



May 16, 2022
Review

EXHIBIT "A"



SCOPE OF SERVICES

FOR

Financial Project ID: 447610-1-32-01

FDOT District 5

ORANGE

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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: 447610-1-32-01

Related Financial Project ID(s): N/A

Federal Aid Project No.:

Roadway: Not Available.

Project Description: US441/SR500 FROM WADSWORTH RD TO LAKE COUNTY LINE

Bridge No(s).: *N/A*

Railroad Crossing No.: *N/A*

Context Classification:

- *C2-Rural Sparsely settled lands; may include agricultural land, grassland, woodland, and wetlands.*
- *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.*

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**
 - **6.1 - Traffic Engineering Studies**
 - **6.2 - Traffic Signal Timing**
 - **6.3.1 - Intelligent Transportation Systems Analysis and Design**
 - **6.3.2 - Intelligent Transportation Systems Implementation**
 - **6.3.3 - Intelligent Transportation Traffic Engineering Systems Communications**

- *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*
- *9.1 - Soil Exploration*
- *15.0 - Landscape Architect*

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.

US441/SR500 RESURFACING FROM WADSWORTH RD TO LAKE COUNTY LINE

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

Public Involvement:
CAP Level: 3
One public meeting.

Other Agency Presentations/Meetings:

Agency	Number of Meetings
Orange County	1
Lake County	1

Joint Project Agreements: *N/A*

Specifications Package Preparation:
One package anticipated.

Estimated Quantities Report Preparation:
Standard effort.

Value Engineering: *N/A*

Risk Assessment Workshop: *N/A*

Plan Type:
Plan only.

Typical Section:
Number of Typical Sections: ***1***

Four 12-ft travel lanes (two per direction), 10-ft shoulders (4-ft paved), 8-ft inside shoulders (4-ft paved) separated by a 40-ft depressed grass median. No changes are proposed.

Pavement Designs:

Number of Pavement Designs: **6**

- 1) milling and resurfacing the travel lanes,**
- 2) milling and resurfacing the turn lanes and median openings,**
- 3) milling and resurfacing the shoulders,**
- 4) pavement widening,**
- 5) new shoulder construction, and**
- 6) deep milling and resurfacing as recommended in the PCA to include base removal and reconstruction.**

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

Cross-Slope Correction:

***Cross slope correction is recommended for this project at the following location;
MP 21.784 to MP 22.116: R1 and R2***

Access Management Classification:

- ***Access Class 3***

See approved technical scope attached.

Transit Route Features:

LakeXpress bus route 4 currently services the SR 500 corridor. Coordinate stop locations, landing pads, temporary construction relocations, and other transit issues with Dave Lazerson at 352-323-5733 or dlazerson@lakecountyfl.gov during the design phase.

Two bus stops were designated with sign-post. 2 accessible boarding and alighting areas are proposed per the FDOT Accessing Transit Design Handbook and FDM 225.2. Coordinate proposed locations with Lake Xpress and construct sidewalk connections from the proposed intersection pedestrian landings.

Major Intersections and Interchanges:

Number of Major Intersections and Interchanges: **2**

SR 500 at CR 500A

SR 500 at Stoneybrook Hills Pkwy

Roadway Alternative Analysis:

TBD Level of Temporary Traffic Control Plan (TTCP): ***1***

TBD

Temporary Lighting:

TBD

Temporary Signals: *N/A*

Temporary Drainage:

TBD

Design Variations:

- **Design Variations**

Design Variation Memorandum. See approved technical scope attached.

Design Exceptions: *N/A*

Back of Sidewalk Profiles: *N/A*

Selective Clearing and Grubbing: *N/A*

2.2 Drainage (Activities 6a and 6b)

Drainage System Type:

Open, ditches.

Number of stormwater management facility sites: ***1 - SJRWMD***

Number of cross drains: ***TBD***

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:

- ***Bright House Networks LLC***
- ***CenturyLink***
- ***City of Mount Dora - Electric***
- ***City of Mount Dora - Reclaimed Water***
- ***City of Mount Dora - Sewer***
- ***City of Mount Dora - Water***
- ***Duke Energy Florida, LLC - Distribution***
- ***Florida Governmental Utilities Authority - Sewer***
- ***Florida Governmental Utilities Authority - Water***
- ***Lake Apopka Natural Gas District***
- ***TECO Peoples Gas***
- ***Zayo Group, LLC***

2.4 Environmental Permits and Environmental Clearances (Activity 8)

Expected Permits:

- ***FL Department of Environmental Protection (FDEP) General Permit***

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

2.5 Structures (Activities 9 - 18) (N/A)

2.6 Signing and Pavement Markings (Activities 19 & 20)

N/A

2.7 Signalization (Activities 21 & 22)

Intersections:

Existing mast arms at Storneybrook Hills Pkwy.

*Add flexible retroreflective backplates, all approaches.
Provide 6 new for proposed crosswalks.*

Traffic Data Collection: *N/A*

Traffic Studies:

TBD.

Count Stations: *N/A*

Traffic Monitoring Sites:

750642

2.8 Lighting (Activities 23 & 24)

Limits and Proposed Type of Lighting:

Type	Limit
[Type]	[Limit]

Lighting Retrofit at signalized intersection.

2.9 Landscape (Activities 25 & 26)

Include coordination with existing and/or proposed underground utilities including but not limited to FDOT lighting, drainage and Intelligent Transportation Systems (ITS). Landscape coordination with ITS shall include both underground conflicts and above-ground impacts to existing and/or proposed ITS coverage. The CONSULTANT shall closely coordinate with the Department's ITS units to ensure that all conflicts are identified, addressed and mitigated in the Contract Documents.

Planting Plans:

For speed management.

Irrigation Plans:

TBD

Hardscape Plans: *N/A*

Outdoor Advertising: *N/A*

2.10 Survey (Activity 27)

Design Survey:
See approved technical scope attached.

Subsurface Utility Exploration:
See approved technical scope attached.

Right of Way Survey: *N/A*

Vegetation Survey: *N/A*

2.11 Photogrammetry (Activity 28) (N/A)

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)

See approved technical scope attached.

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)

See approved technical scope attached.

See approved technical scope attached.

2.18 3D Modeling (Activity 36)

TBD

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 *Letting Date of November 5, 2024*. The current production date is *August 01, 2024*. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a *four* 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 **26** months for final construction contract documents. However, the contract deadline is **26** 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.

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 2011*
- *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*
- *US Army Corps of Engineers Regulatory Programs*
- *USCG Bridge Permit Application Guide, COMDTPUB P16591.3D*
- *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*
- *USGBC LEED Program (Leadership in Energy and Environmental Design) Green Building Rating System*
- *Florida Green Building Coalition (FGBC) Certified Green Building Rating Program (Florida Green)*
- *Green Building Initiative (GBI) Green Globes Rating Program*
- *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 Phase II 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 Phase II plans and no later than Phase III plans) the CONSULTANT shall be responsible for inputting the category information, 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/CONSULTANT] 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 [DEPARTMENT/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 [DEPARTMENT/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 [Number] 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 category information, pay items, and 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

[*Provide project-specific information*]

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

[*Describe other project general tasks*]

4 ROADWAY ANALYSIS (TBD)

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 prepare a Typical Section Package.

4.2 Pavement Type Selection Report (N/A)

4.3 Pavement Design Package

The CONSULTANT shall prepare a Pavement Design Package.

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 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.

4.8 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.

4.9 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.

4.10 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.

4.11 Selective Clearing and Grubbing (N/A)

4.12 Tree Disposition Plans (N/A)

4.13 Design Variations and Exceptions

The CONSULTANT shall prepare the documentation necessary to gain DEPARTMENT approval of all appropriate Design Variation Memorandums, Formal Design Variations and/or Design Exceptions.

A Project Design Variation Memorandum (FDM Form 122-B) shall be prepared to document all non-controlling design elements for a project that do not meet Department criteria. Those elements requiring a more detailed analysis, as per FDM Section 122.2, shall be submitted as Formal Design Variations or Design Exceptions.

4.14 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.

4.15 Quantities for EQ Report

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

4.16 Cost Estimate

4.17 Technical Special Provisions and Modified Special Provisions

4.18 Other Roadway Analyses

4.19 Field Reviews

4.20 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).

