

EXHIBIT A



SCOPE OF SERVICES

FOR

CONTINUING SERVICES PUSH BUTTON FOR DESIGN

FINANCIAL PROJECT ID(S). 443574-1-32-02

DISTRICT ONE

DISTRICTWIDE

FPID No.443574-1-32-02

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SCOPE OF SERVICES FOR CONSULTING ENGINEERING SERVICES

DISTRICT WIDE PUSH BUTTON ROADWAY AND SIGNAL 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 N/A (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: 443574-1-32-02

Federal Aid Project No.: To be determined on a project specific basis

County Section No.: To be determined on a project specific basis

Description: Continuing Services Push Button for Design

Bridge No(s).: To be determined on a project specific basis

Rail Road Crossing No: To be determined on a project specific basis

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 groups include: 3.1: Minor Highway Design

7.1: Signing, Pavement Marking and Channelization

7.3: Signalization

Minor work groups include: 4.1.1: Miscellaneous Structures

4.1.2: Minor Bridge Design

6.3.1 ITS Analysis and Design

7.2 Lighting

8.1: Control Surveying

8.2: Design, Right-of-way, Construction Surveying

9.1: Soil Exploration

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9.2: Geotechnical Classification Lab Testing

15: Landscape Architect

Known alternative construction contracting methods include: To be determined on a project specific basis.

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 (FDM, Traffic Engineering Manual (TEM), Standard Plans, Speed Zoning Manual, MUTCD, 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

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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 Environmental (PD&E) study, the CONSULTANT shall use the approved concepts as a basis for the design unless otherwise directed by the DEPARTMENT.

Consultant Services are required for miscellaneous engineering tasks necessary for production of construction plans for minor design, preliminary concept design, widening and resurfacing projects. Elements of work may include field survey, geotechnical investigations, roadway analysis and design, drainage analysis and design, intersection analysis and design, signing and pavement marking analysis and design, signalization analysis and design, lighting analysis and design, utility relocation and coordination, temporary traffic control plan analysis and design, environmental permitting, intelligent transportation systems analysis and design, quantity computations, and other incidental items as required.

This contract is a Task Work Order (TWO) based contract. Projects will be assigned by TWO. Specific project descriptions and requirements will be defined in the TWO.

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

Public Involvement: Not applicable to this project.

Other Agency Presentations/Meetings: To be determined on a project specific basis.

Utility Work by Highway Agreement(s): To be determined on a project specific basis.

Specification Package Preparation: To be determined on a project specific basis.

Value Engineering: Not applicable to this project.

Risk Assessment Workshop: Not applicable to this project.

Plan Type: To be determined on a project specific basis.

Typical Section: To be determined on a project specific basis.

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Pavement Design: To be determined on a project specific basis.

Pavement Type Selection Report(s): Not applicable for this project.

Cross Slope: To be determined on a project specific basis.

Access Management Classification: To be determined on a project specific basis.

Transit Route Features: To be determined on a project specific basis.

Major Intersections/Interchanges: To be determined on a project specific basis.

Roadway Alternative Analysis: To be determined on a project specific basis.

Level of TCP Plans: To be determined on a project specific basis.

Temporary Lighting: To be determined on a project specific basis.

Temporary Signals: To be determined on a project specific basis.

Temporary Drainage: To be determined on a project specific basis.

Design Variations/Exceptions: To be determined on a project specific basis.

Back of Sidewalk Profiles: To be determined on a project specific basis.

2.2 Drainage (Activities 6a and 6b)

System Type: To be determined on a project specific basis.

2.3 Utilities Coordination (Activity 7)

Utility coordination will be provided by the CONSULTANT.

2.4 Environmental Permits, Compliances, and Clearances (Activity 8) (To be determined on a project specific basis.)

Permits will be obtained by the DEPARTMENT. The CONSULTANT shall provide permitting support with the preparation of plans, sketches, calculations etc. as required by the DEPARTMENT.

Mitigation activities shall be coordinated with the District Environmental Permitting Engineer.

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

2.5 Structures (Activities 9 – 18) (To be determined on a project specific basis.)

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Bridge(s): To be determined on a project specific basis.

Type of Bridge Structure Work:

- **BDR**
- **Temporary Bridge**
- **Short Span Concrete**
-

Retaining Walls: To be determined on a project specific basis.

Noise Barrier Walls: To be determined on a project specific basis.

Miscellaneous: To be determined on a project specific basis.

- 2.6 **Signing and Pavement Markings (Activities 19 & 20)** (To be determined on a project specific basis.)

The CONSULTANT shall prepare signing and pavement marking plans in accordance with DEPARTMENT policies and procedures.

- 2.7 **Signalization (Activities 21 & 22)** (To be determined on a project specific basis.)

The CONSULTANT shall prepare signalization plans in accordance with DEPARTMENT policies and procedures.

Intersections: To be determined on a project specific basis.

Traffic Data Collection: To be determined on a project specific basis.

Traffic Studies: To be determined on a project specific basis.

Count Stations: To be determined on a project specific basis.

Traffic Monitoring Sites: To be determined on a project specific basis.

- 2.8 **Lighting (Activities 23 & 24)** (To be determined on a project specific basis.)

The CONSULTANT shall prepare a Lighting Justification Report (LJR) to determine if highway lighting is justified. If lighting is justified, the CONSULTANT shall prepare lighting plans in accordance with DEPARTMENT criteria.

All roadway sections that currently have street lights shall retain street lighting within the same limits. All signalized intersections shall have street lighting in accordance with DEPARTMENT criteria/guidelines regardless of the LJR recommendation.

- 2.9 **Landscape Architecture (Activities 25 & 26)** (To be determined on a project specific basis.)

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Include coordination with existing and/or proposed underground utilities including but not limited to FDOT lighting, drainage and 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.

2.10 Survey (Activity 27) (To be determined on a project specific basis.)

The DEPARTMENT will provide on a project specific basis.

Design Survey: The CONSULTANT shall provide a design survey through the project limits.

Subsurface Utility Exploration: (Not applicable)

Right of Way Survey: To be determined on a project specific basis.

2.11 Photogrammetry (Activity 28) (Not applicable to this project.)

2.12 Mapping (Activity 29) (Not applicable to this project.)

2.13 Terrestrial Mobile LiDAR (Activity 30) (Not applicable to this project.)

2.14 Architecture (Activity 31) (Not applicable to this project.)

2.15 Noise Barriers (Activity 32) (Not applicable to this project.)

2.16 Intelligent Transportation Systems (Activities 33 & 34) (To be determined on a project specific basis.)

When FDOT owned Intelligent Transportation Systems (ITS) infrastructure is determined to be located within the project limits, the CONSULTANT shall analyze all potential impacts to the ITS infrastructure. If any of the FDOT owned ITS infrastructure will be impacted, the CONSULTANT shall prepare ITS plans for the adjustment/relocation/replacement of the ITS infrastructure.

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 the 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

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Traceability Verification Matrix (RTVM) and others as deemed necessary by the Department.

The ITS shall operate from the TMC location and operating software to be determined on a project specific basis.

Interchanges: To be determined on a project specific basis.

Traffic Data Collection: To be determined on a project specific basis.

Geographical Information System (GIS) Requirements: To be determined on a project specific basis.

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 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 and/or local agency TMC facilities.

The CONSULTANT shall ensure that all ITS field devices and ancillary components comply with the FDOT's Approved Product List (APL) 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

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Documents.

2.17 *Geotechnical (Activity 35) (To be determined on a project specific basis.)*

Geotechnical services will typically be provided by the DEPARTMENT.

2.18 *Project Schedule*

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall meet with the DEPARTMENT for a Project Schedule Definition Meeting, for the purpose of providing 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 Department's production date at the time a TWO is issued. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a two week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals and project deliverables.

All fees and price proposals are to be based on the negotiated schedule determined for each project for final construction contract documents. However, the contract deadline is 60 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.

Throughout the course of production, unless directed otherwise by the DEPARTMENT, the CONSULTANT shall meet all Project Schedule Early-Start dates and Early-Finish dates for each project schedule activity

The CONSULTANT shall maintain and update the Project Schedule by providing Project Schedule Activity Updates to the DEPARTMENT within one (1) work day after the occurrence of any of the following events:

Activity Start Date

Activity Finish Date

Expected Finish Date Change – For any activity in progress, if and when the Expected Finish Date changes from the original schedule the CONSULTANT

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shall provide an updated Expected Finish Date for that activity.

Project schedule updates shall be provided electronically utilizing the DEPARTMENT provided update system. In the event the DEPARTMENT's system is not available, the CONSULTANT shall email the update to the DEPARTMENT Project Scheduler and copy the DEPARTMENT Project Manager. Updates as described above shall be required for all Project Schedule activities for which the CONSULTANT has been delegated responsibility. If any finish dates do not meet the original agreed upon early-finish dates in the baseline project schedule, the CONSULTANT will show how this time will be made up in the CONSULTANT successor activities. Upon the DEPARTMENT's approval of the CONSULTANT's requested changes to the schedule, a new baseline schedule will be approved.

2.19 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.

One (1) week prior to each Phase Plans document submittal, the CONSULTANT shall submit, for the DEPARTMENT Project Manager's review and approval, electronic Phase Plans document submittal. The CONSULTANT shall not submit the remaining electronic Phase Plans document submittal to the DEPARTMENT until the DEPARTMENT Project Manager provides written approval to submit the remaining copies of the Phase Plans document submittal.

Each CONSULTANT document submittal shall be accompanied by a completed Quality Control Checklist form indicating the document submittal items that have been checked and back-checked, and shall be signed by the Project Manager, Quality Control Checker, and the Quality Control Back-checker. Each SUBCONSULTANT document submittal shall be checked by a Quality Control Independent Peer Review by the CONSULTANT. The Project Manager and the responsible Professional Engineer, Landscape Architect, or Professional Surveyor that performed the Quality Control Peer Review will sign a statement certifying that the review was conducted. All of the above documents will be provided to the DEPARTMENT in electronic format and a pdf file format.

For each Plans Phase submittal, the electronic submittal shall be provided on a CD or DVD in a format to be provided by or approved by the DEPARTMENT. This CD or DVD shall contain not only all of the electronic design files for each Plans Phase submittal, it shall also contain all of the document pdf files for each document submittal to the DEPARTMENT to date, to include the above mentioned Quality Control Certification and Checklist forms, in a format to be provided or approved by the DEPARTMENT. The submittal CD or DVD should contain the following information:

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- Current Submittal
- Previous Submittals
- Contract Documents
- Project Management
 - Field Reviews & Photos
 - Meeting Minutes
 - Progress Reports

Prior to each Phase Plans or document submittal, the CONSULTANT shall verify with the DEPARTMENT Project Manager the number of CD's / DVD's required.

For all other submittals, the CONSULTANT shall provide the electronic file(s) to the DEPARTMENT as an email file attachment, or if file size does not allow, either the DEPARTMENT File Transfer Appliance or the FDOT FTP system.

