January 8, 2024

EXHIBIT A

SCOPE OF SERVICES

FOR

CONTINUING SERVICES CONTRACT - TRAFFIC OPERATIONS INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

Financial Project ID: ***TO BE DETERMINED (TBD) - AS ASSIGNED BY TASK WORK ORDER (TWO)***

COUNTY: DISTRICT-WIDE

Florida's Turnpike Enterprise

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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 ***and as assigned under each Task Work Order (TWO). Project assigned under each TWO hereinafter is referred to as project. Florida's Turnpike Enterprise is hereinafter can also be referred to as District.***

Financial Project ID: ***To be assigned under TWO.***

Related Financial Project ID(s): ***To be assigned under TWO (if applicable).***

Federal Aid Project No.: ***To be assigned under TWO (if applicable).***

Roadway: ***To be assigned under TWO.***

Project Description: ***Continuing Services Contract - Traffic Operations Intelligent Transportation Systems (ITS) as assigned under TWO.***

Bridge No(s).: ***To be assigned under TWO.***

Railroad Crossing No.: ***To be assigned under TWO.***

Context Classification: ***To be assigned under TWO.***

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 ***as assigned by each TWO.***

- Major work groups include:
  - ***6.3.1, 6.3.2, 6.3.3***
- Minor work groups include:
  - ***3.3, 4.1.1, 6.1, 6.2, 6.3.4, 7.1, 7.3, 8.1, 8.2, 8.3, 8.4, 9.1, 9.2, 9.4.1, and 14.0***

Known alternative contracting methods include: ***As assigned by TWO.***

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

The Scope of Services establishes which items of work in the FDOT Design Manual (FDM) 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. ***However, the Scope of Services does not limit the responsibilities of all parties as outlined in the FDM.***

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

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

CONSULTANT shall minimize to the maximum extent possible the DEPARTMENT's need to apply its own resources to assignments authorized by the DEPARTMENT.

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

The DEPARTMENT's general consultants will provide Contract administration, project management, and technical reviews of work associated with this Contract.

2 PROJECT DESCRIPTION

The CONSULTANT shall investigate the status of ***each*** project ***assigned under a TWO*** and become familiar with concepts and commitments (typical sections, alignments, etc.) developed from prior studies, activities, ***and/or report(s)***. 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.

This Contract is a Continuous Services contract for Traffic Operations Intelligent Transportation Systems (ITS) Miscellaneous Design Services covering multiple areas within Florida's Turnpike Enterprise system of toll roads, which includes the Turnpike Mainline from Homestead to Wildwood (SR 821 and SR 91), Sawgrass Expressway (SR 869), Beachline East and West Expressway (SR 528), Southern Connector and Seminole Expressway (SR 417), Polk Parkway (SR 570), Veterans Expressway and Suncoast Parkway (SR 589), Western Beltway (SR 429), I-4 Connector, First Coast Expressway (SR 23), and any other toll road or facility that may be under the jurisdiction of Florida's Turnpike Enterprise at anytime during the term of this Agreement. The DEPARTMENT shall request CONSULTANT services on an as-needed basis. Services will be initiated and completed as directed by the Executive Director and Chief Executive Officer, Florida's Turnpike Enterprise. There is no guarantee that any or all of the services described in this Agreement will be assigned during the term of this Agreement. Further, the CONSULTANT is providing these services on a nonexclusive basis. The DEPARTMENT, at its option, may elect to have any of the services set forth herein performed by the CONSULTANT or DEPARTMENT staff. Work to be performed may be assigned individually or in groups and the DEPARTMENT will issue Task Work Order(s) to the CONSULTANT to perform the requested services. Fees will be negotiated when the Task Work Order is issued. Task Work Order(s) assigned under this Agreement may include all or a portion of the services described herein.

While specific work assignments have not been identified at this time, it is anticipated that the primary scope of work assigned under each TWO may include:

- ***General ITS device replacements and enhancements.***
- ***Development of Intelligent Transportation System (ITS) concepts and designs which may include roadways, structures, geotechnical activities, surveys, drainage, signing and pavement markings, signalization, utility relocation, maintenance of traffic, cost estimates, environmental permits, environmental mitigation plans, quantity computation books, and all necessary incidental items for an assigned project.***
- ***Development of Systems Engineering and Concept of Operations (ConOps) Documents***
- ***Development of Intelligent Transportation System (ITS) studies, design memorandums, research and white papers***
- ***Development of FTE ITS Standard Guide Drawings, enhanced Standard Specifications, Modified Special Provisions (MSP), or Technical Special Provisions (TSP).***
- ***Electrical rework of existing systems.***

