165	-1.50	1.24	-4.00	-1.50	1.500	4.000		
14.184	-2.01	1.45	-4.00	-1.50	1.500	4.000		
14.203	-2.18	0.68	-4.00	-1.50	1.500	4.000		
14.222	-2.09	0.79	-4.00	-1.50	1.500	4.000		
14.241	-1.66	1.45	-4.00	-1.50	1.500	4.000		
14.260	-3.11	0.24	-4.00	-1.50	1.500	4.000		
14.279	-4.12	-2.71	-5.800	-4.600	-5.800	-4.600	PC=14.280, PT= 14.403, PI=14.342	
14.298	-3.84	-4.31	-5.800	-4.600	-5.800	-4.600	R= 2865' (LT), DS= 60 MPH	
14.317	-4.30	-4.07	-5.800	-4.600	-5.800	-4.600	e(FDM)= 5.5%	
14.336	-3.86	-4.02	-5.800	-4.600	-5.800	-4.600	e(6%)= 4.6%, e(12%)= 5.8%	
14.355	-5.28	-4.51	-5.800	-4.600	-5.800	-4.600		
14.374	-5.94	-5.42	-5.800	-4.600	-5.800	-4.600		
14.393	-5.47	-4.33	-5.800	-4.600	-5.800	-4.600		
14.412	-4.00	-3.88	-4.00	-1.50	1.500	4.000		
14.431	-1.08	0.72	-4.00	-1.50	1.500	4.000		
14.450	-1.26	1.55	-4.00	-1.50	1.500	4.000		
14.468	-0.96	1.19	-4.00	-1.50	1.500	4.000		
14.487	-1.66	1.12	-4.00	-1.50	1.500	4.000		
14.506	-1.99	1.22	-4.00	-1.50	1.500	4.000		
14.525	-1.01	0.87	-4.00	-1.50	1.500	4.000		MP 14.533 - Whiteview Pkwy
14.544	-0.42	1.05	-4.00	-1.50	1.500	4.000		
14.563	-1.34	1.13	-4.00	-1.50	1.500	4.000		
14.582	-0.75	2.29	-4.00	-1.50	1.500	4.000		
14.601	-0.86	3.07	-4.00	-1.50	1.500	4.000		
14.620	-1.20	3.23	-4.00	-1.50	1.500	4.000		
14.639	-1.22	3.23	-4.00	-1.50	1.500	4.000		
14.658	-1.54	3.18	-4.00	-1.50	1.500	4.000		
14.677	-1.57	3.46	-4.00	-1.50	1.500	4.000		
14.696	-2.36	1.87	-4.00	-1.50	1.500	4.000		
14.715	-2.83	1.66	-4.00	-1.50	1.500	4.000		
14.734	-2.85	1.50	-4.00	-1.50	1.500	4.000		
14.753	-3.02	1.22	-4.00	-1.50	1.500	4.000		
14.772	-3.00	2.29	-4.00	-1.50	1.500	4.000		
14.790	-1.94	3.00	-4.00	-1.50	1.500	4.000		MP 14.788 - Enterprise Dr.
14.809	-1.26	1.80	-4.00	-1.50	1.500	4.000		
14.828	-1.27	2.29	-4.00	-1.50	1.500	4.000		
14.847	0.19	2.86	-4.00	-1.50	1.500	4.000		
14.866	0.21	3.33	-4.00	-1.50	1.500	4.000		
14.885	-0.99	3.37	-4.00	-1.50	1.500	4.000		
14.904	-1.24	3.04	-4.00	-1.50	1.500	4.000		
14.923	-0.68	3.42	-4.00	-1.50	1.500	4.000		
14.942	-0.37	2.13	-4.00	-1.50	1.500	4.000		
14.961	1.40	3.28	5.600	8.200	5.600	8.200	PC=14.964, PT= 15.084, PI=15.024	
14.980	4.65	6.36	5.600	8.200	5.600	8.200	R= 1910' (RT), DS= 60 MPH	
14.999	6.47	8.61	5.600	8.200	5.600	8.200	e(FDM)= 7.7%	
15.018	5.68	7.40	5.600	8.200	5.600	8.200	e(6%)= 5.6%, e(12%)= 8.2%	
15.037	5.03	6.76	5.600	8.200	5.600	8.200		
15.056	4.65	7.03	5.600	8.200	5.600	8.200		
15.075	5.15	6.99	5.600	8.200	5.600	8.200		MP 15.084 - Enterprise Dr.

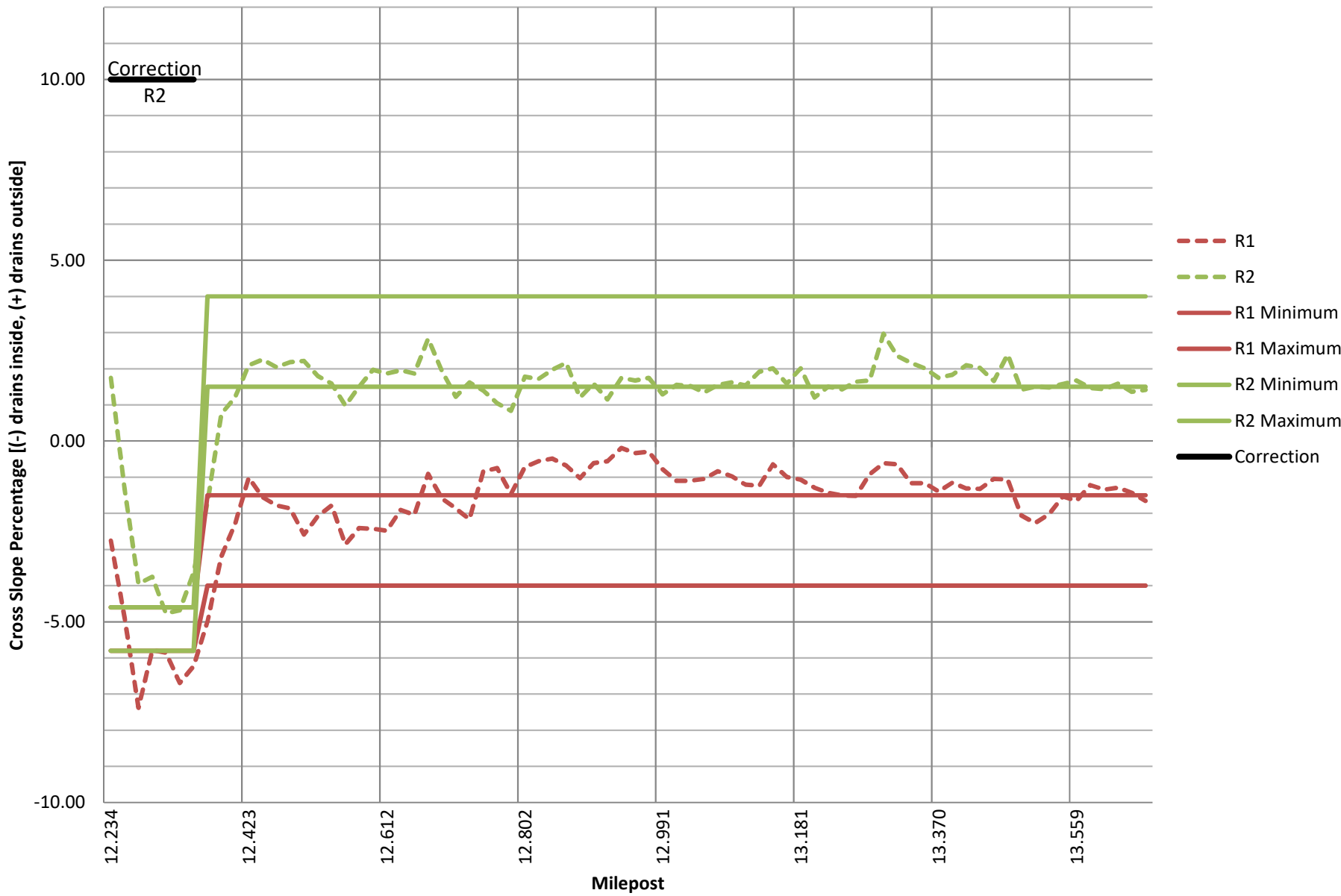
Milepost	R1	R2	R1 Minimum	R1 Maximum	R2 Minimum	R2 Maximum	Alignment Data	Correction Notes
15.093	5.00	6.38	-4.00	-1.50	1.500	4.000		
15.112	2.46	3.54	-4.00	-1.50	1.500	4.000		
15.131	-0.89	3.84	-4.00	-1.50	1.500	4.000		
15.150	-2.83	1.05	-4.00	-1.50	1.500	4.000		
15.169	-6.43	-4.07	-10.400	-6.000	-10.400	-6.000	PC=15.169, PT= 15.308, PI=15.240	
15.188	-9.10	-8.08	-10.400	-6.000	-10.400	-6.000	R= 1432' (LT), DS= 60 MPH	
15.207	-9.54	-9.17	-10.400	-6.000	-10.400	-6.000	e(FDM)= 9.3%	
15.226	-9.61	-9.03	-10.400	-6.000	-10.400	-6.000	e(6%)= 6.0%, e(12%)= 10.4%	
15.245	-10.53	-9.61	-10.400	-6.000	-10.400	-6.000		
15.264	-10.63	-9.35	-10.400	-6.000	-10.400	-6.000		
15.283	-8.56	-7.94	-10.400	-6.000	-10.400	-6.000		
15.302	-8.78	-9.15	-10.400	-6.000	-10.400	-6.000		
15.321	-7.80	-7.17	-4.00	-1.50	1.500	4.000		
15.340	-3.20	-2.67	-4.00	-1.50	1.500	4.000		
15.359	-0.86	-0.24	-4.00	-1.50	1.500	4.000		
15.378	-0.86	0.21	-4.00	-1.50	1.500	4.000		
15.397	-1.33	0.96	-4.00	-1.50	1.500	4.000		
15.415	-0.70	1.45	-4.00	-1.50	1.500	4.000		
15.434	0.12	2.30	-4.00	-1.50	1.500	4.000		
15.453	-0.42	1.75	-4.00	-1.50	1.500	4.000		
15.472	-0.84	2.34	-4.00	-1.50	1.500	4.000		
15.491	-1.45	1.96	-4.00	-1.50	1.500	4.000		
15.510	-2.02	1.31	-4.00	-1.50	1.500	4.000		
15.529	-2.08	1.57	-4.00	-1.50	1.500	4.000		
15.548	-1.50	1.97	-4.00	-1.50	1.500	4.000		
15.567	-1.26	1.96	-4.00	-1.50	1.500	4.000		
15.586	-2.53	1.48	-4.00	-1.50	1.500	4.000		
15.605	-2.23	1.17	-4.00	-1.50	1.500	4.000		
15.624	-2.34	1.50	-4.00	-1.50	1.500	4.000		
15.643	-1.45	2.04	-4.00	-1.50	1.500	4.000		
15.662	-1.73	1.69	-4.00	-1.50	1.500	4.000		
15.681	-1.83	1.64	-4.00	-1.50	1.500	4.000		
15.700	-1.96	1.40	-4.00	-1.50	1.500	4.000		
15.718	-2.02	1.50	-4.00	-1.50	1.500	4.000		
15.737	-2.30	1.96	-4.00	-1.50	1.500	4.000		
15.756	-2.15	1.62	-4.00	-1.50	1.500	4.000		
15.775	-1.24	2.29	5.600	8.200	5.600	8.200	PC=15.784, PT= 15.909, PI=15.847	
15.794	0.72	4.93	5.600	8.200	5.600	8.200	R= 1910' (RT), DS= 60 MPH	
15.813	4.21	6.78	5.600	8.200	5.600	8.200	e(FDM)= 7.7%	
15.832	6.26	7.85	5.600	8.200	5.600	8.200	e(6%)= 5.6%, e(12%)= 8.2%	
15.851	6.47	7.52	5.600	8.200	5.600	8.200		
15.870	5.99	7.69	5.600	8.200	5.600	8.200		
15.889	5.92	6.82	5.600	8.200	5.600	8.200		
15.908	6.13	7.15	5.600	8.200	5.600	8.200		
15.927	2.37	3.82	-4.00	-1.50	1.500	4.000		
15.946	-0.45	1.38	-4.00	-1.50	1.500	4.000		
15.965	-1.45	1.54	-4.00	-1.50	1.500	4.000		
15.984	-1.19	1.96	-4.00	-1.50	1.500	4.000		
16.003	-1.75	1.57	-4.00	-1.50	1.500	4.000		
16.022	-1.69	1.85	-4.00	-1.50	1.500	4.000		
16.040	-1.89	0.89	-4.00	-1.50	1.500	4.000		
16.059	-2.46	-1.75	-4.00	-1.50	1.500	4.000		
16.078	-2.30	-2.50	-4.00	-1.50	1.500	4.000		
16.097	-2.72	-2.83	-4.00	-1.50	1.500	4.000		
16.116	-1.94	-1.94	-4.00	-1.50	1.500	4.000		
16.135	-1.69	-1.75	-4.00	-1.50	1.500	4.000		
16.154	-2.09	-0.56	-4.00	-1.50	1.500	4.000		
16.173	-2.97	1.15	-4.00	-1.50	1.500	4.000		
16.192	-1.55	1.54	-4.00	-1.50	1.500	4.000		
16.211	-1.73	1.43	-4.00	-1.50	1.500	4.000		
16.230	-1.73	1.26	-4.00	-1.50	1.500	4.000		
16.249	-2.27	1.47	-4.00	-1.50	1.500	4.000		
16.268	-3.04	0.94	-4.00	-1.50	1.500	4.000		
16.287	-3.37	1.90	-4.00	-1.50	1.500	4.000		
16.306	-2.16	2.27	-4.00	-1.50	1.500	4.000		
16.325	-2.72	0.44	-8.200	-5.600	-8.200	-5.600	PC=16.333, PT= 16.517, PI=16.427	
16.343	-5.57	-4.49	-8.200	-5.600	-8.200	-5.600	R= 1910' (LT), DS= 60 MPH	
16.362	-7.36	-8.17	-8.200	-5.600	-8.200	-5.600	e(FDM)= 7.7%	
16.381	-7.31	-7.03	-8.200	-5.600	-8.200	-5.600	e(6%)= 5.6%, e(12%)= 8.2%	
16.400	-8.03	-7.68	-8.200	-5.600	-8.200	-5.600		
16.419	-7.08	-8.10	-8.200	-5.600	-8.200	-5.600		
16.438	-6.57	-7.55	-8.200	-5.600	-8.200	-5.600		
16.457	-7.05	-8.03	-8.200	-5.600	-8.200	-5.600		
16.476	-7.27	-7.96	-8.200	-5.600	-8.200	-5.600		
16.495	-5.21	-8.34	-8.200	-5.600	-8.200	-5.600		MP 16.482 - Commerce Blvd.

Milepost	R1	R2	R1 Minimum	R1 Maximum	R2 Minimum	R2 Maximum	Alignment Data	Correction Notes
16.514	-6.01	-8.63	-8.200	-5.600	-8.200	-5.600		
16.533	-5.77	-7.62	-4.00	-1.50	1.500	4.000		
16.552	-0.91	-2.83	-4.00	-1.50	1.500	4.000		
16.571	0.10	0.61	-4.00	-1.50	1.500	4.000		
16.590	-0.38	0.65	-4.00	-1.50	1.500	4.000		
16.609	-0.96	0.70	-4.00	-1.50	1.500	4.000		
16.628	-0.73	0.73	-4.00	-1.50	1.500	4.000		
16.647	-0.02	1.20	-4.00	-1.50	1.500	4.000		MP 16.643 - Palm Coast Pkwy.
16.665	-0.14	1.55	-4.00	-1.50	1.500	4.000		
16.684	-1.62	1.05	-4.00	-1.50	1.500	4.000		
16.703	-1.83	1.62	-4.00	-1.50	1.500	4.000		
16.722	-2.53	1.85	-4.00	-1.50	1.500	4.000		
16.741	-2.04	2.02	-4.00	-1.50	1.500	4.000		
16.760	-2.11	1.29	-4.00	-1.50	1.500	4.000		
16.779	-2.27	0.93	-4.00	-1.50	1.500	4.000		
16.798	-2.69	0.84	-4.00	-1.50	1.500	4.000		
16.817	-1.55	1.24	-4.00	-1.50	1.500	4.000		
16.836	-1.54	1.19	-4.00	-1.50	1.500	4.000		MP 16.828 - St. Joe Canal
16.855	-1.73	2.23	-4.00	-1.50	1.500	4.000		
16.874	-1.22	2.41	-4.00	-1.50	1.500	4.000		
16.893	-0.87	3.02	-4.00	-1.50	1.500	4.000		MP 16.897 - Hargrove Rd.
16.912	-0.75	2.37	-4.00	-1.50	1.500	4.000		
16.931	-0.73	2.09	-4.00	-1.50	1.500	4.000		
16.950	-1.80	1.85	-4.00	-1.50	1.500	4.000		
16.968	-2.58	1.80	-4.00	-1.50	1.500	4.000		
16.987	-2.09	1.97	-4.00	-1.50	1.500	4.000		
17.006	-2.97	1.97	-4.00	-1.50	1.500	4.000		
17.025	-3.44	1.68	-4.00	-1.50	1.500	4.000		
17.044	-2.93	2.64	-4.00	-1.50	1.500	4.000		
17.063	-2.43	3.60	-4.00	-1.50	1.500	4.000		
17.082	-3.44	3.86	-4.00	-1.50	1.500	4.000		
17.101	-4.58	2.67	-4.00	-1.50	1.500	4.000		
17.120	-4.51	2.83	-4.00	-1.50	1.500	4.000		
17.139	-4.19	2.41	-4.00	-1.50	1.500	4.000		MP 17.142 - Weigh Station (RT)
17.158	-3.68	2.16	-4.00	-1.50	1.500	4.000		
17.177	-3.16	1.78	-4.00	-1.50	1.500	4.000		
17.196	-3.53	1.76	-4.00	-1.50	1.500	4.000		MP 17.201 - Weigh Station (LT)
17.215	-3.61	2.78	-4.00	-1.50	1.500	4.000		
17.234	-3.53	2.60	-4.00	-1.50	1.500	4.000		
17.253	-3.70	2.09	-4.00	-1.50	1.500	4.000		
17.272	-3.60	2.08	-4.00	-1.50	1.500	4.000		
17.290	-3.25	2.55	-4.00	-1.50	1.500	4.000		
17.309	-3.44	2.67	-4.00	-1.50	1.500	4.000		
17.328	-2.86	4.19	-4.00	-1.50	1.500	4.000		
17.347	-3.14	4.16	-4.00	-1.50	1.500	4.000		
17.366	-2.78	3.46	-4.00	-1.50	1.500	4.000		
17.385	-2.65	2.99	-4.00	-1.50	1.500	4.000		
17.404	-2.01	2.30	-4.00	-1.50	1.500	4.000		
17.423	-1.24	2.79	-4.00	-1.50	1.500	4.000		MP 17.417 - Wellfield Dr.
17.442	-1.75	3.23	-4.00	-1.50	1.500	4.000		
17.461	-2.53	1.76	-4.00	-1.50	1.500	4.000		
17.480	-2.79	1.71	-4.00	-1.50	1.500	4.000		
17.499	-3.40	1.92	-4.00	-1.50	1.500	4.000		
17.518	-3.65	1.71	-4.00	-1.50	1.500	4.000		
17.537	-3.09	2.36	-4.00	-1.50	1.500	4.000		
17.556	-2.34	2.50	-4.00	-1.50	1.500	4.000		
17.575	-2.37	2.57	-4.00	-1.50	1.500	4.000		
17.593	-2.29	2.76	-4.00	-1.50	1.500	4.000		
17.612	-2.08	2.62	-4.00	-1.50	1.500	4.000		
17.631	-2.27	2.81	-4.00	-1.50	1.500	4.000		
17.650	-1.87	2.22	-4.00	-1.50	1.500	4.000		
17.669	-2.08	2.11	-4.00	-1.50	1.500	4.000		
17.688	-2.18	2.43	-4.00	-1.50	1.500	4.000		
17.707	-2.20	2.43	-4.00	-1.50	1.500	4.000		
17.726	-2.78	1.90	-4.00	-1.50	1.500	4.000		
17.745	-2.67	1.76	-4.00	-1.50	1.500	4.000		
17.764	-2.69	1.40	-4.00	-1.50	1.500	4.000		
17.783	-2.48	1.33	-4.00	-1.50	1.500	4.000		
17.802	-2.46	1.31	-4.00	-1.50	1.500	4.000		
17.821	-2.57	1.92	-4.00	-1.50	1.500	4.000		
17.840	-2.02	2.32	-4.00	-1.50	1.500	4.000		
17.859	-1.76	2.65	-4.00	-1.50	1.500	4.000		
17.878	-2.62	2.06	-4.00	-1.50	1.500	4.000		
17.897	-2.64	1.96	-4.00	-1.50	1.500	4.000		
17.915	-1.20	2.53	-4.00	-1.50	1.500	4.000		

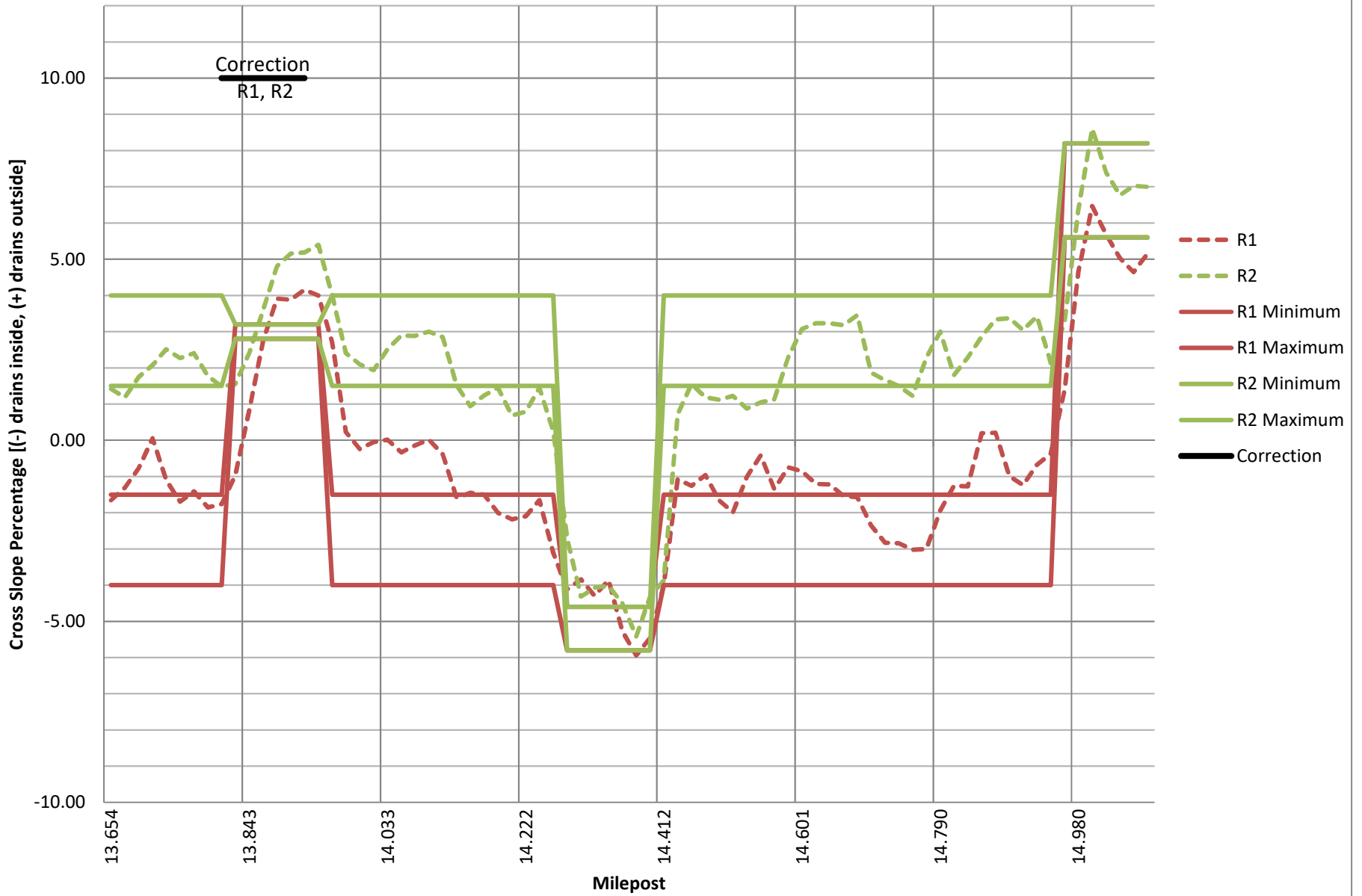
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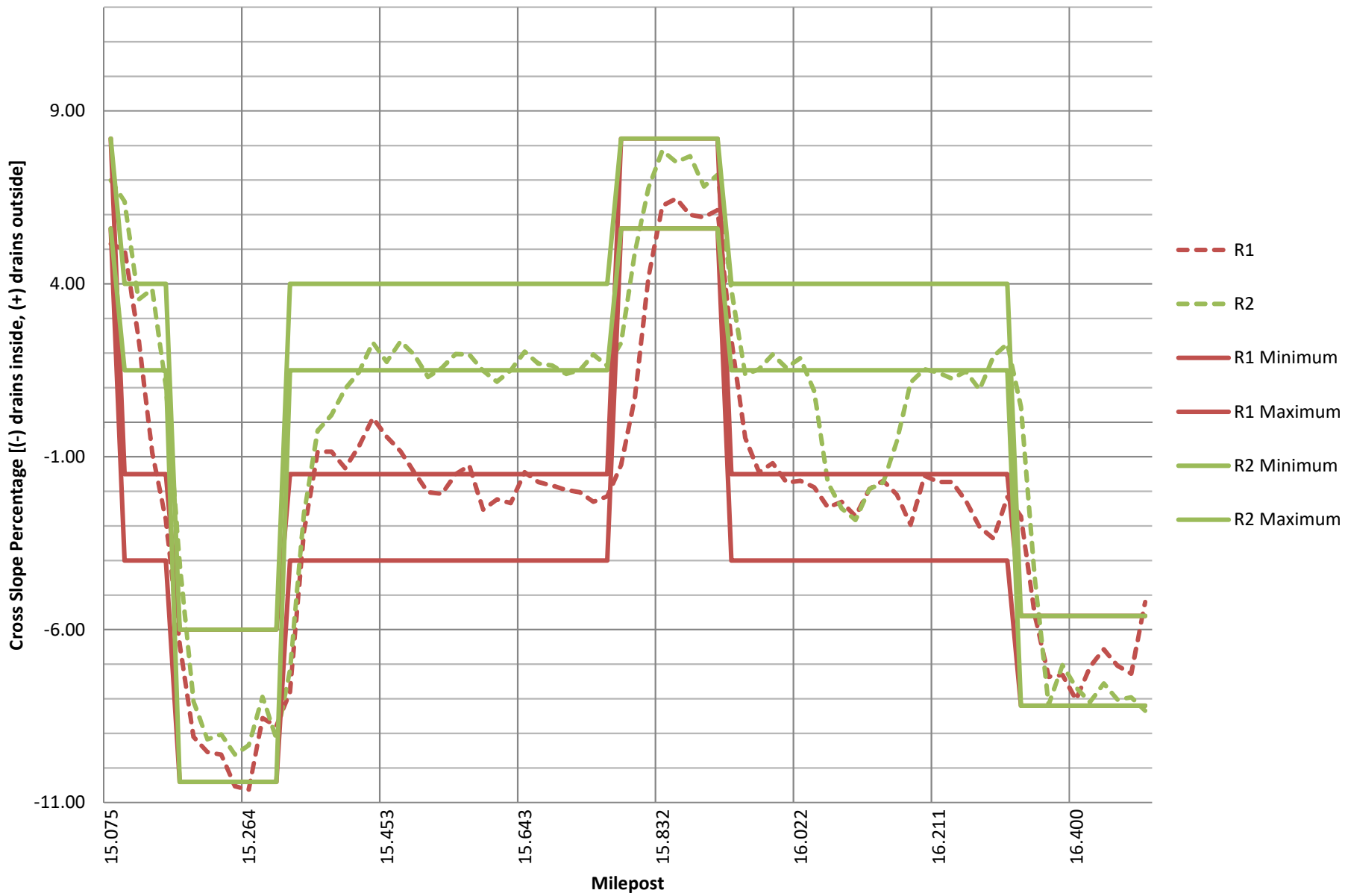
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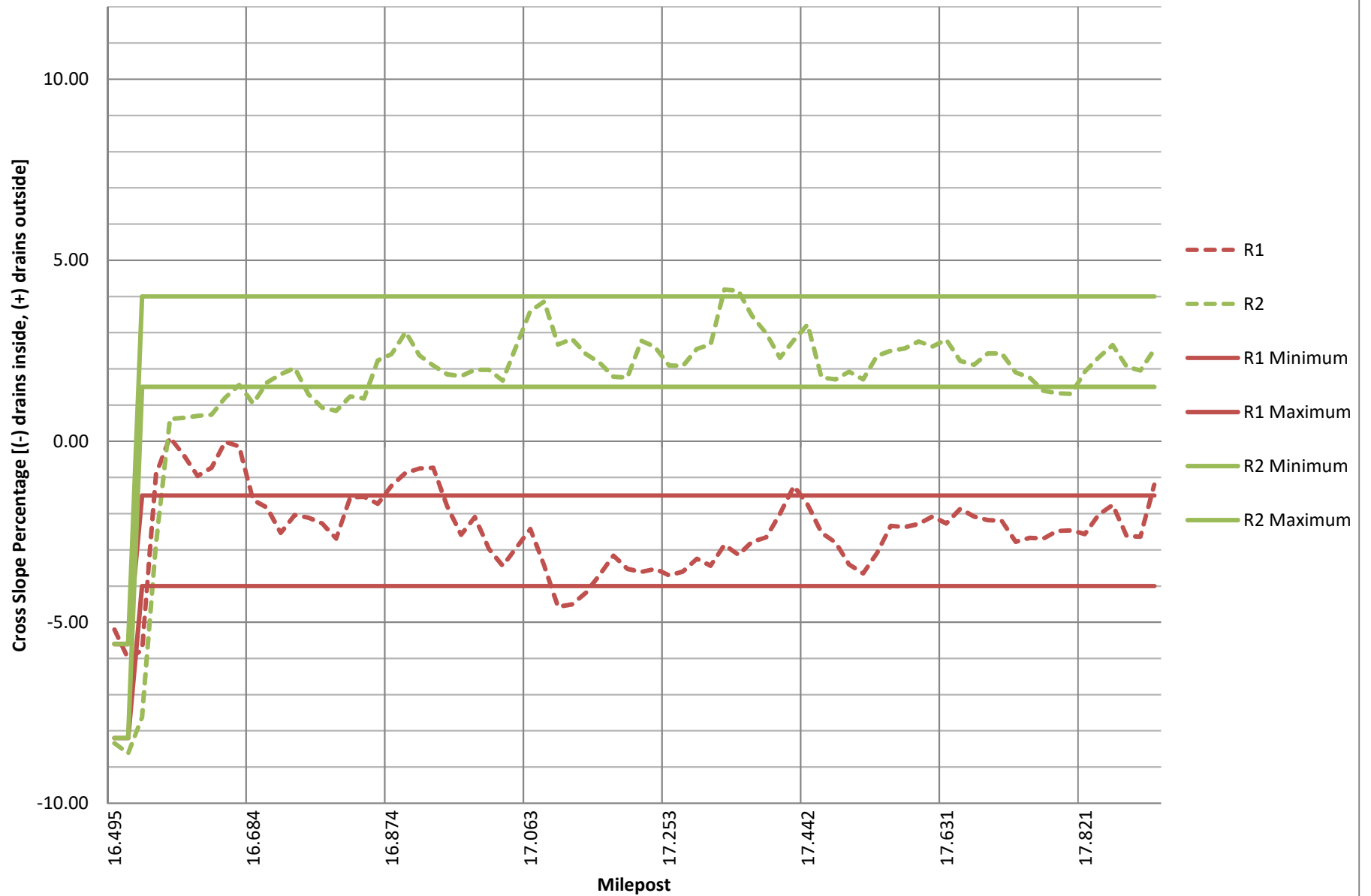
# 445216-1 SR 5 MP 13.654 to 15.075 (RIGHT)



### 445216-1 SR 5 MP 15.075 to 16.495 (RIGHT)



### 445216-1 SR 5 MP 16.495 to 17.915 (RIGHT)





October 18, 2021  
Review

EXHIBIT A  
SCOPE OF SERVICES  
FOR  
Financial Project ID: 447118-1-32-01  
FDOT District 5  
***FLAGLER***

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## SCOPE OF SERVICES FOR CONSULTING ENGINEERING SERVICES

### HIGHWAY AND BRIDGE/STRUCTURAL DESIGN

This Exhibit forms an integral part of the agreement between the State of Florida Department of Transportation (hereinafter referred to as the DEPARTMENT or FDOT) and **TBD** (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: 447118-1-32-01

Related Financial Project ID(s): *[N/A]*

Federal Aid Project No.:

TBD

Roadway:

RoadwayId: 73010000 Begin milepost: 23.442 End milepost: 23.673

Project Description: SR 5/US 1 OVER PELLICER CREEK BRIDGE REPLACEMENT

Bridge No(s).:

- **730008**
- **730045**

Railroad Crossing No.: *N/A*

Context Classification:

- ***C2-Rural Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.***

## 1 PURPOSE

The purpose of this Exhibit is to describe the scope of work and the responsibilities of the CONSULTANT and the DEPARTMENT in connection with the design and preparation of a complete set of construction contract documents and incidental engineering services, as necessary, for improvements to the transportation facility described herein.

- Major work mix includes:
  - **0022 - BRIDGE REPLACEMENT**
- Major work groups include:
  - **4.1.2 - Minor Bridge Design**
- Minor work groups include:
  - **3.1 - Minor Highway Design**

- *4.1.1 - Miscellaneous Structures*
- *7.1 - Signing, Pavement Marking and Channelization*
- *8.1 - Control Surveying*
- *8.2 - Design, Right of Way & Construction Surveying*
- *8.3 - Photogrammetric Mapping*
- *8.4 - Right of Way Mapping*
- *9.1 - Soil Exploration*
- *9.2 - Geotechnical Classification Laboratory Testing*
- *9.3 - Highway Materials Testing*
- *9.4.2 - Non-Redundant Drilled Shaft Bridge Foundation Studies*
- *9.5 - Geotechnical Specialty Laboratory Testing*

Known alternative contracting methods include: *N/A*

The general objective is for the CONSULTANT to prepare a set of contract documents including plans, specifications, supporting engineering analysis, calculations and other technical documents in accordance with FDOT policy, procedures and requirements. These Contract documents will be used by the contractor to build the project and test the project components. These Contract documents will be used by the DEPARTMENT or its Construction Engineering Inspection (CEI) representatives for inspection and final acceptance of the project. The CONSULTANT shall follow a systems engineering process to ensure that all required project components are included in the development of the Contract documents and the project can be built as designed and to specifications.