4.21 Technical Meetings

4.22 Quality Assurance/Quality Control

4.23 Independent Peer Review

4.24 Supervision

4.25 Coordination

5 ROADWAY PLANS (TBD)

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 Erosion Control Plan

Includes analysis and design of the Erosion Control Plan. Includes creating the design file.

6a.24 Field Reviews

6a.25 Technical Meetings

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

6a.26 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.27 Quality Assurance/Quality Control

6a.28 Independent Peer Review

6a.29 Supervision

6a.30 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 & Cross Sections

6b.5 Retention/Detention/Floodplain Compensation Pond Details & Cross Sections

6b.6 Erosion Control Plan

6b.7 SWPPP

6b.8 Quality Assurance/Quality Control

6b.9 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. The Consultant shall be prepared to discuss the projects applied utility schedule logic and current UAO contact information.

7.2 Identify Existing Utility Agency Owner(s)

The Consultant shall identify all Utility Agency Owners (UAOs) in the corridor and within and adjacent to the project limits that may be impacted by the project. Identification shall include the updates UAO contact information. The Consultant shall

contact Sunshine 811, perform a field visit, and review prior FDOT utility permits, reports, existing plans, and surveys provided.

7.3 Make Utility Contacts

First Contact: The CONSULTANT shall send letters and plans to each Utility Agency Owner (UAO), 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 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 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 Design Alternative. 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 alternative 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) marked/RGB 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 UAO marked plans and data individually as they are received for content, accuracy, utility type, material, and size. Provide to the EOR (designer) for inclusion in the plans. Forward all requests for UAO 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 4.8 (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 identified 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 4.8 (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) via electronic delivery or another agreeable format.

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: District Right of Way files and databases; 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 "Request for Corps Jurisdictional Determination"; 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 8.15 (Other Environmental 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, unless directed otherwise by the DEPARTMENT.

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 Complete and Submit Documentation for Coordination and/or USCG Bridge Permit Application

The CONSULTANT shall be responsible for the level of effort needed for the USCG authorization in accordance with the regulatory agency requirements.

8.6.1 Prepare and submit required documents for USCG Coordination

The CONSULTANT shall complete appropriate documentation required for the USCG to determine the navigability of the waterway and whether a USCG permit will be required.

8.6.2 Complete and submit USCG Bridge Permit Application

The CONSULTANT shall prepare and submit required USCG bridge permit application. The CONSULTANT shall be responsible for acquiring the USCG approval.

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 Regulatory Agency Support

The CONSULTANT shall provide regulatory agency support which may include but is not limited to preparing: a Statement of Findings or Memorandum for the Record; Public Notice; Findings of Fact; and Biological Opinion.

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 will conduct a Cultural Resources Assessment Survey for the project Area of Potential Effect and prepare all required documentation detailing the survey results and assessments of resource significance, to obtain State Historic Preservation Officer concurrence. Personnel performing this work must meet or exceed the minimum criteria for archaeologists, historians, architectural historians, and other professionals as outlined in *36 CFR Part 61* and set forth in the Professional Qualifications Standards section of the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (FR, Vol. 48, No. 190, 44738-44739; September 29, 1983)*.

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 Other Environmental Permits

8.16 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.

8.17 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.

8.18 Technical Meetings

8.19 Quality Assurance/Quality Control

8.20 Supervision

8.21 Coordination

9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS (N/A)

N/A

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 (N/A)

N/A

18 STRUCTURES - MISCELLANEOUS (N/A)

N/A

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 (N/A)

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

The CONSULTANT shall develop a Temporary Highway Lighting design and, when required, a Temporary Highway Lighting design file. The Temporary Highway Lighting design must account for all phases of the TTCP and includes the analysis, calculations, and placement of luminaires, supports, conductors, conduits, pull boxes, and electrical power service.

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

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

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

25.1 Data Collection

All research required to collect data necessary to complete the initial design analysis. Includes identifying local ordinances and collection of other project data.

25.2 Site Inventory and Analysis for Proposed Landscape

Includes identification of opportunities and constraints for the proposed landscape project based on existing site conditions. Identify available planting areas for nursery landscape material. Summary of analysis, if required, is included in conceptual design. Roll plots may be required.

25.2a Selective Clearing and Grubbing Site Inventory

25.2b Inventory and Analysis

25.2c1 Vegetation Disposition Plan-Mainline

25.2c2 Vegetation Disposition Plan-Interchange

25.3 Planting Design

25.3a Conceptual Planting Design

Includes delineation of all proposed planting types, scheme development and preliminary costs and reports. The design shall be submitted with the Phase I plans.

25.3a1 Report Preparation

25.3a2 Mainline

25.3a3 Interchanges, Intersections, and Rest Areas

25.3a4 Toll Plazas

25.3b Final Planting Design

Includes identifying the species/type, size, location, spacing, and quality of all plants.

25.3b1 Master Design File Creation

25.3b2 Mainline

25.3b3 Interchanges, Intersections, and Rest Areas

25.3b4 Toll Plazas

25.4 Irrigation Design

25.4a Conceptual Irrigation Design

Conceptual Design: Typically not done in master design file. Includes determination of water and power sources. Phase I design level.

25.4a1 Feasibility Report: Includes analysis of methods, materials and operation costs associated with proposed irrigation system design

25.4a2 Mainline

25.4a3 Interchanges, Intersections, and Rest Areas

25.4a4 Toll Plazas

25.4b Final Irrigation Design

Includes all work in master design files. Irrigation Design includes, but is not limited to, the locations and sizes of pumps, pump stations, mainlines, lateral lines, irrigation heads, valves, backflow and control devices.

25.4b1 Mainline

25.4b2 Interchanges, Intersections, and Rest Areas

25.4b3 Toll Plazas

25.5 Hardscape Design (N/A)

25.6 Roll Plots

Task includes any roll plots for the project to aid in developing final plans (landscape opportunity, disposition, site inventory and analysis, etc.)

25.7 Quantities for EQ Report

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

25.8 Cost Estimates

25.9 Technical Special Provisions and Modified Special Provisions

25.10 Inspection Services

Services may include: on-site inspection, construction, observation, monitoring, supervision, and any reporting requirements.

25.11 Other Landscape Services

25.12 Outdoor Advertising

Includes all work required to determine locations of all outdoor advertising permitted within the roadway project limits. Includes all work required to determine the proposed view zones and the supporting documentation.

25.13 Field Reviews (N/A)

25.14 Technical Meetings / Public Meetings

25.15 Quality Assurance/Quality Control

25.16 Independent Peer Review

25.17 Supervision

25.18 Project Coordination

25.19 Interdisciplinary Coordination

26 LANDSCAPE PLANS

The CONSULTANT shall prepare a set of Landscape Plans which includes the following.

26.1 Key Sheet & Signature Sheet (N/A)

26.2 Plant Schedule (N/A)

26.3 General Notes/Pay Item Notes

26.4 Planting Plans for Linear Areas

26.5 Planting Plans for Non-Linear Areas (Stormwater Facilities, Rest Areas, Interchanges and Toll Plazas)

26.6 Planting Details and Notes

26.7 Irrigation Plans for Linear Areas

26.8 Irrigation Plans for Non-Linear Areas (Stormwater Facilities, Rest Areas, Interchange and Toll Plazas)

26.9 Irrigation Details and Notes

26.10 Hardscape Plans

26.11 Hardscape Details and Notes

26.12 Maintenance Plan

The CONSULTANT shall include a written plan for care and maintenance of the plants and beds, hardscape, and irrigation system after the establishment period. The landscape

maintenance plan will be developed in performance based language and will be in coordination with the local government entity who assumes the maintenance obligation.

26.13 Quality Assurance/Quality Control

26.14 Supervision

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 (N/A)

N/A

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, ITS master and strategic plans, Florida's SEMP guidelines, National, statewide and/or regional ITS architectures, and current design bulletins.

33.1 ITS Analysis

The CONSULTANT shall review the previously prepared and approved preliminary engineering report(s), typical section package, traffic technical memorandum, adjacent projects programmed by the DEPARTMENT and other local highway agencies, and proposed geometric design alignment to identify impacts to existing ITS components (if applicable) and proposed ITS field device placements. The CONSULTANT shall review the project intelligence files provided by the District's asset maintenance agent(s) related to all previously constructed ITS projects and maintenance documentation for the project corridor to ensure all cited ITS elements are included in this project for replacement and/or restoration.