- ***Other elements of work may include, but is not limited to, intersections, interchanges, geotechnical activities, surveys, signalization, utility relocation, landscaping and irrigation, Right-of-Way maps and legal descriptions, maintenance of traffic, cost estimates, environmental permits, environmental mitigation plans, quantity computation books, and all necessary incidental items for a complete project, as assigned in Task Work order (excluding identified not required elements).***

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

Quality Assurance/Quality Control (QA/QC) Staffing Plan for each TWO:

The CONSULTANT shall develop a QA/QC plan that includes the Project Staffing list using the Template on Florida's Turnpike Enterprise Design Website link (https://floridasturnpike.com/business-opportunities/design***) and provide to FDOT's Project Manager.***

Documents Requiring Concurrence Signatures Submittals:

Draft and final versions of design documents requiring DEPARTMENT'S concurrence signatures (i.e., typical sections, design exceptions, design variations, etc.) must be submitted to the FDOT's Project Manager for review through the Electronic Review Comment (ERC) process. Once the ERC process is complete, the FDOT's Project Manager can proceed with obtaining the necessary concurrence signatures.

Public Involvement:
CAP Level:[X] ***As assigned by TWO.***
Other Agency Presentations/Meetings: ***As assigned by TWO.***

Agency Number of Meetings

Joint Project Agreements: ***As assigned by TWO.***

Specifications Package Preparation ***As assigned by TWO.***

Estimated Quantities Report Preparation: ***As assigned by TWO.***

Value Engineering: ***As assigned by TWO.***

Risk Assessment Workshop:
Number of Risk Assessment Workshop: ***As assigned by TWO.***

Plan Type:
As assigned by TWO.
Typical Section:
Number of Typical Sections:
As assigned by TWO.

Pavement Designs:
Number of Pavement Designs: ***As assigned by TWO.***
Pavement Type Selection Report(s): ***N/A.***
If applicable, include: Exception Memorandum to be developed and processed by the DEPARTMENT.

Cross-Slope Correction: ***N/A***

Access Management Classification:
As assigned by TWO.

Median Crossovers: The CONSULTANT shall evaluate existing median crossovers for conformance to criteria in FDM and Florida's Turnpike Enterprise Design website link https://floridasturnpike.com/business-opportunities/design***.***

Transit Route Features: ***As assigned by TWO.***

Major Intersections and Interchanges:
Number of Major Intersections and Interchanges: ***As assigned by TWO.***

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

Level of Temporary Traffic Control Plan (TTCP): ***As assigned by TWO.***

Temporary Lighting:
To be coordinated with the District Lighting Engineer.

Temporary Signals: ***As assigned by TWO.***

Temporary Drainage: ***As assigned by TWO.***

Design Exceptions***/Formal*** Design Variations***/project Design Variation Memorandums: The CONSULTANT shall prepare design Exceptions/Formal Design Variations/project Design Variation Memorandums in accordance with the FDM.: As assigned by TWO.***

Sidewalk Profiles:
Number of Sidewalk Profiles: ***N/A***

2.2 Drainage (Activities 6a and 6b)

Drainage System Type:
As assigned by TWO.

Number of stormwater management facility sites: ***As assigned by TWO.***

Number of cross drains: ***As assigned by TWO.***

The CONSULTANT shall submit a Stormwater Management Design Report at 45%. This report and preliminary plans, including supporting calculations, shall be submitted for review by the DEPARTMENT's Drainage and Permitting staff. As Assigned by TWO.

For Tab 18 structure design purposes: If assigned by TWO include and complete table below.

Box Culverts/Special Design Structures		
Location	***Culvert Size (W x H) Or Special Structure Type***	***New or Extension***
NB/SB/EB/WB Mainline/Ramp and/or Sta XXX		

2.3 Selective Clearing and Grubbing (Activity 6c)

Number of acres of Selective Clearing and Grubbing and/or Plant Preservation Area: ***As assigned by TWO.***

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 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 ***(EOR)*** 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:

As assigned by TWO.

The DEPARTMENT's Project Suite Enterprise Edition (PSEE) is a scheduling and document control program that utilizes a series of modules to organize, update and transmit data. Within PSEE, the DEPARTMENT has created a Utilities Module for use by FDOT staff, CONSULTANTs, and Utility Agency/Owners (UAOs). When the UAO has agreed to utilize the PSEE Utilities Module, the CONSULTANT shall coordinate with the UAOs and transmit plans, schedules, Agreements, and other documents for the arrangement of utility work on the project through the PSEE Utility Module. The CONSULTANT is responsible for coordination with all UAOs, those utilizing the PSEE Utilities Module and those not utilizing the module.

2.5 Environmental Permits and Environmental Clearances (Activity 8)

Expected Permits:

As assigned by TWO.

