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EXHIBIT A



SCOPE OF SERVICES

FOR

Financial Project ID: 449149-1-32-01

FDOT District 1

***GLADES COUNTY***

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**SCOPE OF SERVICES FOR CONSULTING ENGINEERING SERVICES**  
**HIGHWAY AND BRIDGE/STRUCTURAL DESIGN**

This Exhibit forms an integral part of the agreement between the State of Florida Department of Transportation (hereinafter referred to as the DEPARTMENT or FDOT) and [*Consultant Name or leave blank until CONSULTANT is selected*] (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: 449149-1-32-01

Related Financial Project ID(s): [*Related FM Numbers*]

Federal Aid Project No.:

Roadway:

<b>RoadwayId</b>	<b>Begin milepost</b>	<b>End milepost</b>
05090000	4.069	11.611

Project Description: SR 29 FROM SR 78 TO CR 74

Bridge No(s).:

- **050035**
- **050033**
- **050032**
- **050031**

Railroad Crossing No.: **627657N in the vicinity**

Context Classification:

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

## **1 PURPOSE**

The purpose of this Exhibit is to describe the scope of work and the responsibilities of the CONSULTANT and the DEPARTMENT in connection with the design and preparation of a complete set of construction contract documents and incidental engineering services, as necessary, for improvements to the transportation facility described herein.

- Major work mix includes:
  - **0020 - NEW BRIDGE CONSTRUCTION**
- Major work groups include:
  - **3.1 - Minor Highway Design**
  - **4.1.2 - Minor Bridge Design**
- Minor work groups include:
  - **4.1.1 - Miscellaneous Structures**

- **7.1 - Signing, Pavement Marking and Channelization**
- **7.2 - Lighting**
- **8.1 - Control Surveying**
- **8.2 - Design, Right of Way & Construction Surveying**
- **9.1 - Soil Exploration**
- **9.2 - Geotechnical Classification Laboratory Testing**
- **9.4.1 - Standard Foundation Studies**

Known alternative contracting methods include: *N/A*

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

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

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

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

The DEPARTMENT will provide contract administration, management services, and technical reviews of all work associated with the development and preparation of Contract Documents, including Construction Documents. The DEPARTMENT's technical reviews are for high-level conformance and are not meant to be comprehensive reviews. The CONSULTANT shall be fully responsible for all work performed and work products developed under this Scope of

Services. The DEPARTMENT may provide job-specific information and/or functions as outlined in this contract.

## 2 PROJECT DESCRIPTION

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

***SR 29 FROM SR 78 TO CR 74. Two-lane rural roadway. Includes two (2) bridge replacements with longer bridges to provide for wildlife shelves, roadway reconstruction to raise the roadway elevation between these two bridges, milling and resurfacing outside the limits of the two bridges, drainage improvements, guardrail, wildlife fencing, intersection lighting at SR 78 and CR 74, signing and pavement marking.***

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

Public Involvement:

CAP Level: 3

*[Describe public involvement (ex: public notices, public meetings/workshops, public hearing.)]*

Other Agency Presentations/Meetings:

Agency	Number of Meetings
Glades County	1
Heartland TPO	1

Specification Package Preparation:

***TBD at Scope Clarification***

Estimated Quantities Report Preparation:

***Prepare Estimated Quantities Report to be submitted at Phase IIR, Phase IV, and Final plans submittals.*** Value Engineering: ***TBD***

Risk Assessment Workshop: ***N/A***

Plan Type:

***As directed.***

***Plan only for sections of milling and resurfacing,***

***Plan and profile for sections of reconstruction***

Typical Section:

Number of Typical Sections: ***6 Estimated***

*two-lane rural open shoulder reconstruction;*

*two-lane rural open shoulder milling and resurfacing;*

*Bridge #050035 SR 29 over Lone Pine Creek - new bridge construction;*

*Bridge #050033 SR 29 over Cypress Branch (aka Chapparral Slough) - new bridge construction;*

*Bridge #050032 SR 29 over York Branch - No work*

*Bridge # 050031 SR 29 over Turkey Branch - No work*

Pavement Designs:

Number of Pavement Designs: *5 Estimated*

*Reconstruction mainline;*

*Reconstruction shoulders;*

*Mill and Resurface mainline and auxiliary lanes;*

*Mill and Resurface shoulders;*

*Mill and Resurface with Overbuild*

Cross-Slope Correction:

*analysis of existing cross-slope for standard section, identify deficiencies and provide recommendations for correction*

Access Management Classification:

- *Access Class 3*

Roadway Alternative Analysis: *N/A*

Level of Temporary Traffic Control Plan (TTCP): *2*

*FDM 921*

Temporary Lighting: *TBD*

Temporary Signals: *TBD*

Temporary Drainage: *TBD*

Design Variations: *TBD*

- *Others*

Others:

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

Drainage System Type:

*[Describe expected systems, e.g., open, closed, ditches, ponds, exfiltration, floodplain involvement, etc.]*

Number of stormwater management facility sites: *[0]*

Number of cross drains: *[2]*

*Evaluate alternatives to prevent roadway overtopping issues including providing improved hydraulic conveyance or raising the profile of SR 29 by fully reconstructing between MP 4.8 and MP 6.5.*

*Increase the size of the cross drain at MP 5.528 to a minimum of quadruple 42" culverts to be able to handle the flow of a 50-year storm event.*

*Raise existing bridge profiles to expand the hydraulic capabilities and provide 2-foot drift clearance and wildlife connectivity accomodation.*

*Provide a treatment and attenuation swale to formally treat the roadway runoff prior to discharge off-site to address agency permitting requirements.*

### **2.3 Selective Clearing and Grubbing (Activity 6c) TBD**

Number of acres of Selective Clearing and Grubbing and/or Plant Preservation Area: [Number] acres. [List number of acres of Selective Clearing and Grubbing]

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

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

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

The CONSULTANT may employ more than one individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. This person shall be contractually referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the FDOT District Utilities Administrator that they have the following knowledge, skills, and expertise:

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

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



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

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

Expected Utilities:

- *Florida Power and Light*
- *Glades Electric Cooperative*
- *Others TBD*

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

Expected Permits:

- **SWFWMD ERP, ACOE 404, FDEP NPDES**

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

## 2.6 Structures (Activities 9 - 18)

Bridge:

No.	Bridge Number	Length	Description
1	050035	73.9-foot existing	SR 29 over Lone Pine Creek

2	050033	153.1-feet existing	SR 29 over Cypress Branch (aka Chapparal Slough)
3	050032	47.5-feet existing	SR 29 over York Branch
4	050031	31.7-feet existing	SR 29 over Turkey Branch

Type of Bridge Structure Work

- BDR (Activity 10): **2 required**
- Temporary Bridge (Activity 11): **TBD**
- Short Span Concrete (Activity 12): **required**
- Medium Span Concrete (Activity 13): **N/A**
- Structural Steel (Activity 14): **N/A**
- Segmental Concrete (Activity 15): **N/A**
- Movable Span (Activity 16): **N/A**

Retaining Walls (Activity 17): **TBD**

No.	Location	Temp Type	Temp Length	Perm Type	Perm Length
1	[Location]	[Type]	[Length]	[Type]	[Length]

Miscellaneous Structures:

- **Miscellaneous (Activity 18)**

**2.7 Signing and Pavement Markings (Activities 19 & 20)**

*For each project, the CONSULTANT shall prepare signing and pavement marking plans in accordance with Department criteria. Design should reflect FDOT - District One Signing & Pavement Marking Policies and Procedures as indicated in the latest Signing and Marking Updates folder located at website address:*

*<https://ftp.fdot.gov/file/d/FTP/FDOT/d1/traffops/Signing%20and%20Marking/>. This folder also contains additional items useful in designing Signing and Pavement Marking components plans in District One.*

Sign Structures:

No.	Type	Number	Location
1	[Type]	[Number]	[Location]

## **2.8 Signalization (Activities 21 & 22) N/A**

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

The CONSULTANT shall prepare lighting plans in accordance with Department criteria. Provide lighting at the following two intersections:

- SR 29 at SR 78
- SR 29 at CR 74

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

## **2.11 Survey (Activity 27)**

Design Survey:

*TBD*

Subsurface Utility Exploration:

*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.) in areas that work will be performed. (SUE locations will be negotiated by the DUA or their Designee) (See D1 SUE Policy Direction)*

Right of Way Survey: *N/A*

Vegetation Survey: *N/A*

## **2.12 Photogrammetry (Activity 28) TBD**

*[Provide limits and description]*

## **2.13 Mapping (Activity 29) TBD**

Control Survey Map:

*[Provide limits]*

Right of Way Map:

*[Provide limits]*

Legal Descriptions:

*[Provide number]*

Maintenance Map:

*[Provide limits]*

Miscellaneous Items:

[*List items*]

## 2.14 Terrestrial Mobile LiDAR (Activity 30) TBD

[*Provide limits and describe type*]

## 2.15 Architecture (Activity 31) N/A

## 2.16 Noise Barriers (Activity 32) – N/A

## 2.17 Intelligent Transportation Systems (Activities 33 & 34) N/A

[*Provide description of ITS elements and work expected within project limits*]

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

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

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

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

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

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

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

redundant power and communications systems to minimize system downtime due to vandalism.

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

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

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

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

## **2.18 Geotechnical (Activity 35)**

The Consultant shall be responsible for Geotechnical services associated with this project. The DEPARTMENT will provide Pavement Evaluation services.

Within ten (10) days after receiving the Notice-to-Proceed, the CONSULTANT shall submit a Pavement Coring and Condition Evaluation request to the DEPARTMENT through the District 1 and 7 Materials and Research Office (DMRO) SharePoint Site.

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 to review the project scope and Department's requirements.

## **2.19 Project Schedule**

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production Date. The schedule shall be based upon the [District Schedule Information]. The current production date is [7/1/2027]. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a *four* week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

All fees and price proposals are to be based on the negotiated schedule of 48 months 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.

## **2.20 Submittals**

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

## **2.21 Provisions for Work**

The services performed by the CONSULTANT must comply with all applicable DEPARTMENT's manuals, procedure, policies, and guidelines. Specifically, the CONSULTANT must comply with DEPARTMENT's Project Development and Environmental (PD&E) Manual, FDOT Design Manual (FDM), Structures Manual, and Computer Aided Design and Drafting (CADD) Manual. The DEPARTMENT's manuals and guidelines incorporate, by requirement or reference, all applicable federal and state laws, regulations, and Executive Orders. The CONSULTANT will use the latest editions of the manuals, procedures, and guidelines to perform work for this project.

All work shall be prepared with English units (unless otherwise specified) in accordance with the latest editions of standards and requirements utilized by the DEPARTMENT.

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

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

- *Numbers for field books*
- *Preliminary Horizontal Network Control*
- *Access for the CONSULTANT to utilize the DEPARTMENT's Information Technology Resources*
- *All Department agreements with Utility Agency Owner (UAO)*
- *All certifications necessary for project letting*
- *Building Construction Permit Coordination (Turnpike)*
- *All information that may come to the DEPARTMENT pertaining to future improvements*

- *All future information that may come to the DEPARTMENT during the term of the CONSULTANT's Agreement, which in the opinion of the DEPARTMENT is necessary for the prosecution of the work*
- *Available traffic and planning data*
- *All approved utility relocations*
- *Project utility certification to the DEPARTMENT's Central Office*
- *Any necessary title searches*
- *Engineering standards review services*
- *All available information in the possession of the DEPARTMENT pertaining to utility companies whose facilities may be affected by the proposed construction*
- *All future information that may come to the DEPARTMENT pertaining to subdivision plans so that the CONSULTANT may take advantage of additional areas that can be utilized as part of the existing right of way*
- *Systems traffic for Projected Design Year, with K, D, and T factors*
- *Previously constructed Highway Beautification or Landscape Construction Plans*
- *Landscape Opportunity Plan(s)*
- *Existing right of way maps*
- *Existing 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 the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the Project Manager.*
  - *Appropriate signatures on application forms*

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

#### **Project Common Tasks**

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, 4 (Roadway Analysis) through 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 is responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to Phase II plans or completion of quantities, the DEPARTMENT's Long-

Range Estimate (LRE) system will be used to produce a conceptual estimate, according to District policy. Once the quantities have been developed (beginning at Phase II plans and no later than Phase III plans) the CONSULTANT shall be responsible for inputting the category information, pay items, and quantities into AASHTOWare Project Preconstruction through the use of the DEPARTMENT's Designer Interface.

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

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

The Technical Special Provisions shall provide a description of work, materials, equipment and specific requirements, method of measurement and basis of payment. Proposed Technical Special Provisions will be submitted to the District Specifications Office for initial review at the time of the Phase III plans review submission to the DEPARTMENT's Project Manager. This timing will allow for adequate processing time prior to final submittal. The Technical Special Provisions will be reviewed for suitability in accordance with the Handbook for Preparation of Specification Packages. The District Specifications Office will forward the Technical Special Provisions to the District Legal Office for their review and comment. All comments will be returned to the CONSULTANT for correction and resolution. Final Technical Special Provisions shall be digitally signed and sealed in accordance with applicable Florida Statutes.

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

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

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

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

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



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

It is the CONSULTANT'S responsibility to independently and continually QC their plans and other deliverables. The CONSULTANT should regularly communicate with the DEPARTMENT's Design Project Manager to discuss and resolve issues or solicit opinions from those within designated areas of expertise.

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

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

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

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

Independent Peer Review and a Constructability/Bidability Review for design Phase Plans document submittals are required on this project. These separate reviews shall be completed by someone who has not worked on the plan component that is being reviewed. These could include, but are not limited to a separate office under the Prime's umbrella, a subconsultant that is qualified in the work group being reviewed, or a CEI. It does not include persons who have

knowledge of the day to day design efforts. The Constructability/Bidability Review shall be performed by a person with experience working on DEPARTMENT construction projects (CEI, Contractor, etc.).

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

Supervision: The CONSULTANT shall supervise all technical design activities.

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

#### Project General Tasks

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

### **3.1 Public Involvement**

Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of the project. The CONSULTANT shall provide to the DEPARTMENT drafts of all Public Involvement documents (e.g., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least 5 business days prior to printing and / or distribution.

#### **3.1.1 Community Awareness Plan**

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

### **3.1.2 Notifications**

In addition to public involvement data collection, the CONSULTANT shall assist the DEPARTMENT or prepare notifications, flyers, and/or letters to elected officials and other public officials, private property owners, and tenants at intervals during plans production as identified by the DEPARTMENT. All letters and notices shall be reviewed by the CONSULTANT to ensure that they are addressed to the correct and current public officials.