Systems Engineering Analysis

The CONSULTANT shall perform a systems engineering analysis including a Concept of Operations (ConOps), Project Systems Engineering Management Plan (PSEMP), Requirements Traceability Verification Matrix (RTVM), and other documents as necessary based on project complexity and risk as required by Florida Department of Transportation Systems Engineering and Intelligent Transportation Systems (ITS) Architecture Procedure (Procedure Number 750-040-003).

Design Guidelines

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]

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 TSM&O 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) or, when applicable and

approved by the DEPARTMENT, FDOT's Innovative Product List (IPL) and are supported within the SunGuide software or other software approved by the DEPARTMENT.

Closed Circuit Television (CCTV) Subsystem

CCTV devices shall be spaced and located as required to meet the Project requirements, Standard Specifications, FDM Section 233.10, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT. 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 and to monitor DMS messages, and toll-amount DMS, as directed by the DEPARTMENT.

The CONSULTANT shall select CCTV technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT. CCTV assemblies may include a camera lowering device (CLD), as directed by the DEPARTMENT.

Per FDM 233.6 and FDM 233.10, the position, height, and design of each camera pole shall be finalized during the design phase of the project. The maximum distance of this type of camera from the DMS sign is specified in FDM. The minimum distance from the DMS sign shall be determined by the CONSULTANT to provide full viewing of the DMS legends based on the analysis performed and approved by the District ITS office. Such analysis includes viewing angle, horizontal and vertical control determination based on the CCTV camera manufacturers that are on APL.

If required by the DEPARTMENT, 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.

Vehicle Detection Subsystem

Vehicle detection devices shall be spaced as required to meet the Project requirements (speed, volume, and occupancy detection), Standard Specifications, FDM Section 233.9, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select vehicle detection technology to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT. Detection technologies include induction loops, video imaging, microwave, thermal imaging, wireless magnetometer, and vehicle probe detection systems. In the case of the arterial management systems with a systemwide signal controlled intersections, the

CONSULTANT shall select vehicle detection technology type that is currently being used by the local maintaining agencies, if applicable.

The CONSULTANT shall be responsible for the design of a non-intrusive vehicle detection subsystem for the limited access roadway facilities, arterials and sub-arterials with signalized intersections as required by the DEPARTMENT and by local maintaining agencies and specified in the scope of services. 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 the number of location variables identified during the design phase.

Automatic Vehicle Identification (AVI) Subsystem

AVI detection devices shall be spaced as required to meet the Project requirements, Standard Specifications, FDM 233.9.5, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select AVI technology to meet the Project needs, Standard Specifications, FDM, District-specific requirements, ConOps requirements, and as approved by the DEPARTMENT.

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

Dynamic Message Sign (DMS) Subsystem

The CONSULTANT shall be responsible for the design of the DMS subsystem for the roadway facilities. Both expressway and arterial dynamic message signs (DMS) shall be located to meet the Project requirements, Standard Specifications, FDM 233.11, District-specific 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 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 CCTV 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.

Arterial Dynamic Message Sign (ADMS) Subsystems (Front Access)

ADMS shall be spaced as required to meet the Project requirements, Standard Specifications, FDM Section 233.11, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select ADMS technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The ADMS shall be placed for the purpose of Traffic Incident Management (TIM), Integrated Corridor Management (ICM), Active Arterial Management (AAM), and other applications as directed by the DEPARTMENT. ADMS on arterial roadways are to be placed at a distance from the on-ramps of the limited access facilities determined by traffic analysis of the arterial back of queue and to allow time for the motorists to read the sign messages. Communication with ADMS shall be designed so that they can be managed and maintained by the District TMC. All FDOT FDM requirements shall be met for ADMS locations. ADMS locations shall be designed in conjunction with the Project's master signing design on major widening projects. All ADMS shall include a dedicated confirmation CCTV camera that allows for visual verification of the messages posted on the DMS by a TMC Operator (if desired by the District).

Embedded Dynamic Message Signs

Embedded DMS shall be spaced as required to meet the Project requirements, Standard Specifications, FDM Section 233.11, District-specific requirements, express lanes requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select Embedded DMS technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT design shall include Embedded DMS signs when the project is part of a toll facility, part of an express lanes facility, part of a truck parking availability system, or other usage described in the ConOps, as required by the DEPARTMENT. The Embedded DMS signs are comprised of DMS panels embedded in a static sign panel. The Embedded DMS may have one or more line of text depending upon the application. Embedded DMS are to be located on the main line, express lanes, ramps, and on the crossroads as required to meet the project needs.

All Embedded DMS shall include a dedicated confirmation CCTV camera that allows for visual verification of the messages posted on the Embedded DMS by a TMC Operator (if desired by the District).

Dynamic Trailblazing Sign Subsystems (DTBS)

DTBS shall be spaced as required to meet the Project requirements, Standard Specifications, FDM, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT to support evacuation, incident management, detour management, special event traffic management, active arterial management and/or integrated corridor. If directed by the DEPARTMENT, the CONSULTANT shall develop the well-defined active traffic management detour plan.

The CONSULTANT shall select DTBS technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall design the DTBS to recommend directions of travel to motorists. The active DTBS Embedded DMS and/or blank-out signs shall be sized based on the proposed legends or cardinal directions used for the active traffic management detour plans. The DTBS shall be connected to the fiber optic network to be operated and managed at the TMC. The DTBS will be mounted on new support structure or if mounted on existing structure, the required structural analysis shall be performed for the existing structure. The size and types of dynamic and active portion of the signs shall be coordinated with the District ITS office prior to design.

Roadway Weather Information Systems (RWIS)

RWIS shall be spaced as required to meet the Project requirements, Standard Specifications, FDM 233.12.1, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select RWIS technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall develop or modify 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 from below, , as required by the DEPARTMENT::

- Fog/Smoke Detection sensor;
- Classifying Precipitation;
- Precipitation Occurrence Sensor;
- Water Film Height 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.

When required by the DEPARTMENT, the Water Film Height Sensor shall be included in the RWIS design for hydroplaning detection and to activate advance warning signs with flashing beacons. The RWIS Water Film Height Sensor shall be a fully autonomous Non-Invasive Road Weather Intelligent Sensor (NIRS) with optical principles mounted above the roadway that can measure the water film depths and temperature for the purpose of determining hydroplaning conditions and warning the motoring public. In addition, it shall communicate via 120 volts active current (VAC) Web Relay Controller with one (1) or more Flashing Beacon Warning Signs, and Fiber Optic-Based Communications to the TMC. It shall include all ancillary components required for a complete and acceptable operational system. This ITS subsystem shall be connected to the existing Department ITS and fiber optic network via a proposed new Managed Field Ethernet Switch (MFES) inside a proposed local hub. This ITS subsystem shall provide

real time data and analog outputs for roadway water film height and ice detection layer thickness and values.

Traffic Signal Data Subsystem

The Traffic Signal Data Subsystem shall be provided at locations as required to meet the Project requirements, Standard Specifications, FDM, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select Traffic Signal Data Subsystem technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall design the Traffic Signal Data Subsystem to include, as a minimum, Advance Transportation/Traffic Controllers (ATC) provided at the signalized intersections. The ATC shall include an open architecture hardware and software platform to interface with the latest network-wide supervisory Advanced Traffic Management System (ATMS) software currently being used by the local highway agencies supporting a wide variety of Intelligent Transportation Systems (ITS) applications. This includes traffic management, safety, and security.

The CONSULTANT shall design other data-related applications for the Traffic Signal Data Subsystem, as directed by the DEPARTMENT, such as for basic Connected and Automated Vehicles (CAV) elements, ramp signaling, reliable data collection and analytics using Automated Traffic Signal Performance Measures (ATSPM), and edge computing capabilities.

Connected and Automated Vehicles (CAV) Subsystems

The CAV Subsystem shall be provided at locations as required to meet the Project requirements, Standard Specifications, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select CAV Subsystem technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall develop or update CAV Subsystem Technical Special Provisions or Modified Special Provisions (MSP/TSP) for Roadside Units (RSU) and other CAV Subsystem features based upon the unique needs of the project. The CONSULTANT shall ensure that each RSU site consists of a remote processing unit (RPU), communication hardware, mounting hardware, cabling, power supply, and other site-specific components as required. The CONSULTANT shall develop RSU requirements for communication between connected vehicles and roadside equipment such as ATC, detection systems, and warning beacons that are compatible with both Cellular Vehicle to Everything (C-V2X) communication and Dedicated Short Range Communication (DSRC) national standards and protocols. The CONSULTANT shall also coordinate FCC licensing requirements for two-way real-time C-V2X communication and DSRC, depending on national standards and policies, with the DEPARTMENT's Statewide TSM&O program office. The MSP/TSP shall address

integration with the DEPARTMENT's Security Management Credential System (SCMS) requirements.