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

The permitting involvement shall be determined by the CONSULTANT while finalizing the design. Environmental analysis (including field work) relative to wetlands and wildlife will be dependent upon the proposed improvements. The CONSULTANT will be responsible for the environmental analysis as appropriate.

The CONSULTANT shall submit an electronic copy of the draft permit packages to the Florida's Turnpike Enterprise Permits Coordinator and the DEPARTMENT'S Project Manager at the 45% Drainage submittal, or as directed by the DEPARTMENT's Project Manager. Electronic copy of the final permit packages shall be completed and delivered to the Florida's Turnpike Enterprise Permits Coordinator and Project Manager with Phase II Plans Submittal, or as directed by District Project Manager.

The CONSULTANT will pay for all regulatory permit application fees required for the project and shall be reimbursed per current FDOT guidelines.

It is the responsibility of the CONSULTANT to determine the environmental permits that will be required for the project.

2.6 Structures (Activities 9 - 18)

Bridge(s): ***N/A***

Type of Bridge Structure Work: ***N/A***

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

- Retaining Walls (Activity 17): **– N/A**

- ***Noise Barrier Walls:* – N/A**

- ***Miscellaneous Structures (Activity 18): Box culverts and special drainage structures (See Activity 6), overhead sign structures (See Activity 19 and 20), mast arms (See Activity 21 & 22), high mast lighting and nonstandard light poles or foundations (See Activity 23 & 24), Toll Gantries (See Activity 31T), noise barrier walls (See Activity 32), nonstandard ITS poles (See Activity 33 & 34)***

- ***Miscellaneous Bridge/Structures Tasks:* – N/A**

2.7 Signing and Pavement Markings (Activities 19 & 20)

The CONSULTANT shall provide the required Signing and Pavement Marking design and complete all the associated tasks necessary to prepare a component set of Signing and Pavement Marking Plans. The CONSULTANT's services shall include, but are not limited to, preparing notes, plan sheets, details, guide sign worksheets, cross sections, sign structure designs and report of core borings in accordance with FDM Chapter 940, Signing and Pavement Marking Plans.

[List number and location of sign structures (i.e., cantilevers, overhead, etc.) by completing the table below, or N/A. Add a row for each additional sign structure. Include overhead sign structures for advance guide signs for mainline sections with three or more through lanes].

Structure Number	*Description (indicate TADMS or Walk-in DMS as applicable)*	*Direction*	*Mainline/Ramp/Arterial - Station if Available*	*Existing or Proposed*	*Cantilever or Span*	*Notes*	*DMS (Single Line, Walk In, etc.)*
TBD	*As assigned under TWO*	*TBD*	*TBD*	*TBD*	*TBD*	*	

[* Notes - EOR to indicate for existing, same or smaller panel, adding panels, larger panels, remove a panel, etc.]

2.8 Signalization (Activities 21 & 22)

Intersections: ***To be assigned by TWO.***

Traffic Data Collection: ***To be assigned by TWO.***

Traffic Studies: ***To be assigned by TWO.***

Count Stations: ***To be assigned under TWO.***

Traffic Monitoring Sites: ***If assigned by TWO include and complete table below.*** [*List number of Traffic Monitoring Sites on or within one-half mile of project*]

[Fill out the table below. Note that the number of mast arms or strain poles listed should be only the ones that are proposed to be "touched" by this project. Use the last column to indicate if it is a new item, replacement item or to define the signal scope on existing structures (add backplates, add an X-head for additionall turn lane, reposition heads, etc.). CONSULTANT to coordinate with all stakeholders during scoping to determine the availability and obtain the as built plans or design plans.]

Signalized Intersections Impacted By This Project						
Signalized Intersection No.	***Signalized Intersection (Location)***	***# of Single Mast Arms***	***# of Double Mast Arms***	***# Pole Span Wire Assembly***	***As Builts/Design Plans Available (Y/N)***	***"Added" or "Deleted" and Describe Scope for this SA***
1	***example: SR91 NB offramp @ USX***	***2***	***1***	***NA***	***Y***	***Change in head locations on SE Double***
2	***example: SWXXnd and @ X road***	***1***	***1***	***NA***	***Y***	***New Masts Arms SW/NE***
3	***example: SR91 SB offramp @ X road***	***0***	***0***	***(2) pole NW, (2) pole SE***	***N***	***Adjust signal heads NW, Adjust signal heads and add X'*Y' sign to SE***

Instructions: For the last two scope columns, list the quadrant where the subject work is being proposed (NW,SW,SW,SE). EOR to coordinate as needed during scoping to determine availability of plans. Delete this row from the scope when table is completed.