The Scope of Services establishes which items of work in the FDOT Design Manual and other pertinent manuals are specifically prescribed to accomplish the work included in this contract, and also indicate which items of work will be the responsibility of the CONSULTANT and/or the DEPARTMENT.

The CONSULTANT shall be aware that as a project is developed, certain modifications and/or improvements to the original concepts may be required. The CONSULTANT shall incorporate these refinements into the design and consider such refinements to be an anticipated and integral part of the work. This shall not be a basis for any supplemental fee request(s).

The CONSULTANT shall demonstrate good project management practices while working on this project. These include communication with the DEPARTMENT and others as necessary, management of time and resources, and documentation. The CONSULTANT shall set up and maintain throughout the design of the project a contract file in accordance with DEPARTMENT procedures. CONSULTANTS are expected to know the laws and rules governing their professions and are expected to provide services in accordance with current regulations, codes and ordinances and recognized standards applicable to such professional services. The CONSULTANT shall provide qualified technical and professional personnel to perform to Department standards and procedures, the duties and responsibilities assigned under the terms of this agreement. The

CONSULTANT shall minimize to the maximum extent possible the DEPARTMENT's need to apply its own resources to assignments authorized by the Department.

The DEPARTMENT will provide contract administration, management services, and technical reviews of all work associated with the development and preparation of contract documents, including Construction documents. The DEPARTMENT's technical reviews are for high-level conformance and are not meant to be comprehensive reviews. The CONSULTANT shall be fully responsible for all work performed and work products developed under this Scope of Services. The DEPARTMENT may provide job-specific information and/or functions as outlined in this contract, if favorable.

## **2 PROJECT DESCRIPTION**

The CONSULTANT shall investigate the status of the project and become familiar with concepts and commitments (typical sections, alignments, etc.) developed from prior studies and/or activities. If a Preliminary Engineering Report is available from a prior or current Project Development and Environment (PD&E) study, the CONSULTANT shall use the approved concepts as a basis for the design unless otherwise directed by the DEPARTMENT.

### ***SR 5/US 1 OVER PELLICER CREEK BRIDGE REPLACEMENT***

*The purpose of the project is to replace both SR 5/US 1 bridges over Pellicer Creek at the Flagler/St Johns County line. The Florida Department of Transportation has noted that the existing bridges are structurally deficient.*

#### **2.1 Project General and Roadway (Activities 3, 4, and 5)**

Public Involvement:

CAP Level: **4**

*Anticipate one public meeting as well as public other stakeholder coordination as needed for the project.*

Other Agency Presentations/Meetings:

<b>Agency</b>	<b>Number of Meetings</b>
Flagler County	1
St. Johns County	1

Joint Project Agreements: *N/A*

*N/A*

Specifications Package Preparation:

## ***Standard Specifications***

Estimated Quantities Report Preparation: *As Directed*

Risk Assessment Workshop:

Number of Risk Assessment Workshop: 1

### ***Risk Assessment Memo***

Plan Type:

***Plan/Profile***

Typical Section:

Number of Typical Sections: 3

***Typical 1 - MP 23.465 to MP 23.631: Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 8-ft inside shoulders (4-ft paved), and a 30-ft depressed grassed median. This typical will be modified to provide 10-ft outside shoulders (5-ft paved).***

***Typical 2 - Bridge MP 23.631 to 23.673: Four 12-ft travel lanes (two per direction), 2-ft shoulders (inside and outside) with traffic railing. Proposed Typical section includes four 12-ft travel lanes (two per direction), 6-ft inside shoulders and 10-ft outside shoulder with traffic railing.***

***Typical 3 - MP 0.000 to MP 0.117 (78010-000): Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 6-ft inside shoulders (2-ft paved), and a 30-ft depressed grassed median. This typical will be modified to provide 10-ft outside shoulders (5-ft paved) and 8-ft inside shoulders (4-ft paved).***

Pavement Designs:

Number of Pavement Designs: 2

***Pavement Design 1 - full depth reconstruction of the travel lanes***

***Pavement Design 2 - full depth paved shoulder reconstruction.***

Pavement Type Selection Report(s): *N/A*

*N/A*

Cross-Slope Correction: *N/A*

*N/A*

Access Management Classification:

- ***Access Class 3***

*rural principal arterial*

Transit Route Features: *N/A*  
*N/A*

Major Intersections and Interchanges: *N/A*  
*N/A*

Roadway Alternative Analysis: *N/A*  
*N/A*

Level of Temporary Traffic Control Plan (TTCP): **3**

***A diversion/crossovers are necessary for the project***

Temporary Lighting: *N/A*  
*N/A*

Temporary Signals: *N/A*  
*N/A*

Temporary Drainage:  
***Please refer to attached Candidate Project Technical Scope for details***

Design Variations:

- ***Others***

Others: ***Median Width***

***Memo - Please refer to Candidate Project Technical Scope for details***

Design Exceptions: *N/A*

Back of Sidewalk Profiles: *N/A*  
*N/A*

Selective Clearing and Grubbing: *N/A*  
*N/A*

**2.2 Drainage (Activities 6a and 6b)**

Drainage System Type:  
***Open***

Number of stormwater management facility sites: *N/A*

Number of cross drains: [*Number*]

*Please refer to Candidate Project Technical Scope for details*

### **2.3 Utilities Coordination (Activity 7)**

The CONSULTANT is responsible to certify that all necessary arrangements for utility work on this project have been made and will not conflict with the physical construction schedule. The CONSULTANT should coordinate with DEPARTMENT personnel to coordinate transmittals to Utility Companies and meet production schedules.

The CONSULTANT shall ensure FDOT standards, policies, procedures, practices, and design criteria are followed concerning utility coordination.

The CONSULTANT may employ more than one individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. This person shall be contractually referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the FDOT District Utilities Administrator that they have the following knowledge, skills, and expertise:

- A minimum of 4 years of experience performing utility coordination in accordance with FDOT, Federal Highway Administration (FHWA), and American Association of State Highway and Transportation Officials (AASHTO) standards, policies, and procedures.
- A thorough knowledge of the FDOT plans production process and District utility coordination process.
- A thorough knowledge of FDOT agreements, standards, policies, and procedures.

The Utility Coordination Manager shall be responsible for managing all utility coordination, including the following:

- Assuring that Utility Coordination and accommodation is in accordance to the FDOT, FHWA, and AASHTO standards, policies, procedures, and design criteria.
- Assisting the engineer of record in identifying all existing utilities and coordinating any new installations. Assisting the Engineer of Record with resolving utility conflicts.
- Scheduling and performing utility coordination meetings, keeping and distribution of minutes/action items of all utility meetings, and ensuring expedient follow-up on all unresolved issues.
- Distributing all plans, conflict matrixes and changes to affected utility owners and making sure this information is properly coordinated and documented.
- Identifying and coordinating the completion of any FDOT or utility owner agreement that is required for reimbursement, or accommodation of the utility facilities associated with the project.
- Review and certify to the District Utilities Administrator that all Utility Work Schedules are correct and in accordance with the DEPARTMENT's standards, policies, and procedures.

- Prepare, review and process all utility related reimbursable paperwork inclusive of betterment and salvage determination.

The CONSULTANT's utility coordination work shall be performed and directed by the Utility Coordination Manager that was identified and approved by FDOT's Project Manager. Any proposed change of the approved Utility Coordination Manager shall be subject to review and approval by FDOT's Project Manager prior to any change being made in this contract.

Expected Utilities:

- ***Including but not limited to:***

#### **2.4 Environmental Permits and Environmental Clearances (Activity 8)**

Expected Permits:

- ***US Army Corps of Engineers (USACE) Nationwide Permit (NWP)***
- ***FL Department of Environmental Protection (FDEP) General Permit***
- ***Saint Johns River Water Management District (SJRWMD) General Permit***

The DEPARTMENT will provide compensatory wetland mitigation in accordance with Section 373.4137, Florida Statutes.

***Please reference the attached Candidate Technical Scope for details***

#### **2.5 Structures (Activities 9 - 18)**

Bridge:

<b>No.</b>	<b>Bridge Number</b>	<b>Length</b>	<b>Description</b>
1	730008	217 ft.	SR 5 SB over Pellicer Creek
2	730045	220 ft.	SR 5 NB over Pellicer Creek

Type of Bridge Structure Work

- BDR (Activity 10)  
***As Needed***
- Temporary Bridge (Activity 11)  
***If deemed necessary***
- Short Span Concrete (Activity 12)  
***As Needed***
- Medium Span Concrete (Activity 13)

*As Needed*

- Structural Steel (Activity 14): *N/A*
- Segmental Concrete (Activity 15): *N/A*
- Movable Span (Activity 16): *N/A*

Miscellaneous Structures:

- *As Needed*

*Please refer to attached Candidate Technical Scope for details*

## **2.6 Signing and Pavement Markings (Activities 19 & 20)**

Sign Structures:

**No. Type Number Location**

*Please reference Candidate Technical Scope for details*

## **2.7 Signalization (Activities 21 & 22) (N/A)**

*N/A*

## **2.8 Lighting (Activities 23 & 24) (N/A)**

*N/A*

## **2.9 Landscape (Activities 25 & 26) (N/A)**

*N/A*

## **2.10 Survey (Activity 27)**

Design Survey:

*Obtain complete 3D/DTM Topographic survey of the project area. Include a width of 220-ft for 200-ft outside the project, as well as approximately 0.5 AC to each side of the bridge to determine channel bottom for water depths and support the bridge hydraulic analysis. Survey area of approximately 11.68 AC.*

Subsurface Utility Exploration:

*Obtain supplemental field survey for obscured areas or underground features affected by the work within the limits of 3D or planimetric mapping. o Include existing drainage structures, pipes, and flow lines. o Include up to 10 Vvh locations for utilities identified in the Utility Scope Items. o Locate features delineated by the environmental assessment, such as wetland lines*

Right of Way Survey:

*Obtain survey as required to complete the requirements of the SSL application.*

*Establish the existing Rights of Way by existing Maps or Record Subdivision Plats and the field monumentation, within the survey areas that overlap the Right of Way identified on the Concept only. Right of Way depicted on the Concept is an approximation based on record maps or plats best fit to the aerial, no survey has been performed. Perform the field and office survey work necessary for the preparation of a specific purpose survey and TIIFT sketch to complete the acquisition of Right-of-Way for: o Easement across the SSL will be required to accommodate construction. Refer to the Permitting Scope Items, the SSL application includes specific legal description requirements*

## 2.11 Photogrammetry (Activity 28)

*As directed*

## 2.12 Mapping (Activity 29)

Control Survey Map:

*As directed*

Right of Way Map:

*As directed*

Legal Descriptions:

*As directed*

Maintenance Map: N/A

N/A

Miscellaneous Items:

*Establish the existing Rights of Way by existing Maps or Record Subdivision Plats and the field monumentation, within the survey areas that overlap the Right of Way identified on the Concept only. Right of Way depicted on the Concept is an approximation based on record maps or plats best fit to the aerial, no survey has been performed. Perform the field and office survey work necessary for the preparation of a specific purpose survey and TIIFT sketch to complete the acquisition of Right-of-Way for: o Easement across the SSL will be required to accommodate construction. Refer to the Permitting Scope Items, the SSL application includes specific legal description requirements*

### **2.13 Terrestrial Mobile LiDAR (Activity 30) (N/A)**

N/A

### **2.14 Architecture (Activity 31) (N/A)**

N/A

### **2.15 Noise Barriers (Activity 32) (N/A)**

N/A

### **2.16 Intelligent Transportation Systems (Activities 33 & 34)**

*Please reference the Candidate Project Technical Scope for details*

The Federal Highway Administration issued Rule 940 entitled Intelligent Transportation Systems (ITS) Architecture and Standards to ensure new projects conform to the National ITS Architecture and standards as well as with a regional ITS architecture developed to reflect the local needs, issues, problems, and objectives for implementation.

For all projects with ITS activities, the CONSULTANT shall follow the Rule 940 requirements and use a Systems Engineering approach for determining the requirements for the project. The CONSULTANT shall develop all necessary documents to support the Rule 940 requirements like Concept of Operations (ConOPS), Systems Engineering Management Plan (SEMP), Requirements Traceability Verification Matrix (RTVM) and others as deemed necessary by the Department.

*[Describe the hardware configuration analysis and design including system architecture, interfaces, communications, equipment, devices and computers.]*

*[If relevant, mention any prior reports done such as concept reports, etc.]*

The ITS shall operate from the [Name] TMC located at [Location] using the SunGuide® (SunGuide) Software, or if SunGuide is not in use at [Name] TMC, using the appropriate [Name Software Package].

Interchanges: N/A

Interchanges: N/A

Geographical Information System (GIS) Requirements: CONSULTANT shall include in the design the GIS data collection requirements and deliverables for integration with SunGuide software and other Department GIS based asset management applications like ITS FM software.

All design efforts shall be based on deploying "open architecture" subsystems, while remaining fully compatible with previous designs (as applicable) and the FDOT ITS Specifications. All ITS field devices and support systems shall be designed and located outside of the clear zone, or behind protective barrier, within the right of way. This includes cabinets, poles, and support hardware. Utility conflicts shall be identified and resolved during the design phase. The location of design elements will be coordinated with the District Landscape Architect to optimize landscape opportunities. The design shall minimize theft and vandalism. The CONSULTANT shall include in the design vandal resistant mechanisms to minimize theft. The CONSULTANT shall provide additional redundant power and communications systems to minimize system downtime due to vandalism.

The CONSULTANT shall design the project subsystems such that they will be monitored and controlled from the FDOT's TMC facilities located at [Location(s)]. The CONSULTANT shall ensure that all ITS field devices and ancillary components comply with the FDOT's Approved Product List (APL) and are supported within the SunGuide software or other specified software, unless otherwise approved by the DEPARTMENT.

The CONSULTANT shall include in the design any required upgrade to the TMC central hardware, equipment racks, and equipment wiring, as directed by the FDOT project manager, to make the subsystems fully operations from the TMC facilities.

For projects with existing ITS, the CONSULTANT shall include in the design any required upgrade to existing ITS equipment to meet the latest FDOT standards, NEC requirements or as directed by the FDOT project manager and to make the subsystems fully operations from the TMC facilities.

ITS coordination with Landscape Architecture shall include both underground conflicts and above-ground impacts to existing and/or proposed Landscaping. The CONSULTANT shall closely coordinate with the Landscape Architect to ensure that all conflicts are identified, addressed and mitigated in the Contract Documents.

### **2.17 Geotechnical (Activity 35)**

*Please reference the Candidate Project Technical Scope for details*

### **2.18 3D Modeling (Activity 36)**

*As directed*

### **2.19 Project Schedule**

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production Date. The schedule shall be based upon the [District Schedule Information]. The current production date is **January 02, 2026**. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling,

the CONSULTANT shall allow for a **4** week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

All fees and price proposals are to be based on the negotiated schedule of **45** months for final construction contract documents. However, the contract deadline is **45** months from the Notice to Proceed.

Periodically, throughout the life of the contract, the project schedule and payout and fiscal progress curves shall be reviewed and, with the approval of the DEPARTMENT, adjusted as necessary to incorporate changes in the Scope of Services and progress to date.

The approved schedule and schedule status report, along with progress and payout curves, shall be submitted with the monthly progress report.

The schedule shall be submitted in an FDOT system-compatible format.

## **2.20 Submittals**

The CONSULTANT shall furnish construction contract documents as required by the DEPARTMENT to adequately control, coordinate, and approve the work concepts. The CONSULTANT shall distribute submittals as directed by the DEPARTMENT. The DEPARTMENT will determine the specific number of copies required prior to each submittal.

### *Standard Submittals*

## **2.21 Provisions for Work**

All work shall be prepared with English units in accordance with the latest editions of standards and requirements utilized by the DEPARTMENT which include, but are not limited to, publications such as:

### **General:**

- ***Title 29, Part 1910, Standard 1910.1001, Code of Federal Regulations (29 C.F.R. 1910.1001) - Asbestos Standard for Industry, U.S. Occupational Safety and Health Administration (OSHA)***
- ***29 C.F.R. 1926.1101 - Asbestos Standard for Construction, OSHA***
- ***40 C.F.R. 61, Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP), Environmental Protection Agency (EPA)***
- ***40 C.F.R. 763, Subpart E - Asbestos-Containing Materials in Schools, EPA***
- ***40 C.F.R. 763, Subpart G - Asbestos Worker Protection, EPA***
- ***Americans with Disabilities Act (ADA) Standards for Accessible Design***
- ***AASHTO - A Policy on Design Standards Interstate System***
- ***AASHTO - Roadside Design Guide***
- ***AASHTO - Roadway Lighting Design Guide***

- *AASHTO - A Policy for Geometric Design of Highways and Streets*
- *AASHTO - Highway Safety Manual*
- *Rule Chapter 5J-17, Florida Administrative Code (F.A.C.), Standards of Practice for Professional Surveyors and Mappers*
- *Chapter 469, Florida Statutes (F.S.) - Asbestos Abatement*
- *Rule Chapter 62-257, F.A.C., Asbestos Program*
- *Rule Chapter 62-302, F.A.C., Surface Water Quality Standards*
- *Code of Federal Regulations (C.F.R.)*
- *Florida Administrative Codes (F.A.C.)*
- *Chapters 20, 120, 215, 455, Florida Statutes (F.S.) - Florida Department of Business & Professional Regulations Rules*
- *Florida Department of Environmental Protection Rules*
- *FDOT Basis of Estimates Manual*
- *FDOT Computer Aided Design and Drafting (CADD) Manual*
- *FDOT Standard Plans*
- *FDOT Flexible Pavement Design Manual*
- *FDOT - Florida Roundabout Guide*
- *FDOT Handbook for Preparation of Specifications Package*
- *FDOT Standard Plans Instructions*
- *FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways ("Florida Greenbook")*
- *FDOT Materials Manual*
- *FDOT Pavement Type Selection Manual*
- *FDOT Design Manual*
- *FDOT Procedures and Policies*
- *FDOT Procurement Procedure 001-375-030, Compensation for Consultant Travel Time on Professional Services Agreements*
- *FDOT Project Development and Environment Manual*
- *FDOT Project Traffic Forecasting Handbook*
- *FDOT Public Involvement Handbook*
- *FDOT Rigid Pavement Design Manual*
- *FDOT Standard Specifications for Road and Bridge Construction*
- *FDOT Utility Accommodation Manual*
- *Manual on Speed Zoning for Highways, Roads, and Streets in Florida*
- *Federal Highway Administration (FHWA) - Manual on Uniform Traffic Control Devices (MUTCD)*
- *FHWA - National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide*
- *FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook*
- *Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 2005*

- *Florida Statutes (F.S.)*
- *Florida's Level of Service Standards and Guidelines Manual for Planning*
- *Model Guide Specifications - Asbestos Abatement and Management in Buildings, National Institute for Building Sciences (NIBS)*
- *Quality Assurance Guidelines*
- *Safety Standards*
- *Any special instructions from the DEPARTMENT*

**Roadway:**

- *FDOT - Florida Intersection Design Guide*
- *FDOT - Project Traffic Forecasting Handbook*
- *FDOT - Quality/Level of Service Handbook*
- *Florida's Level of Service Standards and Highway Capacity Analysis for the SHS*
- *Transportation Research Board (TRB) - Highway Capacity Manual*

**Permits:**

- *Chapter 373, F.S. - Water Resources*
- *US Fish and Wildlife Service Endangered Species Programs*
- *Florida Fish and Wildlife Conservation Commission Protected Wildlife Permits*
- *Bridge Permit Application Guide, COMDTPUB P16591.3C*
- *Building Permit*

**Drainage:**

- *FDOT Drainage Design Guide*
- *FDOT Drainage Manual*
- *Florida Erosion and Sediment Control Manual*
- *FDOT Drainage Connection Permit Handbook*
- *FDOT Bridge Scour Manual*

**Survey and Mapping:**

- *All applicable Florida Statutes and Administrative Codes*
- *Applicable Rules, Guidelines Codes and authorities of other Municipal, County, State and Federal Agencies.*
- *FDOT Aerial Surveying Standards for Transportation Projects Topic 550-020-002*
- *FDOT Right of Way Mapping Handbook*
- *FDOT Surveying Procedure Topic 550-030-101*
- *Florida Department of Transportation Right of Way Procedures Manual*
- *Florida Department of Transportation Surveying Handbook*
- *Right of Way Mapping Procedure 550-030-015*

### **Traffic Engineering and Operations and ITS:**

- *AASHTO - An Information Guide for Highway Lighting*
- *AASHTO - Guide for Development of Bicycle Facilities*
- *FHWA Standard Highway Signs Manual*
- *FDOT Manual on Uniform Traffic Studies (MUTS)*
- *FDOT Median Handbook*
- *FDOT Traffic Engineering Manual*
- *National Electric Safety Code*
- *National Electrical Code*

### **Florida's Turnpike Enterprise:**

- *Florida's Turnpike Design Handbook (TDH)*
- *Florida's Turnpike Lane Closure Policy*
- *Florida's Turnpike Drainage Manual Supplement*
- *Rigid Pavement Design Guide for Toll Locations with Electronic Toll Collection*
- *Flexible Pavement Design Guide for Toll Locations with Electronic Toll Collection*
- *Florida's Turnpike General Tolling Requirements (GTR)*
- *Additional Florida's Turnpike Enterprise standards, guides, and policies for design and construction can be found on the FTE Design Website:  
<https://floridasturnpike.com/business-opportunities/design/>*

### **Traffic Monitoring:**

- *American Institute of Steel Construction (AISC) Manual of Steel Construction, referred to as "AISC Specifications"*
- *American National Standards Institute (ANSI) RP-8-00 Recommended Practice for Roadway Lighting*
- *AASHTO AWS D1.1/ANSI Structural Welding Code - Steel*
- *AASHTO D1.5/AWS D1.5 Bridge Welding Code*
- *FHWA Traffic Detector Handbook*
- *FDOT General Interest Roadway Data Procedure*
- *FHWA Traffic Monitoring Guide*
- *FDOT's Traffic/Polling Equipment Procedures*

### **Structures:**

- *AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims*
- *AASHTO LRFD Movable Highway Bridge Design Specifications and Interims*
- *AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and Interims*
- *AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code*

- *AASHTO Guide Specifications for Structural Design of Sound Barriers*
- *AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges*
- *FDOT Bridge Load Rating Manual*
- *FDOT Structures Manual*
- *FDOT Structures Design Bulletins (available on FDOT Structures web site only)*
- *Geotechnical*
- *FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications*
- *Manual of Florida Sampling and Testing Methods*
- *Soils and Foundation Handbook*

**Landscape Architecture:**

- *Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants*

**Architectural:**

- *Building Codes*
- *Florida Accessibility Code for Building Construction*
- *Rule Chapter 60D, F.A.C., Division of Building Construction*
- *Chapter 553, F.S. - Building Construction Standards*
- *ANSI A117.1 2003 Accessible and Usable Building and Facilities*
- *Titles II and III, Americans With Disabilities Act (ADA), Public Law 101-336; and the ADA Accessibility Guidelines (ADAAG)*
- *Florida Building Code:*
  - *Building*
  - *Fuel Gas*
  - *Mechanical*
  - *Plumbing*
  - *Existing Building*

**Architectural - Fire Codes and Rules:**

- *National Fire Protection Association (NFPA) - Life Safety Code*
- *NFPA 70 - National Electrical Code*
- *NFPA 101 - Life Safety Code*
- *NFPA 10 - Standard for Portable Fire Extinguishers*
- *NFPA 11 - Standard for Low-Expansion Foam Systems*
- *NFPA 11A - Standard for High- and Medium-Expansion Foam Systems*
- *NFPA 12 - Standard for Carbon Dioxide Extinguishing Systems*
- *NFPA 13 - Installation of Sprinkler Systems*

- *NFPA 30 - Flammable and Combustible Liquids Code*
- *NFPA 54 - National Gas Fuel Code*
- *NFPA 58 - LP-Gas Code*
- *Florida Fire Prevention Code as adopted by the State Fire Marshal - Consult with the Florida State Fire Marshal's office for other frequently used codes*

**Architectural - Extinguishing Systems:**

- *NFPA 10 - Fire Extinguishers*
- *NFPA 13 - Sprinkler*
- *NFPA 14 - Standpipe and Hose System*
- *NFPA 17 - Dry Chemical*
- *NFPA 20 - Centrifugal Fire Pump*
- *NFPA 24 - Private Fire Service Mains*
- *NFPA 200 - Standard on Clean Agent Fire Extinguishing Systems*

**Architectural - Detection and Fire Alarm Systems:**

- *NFPA 70 - Electrical Code*
- *NFPA 72 - Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems*
- *NFPA 72E - Automatic Fire Detectors*
- *NFPA 72G - Installation, Maintenance, and Use of Notification Appliances*
- *NFPA 72H - Testing Procedures for Remote Station and Proprietary Systems*
- *NFPA 74 - Household Fire Warning Equipment*
- *NFPA 75 - Protection of Electronic Computer Equipment*

**Architectural - Mechanical Systems:**

- *NFPA 90A - Air Conditioning and Ventilating Systems*
- *NFPA 92A - Smoke Control Systems*
- *NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment*
- *NFPA 204M - Smoke and Heating Venting*

**Architectural - Miscellaneous Systems:**

- *NFPA 45 - Laboratories Using Chemicals*
- *NFPA 80 - Fire Doors and Windows*
- *NFPA 88A - Parking Structures*
- *NFPA 105- Smoke and Draft-control Door Assemblies*
- *NFPA 110 - Emergency and Standby Power Systems*
- *NFPA 220 - Types of Building Construction*
- *NFPA 241 - Safeguard Construction, Alteration, and Operations*

- *Rule Chapter 69A-47, F.A.C., Uniform Fire Safety For Elevators*
- *Rule Chapter 69A-51, F.A.C., Boiler Safety*

#### **Architectural - Energy Conservation:**

- *Rule Chapter 60D-4, F.A.C., Rules For Construction and Leasing of State Buildings To Insure Energy Conservation*
- *Section 255.255, F.S., Life-Cycle Costs*

#### **Architectural - Elevators:**

- *Rule Chapter 61C-5, F.A.C., Florida Elevator Safety Code*
- *ASME A-17.1, Safety Code for Elevators and Escalators*
- *Architectural - Floodplain Management Criteria*
- *Section 255.25, F.S., Approval Required Prior to Construction or Lease of Buildings*
- *Rules of the Federal Emergency Management Agency (FEMA)*

#### **Architectural - Other:**

- *Rule Chapter 64E-6, F.A.C., Standards for On Site Sewage Disposal Systems (Septic Tanks)*
- *Rule Chapter 62-600, F.A.C., Domestic Wastewater Facilities*
- *Rule Chapter 62-761, F.A.C., Underground Storage Tank Systems*
- *American Concrete Institute*
- *American Institute of Architects - Architect's Handbook of Professional Practice*
- *American Society for Testing and Materials - ASTM Standards*
- *Brick Institute of America*
- *DMS - Standards for Design of State Facilities*
- *Florida Concrete Products Association*
- *FDOT - ADA/Accessibility Procedure*
- *FDOT - Building Code Compliance Procedure*
- *FDOT - Design Build Procurement and Administration*
- *LEED (Leadership in Energy and Environmental Design) Green Building Rating System*
- *National Concrete Masonry Association*
- *National Electrical Code*
- *Portland Cement Association - Concrete Masonry Handbook*
- *United State Green Building Council (USGBC)*

## **2.22 Services to be Performed by the DEPARTMENT**

When appropriate or available, the DEPARTMENT will provide project data including:

- *Numbers for field books*
- *Preliminary Horizontal Network Control*
- *Access for the CONSULTANT to utilize the DEPARTMENT's Information Technology Resources*
- *All Department agreements with Utility Agency Owner (UAO)*
- *All certifications necessary for project letting*
- *Building Construction Permit Coordination (Turnpike)*
- *All information that may come to the DEPARTMENT pertaining to future improvements*
- *All future information that may come to the DEPARTMENT during the term of the CONSULTANT's Agreement, which in the opinion of the DEPARTMENT is necessary for the prosecution of the work*
- *Available traffic and planning data*
- *All approved utility relocations*
- *Project utility certification to the DEPARTMENT's Central Office*
- *Any necessary title searches*
- *Engineering standards review services*
- *All available information in the possession of the DEPARTMENT pertaining to utility companies whose facilities may be affected by the proposed construction*
- *All future information that may come to the DEPARTMENT pertaining to subdivision plans so that the CONSULTANT may take advantage of additional areas that can be utilized as part of the existing right of way*
- *Systems traffic for Projected Design Year, with K, D, and T factors*
- *Previously constructed Highway Beautification or Landscape Construction Plans*
- *Landscape Opportunity Plan(s)*
- *Existing right of way maps*
- *Existing pavement evaluation report for all RRR projects*
- *PD&E Documents*
- *Design Reports*
- *Letters of authorization designating the CONSULTANT as an agent of the DEPARTMENT in accordance with F.S. 337.274*
- *Phase reviews of plans and engineering documents*
- *Regarding Environmental Permitting Services:*
  - *Approved Permit Document when available*
  - *Approval of all contacts with environmental agencies*
  - *General philosophies and guidelines of the DEPARTMENT to be used in the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the Project Manager.*
  - *Appropriate signatures on application forms*

### **3 PROJECT COMMON AND PROJECT GENERAL TASKS**

#### Project Common Tasks

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, 4 (Roadway Analysis) through 36 (3D Modeling). These tasks are to be included in the project scope in each applicable activity when the described work is to be performed by the CONSULTANT.

Cost Estimates: The CONSULTANT is responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to 60% plans or completion of quantities, the DEPARTMENT's Long-Range Estimate (LRE) system will be used to produce a conceptual estimate, according to District policy. Once the quantities have been developed (beginning at 60% plans and no later than 90% plans) the CONSULTANT shall be responsible for inputting the pay items and quantities into AASHTOWare Project Preconstruction through the use of the DEPARTMENT's Designer Interface.

Technical Special Provisions: The CONSULTANT shall provide Technical Special Provisions for all items of work not covered by the Standard Specifications for Road and Bridge Construction and the workbook of implemented modifications.

A Technical Special Provision shall not modify the Standard Specifications and implemented modifications in any way.

The Technical Special Provisions shall provide a description of work, materials, equipment and specific requirements, method of measurement and basis of payment. Proposed Technical Special Provisions will be submitted to the District Specifications Office for initial review at the time of the Phase III plans review submission to the DEPARTMENT's Project Manager. This timing will allow for adequate processing time prior to final submittal. The Technical Special Provisions will be reviewed for suitability in accordance with the Handbook for Preparation of Specification Packages. The District Specifications Office will forward the Technical Special Provisions to the District Legal Office for their review and comment. All comments will be returned to the CONSULTANT for correction and resolution. Final Technical Special Provisions shall be digitally signed and sealed in accordance with applicable Florida Statutes.

The CONSULTANT shall contact the appropriate District Specifications Office for details of the current format to be used before starting preparations of Technical Special Provisions.

Modified Special Provisions: The CONSULTANT shall provide Modified Special Provisions as required by the project. Modified Special Provisions are defined in the Specifications Handbook.

A Modified Special Provision shall not modify the first nine sections of the Standard Specifications and implemented modifications in any way. All modifications to other sections must be justified to the appropriate District and Central Specifications Offices to be included in the project's specifications package.

Field Reviews: The CONSULTANT shall make as many trips to the project site as required to obtain necessary data for all elements of the project.

Technical Meetings: The CONSULTANT shall attend all technical meetings necessary to execute the Scope of Services of this contract. This includes meetings with DEPARTMENT and/or Agency staff, between disciplines and subconsultants, such as access management meetings, pavement design meetings, local governments, railroads, airports, progress review meetings (phase review), and miscellaneous meetings. The CONSULTANT shall prepare, and submit to the DEPARTMENT's Project Manager for review, the meeting minutes for all meetings attended by them. The meeting minutes are due within five (5) working days of attending the meeting.

Quality Assurance/Quality Control: It is the intention of the DEPARTMENT that design CONSULTANTS, including their subconsultant(s), are held responsible for their work, including plans review. The purpose of CONSULTANT plan reviews is to ensure that CONSULTANT plans follow the plan preparation procedures outlined in the FDOT Design Manual, that state and federal design criteria are followed with the DEPARTMENT concept, and that the CONSULTANT submittals are complete. All subconsultant document submittals shall be submitted by the subconsultant directly to the CONSULTANT for their independent Quality Assurance/Quality Control review and subsequent submittal to the DEPARTMENT.

It is the CONSULTANT'S responsibility to independently and continually QC their plans and other deliverables. The CONSULTANT should regularly communicate with the DEPARTMENT's Design Project Manager to discuss and resolve issues or solicit opinions from those within designated areas of expertise.

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of all surveys, designs, drawings, specifications and other services furnished by the CONSULTANT and their subconsultant(s) under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all maps, design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan

shall be one specifically designed for this project. The CONSULTANT shall submit a Quality Control Plan for approval within twenty (20) business days of the written Notice to Proceed and it shall be signed by the CONSULTANT's Project Manager and the CONSULTANT QC Manager. The Quality Control Plan shall include the names of the CONSULTANT's staff that will perform the quality control reviews. The Quality Control reviewer shall be a Florida Licensed Professional Engineer fully prequalified under F.A.C. 14-75 in the work type being reviewed. A marked up set of prints from a Quality Control Review indicating the reviewers for each component (structures, roadway, drainage, signals, geotechnical, signing and marking, lighting, landscape, surveys, etc.) and a written resolution of comments on a point-by-point basis will be required, if requested by the DEPARTMENT, with each phase submittal. The responsible Professional Engineer, Landscape Architect, or Professional Surveyor & Mapper that performed the Quality Control review will sign a statement certifying that the review was conducted and found to meet required specifications.

The CONSULTANT shall, without additional compensation, correct all errors or deficiencies in the designs, maps, drawings, specifications and/or other products and services.

Independent Peer Review: When directed by the DEPARTMENT, a subconsultant may perform Independent Peer Reviews.

Independent Peer Review and a Constructability/Bidability Review for design Phase Plans document submittals are required on this project. These separate reviews shall be completed by someone who has not worked on the plan component that is being reviewed. These could include, but are not limited to a separate office under the Prime's umbrella, a subconsultant that is qualified in the work group being reviewed, or a CEI. It does not include persons who have knowledge of the day to day design efforts. The Constructability/Bidability Review shall be performed by a person with experience working on Department construction projects (CEI, Contractor, etc.).

The Independent Peer Review for design Phase Plans submittals shall ensure the plans meet the FDM, Standard Plans and FDOT CADD Manual. The Constructability/Bidability Review shall ensure the project can be constructed and paid for as designed. Constructability/Bidability Reviews should be conducted prior to the Phase III and Phase IV submittals, using the Phase Review Checklist (Guidance Document 1-1-A) from the Construction Project Administration Manual (CPAM) as a minimum guideline. The CONSULTANT shall submit this checklist, as well as the "marked-up" set of plans during this review, and review comments and comment responses from any previous Constructability/Bidability reviews. These items will be reviewed by District Design and District Construction.

Supervision: The CONSULTANT shall supervise all technical design activities.

Coordination: The CONSULTANT shall coordinate with all disciplines of the project to produce a final set of construction documents.

### Project General Tasks

Project General Tasks, described in Sections 3.1 through 3.7 below, represent work efforts that are applicable to the project as a whole and not to any one or more specific project activity. The work described in these tasks shall be performed by the CONSULTANT when included in the project scope.