### **3.1.3 Preparing Mailing Lists**

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

### **3.1.4 Median Modification Letters N/A**

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

### **3.1.5 Driveway Modification Letters**

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

### **3.1.6 Newsletters**

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

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

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

### **3.1.8 PowerPoint Presentations**

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

### **3.1.9 Public Meeting Preparations**

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

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

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

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

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

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

### **3.1.11 Other Agency Meetings**

In addition to scheduled public meetings the CONSULTANT may be required to participate in meetings with local governing authorities and/or Metropolitan Planning Organization (MPO). The CONSULTANT's participation may include, but not be limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file. It is estimated for this project there will be 2 meetings (as indicated in Section 2.1 above) with local governing authorities and/or MPOs during the design.

### **3.1.12 Web Site**

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

## **3.2 Joint Project Agreements**

## **3.3 Specifications & Estimates**

### **3.3.1 Specifications Package Preparation**

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

The Specifications Package must be submitted for review to the District Specifications Office at least 30 days prior to the contract package to Tallahassee or District due date, or sooner if required by the District Specifications Office. This submittal does not require signing and sealing and shall be coordinated through the District's Project Manager. The CONSULTANT shall coordinate with the DEPARTMENT on the submittal requirements, but at a minimum shall consist of (1) the complete Specifications Package, (2) a copy of the marked-up workbook used to prepare the package, and (3) a copy of the final project plans.

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

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

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

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

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

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

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

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

### **3.7 Plans Update**

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

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

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

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

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

### **3.9 Digital Delivery**

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

### **3.10 Risk Assessment Workshop**

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

No anticipated involvement with Railroad or Airport.

Crossing 627657N is near current project limits on SR 29, near SR 27. The rail office will continue to monitor future plans to review for possible impacts at this location.

##### **3.11.1 Aeronautical Evaluation**

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

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

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

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

Assistance with the preparation of grant applications including providing exhibits and project specific information.

## 4 ROADWAY ANALYSIS

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

### 4.1 Typical Section Package

The CONSULTANT shall prepare a Typical Section Package.

### 4.2 Pavement Type Selection Report

### 4.3 Pavement Design Package

The CONSULTANT shall prepare a Pavement Design Package.

### 4.4 Cross-Slope Analysis

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 Safety Analysis

The CONSULTANT shall perform all safety analysis required for roadway design. This includes safety analysis (justification/mitigation) required for design variations and exceptions, Highway Safety Manual (HSM) assessments, and crash analysis of crash reports.

### 4.6 Design Analysis

**Monitoring Existing Structures:** The CONSULTANT shall perform field observations to visually identify existing structures within the project limits which may require settlement, vibration or groundwater monitoring by the contractor during construction in accordance with FDM Chapter 117. The CONSULTANT shall identify the necessary pay items to be included in the bid documents to monitor existing structures.

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

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

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

#### **4.7 Operational Analysis**

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

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

#### **4.8 Design Reports**

The CONSULTANT shall prepare all applicable report(s). Reports are to be delivered as a signed and sealed pdf file.

#### **4.9 Design Variations and Exceptions**

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

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

#### **4.10 Master Design File Setup & Maintenance, Model Management Plan**

The CONSULTANT shall setup the horizontal/vertical master design file and maintain the design file throughout the life of the design. The CONSULTANT shall create a model management plan when necessary.

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

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



**3D Model Development:** When the project includes a 3D Model deliverable, the CONSULTANT shall design elements in a 3D Model in accordance with the FDOT CADD Manual and FDM.

#### **4.12 Temporary Traffic Control Plan (TTCP) Analysis and Master Design Files**

The CONSULTANT shall design a safe and effective TTCP to move vehicular and pedestrian traffic during all phases of construction. The design shall include construction phasing of roadways ingress and egress to existing property owners and businesses, routing, signing and pavement markings, and detour quantity tabulations, roadway pavement, drainage structures, ditches, front slopes, back slopes, drop offs within clear zone, transit stops, and traffic monitoring sites. Special consideration shall be given to the construction of the drainage system when developing the construction phases. Positive drainage must be maintained at all times. The design shall include construction phasing of roadways to accommodate the construction or relocation of utilities when the contract includes Joint Project Agreements (JPAs).

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

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

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

**TTCP 3D Modeling (Isolated Locations):** When the TTCP includes a 3D Model deliverable, the CONSULTANT shall design TTCP elements for isolated locations intended for design clarification of Level II TTCP designs in a 3D Model in accordance with the FDOT CADD Manual and FDM.

#### **4.13 Utility Data Collection and Analysis**

The CONSULTANT shall collect, analyze, and coordinate utility data. This includes reviewing the Utility Work Schedule (UWS) and developing and coordinating utility conflict information (if not included in section 7 Utilities).

#### **4.14 Roadway Quantities for EQ Report**

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

**TTCP Quantities for EQ Report:** The CONSULTANT shall determine temporary traffic control pay items and quantities and the supporting documentation.

#### **4.15 Cost Estimate**

#### **4.16 Technical or Modified Special Provisions**

#### **4.17 Other Roadway Tasks**

#### **4.18 Quality Assurance/Quality Control**

#### **4.19 Supervision**

#### **4.20 Roadway Meetings**

#### **4.21 Field Reviews**

#### **4.22 Coordination**

### **5 ROADWAY PLANS**

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

#### **5.1 Key Sheet & Signature Sheet**

#### **5.2 Typical Section Sheets**

#### **5.3 Cross Slope Correction Details**

#### **5.4 General Notes/Pay Item Notes**

#### **5.5 Project Layout/Model Management**

#### **5.6 Plan View (Plan Sheets)**

#### **5.7 Profile View (Plan/Profile Sheets)**

#### **5.8 Special Profiles**

#### **5.9 Sidewalk Profiles**

#### **5.10 Interchange Layout Sheet**

#### **5.11 Details**

#### **5.12 Soil Survey Sheets**

### **5.13 Cross Sections**

### **5.14 Temporary Traffic Control Plan**

### **5.15 Utility Adjustment Sheets**

### **5.16 Project Control Sheets**

### **5.17 Utility Verification Data (SUE Data)**

### **5.18 Quality Assurance/Quality Control**

### **5.19 Supervision**

## **6a DRAINAGE ANALYSIS**

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

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

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

### **6a.1 Base Clearance Analysis**

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.2 Hydroplaning Analysis**

Perform a hydroplaning analysis to assist in the determination of the appropriate roadway geometry for all necessary locations (both typical sections and critical cross sections) as needed. See the FDOT Hydroplaning Guidance and FDOT Design Manual (FDM) Chapters 210 and 211 for more information.

### **6a.3 Existing Permit Analysis**

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

### **6a.4 Utility Conflict Matrix (for drainage structures)**

Populating and coordination of the utility conflict matrix for all drainage structures.

### **6a.5 Noise Barrier Drainage Analysis**

### **N/A6a.6 Temporary Drainage Analysis**

Evaluate temporary spread due to placement of temporary barrier walls.

### **6a.7 Pond Siting Analysis and Report**

### **N/A6a.8 Analysis of Pipe Video Inspection Report**

### **N/A6a.9 Bridge Hydraulic Report**

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

### **6a.10 Design of Cross Drains**

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

### **6a.11 Design of Ditches and Side Drains**

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.12 Design of Stormwater Management Facility**

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

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

### **6a.13 Design of Floodplain Compensation**

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

### **6a.14 Design of Storm Drains**

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

#### **6a.15 Optional Culvert Material**

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

#### **6a.16 Design of Trench Drains**

N/A

#### **6a.17 French Drain Systems**

#### **N/A 6a.18 Design of Drainage Wells**

#### **N/A 6a.19 Stormwater Runoff Control Concept**

Includes analysis and design of the Stormwater Runoff Control Concept. Includes creating the design file.

#### **6a.20 Other Drainage Tasks**

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

#### **6a.21 Drainage Design Documentation Report**

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

#### **6a.22 Drainage Quantities for EQ Report**

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

#### **6a.23 Cost Estimate**

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

#### **6a.24 Technical or Modified Special Provisions**

#### **6a.25 Quality Assurance/Quality Control**

#### **6a.26 Supervision**

#### **6a.27 Drainage Meetings**

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

#### **6a.28 Field Reviews**

## **6a.29 Coordination**

## **6b DRAINAGE PLANS**

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

### **6b.1 Drainage Map (Including Interchanges)**

### **6b.2 Bridge Hydraulics Recommendation Sheets**

### **6b.3 Drainage Structures**

### **6b.4 Lateral Ditches**

### **6b.5 Retention/Detention/Floodplain Compensation Ponds**

### **6b.6 Quality Assurance/Quality Control**

### **6b.7 Supervision**

## **6c SELECTIVE CLEARING AND GRUBBING (TBD)**

### **6c.1 Data Collection and Inventory**

The CONSULTANT shall review information from the DEPARTMENT and conduct a project field assessment(s) of existing vegetation. At least one field assessment visit is to be attended by the District Landscape Architect.

The Result of the Field Assessment(s) will determine the course of action for Selective Clearing and Grubbing and the extent of the Vegetation Survey under Task 2.11.

### **6c.2 Assessment and Disposition Determination**

The CONSULTANT shall coordinate with the District Utility Office, drainage engineers, and traffic engineers to ensure that preservation of existing vegetation is coordinated between all disciplines. Coordinate with the District Landscape Architect.

Based on the field assessment, the CONSULTANT may be required do a site inventory analysis of existing vegetation, opportunities for preservation and protection of existing vegetation, relocation options, and selective removal of nuisance and/or non-nuisance vegetation. Coordinate with surveyor to have trees and vegetation tagged and surveyed, per tasks 27.28 or 27.29.

### **6c.3 Selective Clearing and Grubbing Maintenance Report**

The CONSULTANT shall include in the plans instructions for the care and maintenance of the plant preservation areas, and selective clearing and grubbing areas throughout the

construction period. The CONSULTANT will coordinate with the District Landscape Architect to ensure that the intent of the plant preservation areas is in alignment with future highway landscape plans. The CONSULTANT should be knowledgeable in arboricultural practices to the extent that they are able to deliver detailed and informed Selective Clearing and Grubbing Plans.

#### **6c.4 Selective Clearing and Grubbing Plan**

The CONSULTANT will prepare a Selective Clearing and Grubbing Plan outlining the requirements for the relocation and protection of vegetation and trees located within the project boundaries. Will utilize the information collected from the Vegetation Survey. The plan shall include the Tree Disposition Chart and all notes and details required.

#### **6c.5 Selective Clearing and Grubbing Quantities for EQ Report**

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

#### **6c.6 Cost Estimate**

#### **6c.7 Quality Assurance/Quality Control**

#### **6c.8 Supervision**

#### **6c.9 Selective Clearing and Grubbing Meetings**

#### **6c.10 Field Reviews**

#### **6c.11 Coordination**

### **7 UTILITIES**

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

#### **7.1 Utility Kickoff Meeting**

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

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

The CONSULTANT shall identify all Utility Agency Owners (UAOs) in the corridor and within and adjacent to the project limits that may be impacted by the project. Identification shall include the updated UAO contact information. The CONSULTANT shall contact Sunshine 811, perform a field visit, and review prior FDOT utility permits, reports, existing plans, and surveys provided.

### **7.3 Make Utility Contacts**

**First Contact:** The CONSULTANT shall send letters and plans to each Utility Agency Owner (UAO), one set for the utility office, and one set to the DEPARTMENT Offices as required by the District. Includes contact by phone for meeting coordination. Request type, size, location, easements, and cost for relocation if reimbursement is claimed. Request the voltage level for power lines in the project area. Send UAO requests for reimbursement to FDOT for a legal opinion. Include the meeting schedule (if applicable) and the design schedule. Include typical meeting agenda. If scheduling a meeting, give a 4-week notice.

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

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

Not all projects will have all contacts as described above.

### **7.4 Exception Processing**

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

### **7.5 Preliminary Utility Meeting**

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



an opportunity for the UAO(s) to present proposed facilities. The CONSULTANT shall keep accurate minutes and distribute a copy to all attendees.

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

The CONSULTANT shall meet with each UAO as necessary, separately or together, throughout the project design duration to provide guidance in the interpretation of plans, review changes to the plans and schedules, standard or selective clearing and grubbing work, and assist in the development of the UAO(s) marked/RGB plans and work schedules. The CONSULTANT is responsible for motivating the UAO to complete and return the necessary documents after each Utility Contact or Meeting.

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

The CONSULTANT shall review UAOs marked plans and data individually as they are received for content, accuracy, utility type, material, and size. Provide to the EOR for inclusion in the plans. Forward all requests for UAO reimbursement and supporting documentation to the DUO.

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

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

#### **7.9 Utility Design Meeting**

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

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

The CONSULTANT shall review utility marked up plans and work schedules as they are received for content and coordinate review with the designer. Send color markups and

schedules to the appropriate DEPARTMENT office(s) such as survey, geotechnical, drainage, structures, lighting, roadway, signals, utilities, landscape architecture, municipalities, maintaining agency, and District Traffic Operations for review and comment if required by the District. Coordinate with the District for execution. Distribute Executed Final Documents. Prepare Work Order for UAO(s). The CONSULTANT shall coordinate with the DUO the programming of necessary Work Program funds.

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

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

#### **7.12 Utility Constructability Review**

The CONSULTANT shall review utility schedules against construction contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the construction office.

#### **7.13 Additional Utility Services**

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

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

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

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

If requested by the District, the CONSULTANT shall transmit the contract plans as processed for letting to the UAO(s). Transmittals to UAO(s) via electronic delivery or another agreeable format.

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

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

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

OR

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

OR

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

### **7.17 Other Utilities**

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

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

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

### **8.1 Preliminary Project Research**

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

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

### **8.2 Field Work**

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

### **N/A8.2.2 Establish Wetland Jurisdictional Lines and Assessments:**

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

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

### **8.2.3 Species Surveys:**

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

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

The CONSULTANT shall be responsible for verification of wetland and other surface water data identified in Section 8.2 and coordinating regulatory agency field reviews,

including finalization of assessments and jurisdictional determinations with applicable agencies.

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

The CONSULTANT shall collect the data and information necessary to prepare the permit applications and obtain the environmental permits and authorizations required to construct the project as identified in the Project Description and as described in 8.4.1, 8.4.2, and 8.15 (Other Environmental Permits). The CONSULTANT shall prepare each application in accordance with the rules and/or regulations of the regulatory agency responsible for issuing a specific permit and/or authorization to perform work. The application packages must be approved by the DEPARTMENT prior to submittal to regulatory agencies.

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

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

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

*Upon request by the DEPARTMENT the CONSULTANT shall be responsible for preparation and payment of a legal advertisement of “Final Agency Action”. Legal advertisement shall be published one time in a newspaper that meets the notification requirements of the water management district.*

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

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

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

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

## **8.6 Complete and Submit Documentation for Coordination and/or USCG Bridge Permit Application N/A**

The CONSULTANT shall be responsible for determining the level of effort needed for the USCG authorization in accordance with the regulatory agency requirements. The CONSULTANT shall respond to agency RAIs, including necessary revisions to the application package. All responses and completed applications must be approved by the District Permit Coordinator prior to submittal to the regulatory agency.