2.9 Lighting/*Electrical* (Activities 23 & 24)

Limits and Proposed Type of Lighting:

If assigned by TWO include and complete table below. [Identify by location (NB/SB/EB/WB "Roadway Name" or "Ramp Name" and by approximate station) any anticipated nonstandard lighting/electrical items not covered by FDOT standards. Provide backup information to District lighting Engineer to support the need for the special design items listed. This would include light poles, high mast lighting, bridge/structure lighting or lighting foundations. Note, FDOT standard designs should be utilized unless project specific constraints demand a special design.]

Non Standard Design Lighting/electrical Item No.	***Non Standard Lighting (Location)***	***Total # of These Items***	***# of Structural Designs Required (Grouping of designs assumed)***

1	*example: SR X @ USX*	*Ex:2*	*Ex:1*
2	*example: Ramp X @ X road*	*Ex:1*	*Ex:1*

2.10 Landscape (Activities 25 & 26)

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

2.11 Survey (Activity 27)

Design Survey:
The CONSULTANT shall provide, as needed, topography, digital terrain model (DTM), drainage and outfalls, right of way, and other appropriate surveys including field investigations.

Subsurface Utility ***Engineering (SUE)***:
The CONSULTANT shall provide SUE services in 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.

Right of Way Survey: ***To be assigned under TWO.***

Vegetation Survey: ***To be assigned under TWO.***

2.12 Photogrammetry (Activity 28)

To be assigned under TWO.

2.13 Mapping (Activity 29)

The CONSULTANT shall submit Boundary Surveys, CTL maps, ROW Control Surveys, Specific Control Surveys, Sketches of Descriptions, Appraisal Sketches, Key Maps, Detail Sheets and Legal Descriptions to the DEPARTMENT for review at various stages of completion as specified by the DEPARTMENT.

Control Survey Map: ***To be assigned under TWO.***

Right of Way Map: ***To be assigned under TWO.***

Legal Descriptions: ***To be assigned under TWO.***

Maintenance Map: ***To be assigned under TWO.***

Miscellaneous Items: ***To be assigned under TWO.***

2.14 Terrestrial Mobile LiDAR (Activity 30)

To be assigned under TWO.

2.15a Architecture (Activity 31)

To be assigned under TWO.

Green Building Rating System (GBRS)

There are several Green Building Rating Systems available for consideration. They include the US Green Building Council LEED program, The Florida Green Building Coalition (FGBC) Certified Green Building program, and the Green Building Initiative (GBI) Green Globes program.

The intent of a Green Building Rating System is the promotion of the design, construction and maintenance of buildings that are durable, healthy, affordable, and environmentally sound. This is achieved through an approach that looks not only at the building but also includes the surrounding area. Among the elements a GBRS includes access to public transportation, energy usage, daylighting and views, indoor air quality, transportation, water usage, stormwater runoff, recycling, and renewable resources.

Prerequisites and credits are the two types of tasks required by a GBRS to rate a building's environmental impact. Prerequisites are mandatory and must be achieved for a building to meet any certification level; however, no points are earned for their completion. Points are earned for each credit that is achieved with points varying from credit to credit. Not all credits will be achievable due to external conditions while other credits will be too involved or costly to pursue. This is where the design team and the FDOT must determine what credits are to be pursued and the level of certification to strive to meet.

Each GBRS has several levels of certification (Certified, Silver, Gold, or Platinum). Each level requires a higher credit point total.

The State has set "Gold" as the minimum target level of certification for air conditioned/heated buildings larger than 1,000 SF and occupied by the equivalent of at least one full time person or as specifically stated in the GBRS documents.

Hours include the efforts to design, document, submit to the GBRS, and receive certification for the building(s). These hours include all design team disciplines involved in the effort.

2.15b Toll Facility Development (Activity 31T)

General Requirements

The CONSULTANT shall develop toll facility plans, modified special provisions, technical special provisions, reports and design calculations for new toll facilities per assigned under Task Work Order in accordance with the latest GTR. The CONSULTANT shall perform activities listed below.

NEW TOLL SITES							
Site #	***MP & Stationing***	***Building Type / Design***	***ON or Off Ramp/ EL/GTL/ EL+GTL Direction***	***Gantry Type / Pavement Type***	***Gantry Design #***	***E2E Testing Y / N***	***No. of Interim and Ultimate Conditions***

Note:
1. If one site serves multiple gantries, each gantry must be listed in this table.
2. MP & Stationing is for each gantry at a Site
3. For Building Type / Design options, New-Type A, New-Type B, Reuse etc.
4. Direction is NB, SB, Both OR EB, WB, Both
5. Gantry Type – A-Accessible, NAS – Non-Accessible Span, NAC- Non-Accessible Cantilever
   For Pavement Type Flexible – F, Concrete - C
6. For Gantry Design Number. Identify similar gantries for use in structural design. Examples: Cantilever Gantries that span the same single express lane with shoulder & buffer, Span Structure over the same number of lanes and same inside/outside Shoulders
7. .E2E – Y/N is for determining if End-To-End Testing occurs in the project

Coordination with other projects:

If assigned under TWO, coordinate the design with the design of the adjacent projects.