The MSP/TSP shall require RSU field equipment to be on the FDOT APL, the FDOT IPL or, as a minimum, tested at the Traffic Engineering Research Laboratory (TERL) prior to approval for use on the project. The MPS/TSP shall require RSU field equipment to be supported by the central system in the TMC and to be capable of transmitting required messages and data to and from the roadway and users via vehicle on-board units (OBU) and other mobile devices over the applicable communication schema in compliance with industry standards.

When used inside a traffic signal cabinet, the CONSULTANT shall ensure the cabinet is equipped with ATC and the RSU is connected to the signal controller, Ethernet switch, and the above ground radio, and GPS antennas.

When used on the interstate, the CONSULTANT shall develop the TSP/MSP to ensure the RSU is housed inside a corrosion-resistant enclosure that is NEMA 4X with IP66 rating, and meets the system requirements broken into the following categories:

- Power
- Environmental
- Physical
- Functional
- Performance
- Interface

Wrong-way Vehicle Detection Systems (WWVDS)

The WWVDS shall be provided at locations as required to meet the Project requirements, Standard Specifications, FDM, Traffic Engineering and Operations Bulletin 19-03, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select WWVDS technologies to meet the Project needs, ConOps requirements, Traffic Engineering and Operations Bulletin 19-03, and as approved by the DEPARTMENT.

The CONSULTANT shall select the WWVDS technology for compatibility with the District SunGuide software version and to meet the project needs. The WWVDS shall collect and process data locally prior to sending a notification to the TMC. The CONSULTANT shall design the WWVDS for remote configuration, calibration, monitoring, and diagnostic of real-time traffic activities from the TMC using the SunGuide software and software provided by the detection system vendor. The WWVDS shall perform to meet the project requirements under all environmental and traffic conditions expected for the corridor. The WWVDS shall detect wrong way drivers within the specified accuracy. Vibration and shocks shall not affect the performance of the system. The WWVDS and highlighted signs shall be hardwired for power and communications to the main controller. Design shall be in accordance with Traffic Engineering and Operations Bulletin 19-03.

Structural Health Monitoring System (SHMS) Connectivity Subsystem

The SHMS connectivity shall be provided at locations as required to meet the Project requirements, Standard Specifications, FDM, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select SHMS connectivity technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall design the SHMS connectivity subsystem which includes a fully operational ITS cabinet containing the data acquisition logger, MFES, UPS, RPMU, and all necessary surge protection devices to receive the data from various optical sensors or non-optical sensors connected to the local data acquisition enclosures installed inside the bridge arches, attached inside the girders, and the stayed cables supporting the main spans. The CONSULTANT shall coordinate with the structural and SHMS disciplines to provide for a collapsed ring topology of the communication scheme and provide for connectivity to the fiber optic network. The SHMS data shall be transmitted via the existing and proposed 10 Gigabits per second fiber optic cable plant to the designated remote operation center for monitoring by the District Bridge Operations and Maintenance.

The CONSULTANT is not responsible for the design and location of the SHMS sensors, sensor types, electrical, and data acquisition enclosures and hardware.

Ramp Signaling Subsystem (RSS)

The RSS shall be provided at locations as required to meet the Project requirements, Standard Specifications, FDM 233.12.2, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select RSS technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

The CONSULTANT shall design the Ramp Signaling Subsystem at the locations determined by the Department as part of previous traffic studies that justified the installation. The RSS shall provide the TMC the ability to remotely control the RSS via current controlling software supported by the SunGuide. The RSS shall include the following components:

- Cabinet equipment including: controller, modem, display panel, detector amplifiers, output/power distribution assembly, load switches, current monitor, flasher for warning sign beacon, ability to support continuous operation for a minimum 2 hours in the event of power loss, and report power management unit.
- Supporting infrastructure including: conduits; RSS monitoring CCTV; two-head (red and green) LED signal display; and, LED flashing beacons.
- Detection including: mainline (upstream and downstream), RSS demand and passage, and ramp queue detectors.
- Signing including: Ramp Signaled When Flashing (W3-4); One Vehicle per Green (R10-13); Two Vehicle per Green (Modified R10-13), if needed; All Vehicles Stop

- on Red; One car per Green Each Lane (R89-1); Right Lane Ends (W4-2R); Merging Traffic (W4-1)
- Pavement markings including: 12-inch-wide stop bar running from edge line to edge line and 6-inch-wide solid white centerline for a minimum distance of 250 feet upstream of the stop bar and terminated at the stop bar on two-lane metered ramps.

Truck Parking Availability System (TPAS)

The TPAS shall be designed at locations as required to meet the Project requirements, Standard Specifications, FDM, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall select TSPA Subsystem technologies to meet the Project needs, ConOps requirements, and as approved by the DEPARTMENT.

ITS Software Subsystem

The ITS Software Subsystem shall be provided as required to meet the Project requirements, Standard Specifications, FDM, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

The CONSULTANT shall develop ITS Software Subsystem requirements to meet Project needs, the ConOps, and as approved by the DEPARTMENT.

33.2 Communications Subsystem Analysis

See FDM 233.4, 233.5, and 233.8 for communication systems design requirements. The CONSULTANT shall review the existing communication files in GIS or PDF format provided by the DEPARTMENT and or the local highway agencies and create an overall communication map to summarize mapping data associated with the fiber optic conduits and cables connectivity. This provides a communication location-based intelligence for the project and will be used in the communication design. In addition, the CONSULTANT shall include high level overview of how the project corridor(s) are connected to the TMC communication network including the existing and proposed master communication hubs.

The CONSULTANT shall develop 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 and ConOps guidance. 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.

The plan must include loss budget analysis and calculations for the optical cable lengths and bandwidth. The CONSULTANT shall provide the calculations confirming the loss budgets are in conformance with allowable values established in the standard specifications. The CONSULTANT shall calculate the loss budgets based on distance, anticipated fusion splices, and connectors to ensure the cabling will work with the links intended to be used. After installation, the loss budget for the cabling is compared to the actual test results during final acceptance to ensure the cable plant is installed properly.

For major widening projects where the existing underground fiber optic communication cables and ITS sites are impacted, the CONSULTANT shall review the roadway, drainage, and TTCP plans to analyze and identify the magnitude of impact to the existing ITS infrastructure. The CONSULTANT shall prepare the Maintenance of Communication (MOC) concept that supports the final design in efforts to maintain and sustain center-to-field device connectivity and operability to the existing ITS field devices previously deployed along the project corridor. The MOC analysis shall consider and mitigate the impacts of the project's various construction phases so as to sustain center-to-field devices connectivity and operability in order to maintain operational quality as a minimum at the level provided prior to construction start and minimizing down time of the critical devices.

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).

33.3 Grounding, Surge Suppression, and Lightning Protection Analysis

The CONSULTANT shall be responsible for a complete and reliable grounding, surge suppression, and lightning protection design to provide personnel and equipment protection against faults, surge currents and lightning transients. When Standards Plans depicting air terminal device heights above poles or equipment are not available, the height of the air terminal above poles or equipment shall be determined using applicable standards. See FDM 233.3.8 for additional design requirements.

33.4 Power Subsystem

See FDM Section 233.3 for ITS Power Design Requirements. 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, diesel fuel generators, automatic transfer switches (ATS), uninterruptable power supply (UPS), electrical distribution panel, equipment

framing, reinforced concrete pad for the generator, site drainage, site security fencing and security camera (as directed by the DEPARTMENT), power command and control, Ethernet-based Modbus, and ITS Cabinet with Remote Power Management Unit (RPMU), 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

See FDM Section 233.3.6 for voltage drop design requirements. 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 of the conductor or conductors and their ohm resistance values and the required voltages from the service point to the respective ITS devices to maintain voltage drops within 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 covering electrical path from all power sources to each ITS site connected to each power source. 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:

- Quantities and engineers estimate for all applicable items on plans.
- Phase submittal checklist.
- Three-way quantity check list
- Structural calculations for all structures
- Power Design Analysis, voltage drop calculations, and load analysis calculations.
- Correspondences including utility design meeting and conflict resolutions.
- Electrical Power Service Letter of Confirmation.
- Subsurface Utility Exploration tables for each ITS support structure.