## **3.1 Public Involvement**

Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of the project. The CONSULTANT shall provide to the DEPARTMENT drafts of all Public Involvement documents (e.g., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least [*Number*] business days prior to printing and / or distribution.

### **3.1.1 Community Awareness Plan**

Prepare a Community Awareness Plan (CAP) for review and approval by the DEPARTMENT within 30 calendar days after receiving Notice to Proceed. The objective of the plan is to notify local governments, affected property owners, tenants, and the public of the DEPARTMENT'S proposed construction and the anticipated impact of that construction. The CAP shall address timeframes for each review and shall include tentative dates for each public involvement requirement for the project. The CAP will also document all public involvement activities conducted throughout the project's duration. In addition to the benefits of advance notification, the process should allow the DEPARTMENT to resolve controversial issues during the design phase. This item shall be reviewed and updated periodically as directed by the DEPARTMENT throughout the life of the project.

### **3.1.2 Notifications**

In addition to public involvement data collection, the CONSULTANT shall assist the DEPARTMENT or prepare notifications, flyers, and/or letters to elected officials and other public officials, private property owners, and tenants at intervals during plans production as identified by the DEPARTMENT. All letters and notices shall be reviewed by the DEPARTMENT to ensure that they are addressed to the correct and current public officials.

### **3.1.3 Preparing Mailing Lists**

At the beginning of the project, The CONSULTANT shall identify all impacted property owners and tenants (within a minimum of 300 feet of the project corridor) The CONSULTANT shall prepare a mailing list of all such entities and shall update the mailing list as needed during the life of the project.

### **3.1.4 Median Modification Letters**

The CONSULTANT shall prepare a median modification letter to be sent to property owners along the corridor. In addition, the CONSULTANT shall prepare a sketch of each proposed median modification for inclusion in the letter. The letters will be sent on DEPARTMENT letterhead by the CONSULTANT.

### **3.1.5 Driveway Modification Letters**

The CONSULTANT shall prepare a driveway modification letter to be sent to property owners along the corridor. In addition, the CONSULTANT shall prepare a sketch of each proposed driveway modification for inclusion in the letter. The letters will be sent on DEPARTMENT letterhead.

### **3.1.6 Newsletters**

The CONSULTANT shall prepare newsletters for distribution to elected officials, public officials, property owners along the corridor and other interested parties. The letters will be sent by the CONSULTANT.

### **3.1.7 Renderings and Fly-Throughs**

The CONSULTANT shall prepare renderings and fly-throughs for use in public meetings.

### **3.1.8 PowerPoint Presentations**

The CONSULTANT shall prepare PowerPoint presentations for use in public meetings.

### **3.1.9 Public Meeting Preparations**

The CONSULTANT shall prepare the necessary materials for use in public meetings.

The CONSULTANT will investigate potential meeting sites to advise the DEPARTMENT on their suitability. The CONSULTANT will pay all costs for meeting site rents and insurance. No DEPARTMENT meetings will be held on public school system properties.

### **3.1.10 Public Meeting Attendance and Follow-up**

The CONSULTANT shall attend public meeting(s), assist with meeting setup and take down. The CONSULTANT shall also prepare a summary of the public meeting that includes all copies of all materials shown or provided at the public meeting. The summary shall also include a listing of all written comments made during or after the meeting and responses to those written comments.

The CONSULTANT will attend the meetings with an appropriate number of personnel to assist the DEPARTMENT'S Project Manager.

It is estimated for this project there will be One Public meetings during the design.

### **3.1.11 Other Agency Meetings**

In addition to scheduled public meetings the CONSULTANT may be required to participate in meetings with local governing authorities and/or Metropolitan Planning Organization (MPO). The CONSULTANT's participation may include, but not be limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file. It is estimated for this project there will be 2 meetings (as indicated in Section 2.1 above) with local governing authorities and/or MPOs during the design.

### **3.1.12 Web Site**

The CONSULTANT shall create and/or maintain a web site for the project.

## **3.2 Joint Project Agreements (N/A)**

## **3.3 Specifications & Estimates**

### **3.3.1 Specifications Package Preparation**

The CONSULTANT shall prepare and provide a specifications package in accordance with the DEPARTMENT'S Procedure Topic No. 630-010-005 Specifications Package Preparation and the Specifications Handbook. The CONSULTANT shall provide the DEPARTMENT names of at least two team members who have successfully completed the Specifications Package Preparation Training and will be responsible for preparing the Specifications Package for the project. The Specifications Package shall be prepared using the DEPARTMENT's Specs on the Web application. The CONSULTANT shall be able to document that the procedure defined in the Handbook for the Preparation of Specifications Packages is followed, which includes the quality assurance/quality control procedures. The specifications package shall address all items and areas of work and include any Mandatory Specifications, Modified Special Provisions, and Technical Special Provisions.

The specifications package must be submitted for review to the District Specifications Office at least 30 days prior to the contract package to Tallahassee or District due date, or sooner if required by the District Specifications Office. This submittal does not require signing and sealing and shall be coordinated through the District's Project Manager. The CONSULTANT shall coordinate with the DEPARTMENT on the submittal requirements, but at a minimum shall consist of (1) the complete specifications package, (2) a copy of the marked-up workbook used to prepare the package, and (3) a copy of the final project plans.

Final submittal of the specifications package must occur at least 10 working days prior to the contract package to Tallahassee due date. This submittal shall be digitally signed, dated, and sealed in accordance with applicable Florida Statutes.

### **3.3.2 Estimated Quantities Report Preparation**

The CONSULTANT shall prepare an Estimated Quantities (EQ) Report in accordance with FDM 902. Includes loading quantities into Designer Interface for AASHTOWare Project

Preconstruction (PrP), QA/QC efforts associated with AASHTOWare PrP and the EQ Report.

### **3.4 Contract Maintenance and Project Documentation**

Contract maintenance includes project management effort for complete setup and maintenance of files, electronic folders and documents, developing technical monthly progress reports and schedule updates. Project documentation includes the compilation and delivery of final documents, reports or calculations that support the development of the contract plans; includes uploading files to Electronic Document Management System (EDMS) or Project Suite Enterprise Edition (PSEE).

### **3.5 Value Engineering (Multi-Discipline Team) Review**

### **3.6 Prime Consultant Project Manager Meetings**

Includes only the Prime Consultant Project Manager's time for travel and attendance at Activity Technical Meetings and other meetings listed in the meeting summary for Task 3.6 on tab 3 Project General Task of the staff hour forms. Staff hours for other personnel attending Activity Technical Meetings are included in the meeting task for that specific Activity.

### **3.7 Plans Update**

The effort needed for Plans Update services will vary from project to project, depending on size and complexity of the project, as well as the duration of time spent "on the shelf".

Specific services will be negotiated as necessary as a contract amendment.

### **3.8 Post-Design Services**

Post-Design Services may include, but not limited to, meetings, construction assistance, plans revisions, shop drawing review, survey services, as-built drawings, and load ratings. Specific services will be negotiated as necessary as a contract amendment.

Post-Design Services are not intended for instances of CONSULTANT errors or omissions.

### **3.9 Digital Delivery**

The CONSULTANT shall deliver final contract plans and documents in digital format. The final contract plans and documents shall be digitally signed and sealed files delivered to the DEPARTMENT on acceptable electronic media, as determined by the DEPARTMENT.

### **3.10 Risk Assessment Workshop - MEMO**

This project will be subject to Risk Assessment (RA) and Management for the purpose of the identifying, quantifying and managing the potential cost and schedule risks of the project. The RA for this project will be managed by the Department Project Manager and supported by a multidiscipline team (RA Team) of DEPARTMENT and CONSULTANT personnel and

subject-matter experts (SMEs). The Department Project Manager will be the lead for the RA Team.

There will be a Risk Assessment (RA) Workshop and workshop related meetings during the design. The Workshop will generally occur before completion of Phase I design plans, but may occur at any time during the development of a project as determined by the Department Project Manager. The Department Project Manager will develop a Risk Register following the RA Workshop, and utilize the Risk Register throughout the life of the project to mitigate and manage the risks.

The CONSULTANT (and key subconsultant(s) if applicable), and other key members of the design team will attend and participate in the Risk Assessment Workshop for this project. This will involve a Risk Preparatory Session (half-day to 1 day plus information assessment), a Risk Assessment Workshop (1 to 3 days), and Risk Follow-Up Meeting (half-day to 1 day).

The CONSULTANT and other key members of the design team will attend and participate in associated follow-up RA meetings (approximately one meeting every three to six months as deemed necessary) with the Department Project Manager (and RA team if applicable) to discuss the risks, mitigation strategies and any updates to the Risk Register. This includes written communications and phone inquiries. The CONSULTANT will coordinate with subconsultants who need to attend the Workshop and associated meetings.

CONSULTANT shall provide the RA Team meeting materials that are deemed necessary by the Department Project Manager to conduct the Workshop and associated meetings. The meeting materials include the following:

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- One copy of all plan drawings (three copies if a workshop is applicable)
- Drainage alternatives information
- One copy of Bridge Development Reports
- One copy of Pavement Type Selection Report
- One copy of Pavement Design Package
- One copy of other miscellaneous reports
- Project Schedule
- Project Cost Estimate

Project Cost Estimate shall include a tabulation of estimated construction costs for the proposed design, and a breakdown of costs for each major element of the design, such as Right of Way, Design, CEI, Utilities, JPA/LAP funds, etc.

The CONSULTANT shall allow ample time for the appropriate knowledgeable members of their staff to prepare and provide current design documentation and data. All reports provided by the CONSULTANT will be returned after the RA Workshop has been completed; however,

copies of plans and drawings may be kept by the RA team. The CONSULTANT will be responsible for providing follow-up actions as necessary.

### **3.11 Railroad, Transit and/or Airport Coordination**

As Needed

#### **3.11.1 Aeronautical Evaluation**

The Consultant shall be responsible for complying with the requirements of Title 14 of the Code of Federal Regulations Part 77 (14 CFR Part 77), and for determining whether it is necessary to file any Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the Federal Aviation Administration (FAA), utilizing the FAA Notice Criteria Tool. Place a copy of all pertinent documentation in the Project Documentation folder structure; e.g., Notice Criteria Tool inquiries and responses; FAA Form 7460-1 filed with the FAA; Letters of Determination (along with the records demonstrating compliance with the conditions and deadlines). Report any Letters of Determination, designated other than "Does Not Exceed", to the Central Office (Aviation Office, Airspace and Land Use Manager).

### **3.12 Landscape and Existing Vegetation Coordination**

Coordinate to ensure preservation and protection of existing vegetation. Relocation of existing vegetation may be necessary in some cases. Space for proposed landscape should be preserved and conflicts with drainage, utilities, ITS, and signage should be minimized. Coordination with the District Landscape Architect may be necessary as defined in 4.12. Additionally, coordination with the Florida Scenic Highways program should be included to ensure any requirements of the FSH program are met.

### **3.13 Other Project General Tasks**

Contract Time Memo

## **4 ROADWAY ANALYSIS**

The CONSULTANT shall analyze and document Roadway Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

#### **4.1 Typical Section Package**

The CONSULTANT shall provide an approved Typical Section Package prior to the first plans submittal.

#### **4.2 Pavement Type Selection Report (N/A)**

#### **4.3 Pavement Design Package**

The CONSULTANT shall provide an approved Pavement Design Package prior to the Phase II plans submittal date.

#### **4.4 Cross-Slope Correction (N/A)**

#### **4.5 Horizontal/Vertical Master Design Files**

The CONSULTANT shall design the geometrics using the Standard Plans that are most appropriate with proper consideration given to the design traffic volumes, design speed, capacity and levels of service, functional classification, adjacent land use, design consistency and driver expectancy, aesthetics, existing vegetation to be preserved, pedestrian and bicycle concerns, ADA requirements, Safe Mobility For Life Program, access management, PD&E documents and scope of work. The CONSULTANT shall also develop utility conflict information to be provided to project Utility Coordinator in the format requested by the DEPARTMENT.

Note: When the project includes a 3D Model deliverable, also include Activity 36 3D Modeling.

#### **4.6 Access Management**

The CONSULTANT shall incorporate access management standards for each project in coordination with DEPARTMENT staff. The CONSULTANT shall review adopted access management standards and the existing access conditions (interchange spacing, signalized intersection spacing, median opening spacing, and connection spacing). Median openings that will be closed, relocated, or substantially altered shall be shown on plan sheets and submitted with supporting documentation for review with the first plans submittal.

The DEPARTMENT shall provide access management classification information and information derived from PD&E studies and public hearings to be used by the CONSULTANT.

#### **4.7 Roundabout Evaluation**

The CONSULTANT shall analyze and document Roundabout Evaluation Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall perform a Roundabout Screening for assessment of potential site impacts such as utility adjustments or relocations, right of way takes, environmental mitigation, and access management.

The CONSULTANT shall perform a Roundabout Benefit-Cost Evaluation comparing a roundabout with a traditional intersection (stop controlled or signal controlled). The benefit-cost analysis considers safety benefits associated with reduced crashes, delay, life cycle costs including right of way, utilities, construction, operation, and maintenance.

The CONSULTANT shall perform a Geometric and Operation Analysis to establish the roundabout alignment, geometry and lane requirements. Roundabout geometric and operational analysis must be documented in a preliminary report including data collection,

conceptual layout, crash analysis, traffic counts, traffic forecast, and future design and opening year analysis.

The CONSULTANT shall perform all efforts required for traffic data collection and required design elements for all the above steps accordingly, including crash reports, 24-hour machine counts, peak hour turning movement counts, existing geometrics, pedestrian and bicycle volumes, posted speed limits, delay counts, design vehicle, access management, transit operations and physical and right of way limitations.

#### **4.8 Roundabout Final Design Analysis**

The CONSULTANT shall finalize the design of the roundabout in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall perform a final roundabout operational analysis that recommends a functional geometric layout that is cost effective, safe and meets the needs of the community. A final roundabout design will be recommended for implementation, and all geometric and operational analysis will be documented in a final roundabout report.

#### **4.9 Cross Section Design Files**

The CONSULTANT shall establish and develop cross section design files in accordance with the FDOT CADD Manual.

Note: If the Cross Sections are prepared using a 3D model, use Task 36.5 instead of Task 4.9 for the Cross Section Design Files.

#### **4.10 Temporary Traffic Control Plan (TTCP) Analysis**

The CONSULTANT shall design a safe and effective TTCP to move vehicular and pedestrian traffic during all phases of construction. The design shall include construction phasing of roadways ingress and egress to existing property owners and businesses, routing, signing and pavement markings, and detour quantity tabulations, roadway pavement, drainage structures, ditches, front slopes, back slopes, drop offs within clear zone, transit stops, and traffic monitoring sites. Special consideration shall be given to the construction of the drainage system when developing the construction phases. Positive drainage must be maintained at all times. The design shall include construction phasing of roadways to accommodate the construction or relocation of utilities when the contract includes Joint Project Agreements (JPAs).

The CONSULTANT shall investigate the need for temporary traffic signals, temporary highway lighting, detours, diversions, lane shifts, and the use of materials such as sheet piling in the analysis. The Traffic Control Plan shall be prepared by a certified designer who has completed training as required by the DEPARTMENT. Before proceeding with the TTCP, the CONSULTANT shall meet with the appropriate DEPARTMENT personnel. The purpose of

this meeting is to provide information to the CONSULTANT that will better coordinate the Preliminary and Final TTCP efforts.

The CONSULTANT shall consider the local impact of any lane closures or alternate routes. When the need to close a road is identified during this analysis, the CONSULTANT shall notify the DEPARTMENT's Project Manager as soon as possible. Proposed road closings must be reviewed and approved by the DEPARTMENT. Diligence shall be used to minimize negative impacts by appropriate specifications, recommendations or plans development. Local impacts to consider will be local events, holidays, peak seasons, detour route deterioration and other eventualities. CONSULTANT shall be responsible to obtain local authorities permission for use of detour routes not on state highways.

#### **4.11 Master TTCP Design Files**

The CONSULTANT shall develop master TTCP files showing each phase of the TTCP. This includes all work necessary for designing lane configurations, diversions, lane shifts, signing and pavement markings, temporary traffic control devices, and temporary pedestrian ways.

#### **4.12 Selective Clearing and Grubbing (N/A)**

#### **4.13 Tree Disposition Plans (N/A)**

#### **4.14 Design Variations and Exceptions**

If available, the DEPARTMENT shall furnish the Variation/Exception Report. The CONSULTANT shall prepare the documentation necessary to gain DEPARTMENT approval of all appropriate Design Variations and/or Design Exceptions before the first submittal.

#### **4.15 Design Report**

The CONSULTANT shall prepare all applicable report(s) as listed in the Project Description section of this scope. Reports are to be delivered as a signed and sealed pdf file.

#### **4.16 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation, including construction days when required.

#### **4.17 Cost Estimate**

#### **4.18 Technical Special Provisions and Modified Special Provisions**

#### **4.19 Other Roadway Analyses**

#### **4.20 Field Reviews**

#### **4.21 Monitor Existing Structures**

The CONSULTANT shall perform field observations to visually identify existing structures within the project limits which may require settlement, vibration or groundwater monitoring

by the contractor during construction in accordance with FDM Chapter 307. The CONSULTANT shall identify the necessary pay items to be included in the bid documents to monitor existing structures.

Optional Services (may be negotiated at a later date if needed): The CONSULTANT shall coordinate with and assist the geotechnical engineer and/or structural engineer to develop mitigation strategies (when applicable).

#### **4.22 Technical Meetings**

#### **4.23 Quality Assurance/Quality Control**

#### **4.24 Independent Peer Review**

#### **4.25 Supervision**

#### **4.26 Coordination**

### **5 ROADWAY PLANS**

The CONSULTANT shall prepare Roadway, TTCP, Utility Adjustment Sheets, plan sheets, notes, and details. The plans shall include the following sheets necessary to convey the intent and scope of the project for the purposes of construction.

- 5.1 Key Sheet**
- 5.2 Typical Section Sheets**
  - 5.2.1 Typical Sections**
  - 5.2.2 Typical Section Details**
- 5.3 General Notes/Pay Item Notes**
- 5.4 Project Layout**
- 5.5 Plan/Profile Sheet**
- 5.6 Profile Sheet**
- 5.7 Plan Sheet**
- 5.8 Special Profile**
- 5.9 Back-of-Sidewalk Profile Sheet (N/A)**
- 5.10 Interchange Layout Sheet**
- 5.11 Ramp Terminal Details (Plan View)**
- 5.12 Intersection Layout Details**
- 5.13 Special Details**
- 5.14 Cross-Section Pattern Sheets**
- 5.15 Roadway Soil Survey Sheets**
- 5.16 Cross Sections**
- 5.17 Temporary Traffic Control Plan Sheets**
- 5.18 Temporary Traffic Control Cross Section Sheets**
- 5.19 Temporary Traffic Control Detail Sheets**
- 5.20 Utility Adjustment Sheets**
- 5.21 Selective Clearing and Grubbing Sheets (N/A)**
- 5.22 Tree Disposition Plan Sheets (N/A)**
- 5.23 Project Control Sheets**
- 5.24 Environmental Detail Sheets**

Preparation of detail sheets for potential environmental issues such as, underground fuel tanks and monitoring wells, septic tanks within the proposed right of way. All piping and pumps in association with the above referenced issues shall also be located and identified by the survey.

The CONSULTANT shall relay to the DEPARTMENT any findings of contaminated soil, monitoring wells, or any features (particularly springs or sinks) relating to contamination or hazardous material.

Coordination with Permits/Environmental staff and preparing Dredge & Fill Detail sheets where applicable.

#### **5.25 Utility Verification Sheets (SUE Data)**

#### **5.26 Quality Assurance/Quality Control**

#### **5.27 Supervision**

### **6a DRAINAGE ANALYSIS**

The CONSULTANT shall analyze and document Drainage Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall be responsible for designing a drainage and stormwater management system. All design work shall comply with the requirements of the appropriate regulatory agencies and the DEPARTMENT's Drainage Manual.

The CONSULTANT shall coordinate fully with the appropriate permitting agencies and the DEPARTMENT's staff. All activities and submittals should be coordinated through the DEPARTMENT's Project Manager. The work will include the engineering analyses for any or all of the following:

#### **6a.1 Drainage Map Hydrology**

Create a (pre- and/or post-condition) working drainage basin map to be used in defining the system hydrology. This map shall incorporate drainage basin boundaries, existing survey and/or LiDAR and field observations, as necessary, to define the system. Basin delineations shall also include any existing collection systems in a logical manner to aid in the development of the hydraulic model. Include coordination hours needed to convey drainage hydrologic features onto produced drainage maps.

#### **6a.2 Base Clearance Calculations**

Analyze, determine, and document high water elevations per basin which will be used to set roadway profile grade and roadway materials. Determine surface water elevations at cross drains, floodplains, outfalls and adjacent stormwater ponds. Determine groundwater elevations at intervals between the above-mentioned surface waters. Document findings in a Base Clearance Report.

### **6a.3 Pond Siting Analysis and Report**

Evaluate pond sites using a preliminary hydrologic analysis. Document the results and coordination for all the project's pond site analyses. The Drainage Manual provides specific documentation requirements.

### **6a.4 Design of Cross Drains**

Analyze the hydraulic design and performance of cross drains. Check existing cross drains to determine if they are structurally sound and can be extended. Document the design as required. Determine and provide flood data as required.

### **6a.5 Design of Ditches**

Design roadway conveyance and outfall ditches. This task includes capacity calculations, longitudinal grade adjustments, flow changes, additional adjustments for ditch convergences, selection of suitable channel lining, design of side drain pipes, and documentation. (Design of linear stormwater management facilities in separate task.)

### **6a.6 Design of Stormwater Management Facility (Offsite or Infield Pond)**

Design stormwater management facilities to meet requirements for stormwater quality treatment, attenuation and aesthetics. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tie-ins, aesthetics, etc.), perform routing, pollutant/nutrient loading calculations, recovery calculations, design the outlet control structure and buoyancy calculations for pond liners when necessary.

### **6a.7 Design of Stormwater Management Facility (Roadside Treatment Swales and Linear Ponds)**

Design stormwater management facilities to meet requirements for stormwater quality treatment, attenuation and aesthetics. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tie-ins, aesthetics, etc.), perform routing, pollutant/nutrient loading calculations, recovery calculations and design the outlet control structure.

### **6a.8 Design of Floodplain Compensation**

Determine floodplain encroachments, coordinate with regulatory agencies, and develop proposed compensation area layout (shape, contours, slopes, volumes, etc.). Document the design following the requirements of the regulatory agency.

### **6a.9 Design of Storm Drains**

Delineate contributing drainage areas, determine runoff, inlet locations, and spread. Calculate hydraulic losses (friction, utility conflict and, if necessary, minor losses). Determine design tailwater and, if necessary, outlet scour protection.

### **6a.10 Optional Culvert Material**

Determine acceptable options for pipe materials using the Culvert Service Life Estimator.

### **6a.11 French Drain Systems**

Design French Drain Systems to provide stormwater treatment and attenuation. Identify location for percolation tests and review these, determine the size and length of French Drains, design the control structure/weir, and model the system of inlets, conveyances, French Drains, and other outfalls using a routing program.

#### **6a.11.1 Existing French Drain Systems**

Include this task if French Drains are proposed and the existing systems must be analyzed for a pre- versus post comparison of the peak stages and/or discharges.

### **6a.12 Drainage Wells**

Design the discharge into deep wells to comply with regulatory requirements. Identify the location of the well, design the control structure/weir, and model the system using a routing program.

### **6a.13 Drainage Design Documentation Report**

Compile drainage design documentation into report format. Include documentation for all the drainage design tasks and associated meetings and decisions, except for stand-alone reports, such as the Pond Siting Analysis Report and Bridge Hydraulics Report.

### **6a.14 Bridge Hydraulic Report**

Calculate hydrology, hydraulics, deck drainage, scour, and appropriate counter measures. Prepare report and the information for the Bridge Hydraulics Recommendation Sheet.

### **6a.15 Temporary Drainage Analysis**

Evaluate and address drainage to adequately drain the road and maintain existing offsite drainage during all construction phases. Provide documentation.

### **6a.16 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **6a.17 Cost Estimate**

Prepare cost estimates for the drainage components, except bridges and earthwork for stormwater management and flood compensation sites.

## **6a.18 Technical Special Provisions / Modified Special Provisions**

### **6a.19 Hydroplaning Analysis**

Perform a hydroplaning analysis to assist in the determination of the appropriate roadway geometry for all necessary locations (both typical sections and critical cross sections) as needed. See the FDOT Hydroplaning Guidance and FDOT Design Manual (FDM) Chapters 210 and 211 for more information.

### **6a.20 Existing Permit Analysis**

Data gathering including desktop analysis of local, state and federal Drainage permits.

### **6a.21 Other Drainage Analysis**

Includes all efforts for a drainage task not covered by an existing defined task.

### **6a.22 Noise Barrier Evaluation**

Evaluate the capacity of drainage openings in noise barriers and locate them to ensure flows are accommodated.

### **6a.23 Field Reviews**

### **6a.24 Technical Meetings**

Meetings with Department staff, regulatory agencies, local governments such as meetings with District Drainage Engineer, the Water Management District, FDEP, etc.

### **6a.25 Environmental Look-Around Meetings**

Convene a meeting with Department staff, regulatory agencies, local governments and other stakeholders to explore watershed wide stormwater needs and alternative permitting approaches.

### **6a.26 Quality Assurance/Quality Control**

### **6a.27 Independent Peer Review**

### **6a.28 Supervision**

### **6a.29 Coordination**

## **6b DRAINAGE PLANS**

The CONSULTANT shall prepare Drainage plan sheets, notes, and details. The plans shall include the following sheets necessary to convey the intent and scope of the project for the purposes of construction.

- 6b.1 Drainage Map (Including Interchanges)**
- 6b.2 Bridge Hydraulics Recommendation Sheets**
- 6b.3 Drainage Structures**
- 6b.4 Lateral Ditch Plan/Profile**
- 6b.5 Lateral Ditch Cross Sections**
- 6b.6 Retention/Detention Pond Detail Sheets**
- 6b.7 Retention Pond Cross Sections**
- 6b.8 Erosion Control Plan Sheets**
- 6b.9 SWPPP Sheets**
- 6b.10 Quality Assurance/Quality Control**
- 6b.11 Supervision**

## **7 UTILITIES**

The CONSULTANT shall identify utility facilities and secure agreements, utility work schedules, and plans from the Utility Agency Owners (UAO) ensuring all conflicts that exist between utility facilities and the DEPARTMENT's construction project are addressed. The CONSULTANT shall certify all utility negotiations have been completed and that arrangements have been made for utility work to be undertaken.

### **7.1 Utility Kickoff Meeting**

Before any contact with the UAO(s), the CONSULTANT shall meet with the District Utility Office (DUO) to receive guidance, as may be required, to assure that all necessary coordination will be accomplished in accordance with DEPARTMENT procedures. CONSULTANT shall bring a copy of the design project work schedule reflecting utility activities.

### **7.2 Identify Existing Utility Agency Owner(s)**

The Consultant shall identify all utilities within and adjacent to the project limits that may be impacted by the project.

### **7.3 Make Utility Contacts**

First Contact: The CONSULTANT shall send letters and two sets of plans to each utility, one set for the utility office, and one set to the DEPARTMENT Offices as required by the District. Includes contact by phone for meeting coordination. Request type, size, location, easements, and cost for relocation if reimbursement is claimed. Request the voltage level for power lines in the project area. Send UAO requests for reimbursement to FDOT for a legal opinion. Include

the meeting schedule (if applicable) and the design schedule. Include typical meeting agenda. If scheduling a meeting, give a 4-week notice.

Second Contact: At a minimum of 4 weeks prior to the meeting, the CONSULTANT shall transmit two complete sets of Phase II plans and the utility conflict information (when applicable and in the format requested by the DEPARTMENT) to each UAO having facilities located within the project limits, and one set to the DEPARTMENT Offices as required by the District.

Third Contact: Identify agreements and assemble packages. The CONSULTANT shall send agreements, letters, the utility conflict information (when applicable and in the format requested by the DEPARTMENT) and two sets of plans to the UAO(s) including all component sets, one set for the utility office, one set to construction and maintenance if required. Include the design schedule.

Not all projects will have all contacts as described above.

#### **7.4 Exception Processing**

The CONSULTANT shall be responsible for transmitting/coordinating the appropriate design reports including, but not limited to, the Resurfacing, Restoration and Rehabilitation (RRR) report, Preliminary Engineering Report, Project Scope and/or the Concept Report (if applicable) to each UAO to identify any condition that may require a Utility Exception. The CONSULTANT shall identify and communicate to the UAO any facilities in conflict with their location or project schedule. The CONSULTANT shall assist with the processing of design exceptions involving Utilities with the UAO and the DEPARTMENT. Assist with processing per the UAM.

#### **7.5 Preliminary Utility Meeting**

The CONSULTANT shall schedule (time and place), notify participants, and conduct a preliminary utility meeting with all UAO(s) having facilities located within the project limits for the purpose of presenting the project, review the current design schedule, evaluate the utility information collected, provide follow-up information on compensable property rights from the FDOT Legal Office, discuss the utility work by highway contractor option with each utility, and discuss any future design issues that may impact utilities. This is also an opportunity for the UAO(s) to present proposed facilities. The CONSULTANT shall keep accurate minutes and distribute a copy to all attendees.

#### **7.6 Individual/Field Meetings**

The CONSULTANT shall meet with each UAO as necessary, separately or together, throughout the project design duration to provide guidance in the interpretation of plans, review changes to the plans and schedules, standard or selective clearing and grubbing work, and assist in the development of the UAO(s) plans and work schedules. The CONSULTANT

is responsible for motivating the UAO to complete and return the necessary documents after each Utility Contact or Meeting.

### **7.7 Collect and Review Plans and Data from UAO(s)**

The CONSULTANT shall review utility marked plans and data individually as they are received for content. Ensure information from the UAO (utility type, material and size) is sent to the designer for inclusion in the plans. Forward all requests for utility reimbursement and supporting documentation to the DUO.

### **7.8 Subordination of Easements Coordination**

The CONSULTANT, if requested by the DEPARTMENT, shall transmit to and secure from the UAO the executed subordination agreements prepared by the appropriate DEPARTMENT office. The CONSULTANT shall coordinate with the DUO the programming of the necessary work program funds to compensate the UAO.

### **7.9 Utility Design Meeting**

The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s). The CONSULTANT shall be prepared to discuss impacts to existing trees/vegetation and proposed landscape, drainage, traffic signalization, temporary traffic control plans (TTCP) (construction phasing), review the current design schedule and letting date, evaluate the utility information collected, provide follow-up information on compensable property rights from FDOT Legal Office, discuss with each UAO the utility work by highway contractor option, discuss any future design issues that may impact utilities, etc., to the extent that they may have an effect on existing or proposed utility facilities with particular emphasis on drainage and TTCP with each UAO. The intent of this meeting shall be to assist the UAOs in identifying and resolving conflicts between utilities and proposed construction before completion of the plans, including utility adjustment details. Also, to work with the UAOs to recommend potential resolution between known utility conflicts with proposed construction plans as may be deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.9 (Cross Section Design Files) for utility conflict location identification and adjustments.

### **7.10 Review Utility Markups & Work Schedules and Processing of Schedules & Agreements**

The CONSULTANT shall review utility marked up plans and work schedules as they are received for content and coordinate review with the designer. Send color markups and schedules to the appropriate DEPARTMENT office(s) such as survey, geotechnical, drainage, structures, lighting, roadway, signals, utilities, landscape architecture, municipalities, maintaining agency, and District Traffic Operations for review and comment if required by the District. Coordinate with the District for execution. Distribute Executed Final Documents.

Prepare Work Order for UAO(s). The CONSULTANT shall coordinate with the DUO the programming of necessary Work Program funds.

### **7.11 Utility Coordination/Follow-up**

The CONSULTANT shall provide utility coordination and follow up. This includes follow-up, interpreting plans, and assisting the UAOs with completion of their work schedules and agreements. Includes phone calls, face-to-face meetings, etc., to motivate and ensure the UAO(s) complete and return the required documents in accordance with the project schedule. Ensure the resolution of all known conflicts. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees. This task can be applied to all phases of the project.

### **7.12 Utility Constructability Review**

The CONSULTANT shall review utility schedules against construction contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the construction office. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.9 (Cross Section Design Files) for utility conflict identification and adjustments.

### **7.13 Additional Utility Services**

The CONSULTANT shall provide additional utility services. Additional services will be determined when the services are required and requested. This item is not usually included in the scope at the time of negotiation. It is normally added as a supplemental agreement when the need is identified.

### **7.14 Processing Utility Work by Highway Contractor (UWHC)**

This includes coordination of utility design effort between the DEPARTMENT and the UAO(s). The CONSULTANT shall conduct additional coordination meetings, prepare and process the agreements, review tabulation of quantities, perform UWHC constructability and bidability review, review pay items, cost estimates and Technical Special Provisions (TSP) or Modified Special Provision (MSP) prepared by the UAO. This does not include utility the utility design effort. This item is not usually included in the scope at the time of negotiation. It is normally added as a supplemental agreement when the need is identified. Effort for the EOR is not included in this task, see Roadway Analysis Task Group 4.

### **7.15 Contract Plans to UAO(s)**

If requested by the District, the CONSULTANT shall transmit the contract plans as processed for letting to the UAO(s). Transmittals to UAO(s) may be by certified mail, return receipt requested.

### **7.16 Certification/Close-Out**

This includes hours for transmitting utility files to the DUO and preparation of the Utility Certification Letter. The CONSULTANT shall certify to the appropriate DEPARTMENT representative the following:

All utility negotiations (Full execution of each agreement, approved Utility Work Schedules, Technical Special Provisions or Modified Special Provisions written, etc.) have been completed with arrangements made for utility work to be undertaken and completed as required for proper coordination with the physical construction schedule.

OR

An on-site inspection was made and no utility work will be involved.

OR

Plans were sent to the Utility Companies/Agencies and no utility work is required.

### **7.17 Other Utilities**

The CONSULTANT shall provide other utility services. This includes all efforts for a utility task not covered by an existing defined task. Required work will be defined in the scope and negotiated on a case-by-case basis.

## **8 ENVIRONMENTAL PERMITS and ENVIRONMENTAL CLEARANCES**

The CONSULTANT shall notify the DEPARTMENT Project Manager, Environmental Permit Coordinator, and other appropriate DEPARTMENT personnel in advance of all scheduled meetings with the regulatory agencies to allow a DEPARTMENT representative to attend. The CONSULTANT shall copy in the Project Manager and the Environmental Permit Coordinator on all permit related correspondence and meetings. The Consultant shall use current regulatory guidelines and policies for all permits required as identified in Section 2.4.

### **8.1 Preliminary Project Research**

The CONSULTANT shall perform preliminary project research and shall be responsible for regulatory agency coordination to assure that design efforts are properly directed toward permit requirements. The research shall include but should not be limited to a review of the project's PD&E documents including the Environmental Document, Natural Resources Evaluation Report, and Cultural Resources Assessment Survey Report.