Accommodation for future roadway improvements at the toll gantry.

The proposed toll gantry sites' design shall accommodate existing, interim and future site layouts as it relates to lane configurations, gantry spans, site equipment location at each tolling point. This includes the placement of infrastructure for loop pull boxes, gantry

location, span, gantry member layout, flange connections, gear boxes, gate posts, and toll equipment j-arm layouts etc.

Demolition/ Rehabilitation of existing mainline and ramp toll plazas:

The CONSULTANT shall prepare demolition plans for all existing toll plazas within the demolition scope. The CONSULTANT shall follow the latest GTR criteria for plaza demolitions.

The CONSULTANT shall coordinate with Florida's Turnpike Enterprise Tolls to develop a matrix listing all the salvageable materials from the sites to be demolished.

As assigned under a TWO, the following toll equipment buildings shall be identified and remain operational with communication, power, HVAC, and plumbing service for future use by the Toll System personnel.

XXX toll equipment building at XXX, MP XXX.

XXX toll equipment building at XXX, MP XXX.

XXX toll equipment building at XXX, MP XXX.

Additionally, the CONSULTANT shall evaluate the buildings as assigned under TWO., which are impacted by demolition of the canopy. The CONSULTANT shall prepare a report describing options for maintenance of the building structures, architecture, and systems throughout the demolition period and provide recommendations for incorporation into the demolition design.

The table below provides a summary of the expected toll plazas to be part of the demolition scope under this Contract.

DEMOLITION/ RENOVATION TOLL SITES				
TOLL SITE DEMOLITION/RENOVATION			*ON or Off Ramp/ EL/GTL/ EL+GTL Direction*	*Renovation/ Demolition Scope (Canopy only, Gantry reuse, etc.)*
Site #	*Plaza Name / MP & Stationing*	*Building Type / Renovation or Demolition*		

2.16 Noise Barriers (Activity 32) *N/A*

2.17 Intelligent Transportation Systems (Activities 33 & 34)

Including all supporting infrastructure and equipment, short narrative for purpose, ITS hardware descriptions, communications design, need for test and acceptance procedures on the local subsystem, and system levels. Provide an overview of existing and proposed ITS devices, proposed ITS communications to the transportation management center (TMC), power requirements, operational requirements, and maintenance requirements. The description must include reference to the Regional ITS Architecture and Rule 940 requirements if federal funds are included or as may be required by TWO.

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.

As assigned under TWO. *[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 ***from the Traffic Management Centers*** (TMC) located at ***Florida's Turnpike Enterprise Operations Center, Pompano Beach, (Milepost 65) and at the Turkey Lake Headquarters Complex (Milepost 263)*** using the SunGuide® (SunGuide) Software, or if SunGuide is not in use at ***from the Traffic Management Centers*** (TMC), using the appropriate ***software to be determined during assignment of the TWO.***

Interchanges:
As assigned under TWO. *[list all existing and proposed interchanges and ITS field device requirements for tie-in to arterials*]

Traffic Data Collection:
As assigned under TWO. [*List all locations that will require data collection. Describe data to be collected at each location*]

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 ***locations specified above in this section 2.17***. 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 operational 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.

See Signing and Pavement Marking (Section 2.7) for DMS sign structures. As assigned under TWO. [Add DMS sign structures to the table in Section 2.7.]

[The CONSULTANT shall include the table below in the assigned TWO to indicate number of non-standard ITS structures on the project]

Miscellaneous ITS Structure	*Count*	*Groups (Each group requires a separate design)*
MVDS Poles	*x*	*x*
ADMS verification CCTV	*x*	*x*
Service pads with gravity wall & railing	*x*	*x*
Service pads requiring CIP walls (i.e. Taller Than Gravity) & railing	*x*	*x*

2.18 Geotechnical (Activity 35)

The CONSULTANT will provide subsurface investigation and prepare geotechnical reports providing recommendations to support the design and construction of proposed improvements including roadway, structures, drainage and pavement. Provide recommendations addressing monitoring of existing structures and document details and reasons of selecting structures not required by the standard specifications.

Pavement cores and evaluation has been performed by the Florida's Turnpike Enterprise's Materials Office and will be provided to CONSULTANT. The CONSULTANT shall coordinate with the Florida's Enterprise's Roadway Engineer regarding all work and requests, original and additional, associated with the pavement coring information used in the Pavement Design Report.