2.20 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.), Minimum Technical Standards 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*

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- *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 Transportation Technology Geographic Information Systems (GIS) Manual*
 - *FDOT Standard Plans*
 - *FDOT Flexible Pavement Design Manual*
- *FDOT – Manual On Intersection Control Evaluation (ICE)*
 - *FDOT Specification Package Preparation Procedure*
 - *FDOT Instructions for Design Standards*
 - *FDOT Instructions for Structures Related Design Standards*
- *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 (FDM)*
 - *FDOT Procedures and Policies*
- *FDOT Project Development and Environmental 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*
- *Federal Highway Administration (FHWA) - Manual on Uniform Traffic Control Devices (MUTCD)*
- *FHWA – National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide*
- *FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook*
- *Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 2005*
 - *Florida Statutes (F.S.)*
- *Florida’s Level of Service Standards and Guidelines Manual for Planning*
 - *Model Guide Specifications – Asbestos Abatement and Management in Buildings, National Institute for Building Sciences (NIBS)*
 - *Quality Assurance Guidelines*
 - *Safety Standards*
- *Speed Zoning for Highways, Roads, and Streets in Florida Manual*
 - *Any special instructions from the DEPARTMENT*
 - *Roadway*
 - *FDOT - Project Traffic Forecasting Handbook*

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- *FDOT - Quality/Level of Service Handbook*
- *Florida's Level of Service Standards and Highway Capacity Analysis for the SHS*
- *Transportation Research Board (TRB) - Highway Capacity Manual*
 - *Permits*
 - *Chapter 373, F.S. – Water Resources*
 - *US Fish and Wildlife Service Endangered Species Programs*
- *Florida Fish and Wildlife Conservation Commission Protected Wildlife Permits*
- *Bridge Permit Application Guide, COMDTPUB P16591.3C*
 - *Building Permit*
 - *Drainage*
 - *FDOT Bridge Hydraulics Handbook*
 - *FDOT Culvert Handbook*
 - *FDOT Drainage Manual*
 - *FDOT Erosion and Sediment Control Manual*
 - *FDOT Exfiltration Handbook*
 - *FDOT Hydrology Handbook*
 - *FDOT Open Channel Handbook*
 - *FDOT Optional Pipe Materials Handbook*
 - *FDOT Storm Drain Handbook*
 - *FDOT Stormwater Management Facility Handbook*
 - *FDOT Temporary Drainage Handbook*
 - *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*
 - *Minimum Specifications for Traffic Control Signal Devices*
 - *National Electric Safety Code*

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- *National Electrical Code*
 - *Florida's Turnpike Enterprise*
- *Florida's Turnpike Plans Preparation and Practices Handbook (TPPPH)*
 - *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 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*

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Standards for Nursery Plants

- *Architectural*
 - *Building Codes*
 - *Florida Building Code:*
 - *Building*
 - *Fuel Gas*
 - *Mechanical*
 - *Plumbing*
 - *Existing Building*
 - *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)*
 - *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*

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- 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

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- *LEED (Leadership in Energy and Environmental Design) Green Building Rating System*
 - *National Concrete Masonry Association*
 - *National Electrical Code*
 - *Portland Cement Association - Concrete Masonry Handbook*
 - *United State Green Building Council (USGBC)*
- 2.21 *Services to be Performed by the DEPARTMENT When appropriate and /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.*
 - *Existing right of way maps.*
 - *Existing cross slope data for all RRR projects.*
 - *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*

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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.*

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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 35 (Geotechnical). 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 shall be responsible for producing a construction cost estimate and reviewing and updating the cost estimate at a minimum of two (2) times per year and/or when scope changes occur and/or at milestones of the project. Prior to Phase II plans and completion of quantities, the DEPARTMENT's Long Range Estimate (L.R.E.) system will be used to produce a conceptual estimate, according to District policy.*

*Once the quantities have been developed (beginning at Phase II plans) the CONSULTANT shall be responsible for inputting the pay items and quantities into TRNS*PORT PES (Proposal Estimating System) through the use of the DEPARTMENT's Designer Interface for generating the summary of quantities and the FDOT's in-house estimates. A Summary of Pay Items sheet shall be prepared with all required Phase II, III, and IV Plans submittals.*

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 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 Specifications Office to be included in the project's specifications package.

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 Specifications Package Preparation Procedure. 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

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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.

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 (FDM), and Standard Plans, 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 each project assigned under this contract. The CONSULTANT shall submit a Quality Control Plan for approval within twenty (20) business days of the executed TWO and it shall be signed by the CONSULTANT's Project

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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, 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 FDOT Design Manual (FDM0, Standard Plans and 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. The CONSULTANT shall coordinate with other segments within the corridor to establish design consistency within the corridor.

Communication: The default method of communication with the DEPARTMENT for the

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project is eMail. The CONSULTANT shall use the phone and/or letters for communication with the DEPARTMENT only for urgent and/or sensitive issues, or issues that cannot be efficiently communicated by eMail.

All eMails sent by the CONSULTANT to the DEPARTMENT shall conform to the following subject line format: FPID: 999999-1 \ Description \ County – Subject.

The CONSULTANT shall provide, within one (1) work day, an eMail response to each eMail request for services and/or information received from the DEPARTMENT, and shall include in that response an acknowledgment of receipt, understanding of the request, and an estimated time for delivery for the services and/or information requested. Whenever possible, the CONSULTANT shall provide a response to the eMail request for services from the DEPARTMENT using the option “Reply with History – To All Copied”.

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 (To be determined on a project specific basis.)

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 (i.e., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least five (5) business days prior to printing and / or distribution or as determined in the TWO.

3.1.1 Community Awareness Plan (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

In addition to public involvement data collection, the CONSULTANT shall assist

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the DEPARTMENT or prepare notifications, flyers, and/or letters to elected officials and other public officials, private property owners, and tenants at intervals during plans production as identified by the DEPARTMENT. All letters and notices shall be reviewed by the DEPARTMENT to ensure that they are addressed to the correct and current public officials. Property Owner Notification Letters shall be sent via certified mail. The Property Owner Notification letters should be mailed within 10 business days of receiving the Notice to Proceed and mailed at least 10 business days prior to any field work beginning.

3.1.3 *Preparing Mailing Lists* (To be determined on a project specific basis.)

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. The CONSULTANT shall submit a Property Owner Identification Map and corresponding Map Identification List in a format to be provided by or approved by the DEPARTMENT prior to distribution of any property owner notifications.

3.1.4 *Median Modification Letters* (To be determined on a project specific basis.)

3.1.5 *Driveway Modification Letters* (To be determined on a project specific basis.)

3.1.6 *Newsletters* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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

3.1.8 *PowerPoint Presentations* (To be determined on a project specific basis.)

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

3.1.9 *Public Meeting Preparations* (To be determined on a project specific basis.)

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 or CONSULTANT will pay all costs for meeting site rents and insurance as determined in the TWO. No DEPARTMENT meetings will be held on public school system properties.

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FPID No.443574-1-32-02**3.1.10 Public Meeting Attendance and Follow-up (To be determined on a project specific basis.)**

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.

The number of public meetings during design will be determined on a project specific basis.

3.1.11 Other Agency Meetings (To be determined on a project specific basis.)

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. The number of public agency meetings will be determined on a project specific basis.

3.1.12 Web Site (To be determined on a project specific basis.)

The CONSULTANT will create project web pages for this project. These pages will have a distinct address on the District One website: www.swflroads.com. The project pages will be coordinated through the District's web developer. Based upon the DEPARTMENT's template, the web pages will allow for input via email links, provide meeting information, and report summaries will be available for viewing and downloading. Limited graphics will be available due to the size and downloading time for many graphical applications. The CONSULTANT shall coordinate with the District's web developer to update the web pages monthly.

The web site should contain a minimum of the following six pages:

- *Home Page (facts page) – The facts page will be a brief synopsis of the project and graphics depicting the projects location. Key information will be posted on this page, including but not limited to: FDOT District, Design Start Date, Estimate Completion Date, Estimated Project Cost, Lengths and Limits, DEPARTMENT's Project Manager and contact information, CONSULTANT's Project Manager and contact information, etc.*
- *Project Overview – The project overview page will contain an overview of the project with more detail than the facts page, a Consistency with Transportation Plan Goals and Objectives description, and the need and/or*

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purpose for the project.

- *Project Development – The project development page will contain information detailing the Florida Department of Transportation project development process. This page should describe the Planning, PD&E Study, Design, Right-of-Way Acquisition Process, and Construction Process specific to the project.*
- *Public Involvement – The public involvement page will contain a general overview of proposed meetings including: public information meetings, public workshops, public hearings, and any other meetings the DEPARTMENT deems necessary to add to the page. The page should also contain an area where site viewers may enter their name and address (both shall be mandatory inputs) to be added to the project mailing list. The DEPARTMENT's project managers contact information, including email address, mailing address, telephone number, and fax number shall be included on this page.*
- *Project Schedule – The project schedule page should contain a brief generalization of the of the project milestones. The CONSULTANT shall display milestones as approved by the DEPARTMENT. Milestones should be shown by seasons of the year.*

Project Photos – The project photos page will include a selection of photographs obtained from the project area. Each photograph should include a brief description noting the location, direction, and/or any other important details contained within the picture. The photograph page can be in the form of an index, slideshow, or map with hyperlinked photograph locations.

3.2 Utility Work by Highway Agreement(s): (To be determined on a project specific basis.)

When the Utility Work by Highway Agreement deliverable is not prepared by the CONSULTANT, services may include all coordination, meetings, etc., required to ensure compatibility, include Utility Work by Highway Agreement documents in the contract plans package and include the Utility Work by Highway Agreement documents in the digital delivery package.

3.3 Specifications Package Preparation (To be determined on a project specific basis.)

The CONSULTANT shall prepare and provide a specifications package in accordance with the DEPARTMENT'S Specification Package Preparation Procedure and associated training. 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

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Web application. The CONSULTANT shall be able to document that the procedure defined in the Specification Package Preparation Procedure 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.

3.4 *Contract Maintenance and Electronic Document Management System (EDMS)*

Contract maintenance includes project management effort for complete setup and maintenance of files, developing monthly progress reports, schedule updates, work effort to develop and execute subconsultant agreements, etc.

3.5 *Value Engineering (Multi-Discipline Team) Review (Not applicable to this project.)*

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 (To be determined on a project specific basis.)*

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 TWO 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 at a later date as

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necessary as a separate TWO.

Post Design Services are not intended for instances of CONSULTANT errors and/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 (Not applicable to this project.)

3.11 Railroad, Transit and/or Airport Coordination (To be determined on a project specific basis.)

3.12 Other Project General Tasks (To be determined on a project specific basis.)

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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 (To be determined on a project specific basis.)

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

4.2 Pavement Type Selection Report (Not applicable for this project.)

4.3 Pavement Design Package (To be determined on a project specific basis.)

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

4.4 Cross-Slope Correction (To be determined on a project specific basis.)

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

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The CONSULTANT shall design the geometrics using the design standards 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, pedestrian and bicycle concerns, ADA requirements, elder road user policy, 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, and shall review Utility Work Schedules.

4.6 Access Management (To be determined on a project specific basis.)

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 in the Intersection Analysis Report as described below and 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.

The consultant shall use the 8-hour turning movement counts obtained during the PD&E study. Turning movement counts would have been conducted at all unsignalized median openings, side streets, commercial and/or any large traffic generating driveways such as sub-division entrances (excluding single family residences). If turning movement counts are not available or are not up to date as determined by the DEPARTMENT, than updated 8-hour turning movement counts shall be obtained by the CONSULTANT for this project.

The Consultant shall review existing and design year traffic conditions to determine if the proposed median plan can adequately accommodate existing and design year traffic needs. Additionally, median openings shall be recommended at locations that will improve safety and operational characteristics of the State roadway.

The Consultant shall make recommendations for right turn lanes within the project limits based upon the warranting volumes and conditions outlined in the Department's Driveway Information Handbook.

The Consultant shall make recommendations for left turn lane storage lengths at intersections including queue, braking distance, and taper length. The queue length shall be identified separate from the total storage length. Left turn lanes at unsignalized intersections may be recommended using HCS or Synchro software. A 100 foot minimum queue in urban/suburban areas or 50 foot queue in rural areas should be used.