### **8.6.1 Prepare and submit required documents for USCG Coordination**

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

### **8.6.2 Complete and submit USCG Bridge Permit Application**

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

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

The CONSULTANT shall be responsible for the preparation of the ROW Occupancy permit application in accordance with the regulatory agency requirements. The CONSULTANT shall respond to agency RAIs, including necessary revisions to the application package. All responses and completed applications must be approved by the District Permit Coordinator prior to submittal to the regulatory agency. The CONSULTANT shall be responsible for acquiring the ROW Occupancy permit.

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

The CONSULTANT shall be responsible for the preparation of the CCCL permit application and acquire the final "Notice to Proceed" authorization from the Florida Department of Environmental Protection (FDEP). The CONSULTANT shall respond to agency RAIs, including necessary revisions to the application package. All responses and completed applications must be approved by the District Permit Coordinator prior to submittal to the regulatory agency. Legal advertisements shall be published one time in a newspaper that meets the notification requirements of the FDEP.

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

The CONSULTANT shall be responsible for the preparation of the Section 408 (33 USC 408) application and obtaining Section 408 permission. The CONSULTANT shall respond to agency RAIs, including necessary revisions to the application package. All responses and completed applications must be approved by the District Permit Coordinator prior to submittal to the regulatory agency.

### **8.10 Compensatory Mitigation Plan**

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

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

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

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

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

Prior to selection of a final mitigation site, the CONSULTANT will provide the following services in the development of a mitigation plan (as defined in 33 CFR 332.4(c)/40 CFR 230.92.4(c)):

- 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
- Establish baseline report of selected alternative
  - May include, but not limited to: location maps, topographic maps, soil maps, aerial photographs, a delineation of aquatic resources, and data sheets that describe the existing condition of aquatic resources on the project site.

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

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or commenting agencies. Once a mitigation

plan (as defined in 33 CFR 332.4(c)/40 CFR 230.92.4(c)) has been reviewed and approved by the DEPARTMENT, the CONSULTANT will be responsible for coordinating the proposed mitigation plan with the environmental agencies. The CONSULTANT will provide mitigation information needed to update the FDOT Environmental Impact Inventory.

### **8.12 Regulatory Agency Support**

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

### **8.13 Other Environmental Permits**

**The CONSULTANT shall coordinate with Department personnel and Agencies as directed by the Department to determine whether wildlife crossings are needed for this section of SR 29. The CONSULTANT shall prepare a memo for the Bridge Development Report on whether include or exclude wildlife crossing features of all proposed bridges.**

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

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

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

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

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

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

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



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

#### **8.14.3 Section 4(f), 6(f), and Acquisition and Restoration Council Resources (ARC)**

The CONSULTANT shall provide necessary technical information to the District's Project Manager to analyze the impacts to 4(f), 6(f) and ARC resources due to the changes in the project in accordance with Part 2, Chapters 7 and 23 of the PD&E Manual. The CONSULTANT shall prepare all Section 4(f) documentation necessary to obtain Section 4(f) approval.

#### **8.14.4 Wetland Impact Analysis**

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

#### **8.14.5 Essential Fish Habitat Impact Analysis**

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

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

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

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

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

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

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

#### **8.15.2 Archaeological and Historical Resources**

The CONSULTANT shall collect data necessary to completely analyze the impacts, due to changes in the project or project area, to all cultural and historic resources, and

prepare a Cultural Resource Assessment Survey Report, in accordance with Part 2, Chapter 8 of the PD&E Manual.

### **8.15.3 Section 4(f), 6(f), and ARC Resources**

The CONSULTANT shall provide necessary information to analyze and document the impacts to Section 4(f), 6(f), and ARC resources due to the changes in the project or project area in accordance with Part 2, Chapters 7 and 23 of the PD&E Manual. The CONSULTANT shall prepare all 4(f) documentation necessary to obtain Section 4(f) approval.

### **8.15.4 Wetland Impact Analysis**

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

### **8.15.5 Essential Fish Habitat Impact Analysis**

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

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

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

## **8.16 Contamination Impact Analysis**

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

The DEPARTMENT will provide Level II assessment services. If contamination is identified within the limits of construction, the CONSULTANT shall coordinate with the

District Contamination Impact Coordinator to properly mark identified contamination areas in the plans and develop specifications as appropriate.

### **8.17 Asbestos Survey**

The DEPARTMENT will provide asbestos and metal-based coatings survey services.

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

### **8.18 Technical Meetings**

### **8.19 Quality Assurance/Quality Control**

### **8.20 Supervision**

### **8.21 Coordination**

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

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

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

### **9.1 Key Sheet and Index of Drawings**

### **9.2 Project Layout**

### **9.3 General Notes and Bid Item Notes**

### **9.4 Miscellaneous Common Details**

### **9.5 Incorporate Report of Core Borings**

**9.6 Standard Plans- Bridges**

**9.7 Existing Bridge Plans**

**9.8 Structures Quantities for EQ Report**

**9.9 Cost Estimate**

**9.10 Technical Special Provisions and Modified Special Provisions**

**9.11 Field Reviews**

**9.12 Technical Meetings**

**9.13 Quality Assurance/Quality Control**

**9.14 Independent Peer Review**

**9.15 Supervision**

**9.16 Coordination**

## **10 STRUCTURES - BRIDGE DEVELOPMENT REPORT**

The CONSULTANT shall prepare bridge development reports for the Lone Pine Creek and Chapparal Slough bridge replacements

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

General Requirements

**10.1 Bridge Geometry**

**10.2 Ship Impact Data Collection**

**10.3 Ship Impact Criteria**

Superstructure Alternatives

**10.4 Short-Span Concrete**

**10.5 Medium-Span Concrete**

**10.6 Long Span Concrete**

**10.7 Structural Steel**

Foundation and Substructure Alternatives

**10.8 Pier/Bent**

**10.9 Shallow Foundations / GRS Abutments**

## **10.10 Deep Foundations**

Movable Span

## **10.11 Data Collection and Design Criteria**

## **10.12 Movable Span Geometrics and Clearances**

## **10.13 Deck System Evaluation**

## **10.14 Framing Plan Development**

## **10.15 Main Girder Preliminary Design**

## **10.16 Conceptual Span Balance/Counterweight**

## **10.17 Support System Development**

## **10.18 Drive Power Calculations**

## **10.19 Drive System Development**

## **10.20 Power and Control Development**

## **10.21 Conceptual Pier Design**

## **10.22 Foundation Analysis (FL PIER)**

## **10.23 Tender Visibility Study**

Other BDR Issues

## **10.24 Aesthetics**

## **10.25 TTCP/Staged Construction Requirements**

## **10.26 Constructability Requirements**

## **10.27 Load Rating for Damaged/Widened Structures**

## **10.28 Quantity and Cost Estimates**

## **10.29 Quantity and Cost Estimates - Movable Span**

## **10.30 Wall Type Justification**

Report Preparation

## **10.31 Exhibits**

## **10.32 Exhibits - Movable Span**

## **10.33 Report Preparation**

## **10.34 Report Preparation - Movable Span**

### **10.35 BDR Submittal Package**

#### Preliminary Plans

When ONLY Phase I plans are final deliverable, use Task Nos. as shown for applicable bridge types for project Activities 12 thru 16. Staffhours to be negotiated and scaled appropriately.

## **11 STRUCTURES - TEMPORARY BRIDGE TBD**

The CONSULTANT shall prepare plans for Temporary Bridge(s) at the location(s) specified in Section 2.6. The CONSULTANT shall contact FDOT Office of Maintenance to determine the type and availability of temporary before deciding on the temporary bridge type to be used.

#### General Layout Design and Plans

##### **11.1 Overall Bridge Final Geometry**

##### **11.2 General Plan and Elevation**

##### **11.3 Miscellaneous Details**

#### End Bent Design and Plans

##### **11.4 End Bent Structural Design**

##### **11.5 End Bent Details**

#### Intermediate Bent Design and Plans

##### **11.6 Intermediate Bent Structural Design****11.7 Intermediate Bent Details**

#### Miscellaneous Substructure Design and Plans

##### **11.8 Foundation Layout**

## **12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE**

The CONSULTANT shall prepare structures design and plans for the replacement of the bridges over Lone Pine Creek and Chapparral Slough. The CONSULTANT shall prepare plans for Short Span Concrete Bridge(s) at the location(s) specified in Section 2.5.

#### General Layout Design and Plans

##### **12.1 Overall Bridge Final Geometry**

##### **12.2 Expansion/Contraction Analysis**

##### **12.3 General Plan and Elevation**

##### **12.4 Construction Staging**

**12.5 Approach Slab Plan and Details**

**12.6 Miscellaneous Details**

End Bent Design and Plans

**12.7 End Bent Geometry**

**12.8 End Bent Structural Design**

**12.9 End Bent Plan and Elevation**

**12.10 End Bent Details**

Intermediate Bent Design and Plans

**12.11 Bent Geometry**

**12.12 Bent Stability Analysis**

**12.13 Bent Structural Design**

**12.14 Bent Plan and Elevation**

**12.15 Bent Details**

Miscellaneous Substructure Design and Plans

**12.16 Foundation Layout**

Superstructure Design and Plans

**12.17 Finish Grade Elevation Calculation**

**12.18 Finish Grade Elevations**

Cast-In-Place Slab Bridges

**12.19 Bridge Deck Design**

**12.20 Superstructure Plan**

**12.21 Superstructure Sections and Details**

Prestressed Slab Unit Bridges

**12.22 Prestressed Slab Unit Design**

**12.23 Prestressed Slab Unit Layout**

**12.24 Prestressed Slab Unit Details and Schedule**

**12.25 Deck Topping Reinforcing Layout**

**12.26 Superstructure Sections and Details**

Reinforcing Bar Lists

**12.27 Preparation of Reinforcing Bar List**

Load Rating

**12.28 Load Rating**

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

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

N/A

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

N/A

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

N/A

**17 STRUCTURES - RETAINING WALLS (TBD)**

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

General Requirements

**17.1 Key Sheet**

**17.2 Horizontal Wall Geometry**

Permanent Proprietary Walls

**17.3 Vertical Wall Geometry**

**17.4 Semi-Standard Drawings**

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

**17.6 Details**

Temporary Proprietary Walls

**17.7 Vertical Wall Geometry**

**17.8 Semi-Standard Drawings**

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



### **17.10 Details**

Cast-In-Place Retaining Walls

### **17.11 Design**

### **17.12 Vertical Wall Geometry**

### **17.13 General Notes**

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

### **17.15 Sections and Details**

### **17.16 Reinforcing Bar List**

Other Retaining Walls and Bulkheads

### **17.17 Design**

### **17.18 Vertical Wall Geometry**

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

### **17.20 Wall Plan and Elevations**

### **17.21 Details**

## **18 STRUCTURES - MISCELLANEOUS**

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

Concrete Box Culverts

### **18.1 Concrete Box Culverts**

### **18.2 Concrete Box Culverts Extensions**

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

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

Strain Poles

### **18.5 Steel Strain Poles**

### **18.6 Concrete Strain Poles**

### **18.7 Strain Pole Data Table Plan Sheets**

### **18.8 Strain Pole Special Details Plan Sheets**

Mast Arms

**18.9 Mast Arms**

**18.10 Mast Arms Data Table Plan Sheets**

**18.11 Mast Arms Special Details Plan Sheets**

Overhead/Cantilever Sign Structure

**18.12 Cantilever Sign Structures**

**18.13 Overhead Span Sign Structures**

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

**18.15 Monotube Overhead Sign Structure**

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

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

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

High Mast Lighting

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

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

Noise Barrier Walls (Ground Mount)

**18.21 Horizontal Wall Geometry**

**18.22 Vertical Wall Geometry**

**18.23 Summary of Quantities - Aesthetic Requirements**

**18.24 Control Drawings**

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

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

**18.27 Aesthetic Details**

Special Structures

**18.28 Fender System**

**18.29 Fender System Access**

**18.30 Special Structures**

**18.31 Other Structures**

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

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

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

### **18.35 Ancillary Structures Report**

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

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

### **19.1 Traffic Data Analysis**

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### **19.7 S&PM Quantities for EQ Report**

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

#### **19.8 Cost Estimate**

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

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

#### **19.11 Field Reviews**

#### **19.12 Technical Meetings**

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

#### **19.14 Independent Peer Review**

#### **19.15 Supervision**

#### **19.16 Coordination**

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

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

#### **20.1 Key Sheet & Signature Sheet**

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

#### **20.3 Project Layout**

#### **20.4 Plan Sheet**

#### **20.5 Special Details**

#### **20.6 Service Point Details**

#### **20.7 Guide Sign Data**

#### **20.8 Cross Sections (Sign Installations)**

## **20.9 Quality Assurance/Quality Control**

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

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

## **20.10 Supervision**

## **21 SIGNALIZATION ANALYSIS N/A**

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

### **21.1 Traffic Data Collection**

### **21.2 Traffic Data Analysis**

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

### **21.3 Signal Warrant Study**

### **21.4 Systems Timings**

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

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

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

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

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

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

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

## **21.8 Pole Elevation Analysis**

## **21.9 Traffic Signal Operation Report**

*[As defined by the District]*

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

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

## **21.11 Cost Estimate**

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

## **21.13 Other Signalization Analysis**

## **21.14 Field Reviews**

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

- Existing Signal and Pedestrian Phasing
- Controller Make, Model, Capabilities and Condition/Age
- Condition of Signal Structure(s)
- Type of Detection as Compared with Current District Standards
- Interconnect Media
- Controller Timing Data

## **21.15 Technical Meetings**

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

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

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

## **21.17 Independent Peer Review**

## **21.18 Supervision**

## **21.19 Coordination**

## **22 SIGNALIZATION PLANS N/A**

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 & Signature Sheet**

### **22.2 General Notes/Pay Item Notes**

### **22.3 Signalization Plan Sheets**

### **22.4 Interconnect Plans**

### **22.5 Traffic Monitoring Site**

### **22.6 Guide Sign Data**

### **22.7 Special Details**

### **22.8 Service Point Details**

### **22.9 Mast Arm/Monotube Tabulation Sheet**

### **22.10 Strain Pole Schedule**

### **22.11 TTCP Signal**

### **22.12 Temporary Detection Sheet**

### **22.13 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 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.

### **22.14 Supervision**

## **23 LIGHTING ANALYSIS**

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

### **23.1 Lighting Justification Report**

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

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

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

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

### **23.3 Voltage Drop Calculations**

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

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

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

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

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

### **23.6 Temporary Highway Lighting**

### **23.7 Design Documentation**

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



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

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

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

### **23.9 Cost Estimate**

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

### **23.11 Other Lighting Analysis**

### **23.12 Field Reviews**

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

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

### **23.13 Technical Meetings**

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

### **23.15 Independent Peer Review**

### **23.16 Supervision**

### **23.17 Coordination**

## **24 LIGHTING PLANS**

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

### **24.1 Key Sheet & Signature Sheet**

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

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

### **24.4 Project Layout**

### **24.5 Plan Sheets**

### **24.6 Special Details**

### **24.7 Service Point Details**

### **24.8 Temporary Highway Lighting Plan Sheets**

### **24.9 Quality Assurance/Quality Control**

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

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

### **24.10 Supervision**

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

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 Outdoor Advertising Assessment**

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.