Specific geotechnical requirements will be as assigned under TWO. [*types of borings and unique lab tests*]

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 ***as assigned under TWO***. The production date ***will be assigned by TWO***. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a ***(3) three***-week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

Work Activity/Submittal Review (to be determined by DEPARTMENT)	***Time (weeks) (to be determined by DEPARTMENT)***
Roadway Plans Review (Including independent submittals like Typical Section Package, Pavement design, Lane Closure Analysis / 45% Traffic Control Plan (TCP), 45% Drainage, and Design Variations/Exceptions/Technical Memorandums)	***2***
CTL Sheets Review	***1***
Phase I, II, III, IV	***3***
Prepare/Execute Utility Agreements Activity	***16***

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.

Document Submittals include, but may not be limited to, Plan submittals, Engineering Document submittals, Right of Way Map submittals, etc.

The CONSULTANT shall submit all deliverables to the DEPARTMENT electronically in Portable Document Format (PDF), unless notified by the DEPARTMENT's Project Manager. The CONSULTANT shall provide CADD.zip or BIM.zip as outlined in FDOT Computer Aided Design and Drafting (CADD) manual for each phase submittal. For each submittal, the CONSULTANT shall include a Transmittal Memorandum that includes, at a minimum, the file name of each PDF file as well as the number of hardcopies (if any) as directed by the DEPARTMENT's Project Manager.

A Google Earth ready KMZ file will be developed and submitted for all plan or roll plot submittals to the DEPARTMENT. The file will have both existing and proposed information for each discipline and shall follow Florida Turnpike's Enterprise (FTE's) KMZ Standards available on FTEs' Design website link Design – Florida's Turnpike (floridasturnpike.com)***. [Enter when it will be submitted, i.e., Phase II and beyond]***

A preliminary traffic control plan design (45%) must be submitted for review and a traffic control plan workshop with Department production and construction staff must be held following the submission. This workshop shall ideally be scheduled about halfway through the Department ERC review period and is intended to facilitate a collaborative discussion of the traffic control plan to work though the proposed design and the complex issues that require Department assistance. The submission will be reviewed in the ERC system and comments will be provided for the EOR's information and consideration. No written responses will be required in ERC for this submittal as they are expected to be addressed in the subsequent Phase submittal.

After Phase IV and no later than three weeks before the Production Date, the CONSULTANT shall submit signed and sealed Final Plans, Specifications Package, and design documents for review by the DEPARTMENT's PS&E Team in ERC.

The CONSULTANT shall include a "Notes to Reviewers" plan sheet(s) in order to call attention to conditions, issues, and features unique to the project design in all phase submittals prior to the PS&E 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 DEPARMENT's Project Development and Environmental (PD&E) Manual, FDOT Design Manual (FDM), Structures Manual, and Computer Aided Design and Drafting (CADD) Manual***, and FDOT Survey Handbook***. 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.

The CONSULTANT must also comply with the Florida's Turnpike Enterprise manuals, procedures, policies, and guidelines that are outlined below:

- ***Florida's Turnpike Enterprise Lane Closure Policy***
- ***Florida's Turnpike Enterprise U-Turn Policy***
- ***Florida's Turnpike Enterprise General Tolling Requirements (GTR)***
- ***Additional Florida's Turnpike Enterprise guidelines, sample documents and templates for design and construction can be found on the Enterprise Design Website link: https://floridasturnpike.com/business-opportunities/design***

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 ***Florida's Turnpike Enterprise*** 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 ***providing*** the category information pay items, and quantities ***to input into*** AASHTOWare Project Preconstruction through the use of the DEPARTMENT's Designer Interface ***for generating the summary of quantities and the FDOT's in-house estimates. A Summary of Pay Items sheet(s) shall be prepared with all required Plans submittals as required.***

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 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 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. ***Written resolution of review comments shall be input in the DEPARTMENT's Electronic Review Comments (ERC) system.***

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 perform Constructability/Bidability Reviews. The CONSULTANT 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 (if applicable). These items will be reviewed by District Design and District Construction.

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 ***CONSULTANT's*** umbrella, a subconsultant that is qualified in the work group being reviewed, or a CEI ***firm***. 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.

Field Reviews: To be assigned under TWO.

Notification of Work: Traffic shall be maintained on all affected roadways throughout the duration of the Contract during the performance of any work activity by the CONSULTANT within the Florida's Turnpike Enterprise's Right-of-Way.