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The Consultant shall review truck traffic data and existing land uses along the project corridor to determine if additional pavement (bulb out) areas are needed to accommodate u-turns. Auto turn analysis shall be provided.

The turning movement counts, traffic analysis, and recommendations for the Access Management plan shall be provided to the Department in an Intersection Analysis Report. The Intersection Analysis Report shall be provided to the Access Management, Signals, and Intermodal Systems Development Departments for review in paper form. An electronic copy of the Intersection Analysis Report shall be provided to the Design Project Manager in order for it to be loaded into the ERC.

Prior to completion of the Intersection Analysis Report an Access Management Kick-Off meeting shall be held to discuss the proposed recommendations.

The CONSULTANT shall submit a Driveway Summary Matrix in a format to be provided by or approved by the DEPARTMENT.

4.7 Roundabout Evaluation (To be determined on a project specific basis.)

The CONSULTANT shall analyze and document Roundabout Evaluation Tasks in accordance with the Manual on Intersection Control Evaluation (ICE) and all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

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

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

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

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

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The CONSULTANT shall finalize the design of the roundabout in accordance with the Manual on Intersection Control Evaluation (ICE), and all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums.

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

4.9 Cross Section Design Files (To be determined on a project specific basis.)

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

4.10 Traffic Control Analysis (To be determined on a project specific basis.)

The CONSULTANT shall design a safe and effective Traffic Control Plan 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, 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 Utility Work by Highway Agreement(s).

The CONSULTANT shall investigate the need for temporary traffic signals, temporary lighting, alternate detour roads, 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 Traffic Control Plan, 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 Traffic Control Plan 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

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and other eventualities. CONSULTANT shall be responsible to obtain local authorities permission for use of detour routes not on state highways.

4.11 Master TCP Design Files (To be determined on a project specific basis.)

The CONSULTANT shall develop master Traffic Control Plan (TCP) files (for Level II and Level III only) showing each phase of the Traffic Control Plan.

4.12 Design Variations and Exceptions (To be determined on a project specific basis.)

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

4.13 Design Report (To be determined on a project specific basis.)

The CONSULTANT shall prepare all applicable report(s) as listed in the Project Description section of this scope.

The CONSULTANT shall submit to the DEPARTMENT design notes, data, and calculations to document the design conclusions reached during the development of the contract plans.

The design notes, data, and computations shall be recorded on size 8½"x11" sheets, fully titled, numbered, dated, indexed and signed by the designer and the checker. Computer output forms and other oversized sheets shall be 8½"x11" size. The data shall be submitted in electronic format to the DEPARTMENT.

4.14 Quantities

The CONSULTANT shall develop accurate quantities and the supporting documentation, including construction days when required.

4.15 Cost Estimate

4.16 Technical Special Provisions (To be determined on a project specific basis.)

4.17 Other Roadway Analyses (To be determined on a project specific basis.)

4.18 Field Reviews

The CONSULTANT should be aware that Water Management District permit reviewers routinely request survey information up to 100-ft outside of the right-of-way line. The CONSULTANT shall be prepared to provide this information through means other than additional field survey work (i.e. either aerial contour maps or LiDar topography, where available).

FPID No.443574-1-32-02**4.19 Protection of Existing Structures**

The CONSULTANT shall perform field reviews to identify existing structures within the project limits which may require settlement, vibration or groundwater monitoring by the contractor during construction. The CONSULTANT shall identify the necessary pay items to be included in the bid documents for the Protection of Existing Structures.

The CONSULTANT shall identify any existing structures beyond the limits described in Section 108 of the Standard Specifications which may require settlement, vibration or groundwater monitoring by the contractor during construction. Any identified structures shall be summarized and submitted to the DEPARTMENT for approval prior to being shown on the contract plans.

The list of structures identified for protection is provided in the plans for informational purposes for contractor bidding. The contractor is responsible for the construction methods and protection of all structures. The CONSULTANT shall be responsible only for identifying necessary pay items and coordinating with the DEPARTMENT to identify a list of additional structures which may require settlement, vibration or groundwater monitoring.

4.20 Technical Meetings (To be determined on a project specific basis.)

4.21 Quality Assurance/Quality Control: *The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*

4.22 Independent Peer Review (To be determined on a project specific basis.)**4.23 Supervision****4.24 Coordination**

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5 ROADWAY PLANS

The CONSULTANT shall prepare Roadway, Traffic Control, 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 Summary of Pay Items Including Quantity Input

5.3 Typical Section Sheets

5.3.1 Typical Sections

5.3.2 Typical Section Details

5.4 General Notes/Pay Item Notes

5.5 Summary of Quantities Sheets

5.6 Project Layout (To be determined on a project specific basis.)

5.7 Plan/Profile Sheet (To be determined on a project specific basis.)

5.8 Profile Sheet (To be determined on a project specific basis.)

5.9 Plan Sheet (To be determined on a project specific basis.)

5.10 Special Profile (To be determined on a project specific basis.)

5.11 Back-of-Sidewalk Profile Sheet (To be determined on a project specific basis.)

5.12 Interchange Layout Sheet (To be determined on a project specific basis.)

5.13 Ramp Terminal Details (Plan View) (To be determined on a project specific basis.)

5.14 Intersection Layout Details (To be determined on a project specific basis.)

5.15 Special Details (To be determined on a project specific basis.)

5.16 Cross-Section Pattern Sheet(s) (To be determined on a project specific basis.)

5.17 Roadway Soil Survey Sheet(s) (To be determined on a project specific basis.)

5.18 Cross Sections (To be determined on a project specific basis.)

5.19 Temporary Traffic Control Plan Sheets (To be determined on a project specific

5 ROADWAY PLANS

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basis.)

5.20 *Temporary Traffic Control Cross Section Sheets* (To be determined on a project specific basis.)

5.21 *Temporary Traffic Control Detail Sheets*(To be determined on a project specific basis.)

5.22 *Utility Adjustment Sheets* (To be determined on a project specific basis.)

5.23 *Selective Clearing and Grubbing Sheet(s)* (To be determined on a project specific basis.)

5.24 *Project Network Control Sheet(s)*

5.25 *Environmental Detail Sheets*(To be determined on a project specific basis.)

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.

5.26 *Utility Verification Sheet(s) (SUE Data)*

5.27 *Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*

5.28 *Supervision*

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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 and Stormwater Management Facility Handbook.

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 (To be determined on a project specific basis.)

Accurately delineate drainage basin boundaries to be used in defining the system hydrology. Basin delineation shall incorporate existing survey and/or LiDAR and shall be supplemented, as necessary, with other appropriate data sources (such as permitted site plans) and field observations. Basin delineations shall also include any existing collection systems in a logical manner to aid in the development of the hydraulic model. Prepare the Drainage Maps in accordance with the Standard Plans, FDOT Design Manual (FDM), and all other pertinent manuals.

6a.2 Base Clearance Report (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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

If applicable, this report shall also address the potential for regional stormwater management alternatives. Additional stormwater management strategies shall be identified within the adjoining project watersheds that can serve as permissible alternatives as compared to traditional stormwater ponds. The design approach should consider, at a minimum, two (2) adjoining roadway basins in an attempt to minimize the number of stormwater ponds while accomplishing the environmental

6a DRAINAGE ANALYSIS

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permitting needs for this roadway project.

Concurrent to the submittal of the Pond Siting Report, the CONSULTANT shall provide an electronic copy of the report that does not include any right-of-way cost estimates.

6a.4 *Design of Cross Drains (To be determined on a project specific basis.)*

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 (To be determined on a project specific basis.)*

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) (To be determined on a project specific basis.)*

Design stormwater management facilities to meet requirements for stormwater quality treatment and attenuation. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tie-ins, etc.), perform routing, pollutant 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 Ditch as Linear Pond) (To be determined on a project specific basis.)*

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

6a.8 *Design of Floodplain Compensation (To be determined on a project specific basis.)*

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 (To be determined on a project specific basis.)*

Develop a “working drainage map”, determine runoff, inlet locations, and spread. Calculate hydraulic losses (friction, utility conflict and, if necessary, minor losses).

6a DRAINAGE ANALYSIS

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Determine design tailwater and, if necessary, outlet scour protection.

6a.10 Optional Culvert Material (To be determined on a project specific basis.)

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

6a.11 French Drain Systems (To be determined on a project specific basis.)

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.12 Drainage Wells (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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(To be determined on a project specific basis.)

Calculate the watershed hydrology and bridge hydraulics for each waterway crossing that requires a structure having a minimum length of twenty (20) feet. The report shall address all design criteria outlined in the current edition of the FDOT Bridge Hydraulics Handbook. Additionally, this standalone report shall include the Bridge Hydraulics Recommendation Sheets (BHRS), which summarize both the physical properties of the bridge along with the pertinent hydrology and hydraulic information associated with this waterway crossing.

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 (To be determined on a project specific basis.)

Evaluate and address drainage to adequately drain the road and maintain existing offsite drainage during all construction phases. Provide documentation.

6a.16 Cost Estimate

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*Provide computations to summarize the drainage quantities necessary for the Long Range Estimate (LRE) and Trans*Port cost estimates.*

6a.17 *Technical Special Provisions* (To be determined on a project specific basis.)

As needed to document the use of specialty products related to erosion control and the proposed drainage systems.

6a.18 *Other Drainage Analysis* (To be determined on a project specific basis.)

6a.19 *Field Reviews*

The CONSULTANT should be aware that Water Management District permit reviewers routinely request survey information up to 100-ft outside of the Right-of-Way line. The CONSULTANT shall be prepared to provide this information through means other than additional field survey work (i.e. either aerial contour maps or LiDAR topography, where available).

6a.20 *Technical Meetings* (To be determined on a project specific basis.)

6a.21 *Environmental Look-Around Meetings* (To be determined on a project specific basis.)

6a.22 *Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*

6a.23 *Independent Peer Review* (To be determined on a project specific basis.)

6a.24 *Supervision*

6a.25 *Coordination*

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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)** (To be determined on a project specific basis.)
 - 6b.2 Bridge Hydraulics Recommendation Sheets** (To be determined on a project specific basis.)
 - 6b.3 Summary of Drainage Structures** (To be determined on a project specific basis.)
 - 6b.4 Optional Pipe/Culvert Material** (To be determined on a project specific basis.)
 - 6b.5 Drainage Structure Sheet(s) (Per Structure)** (To be determined on a project specific basis.)
 - 6b.6 Miscellaneous Drainage Detail Sheets** (To be determined on a project specific basis.)
 - 6b.7 Lateral Ditch Plan/Profile** (To be determined on a project specific basis.)
 - 6b.8 Lateral Ditch Cross Sections** (To be determined on a project specific basis.)
 - 6b.9 Retention/Detention Pond Detail Sheet(s)** (To be determined on a project specific basis.)
 - 6b.10 Retention Pond Cross Sections** (To be determined on a project specific basis.)
 - 6b.11 Erosion Control Plan Sheet(s)** (To be determined on a project specific basis.)
- Erosion Control Plan sheets do not have to be prepared for projects permitted with the Southwest Florida Water Management District, however erosion control quantities need to be prepared.***
- 6b.12 SWPPP Sheet(s)** (To be determined on a project specific basis.)
 - 6b.13 Quality Assurance/Quality Control:** *The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*
 - 6b.14 Supervision**

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7 UTILITIES

Utility coordination will be provided by the DEPARTMENT. The CONSULTANT shall assist in the utility coordination process by providing plan sheets for greenline preparation prior to Phase II plan development, providing locations for SUE data collection, preparing the utility conflict matrix and reviewing and approving Utility Work Schedules.

8 ENVIRONMENTAL PERMITS, COMPLIANCE AND CLEARANCES (To be determined on a project specific basis.)

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.