### **25.3 Master Design File Setup (Base Files)**

Includes all work required to setup the master design file.

### **25.4 Site Inventory and Analysis**

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

### **25.5 Landscape Opportunity Plan**

Task includes developing a Landscape Opportunity Plan.

## **25.6 Conceptual Planting Design**

## **25.7 Final Planting Design**

## **25.8 Conceptual Irrigation Design**

## **25.9 Final Irrigation Design**

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

## **25.10 Conceptual Hardscape Design**

## **25.11 Final Hardscape Design**

## **25.12 Landscape Quantities for EQ Report**

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

## **25.13 Cost Estimates**

## **25.14 Technical or Modified Special Provisions**

## **25.15 Other Landscape Services**

## **25.16 Quality Assurance/Quality Control**

## **25.17 Supervision**

## **25.18 Landscape Meetings**

## **25.19 Field Reviews**

## **25.20 Coordination**

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

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

### **26.1 Key Sheet & Signature Sheet**

### **26.2 Plant Schedule (Sheet no longer produced) (N/A)**

### **26.3 General Notes/Pay Item Notes**

### **26.4 Planting Plans for Linear Areas**

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

### **26.6 Planting Details**

## **26.7 Irrigation Plans for Linear Areas**

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

## **26.9 Irrigation Details**

## **26.10 Hardscape Plans and Details**

## **26.11 Maintenance Plan**

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

## **26.12 Quality Assurance/Quality Control**

## **26.13 Supervision**

# **27 SURVEY**

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

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

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

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

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

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

Establish or recover VPC, for the purpose of establishing vertical control on datum approved by the District Surveyor (DS) or the District Location Surveyor (DLS).; may

include primary or secondary vertical control points. Includes analysis and processing of all field collected data, and preparation of forms.

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

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

### **27.4 Aerial Targets**

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

### **27.5 Reference Points**

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

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

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

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

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

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

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

### **27.9 Side Street Surveys**

Refer to tasks of this document as applicable.

### **27.10 Underground Utilities**

### **27.11 Outfall Survey**

Locate all above ground features and improvements for the limits of the project by collecting the required data for the purpose of a DTM. Survey with sufficient density of

shots. Shoot all break lines, high and low points. Includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

#### **27.12 Drainage Survey**

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

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

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

#### **27.14 Channel Survey**

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

#### **27.15 Pond Site Survey**

Refer to tasks of this document as applicable.

#### **27.16 Mitigation Survey**

Refer to tasks of this document as applicable.

#### **27.17 Jurisdiction Line Survey**

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

#### **27.18 Geotechnical Support**

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

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

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

#### **27.20 Subdivision Location**

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

the subject county, tie existing monumentation of the beginning and end of unrecorded subdivision.

**27.21 Maintained R/W**

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

**27.22 Boundary Survey**

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

**27.23 Water Boundary Survey**

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

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

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

**27.25 Right of Way Monumentation**

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

**27.26 Line Cutting**

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

**27.27 Work Zone Safety**

Provide work zone as required by DEPARTMENT standards.

**27.28 Vegetation Survey**

**27.29 Tree Survey**

Locate individual trees or palms within the project limits.

**27.30 Miscellaneous Surveys**

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

**27.31 Supplemental Surveys**

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

### **27.32 Document Research**

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

### **27.33 Field Review**

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

### **27.34 Technical Meetings**

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

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

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

### **27.36 Supervision**

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

### **27.37 Coordination**

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

## **28 PHOTOGRAMMETRY (TBD)**

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

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

### **28.1 Flight Preparation**

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

### **28.2 Control Point Coordination**

Determine photo identifiable control points, and mark contact prints.



### **28.3 Mobilization**

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

### **28.4 Flight Operations**

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

### **28.5 Photo Products**

Prepare contact prints, contact diapositives, and photo enlargements.

### **28.6 LiDAR**

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

### **28.7 Aerial Triangulation**

Measure and adjust control within aerial images.

### **28.8 Surfaces**

Includes collection of break lines and spot elevations.

### **28.9 Ortho Generation**

Includes creation of final images.

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

Create the rectified digital image.

### **28.11 Mosaicking**

Create the mosaic.

### **28.12 Sheet Clipping**

Create plot files for sheets from the database.

### **28.13 Topographics (3D)**

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

### **28.14 Planimetrics (2D)**

Prepare 2D planimetric map.

### **28.15 Drainage Basin**

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

### **28.16 CADD Edit**

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

### **28.17 Data Merging**

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

### **28.18 Miscellaneous**

Other tasks not specifically addressed in this document.

### **28.19 Field Review**

Perform on site review of maps.

### **28.20 Technical Meetings**

Attend meetings as required.

### **28.21 Quality Assurance/Quality Control**

Establish and implement a QA/QC plan.

### **28.22 Supervision**

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

### **28.23 Coordination**

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

## **29 MAPPING (TBD)**

The CONSULTANT will be responsible for the preparation of control survey maps, right of way maps, maintenance maps, sketches, other miscellaneous survey maps, and legal descriptions as required for this project in accordance with all applicable DEPARTMENT Manuals, Procedures, Handbooks, District specific requirements, and Florida Statutes. All maps, surveys and legal descriptions will be prepared under the direction of a Florida Professional Surveyor and Mapper (PSM) to DEPARTMENT size and format requirements utilizing DEPARTMENT approved software, and will be designed to provide a high degree of uniformity and maximum readability. The CONSULTANT will submit maps, legal descriptions, quality assurance check prints, checklists, electronic media files and any other documents as required for this project to the DEPARTMENT for review at stages of completion as negotiated.

Master CADD File

### **29.1 Alignment**

## **29.2 Section and 1/4 Section Lines**

## **29.3 Subdivisions**

## **29.4 Property Lines**

## **29.5 Existing Right of Way**

## **29.6 Topography**

## **29.7 Parent Tract Properties and Existing Easements**

## **29.8 Proposed Right of Way Requirements**

The ENGINEER OF RECORD (EOR) will provide the proposed requirements. The PSM is responsible for calculating the final geometry. Notification of Final Right of Way Requirements along with the purpose and duration of all easements will be specified in writing.

## **29.9 Limits of Construction**

The limits of construction DGN file as provided by the EOR will be imported or referenced to the master CADD file. Additional labeling will be added as required. The PSM is required to advise the EOR of any noted discrepancies between the limits of construction line and the existing/proposed right of way lines, and for making adjustments as needed when a resolution is determined.

## **29.10 Jurisdictional/Agency Lines**

These lines may include, but are not limited to, jurisdictional, wetland, water boundaries, and city/county limit lines.

## Sheet Files

### **29.11 Control Survey Cover Sheet**

### **29.12 Control Survey Key Sheet**

### **29.13 Control Survey Detail Sheet**

### **29.14 Right of Way Map Cover Sheet**

### **29.15 Right of Way Map Key Sheet**

### **29.16 Right of Way Map Detail Sheet**

### **29.17 Maintenance Map Cover Sheet**

### **29.18 Maintenance Map Key Sheet**

### **29.19 Maintenance Map Detail Sheet**

### **29.20 Reference Point Sheet**

This sheet(s) will be included with the Control Survey Map, Right of Way Map and Maintenance Map.

#### **29.21 Project Control Sheet**

This sheet depicts the baseline, the benchmarks, the primary and secondary control points and their reference points including the type of material used for each point, their XYZ coordinates, scale factors and convergence angles. This sheet(s) may be included with the Control Survey Map, Right of Way Map and Maintenance Map.

#### **29.22 Table of Ownerships Sheet**

Miscellaneous Surveys and Sketches

#### **29.23 Parcel Sketches**

#### **29.24 TITF Sketches**

#### **29.25 Other Specific Purpose Survey(s)**

#### **29.26 Boundary Survey(s) Map**

#### **29.27 Right of Way Monumentation Map**

#### **29.28 Title Search Map**

#### **29.29 Title Search Report**

#### **29.30 Legal Descriptions**

#### **29.31 Quality Assurance/Quality Control**

#### **29.32 Supervision**

#### **29.33 Mapping Meetings**

#### **29.34 Field Reviews**

#### **29.35 Coordination**

#### **29.36 Supplemental Mapping**

This task is to cover efforts resulting from major design and/or development changes after 60% map development that affect the right of way requirements/parent tract property lines and may include any number of tasks. Request and approval to utilize the Supplemental Mapping hours will be in writing and approved by the District Right of Way Surveyor prior to any work being done under this task.

### **30 TERRESTRIAL MOBILE LiDAR (TBD)**

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

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

### **30.1 Terrestrial Mobile LiDAR Mission Planning**

Research and prepare materials necessary for the successful execution of the Mobile LiDAR Mission. This includes but is not limited to route and safety planning, GPS /data acquisition scheduling, weather reports, and site terrain research.

### **30.2 Project Control Point Coordination**

All efforts necessary to coordinate the proper placement of project ground control; e.g., base stations, transformation control points, and validation points, supporting the Mobile LiDAR survey.

### **30.3 Terrestrial Mobile LiDAR Mobilization**

Prepare the LiDAR sensor and vehicle for project data collection, and get specialized personnel and equipment on site.

### **30.4 Terrestrial Mobile LiDAR Mission**

Perform site calibrations of LiDAR sensor and collect laser survey data, including any simultaneous base station GPS occupations and operation of any necessary safety equipment.

### **30.5 Terrestrial Mobile LiDAR Processing**

Download and post process collected measurement data from Mobile LiDAR vehicle sensors, and any base stations occupied during mission. Analyze Mobile LiDAR measurement points and scan route overlaps. Separate any large point cloud data sets into manageable file sizes with corresponding indexes.

### **30.6 Terrestrial Mobile Photography Processing**

Process, reference, and name digital photographic imagery files collected during Mobile LiDAR mission.

### **30.7 Transformation / Adjustment**

Adjust LiDAR point cloud data to Project Control points. Create point cloud data file(s) in approved digital format. Prepare required reports of precision and accuracy achieved. If this task is performed by separate firm, or is the final product to be delivered, include effort for Survey Report.

### **30.8 Classification / Editing**

Identify and attribute (classify) point cloud data into requested groups. Classify or remove erroneous points.

### **30.9 Specific Surface Reporting**

Prepare reports, data and/or graphics of specific surface details such as, but not limited to pavement rutting, bridge structure clearance to roadway surface.

### **30.10 Topographic (3D) Mapping**

Produce three dimensional (3D) topographic survey map(s) from collected Mobile LiDAR data. This includes final preparation of Construction Information Management (CIM) deliverable, if applicable.

### **30.11 Topographic (2D) Planimetric Mapping**

Produce two dimensional (2D) planimetric map(s) from collected Mobile LiDAR data.

### **30.12 CADD Edits**

Perform final edit of graphics for delivery of required CADD files. This includes final presentation of CIM deliverable, if applicable.

### **30.13 Data Merging**

Merge Mobile LiDAR survey and mapping files, with other field survey files, and data from other sources.

### **30.14 Miscellaneous**

Other tasks not specifically addressed in this document.

### **30.15 Field Reviews**

Perform on site review of maps.

### **30.16 Technical Meetings**

Attend meetings as required.

### **30.17 Quality Assurance/ Quality Control**

Establish and implement a QA/QC plan.

### **30.18 Supervision**

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

### **30.19 Coordination**

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

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

### **PHASE I - 30% SCHEMATIC DESIGN DOCUMENTS SUBMITTAL**

After receipt of written authorization to proceed from the DEPARTMENT and based on the approvals and any authorized adjustments to the Project Scope, Project Schedule or Budget, the Design Professional shall prepare, submit and present for approval by the DEPARTMENT, Phase I (30%) documents, comprised of, but not limited to, the following:

#### Documents

- Architectural and Civil site plan(s) showing, in addition to site survey requirements, landscaping, drainage, water retention ponds, sewage disposal and water supply system, chilled water supply and return piping and such physical features that may adversely affect or enhance the safety, health, welfare, visual environment, or comfort of the occupants.
- A statement on the site plan signed and dated by the Design Professional or his designated subconsultant, including identifying the number of existing trees, the number and size of required trees, and the number of proposed trees to be planted, and other relevant features.
- Soil testing results including a copy of the Geotechnical Engineer's report on the site, and proposed method of treatment when unusual soil conditions or special foundation problems are indicated.
- Review of anticipated GBRS points and certification level; adjust attempted points as needed to meet target certification level. Provide updated GBRS credit scorecard or checklist.

Drawing(s) to include as a minimum, the following deliverables:

- Floor plan drawn at an architectural scale that will allow the entire facility to be shown on one sheet, without breaklines, and which indicates project phasing as applicable to the Scope.
- Floor plans drawn at 3/32 inch or larger scale showing typical occupied spaces or special rooms with dimensions, sanitary facilities, stairs, elevators, identification of accessible areas for the disabled and other program requirements.
- Floor plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, indicating door and window layouts and other relevant features.
- For alterations or additions to an existing facility: Indicate the connections and tie ins to the existing facilities, including all existing spaces, exits, plumbing fixtures and locations and any proposed changes thereto. Distinguish between new and existing areas for renovation, remodeling, or an addition and show demolition plans of areas to be removed.
- Furniture and Equipment plans drawn at 1/8 inch or larger scale showing typical spaces or special rooms with dimensions, equipment and furnishing layouts and other relevant features.
- Reflected ceiling plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, major lighting equipment and ceiling panel layouts.
- Roof and miscellaneous plans to be drawn at 3/32 inch or larger scale showing dimensioned features penetrations, equipment and other relevant features.
- Provide design narrative and plumbing fixture locations.
- All exterior building elevations to illustrate and indicate the scale, finish, size and fenestration of the facility.
- Sufficient building and wall sections to show dimensions, proposed construction material, and relationship of finished floor to finished grades.

- Preliminary Structural Drawings to include plans and sections indicating systems, connections and foundations.
- Mechanical Drawings to include ceiling plans, location of grease trap(s), LP gas tank location, natural gas piping connection to existing utilities. Provide narrative description to include a description of proposed HVAC system equipment including the chiller, pumps, AHUs, cooling tower, electric duct heaters and other relevant features.
- Electrical Drawings include plans with lighting layouts for outdoors and major interior spaces. Show location of electrical rooms, transformers, emergency generator.
- Equipment and Furnishing Schedules to indicate major equipment that will be provided by the Contractor and those that will be provided by the DEPARTMENT or others.

Life Safety plans to show exit strategy, rated doors, emergency wall openings, range and fume hoods, eye wash, emergency showers, ramps, vertical lifts, and other relevant features.