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.

The project intelligence files provided by the DEPARTMENT and researched by the CONSULTANT may include the following documents:

- Existing ITS field devices compared to the latest FDOT Standards and District requirements: device type, model, manufacturer, capabilities, condition, date installed, and historical maintenance logs. The DEPARTMENT will provide the ITS FM data, when available, to the CONSULTANT upon request.
- Condition of support structure(s), and associated mechanical brackets, and vertical hangers.
- Electrical power related to the existing demand loads, sizes of the main and branch circuit breakers for the service disconnect, underground or overhead service feeder sizes from the power company transformer to the meter base.
- Existing fiber optic allocation as a graphical display of the existing buffer tube for the ITS devices at the Managed Field Ethernet Switch points, the buffer allocated for the existing local communication hubs, given number of connections within a corridor while maintaining the maximum number of physical connection on a specific Local Area Network (LAN), and local hubs to existing master communication hubs.
- A KMZ file of the existing fiber optic pull and splice boxes, ITS devices, local hubs, power service poles with latitudes and longitudes data.
- Underground infrastructure.
- Proximity to utilities.
- Other field reconnaissance as necessary to develop a complete ITS design package.

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.

The CONSULTANT shall perform field observation of the existing traffic patterns during the normal peak hours to determine the optimal placement of DMS, ADMS, CCTV cameras, and detection sites.

The CONSULTANT shall perform lane closure analysis and determine the time periods where construction activities can be performed. The lane closure analysis shall be performed using the available traffic data.

In cases when traffic technical memorandums have been performed by others and are available through the DEPARTMENT, or available from TMC CCTV camera

surveillance sites, the CONSULTANT shall use these reports and information in lieu of performing traffic engineering and safety analysis.

The CONSULTANT shall coordinate with District's TSM&O Office for additional information regarding existing Incident Management and TMC Operational Procedures to address maintenance of ITS and post construction requirements.

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 all proposed ITS devices and electrical service points, conduits, pull boxes, conductor sizing, generators, and transformers. 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 sizing, fiber optic splicing, connections, communications hubs, etc.

33.11 ITS Poles and Overhead Structures Elevation Analysis

See FDM Section 233.6 for ITS Poles and Structures design requirements. 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.

The CONSULTANT shall coordinate with roadway, structures, and drainage disciplines to confirm that the elevations are updated during various design phases, and the ITS poles and overhead structure details are revised and designed with the correct heights, lengths, foundation depths and sizes.

33.12 DMS 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].

The DMS sign panel analysis applies to walk-in DMS, front access ADMS, and embedded Toll Amount and Status DMS and Dynamic Trail Blazing Signs. The CONSULTANT shall provide the following design information for the DMS sign design basis and fabrication:

- Pixel Pitch

- Number of display messages
- Character height
- Number of characters per line
- Character spacing
- Mechanical properties of the sign such as weight, height, width, depth, and not including the vertical hanger size and weight.

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 category information, 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 and preferences.
- Underground Infrastructure
- Proximity of other utilities
- Any other field reconnaissance as necessary to develop a complete ITS design package

33.18 Technical Meetings

The CONSULTANT shall attend meetings as necessary to 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. The CONSULTANT shall coordinate with the roadway Utility Adjustment Plan to incorporate all ITS support structural foundations symbols drawn to scale in the Utility Adjustment Plans and attend the utility design meetings conveying the information to all utility owners to preserve the location of the proposed foundations and avoid any conflicts.

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 FDM.

MUTCD

Standard Specifications, Developmental Specifications

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, ramps, railroads crossings, devices, device identification using SunGuide nomenclature, and plan sheet numbering and 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, horizontal directional drilling at critical crossings, wireless ethernet equipment for local and broadband communication, Ethernet based Blue Toad, Ramp Signaling System, RSU block diagrams, Power station site plan, Field Equipment Shelters for master hubs, electrical and communication conduit, equipment inside box girders..

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 ITS devices and cabinets, pull boxes, splice boxes, conduit runs, electrical service points, conduit, pull boxes, and conductors, and underground and overhead utilities, if applicable. Devices shall be located by station and offset as well as setback from the travel way. The CONSULTANT shall ensure the ITS sites and ground mounted cabinets locations are not in wetlands or wet drainage channels, do not interfere with protected species, meet the OSHA circle of safety from the overhead energized lines, and do not conflict with underground utilities.

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). Communication plans shall include conduit, fiber, pull and splice boxes, ITS devices, communication lateral drops, fiber connection hardware, pay items etc.

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 and prepare the Maintenance of Communication (MOC) plans. The CONSULTANT shall develop the MOC 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 MOC plans. The MOC plans shall include the notes, plan sheets, cross sections showing existing and proposed grades with the tables defining the stations limits for the conduit depths below existing and proposed grades for various construction phases.

If applicable, the CONSULTANT shall review the roadway TTCP, drainage, structures, and landscaping plans and prepare the MOC plans for each construction phase. The MOC plans shall include construction phasing notes, half cross sections depicting existing and proposed grades, roadway templates, drainage ponds, flood mitigation zones, provide tables depicting the station range, location and depth of the proposed fiber optic trunk line below existing and proposed grades. The MOC plans shall optimize the reliable field-to-center (F2C) connectivity and operability of the ITS field devices previously deployed along the project corridor. The MOC design effort shall 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.

In cases, where major alteration to the existing roadway begins in the areas where the existing ITS devices and underground communication will be impacted at the initial construction phase, the CONSULTANT shall include the permanent ITS and communication and electrical power work to be constructed in the early phase and stage of the construction to activate the devices. The notes referencing the MOC plan details shall be included in the TTCP plans alerting the CONTRACTOR and emphasizing the importance of keeping the ITS devices operational. Subsequently, the CONSULTANT shall attend the utility design and pre-construction meeting conveying the importance of the MOC and operability of the overall system. The CONSULTANT shall include the MOC plan sheets in the beginning of the ITS plans.

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 TMC(s) at *[Location]* and when applicable master communication hub(s) at *[Location]*.

Conduit paths shall be selected to provide a continuous duct system on one side of the road unless otherwise requested by the DEPARTMENT. The various components of ITS sites 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 is responsible to locate the ITS sites so they are accessible by maintenance vans.

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.

The CONSULTANT shall determine physical connection points and methods between the existing project limits to make the desired physical connection. The CONSULTANT shall determine and identify the Buffer Tube/Fiber and Ring allocation to maintain acceptable maximum number of the local intersection per ring before redundant ringing to a master communication hub and manage the transmission bandwidth. The CONSULTANT shall analyze existing and proposed fiber optic communication infrastructure for physical and logical connectivity into existing infrastructure.

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. Where the ITS site is located on viaducts and bridges, the CONSULTANT shall provide the grounding and lightning protection details in the plans and show the work that is integral to the elevated superstructure and substructure.

34.9 Cross Sections

The CONSULTANT shall prepare cross sections for all ITS devices and support structures including the ground mounted cabinets or local hubs. The cross section shall include the underground and overhead utilities with utility relocation provisions.

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 DMS, Embedded DMS, and DTBS 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. The CONSULTANT shall prepare the plan sheets depicting the electrical riser diagram and the line diagram for each location.

34.12 Strain Pole Schedule

The CONSULTANT shall incorporate the schedule detail chart for concrete or steel strain poles in the plan set. The strain pole schedule details shall include stations, offsets, the ground elevations, proposed elevations, top of foundation elevation, all attachment tie-in heights, pole length, and embedment length.

34.13 Overhead / Cantilever Sign Structure

The CONSULTANT shall be responsible for preparing the civil and structural plans of the overhead/cantilever structures, for proper installation of the DMS on the horizontal truss, viewing angle and decision site distance 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.

The details shall include stations, offsets, the existing ground elevations, proposed elevations, top of drilled shaft foundation elevation, all attachment tie-in heights, upright length, and drilled shaft embedment length. The CONSULTANT shall coordinate the design with the roadway, structural, and MSE wall disciplines and cross reference the critical information on the respective plans for installation, routing of conduits for electrical power and communication inside the substructure and superstructure, and parapets and pilasters. In segments where concrete median barrier walls are proposed, The CONSULTANT shall coordinate the design with the roadway, drainage, and structural disciplines to design the drilled shafts integral to the barrier walls and minimizing the shoulder width reduction.