8.1 Preliminary Project Research (To be determined on a project specific basis.)

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 a review of the project's PD&E documents including but not limited to the Environmental Document, Wetland Evaluation Report, Endangered Species and Biological Assessment and Essential Fish and Habitat Report.

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

8.2 Field Work (To be determined on a project specific basis.)

8.2.1 Pond Site Alternatives:

The CONSULTANT shall review alternative pond sites as directed by the DEPARTMENT.

8.2.2 Establish Wetland Jurisdictional Lines and Assessments:

The CONSULTANT shall collect all data and information necessary to determine the boundaries of wetlands and other surface waters defined by the rules or regulations of each agency processing or reviewing a permit application necessary to construct the DEPARTMENT project.

8 ENVIRONMENTAL PERMITS, COMPLIANCE AND CLEARANCES

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

- *Determine landward extent of wetlands and other surface waters as defined in Rule Chapter 62-340, F.A.C. as ratified in Section 373.4211, F.S.*
 - *Determine the jurisdictional boundaries and obtain a jurisdictional determination of wetlands and other surface waters as defined by rules or regulations of any permitting authority that is processing a DEPARTMENT permit application.*
- *Prepare aerial maps showing the jurisdictional boundaries of wetlands and surface waters. Aerial maps shall be reproducible, of a scale no greater than 1"=200' and be recent photography. The maps shall show the jurisdictional limits of each agency. Photo copies of aerials are not acceptable. All jurisdictional boundaries are to be tied to the project's baseline of survey. When necessary, a wetland specific survey will be prepared by a registered surveyor and mapper.*
- *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 impacted, size of wetland to be impacted, type of impact and identify any wetland 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 United States Army Corps of Engineers (USACE) "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; Uniform Mitigation Assessment Method forms and/or project specific data forms.*

8.2.3 Species Surveys:

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

8.2.4 Archaeological Surveys:

The CONSULTANT shall conduct Archaeological field surveys as required, in accordance with Part 2, Chapter 8 of the PD&E Manual.

8.3 *Agency Verification of Wetland Data (To be determined on a project specific basis.)*

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

8.4 *Complete and Submit All Required Permit Applications (To be determined on a project specific basis.)*

8 ENVIRONMENTAL PERMITS, COMPLIANCE AND CLEARANCES

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The CONSULTANT shall prepare permit application packages as identified in the Project Description section. The permit application package must be approved by the DEPARTMENT prior to submittal to the regulatory agency.

The CONSULTANT shall collect all of the data and information necessary to obtain the environmental permits required to construct the project. The CONSULTANT shall prepare each permit application for DEPARTMENT approval in accordance with the rules and/or regulations of the environmental agency responsible for issuing a specific permit and/or authorization to perform work.

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

The CONSULTANT shall consider temporary, secondary, and permanent impacts to wetlands and/or surface waters considering the various means and methods of constructing the project. The permit application shall include one (1) method of construction with enough detail included to confirm that the project can be built by a contractor using conventional construction techniques. If there are bridges on the project, this documentation will be included in the constructability review section of the Bridge Development Report.

If there are contaminated soils located within the project limits, the CONSULTANT shall schedule a meeting with the District Environmental Permitting Engineer early in the design process to determine if additional permitting efforts may be required outside of the permitting authority of the water management district.

If a Sovereign Submerged Lands Easement needs to be modified or acquired, the CONSULTANT will be responsible for including this information in the environmental resource permit application prepared for the water management district.

For projects where FDOT will be acquiring Right-of-Way:

The CONSULTANT shall be responsible for written notification to outstanding property owners that the DEPARTMENT is submitting a permit application to the water management district.

If an individual environmental resource permit is required from the water management district, the CONSULTANT shall be responsible for preparation and payment of a legal advertisement of receipt of the permit application by the water management district. Legal advertisement shall be published one time in a newspaper that meets the notification requirements of the water management district.

Upon request by the DEPARTMENT the CONSULTANT shall be responsible for preparation and payment of a legal advertisement of "Final Agency Action".

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Legal advertisement shall be published one time in a newspaper that meets the notification requirements of the water management district.

- 8.5 Prepare Dredge and Fill Sketches (as needed) (To be determined on a project specific basis.)

Dredge and Fill Sketches should be provided electronically in 8.5-in x 11-in format.

The CONSULTANT is responsible for providing the DEPARTMENT with electronic CADD files depicting the final permitted impacted wetlands for the DEPARTMENTS records.

- 8.6 Prepare USCG Permit (To be determined on a project specific basis.)

- 8.7 Prepare Water Management District Right of Way Occupancy Permit (To be determined on a project specific basis.)

- 8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application (as needed) (To be determined on a project specific basis.)

If a CCCL Permit is required, the CONSULTANT shall be responsible for the preparation of the legal advertisement required to acquire the final "Notice to Proceed" authorization for 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 Tree Permit Information (as needed) (To be determined on a project specific basis.)

- 8.10 Mitigation Design (To be determined on a project specific basis.)

If wetland impacts cannot be avoided, the CONSULTANT shall prepare a mitigation plan to be included as a part of the Environmental Resource Permit and or Section 404 permit applications.

Prior to the development of alternatives, the CONSULTANT shall meet with the District Environmental Permitting Engineer to determine the DEPARTMENT's policies in proposing mitigation. The CONSULTANT shall proceed in the development of 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:

- ***Payment to DEP/WMD for mitigation services as defined in Section 373.4137, F.S.***
 - ***Monetary participation in offsite regional mitigation plans***

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- *Purchase of mitigation credits from a mitigation bank*
 - *Creation/restoration on public lands*
- *Creation/restoration on right of way purchased by the DEPARTMENT*
 - *Creation/restoration on existing DEPARTMENT right of way*

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 alternative mitigation plans that may be 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 mitigation site, the CONSULTANT will provide the following services in the development of alternative mitigation plans:

- *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* (To be determined on a project specific basis.)

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or reviewing 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.

8.12 *Other Environmental Permits* (To be determined on a project specific basis.)

Environmental Clearances, Reevaluations and Technical Support

Select one of the two sections below for the project. Mark the other section as N/A. The preference is Section 8.14, but the Environmental Management Office will provide guidance based on the level of complexity of the issues.

Section 8.13 is used when the Environmental management Office is preparing and processing the reevaluation, and the CONSULTANT is only providing technical support.

Section 8.14 is used when the CONSULTANT is responsible for preparing the reevaluation and the Environmental Management Office is reviewing and processing.

8.13 *Technical Support to the DEPARTMENT for Environmental Clearances and Re-evaluations* (To be determined on a project specific basis.)

8 ENVIRONMENTAL PERMITS, COMPLIANCE AND CLEARANCES

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

8.13.1 NEPA or SEIR Reevaluation: *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 reevaluation by the DEPARTMENT. The preparation of all environmental reevaluations on major projects include the following types of reevaluations as listed in Part 1 Chapter 13 of the DEPARTMENT's PD&E Manual: Preliminary Engineering, Right of Way, Design Change, and Construction Advertisement Reevaluations.*

Design Change Reevaluations will be completed in accordance with Part 1 Chapter 13 of the PD&E Manual. A technical memorandum identifying the commitments and how they were addressed shall be submitted to the District Project Manager by the CONSULTANT for incorporation into the reevaluation.

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 Features: *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.*

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 due to changes in the project.*

8.13.4 Essential Fish Habitat: *The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to essential fish habitat due to changes in the project.*

8.13.5 Wildlife and Habitat Impact Analysis: *The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to all wildlife and habitat due to changes in the project.*

8.13.6 Section 7 or Section 10 Consultation: *The CONSULTANT shall provide necessary technical information to the District's Project Manager to complete a Section 7 or Section 10 Consultation as applicable.*

8.14 Preparation of Environmental Clearances and Reevaluations (Not applicable to this project.)

FPID No.443574-1-32-02**8.15 Contamination Impact Analysis (To be determined on a project specific basis.)**

The CONSULTANT will provide Environmental Detail Sheets depicting 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.

If potential contamination sites are identified within the project limits (whether mainline or pond/mitigation areas), the DEPARTMENT or its designee will provide the CONSULTANT with potential contamination areas to be marked on the plans. The CONSULTANT shall transfer these markings, in the form of hatching or other marking as appropriate, onto copies of the corresponding individual plan sheets (not on project overview sheets). Along with these markings the CONSULTANT shall print the site identification (name), and a legend clearly indicating what the marking represents. These plan sheets shall be incorporated into the body of the plans with their own individual sheet numbers (separate from the numbered sheets from which they were copied), and they shall be identified on the key sheet just like any other section. The title of this section can be either Potential Contamination Sheets or Potential Contamination Areas or Potential Contamination Sites. At the beginning of this section the CONSULTANT shall include a General Note Concerning Contamination, which will be provided by the DEPARTMENT or its designee.

8.16 Asbestos Survey (To be determined on a project specific basis.)

The DEPARTMENT will provide the asbestos survey if necessary.

8.17 Technical Meetings (To be determined on a project specific basis.)**8.18 Quality Assurance/Quality Control**

Prior to the final project plans being mailed to Tallahassee, the CONSULTANT shall compare all approved environmental permits with the final contract plans to insure that there are no differences between the plans and the permits. If differences are noted which affect the acquired permits, the CONSULTANT shall be responsible for obtaining permit modifications which resolve the differences.

8.19 Supervision**8.20 Coordination**

FPID No.443574-1-32-02**9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS (To be determined on a project specific basis.)**

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

The CONSULTANT shall provide Design Documentation to the DEPARTMENT with each submittal consisting of structural design calculations and other supporting documentation developed during the development of the plans. The design calculations submitted shall adequately address the complete design of all structural elements. These calculations shall be neatly and logically presented on digital media or, at the DEPARTMENT's request, in 8 1/2"x11" format and all sheets shall be numbered. The final design calculations shall be signed and sealed by a Florida-licensed professional engineer. A cover sheet indexing the contents of the calculations shall be included and the engineer shall sign and seal that sheet. All computer programs and parameters used in the design calculations shall include sufficient backup information to facilitate the review task.

9.1 Key Sheet and Index of Drawings (To be determined on a project specific basis.)

9.2 Project Layout (To be determined on a project specific basis.)

9.3 General Notes and Bid Item Notes (To be determined on a project specific basis.)

9.4 Miscellaneous Common Details (To be determined on a project specific basis.)

9.5 Incorporate Report of Core Borings (To be determined on a project specific basis.)

9.6 Existing Bridge Plans (To be determined on a project specific basis.)

9.7 Assemble Plan Summary Boxes and Quantities (To be determined on a project specific basis.)

9.8 Cost Estimate (To be determined on a project specific basis.)

9.9 Technical Special Provisions (To be determined on a project specific basis.)

9.10 Field Reviews (To be determined on a project specific basis.)

9.11 Technical Meetings (To be determined on a project specific basis.)

9.12 Quality Assurance/Quality Control (To be determined on a project specific basis.)

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9.13 Independent Peer Review (To be determined on a project specific basis.)

9.14 Supervision

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10 STRUCTURES - BRIDGE DEVELOPMENT REPORT (To be determined on a project specific basis.)

The Consultant shall prepare a Bridge Development Report (BDR). The BDR shall be submitted as part of the Phase I Roadway Submittal, General Requirements.