The CONSULTANT shall research any existing easements or other restrictions that may exist both within or adjacent to the proposed project boundary. Project research may include but should not be limited to review of available: federal, state, and local permit files and databases; and local government information including county and property appraiser data. The CONSULTANT shall determine if any Sovereign Submerged Lands easements need to be modified or acquired. Any applicable information will be shown on the plans as appropriate.

## **8.2 Field Work**

### **8.2.1 Pond Site Alternatives:**

The CONSULTANT shall review alternative pond sites as directed by the DEPARTMENT and information shall be included in the Pond Siting Report.

### **8.2.2 Establish Wetland Jurisdictional Lines and Assessments:**

The CONSULTANT shall be responsible for, but not limited to, the following activities:

- Determine landward extent of wetlands and other surface waters as detailed in Rule Chapter 62-340, F.A.C., as ratified in Section 373.4211, F.S.; United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Technical Report Y-87-1); Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (ERD/EL TR-10-20).
- Collect all data and information necessary to determine the jurisdictional boundaries of wetlands and other surface waters as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Set seasonal high-water levels in adjacent wetlands with biological indicators
- Obtain a jurisdictional determination as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Prepare aerial maps showing the jurisdictional boundaries of wetlands and other surface waters. Aerial maps shall be reproducible, of a scale of 1"=400' or more detailed and be recent photography. The maps shall show the jurisdictional boundaries of each agency. Photo copies of aerials are not acceptable. When necessary, a wetland specific survey will be prepared by a registered surveyor and mapper. All surveyed jurisdictional boundaries are to be tied to the project's baseline of survey.
- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form which includes the ID number for each wetland (and other surface water, if necessary) impacted, size of wetland to be impacted, type of impact, and identify any wetland (by ID number and size) within the project limits that will not be impacted by the project.
- Prepare appropriate agency forms to obtain required permits. Forms may include but are not limited to the USACE "Wetland Determination Data Form - Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; Uniform Mitigation Assessment Method forms and/or project specific data forms.

### **8.2.3 Species Surveys:**

The CONSULTANT shall conduct wildlife surveys as defined by rules or regulations of any permitting agency, or commenting agency that is processing a DEPARTMENT permit.

### **8.3 Agency Verification of Wetland Data**

The CONSULTANT shall be responsible for verification of wetland and other surface water data identified in Section 8.2 and coordinating regulatory agency field reviews, including finalization of assessments and jurisdictional determinations with applicable agencies.

### **8.4 Complete and Submit All Required Permit Applications**

The CONSULTANT shall collect the data and information necessary to prepare the permit applications and obtain the environmental permits required to construct the project as identified in the Project Description and as described in 8.4.1, 8.4.2, and 8.12 (Other Permits). The CONSULTANT shall prepare each permit application in accordance with the rules and/or regulations of the regulatory agency responsible for issuing a specific permit and/or authorization to perform work. The permit application packages must be approved by the DEPARTMENT prior to submittal to regulatory agencies.

The CONSULTANT will submit all permit applications, as directed by the DEPARTMENT, and be responsible for payment of all permit and public noticing fees.

#### **8.4.1 Complete and Submit all Required Wetland Permit Applications:**

The CONSULTANT shall prepare, complete, and submit required wetland permit (i.e. ERP, Section 404) application packages to the appropriate regulatory agencies. This includes, but is not limited to, applications submitted to WMDs and/or DEP, and USACE. The application package may include but is not limited to attachments (e.g. project location map, aerials, affidavit of ownership, pictures, additional technical analysis, etc.), a cover letter with project description as well as completion of applicable agency forms. The CONSULTANT shall prepare and respond to agency Requests for Additional Information (RAIs), including necessary revisions to the application package. All responses and completed application packages must be approved by the District Permit Coordinator prior to submittal to the regulatory agencies. Geotechnical permitting should also be prepared, submitted, and obtained.

#### **8.4.2 Complete and Submit all Required Species Permit Applications:**

The CONSULTANT shall prepare, complete and submit required species permit applications to the appropriate agencies. This includes federal and state protected species permit application packages as required. The work includes completion of application package (e.g. project location map, aerials, affidavit of ownership, pictures, additional technical analysis, etc.), and cover letter with project description as well as completion of applicable forms. The CONSULTANT shall respond to agency RAIs, including necessary revisions to the application package. All responses and completed applications must be approved by the District Permit Coordinator prior to submittal to the regulatory agency.

### **8.5 Coordinate and Review Dredge and Fill Sketches**

The CONSULTANT shall review Dredge and Fill Detail sheets to ensure information on the sketch(es) meet the requirements of the regulatory agencies and are appropriate for environmental permit application submittal and acquisition. The CONSULTANT will also provide environmental data/information as needed to support the preparation of the Dredge and Fill sketches.

### **8.6 Prepare USCG Permit Application**

### **8.7 Prepare Water Management District or Local Water Control District Right of Way Occupancy Permit Application**

The CONSULTANT shall be responsible for the preparation of the ROW Occupancy permit application in accordance with the regulatory agency requirements. The CONSULTANT shall be responsible for acquiring the ROW Occupancy permit.

### **8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application**

The CONSULTANT shall be responsible for the preparation of the CCCL permit application and acquire the final "Notice to Proceed" authorization from the Florida Department of Environmental Protection (FDEP). Legal advertisements shall be published one time in a newspaper that meets the notification requirements of the FDEP.

### **8.9 Prepare USACE Section 408 Application to Alter a Civil Works Project**

The CONSULTANT shall be responsible for the preparation of the Section 408 (33 USC 408) application and obtaining Section 408 permission.

### **8.10 Compensatory Mitigation Plan**

If impacts cannot be avoided, the CONSULTANT shall prepare a mitigation plan to be included as a part of the application(s).

Prior to the development of mitigation alternatives, the CONSULTANT shall meet with the Project Manager and Environmental Permit Coordinator to determine the DEPARTMENT's policies in proposing mitigation. The CONSULTANT shall develop a mitigation plan based upon the general guidelines provided by the DEPARTMENT.

The CONSULTANT will be directed by the DEPARTMENT to investigate the mitigation options that meet federal and state requirements in accordance with section 373.4137, F.S. Below are mitigation options:

- Purchase of mitigation credits from a mitigation bank
- Payment to DEP/WMD for mitigation services
- Monetary participation in offsite regional mitigation plans

- Creation/restoration of wetlands

In the event that physical creation or restoration is the only feasible alternative to offset wetland impacts, the CONSULTANT shall collect all of the data and information necessary to prepare mitigation plans acceptable to all permitting agencies and commenting agencies who are processing or reviewing a permit application for a DEPARTMENT project.

Prior to selection of a final creation/restoration mitigation site, the CONSULTANT will provide the following services in the development of a mitigation plan:

- Preliminary jurisdictional determination for each proposed site
- Selection of alternative sites
- Coordination of alternative sites with the DEPARTMENT/all environmental agencies
- Written narrative listing potential sites with justifications for both recommended and non-recommended sites.

### **8.11 Mitigation Coordination and Meetings**

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or commenting agencies. Once a mitigation plan has been reviewed and approved by the DEPARTMENT, the CONSULTANT will be responsible for coordinating the proposed mitigation plan with the environmental agencies. The CONSULTANT will provide mitigation information needed to update the FDOT Environmental Impact Inventory.

### **8.12 Other Environmental Permits**

Environmental Clearances, Re-evaluations, and Technical Support

### **8.13 Technical Support to the DEPARTMENT for Environmental Clearances and Re-evaluations (use when CONSULTANT provides technical support only)**

The CONSULTANT shall provide engineering and environmental support for the DEPARTMENT to obtain environmental clearances for all changes to the project after the PD&E study was approved. These changes include but are not limited to pond or mitigation sites identified, land use or environmental changes, and major design changes.

#### **8.13.1 NEPA or SEIR Re-evaluation**

During the development of the final design plans, the CONSULTANT shall be responsible for coordinating with the District Project Manager to provide necessary engineering information required in the preparation of the re-evaluation by the DEPARTMENT. The preparation of environmental re-evaluations includes those as listed in Part 1, Chapter 13 of the DEPARTMENT's PD&E Manual: Right of Way, Design Change, and Construction Advertisement.

Re-evaluations will be completed in accordance with Part 1, Chapter 13 of the PD&E Manual. The CONSULTANT shall provide information to update the Project Commitment Record for incorporation into the re-evaluation.

It is the responsibility of the CONSULTANT to provide the District Project Manager with engineering information on major design changes including changes in typical section, roadway alignment, pond site selection, right of way requirements, bridge to box culvert, drainage, and traffic volumes that may affect noise models.

### **8.13.2 Archaeological and Historical Resources**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to all cultural and historical resources due to changes in the project in accordance with Part 2, Chapter 8 of the PD&E Manual.

### **8.13.3 Wetland Impact Analysis**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to wetlands and other surface waters in accordance with Part 2, Chapter 9 of the PD&E Manual due to changes in the project.

### **8.13.4 Essential Fish Habitat Impact Analysis**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to essential fish habitat in accordance Part 2, Chapter 17 of the PD&E Manual due to changes in the project.

### **8.13.5 Protected Species and Habitat Impact Analysis**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to all protected species and habitat in accordance with Part 2, Chapter 16 of the PD&E Manual due to changes in the project. The CONSULTANT shall perform the necessary analysis to complete agency consultation in accordance with Section 7 or Section 10 of the Endangered Species Act.

## **8.14 Preparation of Environmental Clearances and Re-evaluations (use when CONSULTANT prepares all documents associated with a re-evaluation)**

The CONSULTANT shall prepare reports and clearances for all the changes to the project that occurred after the PD&E study was approved. These changes could include but are not limited to pond and/or mitigation sites identified, land use or environmental changes, and major design changes.

### **8.14.1 NEPA or SEIR Re-evaluation**

During the development of the final design plans, the CONSULTANT shall be responsible for collecting the data and preparing a re-evaluation in accordance with Part 1, Chapter 13 of the PD&E Manual.

### **8.14.2 Archaeological and Historical Resources**

The CONSULTANT shall collect data necessary to completely analyze the impacts, due to changes in the project or project area, to all cultural and historic resources, and prepare a Cultural Resource Assessment Survey Report, in accordance with Part 2, Chapter 8 of the PD&E Manual.

### **8.14.3 Wetland Impact Analysis**

The CONSULTANT shall analyze the impacts to wetlands due to changes to the project and complete the wetlands section of a Natural Resources Evaluation Report, in accordance with Part 2, Chapter 9 of the PD&E Manual.

### **8.14.4 Essential Fish Habitat Impact Analysis**

The CONSULTANT shall analyze the impacts to essential fish habitat due to changes to the project and complete the Essential Fish Habitat section of a Natural Resources Evaluation Report, in accordance with Part 2, Chapter 17 of the PD&E Manual.

### **8.14.5 Protected Species and Habitat Impact Analysis**

The CONSULTANT shall collect data necessary to prepare the protected species and habitat section of the Natural Resources Evaluation Report, and analyze the impacts to protected species and habitat by the changes to the project, in accordance with Part 2, Chapter 16 of the PD&E Manual. The CONSULTANT shall perform the necessary analysis to complete agency consultation in accordance with Section 7 or Section 10 of the Endangered Species Act.

## **8.15 Contamination Impact Analysis**

The CONSULTANT shall prepare Contamination Screening Evaluation for the project limits including stormwater ponds and floodplain compensation sites as described in Part 2, Chapter 20, of the PD&E Manual. The appropriate level of analysis and deliverable type will be approved by the DEPARTMENT's Project Manager and District Contamination Impact Coordinator. The draft Level 1 Contamination Screening Evaluation document shall be submitted to the DEPARTMENT's Project Manager and District Contamination Impact Coordinator for review and final approval. The CONSULTANT shall include an evaluation of any new contamination impacts due to changes to the project from the PD&E design concept, if applicable, and any new discharges or new potential contamination impacts not evaluated in any previously completed Contamination Screening Evaluation. The project impacts, conclusions and recommendations, figures, tables and appendices will be provided in a Level I Contamination Screening Evaluation Report.

The DEPARTMENT will provide Level II assessment services. If contamination is identified within the limits of construction, the CONSULTANT shall coordinate with the District Contamination Impact Coordinator to properly mark identified contamination areas in the plans and develop specifications as appropriate.

### **8.16 Asbestos Survey**

The Department will provide asbestos and metal based coatings survey services.

If asbestos or metal based coatings above threshold levels are found on the bridge(s), the CONSULTANT shall coordinate with the District Contamination Impact Coordinator to obtain plan notes, general notes, specifications, pay item notes, and Operation and Maintenance (O&M) plan for any asbestos to remain in place.

### **8.17 Technical Meetings**

### **8.18 Quality Assurance/Quality Control**

### **8.19 Supervision**

### **8.20 Coordination**

## **9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS**

The CONSULTANT shall analyze, design, and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.19, Provisions for Work. Individual tasks identified in Sections 9 through 18 are defined in the Staff Hour Estimation Handbook and within the provision defined in Section 2. 20, Provisions for Work. Contract documents shall display economical solutions for the given conditions.

The CONSULTANT shall provide Design Documentation to the DEPARTMENT with each submittal consisting of structural design calculations and other supporting documentation developed during the development of the plans. The design calculations submitted shall adequately address the complete design of all structural elements. These calculations shall be neatly and logically presented on digital media or, at the DEPARTMENT's request, on 8 ½"x11" paper and all sheets shall be numbered. The final design calculations shall be signed and sealed by a Florida-licensed professional engineer. A cover sheet indexing the contents of the calculations shall be included and the engineer shall sign and seal that sheet. All computer programs and parameters used in the design calculations shall include sufficient backup information to facilitate the review task.

- 9.1 Key Sheet and Index of Drawings**
- 9.2 Project Layout**
- 9.3 General Notes and Bid Item Notes**
- 9.4 Miscellaneous Common Details**
- 9.5 Incorporate Report of Core Borings**
- 9.6 Standard Plans- Bridges**
- 9.7 Existing Bridge Plans**
- 9.8 Quantities for EQ Report**
- 9.9 Cost Estimate**
- 9.10 Technical Special Provisions and Modified Special Provisions**
- 9.11 Field Reviews**
- 9.12 Technical Meetings**
- 9.13 Quality Assurance/Quality Control**
- 9.14 Independent Peer Review**
- 9.15 Supervision**
- 9.16 Coordination**

## **10 STRUCTURES - BRIDGE DEVELOPMENT REPORT**

The Consultant shall prepare a Bridge Development Report (BDR). The BDR shall be submitted as part of the Phase I Roadway Submittal, General Requirements.

General Requirements

**10.1 Bridge Geometry**

**10.2 Ship Impact Data Collection**

**10.3 Ship Impact Criteria**

Superstructure Alternatives

**10.4 Short-Span Concrete**

**10.5 Medium-Span Concrete**

**10.6 Long Span Concrete**

**10.7 Structural Steel**

Foundation and Substructure Alternatives

**10.8 Pier/Bent**

**10.9 Shallow Foundations / GRS Abutments**

**10.10 Deep Foundations**

Movable Span

**10.11 Data Collection and Design Criteria**

**10.12 Movable Span Geometrics and Clearances**

**10.13 Deck System Evaluation**

**10.14 Framing Plan Development**

**10.15 Main Girder Preliminary Design**

**10.16 Conceptual Span Balance/Counterweight**

**10.17 Support System Development**

**10.18 Drive Power Calculations**

**10.19 Drive System Development**

**10.20 Power and Control Development**

**10.21 Conceptual Pier Design**

**10.22 Foundation Analysis (FL PIER)**

**10.23 Tender Visibility Study**

Other BDR Issues

**10.24 Aesthetics**

**10.25 TTCP/Staged Construction Requirements**

**10.26 Constructability Requirements**

**10.27 Load Rating for Damaged/Widened Structures**

**10.28 Quantity and Cost Estimates**

**10.29 Quantity and Cost Estimates - Movable Span**

**10.30 Wall Type Justification**

Report Preparation

**10.31 Exhibits**

**10.32 Exhibits - Movable Span**

**10.33 Report Preparation**

**10.34 Report Preparation - Movable Span**

**10.35 BDR Submittal Package**

Preliminary Plans

When ONLY Phase I plans are final deliverable, use Task Nos. as shown for applicable bridge types for project Activities 12 thru 16. Staffhours to be negotiated and scaled appropriately.

**11 STRUCTURES - TEMPORARY BRIDGE**

The CONSULTANT shall prepare plans for Temporary Bridge(s) at the location(s) specified in Section 2.5. The CONSULTANT shall contact FDOT Office of Maintenance to determine the type and availability of temporary before deciding on the temporary bridge type to be used.

General Layout Design and Plans

**11.1 Overall Bridge Final Geometry**

**11.2 General Plan and Elevation**

**11.3 Miscellaneous Details**

End Bent Design and Plans

**11.4 End Bent Structural Design**

**11.5 End Bent Details**

Intermediate Bent Design and Plans

**11.6 Intermediate Bent Structural Design**

**11.7 Intermediate Bent Details**

Miscellaneous Substructure Design and Plans

**11.8 Foundation Layout**

**12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE**

The CONSULTANT shall prepare plans for Short Span Concrete Bridge(s) at the location(s) specified in Section 2.5.

General Layout Design and Plans

**12.1 Overall Bridge Final Geometry**

**12.2 Expansion/Contraction Analysis**

**12.3 General Plan and Elevation**

**12.4 Construction Staging**

**12.5 Approach Slab Plan and Details**

**12.6 Miscellaneous Details**

End Bent Design and Plans

**12.7 End Bent Geometry**

**12.8 End Bent Structural Design**

**12.9 End Bent Plan and Elevation**

**12.10 End Bent Details**

Intermediate Bent Design and Plans

**12.11 Bent Geometry**

**12.12 Bent Stability Analysis**

**12.13 Bent Structural Design**

**12.14 Bent Plan and Elevation**

**12.15 Bent Details**

Miscellaneous Substructure Design and Plans

**12.16 Foundation Layout**

Superstructure Design and Plans

**12.17 Finish Grade Elevation Calculation**

**12.18 Finish Grade Elevations**

Cast-In-Place Slab Bridges

**12.19 Bridge Deck Design**

**12.20 Superstructure Plan**

**12.21 Superstructure Sections and Details**

Prestressed Slab Unit Bridges

**12.22 Prestressed Slab Unit Design**

**12.23 Prestressed Slab Unit Layout**

**12.24 Prestressed Slab Unit Details and Schedule**

**12.25 Deck Topping Reinforcing Layout**

**12.26 Superstructure Sections and Details**

Reinforcing Bar Lists

**12.27 Preparation of Reinforcing Bar List**

Load Rating

**12.28 Load Rating**

**13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE**

The CONSULTANT shall prepare plans for Medium Span Concrete Bridge(s) at the location(s) specified in Section 2.5.

General Layout Design and Plans

**13.1 Overall Bridge Final Geometry**

**13.2 Expansion/Contraction Analysis**

**13.3 General Plan and Elevation**

**13.4 Construction Staging**

**13.5 Approach Slab Plan and Details**

**13.6 Miscellaneous Details**

End Bent Design and Plans

**13.7 End Bent Geometry**

**13.8 Wingwall Design and Geometry**

**13.9 End Bent Structural Design**

**13.10 End Bent Plan and Elevation**

**13.11 End Bent Details**

Intermediate Bent Design and Plans

**13.12 Bent Geometry**

**13.13 Bent Stability Analysis**

**13.14 Bent Structural Design**

**13.15 Bent Plan and Elevation**

**13.16 Bent Details**

Pier Design and Plans

**13.17 Pier Geometry**

**13.18 Pier Stability Analysis**

**13.19 Pier Structural Design**

**13.20 Pier Plan and Elevation**

**13.21 Pier Details**

Miscellaneous Substructure Design and Plans

**13.22 Foundation Layout**

Superstructure Deck Design and Plans

- 13.23 Finish Grade Elevation (FGE) Calculation**
- 13.24 Finish Grade Elevations**
- 13.25 Bridge Deck Design**
- 13.26 Bridge Deck Reinforcing and Concrete Quantities**
- 13.27 Diaphragm Design**
- 13.28 Superstructure Plan**
- 13.29 Superstructure Section**
- 13.30 Miscellaneous Superstructure Details**
  - Reinforcing Bar Lists
- 13.31 Preparation of Reinforcing Bar List**
  - Continuous Concrete Girder Design
- 13.32 Section Properties**
- 13.33 Material Properties**
- 13.34 Construction Sequence**
- 13.35 Tendon Layouts**
- 13.36 Live Load Analysis**
- 13.37 Temperature Gradient**
- 13.38 Time Dependent Analysis**
- 13.39 Stress Summary**
- 13.40 Ultimate Moments**
- 13.41 Ultimate Shear**
- 13.42 Construction Loading**
- 13.43 Framing Plan**
- 13.44 Girder Elevation, including Grouting Plan and Vent Locations**
- 13.45 Girder Details**
- 13.46 Erection Sequence**
- 13.47 Splice Details**
- 13.48 Girder Deflections and Camber**

Simple Span Concrete Design

**13.49 Prestressed Beam**

**13.50 Prestressed Beam Schedules**

**13.51 Framing Plan**

Beam Stability

**13.52 Beam/Girder Stability**

Bearing

**13.53 Bearing Pad and Bearing Plate Design**

**13.54 Bearing Pad and Bearing Plate Details**

Load Rating

**13.55 Load Ratings**

**14 STRUCTURES - STRUCTURAL STEEL BRIDGE (N/A)**

N/A

**15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE (N/A)**

N/A

**16 STRUCTURES - MOVABLE SPAN (N/A)**

N/A

**17 STRUCTURES - RETAINING WALLS**

The CONSULTANT shall prepare plans for Retaining Wall(s) as specified in Section 2.5.

General Requirements

**17.1 Key Sheet**

**17.2 Horizontal Wall Geometry**

Permanent Proprietary Walls

**17.3 Vertical Wall Geometry**

**17.4 Semi-Standard Drawings**

**17.5 Wall Plan and Elevations (Control Drawings)**

**17.6 Details**

Temporary Proprietary Walls

**17.7 Vertical Wall Geometry**

**17.8 Semi-Standard Drawings**

**17.9 Wall Plan and Elevations (Control Drawings)**

**17.10 Details**

Cast-In-Place Retaining Walls

**17.11 Design**

**17.12 Vertical Wall Geometry**

**17.13 General Notes**

**17.14 Wall Plan and Elevations (Control Drawings)**

**17.15 Sections and Details**

**17.16 Reinforcing Bar List**

Other Retaining Walls and Bulkheads

**17.17 Design**

**17.18 Vertical Wall Geometry**

**17.19 General Notes, Tables and Miscellaneous Details**

**17.20 Wall Plan and Elevations**

**17.21 Details**

## **18 STRUCTURES - MISCELLANEOUS**

The CONSULTANT shall prepare plans for Miscellaneous Structure(s) as specified in Section 2.5.

Concrete Box Culverts

**18.1 Concrete Box Culverts**

**18.2 Concrete Box Culverts Extensions**

**18.3 Concrete Box Culvert Data Table Plan Sheets**

**18.4 Concrete Box Culvert Special Details Plan Sheets**

Strain Poles

**18.5 Steel Strain Poles**

**18.6 Concrete Strain Poles**

**18.7 Strain Pole Data Table Plan Sheets**

**18.8 Strain Pole Special Details Plan Sheets**

Mast Arms

**18.9 Mast Arms**

**18.10 Mast Arms Data Table Plan Sheets**

**18.11 Mast Arms Special Details Plan Sheets**

Overhead/Cantilever Sign Structure

**18.12 Cantilever Sign Structures**

**18.13 Overhead Span Sign Structures**

**18.14 Special (Long Span) Overhead Sign Structures**

**18.15 Monotube Overhead Sign Structure**

**18.16 Bridge Mounted Signs (Attached to Superstructure)**

**18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets**

**18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets**

High Mast Lighting

**18.19 Non-Standard High Mast Lighting Structures**

**18.20 High Mast Lighting Special Details Plan Sheets**

Noise Barrier Walls (Ground Mount)

**18.21 Horizontal Wall Geometry**

**18.22 Vertical Wall Geometry**

### **18.23 Summary of Quantities - Aesthetic Requirements**

### **18.24 Control Drawings**

### **18.25 Design of Noise Barrier Walls Covered by Standards**

### **18.26 Design of Noise Barrier Walls not Covered by Standards**

### **18.27 Aesthetic Details**

Special Structures

### **18.28 Fender System**

### **18.29 Fender System Access**

### **18.30 Special Structures**

### **18.31 Other Structures**

### **18.32 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles**

### **18.33 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles (No As built or Design Plans Available)**

### **18.34 Analytical Evaluation of Signal and Sign Structures, and High Mast Light Poles**

### **18.35 Ancillary Structures Report**

## **19 SIGNING AND PAVEMENT MARKING ANALYSIS**

The CONSULTANT shall analyze and document Signing and Pavement Markings Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

### **19.1 Traffic Data Analysis**

The CONSULTANT shall review the approved preliminary engineering report, typical section package, traffic technical memorandum and proposed geometric design alignment to identify proposed sign placements and roadway markings. Perform queue analysis.

### **19.2 No Passing Zone Study**

The CONSULTANT shall perform all effort required for field data collection, and investigation in accordance with the DEPARTMENT's Manual on Uniform Traffic Studies.

The CONSULTANT shall submit the signed and sealed report to the DEPARTMENT for review and approval.

### **19.3 Signing and Pavement Marking Master Design File**

The CONSULTANT shall prepare the Signing & Marking Design file to include all necessary design elements and all associated reference files.

### **19.4 Multi-Post Sign Support Calculations**

The CONSULTANT shall determine the appropriate column size from the DEPARTMENT's Multi-Post Sign Program(s).

### **19.5 Sign Panel Design Analysis**

Establish sign layout, letter size and series for non-standard signs.

### **19.6 Sign Lighting/Electrical Calculations**

The CONSULTANT shall analyze and document Lighting/Electrical Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall prepare a photometric analysis to be submitted as part of the Lighting Design Analysis Report. An analysis shall be provided for each new and/or modified sign panel which requires lighting.

The Consultant shall submit voltage drop calculations and load analysis for each new and/or modified sign panel which requires lighting.

### **19.7 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **19.8 Cost Estimate**

### **19.9 Technical Special Provisions and Modified Special Provisions**

### **19.10 Other Signing and Pavement Marking Analysis**

### **19.11 Field Reviews**

### **19.12 Technical Meetings**

### **19.13 Quality Assurance/Quality Control**

### **19.14 Independent Peer Review**

### **19.15 Supervision**

### **19.16 Coordination**

## **20 SIGNING AND PAVEMENT MARKING PLANS**

The CONSULTANT shall prepare a set of Signing and Pavement Marking Plans in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums that includes the following.

### **20.1 Key Sheet**

### **20.2 General Notes/Pay Item Notes**

### **20.3 Project Layout**

### **20.4 Plan Sheet**

### **20.5 Typical Details**

### **20.6 Guide Sign Work Sheets**

### **20.7 Traffic Monitoring Site**

### **20.8 Cross Sections**

### **20.9 Special Service Point Details**

### **20.10 Special Details**

### **20.11 Interim Standards**

### **20.12 Quality Assurance/Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of traffic design drawings, specifications and other services furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

### **20.13 Supervision**

## **21 SIGNALIZATION ANALYSIS (N/A)**

*N/A*

## **22 SIGNALIZATION PLANS (N/A)**

*N/A*

## **23 LIGHTING ANALYSIS (N/A)**

*N/A*

## **24 LIGHTING PLANS (N/A)**

*N/A*

## **25 LANDSCAPE ANALYSIS (N/A)**

*N/A*

## **26 LANDSCAPE PLANS (N/A)**

*N/A*

## **27 SURVEY**

The CONSULTANT shall perform survey tasks in accordance with all applicable statutes, manuals, guidelines, standards, handbooks, procedures, and current design memoranda.

The CONSULTANT shall submit all survey notes and computations to document the surveys. All field survey work shall be recorded in approved media and submitted to the DEPARTMENT. Field books submitted to the DEPARTMENT must be of an approved type. The field books shall be certified by the surveyor in responsible charge of work being performed before the final product is submitted.

The survey notes shall include documentation of decisions reached from meetings, telephone conversations or site visits. All like work (such as bench lines, reference points, etc.) shall be recorded contiguously. The DEPARTMENT may not accept field survey radial locations of section corners, platted subdivision lot and block corners, alignment control points, alignment control reference points and certified section corner references. The DEPARTMENT may instead require that these points be surveyed by true line, traverse or parallel offset.

### **27.1 Horizontal Project Control (HPC)**

Establish or recover HPC, for the purpose of establishing horizontal control on the Florida State Plane Coordinate System or datum approved by the District Surveyor (DS) or District Location Surveyor (DLS); may include primary or secondary control points. Includes analysis and processing of all field collected data, and preparation of forms.

### **27.2 Vertical Project Control (VPC)**

Establish or recover VPC, for the purpose of establishing vertical control on datum approved by the District Surveyor (DS) or the District Location Surveyor (DLS).; may include primary or secondary vertical control points. Includes analysis and processing of all field collected data, and preparation of forms.

### **27.3 Alignment and/or Existing Right of Way (R/W) Lines**

Establish, recover or re-establish project alignment. Also includes analysis and processing of all field collected data, existing maps, and/or reports for identifying mainline, ramp, offset, or secondary alignments. Depict alignment and/or existing R/W lines (in required format) per DEPARTMENT R/W Maps, platted or dedicated rights of way.

### **27.4 Aerial Targets**

Place, locate, and maintain required aerial targets and/or photo identifiable points. Includes analysis and processing of all field collected data, existing maps, and/or reports. Placement of the targets will be at the discretion of the aerial firm.

### **27.5 Reference Points**

Reference Horizontal Project Control (HPC) points, project alignment, vertical control points, section, ¼ section, center of section corners and General Land Office (G.L.O.) corners as required.

### **27.6 Topography/Digital Terrain Model (DTM) (3D)**

Locate all above ground features and improvements for the limits of the project by collecting the required data for the purpose of creating a DTM with sufficient density. Shoot all break lines, high and low points. Effort includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.7 Planimetric (2D)**

Locate all above ground features and improvements. Deliver in appropriate electronic format. Effort includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.8 Roadway Cross Sections/Profiles**

Perform cross sections or profiles. May include analysis and processing of all field-collected data for comparison with DTM.

### **27.9 Side Street Surveys**

Refer to tasks of this document as applicable.

### **27.10 Underground Utilities**

Designation includes 2-dimensional collection of existing utilities and selected 3-dimensional verification as needed for designation. Location includes non-destructive excavation to determine size, type and location of existing utility, as necessary for final 3-dimensional verification. Survey includes collection of data on points as needed for designates and locates. Includes analysis and processing of all field collected data, and delivery of all appropriate electronic files.

### **27.11 Outfall Survey**

Locate all above ground features and improvements for the limits of the project by collecting the required data for the purpose of a DTM. Survey with sufficient density of shots. Shoot all break lines, high and low points. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.12 Drainage Survey**

Locate underground data (XYZ, pipe size, type, condition and flow line) that relates to above ground data. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.13 Bridge Survey (Minor/Major)**

Locate required above ground features and improvements for the limits of the bridge. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

### **27.14 Channel Survey**

Locate all topographic features and improvements for the limits of the project by collecting the required data. Includes field edits, analysis and processing of all field collected data, maps, and/or reports.

### **27.15 Pond Site Survey**

Refer to tasks of this document as applicable.

### **27.16 Mitigation Survey**

Refer to tasks of this document as applicable.

### **27.17 Jurisdiction Line Survey**

Perform field location (2-dimensional) of jurisdiction limits as defined by respective authorities, also includes field edits, analysis and processing of all field collected data, preparation of reports.

### **27.18 Geotechnical Support**

Perform 3-dimensional (X,Y,Z) field location, or stakeout, of boring sites established by geotechnical engineer. Includes field edits, analysis and processing of all field collected data and/or reports.

### **27.19 Sectional/Grant Survey**

Perform field location/placement of section corners, 1/4 section corners, and fractional corners where pertinent. Includes analysis and processing of all field-collected data and/or reports.

### **27.20 Subdivision Location**

Survey all existing recorded subdivision/condominium boundaries, tracts, units, phases, blocks, street R/W lines, common areas. Includes analysis and processing of all field collected data and/or reports. If unrecorded subdivision is on file in the public records of the subject county, tie existing monumentation of the beginning and end of unrecorded subdivision.

### **27.21 Maintained R/W**

Perform field location (2-dimensional) of maintained R/W limits as defined by respective authorities, if needed. Also includes field edits, analysis and processing of all field collected data, preparation of reports.

### **27.22 Boundary Survey**

Perform boundary survey as defined by DEPARTMENT standards. Includes analysis and processing of all field-collected data, preparation of reports.

### **27.23 Water Boundary Survey**

Perform Mean High Water, Ordinary High Water and Safe Upland Line surveys as required by DEPARTMENT standards.

### **27.24 Right of Way Staking, Parcel / Right of Way Line**

Perform field staking and calculations of existing/proposed R/W lines for on-site review purposes.

### **27.25 Right of Way Monumentation**

Set R/W monumentation as depicted on final R/W maps for corridor and water retention areas.

### **27.26 Line Cutting**

Perform all efforts required to clear vegetation from the line of sight.

### **27.27 Work Zone Safety**

Provide work zone as required by DEPARTMENT standards.

### **27.28 Vegetation Survey**

### **27.29 Tree Survey**

Locate individual trees or palms within the project limits.

### **27.30 Miscellaneous Surveys**

Refer to tasks of this document, as applicable, to perform surveys not described herein. The percent for Supplemental will be determined at negotiations. This item can only be used if

authorized in writing by the District Surveyor (DS), District Location Surveyor (DLS) or their representative.

### **27.31 Supplemental Surveys**

Supplemental survey days and hours are to be approved in advance by DS or DLS. Refer to tasks of this document, as applicable, to perform surveys not described herein.

### **27.32 Document Research**

Perform research of documentation to support field and office efforts involving surveying and mapping.

### **27.33 Field Review**

Perform verification of the field conditions as related to the collected survey data.

### **27.34 Technical Meetings**

Attend meetings as required and negotiated by the Surveying and Mapping Department.

### **27.35 Quality Assurance/Quality Control (QA/QC)**

Establish and implement a QA/QC plan. Also includes subconsultant review, response to comments and any resolution meetings if required, preparation of submittals for review, etc.

### **27.36 Supervision**

Perform all activities required to supervise and coordinate project. These activities must be performed by the project supervisor, a Florida P.S.M. or their delegate as approved by the District Surveying Office.

### **27.37 Coordination**

Coordinate survey activities with other disciplines. These activities must be performed by the project supervisor, a Florida P.S.M. or their delegate as approved by the District Surveying Office.

## **28 PHOTOGRAMMETRY**

The CONSULTANT shall perform photogrammetric tasks in accordance with all applicable statutes, manuals, guidelines, standards, handbooks, procedures, and current design memoranda.

In addition to the maps and photographic products, the CONSULTANT shall submit all computations to document the mapping. This will include documentation of all decisions reached from meetings, telephone conversations, and site visits.

### **28.1 Flight Preparation**

Review record data, create target diagrams, and plan the mission.

## **28.2 Control Point Coordination**

Determine photo identifiable control points, and mark contact prints.

## **28.3 Mobilization**

Perform pre- and post-flight aircraft inspection; prepare the aircraft and camera for the mission.