- By symbol, indicate fire extinguishers, fire alarm equipment, smoke vents, master valves and emergency disconnects, emergency lighting, emergency power equipment, fire sprinklers, exit signs, smoke and fire dampers, and other life safety equipment relevant to the facility.
- By symbol, indicate connections and tie ins to existing equipment.

For existing facilities where remodeled or renovated spaces are required and where an ADA and code conforming ramp cannot be utilized, document proposed vertical platform lifts or inclined wheelchair lifts and provide the following documents as part of or in addition to the required life safety plans:

- Floor plans of proposed vertical platform lifts including layout drawings showing corridor widths and exiting from the affected facility.
- Sketches of proposed inclined wheel chair lift to include layout drawings showing clear and affected areas of the following conditions stairway width in the folded and unfolded position, the upper and lower platform storage locations, and the means of egress from the affected areas of the facility.

Outline Specifications (Edited Table of Contents)

- Organized to conform to the formats for outline specifications as established by the Construction Specifications Institute's current edition of Master Format on the date of execution of the Contract.
- Provide only those sections relevant to the project scope.
- Complete for Divisions 2 through 48 for finishes, material, and systems including structural, HVAC, electrical, plumbing and specialty items, including fire sprinklers, alarm systems, electronic controls, and computer networking components.
- They shall incorporate all GBRS requirements dictated by the credits being pursued for the project.

Other Requirements

- Provide a Life Cycle Cost Analysis (LCCA) for review and approval. LCCA shall be by a commercially available life cycle cost analysis program and as required by the State of Florida and the DEPARTMENT.
- Design to meet or exceed Florida Energy Efficiency Code for Building Construction (FEEC). Submit preliminary (input and output) FEEC forms.



- The Design Professional shall advise the DEPARTMENT of any adjustments to the budget and shall submit a fully detailed Phase I estimate of probable construction cost, projected to the expected time of bid and containing sufficient detail to provide information necessary to evaluate compliance with the Construction Budget set for this project. Format estimate and provide detail matching the organization and content of the project's Outline Specifications complete for Divisions 2 through 48.
- Provide an updated Project Development Schedule reflecting development and anticipated schedules for all subsequent project activities.
- Preliminary selection of materials and finishes in digital format to establish design intent. Provide two schemes for selection and approval by the DEPARTMENT. Provide documentation demonstrating compliance with GBRs requirements.

Staff from each of the Design Professional's major technical disciplines, and subconsultants shall attend coordination, review, and presentation meetings with the Owner to explain the design concept and technical resolution of their respective building or site systems.

If requested, the Design Professional shall submit five (5) sets of all documents required under this phase without additional charge, for approval by the Owner. The Design Professional shall not proceed with the next phase until the completion of all required presentations and reports are provided digitally and the CONSULTANT receives written Authorization to Proceed with the next phase.

## **PHASE II - 60% DESIGN DOCUMENTS SUBMITAL:**

After written Authorization to Proceed from DEPARTMENT and based on the approved Phase I documents, and any adjustments in the scope or quality of the project or in the Fixed Limit of Construction Cost authorized by DEPARTMENT, the Design Professional shall prepare for approval by DEPARTMENT, Phase II (60% Construction) Documents setting forth in detail the requirements for the construction of the Project. The Design Professional is responsible for the full compliance of the design with all applicable codes. Phase II documents comprised of, but not limited to, the following:

### Documents

- Updated Florida Energy Efficiency Code for Building Construction (FEEC) (input and output) compliance forms, including calculations for mechanical systems, documenting energy efficiency ratio rating of HVAC equipment, electrical systems, insulation, and building envelope to be submitted to the DEPARTMENT for review and approval.
- Calculations: Provide preliminary calculations for structural, mechanical and electrical systems.
- Review of anticipated GBRs points and certification level; adjust attempted points as needed to meet target certification level. Provide updated GBRs credit scorecard or checklist.

### Drawings

Site Plan(s) and detailing which, in addition to the Phase I requirements, indicate the following:

- Spot elevations, based on the civil grading plan, for the perimeter of the new construction, sidewalk, or any other areas pertinent to the drainage of rainwater.

- Location of storm water service for new construction roof drainage.
- Parking lot lighting poles, location and type.
- Final location for manholes, handholds, and pull boxes.
- Layout of underground distribution systems (normal power emergency power, fire alarm, master clock, intercommunication, television, telephone, security, control and spares).
- Locations of all site improvements, playground and equipment, street furniture, planters and other features.
- Details of all curbing, typical parking spaces (regular and handicap accessible), handicap ramps, directional signage, site lighting, flagpole and fence foundations, and any other site conditions pertinent to the scope of work.

A plan to delineate staging areas, site barriers, and other area designations to control the public from construction activities and traffic.

Landscape plans and details including, a plant list clearly noted and cross-referenced, details for shrub and tree plantings, identification of plants and trees to remain, to be removed or relocated, and other necessary documentation.

Irrigation plans and details delineating the entire area of the project, and addressing necessary connections, alteration, repair or replacement of any existing irrigation.

Floor plans to include the following:

- All dimensions and any cross references explaining the extent of work, wall types, or other component, assembly, or direction regarding the Construction.
- Wall chases, floor drains and rainwater leaders.
- Show structural tie columns and coordinate with the floor plan.
- Cross referenced interior elevations.
- Delineate and note all built in cabinetry or equipment.
- Identify room and door numbers with all doors having individual numbers.

#### Demolition Plans

Indicate required demolition activities.

- Provide separate demolition plan(s) and other drawings (elevations, sections, etc.) if the scope of work includes demolition which is too excessive to indicate in drawings depicting new construction.
- Indicate notes on the extent of the demolition: address dimensions at locations where partial walls are being removed or altered, existing room names and numbers, existing partitions, equipment, plumbing, HVAC or electrical elements,
- Include notes dealing with protection of existing areas as a result of demolition.
- Delineate any modifications to existing buildings involving structural elements within the structural documents rather than on the architectural.

Building elevations developed further than at Phase II and including delineation of building joints (including dimensionally located stucco control joints), material locations, elevation height, and other building features.

Building and wall sections to establish vertical controls and construction types. Include clear graphic, and notes on construction assemblies and systems to be used, dimensions, heights. Provide, associated detailing to delineate solutions for difficult connections.

Reflected ceiling plans to indicate ceiling types, heights, ceiling grid layout, light fixture types, mechanical diffuser and return location, and sprinkler heads if area is sprinklered. Delineate and detail any dropped soffits or joint conditions between different materials. Coordinate with architectural, electrical, mechanical, and plumbing disciplines.

#### Roof Plans

- Indicate all roof penetrations, including drains, scuppers, exhaust fans, and any other equipment on the roof. Show direction of roof slopes with elevations at the high and low points, type of roofing system to be used, expansion joints, typical parapet, and flashing details.
- Provide dimensions to locate all penetrations and cross-reference details.

Large scale building details as appropriate to this level of document development and as required to establish vertical controls for the Project. Include clear graphics and notes on construction assemblies and systems to be used, and dimensions and heights. Provide associated detailing to delineate solutions for difficult connections.

Interior elevations of all rooms including cross references of cabinetry details, dimensions and heights, notes indicating type of equipment (and whether equipment is in or out of contract), wall materials, finishes, and classroom equipment, and accessories.

Details of casework as necessary to appropriately delineate custom or premanufactured casework. Provide appropriate schedules referencing manufacturer's numbers or catalogs, finishes, hardware, and other construction characteristics.

Details of the following:

- Door jamb, head and sill conditions.
- Wall and partition types.
- Window head, sill and jamb conditions, and anchorage methods shown, in lieu of referencing to manufacturer's standards.
- Interior signage to include classroom and building identification, emergency exiting and equipment signs, and any other items pertinent to the identification of the project. Coordinate with electrical discipline.
- Interior and exterior expansion control connections.
- Any other specialized items necessary to clearly express the intent of the project design.

Room finishes and door schedules coordinated with the floor plans, developed to 60% completion.

Structural foundation and framing plans, with associated diagrams, schedules, notes, detailing and section drawings completed sufficiently to communicate the design intent and coordination with other disciplines.

#### Mechanical Drawings

- Provide double line ductwork layout and HVAC equipment layout drawings with related diagrams and schematic diagrams, schedules, notes, detailing and section drawings completed sufficiently to communicate the design intent and coordination with other disciplines.
- Provide dimensioned 1/2-inch scale plans, elevations and sections of the mechanical rooms showing service, clearance, room openings, nominal equipment size, ceiling height, duct clearance between bottom of joist and top of ceiling and any ceiling mounted lighting fixtures, electrical equipment or other building assembly or component, etc.

## Electrical

Provide drawings for the following systems:

- Electrical Drawings include plans with lighting layouts for outdoors and major interior spaces and electrical outlets for all major spaces. Show locations of electrical rooms, transformers, emergency generator. Also show locations of mechanical equipment such as chillers, compressors, and air handler units and their respective electrical connections and other relevant features.
- Lighting including, circuiting and luminaire identification and switching. Also provide illuminance computer printout for all indoor typical indoor spaces and parking lots.
- Convenience outlets and circuiting, special outlets and circuiting, and power systems and equipment.
- Provide riser diagrams for all electrical systems including master clock, intercom, fire alarm, ITV, computer networking/telephone, and emergency and normal power distribution. Provide light fixture schedule.
- Panel schedule may be in preliminary form, but circuitry must be included.
- Applicable installation details.
- General legend and list of abbreviations.
- Voltage drop computations for all main feeders.
- Short circuit analysis
- Provide 1/2" scale floor plan and wall elevations for all electrical rooms.
- Indicate surge protector for main switchboard and electrical panels.

## Plumbing

Provide drawings for the following systems:

- Provide fixture unit calculations, isometrics, one line diagram and riser details, schedule of common fixtures, and other relevant features.
- Provide plumbing equipment and fixture drawings with related diagrams, schedules, notes, detailing, and section drawings completed sufficiently to communicate the design intent and coordination with other disciplines.

## Specifications

- Provide preliminary Project Manual including front-end documents. Completion of fill in items in Bidding documents and other "Division 0" documents is not required.
- Provide a preliminary Division 1 based upon the standard documents provided by the Owner and edited by the Design Professional after consultation with the Owner to establish project specific requirements.

- Include progress set of all other Sections in Divisions 2 through 48 with each section developed to demonstrate to the Owner an understanding of the project and an appropriate level of developmental progress comparable to that of the drawings.
- Specification sections shall be organized to follow the Construction Specification Institute's (CSI) current edition of Master Format with each section developed to include CSIs standard 3-part section and page formats with full paragraph numbering. They shall incorporate all GBRS requirements dictated by the credits being pursued for the project.

An updated Project Development Schedule, formatted as a preliminary construction schedule reflecting continued Project development and illustrating anticipated schedules for all subsequent project activities including permitting and submittal coordination with all agencies having jurisdiction on the Project, project phasing, site, mobilization, temporary facilities, general construction sequencing, anticipated substantial completion dates, DEPARTMENT occupancy, and all other significant Project events.

Color boards illustrating color selections, finishes, textures and aesthetic qualities for all finish materials for final review and approval by the DEPARTMENT, and to establish a final palette of material selections for development of subsequent specifications, schedules and other requirements for incorporation into the Contract Documents. This may be submitted digitally if approved by the DEPARTMENT. Provide documentation demonstrating compliance with GBRS requirements.

A letter from the Design Professional and each of the major technical disciplines and any necessary subconsultants or explaining how each previous comment concerning the project has been addressed or corrected.

Staff from each of the Design Professional's major technical disciplines, and subconsultants shall attend coordination, review and presentation meetings with the Owner to explain the design concept and technical resolution of their respective building or site systems.

If requested, the Design Professional shall submit five (5) sets of all documents required under this phase without additional charge, for approval by the Owner. The Design Professional shall not proceed with the next phase until the completion of all required presentations and reports are provided digitally and the CONSULTANT receives a written Authorization to Proceed with the next phase.

### **PHASE III - 100% CONSTRUCTION DOCUMENTS SUBMITTAL**

After written Authorization to Proceed from DEPARTMENT and based on the approved Phase II documents and any adjustments in the scope or quality of the project or in the Fixed Limit of Construction Cost authorized by DEPARTMENT, the Design Professional shall prepare for approval by DEPARTMENT, Phase III (100% Construction) Documents setting forth in detail the requirements for the construction of the Project. The Design Professional is responsible for the full compliance of the design with all applicable codes. Phase III documents are to be comprised of, but not limited to, the following:

General Requirements - Digital submittals are acceptable upon the approval of the DEPARTMENT.

- Updated Florida Energy Efficiency Code for Building Construction (FEEC) (input and output) compliance forms. Submit five (5) copies signed and sealed by a State of Florida registered design professional.
- Signed and Sealed/Statements of Compliance: Only complete documents, properly signed and sealed by the CONSULTANT and respective subconsultants, will be accepted for review; in addition, these documents shall contain a statement of compliance by the architect or engineer of record as follows: "To the best of my knowledge and belief these drawings, and the project manual are complete, and comply with the Department of Transportation Requirements".
- Submit engineering calculations for mechanical, electrical, and structural systems in a separately bound manual.
- Review of anticipated GBRS points and certification level; adjust attempted points as needed to meet target certification level. Provide updated GBRS credit scorecard or checklist.

### Drawings

The drawings shall include all previous phase review requirements, and the Phase III 100% document requirements specified above, along with the following:

- Site plans including, but not limited to, area location map, legal description of property, demolition, excavation, utilities, finish grading, landscaping, mechanical, electrical, civil/structural, and architectural site plans:
- Drawings include at a minimum, the following:
  - Key sheets including a table of contents and statement of compliance by the design professional. Each discipline shall have a list of abbreviations, schedule of material indications, and schedule of notations and symbols at the beginning of their section of the plans.
  - Architectural drawings including floor plans, door, window and finish schedules, roof plans, elevations, sections, and details.
  - Civil/Structural drawings including paving, traffic loops, service drives, parking; drainage; foundation plans; floor plans; roof plans; structural plans; sections; details; and, pipe, culvert, beam and column schedules.
  - Mechanical drawings including floor plans; sections; details; riser diagrams; kitchen exhaust hoods; and equipment, fan, and fixture schedules.
  - Electrical drawings including floor plans; sections; details; riser diagrams, and fixture and panel schedules.
  - The drawings should indicate that the approved mechanical/electrical systems, from the previous phases FEEC/LCCA analysis, have been incorporated into the documents.

### Specifications

- Provide a complete Project Manual including front-end documents. Completion of fill in items in Bidding documents and other "Division 0" documents is not required.
- Provide a complete Division 1 based upon the standard documents provided by the Owner and edited by the Design Professional after consultation with the Owner to establish project specific requirements.