General Requirements

10.1 Bridge Geometry (To be determined on a project specific basis.)

10.2 Ship Impact Data Collection (To be determined on a project specific basis.)

10.3 Ship Impact Criteria (To be determined on a project specific basis.)

Superstructure Alternatives

10.4 Short-Span Concrete (To be determined on a project specific basis.)

10.5 Medium-Span Concrete (To be determined on a project specific basis.)

10.6 Long Span Concrete (To be determined on a project specific basis.)

10.7 Structural Steel (To be determined on a project specific basis.)

Foundation and Substructure Alternatives

10.8 Pier/Bent (To be determined on a project specific basis.)

10.9 Shallow Foundations / GRS Abutments (To be determined on a project specific basis.)

10.10 Deep Foundations (To be determined on a project specific basis.)

Movable Span

10.11 Data Collection and Design Criteria (To be determined on a project specific basis.)

10.12 Movable Span Geometrics and Clearances (To be determined on a project specific basis.)

10.13 Deck System Evaluation (To be determined on a project specific basis.)

10.14 Framing Plan Development (To be determined on a project specific basis.)

10.15 Main Girder Preliminary Design (To be determined on a project specific basis.)

10.16 Conceptual Span Balance/Counterweight (To be determined on a project specific basis.)

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10.17 Support System Development (To be determined on a project specific basis.)

10.18 Drive Power Calculations (To be determined on a project specific basis.)

10.19 Drive System Development (To be determined on a project specific basis.)

10.20 Power and Control Development (To be determined on a project specific basis.)

10.21 Conceptual Pier Design (To be determined on a project specific basis.)

10.22 Foundation Analysis (FL PIER) (To be determined on a project specific basis.)

10.23 Tender Visibility Study (To be determined on a project specific basis.)

Other BDR Issues

10.24 Aesthetics (To be determined on a project specific basis.)

10.25 TCP/Staged Construction Requirements (To be determined on a project specific basis.)

10.26 Constructability Requirements (To be determined on a project specific basis.)

10.27 Load Rating for Damaged/Widened Structures (To be determined on a project specific basis.)

10.28 Quantity and Cost Estimates (To be determined on a project specific basis.)

10.29 Quantity and Cost Estimates - Movable Span (To be determined on a project specific basis.)

10.30 Wall Type Justification (To be determined on a project specific basis.)

Report Preparation

10.31 Exhibits (To be determined on a project specific basis.)

10.32 Exhibits - Movable Span (To be determined on a project specific basis.)

10.33 Report Preparation (To be determined on a project specific basis.)

10.34 Report Preparation - Movable Span (To be determined on a project specific basis.)

10.35 BDR Submittal Package (To be determined on a project specific basis.)

Preliminary Plans (To be determined on a project specific basis.)

When ONLY 30% plans are final deliverable, use Task Nos. as shown for applicable

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bridge types for project Activities 12 thru 16. Staff hours to be negotiated and scaled appropriately.

11 STRUCTURES - TEMPORARY BRIDGE (To be determined on a project specific basis.)

The CONSULTANT shall prepare plans for Temporary Bridge(s) at the location(s) specified in Section 2.5. The CONSULTANT shall contact FDOT Office of Maintenance to determine the type and availability of temporary before deciding on the temporary bridge type to be used.

General Layout Design and Plans

11.1 Overall Bridge Final Geometry (To be determined on a project specific basis.)

11.2 General Plan and Elevation (To be determined on a project specific basis.)

11.3 Miscellaneous Details (To be determined on a project specific basis.)

End Bent Design and Plans

11.4 End Bent Structural Design (To be determined on a project specific basis.)

11.5 End Bent Details (To be determined on a project specific basis.)

Intermediate Bent Design and Plans

11.6 Intermediate Bent Structural Design (To be determined on a project specific basis.)

11.7 Intermediate Bent Details (To be determined on a project specific basis.)

Miscellaneous Substructure Design and Plans

11.8 Foundation Layout (To be determined on a project specific basis.)

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12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE (To be determined on a project specific basis.)

13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE (To be determined on a project specific basis.)

14 STRUCTURES - STRUCTURAL STEEL BRIDGE (Not applicable to this project.)

15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE (Not applicable to this project.)

16 STRUCTURES - MOVABLE SPAN (Not applicable to this project.)

17 STRUCTURES - RETAINING WALLS (To be determined on a project specific basis.)

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

General Requirements

17.1 Key Sheet (To be determined on a project specific basis.)

17.2 Horizontal Wall Geometry (To be determined on a project specific basis.)

Permanent Proprietary Walls

17.3 Vertical Wall Geometry (To be determined on a project specific basis.)

17.4 Semi-Standard Drawings (To be determined on a project specific basis.)

17.5 Wall Plan and Elevations (Control Drawings) (To be determined on a project specific basis.)

17.6 Details (To be determined on a project specific basis.)

Temporary Proprietary Walls

17.7 Vertical Wall Geometry (To be determined on a project specific basis.)

17.8 Semi-Standard Drawings (To be determined on a project specific basis.)

17.9 Wall Plan and Elevations (Control Drawings) (To be determined on a project specific basis.)

17.10 Details (To be determined on a project specific basis.)

17 STRUCTURES – RETAINING WALL

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Cast-In-Place Retaining Walls

17.11 Design (To be determined on a project specific basis.)

17.12 Vertical Wall Geometry (To be determined on a project specific basis.)

17.13 General Notes (To be determined on a project specific basis.)

17.14 Wall Plan and Elevations (Control Drawings) (To be determined on a project specific basis.)

17.15 Sections and Details (To be determined on a project specific basis.)

17.16 Reinforcing Bar List (To be determined on a project specific basis.)

Other Retaining Walls and Bulkheads

17.17 Design (To be determined on a project specific basis.)

17.18 Vertical Wall Geometry (To be determined on a project specific basis.)

17.19 General Notes, Tables and Miscellaneous Details (To be determined on a project specific basis.)

17.20 Wall Plan and Elevations (To be determined on a project specific basis.)

17.21 Details (To be determined on a project specific basis.)

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18 STRUCTURES – MISCELLANEOUS (To be determined on a project specific basis.)

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

Concrete Box Culverts

18.1 Concrete Box Culverts (To be determined on a project specific basis.)

18.2 Concrete Box Culverts Extensions (To be determined on a project specific basis.)

18.3 Concrete Box Culvert Data Table Plan Sheets (To be determined on a project specific basis.)

18.4 Concrete Box Culvert Special Details Plan Sheets (To be determined on a project specific basis.)

Strain Poles

18.5 Steel Strain Poles(To be determined on a project specific basis.)

18.6 Concrete Strain Poles (To be determined on a project specific basis.)

18.7 Strain Pole Data Table Plan Sheets (To be determined on a project specific basis.)

18.8 Strain Pole Special Details Plan Sheets (To be determined on a project specific basis.)

Mast Arms

18.9 Mast Arms (To be determined on a project specific basis.)

18.10 Mast Arms Data Table Plan Sheets (To be determined on a project specific basis.)

18.11 Mast Arms Special Details Plan Sheets (To be determined on a project specific basis.)

Overhead/Cantilever Sign Structure

18.12 Cantilever Sign Structures (To be determined on a project specific basis.)

18.13 Overhead Span Sign Structures (To be determined on a project specific basis.)

18.14 Special (Long Span) Overhead Sign Structures (To be determined on a project specific basis.)

18.15 Monotube Overhead Sign Structure (To be determined on a project specific basis.)

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18.16 Bridge Mounted Signs (Attached to Superstructure) (To be determined on a project specific basis.)

18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets (To be determined on a project specific basis.)

18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets (To be determined on a project specific basis.)

High Mast Lighting

18.19 Non-Standard High Mast Lighting Structures (To be determined on a project specific basis.)

18.20 High Mast Lighting Special Details Plan Sheets (To be determined on a project specific basis.)

Noise Barrier Walls (Ground Mount)

18.21 Horizontal Wall Geometry (To be determined on a project specific basis.)

18.22 Vertical Wall Geometry (To be determined on a project specific basis.)

18.23 Summary of Quantities – Aesthetic Requirements (To be determined on a project specific basis.)

18.24 Control Drawings (To be determined on a project specific basis.)

18.25 Design of Noise Barrier Walls Covered by Standards (To be determined on a project specific basis.)

18.26 Design of Noise Barrier Walls not Covered by Standards (To be determined on a project specific basis.)

18.27 Aesthetic Details (To be determined on a project specific basis.)

Special Structures

18.28 Fender System (To be determined on a project specific basis.)

18.29 Fender System Access (To be determined on a project specific basis.)

18.30 Special Structures (To be determined on a project specific basis.)

18.31 Other Structures (To be determined on a project specific basis.)

18 STRUCTURES – MISCELLANEOUS

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19 **SIGNING AND PAVEMENT MARKING ANALYSIS** (To be determined on a project specific basis.)

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** (To be determined on a project specific basis.)

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** (To be determined on a project specific basis.)

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 **Reference and Master Design File** (To be determined on a project specific basis.)

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** (To be determined on a project specific basis.)

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

19.5 **Sign Panel Design Analysis** (To be determined on a project specific basis.)

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

19.6 **Sign Lighting/Electrical Calculations** (To be determined on a project specific basis.)

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

19 SIGNING AND PAVEMENT MARKING ANALYSIS

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new and/or modified sign panel which requires lighting.

19.7 Quantities

19.8 Cost Estimate

19.9 Technical Special Provisions (To be determined on a project specific basis.)

19.10 Other Signing and Pavement Marking Analysis (To be determined on a project specific basis.)

19.11 Field Reviews

19.12 Technical Meetings

19.13 Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.

19.14 Independent Peer Review (To be determined on a project specific basis.)

19.15 Supervision

19.16 Coordination

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20 SIGNING AND PAVEMENT MARKING PLANS (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

20.2 Summary of Pay Items Including TRNS*Port Input (To be determined on a project specific basis.)

20.3 Tabulation of Quantities

20.4 General Notes/Pay Item Notes

20.5 Project Layout (To be determined on a project specific basis.)

20.6 Plan Sheet

20.7 Typical Details (To be determined on a project specific basis.)

20.8 Guide Sign Work Sheet(s) (To be determined on a project specific basis.)

20.9 Traffic Monitoring Site(To be determined on a project specific basis.)

20.10 Cross Sections (To be determined on a project specific basis.)

20.11 Special Service Point Details (To be determined on a project specific basis.)

20.12 Special Details (To be determined on a project specific basis.)

20.13 Interim Standards(To be determined on a project specific basis.)

20.14 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 SIGNALIZATION ANALYSIS

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20.15 Supervision

21 SIGNALIZATION ANALYSIS (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

The CONSULTANT shall perform all effort required for traffic data collection, including crash reports, 24 hr. machine counts, 8 hr. turning movement counts, 7 day machine counts, and speed & delay studies.

21.2 Traffic Data Analysis (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

21.4 Systems Timings (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

21.8 Pole Elevation Analysis (To be determined on a project specific basis.)

21.9 Traffic Signal Operation Report (To be determined on a project specific basis.)

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21.10 Quantities

21.11 Cost Estimate

21.12 Technical Special Provisions (To be determined on a project specific basis.)

21.13 Other Signalization Analysis (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

21.18 Supervision

21.19 Coordination

21 SIGNALIZATION ANALYSIS

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22 *SIGNALIZATION PLANS* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

22.2 *Summary of Pay Items Including Designer Interface (TRNS*Port) Input*

22.3 *Tabulation of Quantities*

22.4 *General Notes/Pay Item Notes*

22.5 *Plan Sheet*

22.6 *Interconnect Plans* (To be determined on a project specific basis.)

22.7 *Traffic Monitoring Site* (To be determined on a project specific basis.)

22.8 *Guide Sign Worksheet* (To be determined on a project specific basis.)

22.9 *Special Details* (To be determined on a project specific basis.)

22.10 *Special Service Point Details* (To be determined on a project specific basis.)