## **28.4 Flight Operations**

Operate the aircraft, aerial camera, and other instruments to obtain aerial photography.

## **28.5 Film Processing**

Process, check, and annotate the aerial film.

## **28.6 Photo Products**

Prepare contact prints, contact diapositives, and photo enlargements.

## **28.7 Scanning**

Scan photographic images.

## **28.8 LiDAR**

Includes data acquisition, post processing of LiDAR data to XYZ coordinates for "bare earth" classification.

## **28.9 Aerial Triangulation**

Measure and adjust control within aerial images.

## **28.10 Surfaces**

Includes collection of break lines and spot elevations.

## **28.11 Ortho Generation**

Includes creation of final images.

## **28.12 Rectified Digital Imagery (Georeferenced)**

Create the rectified digital image.

## **28.13 Mosaicking**

Create the mosaic.

## **28.14 Sheet Clipping**

Create plot files for sheets from the database.

### **28.15 Topographics (3D)**

Prepare topographic maps including surface and planimetrics. (Photogrammetrist will not propose hours for Surfaces and Topographics.)

### **28.16 Planimetrics (2D)**

Prepare 2D planimetric map.

### **28.17 Drainage Basin**

Includes preparing drainage basin maps in clipped "sheet" format.

### **28.18 CADD Edit**

Perform final edit of graphics for delivery of required Microstation design files (.dgn), CADD, and Geopak files.

### **28.19 Data Merging**

Merge photogrammetric files, field survey files, and data from other sources.

### **28.20 Miscellaneous**

Other tasks not specifically addressed in this document.

### **28.21 Field Review**

Perform on site review of maps.

### **28.22 Technical Meetings**

Attend meetings as required.

### **28.23 Quality Assurance/Quality Control**

Establish and implement a QA/QC plan.

### **28.24 Supervision**

Supervise all photogrammetric activities. This task must be performed by the project supervisor, a Florida P.S.M.

### **28.25 Coordination**

Coordinate with all elements of the project to produce a final photogrammetric product.

## **29 MAPPING**

The CONSULTANT will be responsible for the preparation of control survey maps, right of way maps, maintenance maps, sketches, other miscellaneous survey maps, and legal descriptions as required for this project in accordance with all applicable DEPARTMENT Manuals, Procedures,

Handbooks, District specific requirements, and Florida Statutes. All maps, surveys and legal descriptions will be prepared under the direction of a Florida Professional Surveyor and Mapper (PSM) to DEPARTMENT size and format requirements utilizing DEPARTMENT approved software, and will be designed to provide a high degree of uniformity and maximum readability. The CONSULTANT will submit maps, legal descriptions, quality assurance check prints, checklists, electronic media files and any other documents as required for this project to the DEPARTMENT for review at stages of completion as negotiated.

Master CADD File

**29.1 Alignment**

**29.2 Section and 1/4 Section Lines**

**29.3 Subdivisions / Property Lines**

**29.4 Existing Right of Way**

**29.5 Topography**

**29.6 Parent Tract Properties and Existing Easements**

**29.7 Proposed Right of Way Requirements**

The ENGINEER OF RECORD (EOR) will provide the proposed requirements. The PSM is responsible for calculating the final geometry. Notification of Final Right of Way Requirements along with the purpose and duration of all easements will be specified in writing.

**29.8 Limits of Construction**

The limits of construction DGN file as provided by the EOR will be imported or referenced to the master CADD file. Additional labeling will be added as required. The PSM is required to advise the EOR of any noted discrepancies between the limits of construction line and the existing/proposed right of way lines, and for making adjustments as needed when a resolution is determined.

**29.9 Jurisdictional/Agency Lines**

These lines may include, but are not limited to, jurisdictional, wetland, water boundaries, and city/county limit lines.

Sheet Files

**29.10 Control Survey Cover Sheet**

**29.11 Control Survey Key Sheet**

**29.12 Control Survey Detail Sheet**

**29.13 Right of Way Map Cover Sheet**

**29.14 Right of Way Map Key Sheet**

**29.15 Right of Way Map Detail Sheet**

**29.16 Maintenance Map Cover Sheet**

**29.17 Maintenance Map Key Sheet**

**29.18 Maintenance Map Detail Sheet**

**29.19 Reference Point Sheet**

This sheet(s) will be included with the Control Survey Map, Right of Way Map and Maintenance Map.

**29.20 Project Control Sheet**

This sheet depicts the baseline, the benchmarks, the primary and secondary control points and their reference points including the type of material used for each point, their XYZ coordinates, scale factors and convergence angles. This sheet(s) may be included with the Control Survey Map, Right of Way Map and Maintenance Map.

### **29.21 Table of Ownerships Sheet**

Miscellaneous Surveys and Sketches

### **29.22 Parcel Sketches**

### **29.23 TITF Sketches**

### **29.24 Other Specific Purpose Survey(s)**

### **29.25 Boundary Survey(s) Map**

### **29.26 Right of Way Monumentation Map**

### **29.27 Title Search Map**

### **29.28 Title Search Report**

### **29.29 Legal Descriptions**

### **29.30 Final Map/Plans Comparison**

The PSM will perform a comparison of the final right of way maps with the available construction plans to review the correctness of the type of parcel to be acquired and the stations/offsets to the required right of way. The PSM will coordinate with the EOR to resolve any conflicts or discrepancies and provide documentation of the review.

### **29.31 Field Reviews**

### **29.32 Technical Meetings**

### **29.33 Quality Assurance/Quality Control**

### **29.34 Supervision**

### **29.35 Coordination**

### **29.36 Supplemental Mapping**

This task is to cover efforts resulting from major design and/or development changes after 60% map development that affect the right of way requirements/parent tract property lines and may include any number of tasks. Request and approval to utilize the Supplemental Mapping hours will be in writing and approved by the District Right of Way Surveyor prior to any work being done under this task.

## **30 TERRESTRIAL MOBILE LiDAR (N/A)**

N/A

## **31 ARCHITECTURE DEVELOPMENT (N/A)**

N/A

## **32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE (N/A)**

N/A

## **33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS**

The CONSULTANT shall analyze and document Intelligent Transportations System (ITS) Analysis Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, existing ITS standard operating procedures, strategic plans, Florida's SEMP guidelines, National and regional ITS architectures, and current design memoranda.

ITS work includes the application of sensor, computer, electronics and communication technologies and management strategies, in an integrated manner, to improve the safety and efficiency of the surface transportation system. ITS includes, but is not limited to, Advanced Traffic Management Systems (ATMS), Advanced Traveler Information Systems (ATIS), Advanced Rural Transportation Systems (ARTS), Advanced Public Transportation Systems (APTS), Advanced Highway Systems (AHS), Commercial Vehicle Operation (CVO) and Electronic Toll Collection (ETC) Systems.

In instances where the CONSULTANT performs analysis or prepares the design packages for the deployment of ITS, the CONSULTANT will not be allowed to compete as a proposing firm, or participate as a subconsultant to a proposing firm during subsequent advertisements involving work performed under this contract.

### **33.1 ITS Analysis**

The CONSULTANT shall review the approved preliminary engineering report, typical section package, traffic technical memorandum and proposed geometric design alignment to identify impacts to existing ITS components (if applicable) and proposed ITS field device placements. The CONSULTANT shall review all related District ITS plans and documentation for the project corridor to ensure all cited ITS elements are included in this project, and develop a Concept of Operations (ConOps), Project Systems Engineering Management Plan (PSEMP), RTVM, and other documents as necessary for conformance with Federal Highway Administration (FHWA) requirements. The CONSULTANT shall use applicable DEPARTMENT requirements and guidelines, including, but not limited to, the FDM, Standard Plans, and Standard Specifications for Road and Bridge Construction in the design of ITS. The CONSULTANT design is expected to include the following attributes, facilities, infrastructure, ITS devices, systems, and associated work: **Associated Work**

CCTV camera system shall provide 100 percent coverage of all mainline lanes, entrance and exit ramps, interchanges (includes view of crossing arterials), blind spots (such as those caused due to existing and proposed bridges, existing and proposed signage, vegetation, and horizontal and vertical curvatures). Cameras shall be spaced to meet the Project requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

Vehicle detection devices shall be spaced as required to meet the Project requirements (speed, volume, and occupancy detection), guidance from the ConOps and as approved by the DEPARTMENT.

Both expressway and arterial dynamic message signs (DMS) shall be located to meet the Project requirements, guidance from the ConOps, and as approved by the DEPARTMENT. All FDOT FDM requirements shall be met for DMS locations. DMS locations shall be designed in conjunction with the Project's master signing design.

The CONSULTANT shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the Project. The CONSULTANT shall coordinate with District's Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures (If desired by the District).

All ITS devices shall be compatible with the latest version of the National Transportation Communications for ITS Protocol (NTCIP) and compatible with SunGuide software platform.

The CONSULTANT shall design the project such that all ITS field devices and ancillary components comply with FDOT's Approved Product List (APL) and are supported within the SunGuide software or other software approved by the DEPARTMENT.

#### Closed Circuit Television (CCTV) Camera Assembly

The CONSULTANT shall be responsible for the design and exact field locations for the camera assemblies. The camera subsystem shall provide overlapping coverage to overcome visual blockage. Camera assemblies may include a camera lowering device (CLD).

The camera subsystem shall be designed to provide additional benefits such as the monitoring of DMS operations and security surveillance of critical infrastructure elements. A stand-alone DMS confirmation camera shall be designed and installed to support TMC operations to verify and confirm the posted DMS messages (if desired by the DEPARTMENT). The position, height, and design of each camera pole shall be finalized during the design phase of the project. Each site shall be designed for overall monitoring capability, as well as designed to provide safe and effective maintenance conditions.

The camera assembly deployment shall be designed to provide fields of view that give the required corridor coverage. The CONSULTANT shall determine the camera location by performing a videography study at each proposed camera site. The study shall include video at the proposed camera location and elevation with respect to the roadway elevation. The CONSULTANT shall identify the final number and locations of the camera assemblies based on the videography study.

The camera system design shall ensure that the video quality is not degraded due to wind or vibration. The CONSULTANT shall be responsible for the design of the poles and foundations to minimize the potential for vibration. The CONSULTANT shall prepare cross section plan

sheets showing details of horizontal and vertical clearances of the proposed equipment with identified utilities.

The CONSULTANT shall be responsible for the design of the grounding and lightning protection system based on FDOT criteria

The CCTV camera assembly shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 682.

#### Vehicle Detection Subsystem

The CONSULTANT shall select vehicle detection technology to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall be responsible for the design of a non-intrusive vehicle detection subsystem for the roadway facilities. The detectors shall be positioned near other ITS field device infrastructure including the fiber-optic splice vaults when feasible to reduce cost. Final detection station locations shall be based on a number of location variables identified during the design phase.

The vehicle detection subsystem shall collect and process volume, speed and occupancy data on a lane-by-lane basis for the corridor mainlines, in both directions of travel. The data will be used by the TMC for functions including detecting incidents, determining travel times, estimating traffic conditions for dissemination to travelers, sharing information with other agencies, and data archiving for transportation planning and historical data analysis. The vehicle detection subsystem shall allow for connectivity to the TMC.

Vehicle detectors must meet the Project requirements under all environmental and traffic conditions expected for the corridors. The detection system shall produce accurate volume, speed and occupancy data for all corridor traffic operation conditions. The CONSULTANT design must limit the likelihood of occlusions, other blocking of vehicles and adjacent lanes detection that degrade the detection system performance below specified accuracy. Design the system so that signs, walls, guardrails, and other physical elements do not degrade detection performance.

The system shall allow remote configuration, calibration, monitoring, and diagnostic of real-time traffic activities from a remote location, such as the TMC, using the FDOT SunGuide central software and software provided by the detection system vendor.

The CONSULTANT shall determine the exact location of the field devices to meet the desired coverage and functional requirements of vehicle detectors. The detector and associated cabinet locations shall be identified by the CONSULTANT. The CONSULTANT will coordinate and perform a detailed site survey with a factory trained and certified representative of the detection system manufacturer being proposed in their design. The site survey must confirm that the design does not exceed the operational capabilities of the proposed detection technology or device.

The CONSULTANT shall be responsible for the design of a vehicle detection system that allows travel times to be automatically calculated for roadway facilities. The travel time system may utilize a variety of vehicle detection systems, including loop, video, microwave, wireless magnetometer, and Automatic Vehicle Identification (AVI) systems. The system shall utilize the project communications backbone in order to collect and distribute travel time data to the TMCs.

When utilizing transponders, they will be read by AVI reader equipment placed at checkpoints along the roadway. As a transponder passes a checkpoint, its data shall be acquired by the AVI system. The AVI system shall automatically add the time, date, transponder reading antenna number, and the antenna location to the transponder identification code and store the data.

Systems that rely upon transponders shall utilize supplemental toll tag readers placed at appropriate existing device locations as applicable, as well as interchanges and at intermediate locations throughout the project as required to provide the required coverage to satisfy travel time measurement requirements. Using the designed communications, the transponder information shall be forwarded to the TMC for further processing.

The CONSULTANT shall coordinate all design efforts for use of SunPass AVI transponders with the Florida's Turnpike Enterprise (FTE) Tolls group.

The vehicle detection system utilized shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Specification 660.

#### Dynamic Message Sign Subsystem

The CONSULTANT shall be responsible for the design of the DMS subsystem for the roadway facilities.

The position of each DMS shall be finalized during the design phase of the project. The CONSULTANT shall select DMS technology, type, and display to meet the Project requirements and ConOps requirements.

The CONSULTANT shall locate the DMS to satisfy the required sign functionality and to provide the required visibility of the signs. The project communications system shall enable full control of the DMS from the TMC facilities. All DMS hardware, software and related infrastructure components shall be fully compatible with SunGuide software. All DMS shall include a dedicated confirmation camera that allows for visual verification of the messages posted on the DMS by a TMC Operator (if desired by the District).

The CONSULTANT shall design support structures to accommodate the specified DMS to meet the design functional, operational, and maintenance requirements.

The DMS shall be designed in accordance with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 700.

All Highway Signing, including Dynamic Message Signs, shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Specification 700.

#### Roadway Weather Information Systems (RWIS)

The CONSULTANT shall develop Technical Special Provisions or Modified Special Provisions for RWIS based upon the unique needs of the project. The CONSULTANT shall ensure that, each RWIS site consists of a remote processing unit (RPU), communication hardware, and determine the site-specific components as required from below:

Fog/Smoke Detection sensor;

Classifying Precipitation;

Precipitation Occurrence Sensor;

Air Temperature/Relative Humidity Sensor;

Wind Speed and Direction Sensor;

RWIS Tower/Pole Structure, foundation, base, and cabinet with electrical service, and lightning protection & grounding assembly; and,

Communication hardware.

The RWIS subsystem shall include all hardware, software, and licenses to operate, including SQL database for the TMC and RWIS Central Hardware for TMC.

### **33.2 Communications**

The CONSULTANT shall be responsible for the development of a communications plan to determine the optimal communications medium for the project corridor. The plan shall be developed prior to submittal of Phase I plans. The plan shall identify communications media alternatives and provide a cost estimate that includes initial, operations and maintenance cost for the life cycle of the communications network. The plan shall ensure that video, voice, and data will be communicated in real-time between center to-field and center-to-center (C2C) nodes as applicable. The communications system design must utilize non-proprietary, open-architecture, standards-based, robust, scalable, and proven technology. The communication plan analysis shall address communication and connections between field devices, communications and connections between field devices and the TMC, center-to-center communications between TMCs, and any other communication links or connections required to meet project goals. The plan must include bandwidth analysis and recommendations, needs assessment, and provide recommendations regarding minimum requirements, media, network devices, protocols, network topology, communication redundancy, future needs, spare capacity, and any communications or data sharing with other agencies.

After approval of the plan, the CONSULTANT shall submit a revised plan including a detailed design analysis for each submittal. The CONSULTANT's communications design shall include multiple redundant paths for each location, which allows for automatic switching of communications path onto a secondary path, if the primary path is impacted (if desired by the District).

The communications system components shall be in accordance with Sections 630, 633, and 635 of the latest FDOT Standard Specifications for Road and Bridge Construction (online edition).

### **33.3 Grounding and Lightning Protection**

The CONSULTANT shall be responsible for a complete and reliable grounding and lightning protection design to provide personnel and equipment protection against faults, surge currents and lightning transients.

The grounding and lightning protection system shall be designed in accordance with the latest version of the FDOT Standard Specifications for Road and Bridge Construction, Specification 620.

### **33.4 Power Subsystem**

The CONSULTANT shall be responsible for an electrical design in accordance with all NEC requirements. No solar power should be utilized as a power solution for the Project unless otherwise approved by the DEPARTMENT. To enhance power reliability, the CONSULTANT shall design a power distribution and backup system consisting of, at a minimum, underground power conduits and conductors, transformers, generators, automatic transfer switches, UPS, and all associated equipment. The power backup system shall supply electrical power in event of commercial power supply failure for all system components. Power equipment shall be installed in areas to avoid wet locations. All connections and equipment shall be protected from moisture and water intrusion. The CONSULTANT shall ensure that vandal resistant mechanisms for all electrical infrastructure shall be included as part of the Design.

The CONSULTANT shall submit the power system design and voltage drop calculations for the power distribution system as part of phase II, III, and IV design submittals. The CONSULTANT shall conduct a short circuit and protection coordination study for the designed power system and document the study as part of the power system design report.

### **33.5 Voltage Drop Calculations**

The electrical design shall address allowable voltage drops per the NEC. The CONSULTANT shall submit voltage drop calculations for any electrical circuit providing power to the ITS field devices beyond the electric utility service point. The calculations shall document the length of each circuit, its load, the size conductor or conductors used and their ohm resistance values and the required voltages from the service point to the respective ITS devices to maintain

voltage drops with allowable limits. The voltage drop incurred on each circuit (total volts and percentage of drop) shall be calculated, and all work necessary to calculate the voltage drop values for each circuit should be presented in such a manner as to be duplicated by the District. Load analysis calculations shall be submitted. All voltage drop calculations shall allow for future expansion of ITS infrastructure, if identified in the Project ConOps.

### **33.6 Design Documentation**

The CONSULTANT shall submit a Design Documentation Book with each plan submittal under separate cover and not part of the roadway documentation book. At a minimum, the design documentation book shall include:

- Computation books for all applicable items on plans.
- Phase submittal checklist.
- Three-way quantity check list
- Structural calculations for all structures
- Voltage drop calculations.
- Load analysis calculations.

### **33.7 Existing ITS**

The CONSULTANT shall research any required legacy system or system components that may be impacted by new work, such as: existing communications; existing types, numbers, locations, models, manufacturers, and age of ITS devices; as-built plans; existing operating software; existing center-to-field devices; and C2C communications and capabilities.

### **33.8 Queue Analysis**

The CONSULTANT shall perform a queue analysis at high volume interchanges and high frequency conflict / crash locations to determine optimal placement of DMS using project forecasted traffic volumes. This analysis shall be performed prior to submittal of the Phase I plans. The Consultant shall perform other traffic engineering analysis as necessary to ensure that the DMS locations are selected based on optimum message delivery to the motorists.

### **33.9 Reference and Master ITS Design File**

The CONSULTANT shall prepare the ITS design file to include all necessary design elements and the reference files for topo, R/W roadway, utilities files, etc. This effort includes the design and layout of proposed ITS devices, including but not limited to: CCTV / Detection poles, DMS, detection devices, advanced traffic controllers, conduit, cabinet-related pull boxes, service points, fiber optic sizing, and communications hubs. All existing ITS infrastructure shall be referenced to the new ITS plan sheets (if applicable).

### **33.10 Reference and Master Communications Design File**

The CONSULTANT shall prepare the communication design file to include all necessary design elements and all associated reference files as well as reference files of topo, R/W, roadway, utilities files, existing ITS communications infrastructure, etc. This effort includes design and layout of proposed communications conduit, cabinet, pull boxes, splice boxes, standard route markers, communications plan overview, fiber optic splicing, connections, communications hubs, etc.

### **33.11 Pole Elevation Analysis**

The CONSULTANT shall evaluate pole elevation requirements and design pole heights to meet the Project requirements including field of view; elimination of occlusion; site access for maintenance vehicles and personnel; access to pole mounted equipment, such as CCTV cameras, traffic detectors, and cabinets; and probability of lightning strike.

### **33.12 Sign Panel Design Analysis**

The CONSULTANT shall design all ITS signing in conjunction with the Roadway Master Signing. This includes any static sign panel that includes changeable message elements. Expressway and arterial full size DMS shall not be co-located with other static signs. [If desired by the District].

### **33.13 Quantities for EQ Report**

The CONSULTANT shall determine pay items and quantities and the supporting documentation.

### **33.14 Cost Estimate**

The CONSULTANT shall prepare an engineer's cost estimate for the project using historical data from the FDOT or from other Industry sources. The CONSULTANT shall also load the pay items and quantities into AASHTOWare Project Preconstruction.

### **33.15 Technical Special Provisions and Modified Special Provisions**

The CONSULTANT shall develop Technical Special Provisions (TSP) and Modified Special Provisions (MSP) for the specific items or conditions of the project that are not addressed in the FDOT's Standard Specifications, Supplemental Specifications and Special Provisions.

### **33.16 Other ITS Analyses**

*[Add detailed project needs for any other ITS-related analyses]*

### **33.17 Field Reviews**

The CONSULTANT shall conduct a field review for the required phase submittals. The review shall identify necessary data for all elements of the project including, but not limited to, the following:

- Existing ITS Field Devices as compared with the latest FDOT standards and District requirements
- Device Make, Model, Capabilities, Condition / Age, Existence of SunGuide Software Driver
- Condition of Structure(s), cabinets, and other above-ground infrastructure and devices
- Type of Detection as Compared with Current District Standards
- Underground Infrastructure
- Proximity of other utilities
- Traffic Operations
- Any other field reconnaissance as necessary to develop a complete ITS design package

### **33.18 Technical Meetings**

The CONSULTANT shall attend meetings as necessary support the project.

### **33.19 Quality Assurance / Quality Control**

The CONSULTANT shall be responsible for the professional quality, technical accuracy and coordination of designs, drawings, specifications, and other services and work furnished by the CONSULTANT under this contract.

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or may be one specifically designed for this project. The CONSULTANT shall utilize the District's quality control checklist. The responsible Professional Engineer that performed the Quality Control review shall sign a statement certifying that the review was conducted.

The CONSULTANT shall, without additional compensation, correct all errors or deficiencies in their works.

### **33.20 Supervision**

The CONSULTANT shall provide all efforts required to supervise all technical design activities.

### **33.21 Coordination**

The CONSULTANT shall coordinate with Survey, Geotech, Drainage, Structures, Lighting, Roadway Design, Utilities, municipalities, maintaining agencies and Traffic Operations to produce a final set of construction contract documents and to ensure that a high degree of accuracy for the design plans is achieved.

## **34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS**

The CONSULTANT shall prepare a set of ITS Plans in accordance with the FDOT Design Manual that includes the following:

### **34.1 Key Sheet**

The CONSULTANT shall prepare the key sheet in accordance with the latest format depicted in the FDOT Design Manual.

MUTCD

Standard Specs

Standard Plans

### **34.2 General Notes / Pay Item Notes**

The CONSULTANT shall include all pertinent general notes and pay item notes as deemed fit and as established by the District.

### **34.3 Project Layout**

The CONSULTANT shall prepare plan sheet(s) with an overview of the entire project that include stations and offsets, project limits, intersection locations, devices, device identification using SunGuide nomenclature, and plan sheet coverage.

### **34.4 Typical and Special Details**

The CONSULTANT shall prepare typical and / or special details for conditions in the project not addressed by the DEPARTMENT's Standard Plans for Design, Construction, Maintenance, and Utility Operations on the State Highway System. The CONSULTANT shall prepare special details not addressed by FDOT Standard Plans, including block diagrams, hub cabinets, wiring diagrams, solar power service, and special mounting details.

### **34.5 Plan Sheet**

The CONSULTANT shall prepare the ITS plan sheets utilizing the Design file to include all necessary information related to the project design elements and all associated reference files. The plan sheets shall include general and pay item notes and pay items. The plans shall depict the location of pull boxes, splice boxes, conduit runs and device locations with setbacks from the travel way. Devices shall be located by station and offset.

### **34.6 ITS Communications Plans**

The CONSULTANT shall prepare plans for the communications network. These plans shall consist of block diagrams, splicing diagrams, port assignments, wiring diagrams, and all other information necessary to convey the design concept to the contractor. These plans shall be

included in the ITS plan set and be prepared in a manner consistent with immediately adjacent ITS project installations (planned or installed).

The communication system shall be an open-architecture, non-proprietary, real-time, multimedia communications network. The communication system design must be compatible and completely interoperable with the existing systems.

[Discuss any needs or allowance for temporary communication connectivity options.]

The CONSULTANT's design shall include protecting and maintaining the existing ITS infrastructure. For locations where existing ITS infrastructure is impacted, the CONSULTANT's design shall include mitigation to minimize the downtime of existing system as per the District's requirements.

The CONSULTANT is responsible for the design of the communication infrastructure and its integration with the DEPARTMENT's communication system. Additionally, the CONSULTANT shall determine the most cost effective, best performing, communication connectivity option. The communication system must allow command and control as well as data and video transmission between the field devices and the TMCs at [Location].

Conduit paths shall be selected to provide a continuous duct system on one side of the road unless otherwise requested by the FDOT. The various components of ITS deployment will be located on both sides of the freeway and therefore under pavement bore and lateral conduits will be necessary to access equipment locations.

The CONSULTANT shall produce fiber optic cable splicing diagrams to show the connectivity of the fiber optic cable from its termini at field devices to the TMC. The diagrams shall denote new and existing fiber routes, splices, and terminations involved in the work. The diagrams shall identify cables by size, tube color / number and stand colors / numbers. All cables shall be identified either by numbering system identified either by numbering system identified on the plans or by bounding devices. The diagrams shall denote the types of connectors in the patch panels.

### **34.7 Fiber Optic Splice Diagrams**

The CONSULTANT shall produce fiber optic cable splicing diagrams to show the connectivity of the fiber optic cable from its termini at field devices to the TMC. The diagrams shall denote new and existing fiber routes, splices, and terminations involved in the work. The diagrams shall identify cables by size, tube color / number and stand colors / numbers. All cables shall be identified either by numbering system identified either by numbering system identified on the plans or by bounding devices. The diagrams shall denote the types of connectors in the patch panels.

### **34.8 Grounding and Lightning Protection Plans**

The CONSULTANT shall include efforts to design a complete and reliable lightning protection design for each pole and associated devices, ITS device installation, as well as

device cabinets and communications hubs, etc. if not already addressed in the FDOT's Standard Plans for Design, Construction, Maintenance and Utility Operations on the State Highway System.

### **34.9 Cross Sections**

The CONSULTANT shall prepare cross sections for ITS devices.

### **34.10 Guide Sign Work Sheets**

The CONSULTANT shall prepare the guide sign work sheets to include all necessary information related to the design of the static and dynamic message signs in the project corridor.

### **34.11 Special Service Point Details**

The CONSULTANT shall design any special service point and electrical distribution system beyond the electric utility company's service point. The plan shall depict with pay items, general and plan notes the locations of transformers, switches, disconnects, conduits, pull boxes and power conductors. The plans shall identify the location of underground and overhead service points with identifying pole and transformer numbers.

### **34.12 Strain Pole Schedule**

The CONSULTANT shall incorporate the schedule detail chart for concrete or steel strain poles in the plan set.

### **34.13 Overhead / Cantilever Sign Structure**

For overhead truss and cantilever mounted devices, the CONSULTANT shall evaluate pertinent data and information to develop the layout for locating and mounting devices to the horizontal element of the structure, and coordinate the design of the structures with the roadway and structural engineers.

The CONSULTANT shall be responsible for determining the overhead/cantilever structure requirements for proper installation of the DMS, viewing angle and site distance requirement as per Chapter 2e - Guide Signs-Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and Florida Department of Transportation FDOT Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

### **34.14 Other Overhead Sign Structures (Long Span, Monotube, etc.)**

For other overhead sign structures, the CONSULTANT shall evaluate pertinent data and information to develop layout for locating and mounting device to the horizontal element of the structure, and coordinate the design of the structures with the roadway and structural engineers.

The CONSULTANT shall be responsible for determining the requirements for other type of structures (long span, monotube, etc) used as part of the project for proper installation of the DMS, viewing angle and site distance requirement as per Chapter 2e - Guide Signs-Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and Florida Department of Transportation FDOT Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

#### **34.15 Temporary Traffic Control Plans**

The CONSULTANT shall prepare Temporary Traffic Control Plans (TTCP) to minimize impact to traffic during the construction of ITS field devices and associated communications infrastructure that will be deployed along the project corridor.

The TTCP shall strive to maintain and sustain center-to-field device connectivity and operability to the ITS field devices previously deployed along the project corridor. The TTCP effort shall consider and mitigate the impacts of the project's various construction phases so as to sustain center-to-field devices connectivity and operability, maintaining operational quality as a minimum at the level provided prior to construction start and minimizing down time as much as possible. The CONSULTANT shall develop the TTCP sheets for the project, providing temporary communications as necessary, notes, details, and direction applicable to the ITS elements and associated communications for inclusion in the TTCP.

The CONSULTANT shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the Project. The CONSULTANT shall coordinate with District's Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures. [If desired by the District]

#### **34.16 Interim Standards**

The CONSULTANT shall adhere to all Department's Interim Standards for ITS applications.

#### **34.17 GIS Data and Asset Management Requirements**

The CONSULTANT is responsible for providing Geographic Information System (GIS), spatial data, for the ITS components design. This information is required to integrate ITS components to the SunGuide software. A coordinate point compatible with the Florida State Plane System or FDOT's current coordinate plane system shall be collected for all ITS components part of the Project design. All GIS information provided shall be compatible with the FDOT's ITS FM asset management software.

The information shall be transferred to the as-built plans and submitted to the District in electronic format along with the as-built plans.

The Global Positioning System (GPS) unit shall be provided by the CONSULTANT and used to collect data with a minimum accuracy of three (3) meters when differentially corrected. The CONSULTANT shall collect spatial data points and physical address location for:

- DMS location (mainline and arterial)
- Vehicle detection pole location
- CCTV camera pole location
- Ground mounted cabinets
- Fiber optic cable path (fiber backbone)
- Communications hubs
- Standard route markers
- Lateral fiber optic cable connections
- Lateral power cable connections
- Pull boxes (power and fiber)
- Splice boxes
- Power drops (service point and cable path)

#### **34.18 Quality Assurance / Quality Control**

The CONSULTANT shall utilize the District's quality control checklist for traffic design drawings in addition to the QC effort described in section three.

#### **34.19 Supervision**

The CONSULTANT shall supervise all technical design activities.

### **35 GEOTECHNICAL**

The CONSULTANT shall, for each project, be responsible for a complete geotechnical investigation. All work performed by the CONSULTANT shall be in accordance with DEPARTMENT standards, or as otherwise directed by the District Geotechnical Engineer. The District Geotechnical Engineer will make interpretations and changes regarding geotechnical standards, policies and procedures and provide guidance to the CONSULTANT.

Before beginning each phase of investigation and after the Notice to Proceed is given, the CONSULTANT shall submit an investigation plan for approval and meet with the DEPARTMENT's Geotechnical Engineer or representative to review the project scope and DEPARTMENT requirements. The investigation plan shall include, but not be limited to, the proposed boring locations and depths, and all existing geotechnical information from available sources to generally describe the surface and subsurface conditions of the project site. Additional meetings may be required to plan any additional field efforts, review plans, resolve plans/report comments, resolve responses to comments, and/or any other meetings necessary to facilitate the project.

The CONSULTANT shall notify the DEPARTMENT in adequate time to schedule a representative to attend all related meetings and field activities.

### **35.1 Document Collection and Review**

CONSULTANT will review printed literature including topographic maps, county agricultural maps, aerial photography (including historic photos), ground water resources, geology bulletins, potentiometric maps, pile driving records, historic construction records and other geotechnical related resources. Prior to field reconnaissance, CONSULTANT shall review U.S.G.S., S.C.S. and potentiometric maps, and identify areas with problematic soil and groundwater conditions.

#### Roadway

The CONSULTANT shall be responsible for coordination of all geotechnical related field work activities. The CONSULTANT shall retain all samples until acceptance of Phase IV plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

Obtain pavement cores as directed in writing by the District Geotechnical Engineer.

If required by the District Geotechnical Engineer, a preliminary roadway exploration shall be performed before the Phase I plans submittal. The preliminary roadway exploration will be performed and results provided to the Engineer of Record to assist in setting roadway grades and locating potential problem areas. The preliminary roadway exploration shall be performed as directed in writing by the District Geotechnical Engineer.

CONSULTANT shall perform specialized field-testing as required by project needs and as directed in writing by the District Geotechnical Engineer.

All laboratory testing and classification will be performed in accordance with applicable DEPARTMENT standards, ASTM Standards or AASHTO Standards, unless otherwise specified in the Contract Documents.

### **35.2 Develop Detailed Boring Location Plan**

Develop a detailed boring location plan. Meet with DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program expects to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

### **35.3 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

### **35.4 Muck Probing**

Probe standing water and surficial muck in a detailed pattern sufficient for determining removal limits to be shown in the Plans.

### **35.5 Coordinate and Develop TTCP for Field Investigation**

Coordinate and develop Temporary Traffic Control Plan (TTCP). All work zone traffic control will be performed in accordance with the DEPARTMENT's Standard Plans Index 102 series.

### **35.6 Drilling Access Permits**

Obtain all State, County, City, and Water Management District permits for performing geotechnical borings, as needed.

### **35.7 Property Clearances**

Notify property tenants in person of drilling and field activities, if applicable. Written notification to property owners/tenants is the responsibility of the DEPARTMENT's Project Manager.

### **35.8 Groundwater Monitoring**

Monitor groundwater, using piezometers.

### **35.9 LBR / Resilient Modulus Sampling**

Collect appropriate samples for Limerock Bearing Ratio (LBR) testing. Deliver Resilient Modulus samples to the District Materials Office or the State Materials Office in Gainesville, as directed by the DEPARTMENT.

### **35.10 Coordination of Field Work**

Coordinate all field work required to provide geotechnical data for the project.

### **35.11 Soil and Rock Classification - Roadway**

Refine soil profiles recorded in the field, based on results of laboratory testing.

### **35.12 Design LBR**

Determine design LBR values from the 90% and mean methods when LBR testing is required by the DEPARTMENT.

### **35.13 Laboratory Data**

Tabulate laboratory test results for inclusion in the geotechnical report, the report of tests sheet (Roadway Soil Survey Sheet), and for any necessary calculations and analyses.

### **35.14 Seasonal High Water Table**

Review the encountered ground water levels and estimate seasonal high ground water levels. Estimate seasonal low ground water levels, if requested.

### **35.15 Parameters for Water Retention Areas**

Calculate parameters for water retention areas, exfiltration trenches, and/or swales.

### **35.16 Delineate Limits of Unsuitable Material**

Delineate limits of unsuitable material(s) in both horizontal and vertical directions. Assist the Engineer of Record with detailing these limits on the cross-sections. If requested, prepare a plan view of the limits of unsuitable material.

### **35.17 Electronic Files for Cross-Sections**

Create electronic files of boring data for cross-sections.