- Provide a complete set of all other Sections in Divisions 2 through 48 with each section developed to demonstrate to the Owner an understanding of the project and an appropriate level of developmental progress comparable to that of the drawings.
- Specification sections shall be organized to follow the Construction Specification Institute's (CSI) current edition of Master Format with each section developed to include CSI's standards 3-part section and page formats with full paragraph numbering. They shall incorporate all GBRS requirements dictated by the credits being pursued for the project.

Staff from each of the Design Professional's major technical disciplines, and subconsultants shall attend coordination, review, and presentation meetings with the Owner to explain the design concept and technical resolution of their respective building or site systems.

If requested, the Design Professional shall submit five (5) sets of all documents required under this phase without additional charge, for approval by the Owner. The Design Professional shall not proceed with the next phase until the completion of all required presentations and reports are provided digitally and the CONSULTANT receives a written Authorization to Proceed with the next phase.

#### **PHASE IV FINAL BID DOCUMENTS SUBMITTAL:**

After written Authorization to Proceed from DEPARTMENT and based on the approved Phase III documents and any adjustments in the scope or quality of the project or in the Fixed Limit of Construction Cost authorized by DEPARTMENT, the Design Professional shall prepare for approval by DEPARTMENT, Phase IV (Release for Construction, or RFC) Documents setting forth in detail the requirements for the construction of the Project: The Design Professional is responsible for the full compliance of the design with all applicable codes. Phase IV documents are to be comprised of, but not limited to, the following:

General Requirements - Digital submittals are acceptable upon approval of the DEPARTMENT.

- This submittal is the official record set and shall be the bid documents.
- Signed and Sealed/Statements of Compliance: Only complete documents, properly signed and sealed by the CONSULTANT and respective subconsultants, will be accepted for review; in addition, these documents shall contain a statement of compliance by the architect or engineer of record as follows: "To the best of my knowledge and belief these drawings, and the project manual are complete, and comply with the DEPARTMENT of Transportation Requirements".
- Submit engineering calculations for mechanical, electrical, and structural systems in a separately bound manual.
- Update anticipated GBRS points and certification level; adjust attempted points as needed to meet target certification level. Provide updated GBRS credit scorecard or checklist.

#### Drawings

The drawings shall include all previous phase review requirements, and the Phase IV final document requirements specified above, along with the following:

- Site plans including, but not limited to, area location map, legal description of property, demolition, excavation, utilities, finish grading, landscaping, mechanical, electrical, civil/structural, and architectural site plans:
- Drawings include at a minimum, the following:
  - Key sheets including a table of contents and statement of compliance by the design professional. Each discipline shall have a list of abbreviations, schedule of material indications, and schedule of notations and symbols at the beginning of their section of the plans.
  - Architectural drawings including floor plans, door, window and finish schedules, roof plans, elevations, sections, and details.
  - Structural drawings including foundation plans; floor plans; roof plans; structural plans; sections; details; and beam and column schedules.
  - Mechanical drawings including floor plans; sections; details; riser diagrams; kitchen exhaust hoods; and equipment, fan, and fixture schedules.
  - Electrical drawings including floor plans; sections; details; riser diagrams, and fixture and panel schedules.
  - The drawings should indicate that the approved mechanical/electrical systems, from the previous phases FEEC/LCCA analysis, have been incorporated into the documents.

#### Specifications

- Provide a final Project Manual including front-end documents. Completion of fill in items in Bidding documents and other "Division 0" documents is not required.
- Provide a final Division 1 based upon the standard documents provided by the Owner and edited by the Design Professional after consultation with the Owner to establish project specific requirements.
- Provide a final set of all other Sections in Divisions 2 through 48 with each section developed to demonstrate to the Owner an understanding of the project and an appropriate level of developmental progress comparable to that of the drawings.
- Specification sections shall be organized to follow the Construction Specification Institute's (CSI) current edition of Master Format with each section developed to include CSI's standards 3-part section and page formats with full paragraph numbering. They shall incorporate all GBRS requirements dictated by the credits being pursued for the project.

Upon completion of the Final Bid Documents, the Design Professional shall submit to the Owner five (5) copies of the Drawings, Specifications, reports, programs, a final updated Project Development Schedule, a final up dated Statement of Probable Construction Cost and such other documents as reasonably required by Owner.

All documents for this phase shall be provided in both hard copy and in electronic media. The DEPARTMENT will approve Phase IV documents for submission to the DEPARTMENT for review and approval.

#### Architectural Plans

### **31.1 Architectural Program Review/Verification**



- 31.2 Key Sheet and Index of Sheets**
- 31.3 General Notes, Abbreviations, Symbols, and Legend**
- 31.4 Life Safety Plans**
- 31.5 Site Plans**
- 31.6 Floor Plans (small scale)**
- 31.7 Floor Plans (large scale)**
- 31.8 Exterior Elevations**
- 31.9 Roof Plans**
- 31.10 Roof Details**
- 31.11 Interior Elevations**
- 31.12 Rest Room Plans (Enlarged)**
- 31.13 Rest Room Elevations**
- 31.14 Building Sections**
- 31.15 Stair Section, Enlarged Stair Plan and Details**
- 31.16 Reflective Ceiling Plans**
- 31.17 Room Finish Schedule or Finish Plan**
- 31.18 Door and Window Finish Schedule**
- 31.19 Door Jamb Details and Window Details**
- 31.20 Exterior Wall Sections**
- 31.21 Interior Wall Sections**
- 31.22 Overhead Door Details**
- 31.23 Curtain Wall Details**
- 31.24 Fascia, Soffit and Parapet Details**
- 31.25 Signage Details**
- 31.26 Miscellaneous Details**
- 31.27 Repetitive Sheets**
- 31.28 Design Narrative Reports**
- 31.29 Permitting**

**31.30 Other Pertinent Project Documentation**

**31.31 Cost Estimate**

**31.32 Technical Special Provisions and Modified Special Provisions Packages**

**31.33 Field Reviews**

**31.34 Technical Meetings**

**31.34.1 FDOT**

**31.34.2 Local Governments (cities)**

**31.34.3 Local Governments (counties)**

**31.34.4 Other Meetings**

**31.34.5 Progress Meetings**

**31.34.6 Phase Review Meetings**

**31.35 Quality Assurance/Quality Control**

**31.36 Meeting with Independent Peer Review**

**31.37 Supervision**

Structural Plans

**31.38 General Notes, Abbreviations, Symbols, and Legend**

**31.39 Foundation Plans (Small Scale)**

**31.40 Foundation Plans (Large Scale)**

**31.41 Slab Plans (Small Scale)**

**31.42 Slab Plans (Large Scale)**

**31.43 Slab Placement Plans**

**31.44 Slab Placement Details**

**31.45 Foundation Sections**

**31.46 Foundation Details**

**31.47 Slab Sections**

**31.48 Slab Details**

**31.49 Roof Framing Plans (Small Scale)**

**31.50 Roof Framing Plans (Large Scale)**

**31.51 Roof Loading Plans and Details**

**31.52 Roof Sections**

**31.53 Roof Details**

**31.54 Bearing Wall Sections**

**31.55 Bearing Wall Details**

**31.56 Column Sections**

**31.57 Column Details**

**31.58 Miscellaneous Sections**

**31.59 Repetitive Sheets**

**31.60 Other Pertinent Project Documentation**

**31.61 Cost Estimate**

**31.62 Technical Special Provisions and Modified Special Provisions Packages**

**31.63 Field Reviews**

**31.64 Technical Meetings**

**31.64.1 FDOT**

**31.64.2 Local Governments (cities)**

**31.64.3 Local Governments (counties)**

**31.64.4 Other Meetings**

**31.64.5 Progress Meetings**

**31.64.6 Phase Review Meetings**

**31.65 Quality Assurance/Quality Control**

**31.66 Independent Peer Review**

**31.67 Supervision**

Mechanical Plans

**31.68 General Notes, Abbreviations, Symbols, Legend, and Code Issues**

**31.69 Plans (Small Scale)**

**31.70 Plans (Large Scale)**

**31.71 Details**

**31.72 Sections**

**31.73 Piping Schematics**

**31.74 Control Plans**

**31.75 Schedules**

**31.76 HVAC Calculations**

**31.77 Life Cycle Cost Analysis**

**31.78 Repetitive Sheets**

**31.79 Other Pertinent Project Documentation**

**31.80 Cost Estimate**

**31.81 Technical Special Provisions and Modified Special Provisions Packages**

**31.82 Field Reviews**

**31.83 Technical Meetings**

**31.83.1 FDOT**

**31.83.2 Local Governments (cities)**

**31.83.3 Local Governments (counties)**

**31.83.4 Other Meetings**

**31.83.5 Progress Meetings**

**31.83.6 Phase Review Meetings**

**31.84 Quality Assurance/Quality Control**

**31.85 Independent Peer Review**

**31.86 Supervision**

Plumbing Plans

**31.87 General Notes, Abbreviations, Symbols, Legend, and Code Issues**

**31.88 Plans (Small Scale)**

**31.89 Plans (Large Scale)**

**31.90 Isometrics (Large Scale)**

**31.91 Riser Diagrams**

**31.92 Details**

**31.93 Repetitive Sheets**

**31.94 Other Pertinent Project Documentation**

**31.95 Cost Estimate**

**31.96 Technical Special Provisions and Modified Special Provisions Packages**

**31.97 Field Reviews**

**31.98 Technical Meetings**

**31.98.1 FDOT**

**31.98.2 Local Governments (cities)**

**31.98.3 Local Governments (counties)**

**31.98.4 Other Meetings**

**31.98.5 Progress Meetings**

**31.98.6 Phase Review Meetings**

**31.99 Quality Assurance/Quality Control**

**31.100 Independent Peer Review**

**31.101 Supervision**

Fire Protection Plan

**31.102 General Notes, Abbreviations, Symbols, Legend, and Code Issues**

**31.103 Fire Protection Plan**

**31.104 Riser Diagram, Details, and Partial Plans**

**31.105 Hydraulic Calculation**

**31.106 Repetitive Sheets**

**31.107 Other Pertinent Project Documentation**

**31.108 Cost Estimate**

**31.109 Technical Special Provisions and Modified Special Provisions Packages**

**31.110 Field Reviews**

**31.111 Technical Meetings**

**31.111.1 FDOT**

**31.111.2 Local Governments (cities)**

- 31.111.3 Local Governments (counties)**
- 31.111.4 Other Meetings**
- 31.111.5 Progress Meetings**
- 31.111.6 Phase Review Meetings**
- 31.112 Quality Assurance/Quality Control**
- 31.113 Independent Peer Review**
- 31.114 Supervision**
- Electrical Plans
- 31.115 General Notes, Abbreviations, Symbols, Legend, and Code Issues**
- 31.116 Electrical Site Plan**
- 31.117 Lighting Plans**
- 31.118 Lighting Fixtures Schedules**
- 31.119 Lighting Fixtures Details**
- 31.120 Lightning Protection Plans**
- 31.121 Lightning Protection Details**
- 31.122 Power Plans**
- 31.123 Power Distribution Riser Diagrams**
- 31.124 Panel Board Schedules**
- 31.125 Data Plans**
- 31.126 Data Details**
- 31.127 Communication Plans**
- 31.128 Communication Details**
- 31.129 Security Alarm System Plans**
- 31.130 Miscellaneous Details**
- 31.131 Repetitive Sheets**
- 31.132 Energy Analysis**
- 31.133 Other Pertinent Project Documentation**
- 31.134 Cost Estimate**

**31.135 Technical Special Provisions and Modified Special Provisions Packages**

**31.136 Field Reviews**

**31.137 Technical Meetings**

**31.137.1 FDOT**

**31.137.2 Local Governments (cities)**

**31.137.3 Local Governments (counties)**

**31.137.4 Other Meetings**

**31.137.5 Progress Meetings**

**31.137.6 Phase Review Meetings**

**31.138 Quality Assurance/Quality Control**

**31.139 Independent Peer Review**

**31.140 Supervision**

**31.141 GBRS Certification**

**31.141.1 GBRS Coordination Meetings**

**31.141.2 GBRS Commissioning**

**31.141.3 GBRS Green Credit**

**31.142 Coordination**

**31.143 Building Information Modeling (BIM)**

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

The CONSULTANT shall fulfill the commitments resulting from the traffic noise analysis and noise barrier evaluation performed during the Project Development and Environment (PD&E) Phase, as directed and clarified by the DEPARTMENT.

The noise analysis shall be performed in accordance with the FDOT's Noise Policy (Part 2, Chapter 17 of the FDOT's PD&E Manual) and the FDOT's Traffic Noise Modeling and Analysis Guidelines. The noise analysis and noise abatement evaluation shall be performed by or supervised/reviewed by a person(s) who has attended the DEPARTMENT's Traffic Noise Analysis training course or has attended and successfully completed the National Highway Institute's Highway Traffic Noise Course (FHWA-NHI-142051). The Federal Highway Administration (FHWA) approved noise model, the Traffic Noise Model (TNM) Version 2.5

(or most current version) shall be used for the noise analysis, unless otherwise directed by the DEPARTMENT.

### **32.1 Noise Analysis**

The CONSULTANT shall review the preferred PD&E alternative and Noise Study Report (NSR) to identify any design changes that would require a reanalysis of traffic noise. Coordination will be held with the District Environmental Management Office, prior to initiating any reanalysis, to discuss possible effects of design changes on the validity of in the noise study performed during PD&E.

The CONSULTANT shall perform a land use review to identify noise sensitive sites that may have received a building permit subsequent to the PD&E noise study but prior to the Date of Public Knowledge (DPK), or to identify areas where the land use may have changed or is subject to change. New noise sensitive sites meeting DPK requirements that were not considered during the PD&E phase will be subject to a traffic noise analysis to be performed by the CONSULTANT. Additionally, noise sensitive sites analyzed in the PD&E phase may have to be re-analyzed if affected by design changes.

The CONSULTANT shall review any commitments made during the PD&E phase regarding possible traffic noise impacts to special use locations. Analysis of special use locations shall be performed using the DEPARTMENT's "A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations" document and shall be coordinated with the District Environmental Management Office.

The CONSULTANT shall review the commitments made during the PD&E phase regarding noise barrier concepts determined to be potentially feasible and reasonable. The CONSULTANT will perform a design level noise analysis in accordance with Part 2, Chapter 18 of the PD&E Manual. This includes the reevaluation of the feasibility and reasonableness for noise barriers recommended for further consideration during the design phase and for any additional noise barriers required, using design information (e.g., profile data, horizontal alignment data, etc.) and incorporate into the analysis any new conditions or additional costs related to noise barrier construction that have been identified during design. A design phase noise analysis will be performed at any additional locations required (based on DPK requirements or roadway design changes). Additional elevation surveys may also be required at proposed barrier locations or other locations as required.

Changes to, or fulfillment of, the original noise abatement commitments made during PD&E shall be documented in a Noise Study Report (NSR) Addendum to be prepared by the CONSULTANT in coordination with the District Environmental Management Office. A copy of the final NSR Addendum shall be provided to the District Environmental Management Office.