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

The CONSULTANT shall be responsible for preparing the civil and structural plans when 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 decision sight distance requirement as per AASHTO Green Book, 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.

The details shall include stations, offsets, the existing ground elevations, proposed elevations, top of drilled shaft foundation elevation, all attachment tie-in heights, upright length, and drilled shaft diameter and embedment length. The CONSULTANT shall coordinate the design with the roadway, drainage, structural, and MSE wall disciplines and cross reference the critical information in the respective plans for installation, routing

of conduits for electrical power and communication inside the substructure and superstructure, bridge deck, and parapets with pilasters.

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, Embedded DMS, ADMS, DTBS location (mainline and arterial)
- Vehicle detection pole location
- CCTV camera pole location

- WWVDS sites
- Ramp Signal system sites
- RWIS locations
- RSU sites
- 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)
- Power station site equipment (Generator, Power Distribution, ITS Cabinet, Pad Mounted Transformers, power service pole)

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 review 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 review 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. 3D deliverables files for review, 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 review by the DEPARTMENT, Phase III 3D model and 3D 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 review by DEPARTMENT, the Phase IV 3D model and deliverables, 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.

Candidate Resurfacing Project Technical Scope

October 13, 2020

To: Amir Asgarinik
 From: Michael O'Donnell

RE: SR 500 (US 441) Resurfacing from Wadsworth Rd to the Lake County Line

State Road Number: 500
 Section Number: 75020-000
 County: Orange
 Project Limits: From Wadsworth Rd to the Lake County Line
 Begin MP/End MP: 21.781 to 22.865 (Length 1.084 MI)
 FM: 447610-1

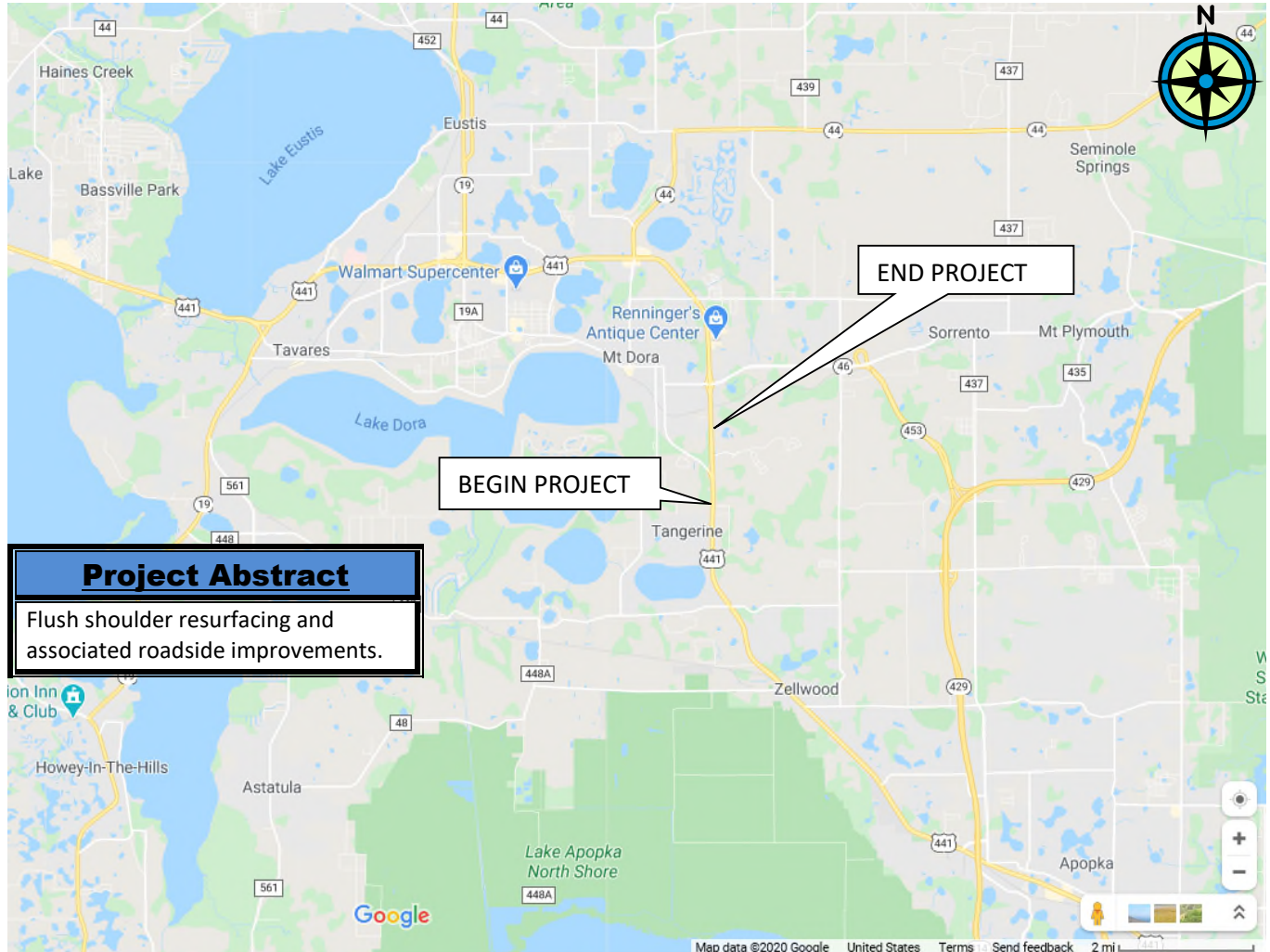
1. Existing R/W Map Project Numbers:	75020-2108 (1958); MP 22.865, 100-ft LT & RT 75020-3126 (1941); MP 21.781 to MP 22.865, 50-ft LT & RT (typ)						
2. Old Construction Project Numbers:	422003-1 (2009); MP 21.784 to MP 22.865, Mill & Resurf 413585-1 (2006); MP 7.616 to MP 21.784, Mill & Resurf 75020-3540 (1994); MP 21.782 to MP 22.865, Mill & Resurf 75020- 3525 (1983); MP 18.876 to MP 22.865, Mill & Resurf 75020-3902-910 (1975); MP 12.000 to MP 22.865, Safety Imp 75020-3108 (1959); MP 21.781 to MP 22.865, New Const						
3. Additional R/W required?	No.						
4. Level of Community Awareness Plan:	Level 3, milling and resurfacing with access management modifications.						
5. Agreements required?	Yes.						
6. Are there any bridges within the limits?	No.						
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?	This Scope has been reviewed by EMO and no concerns were noted.						
12. Existing Utilities per Sunshine One Call: 12 (SS1C/field markers/as-builts)	Bright House Networks LLC CenturyLink City of Mount Dora - Electric City of Mount Dora - Reclaimed Water City of Mount Dora - Sewer City of Mount Dora - Water Duke Energy Florida, LLC - Distribution Florida Governmental Utilities Authority - Sewer Florida Governmental Utilities Authority - Water Lake Apopka Natural Gas District TECO Peoples Gas Zayo Group, LLC						
13. Any special MOT concerns?	None.						
14. Any construction concerns?	None.						
15. Posted/Design Speed Limits: *See Typical Sections	<table border="0"> <tr> <td><u>Milepost Range</u></td> <td><u>Design Speed</u></td> <td><u>Posted Speed</u></td> </tr> <tr> <td>MP 21.781 to MP 22.865</td> <td>65 mph*</td> <td>55 mph</td> </tr> </table>	<u>Milepost Range</u>	<u>Design Speed</u>	<u>Posted Speed</u>	MP 21.781 to MP 22.865	65 mph*	55 mph
<u>Milepost Range</u>	<u>Design Speed</u>	<u>Posted Speed</u>					
MP 21.781 to MP 22.865	65 mph*	55 mph					
16. Design Criteria and Highway System:	SHS, FDM (2020), RRR						
	<table border="0"> <tr> <td><u>Milepost Range</u></td> <td><u>Context Classification</u></td> </tr> <tr> <td>MP 21.781 to MP 22.865</td> <td>C3C "Suburban Commercial"</td> </tr> </table>	<u>Milepost Range</u>	<u>Context Classification</u>	MP 21.781 to MP 22.865	C3C "Suburban Commercial"		
<u>Milepost Range</u>	<u>Context Classification</u>						
MP 21.781 to MP 22.865	C3C "Suburban Commercial"						
17. Lump Sum or Pay Item?	Pay Item.						
18. Proposed Design Schedule:	20-26 months, additional time for ERP coordination.						