### **35.18 Embankment Settlement and Stability**

Estimate the total magnitude and time rate of embankment settlements. Calculate the factor of safety against slope stability failure.

### **35.19 Monitor Existing Structures**

Provide Roadway EOR guidance on the radius to review existing structures for monitoring.

Optional services (may be negotiated at a later date if needed): Identify existing structures in need of settlement, vibration and/or groundwater monitoring by the contractor during construction and coordinate with the EOR and structural engineer (when applicable) to develop mitigation strategies. When there is risk of damage to the structure or facility, provide recommendations in the geotechnical report addressing project specific needs and coordinate those locations with the EOR. See FDM Chapter 307 and Chapter 9 of the Soils and Foundations Handbook.

### **35.20 Stormwater Volume Recovery and/or Background Seepage Analysis**

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

### **35.21 Geotechnical Recommendations**

Provide geotechnical recommendations regarding the proposed roadway construction project including the following: description of the site/alignment, design recommendations and discussion of any special considerations (e.g. removal of unsuitable material, consolidation of weak soils, estimated settlement time/amount, groundwater control, high groundwater conditions relative to pavement base, etc.) Evaluate and recommend types of geosynthetics and properties for various applications, as required.

### **35.22 Pavement Condition Survey and Pavement Evaluation Report**

If a pavement evaluation is performed, submit the report in accordance with Section 3.2 of the Materials Manual: Flexible Pavement Coring and Evaluation. Enter all core information into the Pavement Coring and Reporting (PCR) system.

### **35.23 Preliminary Roadway Report**

If a preliminary roadway investigation is performed, submit a preliminary roadway report before the Phase I plans submittal. The purpose of the preliminary roadway report will be to assist in setting road grades and locating potential problems.

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

### **35.24 Final Report**

The Final Roadway Report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

### **35.25 Auger Boring Drafting**

Draft auger borings as directed by the DEPARTMENT.

### **35.26 SPT Boring Drafting**

Draft SPT borings as directed by the DEPARTMENT.

Structures

The CONSULTANT shall be responsible for coordination of all geotechnical related fieldwork activities. The CONSULTANT shall retain all samples until acceptance of Phase IV plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

CONSULTANT shall perform specialized field-testing as required by needs of project and as directed in writing by the District Geotechnical Engineer.

All laboratory testing and classification will be performed in accordance with applicable DEPARTMENT standards, ASTM Standards or AASHTO Standards, unless otherwise specified in the Contract Documents.

The staff hour tasks for high embankment fills and structural foundations for bridges, box culverts, walls, high-mast lighting, overhead signs, mast arm signals, strain poles, buildings, and other structures include the following:

#### **35.27 Develop Detailed Boring Location Plan**

Develop a detailed boring location plan. Meet with DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program expects to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

#### **35.28 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

#### **35.29 Coordinate and Develop TTCP for Field Investigation**

Coordinate and develop TTCP plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Standard Plans Index 102 series.

#### **35.30 Drilling Access Permits**

Obtain all State, County, City, and Water Management District permits for performing geotechnical borings, as needed.

#### **35.31 Property Clearances**

Notify property tenants in person of drilling and field activities, if applicable. Written notification to property owners/tenants is the responsibility of the DEPARTMENT's Project Manager.

#### **35.32 Collection of Corrosion Samples**

Collect corrosion samples for determination of environmental classifications.

#### **35.33 Coordination of Field Work**

Coordinate all field work required to provide geotechnical data for the project.

### **35.34 Soil and Rock Classification - Structures**

Soil profiles recorded in the field should be refined based on the results of laboratory testing.

### **35.35 Tabulation of Laboratory Data**

Laboratory test results should be tabulated for inclusion in the geotechnical report and for the necessary calculations and analyses.

### **35.36 Estimate Design Groundwater Level for Structures**

Review encountered groundwater levels, estimate seasonal high groundwater levels, and evaluate groundwater levels for structure design.

### **35.37 Selection of Foundation Alternatives (BDR)**

Evaluation and selection of foundation alternative, including the following:

- GRS-IBS
- Spread footings
- Prestressed concrete piling - various sizes
- Steel H- piles
- Steel pipe piles
- Drilled shafts
- Foundation analyses shall be performed using approved DEPARTMENT methods. Assist in selection of the most economical, feasible foundation alternative.

### **35.38 Detailed Analysis of Selected Foundation Alternate(s)**

Detailed analysis and basis for the selected foundation alternative. Foundation analyses shall be performed using approved DEPARTMENT methods and shall include:

- GRS-IBS (including the parameters identified in the Instructions for Developmental Design Standard D6025 to be provided by the Geotechnical Engineer)
- Spread footings (including soil bearing capacity, minimum footing width, and minimum embedment depth).
- For pile and drilled shaft foundations, provide graphs of ultimate axial soil resistance versus tip elevations. Calculate scour resistance and/or downdrag (negative skin friction), if applicable.
- CONSULTANT shall assist the Engineer of Record in preparing the Pile Data Table (including test pile lengths, scour resistance, downdrag, minimum tip elevation, etc.)
- Provide the design soil profile(s), which include the soil model/type of each layer and all soil-engineering properties required for the Engineer of Record to run the FBPIer computer program. Review lateral analysis of selected foundation for geotechnical compatibility.

- Estimated maximum driving resistance anticipated for pile foundations.
- Provide settlement analysis.

### **35.39 Bridge Construction and Testing Recommendations**

Provide construction and testing recommendations including potential constructability problems.

### **35.40 Lateral Load Analysis (Optional)**

Perform lateral load analyses as directed by the DEPARTMENT.

### **35.41 Walls**

Provide the design soil profile(s), which include the soil model/type of each layer and all soil engineering properties required by the Engineer of Record for conventional wall analyses and recommendations. Review wall design for geotechnical compatibility and constructability.

Evaluate the external stability of conventional retaining walls and retained earth wall systems. For retained earth wall systems, calculate and provide minimum soil reinforcement lengths versus wall heights, and soil parameters assumed in analysis. Estimate differential and total (long term and short term) settlements.

Provide wall construction recommendations.

### **35.42 Sheet Pile Wall Analysis (Optional)**

Analyze sheet pile walls as directed by the DEPARTMENT.

### **35.43 Design Soil Parameters for Signs, Signals, High Mast Lights, and Strain Poles and Geotechnical Recommendations**

- Provide the design soil profile(s) that include the soil model/type of each layer and all soil properties required by the Engineer of Record for foundation design. Review design for geotechnical compatibility and constructability.

### **35.44 Box Culvert Analysis**

- Provide the design soil profile(s) that include the soil model/type of each layer and all soil properties required by the Engineer of Record for foundation design. Review design for geotechnical compatibility and constructability.
- Provide lateral earth pressure coefficients.
- Provide box culvert construction and design recommendations.
- Estimate differential and total (long term and short term) settlements.
- Evaluate wingwall stability.

### **35.45 Preliminary Report - BDR**

The preliminary structures report shall contain the following discussions as appropriate for the assigned project:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis).
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

### **35.46 Final Report - Bridge and Associated Walls**

The final structures report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

### **35.47 Final Reports - Signs, Signals, Box Culvert, Walls, and High Mast Lights**

The final reports shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis).
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

Final reports will incorporate comments from the DEPARTMENT and contain any additional field or laboratory test results, recommended foundation alternatives along with design parameters and special provisions for the contract plans. These reports will be submitted to the District Geotechnical Engineer for review prior to project completion. After review by the District Geotechnical Engineer, the reports will be submitted to the District Geotechnical Engineer in final form and will include the following:

- All original plan sheets (11" x 17")
- One set of all plan and specification documents, in electronic format, according to DEPARTMENT requirements
- Two sets of record prints
- Six sets of any special provisions
- All reference and support documentation used in preparation of contract plans package

Additional final reports (up to four), aside from stated above, may be needed and requested for the DEPARTMENT's Project Manager and other disciplines.

The final reports, special provisions, as well as record prints, will be signed and sealed by a Professional Engineer licensed in the State of Florida.

Draft the detailed boring/sounding standard sheet, including environmental classification, results of laboratory testing, and specialized construction requirements, for inclusion in final plans.

### **35.48 SPT Boring Drafting**

Prepare a complete set of drawings to include all SPT borings, auger borings and other pertinent soils information in the plans. Include these drawings in the Final Geotechnical Report. Draft borings, location map, S.C.S. map and U.S.D.A. map as directed by the DEPARTMENT. Soil symbols must be consistent with those presented in the latest Florida Department of Transportation Soils and Foundations Handbook.

### **35.49 Other Geotechnical**

Other geotechnical effort specifically required for the project as determined by the Department, and included in the geotechnical upset limit.

### **35.50 Technical Special Provisions and Modified Special Provisions**

#### **35.51 Field Reviews**

Identify and note surface soil and rock conditions, surface water conditions and locations, and preliminary utility conflicts. Observe and note nearby structures and foundation types.

#### **35.52 Technical Meetings**

#### **35.53 Quality Assurance/Quality Control**

#### **35.54 Supervision**

#### **35.55 Coordination**

## **36 3D MODELING**

The CONSULTANT shall analyze and document Roadway Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

The CONSULTANT shall deliver all master design files, 3D surface design models, and all supporting digital files for the development of plans as required in the FDOT CADD Manual.

The CONSULTANT shall prepare a 3D model using the latest FDOT software in accordance with the FDOT CADD Manual. Includes all efforts required for developing files for 3D deliverables supporting automated machine guidance for design models. This includes importing survey data and creation of existing 3D surface features and models, and developing proposed corridor models with necessary detail of features to depict the proposed project in 3D to comply with the FDOT CADD Manual.

The CONSULTANT shall add detail to the corridor and design model for 3D design. Includes many elements that contribute to this including but not limited to slope transitions, typical section transitions, changes in pavement depth, berms, swales/ditches, and other feature transitions. Extra corridor structure leads to extra assemblies, extra targeting, etc.

The CONSULTANT shall create an accurate roadway design model which includes modeling the intersections.

The CONSULTANT shall submit .dgn files associated with the 3D Model and their respective components.

### **36.1 Phase I 3D Design Model**

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase I 3D interactive model, comprised of, but not limited to: Existing features (pavement, shoulders, sidewalk, curb/gutter, utilities-if required per scope, drainage - if required per scope) and proposed corridor(s).

### **36.2 Phase II 3D Design Model**

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase II 3D model, comprised of, but not limited to: Modification of the Phase I model to update the model to comply with changes based on the Phase I review comments and to include the addition of ponds, floodplain compensation sites, retaining walls, barrier walls, guardrail terminals, cross overs, gore areas, side street connections, roundabouts, and driveways.

[List optional services to be included, e.g. Curb Ramps, Closed Drainage Network, Bridge Modeling, Bridge Abutment, Overhead sign post/structures with foundation, Toll gantry and overhead DMS structures with foundation, proposed utilities (pressure pipe/gravity), etc.].

### **36.3 Phase III 3D Design Model**

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase III 3D model and deliverables files for review, comprised of, but not limited to: Modification of the Phase II model to update the model to comply with changes based on the Phase II review comments and to further refine areas of transition between templates, detailed grading areas, bridge approaches and end bents, median noses, shoulder transition areas, retaining walls, barrier walls and guardrail.

### **36.4 Final 3D Model Design**

The CONSULTANT shall prepare for approval by DEPARTMENT, the Phase IV 3D model, comprised of, but not limited to: Modification of the Phase III model to update the model to comply with changes based on the phase III review comments and to accurately generate, export and otherwise prepare the final 3D deliverable files as described in the FDOT CADD Manual.

### **36.5 Cross Section Design Files**

The CONSULTANT shall establish and develop cross section design files in accordance with the FDOT CADD manual and FDOT Design Manual. Includes all work required to establish and utilize intelligent/automated methods for creating cross sections including determining the locations for which all cross sections will be shown, existing and proposed features, cross section refinement, placement of utilities and drainage, soil boxes, R/W lines, earthwork calculations, and other required labeling.

### **36.6 Template and Assembly Development (Optional)**

The CONSULTANT shall prepare for approval by DEPARTMENT, project specific templates/assemblies needed to develop the features required to deliver the 3D model.

### **36.7 Quality Assurance/Quality Control**

### **36.8 Supervision**

### **36.9 Coordination**

## **37 PROJECT REQUIREMENTS**

### **37.1 Liaison Office**

The DEPARTMENT and the CONSULTANT will designate a Liaison Office and a Project Manager who shall be the representative of their respective organizations for the Project. While it is expected the CONSULTANT shall seek and receive advice from various state, regional, and local agencies, the final direction on all matters of this project remain with the DEPARTMENT Project Manager.

### **37.2 Key Personnel**

The CONSULTANT's work shall be performed and directed by the key personnel identified in the proposal presentations by the CONSULTANT. Any changes in the indicated personnel shall be subject to review and approval by DEPARTMENT.

### **37.3 Progress Reporting**

The CONSULTANT shall meet with the DEPARTMENT as required and shall provide a written monthly progress report with approved schedule, schedule status, and payout curve or by using the earned value method that describe the work performed on each task. The report will include assessing project risk through monthly documentation of identifying and updating the risk category and approach for monitoring those tasks. Invoices shall be submitted after the DEPARTMENT approves the monthly progress report and the payout curve or with earned value analysis. The Project Manager will make judgment on whether work of sufficient quality and quantity has been accomplished by comparing the reported percent complete against actual work accomplished.

### **37.4 Correspondence**

Copies of all written correspondence between the CONSULTANT and any party pertaining specifically to this contract shall be provided to the DEPARTMENT for their records within one (1) week of the receipt or mailing of said correspondence.

### **37.5 Professional Endorsement**

The CONSULTANT shall have a Licensed Professional Engineer in the State of Florida sign and seal all reports, documents, Technical Special Provisions and Modified Special Provisions, and plans as required by DEPARTMENT standards.

### **37.6 Computer Automation**

The project will be developed utilizing Computer Aided Drafting and Design (CADD) systems. The DEPARTMENT makes available software to help assure quality and conformance with policy and procedures regarding CADD. It is the responsibility of the CONSULTANT to meet the requirements in the FDOT CADD Manual. The CONSULTANT shall submit final documents and files as described therein.

### **37.7 Coordination with Other Consultants**

The CONSULTANT is to coordinate his work with any and all adjacent and integral consultants so as to effect complete and homogenous plans and specifications for the project(s) described herein.

### **37.8 Optional Services**

At the DEPARTMENT's option, the CONSULTANT may be requested to provide optional services. The fee for these services shall be negotiated in accordance with the terms detailed in Exhibit B, Method of Compensation, for a fair, competitive and reasonable cost, considering the scope and complexity of the project(s). Additional services may be authorized by Letter of Authorization or supplemental amendment in accordance with paragraph 2.00 of the Standard Consultant Agreement. The additional services may include Construction Assistance, Review of Shop Drawings, Final Bridge Load Rating, update (Category II) bridge plans electronically (CADD) for the Final "As-Built" conditions, based on documents provided by the DEPARTMENT (CADD Services Only) or other Services as required.

## **38 INVOICING LIMITS**

Payment for the work accomplished shall be in accordance with Method of Compensation of this contract. Invoices shall be submitted to the DEPARTMENT, in a format prescribed by the DEPARTMENT. The DEPARTMENT Project Manager and the CONSULTANT shall monitor the cumulative invoiced billings to ensure the reasonableness of the billings compared to the project schedule and the work accomplished and accepted by the DEPARTMENT.

The CONSULTANT shall provide a list of key events and the associated total percentage of work considered to be complete at each event. This list shall be used to control invoicing. Payments will not be made that exceed the percentage of work for any event until those events have actually occurred and the results are acceptable to the DEPARTMENT.



**FINAL**  
**Candidate Project Technical Scope**

**447118-1, SR 5 Bridge Replacement over Pellicer Creek**  
**From 1,100-ft south to 617-ft north of Flagler/St Johns county line**

Section 73010-000, MP 23.465 to MP 23.673

Section 78010-000, MP 0.000 to MP 0.117

Flagler and St Johns Counties

Prepared for:

**THE FLORIDA DEPARTMENT OF TRANSPORTATION**  
**PROGRAM MANAGEMENT**

719 South Woodland Boulevard

DeLand, Florida 32720



General Engineering Consultant (GEC) Services

Financial Project ID: 436094-1-32-01

Contract No.: C-9L04

HNTB No.: 54854-PL-172

Prepared by:

**HNTB Corporation**

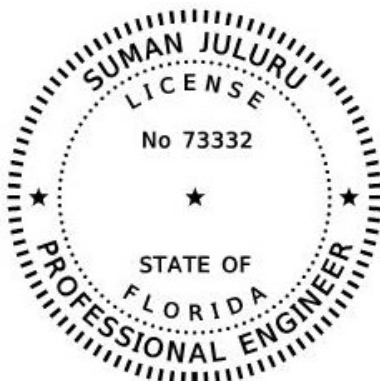
610 Crescent Executive Court, Suite 400

Lake Mary, Florida 32746

407-805-0355

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This item has been digitally signed and sealed by Suman Juluru, P.E on the date adjacent to the seal.

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

**Candidate Bridge Replacement Project Technical Scope**

July 7, 2020

To: Amir Asgarinik  
 From: Suman Juluru

**RE: SR 5 Bridge Replacement over Pellicer Creek**

State Road Number: 5  
 Section Number: 73010-000, 78010-000  
 County: Flagler and St Johns  
 Project Limits: From 1,100-ft south to 617-ft north of Flagler/St Johns county line  
 Begin MP/End MP: 23.465 to 23.673 (Flagler) & 0.000 to 0.117 (Length 0.325 MI)  
 FM: 447118-1

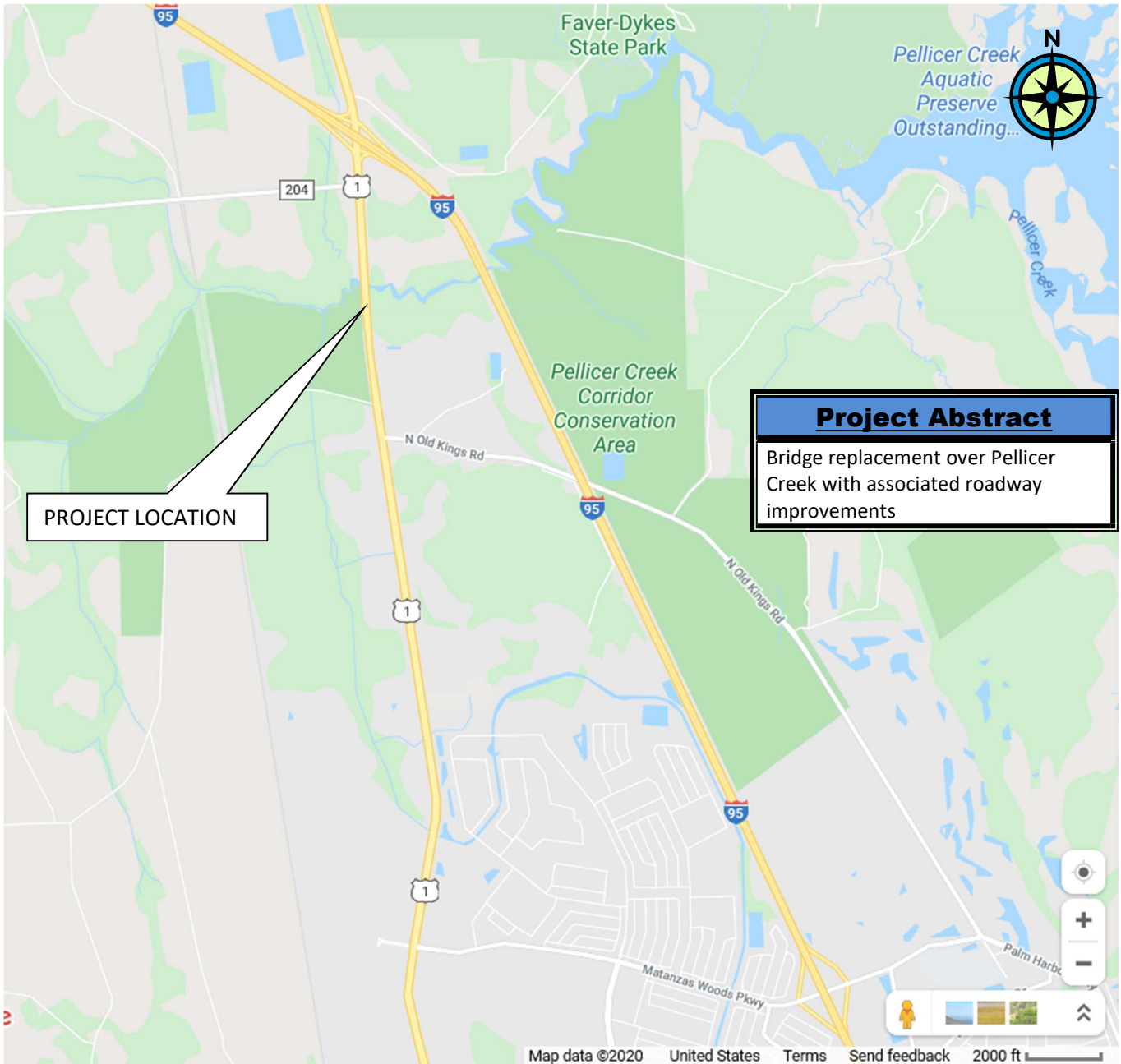
**Note: Begin design in the first quarter of its funded year (projected FY22).**

1. Existing R/W Map Project Numbers:	7301-105 (1953); Flagler, 127-ft LT and 98-ft RT of Median Centerline 7301-49A (1941); Flagler, 100-ft LT & 100-ft RT 7801-(112)275 (195); St Johns, 69-ft RT of Median Centerline, LT Unknown
2. Old Construction Project Numbers:	<u>Flagler County (73010-000):</u> 428603-1 (2013); MP 0.000 to MP 23.673, SAPM & Med Shldr 413571-1 (2006); MP 10.870 to MP 23.673, Mill & Resurface 416163-1 (2005); SB Bridge Pile Jackets 73010-3517 (1984); NB Bridge Pile Jackets 73010-3510 (1977); MP 23.631 to MP 23.673, Bridge Repair 7301-801 (1956); MP 12.191 to MP 23.673, Resurfacing 7301-275 (1955); MP 12.191 to MP 23.673, Widening, includes NB Bridge Construction 7301-103 (1948); SB Bridge Widening <u>St Johns County (78010-000):</u> 437617-1 (2020); MP 0.000 to 7.330, Mill & Resurface 7801-275 (1956); MP 0.000 to MP 14.891, Widening
3. Additional R/W Required?	Yes, a TIITF easement will be required.
4. Level of Community Awareness Plan:	Level 4, Bridge replacement
5. Agreements Required?	No.
6. Are there any bridges within the limits?	730008 SR 5 SB over Pellicer Creek 730045 SR 5 NB over Pellicer Creek
7. Are there any RR crossings within the project limits or in the vicinity?	No.
8. Are there any Airports within 10 nautical miles?	Yes.
9. Storm Water Management Jurisdiction:	SJRWMD
10. Is the Project within CCCL ( <i>Coastal Construction Control Line</i> )?	No.
11. Is the project near a significant archaeological site?	Emo has reviewed this project and no concerns were noted.
12. Existing Utilities: 6 (per SS1C, as-builts and field markers)	AT&T Florida CenturyLink Florida Power & Light- Flagler Florida Power & Light- St Johns TECO Peoples Gas Uniti Fiber
13. Any Special MOT concerns?	A diversion is required.
14. Any Construction Concerns?	Bridge construction (permanent and temporary) over wetlands. Coordination with FDOT District 2 for improvements in St Johns County.

**Candidate Bridge Replacement Project Technical Scope**

15. Posted/Design Speed Limits:	<u>Milepost Range</u>	<u>Design Speed</u>	<u>Posted Speed</u>
	MP 23.465 to MP 23.673	65 mph	65 mph
	MP 0.000 to MP 0.117	65 mph	55 mph
16. Design Criteria and Highway System:	SHS, FDM (2020), New Construction, context classification		
	<u>Milepost Range</u>	<u>Context Classification</u>	
	MP 23.465 to MP 23.673	C2 - Rural	
	MP 0.000 to MP 0.117	C2 - Rural	
17. Lump Sum or Pay Item?	Pay Item.		
18. Proposed Design Schedule:	48 months due to Sovereign Submerged Lands (TIITF Easement) and procurement and permitting.		

**Project Location Map:**



The Engineer is responsible for verifying all items in the proposed scope and shall review the project for conformance with all applicable criteria and standards. This Technical Scope has been presented to FDOT Department Heads and received final concurrence through the Technical Review Meeting process. The project scope, schedule, and budget have been established based on this Technical Scope and approved to enter the work program.

## Candidate Bridge Replacement Project Technical Scope

### Intent and Nature of Project:

The purpose of the project is to replace both SR 5/US 1 bridges over Pellicer Creek at the Flagler/St Johns County line. The Florida Department of Transportation has noted that the existing bridge is structurally deficient. The NB bridge has a sufficiency rating of 45.6 and SB bridge has a sufficiency rating of 59.8 based on the latest inspection report dated September 2019. This rating was primarily due to major elements, deck, superstructure and substructure NBI rating of Fair to Satisfactory, because of ongoing deterioration of the deck. The deck geometry appraisal rendered the bridges basically intolerable requiring high priority of corrective action due to the deficient paved shoulders. Complete replacement is recommended.

### Project Description:

- Project is at the border of Flagler and St. Johns County, crossing Pellicer Creek.
- SR 5 is classified as a rural principal arterial with access classification 03 and is a designated evacuation route per the Florida Division of Emergency Management.
- The following projects have been identified within the vicinity of this resurfacing project:
  - 445216-2: Candidate resurfacing project on SR 5 from Palm Coast Parkway to the St Johns County Line. This project does not have a letting date but is intended to be a goes-with as lead to this bridge replacement project in FY 26. The FDOT PM is Amir Asgarnik.
  - 437617-1: District 2 resurfacing project on SR 5 from the Flagler County line to south of SR 206 (MP 0.000 to MP 7.380). Currently under construction with scheduled completion date of July 2020. The FDOT PM is Jeff Daugharty.

### Typical Sections:

- The project includes 3 typical sections.
  - 1) MP 23.465 to MP 23.631: Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 8-ft inside shoulders (4-ft paved), and a 30-ft depressed grassed median. This typical will be modified to provide 10-ft outside shoulders (5-ft paved).
  - 2) Bridge MP 23.631 to 23.673: Four 12-ft travel lanes (two per direction), 2-ft shoulders (inside and outside) with traffic railing. Proposed Typical section includes four 12-ft travel lanes (two per direction), 6-ft inside shoulders and 10-ft outside shoulder with traffic railing.
  - 3) MP 0.000 to MP 0.117 (78010-000): Four 12-ft travel lanes (two per direction), 8-ft outside shoulders (4-ft paved), 6-ft inside shoulders (2-ft paved), and a 30-ft depressed grassed median. This typical will be modified to provide 10-ft outside shoulders (5-ft paved) and 8-ft inside shoulders (4-ft paved).

- Based on 2019 Traffic Data:

MP	TMS Site No.	AADT	T%
20.695 (73010-000) *	730102	12,000	8.1
0.300 (78000-000) *	780021	13,000	3.4

\* Not within the project limits, data provided for traffic characteristics only.

### Roadway Scope Items:

- Roadway work is limited to that necessary to replace the bridge, including:
  - Raise the roadway profile approximately 2-ft 10-in to maintain vertical clearances over the channel.
  - Reconstruction of bridge approaches are required to match the proposed bridge profile, from 850-ft feet south of the bridge to 625-ft north.
  - Construct treatments for the bridge barriers per Standard Plans Index 536-001.
  - MP 0.104 LT: Reconstruct concrete turnout apron to provide a smooth transition.
- Coordinate all design submittals (Typical section, pavement design, drainage, etc.) with FDOT District 2.
- Coordinate with FDOT District 2 to confirm if the full depth reconstruction will require the same Stress Absorbing Membrane (SAM) pavement design that was implemented as part of 437167-1 in St Johns County. The full depth reconstruction may eliminate the cause of need for the specialized pavement design.
- Prepare 2 pavement designs for roadway reconstruction after bridge construction: 1) full depth reconstruction of the travel lanes and 2) full depth paved shoulder reconstruction. Resurfacing to restore striping affected by TCP diversions is to match friction course section of 445216-2 and 437167-1.
- The District Materials Office noted consideration be given to including asphaltic base course (type B-12.5) on the roadway approaches. Coordinate structure and layer requirements prior to developing the pavement design. The LRE has been adjusted to include the additional cost if this option is selected.

## Candidate Bridge Replacement Project Technical Scope

### Temporary Traffic Control

- Complete Public Involvement to develop and include in the plans, specific notification and scheduling requirement for implementing traffic shifts.
  - There are two access points on the north side of the bridge that will temporarily be restricted from making movements at the existing full median opening at MP 0.080. The nearest u-turn location is 3,725-ft to the south. The SB access point is for Pellicer Creek Campground, ensure trailers are accommodated.
- See Construction Sequence Typical and Plan Concepts for additional details on assumed methods.
- The bridge construction will be phased to allow two lane, two-way traffic to remain open at all times during construction, with limited exceptions, under continuous temporary traffic control.
  - The diversion to one of the existing bridges creates an undivided condition per Standard Plan 102-620. A speed reduction to 45 mph is proposed and a temporary lane separator is required. The typical section across the bridge will include the 1-ft temporary lane separator, one 12-ft lane width in each direction, with 1.5-ft to be allocated to outside and median shoulders.
  - The proposed work zone speed of 45 mph is a 20 mph reduction for the NB direction and will require approval of the District Traffic Operations Engineer and the District Director of Transportation Operations.
- Bridge closure is required on either bridge for construction and traffic from both directions will be shifted to the other bridge. Recommend closing and replacing NB bridge first due to settlement joint on both approaches.

### **Structural Scope Items:**

#### Existing Bridges

- The existing southbound bridge (730008) was constructed in 1927 and reconstructed/widened in 1948. The superstructure consists of concrete tee beams with a 10-in deck. The substructure consists of fiberglass jacketed square prestressed concrete piling, concrete jacketed steel H piling, bent caps and rip rap revetment slope protection.
- Bridge 730008 has seven spans at approximately 31-ft each with a 28-ft curb to curb width and an overall bridge width of about 33.17-ft and contains no sidewalks. There appears to be no overhead electric or existing utilities on either side of the existing bridge. Substructure is not adequate for re-use as evident by the existing pile jackets. Recommend that existing substructure elements not be evaluated for re-use.
- The existing northbound bridge (730045) was constructed in 1956. The superstructure consists of a 12-in concrete slab with an 8-in deck. The substructure consists of fiberglass jacketed square prestressed concrete piling, bent caps, and rip rap revetment slope protection.
- Bridge 730045 has eleven spans at approximately 20-ft each with a 28-ft curb to curb width and an overall bridge width of about 34.08-ft and contains no sidewalks. There is one 6-in fiberglass conduit connected to the east side deck overhang of the bridge and one abandoned pipe attached to the west side bridge barrier. There is overhead electric on the east side of the existing bridge. Substructure is not adequate for re-use as evident by the existing pile jackets. Recommend that existing substructure elements not be evaluated for re-use.

#### Proposed Replacement Bridges

- Replace both existing bridges with two new concrete structures within the existing 225-ft Right of Way. Complete a Bridge Development Report to define specific parameters. Assumptions for estimated scope and cost are described below.
- The proposed bridge typical section for the northbound and southbound directions includes a 6-ft inside shoulder, two 12-ft travel lanes, a 10-ft outside shoulder, and a single slope barrier on both sides totaling 40-ft curb to curb width and an overall bridge width of 42.67-ft.
- Both bridges will each contain three 80-ft spans for a total bridge length of 240-ft. The typical section includes 5 FIB-36 beams with a maximum spacing of 9-ft. The minimum bottom beam elevation must be consistent with or above the low member elevation for existing bridges. The proposed bridges will have a super structure depth of at least 4-ft. The superstructure will be supported by pile bents using 18" or 24" prestressed square concrete piles.
- Prepare final design calculations, plans, permitting and cost estimate for the replacement bridges. Provide Bridge Hydraulic Report and LRFD Bridge Load Rating calculations.
- The bridges require evaluation by a Coastal Engineer to determine wave forces, in accordance with FDOT Drainage Manual, Section 4.9.5:
  - The exact bridge elevation and profile are unknown, however old construction documents indicate that bridge elevation 10.25±, NAVD88. A vertical rise is apparent approaching the bridge. A proposed elevation of 13.13-ft is assumed, with the bottom of beams at 8.5-ft.

## Candidate Bridge Replacement Project Technical Scope

- Tidal Datums were reviewed at control tide station 8720218, located at Bar pilots dock, and Mean High Water calculated at elevation 1.159 based on benchmark 0692 D 1998.
- The 100 year base flood elevation has been established per FEMA Map Number 12035C0018E, June 2018. The bridge falls within Zone AE, with elevation 6 to the east/west.
- Given the 100-year flood elevation does not encroaches on the bridge, it is assumed the design wave crest elevation would not as well.
- Per section 110-6.2.1 of the Standard Specifications for Road and Bridge Construction, removal of existing bridge piles will be done as to not obstruct any new structures or any waterways. It is recommended to remove or to cut piles to 2-ft below the existing ground line beneath the water, as to not further obstruct the waterway. Pile jackets are present on both existing bridges.
- It is anticipated that all bridge work can be completed within the closed portion of SR 5 along the Pellicer Creek crossing. There is limited room for crane equipment and staging for larger materials. Barge and/or trestle work should be anticipated if adequate staging cannot be determined during design. Water depths vary and the limited draft should be considered in determining bridge materials and construction sequencing. At least one lane access must be maintained along this route.
- Precast elements should be investigated to expedite construction as well as accelerated bridge construction techniques.
- Bridge mounted utilities are not expected.

### Proposed Embankment Slope

- The existing bridges have rip rap at the abutment ends. 1:2 embankment slope is expected at end bents for both bridges. The hydraulic analysis will determine if the rip rap is needed. Assumed as required for LRE purposes.

### **Drainage Scope Items:**

- Create a working drainage map (pre and post condition) to be used in defining the bridge hydrology and approach roadway drainage.
- Design the storm drains for the approach roadway. Delineate contributing drainage areas, determine runoff, inlet locations, and spread. Calculate hydraulic losses and determine potential utility conflicts. Determine design tailwater and, if necessary, outlet scour protection.
- Modify the existing drainage system as required to complete proposed roadway reconstruction work as shown on the Concept.
  - Regrade existing roadside ditch to accommodate the proposed roadway profile.
  - Adjust 2 ditch bottom inlets in the median.
  - MP 0.065 RT: Remove 2 existing MES, construct new inlet and extend existing pipes.
  - MP 0.009 RT: Replace existing MES with inlet.
  - MP 0.104 LT: Reconstruct side drain and MES under the driveway
- Complete a bridge hydraulic analysis, compiling the finding in a Bridge Hydraulic Report and on a Bridge Hydraulic Recommendation Sheet. Calculate hydrology, hydraulics, deck drainage, scour, and appropriate counter measures.
- Prepare erosion control plans: Evaluate the need to install additional bank and shore material to stabilize shoreline and mitigate erosion. For LRE purposes, bank and shore has been included. Coordinate with revegetation plan per the SJRWMD General Permit. Re-grade the unpaved shoulder and sod to eliminate eroded areas along both sides of the road for both bridge approaches. Provide acceptable slopes to meet criteria at the time of design.