Traffic Data: The CONSULTANT shall review the traffic data obtained during the PD&E phase to determine if the data remains valid for design phase reanalysis. If the traffic data is no longer valid, the CONSULTANT shall provide to the noise analyst the following data for each road segment (i.e. intersection to intersection) for the design year with the proposed improvements to the road:



- Level of Service C (LOS C) directional volumes
- Number of lanes
- Demand peak hour volumes (peak and off-peak directions)
- Existing and proposed posted speed
- Percentage of heavy trucks (HT) in the design hour
- Percentage of medium trucks (MT) in the design hour
- Percentage of buses in the design hour
- Percentage of motorcycles (MC) in the design hour

Except for LOS C volumes, the data above shall also be provided for all interchange/highway ramps. The District Noise Specialist may also identify cross streets for which the same data is necessary. (i.e. a cross street for which noise sensitive sites are in close proximity to the project). The CONSULTANT shall contact the District Noise Specialist for direction on the format to be used for providing the traffic data and any requirements regarding approval of the data prior to its use for noise analysis. The traffic data to be used in the noise analysis must be generated by a qualified traffic engineer/planner who works for the DEPARTMENT or is a DEPARTMENT consultant.

### **32.2 Noise Barrier Evaluation**

The CONSULTANT will present the data along with recommendations to the DEPARTMENT for selection of the noise barrier's locations, barriers heights and lengths to be incorporated into the design plans. These recommendations shall consider the noise barrier feasibility and reasonableness.

An evaluation of proposed noise barriers will be performed to identify any engineering conflicts or constraints. The CONSULTANT will be responsible for documenting any resolutions to engineering conflicts or issues that require modification to or preclude construction of a noise barrier. At a minimum, the engineering review will consider the following:

- Right of way needs including access rights (air, light, view, ingress/egress, outdoor advertising conflicts)
- Limited access issues
- Necessary construction and maintenance easements
- Safety issues (e.g., line of sight)
- Maintenance issues
- Structural and vegetative restrictions within easement
- Utility conflicts
- Drainage issues
- Environmental issues
- Other criteria as applicable

The CONSULTANT shall re-analyze noise barrier(s) for feasibility and reasonableness and re-establish barrier height and length if design constraints require alteration in a barrier's location or dimensions.

After reestablishing the recommended height and length of the barrier(s), the CONSULTANT shall coordinate with design engineers and the District Planning and Environmental Office to include the barrier(s) on the design plans. In addition, the CONSULTANT will present a documentation to the DEPARTMENT Project Manager containing a recommendation for selection of the barrier height and length to be carried forward for public input. This recommendation shall consider amount of noise reduction provided, engineering constraints and cost (reasonableness). In addition, the CONSULTANT will also consider the overall visual appearance in relation to the existing and proposed site conditions. This includes smoothing the profile along the top of a noise barrier to the extent possible while minimizing any loss in the amount of noise reduction provided and extending the ends of a noise barrier to cover additional receivers. Extending the ends of a noise barrier will not exceed the cost criteria and will only be performed when it is appropriate and in the public interest.

### **32.3 Public Involvement**

If noise barriers are determined to be feasible and cost reasonable, the CONSULTANT may, at the request of the DEPARTMENT, carry out the public involvement and surveys necessary to report to the DEPARTMENT whether or not the majority of the impacted and/or benefited receptors desire the construction of a noise barrier. Input may also be obtained from the public regarding barrier aesthetics (color and texture) on one or both sides of the barrier. The CONSULTANT shall be responsible for coordinating with local government officials.

As requested by the DEPARTMENT, the following tasks may be completed by the CONSULTANT for public involvement purposes:

- Identification of impacted and/or benefited property owners
- Identification of renters and non-residing property owners (for a property that may be rented)
- Preparation of a mailing list (property owners, renters and non-residing property owners)
- Preparation of a summary package (including an information letter, aerial showing the noise barrier location and a survey form to document the recipients position to be sent to property owners, and occupants/non-residing property owners informing them of the proposed noise barrier
- If necessary, preparation of additional mailings and/or door-to-door/telephone surveys until a majority decision is obtained or until directed by the District Noise Specialist tallying of survey results
- Noise barrier aesthetics coordination
- Public meetings coordination (including arranging the meeting location, advertisements, displays, etc.)
- Responding to public inquiries on an individual basis in coordination with the DEPARTMENT.

The CONSULTANT shall bring to the attention of the DEPARTMENT unforeseen conditions and issues which are relevant to the project decision. Other than noise barrier length, height and location, the CONSULTANT shall abstain from indicating preferences

for any of the barrier options prior to or during contact with the property owners unless specifically requested to do so by the DEPARTMENT. Following the public involvement process, the CONSULTANT shall produce a final noise barrier recommendation that identifies the starting and ending points for all noise barriers, the top elevation(s), and may provide the DEPARTMENT the aesthetic elements to be provided (e.g. - color, texture, graphics).

### **32.4 Outdoor Advertising Identification**

The CONSULTANT shall identify potential noise barriers that may block the view of an existing lawfully erected sign that is governed by and conforms to state and federal requirements for land use, size, height and spacing consistent with the requirements of Florida Statute (FS) 479.25 and the FDOT Noise Policy (Part 2, Chapter 18 of the PD&E Manual). The CONSULTANT shall notify the DEPARTMENT's Project Manager of a potential noise barrier(s) that may affect the visibility of a legally permitted outdoor advertising sign. The CONSULTANT will document the potential conflicts and the coordination with property owners and local governments in the NSR Addendum and in the environmental document reevaluation.

### **32.5 Noise Study Report (NSR) Addendum**

The results of noise barrier evaluations performed by the CONSULTANT shall be documented in the NSR Addendum (in accordance with Part 2, Chapter 18 of the PD&E Manual and Chapter 264 of the FDOT Design Manual (FDM)) and shall include the Design Changes, results of the computer modeling (electronically), public involvement activities, and final noise abatement commitments. At the discretion of the District, the CONSULTANT will include noise wall plan sheets in the NSR Addendum.

### **32.6 Technical Meetings**

Prior to proceeding with the noise barrier analysis, the CONSULTANT shall discuss and coordinate with the appropriate District Project Manager and the District Environmental Management Office staff. The purpose of this discussion will be for the DEPARTMENT to provide the CONSULTANT with all pertinent project information and to confirm the methodologies and project schedule to be used to conduct the noise analysis. This meeting is mandatory and should occur after the Notice to Proceed is given to the CONSULTANT. It is the responsibility of the CONSULTANT to undertake the necessary action (e.g. phone calls, meetings, correspondence, meeting minutes, etc.) to ensure that District Project Manager and the District Environmental Management Office staff is kept informed of the noise analysis efforts so that these tasks are accomplished in a manner that will enhance the overall success of the project.

### **32.7 Quality Assurance/Quality Control**

QA/QC reviews will be performed for all NSR Addendums submitted to the DEPARTMENT. Documentation of the QA/QC will be provided to the District Project Manager.

The **CONSULTANT** shall ensure that the noise barrier(s) location(s), length, height and aesthetics as shown on the final design plans are consistent with the results of the noise barrier evaluation and recommendation documented in the original NSR and/or the NSR Addendum.

### **32.8 Supervision**

### **32.9 Coordination**

## **33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS N/A**

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

### **33.1 ITS Analysis**

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

#### Systems Engineering Analysis

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

#### Design Guidelines

The **CONSULTANT** shall use applicable **DEPARTMENT** requirements and guidelines, including, but not limited to, the FDM, Standard Plans, and Standard Specifications for Road and Bridge Construction in the design of ITS. The **CONSULTANT** design is expected to include the following attributes, facilities, infrastructure, ITS devices, systems, and associated work: [*Associated Work*]

The **CONSULTANT** shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the Project. The **CONSULTANT** shall coordinate with District's TSM&O Office

for additional information regarding existing Incident Management and TMC Operational Procedures (If desired by the District).

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

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

#### Closed Circuit Television (CCTV) Subsystem

CCTV devices shall be spaced and located as required to meet the Project requirements, Standard Specifications, FDM Section 233.10, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT. The CONSULTANT shall be responsible for the design and exact field locations for the camera assemblies. The camera subsystem shall provide overlapping coverage to overcome visual blockage and to monitor DMS messages, and toll-amount DMS, as directed by the DEPARTMENT.

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

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

If required by the DEPARTMENT, the CONSULTANT shall determine the camera location by performing a videography study at each proposed camera site. The study shall include video at the proposed camera location and elevation with respect to the roadway elevation. The CONSULTANT shall identify the final number and locations of the camera assemblies based on the videography study.

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

#### Vehicle Detection Subsystem

Vehicle detection devices shall be spaced as required to meet the Project requirements (speed, volume, and occupancy detection), Standard Specifications, FDM Section 233.9,

District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

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

The CONSULTANT shall be responsible for the design of a non-intrusive vehicle detection subsystem for the limited access roadway facilities, arterials and sub-arterials with signalized intersections as required by the DEPARTMENT and by local maintaining agencies and specified in the scope of services. The detectors shall be positioned near other ITS field device infrastructure including the fiber-optic splice vaults when feasible to reduce cost. Final detection station locations shall be based on the number of location variables identified during the design phase.

#### Automatic Vehicle Identification (AVI) Subsystem

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

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

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

#### Dynamic Message Sign (DMS) Subsystem

The CONSULTANT shall be responsible for the design of the DMS subsystem for the roadway facilities. Both expressway and arterial dynamic message signs (DMS) shall be located to meet the Project requirements, Standard Specifications, FDM 233.11, District-specific requirements, guidance from the ConOps, and as approved by the DEPARTMENT. All FDOT FDM requirements shall be met for DMS locations. DMS locations shall be designed in conjunction with the Project's master signing design. The position of each DMS shall be finalized during the design phase of the project.

The CONSULTANT shall select DMS technology, type, and display to meet the Project requirements and ConOps requirements.

The CONSULTANT shall locate the DMS to satisfy the required sign functionality and to provide the required visibility of the signs. The project communications system shall enable full control of the DMS from the TMC facilities. All DMS hardware, software and related infrastructure components shall be fully compatible with SunGuide software. All DMS

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

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

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

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

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

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

#### Embedded Dynamic Message Signs

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

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

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

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

#### Dynamic Trailblazing Sign Subsystems (DTBS)

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

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

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

#### Roadway Weather Information Systems (RWIS)

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

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

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

- Fog/Smoke Detection sensor;
- Classifying Precipitation;
- Precipitation Occurrence Sensor;
- Water Film Height Sensor;
- Air Temperature/Relative Humidity Sensor;
- Wind Speed and Direction Sensor;
- RWIS Tower/Pole Structure, foundation, base, and cabinet with electrical service, and lightning protection & grounding assembly; and,
- Communication hardware.

When required by the DEPARTMENT, the Water Film Height Sensor shall be included in the RWIS design for hydroplaning detection and to activate advance warning signs with flashing beacons. The RWIS Water Film Height Sensor shall be a fully autonomous Non-Invasive Road Weather Intelligent Sensor (NIRS) with optical principles mounted above the roadway that can measure the water film depths and temperature for the purpose of



determining hydroplaning conditions and warning the motoring public. In addition, it shall communicate via 120 volts active current (VAC) Web Relay Controller with one (1) or more Flashing Beacon Warning Signs, and Fiber Optic-Based Communications to the TMC. It shall include all ancillary components required for a complete and acceptable operational system. This ITS subsystem shall be connected to the existing DEPARTMENT ITS and fiber optic network via a proposed new Managed Field Ethernet Switch (MFES) inside a proposed local hub. This ITS subsystem shall provide real time data and analog outputs for roadway water film height and ice detection layer thickness and values.

#### Traffic Signal Data Subsystem

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

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

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

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

#### Connected and Automated Vehicles (CAV) Subsystems

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

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

The CONSULTANT shall develop or update CAV Subsystem Technical Special Provisions or Modified Special Provisions (MSP/TSP) for Roadside Units (RSU) and other CAV Subsystem features based upon the unique needs of the project. The CONSULTANT shall ensure that each RSU site consists of a remote processing unit (RPU), communication hardware, mounting hardware, cabling, power supply, and other site-specific components as required. The CONSULTANT shall develop RSU requirements for communication between connected vehicles and roadside equipment such as ATC, detection systems, and warning beacons that are compatible with both Cellular Vehicle to Everything (C-V2X)

communication and Dedicated Short Range Communication (DSRC) national standards and protocols. The CONSULTANT shall also coordinate FCC licensing requirements for two-way real-time C-V2X communication and DSRC, depending on national standards and policies, with the DEPARTMENT's Statewide TSM&O program office. The MSP/TSP shall address integration with the DEPARTMENT's Security Management Credential System (SCMS) requirements.

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

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

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

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

#### Wrong-way Vehicle Detection Systems (WWVDS)

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

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

The CONSULTANT shall select the WWVDS technology for compatibility with the District SunGuide software version and to meet the project needs. The WWVDS shall collect and process data locally prior to sending a notification to the TMC. The CONSULTANT shall design the WWVDS for remote configuration, calibration, monitoring, and diagnostic of real-time traffic activities from the TMC using the SunGuide software and software provided by the detection system vendor. The WWVDS shall perform to meet the project requirements under all environmental and traffic conditions expected for the corridor. The WWVDS shall detect wrong way drivers within the specified

accuracy. Vibration and shocks shall not affect the performance of the system. The WWVDS and highlighted signs shall be hardwired for power and communications to the main controller. Design shall be in accordance with Traffic Engineering and Operations Bulletin 19-03.

#### Structural Health Monitoring System (SHMS) Connectivity Subsystem

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

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

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

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

#### Ramp Signaling Subsystem (RSS)

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

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

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

- Cabinet equipment including: controller, modem, display panel, detector amplifiers, output/power distribution assembly, load switches, current monitor, flasher for warning sign beacon, ability to support continuous operation for a minimum 2 hours in the event of power loss, and report power management unit.
- Supporting infrastructure including: conduits; RSS monitoring CCTV; two-head (red and green) LED signal display; and, LED flashing beacons.

- Detection including: mainline (upstream and downstream), RSS demand and passage, and ramp queue detectors.
- Signing including: Ramp Signaled When Flashing (W3-4); One Vehicle per Green (R10-13); Two Vehicle per Green (Modified R10-13), if needed; All Vehicles Stop on Red; One car per Green Each Lane (R89-1); Right Lane Ends (W4-2R); Merging Traffic (W4-1)
- Pavement markings including: 12-inch-wide stop bar running from edge line to edge line and 6-inch-wide solid white centerline for a minimum distance of 250 feet upstream of the stop bar and terminated at the stop bar on two-lane metered ramps.