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Agreements Required:

Proposed roadway lighting will require an agreement with the maintaining agency, including maintenance costs.

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 75020-000 from MP 21.781 to MP 22.865. The limits of the project match the request. Additionally, the recommendations of the "Qualitative Assessment of Intersection Operations of US 441 at CR 500A" (Study) completed by Traffic Engineering Data Solutions, Inc., dated August 2020, are to be incorporated as directed by the District Modal Development Office.

Project Description:

- Project is in northwestern Orange County, north of Apopka and south of Mount Dora, and is within the Orlando Urban Area boundary.
- SR 500 is classified as an urban principal arterial from MP 21.781 to MP 21.940 and a rural principal arterial from MP 21.940 to MP 22.865 with access classification 03. SR 500 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:

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- 238275-2: Wekiva Parkway Section 3B in Lake County to reconstruct, widen and resurface SR 500 from north of SR 46 to the Orange County Line currently under construction. Anticipated completion is Fall 2020. The FDOT Design PM is Ty Garner.
- 429356-1: SR 500 (US 441) widening and reconstruction from SR 46 to SR 44 is in the Right of Way phase with production currently scheduled for May 2021. The project is not funded for construction. The FDOT Design PM is Ty Garner.

Typical Sections:

- The Engineer is to recommend and coordinate with District staff to establish a Target Speed per FDM 202.2.1 and include Speed Management Strategies accordingly.
 - The original design speed was 65 mph which was maintained on subsequent resurfacing projects. The 65 mph design speed is outside the allowable range for the updated C3C context classification per FDM Table 201.5.1. However, the design speed is to remain per the design controls in FDM 201.5.3.
- The project includes 1 typical section;
 - 1) MP 21.781 to MP 22.865: Four 12-ft travel lanes (two per direction), 10-ft shoulders (4-ft paved), 8-ft inside shoulders (4-ft paved) separated by a 40-ft depressed grass median. No changes are proposed.
- Based on 2019 Traffic Data:

MP	TMS Site No.	AADT	T%
22.808	750642	32,500	8.7

Roadway Scope Items:

- A Pavement Condition Assessment (PCA) was completed by FDOT on June 12, 2020. The pavement is in fair condition with moderate friction course raveling, moderate longitudinal, branch and block cracking in the wheel paths, and moderate tire rim gouging. Prepare six pavement designs; 1) milling and resurfacing the travel lanes, 2) milling and resurfacing the turn lanes and median openings, 3) milling and resurfacing the shoulders, 4) pavement widening, 5) new shoulder construction, and 6) deep milling and resurfacing as recommended in the PCA to include base removal and reconstruction.
 - Pavement design Engineer of Record is to coordinate permitting requirements related to the base exposure during deep milling and resurfacing with the District Environmental Permits Office.
 - Detailing may be required for the southbound asphalt/concrete pavement interface at the begin project limit.
- Begin milling and resurfacing approximately 135-ft south of Wadsworth Rd, matching the existing pavement joints. End milling and resurfacing at the Lake County Line, matching the future existing pavement joint created by FPID: 238275-2. Limits of connecting side streets will be to the existing visible pavement joint or as shown on the Concept. Mill and resurface the travel and auxiliary lanes, paved shoulders, and all other pavement features.
- MPSV data was collected March 10, 2020 and analyzed for cross slope correction. See separate Van Data Analysis for additional information, including justification for cross slope correction of curves. Cross slope correction is recommended for this project at the following location;
 - MP 21.784 to MP 22.116: R1 and R2
- Accommodate bicycle keyholes as noted in the Multimodal Scope Items.
- The existing median curb gutter pans have been overlaid with asphalt. Include provisions for potential curb and gutter damage during milling and resurfacing.
- Loose aggregate and sediment is depositing on the paved shoulder and outside travel lane from the unpaved turnouts. Construct an additional 5-ft asphalt apron to reduce collection on the paved shoulder and bicycle facility at the following locations;
 - MP 22.065 LT
 - MP 22.521 LT
- Construct asphalt driveways to accommodate the proposed sidewalk at the following locations;
 - MP 22.566 LT (Relocated as directed by the District Design Office)
 - MP 22.581 LT
- MP 22.230 Med (CR 500A): Incorporate the recommendations of the Study as directed by the District Modal Development Office;
 - Modify the intersection to remove the eastbound CR 500A to northbound SR 500 left turn.
 - Shift the northbound SR 500 to westbound CR 500A left turn to align closer to a 90° angle.
- MP 22.292 LT (CR 500A/Shell): Remove the concrete pavement right turn lane and portion of the turnout to accommodate the proposed keyhole widening. Reconstruct full width asphalt pavement to provide a uniform

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auxiliary lane surface. Reconstruct a portion of the concrete turnout to provide a smooth transition and longitudinal profile.

- Median reconstruction is required to accommodate the proposed crosswalks and pedestrian refuges as directed by the District Modal Development Office.
 - 22.543 (SR 500)
 - 22.555 (Stoneybrook Hills Pkwy)
 - 22.564 (SR 500)

Drainage Scope Items:

- Based on field observations the existing roadside drainage system appears to be functioning properly.
- Modify the existing drainage system as required to complete proposed roadway work as shown on the Concept;
 - MP 22.063 (Chevron) RT: Remove existing side drain. Realign roadside ditch and construct new side drain to accommodate keyhole widening.
 - MP 22.230 (CR 500A) Med: Regrade median ditch, remove existing DBI and construct new DBI to accommodate turn lane modifications. Utilize existing median drain pipe.
 - MP 22.230 (CR 500A) LT: Modify existing curb inlets to accommodate lane elimination and proposed curb line shift. Ensure positive infield drainage and overbuild the pavement to remove the crown and drain to the outer shoulder gutter.
 - MP 22.360 (CR 500A/Shell) LT: Remove the existing concrete ditch pavement and side drains between the driveway turnouts. Reconstruct and realign the concrete ditch, construct two new DBIs, and pipe the roadside ditch to accommodate keyhole widening.
 - MP 22.378 (Shops at Stoneybrook Hills) RT: Remove the existing concrete ditch pavement. Regrade the existing roadside ditch, utilizing the existing structures and pipe, and provide additional DBI to accommodate keyhole widening. Adjust the manhole top in the front slope and existing DBI within the return to match the proposed grade. Backslope, limited Right of Way and elevation differential are constraints.

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, etc. to be flush with proposed sidewalk, 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 within proximity to noted utilities include roadway widening, drainage modifications, intersection lighting and pedestrian signals.

Multimodal Scope Items:

- The Engineer shall include a project-specific pedestrian/bicyclist temporary traffic control plan.

Transit

- LakeXpress bus route 4 currently services the SR 500 corridor. Coordinate stop locations, landing pads, temporary construction relocations, and other transit issues with Dave Lazerson at 352-323-5733 or dlazerson@lakecountyfl.gov during the design phase.
- Two bus stops were designated with sign-post. 2 accessible boarding and alighting areas are proposed per the FDOT Accessing Transit Design Handbook and FDM 225.2. Coordinate proposed locations with Lake Xpress and construct sidewalk connections from the proposed intersection pedestrian landings.

Bicycles

- The existing 4-ft paved outside shoulders serve as the bicycle facility through the project limits. Bicycle facilities will be provided as the paved shoulders and unmarked keyholes. The paved shoulder and keyholes in this area will not be marked per FDM 223.2.2.
- Keyhole lanes shall be provided per FDM 223.2.1.3 (pending Central Office revision). Existing total turn lane and paved shoulder widths listed below; overbuild, remove and reconstruct, or widen paved shoulders to shift the right turn lane to accommodate a 5-ft bicycle keyhole, 11-ft auxiliary lane and 6-ft shoulder (2-ft paved min).
 - MP 22.063 (Chevron) RT: 12-ft lane, no paved shoulder. Extend to meet required deceleration length.
 - MP 22.292 (CR 500A/Shell) LT: 12-ft lane (partial concrete pavement), no paved shoulder.
 - MP 22.384 (Shops at Stoneybrook Hills) RT: 12-ft lane and 6-ft paved shoulder.
 - MP 22.559 (Stoneybrook Hills Pkwy) RT: 12-ft lane and 8-ft paved shoulder.
- MP 22.174 LT: Provide a bicycle stopping area south of the physical gore where cyclists approaching from SB SR 500 can stop and cross the ramp from SB CR 500A perpendicularly to traffic. The perpendicular crossing is an alternative

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to crossing conflicting ramp traffic at high speeds. Refer to AASHTO’s bike lane yield design per the Bicycle Facility Design Guide, Exhibit 4.41 Option 2. Construct 5-ft paved shoulder on the southbound entrance ramp to provide bicycle continuity, match existing paved shoulder at approximate MP 22.211 LT.