### **Utility Scope Items:**

- Utility coordination will be required to determine adjustments so there are no conflicts with the proposed construction.
  - A 6-in fiberglass conduit is hung from the east side of the NB bridge 730045. Per the bridge inspection report the utility is fiber optic.
  - A channel marker is present on the east side for fiber optic cable.
  - Buried telephone is noted on the east side.
  - A gas main is present on the east side.
  - Overhead electric is present on the east side, offset 34-ft from the edge of pavement and continuous across Pellicer Creek.
- Quality Level A "QL A" utility information is anticipated. Construction activities that involve underground work within proximity to noted utilities include existing bridge piling removal, new bridge piles, guardrail, roadway reconstruction, and removal of rip rap.

### **Multimodal Scope Items:**

#### Transit

**Candidate Bridge Replacement Project Technical Scope**

- There are no transit routes within the project limits.

Bicycles

- The existing 4-ft paved outside shoulders serve as the bicycle facility through the flush shoulder sections. This project proposes 5-ft paved outside shoulders for roadway segment and 10-ft outside shoulder on bridge. Due to the limits existing bridge clear width of 28-ft, the shoulders will be narrowed to 1-ft for the duration of the traffic shift onto one of the existing bridges.

Pedestrians

- This project includes gaps in the sidewalk connectivity, with the following missing segments identified by the District. Sidewalk is not included in this project.

Gap ID	Begin MP	End MP	Side	County Ranking	District Ranking	Filled
Flagler-006	21.940	23.673	Both	16	1023	No

**Environmental/Permitting Scope Items:**

- Coordinate with FDOT, submitting a permit determination letter to the Environmental Permits Office, Attention District Five Permits Coordinator, for review and concurrence during the design process, considering the below descriptions of work and conditions.
  - This project is anticipated to exceed one acre of soil disturbing activities and will require NPDES coverage under the FDEP Generic Permit for Stormwater Discharge from Large and Small Construction Activities.
  - The project can qualify for a SJRWMD General Permit as authorized under rule 62-330.443 F.A.C. and the project shall include the requirements to meet that qualification as guiding criteria.
    - Temporary wetland and surface water impacts are anticipated of 0.11 AC. Maintain the total impacted acreage, i.e. both temporary and permanent, at 0.5 acre or less. Temporary impacts are for removal \ cut off of existing piles and driving of new piles.
    - Approach roadway work is limited only to that necessary to construct and connect to the proposed bridge.
    - Mitigation will be required for temporary and permanent wetland impacts.
  - A Nationwide permit from USACE will be required.
  - A Bridge Permit from the U.S. Coast Guard is not anticipated.
  - The contractor will be required to follow the U.S. Fish and Wildlife Service-Approved In-Water Work Conditions for manatees, sea turtles and small-toothed sawfish. Reference to these conditions must be included in the plans.
  - Refer to “Existing Conditions Technical Memorandum” prepared by FDOT for summary of the existing conditions in the vicinity of the bridges over Pellicer Creek.
- In 1988, a resurfacing and shoulder paving project was permitted along U.S. 1 including the dual bridges over Pellicer Creek. Under Standard General Permit 39679-1 (originally Noticed General Permit #42-035-0111ANG), previously constructed swales provide treatment for U.S. 1 runoff (excluding the bridges) prior to discharging to Pellicer Creek. Since these swales were constructed prior to SJRWMD permitting requirements, stormwater calculations are not available; however, temporary, or permanent impacts to the swales due to the proposed bridge replacement may require replacement of the swales to maintain the existing treatment of U.S. 1.
- Portions of this project lie within the drainage basin for the Pellicer Creek Aquatic Preserve (Outstanding Florida Water).
- The following public lands were identified in proximity to the project limits. No Contractor staging, storing, disposing, etc. or other work activities are permitted on public lands per section 4(f) of the USDOT Act;
  - Pellicer Creek Aquatic Preserve
  - Pellicer Creek Conservation Area
- A Stormwater Pollution Prevention Plan (SWPPP) and an Erosion Control Plan will be required as part of the construction documents.
- Complete an environmental assessment:
  - Records indicate that rare species or suitable habitat may exist within or near the project limits. The following species were noted as documented potentially or likely occurring that may require additional environmental surveys; Wood Stork, Atlantic Sturgeon, Eastern Indigo Snake, Florida Sandhill Crane and Gopher Tortoise.
  - Wetlands were noted within the Right-of-Way and are impacted. The apparent wetland lines shown on the concept plans are from the Florida Geographic Data Library and are for informational purposes only.

## Candidate Bridge Replacement Project Technical Scope

### Traffic Design (Includes Signing, Signals, ITS) Scope Items:

- Signing and Pavement Marking shall be completed for the project limits. Inventory all signing within the project limits including evaluation for compliance with FDOT Specifications, FDM, Standard Plans, MUTCD, FHWA, etc. criteria. Any existing signs or pavement markings that conflict with the proposed signs or pavement markings, or non-compliant signs or pavement markings, shall be addressed in the plans.
- Any ITS items within the project limits shall be shown on plan sheets that are necessary for other work. Plan sheets are not necessary solely to show ITS elements. ITS Certification Memo will be required at Production. See District Design Memo 09-02.
  - ITS facilities were researched through map and field review and none identified at the time of scoping. The Engineer is to confirm if any ITS facilities exist during design.

### Lighting Scope Items:

- None.

### Landscaping:

- None.

### Survey Required:

- Obtain complete 3D/DTM Topographic survey of the project area. Include a width of 220-ft for 200-ft outside the project, as well as approximately 0.5 AC to each side of the bridge to determine channel bottom for water depths and support the bridge hydraulic analysis. Survey area of approximately 11.68 AC.
- Obtain supplemental field survey for obscured areas or underground features affected by the work within the limits of 3D or planimetric mapping.
  - Include existing drainage structures, pipes, and flow lines.
  - Include up to 10 Vvh locations for utilities identified in the Utility Scope Items.
  - Locate features delineated by the environmental assessment, such as wetland lines.
- Obtain survey as required to complete the requirements of the SSL application, see Permitting Scope Items.
- Include survey for vertical clearance documentation at the existing NB and SB bridges, pavement surface and low member elevations.

### Right-of-Way and Mapping Scope Items:

- Establish the existing Rights of Way by existing Maps or Record Subdivision Plats and the field monumentation, within the survey areas that overlap the Right of Way identified on the Concept only. Right of Way depicted on the Concept is an approximation based on record maps or plats best fit to the aerial, no survey has been performed.
- Perform the field and office survey work necessary for the preparation of a specific purpose survey and TIIFT sketch to complete the acquisition of Right-of-Way for:
  - Easement across the SSL will be required to accommodate construction. Refer to the Permitting Scope Items, the SSL application includes specific legal description requirements.

### Geotechnical Scope Items:

- Obtain SPT soil borings and complete geotechnical evaluation necessary to support the bridge design. Four soil borings are required, one at each bent location. Borings should extend a minimum of 15 feet below the existing pile tip elevation.
- Samples of streambed materials and each underlying stratum are needed for determination of the median particle diameter for scour analysis.
- Obtain roadway borings for soil materials classification, pavement design, and water table levels.

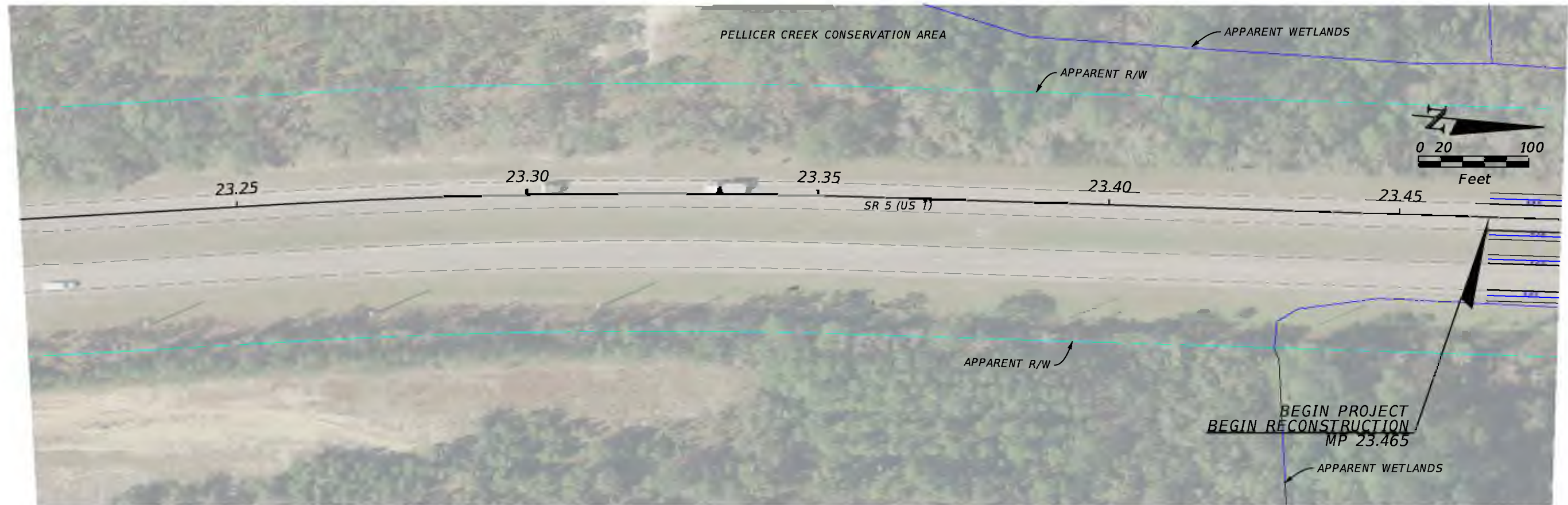
### Design Documentation:

- The design documentation items noted below are necessary to implement the proposed improvements. The Engineer is responsible for verifying all items in the proposed scope and design conformance with all applicable criteria and standards, including the identification of any required Exceptions and Variations.
- Design Variation Memorandum
  - *Median Width*- Per FDM Table 210.3.1, for flush shoulder roadways with design speed greater than 50-mph are to have a 40-ft median. The proposed roadway median width at the below locations do not meet the required width and will match the existing median width:
    - MP 23.465 to 23.631: 30-ft
    - MP 0.002 to 0.117: 30-ft

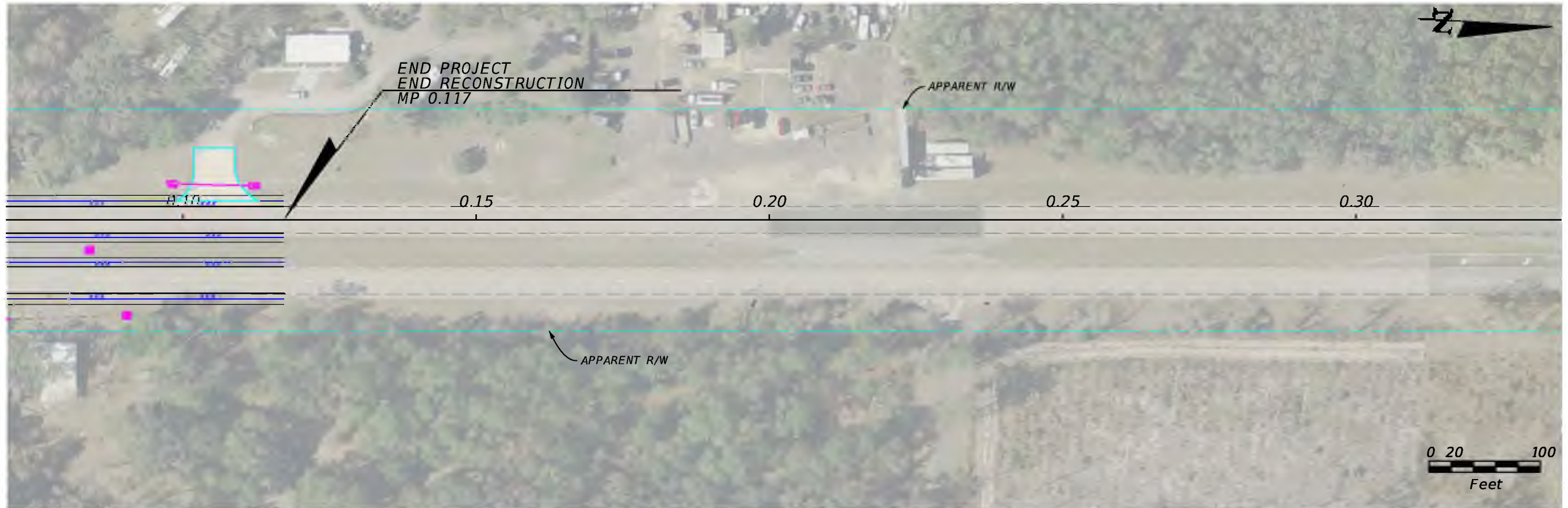
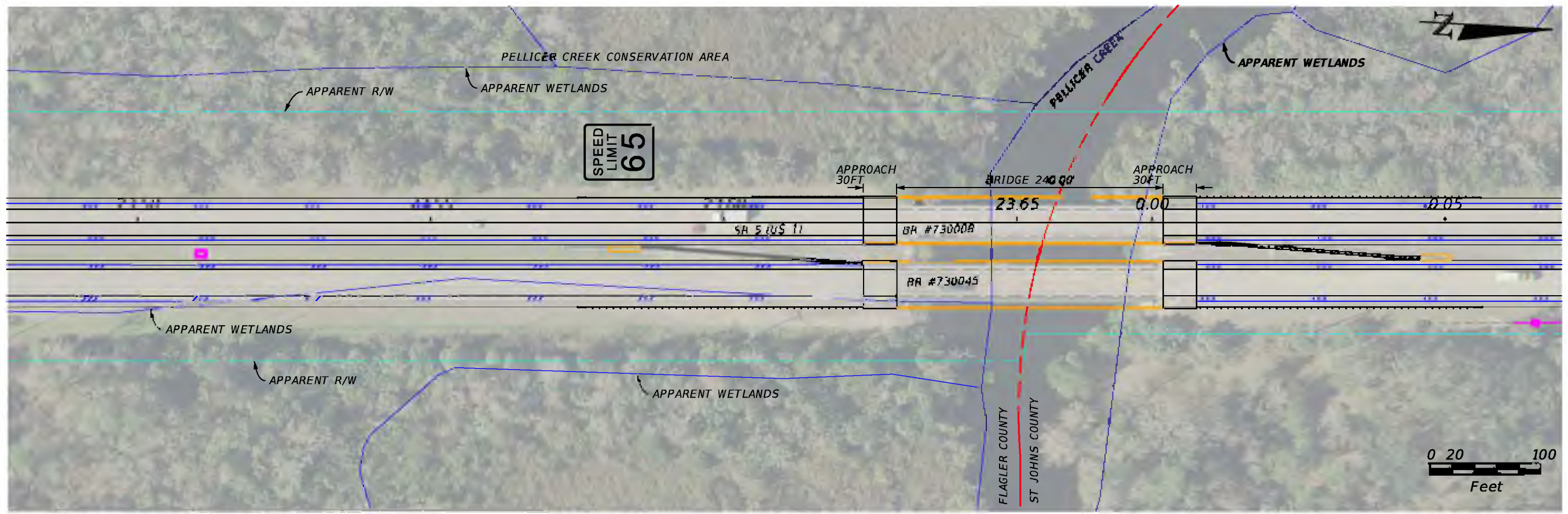
**Candidate Bridge Replacement Project Technical Scope**

**Candidate Project Development Considerations (items not to be included in final design):**

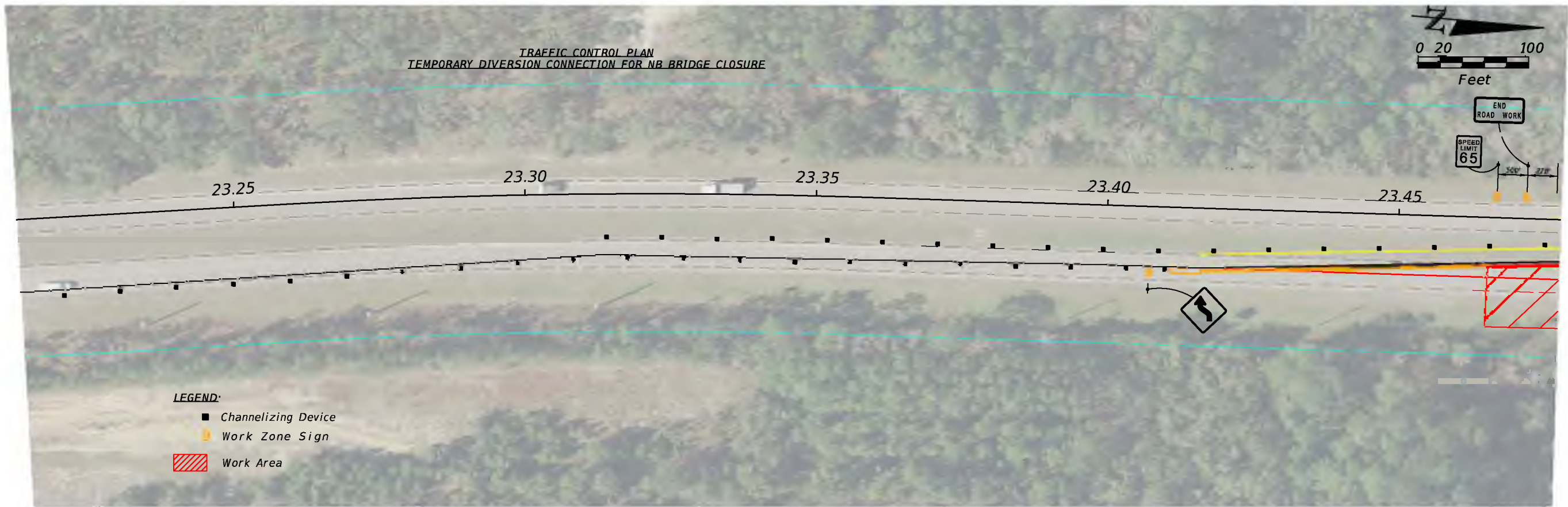
- None.



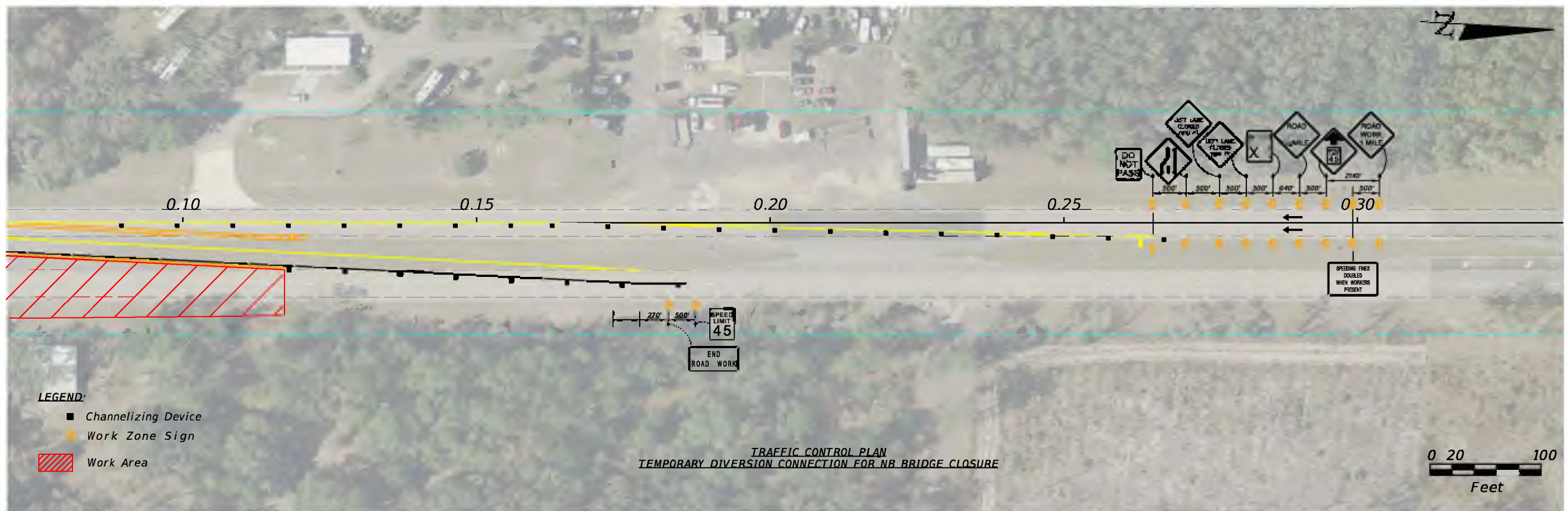
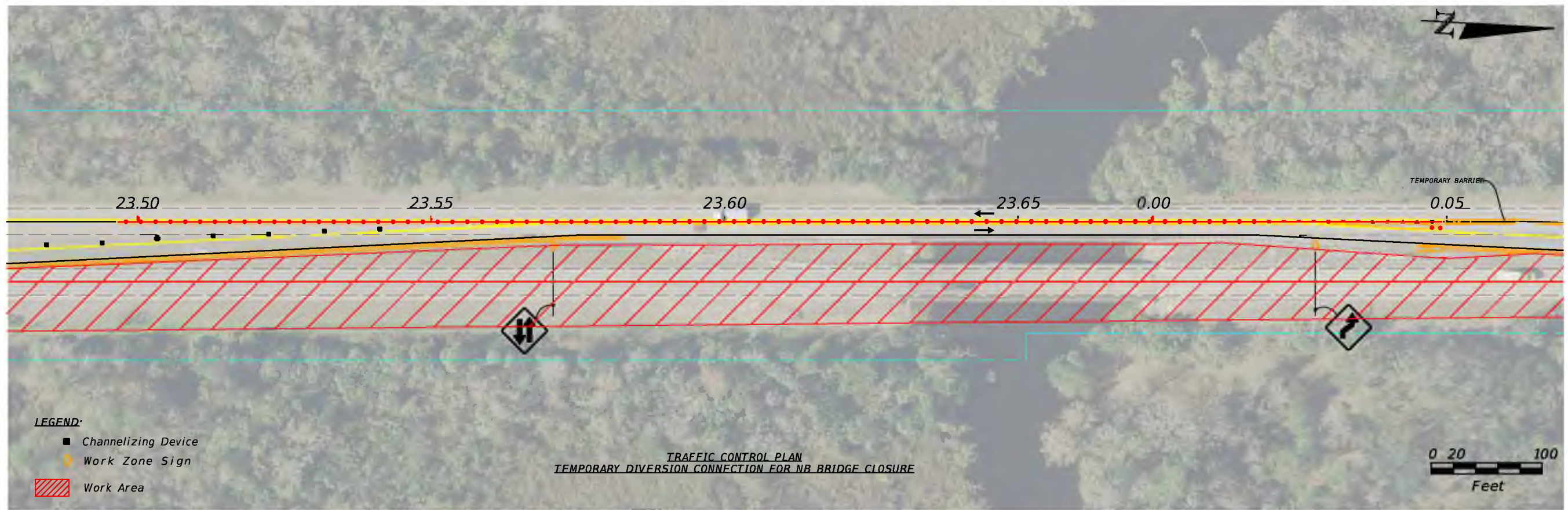
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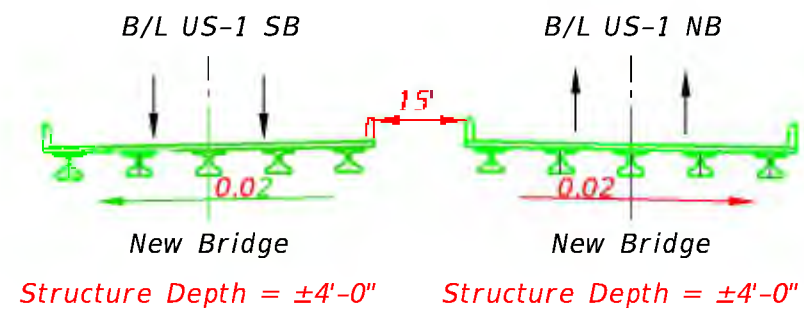
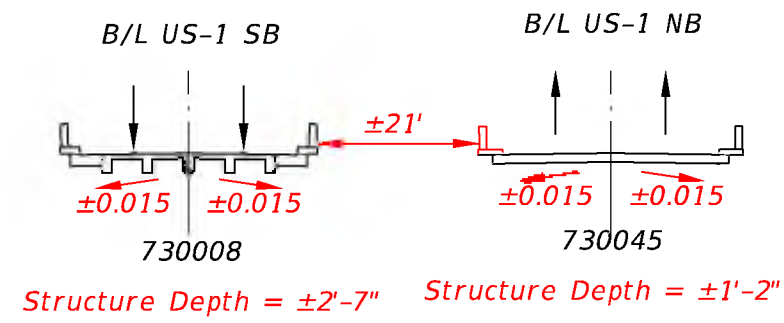
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R/W Line

R/W Line

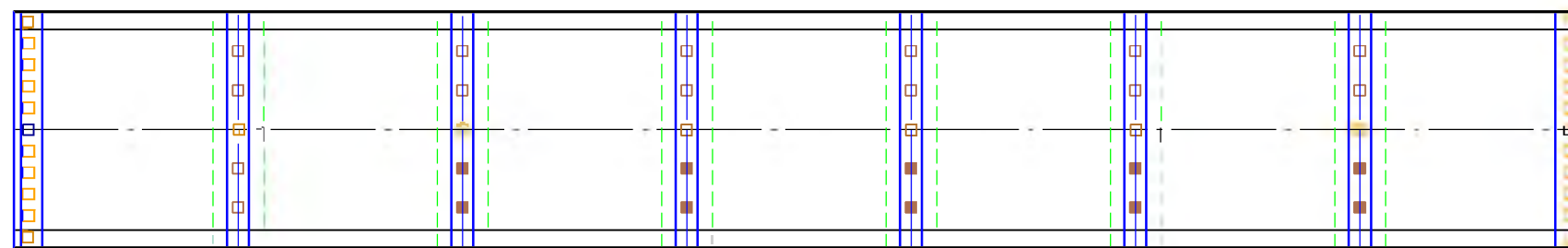
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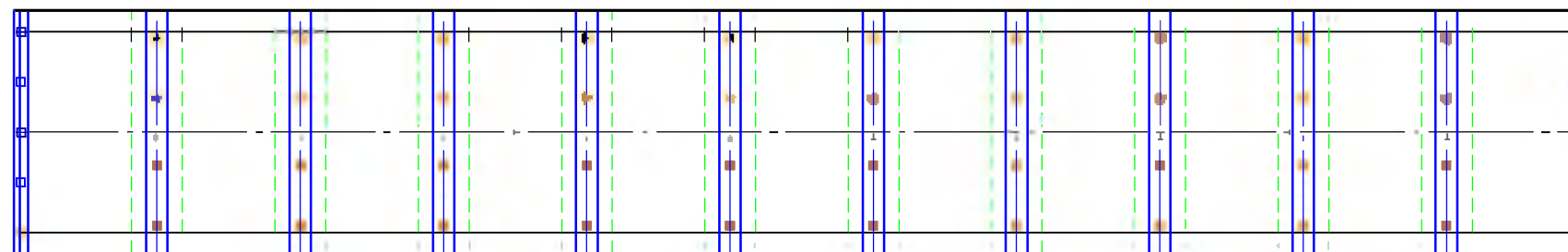


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# Existing

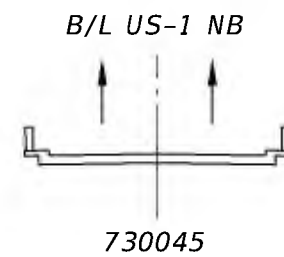
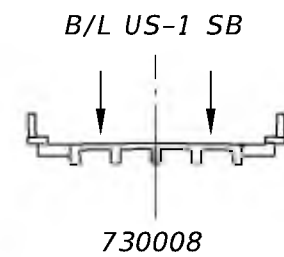


730008



730045

R/W Line

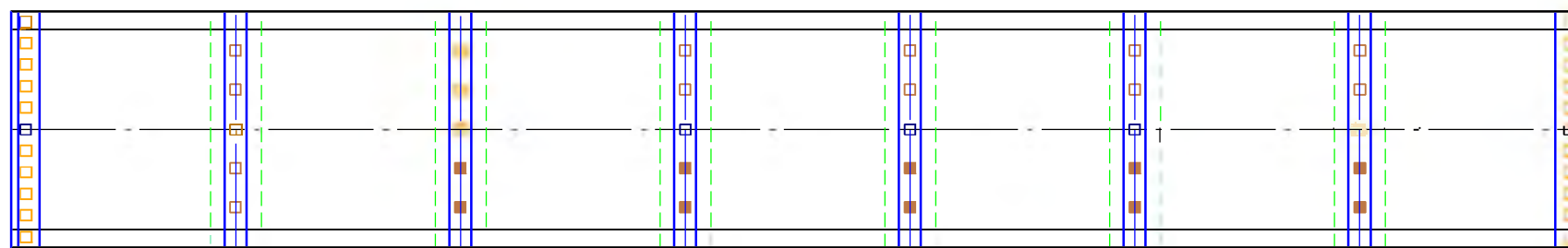


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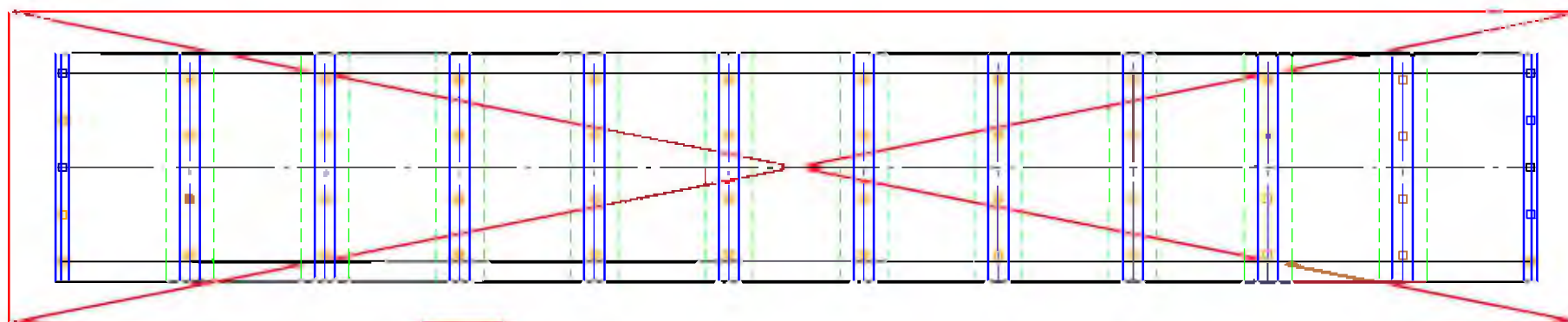
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CONCEPT PLANS

# Phase 1

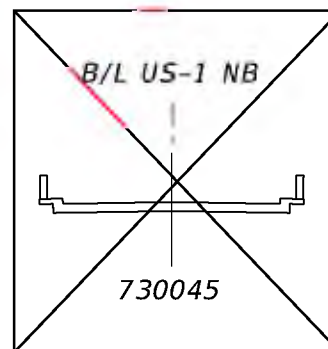
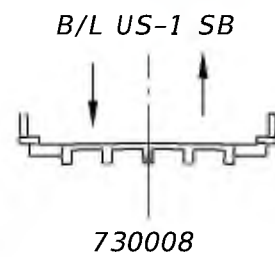


730008



730045

R/W Line

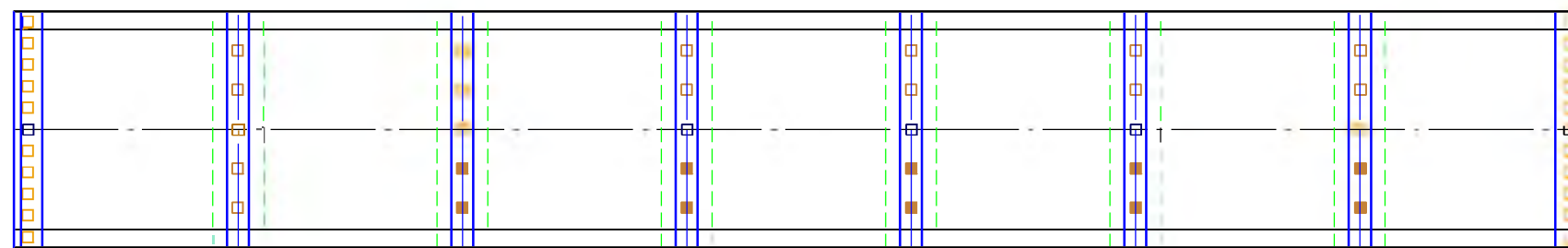


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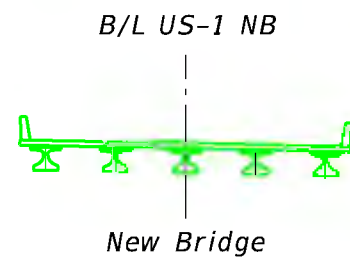
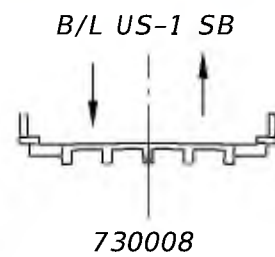
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# Phase 2



R/W Line

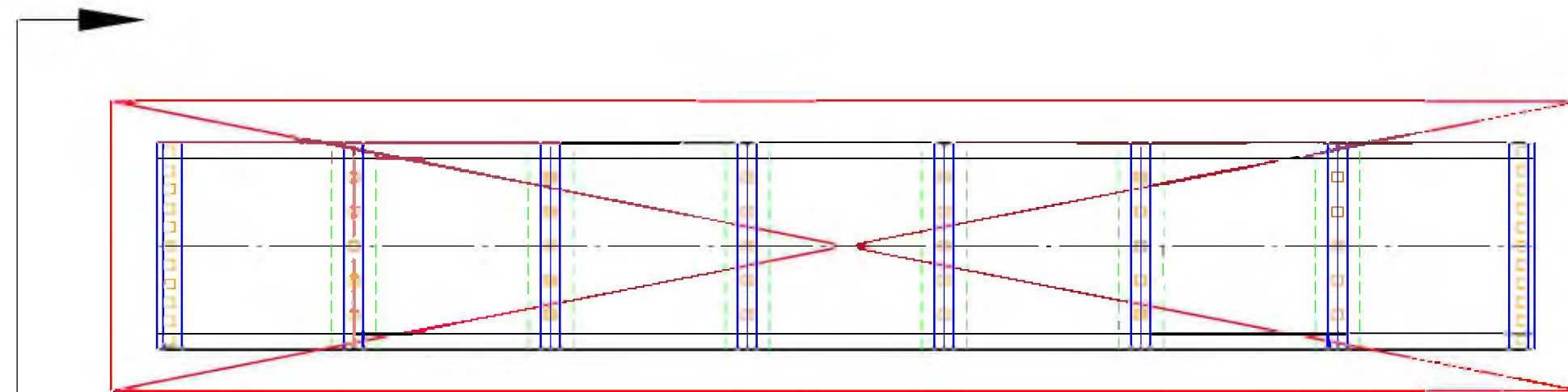


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# Phase 3

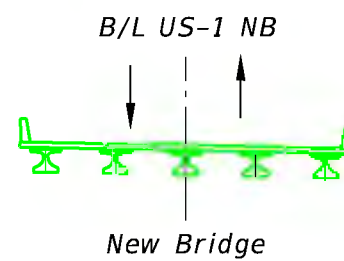
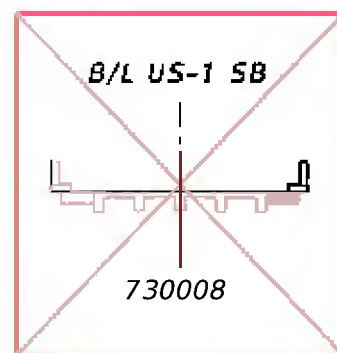