22.11 *Mast Arm/Monotube Tabulation Sheet* (To be determined on a project specific basis.)

22.12 *Strain Pole Schedule* (To be determined on a project specific basis.)

22.13 *TCP Signal (Temporary)* (To be determined on a project specific basis.)

22.14 *Temporary Detection Sheet* (To be determined on a project specific basis.)

22.15 *Utility Conflict Sheet*(To be determined on a project specific basis.)

22.16 *Interim Standards* (To be determined on a project specific basis.)

22.17 *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

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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.

22.18 Supervision

23 LIGHTING ANALYSIS (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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 Highway Safety 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 (To be determined on a project specific basis.)

The CONSULTANT shall prepare a Preliminary Lighting Design Analysis Report. The report shall be submitted under a separate cover with the Phase II plans submittal. The report shall provide analyses for each typical section of the mainline, typical section for the ramps (one and/or two lanes), interchanges, underdeck lighting, and arterial roads. Each lighting calculation shall be properly identified as to the area that it covers.

The report shall include the Lighting Design Criteria that will be used and shall include the evaluation of at least three lighting design alternatives and a recommendation on the alternative to use. Each alternative shall be properly described; the alternatives shall consider different pole heights, lamp wattage, and

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arm lengths. Each alternative shall be provided with a cost estimate that includes initial cost in addition to operations and maintenance cost for one year.

The report shall also include the lighting calculations for each lighted sign.

After approval of the preliminary report, the CONSULTANT shall submit a revised report for each submittal. The Lighting Design Analysis Report shall include:

Voltage drop calculations

Load analysis calculations for each branch circuit

23.3 *Aeronautical Evaluation (To be determined on a project specific basis.)*

The CONSULTANT shall prepare an Aeronautical Evaluation/Airspace Analysis Report for those projects within 10 Nautical mile radius of an airport. It shall be submitted for approval by the DEPARTMENT and by FAA prior to Phase II plans submittal.

The report shall include an evaluation of the glide slope of all adjacent airport runways (including future runways) and the preparation of the required FAA forms and special lighting calculations based on NO PENETRATION of the approach or transitional surfaces and coordination with the Airport Manager.

The report shall include a profile drawing for each condition affected by the runway approach and transitional surfaces. This drawing(s) shall show the roadway profile grade line at the edge of the shoulder pavement with proper baseline stations, the FAR Part 77 - 50:1 (or 34:1) approach surface line and the 7:1 transitional surface line. The scale of this drawing shall be 1"=100' horizontal and 1"=10' vertical. The proposed location of each light pole shall be properly shown at the respective station to clearly indicate that no penetration to either the approach surface or to the transitional surface is anticipated.

23.4 *Voltage Drop Calculations (To be determined on a project specific basis.)*

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.

23.5 *FDEP Coordination and Report (To be determined on a project specific basis.)*

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23.6 *Reference and Master Design Files*(To be determined on a project specific basis.)

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

23.7 *Temporary Lighting* (To be determined on a project specific basis.)

The CONSULTANT shall provide temporary lighting requirements for all affected phases of construction to light roadways in areas where required. The temporary lighting shall be included with the Traffic Control Plans with proper notes, illumination and uniformity criteria and details.

23.8 *Design Documentation* (To be determined on a project specific basis.)

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.***

23.9 *Quantities*

23.10 *Cost Estimate*

23.11 *Technical Special Provisions* (To be determined on a project specific basis.)

23.12 *Other Lighting Analysis* (To be determined on a project specific basis.)

23.13 *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***

23.14 *Technical Meetings* (To be determined on a project specific basis.)

23.15 *Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*

23.16 *Independent Peer Review*

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23.17 *Supervision*

23.18 *Coordination*

24 *LIGHTING PLANS* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

24.2 *Summary of Pay Item Sheet Including Designer Interface (TRNS*Port) Input*

24.3 *Tabulation of Quantities*

24.4 *General Notes/Pay Item Notes*

24.5 *Pole Data, Legend & Criteria* (To be determined on a project specific basis.)

24.6 *Service Point Details* (To be determined on a project specific basis.)

24.7 *Project Layout* (To be determined on a project specific basis.)

24.8 *Plan Sheet* (To be determined on a project specific basis.)

24.9 *Special Details* (To be determined on a project specific basis.)

24.10 *Temporary Lighting Data and Details* (To be determined on a project specific basis.)

24.11 *Traffic Control Plan Sheets* (To be determined on a project specific basis.)

24.12 *Interim Standards* (To be determined on a project specific basis.)

24.13 *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

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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.

24.14 Supervision

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25 LANDSCAPE ARCHITECTURE ANALYSIS (To be determined on a project specific basis.)

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

Includes identification of opportunities and constraints for the proposed project based on existing site conditions. Summary of analysis, if required, is included in conceptual design.

25.3 Planting Design

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

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

25.4 Irrigation Design

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

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

Final 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.

25.5 Hardscape Design

Conceptual design - scheme development and preliminary costs: Typically not done in master design file. Delineation of areas and elements to be included in design. Select cut sheets, prepare image boards. Includes report, if required.

Final Design: Includes all work in master design files. Hardscape Design includes, but is not limited to, sidewalks, plazas, Steps, Fountains, Walls, Pedestrian bridges, non-regulatory signs or project graphics, roadway aesthetics, site furnishings.

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25.6 *Plan Summary Boxes*

25.7 *Cost Estimates*

25.8 *Technical Special Provisions*

25.9 *Other Landscape Architecture*

25.10 *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.

25.11 *Field Reviews*

25.12 *Technical Meetings / Public Meetings*

25.13 *Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*

25.14 *Independent Peer Review*

25.15 *Supervision*

25.16 *Project Coordination*

25.17 *Interdisciplinary Coordination*

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26 LANDSCAPE ARCHITECTURE PLANS (To be determined on a project specific basis.)

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

26.1 Key Sheet

26.2 Tabulation of Quantities

26.3 General Notes

26.4 Tree and Vegetation Inventory, Protection and Relocation Plans

26.5 Planting Plans for Linear Roadway Projects

26.6 Planting Plans (Interchanges and Toll Plazas)

26.7 Planting Details and Notes

The CONSULTANT shall include a written or graphic guide for care and maintenance of the irrigation system after the warranty period. This Maintenance Plan will be developed in coordination with the local government entity who assumes the maintenance obligation.

26.8 Irrigation Plans for Linear Roadway Project

26.9 Irrigation Plans for Interchange and Toll Plazas

26.10 Irrigation Details and Notes

26.11 Hardscape Plans

26.12 Hardscape Details and Notes

26.13 Maintenance Plan

The CONSULTANT shall include a written plan for care and maintenance of the plants and beds, hardscape, and irrigation system after the warranty period. This maintenance plan will be developed in performance based language and will be in coordination with the local government entity who assumes the maintenance obligation.

26.14 Cost Estimate

26.15 Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.

26.16 Supervision

27 SURVEY

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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 or Global Positioning System (GPS) procedures.

27.1 Horizontal Project Control (HPC) (To be determined on a project specific basis.)

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) (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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.

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27.5 *Reference Points* (To be determined on a project specific basis.)

Reference Horizontal Project Network Control (HPNC) points, project alignment, vertical control points, section, 1/4 section, center of section corners and General Land Office (G.L.O.) corners as required.

27.6 *Topography/Digital Terrain Model (DTM) (3D)* (To be determined on a project specific basis.)

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)* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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

27.9 *Side Street Surveys* (To be determined on a project specific basis.)

Refer to tasks of this document as applicable.

27.10 *Underground Utilities* (To be determined on a project specific basis.)

The CONSULTANT shall SUE all locations that include new underground infrastructure or earthwork excavation (i.e. drilled shafts, bridge piles, strain poles, mast arms, miscellaneous foundations, drainage structures, pipe culverts, new ditches, etc.). The expectation is for the CONSULTANT to know exactly where all existing underground utilities and infrastructure are located in areas that work will be performed to properly design for any new underground infrastructure or earthwork excavation that will be constructed on the project.

The CONSULTANT's approach to practicing SUE shall be consistent with the American Society of Civil Engineers (ASCE) Standard (CI/ASCE 38-02) entitled "Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data" as follows:

- Identify utility owners that have facilities on, or may be affected by, the project limits. Contact these utility owners (face to face meetings recommended) and provide them with information about the proposed project and schedule periodic follow-up meetings. (ASCE Quality Level D).

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- Review all information that can be obtained and plot on utility composite drawing (CADD file to be furnished). (ASCE Quality Level D).
- Make field observations to identify visible above-ground utility features. Provide all information in field sketches so surveyor can prepare a complete survey and plot a rectilinear grid. (ASCE Quality Level C)
- Use appropriate surface geophysical methods (i.e., pipe and cable locators, terrain conductivity methods, resistivity measurements, metal detectors, Ground Penetrating Radar, etc) to designate existing subsurface utilities or to trace a particular utility system. This provides two-dimensional horizontal information. Place paint marks on the ground. Place identification flags or stakes on the paint marks or coding on the pavement and survey to project controls. Depict resulting information via computer aided design and drafting (CADD). Provide notes and sketches to designer of record and/or on-site engineer. Non-tonable (non-metallic) utilities will be discussed at this time with the designer of record and/or on-site engineer. (ASCE Quality Level B).
- Meet with designer of record and/or on-site engineer to determine utility conflicts and ASCE Quality Level A test hole locations.
- Expose selected subsurface utilities to obtain three-dimensional information. Use minimally intrusive excavation methods, such as vacuum excavation and Air-Lance. Depict resulting information. Resolve differences between all information gathered. Provide test hole data sheets (THDS) to designer of record and/or on-site engineer. All test holes are to be back-filled as described below. (ASCE Quality Level A).
- Collect and store utility location and condition information in a database for asset management. Provide a detailed report of utility locations, depths, size, type, etc. All information shall be provided in the format requested by the DEPARTMENT.

27.11 *Outfall Survey* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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)* (To be determined on a project specific basis.)

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.

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27.14 *Channel Survey* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

Refer to tasks of this document as applicable.

27.16 *Mitigation Survey* (To be determined on a project specific basis.)

Refer to tasks of this document as applicable.

27.17 *Jurisdiction Line Survey* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

Perform boundary survey as defined by DEPARTMENT standards. Includes

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analysis and processing of all field-collected data, preparation of reports.

27.23 *Water Boundary Survey* (To be determined on a project specific basis.)

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*(To be determined on a project specific basis.)

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

27.25 *Right of Way Monumentation* (To be determined on a project specific basis.)

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

27.26 *Line Cutting* (To be determined on a project specific basis.)

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

27.27 *Work Zone Safety* (To be determined on a project specific basis.)

Provide work zone as required by DEPARTMENT standards.

27.28 *Miscellaneous Surveys* (To be determined on a project specific basis.)

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.

27.29 *Supplemental Surveys* (To be determined on a project specific basis.)

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.

Additional spot elevations may be needed in support of the traffic noise analysis discussed in Section 32 (Noise Impact Design Assessment). As specified in Section 32.2, the need for and number of additional spot elevations will be determined by the CONSULTANT in coordination with the DEPARTMENT. Assume up to thirty (30) spot elevations will be required unless a different number is agreed to by the DEPARTMENT.

27.30 *Document Research*(To be determined on a project specific basis.)

Perform research of documentation to support field and office efforts involving

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surveying and mapping.

27.31 Field Review

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

27.32 Technical Meetings (To be determined on a project specific basis.)

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

27.33 Quality Assurance/Quality Control (QA/QC)

Establish and implement a QA/QC plan. The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.

Also includes subconsultant review, response to comments and any resolution meetings if required, preparation of submittals for review, etc.

27.34 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.

27.35 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.