Pedestrians

- This project includes gaps in the sidewalk connectivity, with the following missing segments identified by the District. Construction of sidewalk to fill the gap is not included in this project due to limited pedestrian generators or attractors and lack of connectivity on either end of the project.

Gap ID	Begin MP	End MP	Side	County Ranking	District Ranking	Filled
ORA 103	20.587	22.865	Both	29	147	No

- MP 22.523 to MP 22.592 LT & RT: Construct sidewalk as shown on the Concept to connect the bus stops to the proposed pedestrian crossings and existing sidewalk at Stoneybrook Hills Pkwy.

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.
 - Per the Pavement Condition Assessment (PCA) full depth milling and resurfacing may be necessary to rehabilitate the roadway and may expose the underlying base material. Coordinate permitting requirements with the pavement design Engineer of Record.
 - Environmental resource permitting (ERP) is expected due to drainage work, road widening, and full depth rehabilitation. Additional schedule time may be required.
- Complete an environmental assessment:
 - Wetlands were noted 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.
 - There are floodplains within the project limits. The current scope of work is not anticipated to impact the floodplains, however if there are any changes to the scope of work this will need to be coordinated with the FDOT Environmental Permits Office for evaluation to determine if additional documentation must be provided.
 - Records indicate that rare species or suitable habitat may exist within or near the project limits. The following species were noted as likely or potentially occurring that may require additional environmental surveys; Wood Stork, Eastern Indigo Snake, Gopher Tortoise, Sand Skink and Florida Sandhill Crane.
 - This project is within the Sand Skink Consultation Area therefore a survey will be required. Early coordination with USFWS should be performed as a time sensitive and/or seasonal survey may be required.
 - The following location has been identified as a contamination site within the project corridor. Proposed work as shown on the Concept should not interact with this site. 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 21.650 LT: DEP Site #9812903 (Castillo Property)

Structural Scope Items:

- Backplate addition is a proposed component of this Scope to meet current standards and are to be added in accordance with Traffic Engineering Manual Section 3.9 (new added section, as released in Traffic Engineering and Operations Bulletin 20-02). Flexible Retroreflective Backplates will not require structural capacity analysis.

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.
 - Project includes relocation, removal or replacement of any signs on connecting facilities. Coordinate with local agencies for acceptance and maintenance responsibilities as directed by the District Maintenance Office.

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- 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 1 signalized intersection;

MP 22.556 – Stoneybrook Hills Pkwy (Mast Arms)	
Detection	Reestablish per Smart Signal below.
Backplates	None. Add flexible retroreflective backplates, all approaches.
Left Turns	Protected only, no change.
Pedestrian Signals	None existing, provide 6 new for proposed crosswalks.
Other	Retime for proposed pedestrian crosswalks.

- The Engineer shall design the new signal detection and traffic signal controller 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.
 - Advance detection for all lanes of the intersection (including turn lanes).
 - 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 with 64 channels if it is not already of this type.
 - Provide detector channel designation details within the plans.
 - 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)
 - 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
22.808	750642, PTMS	Remove existing cabinet, site to be abandoned.

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 present at the unsignalized CR 500A intersection and is to remain.
- Intersection Lighting Retrofit per FDM 231.3.2.1. is recommended at the signalized intersection;
 - MP 22.556 (Stoneybrook Hills Pkwy)

Landscaping:

- None.

Survey Required:

- Obtain Design Survey, collecting data for the areas and locations shown on the Concept. Total survey area is 10.2 AC.
 - 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 10 Vvh’s.

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- 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.
- 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. These areas are in addition to the total survey area described above.
 - MP 21.784 to MP 22.116 RT: 1,800-ft total, 920-ft in curve

Right of Way and Mapping Scope Items:

- All Scope items are clearly within the existing Right of Way or established Easements. 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.
- Driveways are to be modified to improve pedestrian mobility as described in the Scope. Verify proposed access modifications with the Right of Way Office and coordinate relocation with the property owner as identified in the Roadway Scope Items.

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.

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 Memoranda, Exceptions and Variations.
- Design Variation Memorandum
 - Turn Lane Length- Per FDM Exhibit 212-1 the minimum turn lane length is 460-ft for 65 mph design speeds, plus 100-ft minimum queue per FDM 212.14.2 (560-ft total) for urban context classifications. The total distance (deceleration and queue) for the 55 mph posted speed is 450-ft. The following turn lanes do not meet length requirements for the design speed and are to remain:
 - MP 21.811 Med (Wadsworth Rd) SB: 420-ft provided
 - MP 22.077 Med (Chevron) SB: 440-ft provided
 - MP 22.306 RT (Shell) SB: 300-ft provided
 - MP 22.541 LT (Stoneybrook Hills Pkwy) NB: 520-ft provided, shortened to accommodate pedestrian crosswalk.
 - MP 22.541 RT (Stoneybrook Hills Pkwy) NB: 415-ft provided, shortened to accommodate pedestrian crosswalk.
 - MP 22.564 LT (Stoneybrook Hills Pkwy) SB: 530-ft provided, shortened to accommodate pedestrian crosswalk.
 - MP 22.852 Med NB: 435-ft provided
 - The following median openings have no deceleration length and are to remain.
 - MP 21.785 (Wadsworth Rd) NB
 - MP 21.940 NB/SB
 - MP 22.077 NB
 - MP 22.710 NB/SB
 - Access Management- Per FDM Table 201.4.2, full median opening spacing is 2,640-ft and directional spacing is 1,320-ft for access classification 03 facilities. The following median openings do not meet spacing requirements and are to remain. Access management analysis and modifications are not a component of this project:
 - MP 21.679 (Dudley Ave) to MP 21.805 (Wadsworth Rd): 670-ft provided (full)
 - MP 21.805 (Wadsworth Rd) to MP 21.933: 675-ft provided (full)
 - MP 21.933 to MP 22.066 (Chevron): 700-ft provided (full)
 - MP 22.066 (Chevron) to MP 22.235 (CR 500A): 895-ft provided (full)
 - MP 22.235 (CR 500A) to MP 22.556 (Stoneybrook Hills Pkwy): 1,695-ft provided (full)
 - If the Study is implemented, pending public hearing, this median opening will become directional and the median opening will no longer require documentation as it will meet the 1,320-ft requirement.

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- MP 22.556 (Stoneybrook Hills Pkwy) to MP 22.709: 810-ft provided (full)
- MP 22.709 to MP 22.861: 800-ft provided (full)
- Length of Vertical Curve- Per FDM Table 210.10.4 the minimum vertical curve length with a design speed of 65 mph is 350-ft in a Sag and 450-ft in a Crest. The following vertical curves do not meet the minimum vertical curve length but do meet k value criteria and are to remain. There is no apparent crash history attributable to the deficient curve lengths;
 - PI MP 22.644: 300-ft provided (Sag), K= 214, 157 required. Exceeds 250-ft minimum for 55 mph posted speed.
 - PI MP 22.865: 200-ft provided (Crest), K= 326, 193 required (RRR)
- Design Variation
 - None.
- Design Exception
 - None.

Candidate Project Development Considerations (items not to be included in final design):

- Existing extended turn lane entrance tapers are to remain.
- Per FDM 201.5.3 a Design Variation is not required when the design speed or posted speed is not within the allowable range provided in Table 201.5.1. The design speed range for the provided C3C context classification is 35-55 mph. The current design and posted speeds are 65 and 55 mph respectively. The Scope included the development of a Target Speed by the Engineer.
- Erosion outside the Right of Way at the Shops at Stoneybrook Hills is to be addressed by the property owner based on apparent historical drainage patterns and available site development plans. No work is to be included in this project.
- Leesburg Operations requested extension of milling along CR 500A for the limits of FDOT ownership. Records could not be located that define transfer of CR 500A in Orange County, however the Lake County portion was transferred in 1989 and Orange County is assumed to be similar.