Prior to the CONSULTANT beginning work on this project, a Notification of Work form shall be submitted to the DEPARTMENT's Project Manager for signature. (Note: This notification of work form shall replace the previously used General Use Permit.) A completed and signed copy of the notification of work form shall be carried at all times in any CONSULTANT vehicle while within an assigned project limits and performing work necessary for the assigned project(s). The above shall apply to all members of the CONSULTANT team under Contract to the Florida's Turnpike Enterprise, including all sub-CONSULTANTs.

Notification of Work form is available at the following internet website:

Microsoft Word - NOW FORM FTE Notification of Work (floridasturnpike.com)

Any lane closures on Florida's Turnpike Enterprise system shall be in accordance with the Florida's Turnpike Enterprise Lane Closure Policy.

As assigned under TWO. [Describe project-specific effort required (4.1-4.26, 5.1-5.29), if N/A, do not include. Fill out the table below.]

Road Name	***Task Description***	***Limits Associated to the task***
Roadway Name over (SR 91, SR 429, SR 417, etc.)	***Provide a short description of the tasks to be included (Typical section, pavement design, MOT plans, Cross sections, Dredge & Fill Sketches, etc.)***	***Provide station limits or overall length, and movement direction (i.e. Northbound, Southbound, etc.) associated with the task herein.***

Project General Tasks

Project General Tasks, described in Sections 3.1 through 3.7 below, represent work efforts that are applicable to the ***assigned*** 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 ***of the assigned TWO***.

The CONSULTANT will coordinate and perform the appropriate level of public involvement for this Project as outlined in the applicable chapters of the FDOT Design Manual, PD&E Manual, and the FDOT Public Involvement Handbook.

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 ***ten (10)*** 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 ***thirty*** (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 ***public notices, advertisements***, flyers, and/or letters to elected officials and other public officials, private property owners, and tenants at intervals during plans production as identified by the DEPARTMENT. All letters and notices shall be reviewed by the ***DEPARTMENT*** to ensure that they are addressed to the correct and current public officials.

All letters and notices shall be approved by the DEPARTMENT. The CONSULTANT shall prepare display advertisements and will pay the cost of publishing. The CONSULTANT will pay the cost of postage for all letters and notifications.

3.1.3 Preparing Mailing Lists

At the beginning of the project, The CONSULTANT shall identify all impacted property owners and tenants ***including elected and appointed officials, and any other stakeholders.***

The CONSULTANT shall prepare a mailing list of all such entities and shall update the mailing list as needed during the life of the project.

3.1.4 Median Modification Letters

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

3.1.5 Driveway Modification Letters

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

3.1.6 Newsletters

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

3.1.7 Renderings and Fly-Throughs

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

3.1.8 PowerPoint Presentations

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

The PowerPoint presentations will include the following as the DEPARTMENT requires:

Presentation scripts

Graphics for presentation

Voiceover audio presentation

3.1.9 Public Meeting/*Hearing* Preparations

The CONSULTANT shall prepare the necessary materials for use in public meeting(s)/***hearing(s).***

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

The CONSULTANT will pay all costs to provide interactive display boards for in-person Public meeting(s) as assigned in the TWO.

3.1.10 Public Meeting/*Hearing* Attendance and Follow-up

The CONSULTANT shall attend public meeting(s)***/hearing(s)***, assist with meeting setup and take down. The CONSULTANT shall also prepare a summary ***report*** of the public meeting***/hearing*** that includes all copies of all materials shown or provided at the public meeting***/hearing***. The summary shall also include a listing of all written comments made during or after the meeting***/hearing. The CONSULTANT shall draft responses for Department's approval 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 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 meetings (as indicated in Section 2.1 above) with local governing authorities and/or MPOs during the design.

The CONSULTANT will coordinate with the appropriate local government agencies and obtain all land use development activities (current and future) within the project area within 60 days of NTP. The CONSULTANT will inform the DEPARTMENT of any impact of the land use changes to the project and recommend strategies to address the impacts.

3.1.12 Web Site

The CONSULTANT shall provide material and content for a project website in conjunction with the DEPARTMENT's web designer.

The CONSULTANT shall provide social media support for the project, which includes, but is not limited to, monitoring social media sites related to the project, providing monthly social media monitoring updates to the DEPARTMENT from Notice to Proceed through Letting, and providing video footage and text for up to two (2) social media advertisements.

3.2 Joint Project Agreements

When the Joint Project Agreement (JPA) deliverable is not prepared by the CONSULTANT, services may include all coordination, meetings, etc., required to ensure compatibility, include JPA documents in the Contract plans package and include the JPA documents in the digital delivery package.

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.

If applicable, identification and development of draft TSPs/MSPs shall begin no later than Phase II submittal and shall be submitted for review no later than the Phase III submittal. DEPARTMENT approval of TSPs/MSPs is required prior to any Phase IV submittal. The draft Specifications Package shall be submitted for review as part of the Phase IV Submittal.