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28 *PHOTOGRAMMETRY* (Not applicable to this project.)

29 *MAPPING* (Not applicable to this project.)

30 *TERRESTRIAL MOBILE LiDAR* (Not applicable to this project.)

31 *ARCHITECTURE DEVELOPMENT* (Not applicable to this project.)

32 *NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE* (To be determined on a project specific basis.)

33 *INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS* (To be determined on a project specific basis.)

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

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

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

33.1 *ITS Analysis*(To be determined on a project specific basis.)

The CONSULTANT shall review the approved preliminary engineering report, typical section package, traffic technical memorandum and proposed geometric design alignment to identify impacts to existing ITS components (if applicable) and proposed ITS field device placements. The CONSULTANT shall review all related District ITS plans and documentation for the project corridor to ensure all cited ITS elements are included in this project, and develop a Concept of Operations (ConOps), Project Systems Engineering Management, RTVM, and

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS

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other documents as necessary for conformance with the Federal Highways Administration (FHWA) requirement. The CONSULTANT shall use applicable DEPARTMENT requirements and guidelines, including, but not limited to, the PPM, Design Standards, 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: To be determined on a project specific basis.

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

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

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

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

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

The CONSULTANT shall design the project such that all ITS field devices and ancillary components comply with FDOT's Approved Product List (APL) / Qualified Product List (QPL) and the existing list of devices and components supported within the SunGuide software or other approved software, unless otherwise approved by the DEPARTMENT.

Closed Circuit Television (CCTV) Camera Assembly

The CONSULTANT shall be responsible for the design and exact field locations for the CCTV camera assemblies. The CCTV camera subsystem shall provide full

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coverage of the roadway network, with overlapping coverage to ensure 100 percent coverage. The typical spacing shall be one mile with verification that there is no visual blockage. Effort should be made to provide viewing in all directions at interchanges. All CCTV camera assemblies shall include a camera lowering device (CLD) at all locations.

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

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

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

The CONSULTANT shall be responsible for the design of the lightning protector system and surge protection system based on FDOT criteria and designed to minimize damage to cameras.

The CCTV camera assembly shall be approved by the FDOT-TERL and be listed on the APL, as applicable, for use in the State of Florida.

The CCTV camera assembly shall be designed in accordance with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Specification 682.

Traffic Detection Subsystem

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

The CONSULTANT shall be responsible for the design of a non-intrusive traffic detection subsystem for the roadway facilities. The detectors shall be positioned near other ITS field device infrastructure including the fiber-optic splice vaults

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when feasible to reduce cost. Final detection station locations shall be based on a number of location variables identified during the design phase.

The traffic detection subsystem shall be able to collect and process volume, speed and occupancy data on a lane-by-lane basis for the corridor mainlines, in both directions of travel. If self-calibration feature is not specified, requirements for calibration shall be stated. The data will be used by the TMC for functions including detecting incidents, determining travel times, estimating traffic conditions for dissemination to travelers, sharing information with other agencies, and data archiving for transportation planning and historical data analysis. The traffic detection subsystem shall allow for connectivity to the TMC.

The traffic detectors shall perform to meet the Project requirements under all environmental and traffic conditions expected for the corridors. The detectors shall detect volumes, speeds and occupancies for all corridor traffic operation conditions within the specified accuracy including all volume levels, all speed levels and traffic compositions. Occlusions, other blocking of vehicles and adjacent lanes detection shall not degrade the detection system performance below specified accuracy. Signs, walls, guardrails, and other physical elements in the system shall not have a significant effect on the detection performance. Vibration and shocks shall not affect the performance of the system.

The detector technology / product shall be certified by the FDOT Traffic Engineering Research Lab (TERL) and be on the APL, as applicable, for use in the State of Florida. The traffic detection utilized shall be designed in accordance with the latest version of the FDOT Standard Specifications for Road and Bridge Construction, Specification 660.

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

The CONSULTANT shall determine the exact location of the field devices to meet the desired coverage and functional requirements of traffic detectors. The detector and associated cabinet locations shall be identified by the CONSULTANT. A detailed site survey shall be conducted by a factory trained and certified representative. The site survey shall be designed to identify the exact locations and details for each detection station.

Travel Time Detection Subsystem

The CONSULTANT shall be responsible for the design of a travel time detection subsystem for the roadway facilities. This travel time detection subsystem will enable the FDOT to capture vehicle travel times between pre-defined nodes. The travel time data shall utilize the project communications backbone in order to collect and distribute travel time data to the TMCs.

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The travel time detection subsystem shall utilize the FDOT's SunPass Automatic Vehicle Identification (AVI) transponders that are properly mounted on vehicles traveling along the roadway being monitored or utilize other travel time technologies such as license plate readers (LPR).

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

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

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

Highway Advisory Radio Subsystem

The CONSULTANT shall be responsible for the design the highway advisory radio (HAR) subsystem to be managed from the FDOT TMC and broadcast to provide a seamless HAR subsystem with other FDOT area HAR stations. The system shall be designed to ensure against the transmission of erroneous data.

The HAR subsystem shall operate on a clear frequency without interference from adjacent frequencies, during both daytime and nighttime conditions. The selected frequency shall be quiet other than normal static. The CONSULTANT shall document all existing HAR and other radio station frequencies and perform all necessary analysis to determine if it is possible to operate the HAR on the selected frequency.

The HAR subsystem shall be licensed for fixed operation by the FCC. The HAR stations shall not interfere with AM broadcast radio stations. In addition, the HAR station shall not interfere with any existing HAR stations or with each other. FCC restrictions shall be followed to decrease the likelihood of interference. The CONSULTANT shall attempt to have the new HAR installation to broadcast at the same frequency as the existing FDOT HAR subsystems if desired.

The HAR subsystem design shall ensure that the field equipment is housed in a sealed enclosure to protect the electronics against moisture and pollution. Cabinet locks shall be used to prevent unauthorized access and vandalism.

The CONSULTANT shall submit maps to the FDOT indicating the coverage of the HAR stations for the proposed station locations. The site locations of the HAR

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stations shall consider all factors associated with the HAR system. The HAR coverage shall take into consideration interference from adjacent frequencies, the time required by the drivers to listen to the message, make decisions to change lanes, and change lanes to exit at the diversion point.

All HAR subsystem functions shall be controllable from the TMC.

The antenna selection, location and height shall provide the required coverage and quality of the system and shall meet the FCC licensing requirement.

The ground system shall be designed to provide the required radio performance. Testing shall be performed to ensure that there is proper soil conductivity and hydrogen ion concentration for the HAR ground system. A radial ground system, buried at the appropriate depth beneath the surface, shall be used.

The CONSULTANT shall also be responsible for the design and location of remotely-operated static signs with flashing lights (one sign per direction) to alert motorists in both direction of travel of active HAR broadcasts. The signs shall be located at the outer edges of the transmission zone. The signs shall conform to the appropriate guide sign guidelines as described in the MUTCD. The signs shall be retro-reflective in accordance with FDOT specifications. Flashing lights (beacons) on top of the signs shall be used to indicate to motorists that an urgent HAR message is being broadcast. The flashing beacons shall be activated from the FDOT's TMC facilities.

The HAR subsystems shall be designed in accordance with the FDOT Specifications for Road and Bridge Construction, Supplemental Specification 687.

Dynamic Message Sign Subsystem

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

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

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

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

The DMS shall be certified by the FDOT TERL and be on the APL, as applicable,

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for use in the State of Florida

The DMS shall be designed in accordance with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 701.

Roadway Weather Information Systems (RWIS)

The CONSULTANT shall ensure that, each RWIS site consists of:

Remote Processing Unit (RPU);

Fog/Smoke Detection sensor;

Passive Pavement Sensor (PPS);

Classifying Precipitation;

Precipitation Occurrence Sensor;

Air Temperature/Relative Humidity Sensor;

Wind Speed and Direction Sensor;

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

Communication hardware.

The Design/Build Firm shall ensure that the RWIS subsystem shall include all hardware, software, and licenses to operate as follows:

RWIS Central Software including SQL database for the RTMC;

RWIS Central Hardware for RTMC;

Atmospheric sensors shall measure their respective weather parameters and communicate the signals from each to the RPU;

The RPU shall process and temporarily store the output from the pavement sensors and atmospheric sensors;

The RWIS server shall poll each RPU on a scheduled basis via communications telemetry as specified in the design plans. The RPU shall respond to the poll and transfer all of its data to the RWIS server;

All data transfers between the RWIS server and RPUs shall be compliant with the most current Federal and State of Florida standard NTCIP ESS protocols;

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The RWIS server system shall store the RWIS data in a standard SQL Server database for access by Department users via SunGuide® software; and,

The RWIS user displays shall include all sensor and forecast data in a browser-based data display format.

The RWIS will comply with the FDOT Standard Specifications Section 781-5.

33.2 Communications Plan (To be determined on a project specific basis.)

The CONSULTANT shall be responsible for the development of a communications plan to determine the optimal communications medium for the project corridor. The plan shall be developed prior to submittal of Phase I plans.

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

After approval of the plan, the CONSULTANT shall submit a revised plan including a detailed design analysis for each submittal. The CONSULTANT's communications design shall include multiple redundant paths for each location, which allows for automatic switching of communications path onto a secondary path, if the primary path is impacted (if desired by the District).

The communications system components shall be in accordance with the latest FDOT Standard Specifications for Road and Bridge Construction Specification 684.

33.3 Lightning Protection Analysis (To be determined on a project specific basis.)

The CONSULTANT shall be responsible for a complete and reliable lightning protection system design for each structure and pole and the devices attached thereto as well as ITS field device cabinets and communications hubs if not addressed by the FDOT's Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System and the Interim Drawings. The ITS components of the project shall be protected from damage caused by lightning strikes, transient voltage surges, and induced current. The CONSULTANT shall design all grounding, lightning protection, and surge

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protection in accordance with Underwriters Lab (UL) 96A specifications.

The CONSULTANT shall include surge protection devices for all cables and conductors (power, video, and data). All Project ITS subsystems, devices and ancillary components with electrical interconnects shall be protected from voltage surges caused by lightning, transient voltage surges, and external electromagnetic fields at the time of installation of each device.

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

33.4 *Power Subsystem (To be determined on a project specific basis.)*

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

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

33.5 *Voltage Drop Calculations (To be determined on a project specific basis.)*

The electrical design shall address allowable voltage drops per the NEC. The CONSULTANT shall submit voltage drop calculations for any electrical circuit providing power to the ITS field devices beyond the electric utility service point.

The calculations shall document the length of each circuit, its load, the size conductor or conductors used and their ohm resistance values and the required voltages from the service point to the respective ITS devices to maintain voltage drops with allowable limits. The voltage drop incurred on each circuit (total volts and percentage of drop) shall be calculated, and all work necessary to calculate the voltage drop values for each circuit should be presented in such a manner as to be duplicated by the District. Load analysis calculations shall be submitted. All voltage drop calculations shall allow for future expansion of ITS infrastructure, if identified in the Project ConOps.

FPID No.443574-1-32-02**33.6 Design Documentation (To be determined on a project specific basis.)**

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

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

33.7 Existing ITS

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

33.8 Queue Analysis (To be determined on a project specific basis.)

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

33.9 Reference and Master ITS Design File (To be determined on a project specific basis.)

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

33.10 Reference and Master Communications Design File (To be determined on a project specific basis.)

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

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS

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markers, communications plan overview, fiber optic splicing, connections, communications hubs, etc.