730008



New Bridge

R/W Line

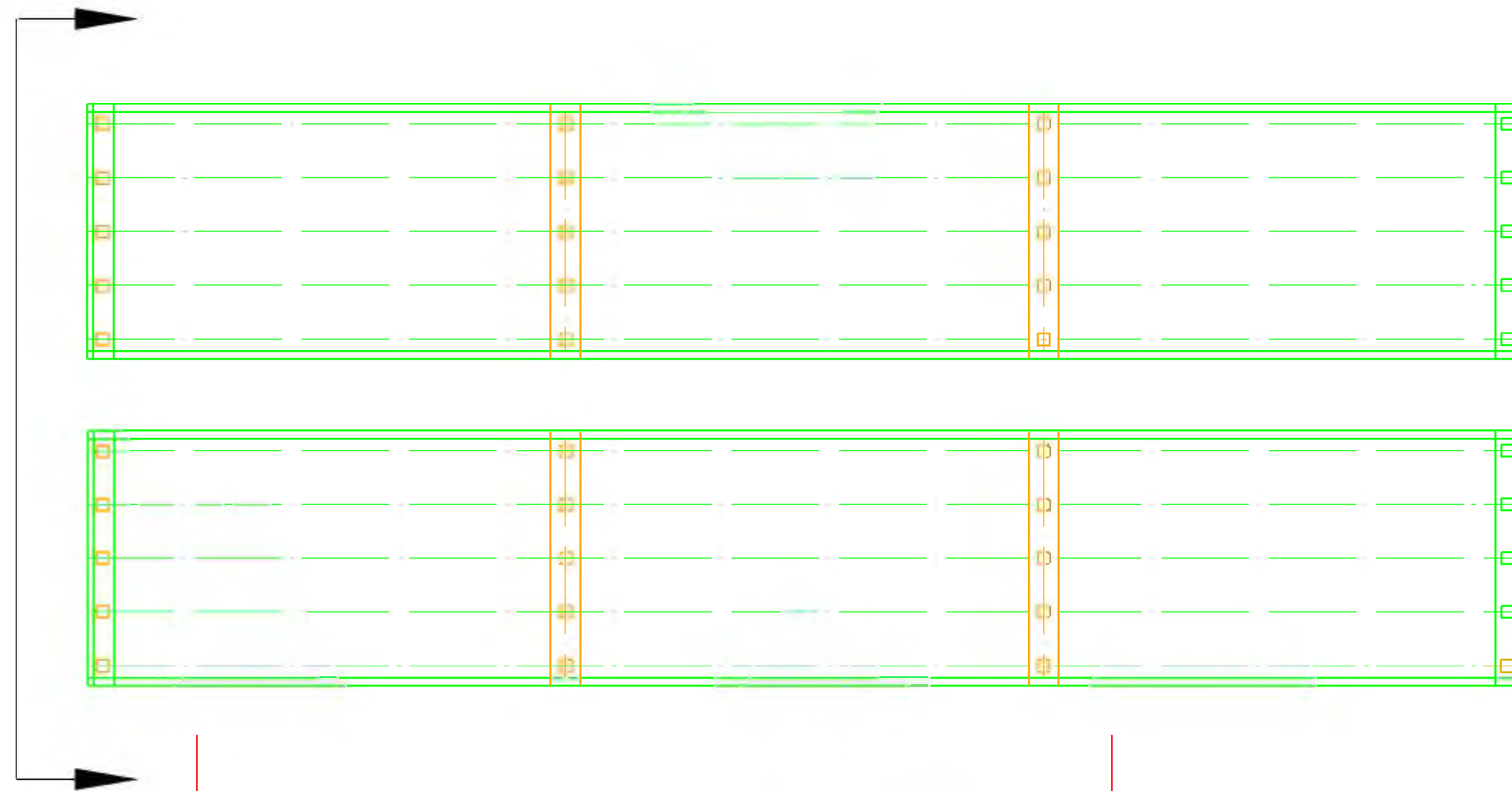


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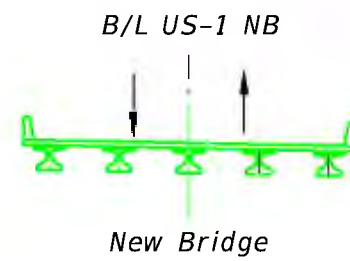
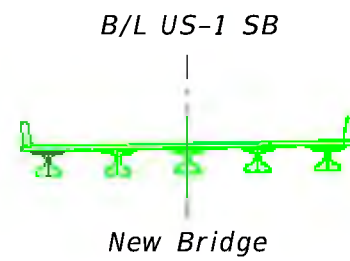
# Phase 4



*New Bridge*

*New Bridge*

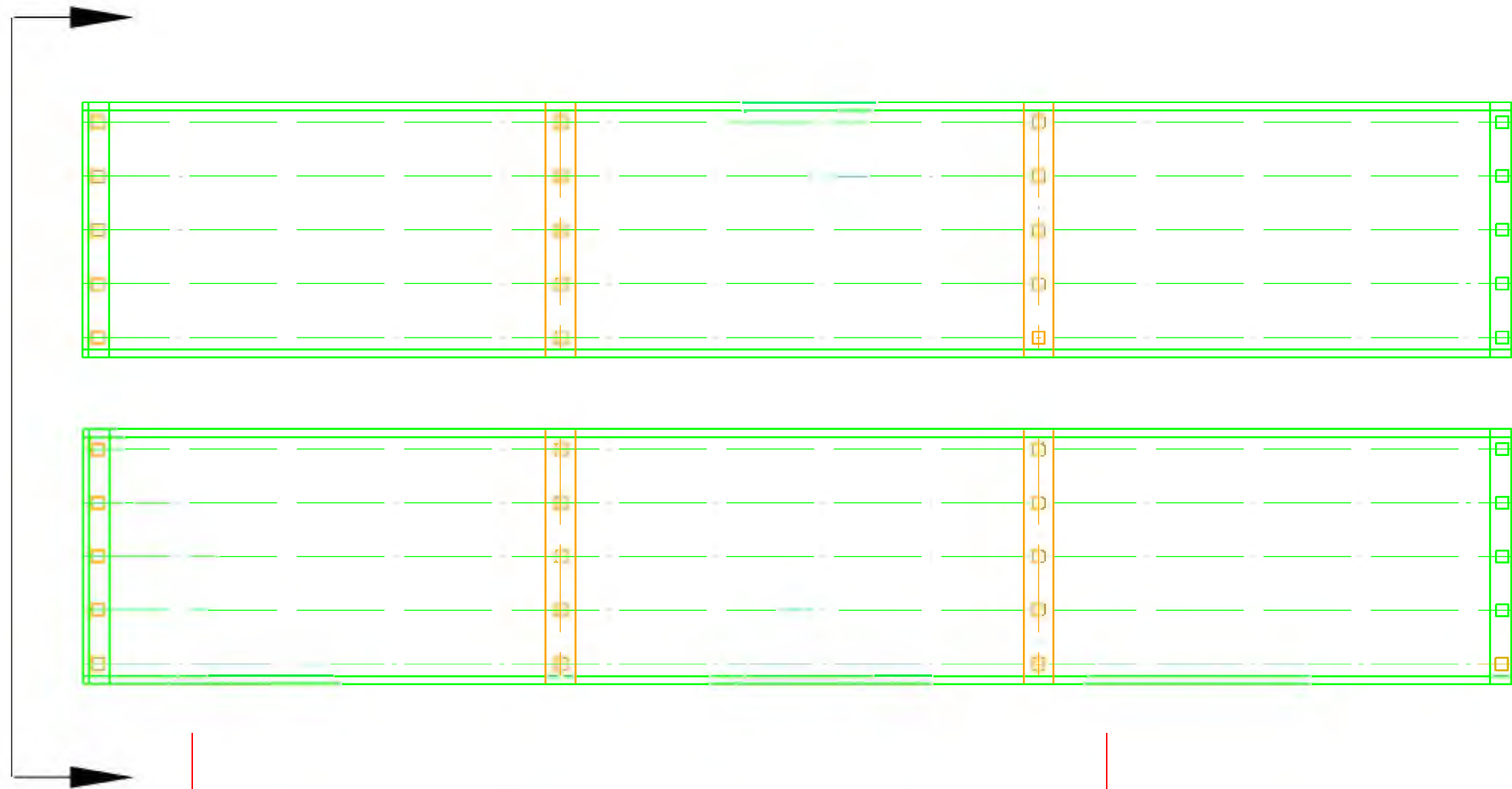
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R/W Line

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*Final*

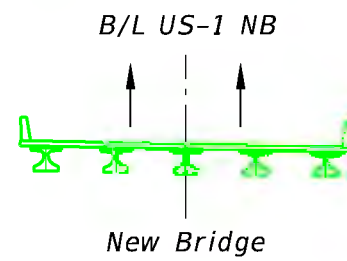
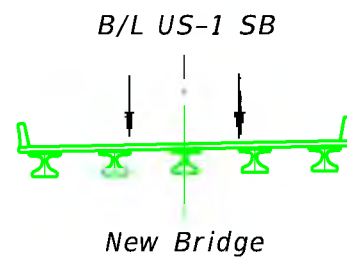


*New Bridge*

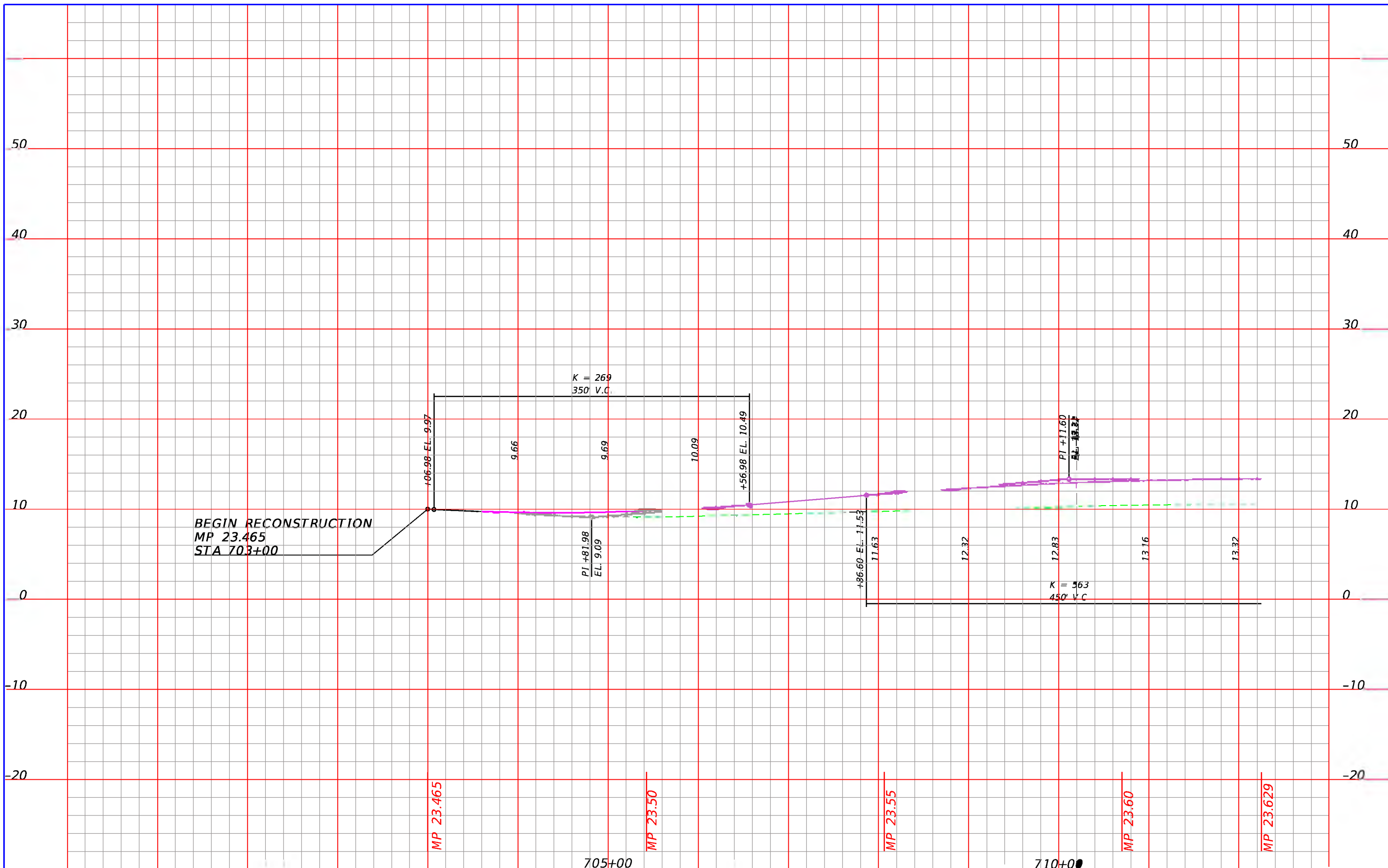
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R/W Line

R/W Line



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BEGIN RECONSTRUCTION  
MP 23.465  
STA 703+00

MP 23.465

MP 23.50

MP 23.55

MP 23.60

MP 23.629

705+00

710+00

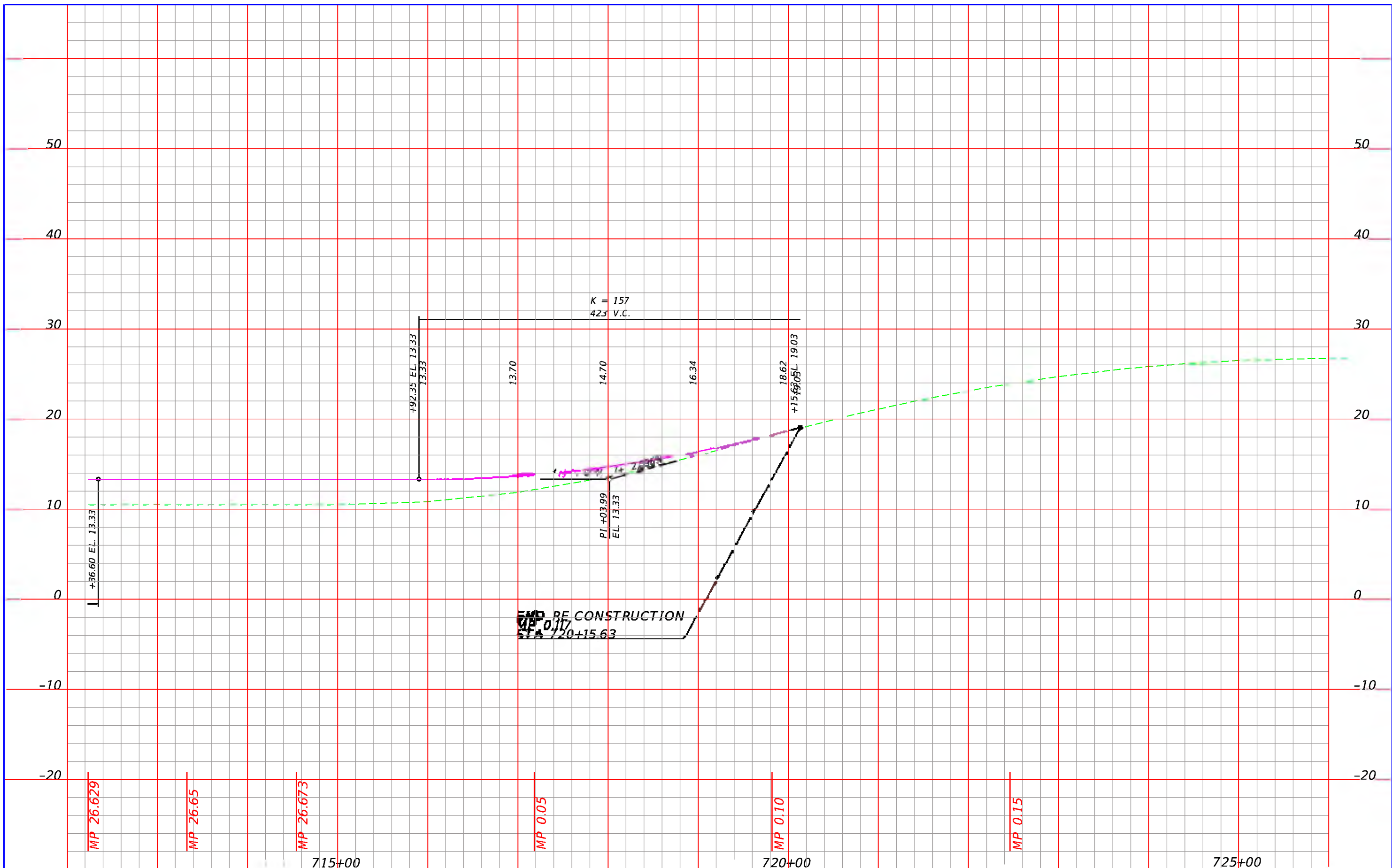
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<p><b>CONCEPT PLANS</b></p>
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SHEET NO.
12



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<p><b>CONCEPT PLANS</b></p>	<p>SHEET NO. 13</p>
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## FDOT Long Range Estimating System - Production

### R3: Project Details by Sequence Report

**Project:** 447118-1-52-01

**Letting Date:** 01/2099

**Description:** SR 5/US 1 OVER PELLICER CREEK BRIDGE REPLACEMENT

**District:** 05      **County:** 73 FLAGLER      **Market Area:** 07      **Units:** English  
**Contract Class:** 1      **Lump Sum Project:** N      **Design/Build:** N      **Project Length:** 0.460 MI

**Project Manager:** ED KESTORY

**Version 7 Project Grand Total**

**\$6,097,294.07**

**Description:** FINAL 6-18-20

**Sequence:** 1 NDR - New Construction, Divided, Rural

**Net Length:** 0.279 MI  
1,473 LF

**Description:** Roadway 23.465-23.629=0.164 0.002-0.117=0.115 Bridge 23.629-0.002

#### EARTHWORK COMPONENT

**User Input Data**

Description	Value
Standard Clearing and Grubbing Limits L/R	100.00 / 100.00
Incidental Clearing and Grubbing Area	0.00
Alignment Number	1
Distance	0.279
Top of Structural Course For Begin Section	103.00
Top of Structural Course For End Section	103.00
Horizontal Elevation For Begin Section	100.00
Horizontal Elevation For End Section	100.00
Front Slope L/R	6 to 1 / 6 to 1
Median Slope L/R	6 to 1 / 6 to 1
Median Shoulder Cross Slope L/R	5.00 % / 5.00 %
Outside Shoulder Cross Slope L/R	6.00 % / 6.00 %
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	6.76 AC	\$13,500.00	\$91,260.00
120-6	EMBANKMENT	11,372.49 CY	\$15.50	\$176,273.60
<b>Earthwork Component Total</b>				<b>\$267,533.60</b>

#### ROADWAY COMPONENT

**User Input Data**

Description	Value
Number of Lanes	4
Roadway Pavement Width L/R	24.00 / 24.00
Structural Spread Rate	330
Friction Course Spread Rate	80

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
160-4	TYPE B STABILIZATION	13,749.12 SY	\$5.75	\$79,057.44
285-709	OPTIONAL BASE,BASE GROUP 09	8,072.70 SY	\$24.00	\$193,744.80
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	1,296.35 TN	\$116.50	\$151,024.78
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	314.27 TN	\$180.00	\$56,568.60

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
102-2-1	SPECIAL DETOUR 1 <b>Comment:</b> 3,500 SY of Temporary Pavement with Earthwork/Base, 3,600 LF of Temp Barrier Wall, 2,400 LF Temp Traffic Separator, RPM's and Temp Crash cushions.	1.00 LS	\$180,000.00	\$180,000.00
334-1-12	SUPERPAVE ASPHALTIC CONC, TRAFFIC B <b>Comment:</b> Potential additional cost for Black base.	150.00 TN	\$120.51	\$18,076.50
339-1	MISCELLANEOUS ASPHALT PAVEMENT	275.00 TN	\$215.00	\$59,125.00
536-1-1	GUARDRAIL- ROADWAY, GEN TL-3	880.00 LF	\$22.43	\$19,738.40
536-1-3	GUARDRAIL- ROADWAY, DOUBLE FACE	370.00 LF	\$33.30	\$12,321.00
536-8-13	APPROACH TRANS CONN TO RIGID BA, F&I, 3	8.00 EA	\$3,054.92	\$24,439.36
536-85-24	GUARDRAIL END TREATMENT- PARA APP TERM	4.00 EA	\$3,262.90	\$13,051.60
544-3-2	CRASH CUSHION, TL-3, WIDE	2.00 EA	\$35,000.00	\$70,000.00

**Pavement Marking Subcomponent**

Description	Value
Include Thermo/Tape/Other	Y
Pavement Type	Asphalt
Solid Stripe No. of Paint Applications	1
Solid Stripe No. of Stripes	4
Skip Stripe No. of Paint Applications	1
Skip Stripe No. of Stripes	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
706-1-1	RAISED PAVMT MARK, TYPE B W/O FINAL SURF	113.00 EA	\$4.35	\$491.55
710-11-101	PAINTED PAVT MARK,STD,WHITE,SOLID,6"	1.12 GM	\$1,100.01	\$1,232.01
710-11-131	PAINTED PAVT MARK,STD,WHITE,SKIP, 6"	0.56 GM	\$503.80	\$282.13
711-15-101	THERMOPLASTIC, STD-OP, WHITE, SOLID, 6"	1.12 GM	\$5,402.03	\$6,050.27
711-15-131	THERMOPLASTIC, STD-OP, WHITE, SKIP, 6"	0.56 GM	\$1,300.19	\$728.11

**Roadway Component Total** \$885,931.55

**SHOULDER COMPONENT**

**User Input Data**

Description	Value
Total Outside Shoulder Width L/R	10.00 / 10.00
Total Outside Shoulder Perf. Turf Width L/R	2.67 / 2.67
Paved Outside Shoulder Width L/R	5.00 / 5.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	1,744.83 SY	\$16.50	\$28,789.70
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	135.04 TN	\$116.50	\$15,732.16
337-7-25	ASPH CONC FC,INC BIT,FC-5,PG76-22	65.47 TN	\$180.00	\$11,784.60
546-72-1	GROUND-IN RUMBLE STRIPS, 16"	0.56 GM	\$984.26	\$551.19
570-1-2	PERFORMANCE TURF, SOD	874.05 SY	\$2.85	\$2,491.04

**Erosion Control****Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
104-10-3	SEDIMENT BARRIER	3,830.11 LF	\$0.99	\$3,791.81
104-11	FLOATING TURBIDITY BARRIER	450.00 LF	\$9.46	\$4,257.00
104-12	STAKED TURBIDITY BARRIER- NYL REINF PVC	69.75 LF	\$7.02	\$489.65
104-15	SOIL TRACKING PREVENTION DEVICE	2.00 EA	\$3,118.00	\$6,236.00
104-18	INLET PROTECTION SYSTEM	2.00 EA	\$140.35	\$280.70
107-1	LITTER REMOVAL	6.76 AC	\$29.38	\$198.61
107-2	MOWING	6.76 AC	\$51.45	\$347.80

**Shoulder Component Total**

\$74,950.25

**MEDIAN COMPONENT****User Input Data**

Description	Value
Total Median Width	30.00
Performance Turf Width	20.00
Total Median Shoulder Width L/R	8.00 / 8.00
Paved Median Shoulder Width L/R	4.00 / 4.00
Structural Spread Rate	165
Friction Course Spread Rate	80
Total Width (T) / 8" Overlap (O)	T
Rumble Strips $\frac{1}{2}$ No. of Sides	2

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
285-704	OPTIONAL BASE,BASE GROUP 04	1,417.47 SY	\$16.50	\$23,388.26
334-1-13	SUPERPAVE ASPHALTIC CONC, TRAFFIC C	108.03 TN	\$116.50	\$12,585.50
337-7-25		52.38 TN	\$180.00	\$9,428.40

	ASPH CONC FC,INC BIT,FC-5,PG76-22			
546-72-1	GROUND-IN RUMBLE STRIPS, 16"	1.00 GM	\$984.26	\$984.26
570-1-2	PERFORMANCE TURF, SOD	3,273.60 SY	\$2.85	\$9,329.76
<b>Median Component Total</b>				<b>\$55,716.18</b>

**DRAINAGE COMPONENT**

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-551	INLETS, DT BOT, TYPE E, <10'	2.00 EA	\$5,067.80	\$10,135.60
430-174-124	PIPE CULV, OPT MATL, ROUND,24"SD	112.00 LF	\$84.03	\$9,411.36
430-984-129	MITERED END SECT, OPTIONAL RD, 24" SD	2.00 EA	\$1,691.68	\$3,383.36
570-1-2	PERFORMANCE TURF, SOD	196.42 SY	\$2.85	\$559.80

**X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
425-1-555	INLETS, DT BOT, TYPE E, PARTIAL	2.00 EA	\$3,368.71	\$6,737.42

**Drainage Component Total** **\$30,227.54**

**SIGNING COMPONENT**

**Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
700-1-11	SINGLE POST SIGN, F&I GM, <12 SF	1.00 AS	\$336.74	\$336.74
700-1-12	SINGLE POST SIGN, F&I GM, 12- 20 SF	7.00 AS	\$1,154.74	\$8,083.18
700-2-14	MULTI- POST SIGN, F&I GM, 31-50 SF	1.00 AS	\$4,376.94	\$4,376.94
700-2-15	MULTI- POST SIGN, F&I GM, 51- 100 SF	2.00 AS	\$5,797.30	\$11,594.60

**Signing Component Total** **\$24,391.46**

**BRIDGES COMPONENT**

**Bridge 730045**

Description	Value
Estimate Type	Detailed Estimate
Primary Estimate	YES
Structure No.	730045
Geographic District	05
Segment Count	1
Bridge Length (LF)	240.00
Average Bridge Width (LF)	40.00
Average Skew Angle	0.00
Construction Type	New/Replacement
Typical Section	Rural Undivided
Sidewalk Width Left	0.00
Sidewalk Width Right	0.00

Concrete Traffic Railing	Left/Right
Pedestrian/Bicycle Railing	
Total Design Load Demand Weight	5,523
<b>Final Bridge Cost</b>	<b>\$1,525,831.41</b>
<b>Calculated Final Cost per SF</b>	<b>\$158.94</b>
Description	SR 5 NB

**Bridge Deck and Approach Slab Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	8,600.00 SF	\$21.00	\$180,600.00
400-2-10	CONC CLASS II, APPROACH SLABS	90.17 CY	\$500.00	\$45,085.00
400-9	BRIDGE DECK GROOV & PLANING, DECK 8.5" GR	1,084.44 SY	\$8.98	\$9,738.27
415-1-9	REINF STEEL- APPROACH SLABS	17,200.00 LB	\$0.94	\$16,168.00
521-5-4	CONC TRAF RAIL- BRG, 32" VERT FACE	300.00 LF	\$100.00	\$30,000.00
521-5-4	CONC TRAF RAIL- BRG, 32" VERT FACE	300.00 LF	\$100.00	\$30,000.00

**Bridge X-Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
450-2-36	PREST BEAMS: FLORIDA-I BEAM 36"	480.00 LF	\$275.66	\$132,316.80
530-3-3	RIPRAP- RUBBLE, BANK AND SHORE	50.00 TN	\$125.88	\$6,294.00

**BRIDGE SEGMENTS****Segment 1**

Segment Position	First/Last
Segment Over	Water
Segment Length (LF)	240
Segment Width (LF)	40
Average Clearance (LF)	25
End Bent Fill Height (LF)	18
Average Pile Length (LF)	100
No. of Intermediate Supports	2
Superstructure / Beam Type	I-Beam
Substructure / Pier Type	Multi Columns
Foundation Type	Pre-stressed Sq. Piles 18"
Design Load Demand Weight	5,523
<b>Total Segment Cost</b>	<b>\$1,256,229.34</b>

**Segment 1 Superstructure, Substructure and Foundation Pay Items**

Pay item	Description	Quantity Unit	Unit Price	Extended Amount
400-2-4	CONC CLASS II, BRIDGE SUPERSTRUCTURE	283.73 CY	\$825.00	\$234,077.25
400-4-5	CONC CLASS IV, SUBSTRUCTURE	160.44 CY	\$1,000.00	\$160,440.00
400-4-5	CONC CLASS IV, SUBSTRUCTURE	175.00 CY	\$1,000.00	\$175,000.00
400-147	COMPOSITE NEOPRENE PADS	6.35 CF	\$1,122.16	\$7,125.72

415-1-4	REINF STEEL- SUPERSTRUCTURE	65,257.90 LB	\$0.96	\$62,647.58
415-1-5	REINF STEEL- SUBSTRUCTURE	21,659.40 LB	\$0.96	\$20,793.02
415-1-5	REINF STEEL- SUBSTRUCTURE	37,625.00 LB	\$0.96	\$36,120.00
450-2-36	PREST BEAMS: FLORIDA-I BEAM 36"	720.00 LF	\$275.66	\$198,475.20
455-34-3	PRESTRESSED CONCRETE PILING, 18" SQ	2,829.60 LF	\$100.00	\$282,960.00
455-143-3	TEST PILES-PREST CONCRETE, 18" SQ	314.40 LF	\$249.97	\$78,590.57

**Bridge 730045 Total** \$1,706,431.41

**Bridge 730008**

Description	Value
Estimate Type	Detailed Estimate
Primary Estimate	YES
Structure No.	730008
Geographic District	05
Segment Count	1
Bridge Length (LF)	240.00
Average Bridge Width (LF)	40.00
Average Skew Angle	0.00
Construction Type	New/Replacement
Typical Section	Rural Undivided
Sidewalk Width Left	0.00
Sidewalk Width Right	0.00
Concrete Traffic Railing	Left/Right
Pedestrian/Bicycle Railing	
Total Design Load Demand Weight	5,523
<b>Final Bridge Cost</b>	<b>\$1,525,831.41</b>
<b>Calculated Final Cost per SF</b>	<b>\$158.94</b>
Description	SR SB

**Bridge Deck and Approach Slab Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
110-3	REMOVAL OF EXISTING STRUCTURES/BRIDGES	8,600.00	SF	\$21.00	\$180,600.00
400-2-10	CONC CLASS II, APPROACH SLABS	90.17	CY	\$500.00	\$45,085.00
400-9	BRIDGE DECK GROOV & PLANING, DECK 8.5" GR	1,084.44	SY	\$8.98	\$9,738.27
415-1-9	REINF STEEL- APPROACH SLABS	17,200.00	LB	\$0.94	\$16,168.00
521-5-4	CONC TRAF RAIL- BRG, 32" VERT FACE	300.00	LF	\$100.00	\$30,000.00
521-5-4	CONC TRAF RAIL- BRG, 32" VERT FACE	300.00	LF	\$100.00	\$30,000.00

**Bridge X-Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
450-2-36	PREST BEAMS: FLORIDA-I BEAM 36"	480.00	LF	\$275.66	\$132,316.80
530-3-3	RIPRAP- RUBBLE, BANK AND SHORE	50.00	TN	\$125.88	\$6,294.00

**BRIDGE SEGMENTS****Segment 1**

Segment Position	First/Last
Segment Over	Water
Segment Length (LF)	240
Segment Width (LF)	40
Average Clearance (LF)	25
End Bent Fill Height (LF)	18
Average Pile Length (LF)	100
No. of Intermediate Supports	2
Superstructure / Beam Type	I-Beam
Substructure / Pier Type	Multi Columns
Foundation Type	Pre-stressed Sq. Piles 18"
Design Load Demand Weight	5,523
<b>Total Segment Cost</b>	<b>\$1,256,229.34</b>

**Segment 1 Superstructure, Substructure and Foundation Pay Items**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
400-2-4	CONC CLASS II, BRIDGE SUPERSTRUCTURE	283.73	CY	\$825.00	\$234,077.25
400-4-5	CONC CLASS IV, SUBSTRUCTURE	160.44	CY	\$1,000.00	\$160,440.00
400-4-5	CONC CLASS IV, SUBSTRUCTURE	175.00	CY	\$1,000.00	\$175,000.00
400-147	COMPOSITE NEOPRENE PADS	6.35	CF	\$1,122.16	\$7,125.72
415-1-4	REINF STEEL- SUPERSTRUCTURE	65,257.90	LB	\$0.96	\$62,647.58
415-1-5	REINF STEEL- SUBSTRUCTURE	21,659.40	LB	\$0.96	\$20,793.02
415-1-5	REINF STEEL- SUBSTRUCTURE	37,625.00	LB	\$0.96	\$36,120.00
450-2-36	PREST BEAMS: FLORIDA-I BEAM 36"	720.00	LF	\$275.66	\$198,475.20
455-34-3	PRESTRESSED CONCRETE PILING, 18" SQ	2,829.60	LF	\$100.00	\$282,960.00
455-143-3	TEST PILES-PREST CONCRETE, 18" SQ	314.40	LF	\$249.97	\$78,590.57
<b>Bridge 730008 Total</b>					<b>\$1,706,431.41</b>
<b>Bridges Component Total</b>					<b>\$3,412,862.82</b>
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<b>Sequence 1 Total</b>					<b>\$4,751,613.40</b>
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## FDOT Long Range Estimating System - Production

### R3: Project Details by Sequence Report

**Project:** 447118-1-52-01

**Letting Date:** 01/2099

**Description:** SR 5/US 1 OVER PELLICER CREEK BRIDGE REPLACEMENT

**District:** 05      **County:** 73 FLAGLER

**Market Area:** 07      **Units:** English

**Contract Class:** 1      **Lump Sum Project:** N

**Design/Build:** N      **Project Length:** 0.460 MI

**Project Manager:** ED KESTORY

**Version 7 Project Grand Total** **\$6,097,294.07**

**Description:** FINAL 6-18-20

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**Project Sequences Subtotal** **\$4,751,613.40**

102-1	Maintenance of Traffic	10.00 %	\$475,161.34
101-1	Mobilization	10.00 %	\$522,677.47

**Project Sequences Total** **\$5,749,452.21**

Project Unknowns	5.00 %	\$287,472.61
Design/Build	0.00 %	\$0.00

**Non-Bid Components:**

Pay item	Description	Quantity	Unit	Unit Price	Extended Amount
999-25	INITIAL CONTINGENCY AMOUNT (DO NOT BID)		LS	\$60,369.25	\$60,369.25

**Project Non-Bid Subtotal** **\$60,369.25**

**Version 7 Project Grand Total** **\$6,097,294.07**