#### Truck Parking Availability System (TPAS)

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

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

#### ITS Software Subsystem

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

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

### **33.2 Communications Subsystem Analysis**

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

The CONSULTANT shall develop a communications plan to determine the optimal communications medium for the project corridor. The plan shall be developed prior to submittal of Phase I plans. The plan shall identify communications media alternatives and provide a cost estimate that includes initial, operations and maintenance cost for the life cycle of the communications network. The plan shall ensure that video, voice, and data will be communicated in real-time between center to-field and center-to-center (C2C) nodes as applicable. The communications system design must utilize non-proprietary, open-architecture, standards-based, robust, scalable, and proven technology. The communication plan analysis shall address communication and connections between field devices, communications and connections between field devices and the TMC, center-to-

center communications between TMCs, and any other communication links or connections required to meet project goals and ConOps guidance. The plan must include bandwidth analysis and recommendations, needs assessment, and provide recommendations regarding minimum requirements, media, network devices, protocols, network topology, communication redundancy, future needs, spare capacity, and any communications or data sharing with other agencies.

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

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

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

### **33.3 Grounding, Surge Suppression, and Lightning Protection Analysis**

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

### **33.4 Power Subsystem**

See FDM Section 233.3 for ITS Power Design Requirements. The CONSULTANT shall be responsible for an electrical design in accordance with all NEC requirements. No solar power should be utilized as a power solution for the Project unless otherwise approved by the DEPARTMENT. To enhance power reliability, the CONSULTANT shall design a power distribution and backup system consisting of, at a minimum, underground power

conduits and conductors, transformers, diesel fuel generators, automatic transfer switches (ATS), uninterruptable power supply (UPS), electrical distribution panel, equipment framing, reinforced concrete pad for the generator, site drainage, site security fencing and security camera (as directed by the DEPARTMENT), power command and control, Ethernet-based Modbus, and ITS Cabinet with Remote Power Management Unit (RPMU), and all associated equipment. The power backup system shall supply electrical power in event of commercial power supply failure for all system components. Power equipment shall be installed in areas to avoid wet locations. All connections and equipment shall be protected from moisture and water intrusion. The CONSULTANT shall ensure that vandal resistant mechanisms for all electrical infrastructure shall be included as part of the Design.

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

### **33.5 Voltage Drop Calculations**

See FDM Section 233.3.6 for voltage drop design requirements. The electrical design shall address allowable voltage drops per the NEC. The CONSULTANT shall submit voltage drop calculations for any electrical circuit providing power to the ITS field devices beyond the electric utility service point. The calculations shall document the length of each circuit, its load, the size of the conductor or conductors and their ohm resistance values and the required voltages from the service point to the respective ITS devices to maintain voltage drops within allowable limits. The voltage drop incurred on each circuit (total volts and percentage of drop) shall be calculated, and all work necessary to calculate the voltage drop values for each circuit should be presented in such a manner as to be duplicated by the District. Load analysis calculations shall be submitted covering electrical path from all power sources to each ITS site connected to each power source. All voltage drop calculations shall allow for future expansion of ITS infrastructure, if identified in the Project ConOps.

### **33.6 Design Documentation**

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

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

### **33.7 Existing ITS**

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

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

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

### **33.8 Queue Analysis**

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

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

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

In cases when traffic technical memorandums have been performed by others and are available through the DEPARTMENT, or available from TMC CCTV camera surveillance sites, the CONSULTANT shall use these reports and information in lieu of performing traffic engineering and safety analysis.

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

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

The CONSULTANT shall prepare the ITS design file to include all necessary design elements and the reference files for topo, R/W roadway, utilities files, etc. This effort includes the design and layout of all proposed ITS devices and electrical service points, conduits, pull boxes, conductor sizing, generators, and transformers. All existing ITS infrastructure shall be referenced to the new ITS plan sheets (if applicable).

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

The CONSULTANT shall prepare the communication design file to include all necessary design elements and all associated reference files as well as reference files of topo, R/W, roadway, utilities files, existing ITS communications infrastructure, etc. This effort includes design and layout of proposed communications conduit, cabinet, pull boxes, splice boxes, standard route markers, communications plan overview, fiber optic sizing, fiber optic splicing, connections, communications hubs, etc.

### **33.11 ITS Poles and Overhead Structures Elevation Analysis**

See FDM Section 233.6 for ITS Poles and Structures design requirements. The CONSULTANT shall evaluate pole elevation requirements and design pole heights to meet the Project requirements including field of view; elimination of occlusion; site access for maintenance vehicles and personnel; access to pole mounted equipment, such as CCTV cameras, traffic detectors, and cabinets; and probability of lightning strike.

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

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

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

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

- Pixel Pitch
- Number of display messages
- Character height
- Number of characters per line
- Character spacing



- Mechanical properties of the sign such as weight, height, width, depth, and not including the vertical hanger size and weight.

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

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

### **33.14 Cost Estimate**

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

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

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

### **33.16 Other ITS Analyses**

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

### **33.17 Field Reviews**

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

- Existing ITS Field Devices as compared with the latest FDOT standards and District requirements
- Device Make, Model, Capabilities, Condition / Age, Existence of SunGuide Software Driver
- Condition of Structure(s), cabinets, and other above-ground infrastructure and devices
- Type of Detection as Compared with Current District Standards and preferences.
- Underground Infrastructure
- Proximity of other utilities
- Any other field reconnaissance as necessary to develop a complete ITS design package

### **33.18 Technical Meetings**

The CONSULTANT shall attend meetings as necessary to support the project.

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

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

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

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

### **33.20 Supervision**

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

### **33.21 Coordination**

The CONSULTANT shall coordinate with Survey, Geotech, Drainage, Structures, Lighting, Roadway Design, Utilities, municipalities, maintaining agencies and Traffic Operations to produce a final set of construction contract documents and to ensure that a high degree of accuracy for the design plans is achieved. The CONSULTANT shall coordinate with the roadway Utility Adjustment Plan to incorporate all ITS support structural foundations symbols drawn to scale in the Utility Adjustment Plans and attend the utility design meetings conveying the information to all utility owners to preserve the location of the proposed foundations and avoid any conflicts.

## **34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS N/A**

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

### **34.1 Key Sheet and Signature Sheet**

The CONSULTANT shall prepare the key sheet and signature sheet, if required, in accordance with the latest format depicted in the FDM.

MUTCD

Standard Specifications, Developmental Specifications

Standard Plans

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

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

### **34.3 Project Layout**

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

#### **34.4 Communication Overview Sheet**

#### **34.5 Typical and Special Details**

The CONSULTANT shall prepare typical and / or special details for conditions in the project not addressed by the DEPARTMENT's Standard Plans for Design, Construction, Maintenance, and Utility Operations on the State Highway System. The CONSULTANT shall prepare special details not addressed by FDOT Standard Plans, including block diagrams, hub cabinets, wiring diagrams, solar power service, and special mounting details, horizontal directional drilling at critical crossings, wireless ethernet equipment for local and broadband communication, Ethernet based Blue Toad, Ramp Signaling System, RSU block diagrams, Power station site plan, Field Equipment Shelters for master hubs, electrical and communication conduit, equipment inside box girders.

#### **34.6 ITS and Communication Plan Sheet**

The CONSULTANT shall prepare the ITS and communication plan sheets utilizing the Design file to include all necessary information related to the project design elements and all associated reference files. The plan sheets shall include general and pay item notes and pay items. The plans shall depict the location of ITS devices and cabinets, pull boxes, splice boxes, conduit runs, electrical service points, conduit, pull boxes, and conductors, and underground and overhead utilities, if applicable. Devices shall be located by station and offset as well as setback from the travel way. The CONSULTANT shall ensure the ITS sites and ground mounted cabinets locations are not in wetlands or wet drainage channels, do not interfere with protected species, meet the OSHA circle of safety from the overhead energized lines, and do not conflict with underground utilities.

The CONSULTANT shall prepare plans for the communications network. These plans shall consist of block diagrams, splicing diagrams, port assignments, wiring diagrams, and all other information necessary to convey the design concept to the contractor. These plans shall be included in the ITS plan set and be prepared in a manner consistent with immediately adjacent ITS project installations (planned or installed). Communication plans shall include conduit, fiber, pull and splice boxes, ITS devices, communication lateral drops, fiber connection hardware, pay items etc.

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

#### **34.7 Maintenance of Communications Plans**

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

The CONSULTANT's design shall include protecting and maintaining the existing ITS infrastructure. For locations where existing ITS infrastructure is impacted, the CONSULTANT's design shall include mitigation to minimize the downtime of existing system as per the District's requirements and prepare the Maintenance of Communication (MOC) plans. The CONSULTANT shall develop the MOC sheets for the project, providing temporary communications as necessary, notes, details, and direction applicable to the ITS elements and associated communications for inclusion in the MOC plans. The MOC plans shall include the notes, plan sheets, cross sections showing existing and proposed grades with the tables defining the stations limits for the conduit depths below existing and proposed grades for various construction phases.

If applicable, the CONSULTANT shall review the roadway TTCP, drainage, structures, and landscaping plans and prepare the MOC plans for each construction phase. The MOC plans shall include construction phasing notes, half cross sections depicting existing and proposed grades, roadway templates, drainage ponds, flood mitigation zones, provide tables depicting the station range, location and depth of the proposed fiber optic trunk line below existing and proposed grades. The MOC plans shall optimize the reliable field-to-center (F2C) connectivity and operability of the ITS field devices previously deployed along the project corridor. The MOC design effort shall mitigate the impacts of the project's various construction phases so as to sustain center-to-field devices connectivity and operability, maintaining operational quality as a minimum at the level provided prior to construction start and minimizing down time as much as possible.

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

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

Conduit paths shall be selected to provide a continuous duct system on one side of the road unless otherwise requested by the DEPARTMENT. The various components of ITS sites will be located on both sides of the freeway and therefore under pavement bore and lateral conduits will be necessary to access equipment locations. The CONSULTANT is responsible to locate the ITS sites so they are accessible by maintenance vans.

### **34.8 Fiber Optic Splice Diagrams**

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

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

### **34.9 Grounding and Lightning Protection Plans**

The CONSULTANT shall include efforts to design a complete and reliable lightning protection design for each pole and associated devices, ITS device installation, as well as device cabinets and communications hubs, etc. if not already addressed in the FDOT's Standard Plans for Design, Construction, Maintenance and Utility Operations on the State Highway System. Where the ITS site is located on viaducts and bridges, the CONSULTANT shall provide the grounding and lightning protection details in the plans and show the work that is integral to the elevated superstructure and substructure.

### **34.10 Cross Sections**

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

### **34.11 Hybrid and DMS Guide Sign Data**

The CONSULTANT shall prepare the guide sign data sheets to include all necessary information related to the design of the static and DMS, Embedded DMS, and DTBS in the project corridor.

### **34.12 Service Point Details**

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

### **34.13 Strain Pole Schedule**

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

#### **34.14 Temporary Traffic Control Plans**

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

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

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

#### **34.15 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.

#### **34.16 Supervision**

The CONSULTANT shall supervise all technical design activities.

### **35 GEOTECHNICAL**

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

Before beginning each phase of investigation and after the Notice to Proceed is given, the CONSULTANT shall submit an investigation plan for approval and meet with the DEPARTMENT's Geotechnical Engineer or representative to review the project scope and DEPARTMENT requirements. The investigation plan shall include, but not be limited to, the proposed boring locations and depths, and all existing geotechnical information from available sources to generally describe the surface and subsurface conditions of the project site.

Additional meetings may be required to plan any additional field efforts, review plans, resolve plans/report comments, resolve responses to comments, and/or any other meetings necessary to facilitate the project.

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

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

CONSULTANT will review printed literature including topographic maps, county agricultural maps, aerial photography (including historic photos), ground water resources, geology bulletins, potentiometric maps, pile driving records, historic construction records and other geotechnical related resources. Prior to field reconnaissance, CONSULTANT shall review U.S.G.S., S.C.S. and potentiometric maps, and identify areas with problematic soil and groundwater conditions.

#### Roadway

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

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

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

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

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

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

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

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

Stake borings and obtain utility clearance.

### **35.4 Muck Probing**

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

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

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

### **35.6 Drilling Access Permits**

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

### **35.7 Property Clearances**

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

### **35.8 Groundwater Monitoring**

Monitor groundwater, using piezometers.

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

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

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

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

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

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

### **35.12 Design LBR**

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

### **35.13 Laboratory Data**

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

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

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



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

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

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

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

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

Create electronic files of boring data for cross-sections.

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

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

### **35.19 Monitor Existing Structures**

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

Optional services (may be negotiated at a later date if needed): Identify existing structures in need of settlement, vibration and/or groundwater monitoring by the contractor during construction and coordinate with the EOR and structural engineer (when applicable) to develop mitigation strategies. When there is risk of damage to the structure or facility, provide recommendations in the geotechnical report addressing project specific needs and coordinate those locations with the EOR. See FDM Chapter 117 and Chapter 9 of the Soils and Foundations Handbook.

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

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

### **35.21 Geotechnical Recommendations**

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

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

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

### **35.23 Preliminary Roadway Report**

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

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

### **35.24 Final Report**

The Final Roadway Report shall include the following:

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

### **35.25 Auger Boring Drafting**

Draft auger borings as directed by the DEPARTMENT.

### **35.26 SPT Boring Drafting**

Draft SPT borings as directed by the DEPARTMENT.

Structures

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

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

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

The staff hour tasks for high embankment fills and structural foundations for bridges, box culverts, walls, high-mast lighting, overhead signs, mast arm signals, strain poles, buildings, and other structures include the following (35.27 through 35.48):

### **35.27 Develop Detailed Boring Location Plan**

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

### **35.28 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

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

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

### **35.30 Drilling Access Permits**

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

### **35.31 Property Clearances**

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

### **35.32 Collection of Corrosion Samples**

Collect corrosion samples for determination of environmental classifications.

### **35.33 Coordination of Field Work**

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

### **35.34 Soil and Rock Classification - Structures**

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

### **35.35 Tabulation of Laboratory Data**

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

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

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

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

Evaluation and selection of foundation alternative, including the following:

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

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

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

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

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

Provide construction and testing recommendations including potential constructability problems.

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

Perform lateral load analyses as directed by the DEPARTMENT.

### **35.41 Walls**

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

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

Provide wall construction recommendations.

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

Analyze sheet pile walls as directed by the DEPARTMENT.

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

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

#### **35.44 Box Culvert Analysis**

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

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

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

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

FHWA check list, pile driving records (if available), and any other pertinent information.

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

The final structures report shall include the following:

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

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

The final reports shall include the following:

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

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

- All original plan sheets (11" x 17")

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

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

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

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

#### **35.48 SPT Boring Drafting**

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

#### **35.49 Other Geotechnical**

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

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

#### **35.51 Field Reviews**

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

#### **35.52 Technical Meetings**

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

#### **35.54 Supervision**

#### **35.55 Coordination**

### **36 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.

### **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 Modified 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 quality and conformance with policy and procedures regarding CADD. It is the responsibility of the CONSULTANT to meet the requirements in the FDOT CADD Manual. The CONSULTANT shall submit final documents and files as described therein.

### **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.

### **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.