33.11 Pole Elevation Analysis (To be determined on a project specific basis.)

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

33.12 Sign Panel Design Analysis (To be determined on a project specific basis.)

The CONSULTANT shall design all ITS signing in conjunction with the Roadway Master Signing. This includes any static sign panel design analysis where DMS is in-laid within a static sign or for HAR signage. Expressway and arterial full size DMS shall not be co-located with other static signs.

33.13 Quantities

The CONSULTANT shall include all work required to determine the quantities for all items, including ITS structures and devices, interconnect, and infrastructure (such as conduits, pull boxes, splice boxes, fusion splices, splice enclosures, etc.). This work effort shall include generating accurate quantities for computing the engineer's estimate as required by the District. Use digital submittal of plans as required by the DEPARTMENT.

33.14 Cost Estimate

*The CONSULTANT shall prepare an engineer's cost estimate for the project using historical data from the FDOT or from other Industry sources. The CONSULTANT shall also load the pay items and quantities into TRNS*PORT for generating the summary of quantities and the FDOT's in-house estimates.*

33.15 Technical Special Provisions (To be determined on a project specific basis.)

The CONSULTANT shall develop Technical Special Provisions (TSP) 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 (To be determined on a project specific basis.)

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*

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- ***Device Make, Model, Capabilities, Condition / Age, Existence of SunGuide Software Driver***
- ***Condition of Structure(s), cabinets, and other above-ground infrastructure and devices***
 - ***Type of Detection as Compared With Current District Standards***
 - ***Underground Infrastructure***
 - ***Proximity of other utilities***
 - ***Traffic Operations***
- ***Any other field reconnaissance as necessary to develop a complete ITS design package***
 -

33.18 *Technical Meetings* (To be determined on a project specific basis.)

The CONSULTANT shall attend meetings as necessary support the project.

33.19 *Quality Assurance / Quality Control*

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

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

The CONSULTANT shall utilize the District's quality control checklist. The responsible Professional Engineer that performed the Quality Control review shall sign a statement certifying that the review was conducted.

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

33.20 *Supervision* (To be determined on a project specific basis.)

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

33.21 *Coordination* (To be determined on a project specific basis.)

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.

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34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS(To be determined on a project specific basis.)

The CONSULTANT shall prepare a set of ITS Plans in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), Standard Plans, FDOT Design Manual (FDM), and all other pertinent manuals, that includes the following:

34.1 Key Sheet (To be determined on a project specific basis.)

The CONSULTANT shall prepare the key sheet in accordance with the latest format depicted in the Manual on Uniform Traffic Control Devices (MUTCD), Standard Plans, FDOT Design Manual (FDM), and all other pertinent manuals.

Standard Specs

34.2 Summary of Pay Items Including Designer Interface (TRNS*port Input)

The CONSULTANT shall include input into Designer Interface (TRNS*port) and create the CADD generated sheet.

34.3 Tabulation of Quantities

The CONSULTANT shall place pay item numbers, descriptions, quantities and grand totals on the tabulation sheet(s) and provide updating of the tabulation of quantities sheets during the design period.

34.4 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.

34.5 Project Layout (To be determined on a project specific basis.)

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

34.6 Typical and Special Details (To be determined on a project specific basis.)

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

FPID No.443574-1-32-02**34.7 Plan Sheet** (To be determined on a project specific basis.)

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

34.8 ITS Communications Plans(To be determined on a project specific basis.)

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

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

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

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

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

34.9 Fiber Optic Splice Diagrams (To be determined on a project specific basis.)

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

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by bounding devices. The diagrams shall denote the types of connectors in the patch panels.

- 34.10 *Grounding and Lightning Protection Plans* (To be determined on a project specific basis.)

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 Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System.

- 34.11 *Cross Sections* (To be determined on a project specific basis.)

The CONSULTANT shall prepare cross sections for ITS devices.

- 34.12 *Guide Sign Work Sheet(s)* (To be determined on a project specific basis.)

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

- 34.13 *Special Service Point Details* (To be determined on a project specific basis.)

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

- 34.14 *Strain Pole Schedule* (To be determined on a project specific basis.)

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

- 34.15 *Overhead / Cantilever Sign Structure* (To be determined on a project specific basis.)

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

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

FPID No.443574-1-32-02**34.16 Other Overhead Sign Structures (Long Span, Monotube, etc.) (To be determined on a project specific basis.)**

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

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

34.17 Traffic Control Plans (To be determined on a project specific basis.)

The CONSULTANT shall prepare Traffic Control Plans (TCP) 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 TCP 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 TCP 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 TCP 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 TCP.

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.

34.18 Interim Standards (To be determined on a project specific basis.)

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

34.19 GIS Data and Asset Management Requirements (To be determined on a project specific basis.)

The CONSULTANT is responsible for providing Geographic Information System

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(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 sub-meter or better position accuracy. The CONSULTANT shall collect spatial data points and physical address location for:

- *DMS location (mainline and arterial)*
 - *Vehicle detection pole location*
 - *HAR system components*
 - *CCTV camera pole location*
 - *Ground mounted cabinets*
- *Fiber optic cable path (fiber backbone)*
 - *Communications hubs*
 - *Standard route markers*
- *Lateral fiber optic cable connections*
- *Lateral power cable connections*
 - *Pull boxes (power and fiber)*
 - *Splice boxes*
- *Power drops (service point and cable path)*

Data collection forms shall be used from the ITS FM Site:

<https://www.fdot.gov/traffic/itsfm/new-construction/contractor/data-collection-forms.shtml>

34.20 *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.

34.21 *Supervision*

The CONSULTANT shall supervise all technical design activities.

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35 GEOTECHNICAL (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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.

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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*(To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

Stake borings and obtain utility clearance.

- 35.4 *Muck Probing* (To be determined on a project specific basis.)

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 MOT Plans for Field Investigation* (To be determined on a project specific basis.)

Coordinate and develop Maintenance of Traffic (MOT) plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Standard Plans for Road Construction Standard Index 102 Series.

- 35.6 *Drilling Access Permits* (To be determined on a project specific basis.)

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

- 35.7 *Property Clearances* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

Monitor groundwater, using piezometers.

- 35.9 *LBR / Resilient Modulus Sampling*(To be determined on a project specific basis.)

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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* (To be determined on a project specific basis.)

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

35.11 *Soil and Rock Classification – Roadway* (To be determined on a project specific basis.)

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

35.12 *Design LBR* (To be determined on a project specific basis.)

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

35.13 *Laboratory Data* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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*(To be determined on a project specific basis.)

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

35.16 *Delineate Limits of Unsuitable Material* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

Create electronic files of boring data for cross-sections.

35.18 *Embankment Settlement and Stability* (To be determined on a project specific basis.)

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

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35.19 Protection of Existing Structures (To be determined on a project specific basis.)

Identify sensitive structures and facilities which will likely be adversely affected by construction operations including but not limited to paving, compaction, vibration installation or extraction of sheet pile or casing, pile driving, drilled shaft construction, excavations and changes in groundwater level etc. Determine whether these structures and facilities need to be monitored for settlement and vibration during construction. Provide recommended notes on geotechnical report and Plans addressing project specific needs. When there is risk of damage to the structure or facility ensure it is identified in the Plans for pre-construction and post-construction inspection in accordance with Specification 108. See FDOT Design Manual Part 1, Chapter 117. List the location of the existing structures selected to be monitored during construction and coordinate those locations with the EOR.

35.20 Stormwater Volume Recovery and/or Background Seepage Analysis (To be determined on a project specific basis.)

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

35.21 Geotechnical Recommendations (To be determined on a project specific basis.)

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 (i.e. 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 (To be determined on a project specific basis.)

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 (To be determined on a project specific basis.)

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 Indices 500 and 505.*
- *The results of all tasks discussed in all previous sections regarding data*

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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* (To be determined on a project specific basis.)

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 Indices 500 and 505.*
- *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* (To be determined on a project specific basis.)

Draft auger borings as directed by the DEPARTMENT.

35.26 *SPT Boring Drafting* (To be determined on a project specific basis.)

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,

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strain poles, buildings, and other structures include the following:

35.27 *Develop Detailed Boring Location Plan* (To be determined on a project specific basis.)

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*(To be determined on a project specific basis.)

Stake borings and obtain utility clearance.

35.29 *Coordinate and Develop MOT Plans for Field Investigation*(To be determined on a project specific basis.)

Coordinate and develop MOT plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Standard Plans for Road Construction Standard Index 102 Series.

35.30 *Drilling Access Permits* (To be determined on a project specific basis.)

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

35.31 *Property Clearances* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

Collect corrosion samples for determination of environmental classifications.

35.33 *Coordination of Field Work* (To be determined on a project specific basis.)

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

35.34 *Soil and Rock Classification – Structures* (To be determined on a project specific basis.)

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

35.35 *Tabulation of Laboratory Data* (To be determined on a project specific basis.)

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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* (To be determined on a project specific basis.)

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

35.37 *Selection of Foundation Alternatives (BDR)* (To be determined on a project specific basis.)

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)* (To be determined on a project specific basis.)

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.***

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- **Provide settlement analysis.**
-

35.39 *Bridge Construction and Testing Recommendations* (To be determined on a project specific basis.)

Provide construction and testing recommendations including potential constructability problems.

35.40 *Lateral Load Analysis (Optional)* (To be determined on a project specific basis.)

Perform lateral load analyses as directed by the DEPARTMENT.

35.41 *Walls* (To be determined on a project specific basis.)

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)* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

- ***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* (To be determined on a project specific basis.)

- ***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* (To be determined on a project specific basis.)

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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*(To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

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.*

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- *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 (To be determined on a project specific basis.)

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.

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35.49 *Other Geotechnical* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

35.51 *Field Reviews* (To be determined on a project specific basis.)

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* (To be determined on a project specific basis.)

35.53 *Quality Assurance/Quality Control: The consultant shall submit a Quality Assurance/Quality Control Plan to the Department for review and acceptance.*

35.54 *Supervision*

35.55 *Coordination*

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36 PROJECT REQUIREMENTS

36.1 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.

36.2 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. The CONSULTANT shall assign a Deputy Project Manager who shall be the representative in the absence of the Project Manager.

36.3 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.

36.4 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.

36.5 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 plans as required by DEPARTMENT standards.

36.6 Computer Automation

The project will be developed utilizing Computer Aided Drafting and Design (CADD) systems. The DEPARTMENT makes available software to help assure

36 PROJECT REQUIREMENTS

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quality and conformance with policy and procedures regarding CADD. It is the responsibility of the CONSULTANT to meet the requirements in the DEPARTMENT's CADD Manual. The CONSULTANT shall submit final documents and files as described therein. This project shall use corridor modeling.

36.7 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.

36.8 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.

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37 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.

The CONSULTANT shall not submit the monthly electronic Invoice until notification from the DEPARTMENT Project Manager the Progress Report and the draft Invoice are both approved. The CONSULTANT shall submit a monthly electronic Invoice, in a format prescribed by the DEPARTMENT, within one (1) work day after notification of the approval of the Progress Report and the draft Invoice, as specified in Section 33.3. Concurrent with the submittal of the electronic Invoice to CITS, the CONSULTANT shall send an eMail notification to the DEPARTMENT Project Manager advising the electronic submittal to CITS has occurred.

The CONSULTANT shall submit a final electronic Invoice for design services up to and including the Mail Date of the project and shall notate on the invoice, the following capitalized words, "FINAL INVOICE FOR DESIGN SERVICES"

The CONSULTANT shall submit, in a format to be provided by the DEPARTMENT, a request for a Supplemental Amendment for Post Design Services on the Production Date of the project.

The DEPARTMENT Project Manager and the CONSULTANT shall monitor the cumulative invoiced billings to insure the reasonableness of the billings compared to the project schedule and the work accomplished and accepted by the DEPARTMENT.