These submittals do not require signing and sealing and shall be coordinated through the DEPARTMENT's Project Manager. The draft Specifications Package submittal shall consist of; (1) the complete Specifications Package, (2) PDF copy of workbook used to prepare the package, (3) a copy of the final project plans, and (4) completed copy of Florida's Turnpike Enterprise's Specifications QA/QC Checklist available on Plans, Specs and Estimates - Florida's Turnpike (Florida's Turnpike – Florida's Turnpike (floridasturnpike.com)***.***

Final submittal of the Specifications Package must occur ***on or prior to the Production*** date ***(date is referenced in Section 2.19)***. 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

The design for this project will be subjected to a Value Engineering (VE) review. The VE review will be conducted by a multidiscipline, independent team of DEPARTMENT and CONSULTANT personnel for improving the value of the project.

The CONSULTANT shall develop the design and Contract Documents using sound value engineering practices to the fullest extent possible, in order to support appropriate design decisions in producing the Contract plans for the most efficient and economical design.

Value Engineering is an event-related activity and should occur at a time when it will provide the greatest opportunity for value improvement, as determined by the DEPARTMENT Project Manager and Value Engineering Coordinator. This opportune time during the design phase of a project will generally fall between completion of Phase I design plans and completion of Phase II design plans, but may occur at any time during the development of a project.

Activities required by the CONSULTANT in support of the VE team are:

Providing Materials and Information: The CONSULTANT shall allow ample time for the appropriate knowledgeable members of their staff to present current design documentation and data to the VE team, as deemed necessary for an effective project review.

The CONSULTANT Project Manager and other key members of the design team shall meet with the VE team to explain the development of design features and how and why they were selected. The information will be provided in the form of a personal verbal presentation and the submittal of a package containing current plans and other documentation. This presentation will take place at the location of the VE study and may be followed up with additional meetings, written communications, and phone enquiries.

Information and data that should be available to the VE Team include, but is not limited to the following:

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- Three copies of all plan drawings

- Drainage alternatives information
- One copy of Bridge Development Reports
- One copy of Pavement Type Selection Report
- One copy of Pavement Design Package
- One copy of other miscellaneous reports
- Project Cost Estimate

The Project Cost Estimate shall include a tabulation of estimated construction costs for the proposed design. This list shall, at a minimum, contain a breakdown of costs for each major element of the design.

The CONSULTANT shall provide, in the form of a matrix, all criteria and weighted impacts used in arriving at decisions for the selection of specific design features. These criteria must include Safety, Operation, Maintenance and Public Acceptance.

All reports provided by the CONSULTANT will be returned after the VE review has been completed. However, copies of plans and drawings may be kept by the VE team.

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.

Progress Meetings: The CONSULTANT shall attend all progress meetings. [number] progress meetings are anticipated for this project. The CONSULTANT shall prepare, and submit to the DEPARTMENT's Project Manager for review, the meeting agenda and notes for all meetings attended by them. The meeting notes are due within five (5) working days of attending the meeting.

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.

Florida's Turnpike Enterprise has developed a separate Post Design Services (PDS) scope and Staff Hour Sheet templates.

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

This project will be subject to Risk Assessment (RA) and Management for the purpose of the identifying, quantifying, and managing the potential cost and schedule risks of the project. The RA for this project will be managed by the DEPARTMENT Project Manager and supported by a multidiscipline team (RA Team) of DEPARTMENT and CONSULTANT personnel and subject-matter experts (SMEs). The DEPARTMENT Project Manager will be the lead for the RA Team.

There will be a Risk Assessment (RA) Workshop and Workshop related meetings during the design. The Workshop will generally occur before completion of Phase I design plans, but may occur at any time during the development of a project as determined by the DEPARTMENT Project Manager. The DEPARTMENT Project Manager will develop a Risk Register following the RA Workshop and utilize the Risk Register throughout the life of the project to mitigate and manage the risks.

The CONSULTANT (and key subconsultant(s) if applicable), and other key members of the design team will attend and participate in the Risk Assessment Workshop for this project. This will involve a Risk Preparatory Session (half-day to 1 day plus information assessment), a Risk Assessment Workshop (1 to 3 days), and Risk Follow-Up Meeting (half-day to 1 day).

The CONSULTANT and other key members of the design team will attend and participate in associated follow-up RA meetings (approximately one meeting every three to six months as deemed necessary) with the DEPARTMENT Project Manager (and RA team if applicable) to discuss the risks, mitigation strategies and any updates to the Risk Register. This includes written communications and phone inquiries. The CONSULTANT will coordinate with subconsultants who need to attend the Workshop and associated meetings.

CONSULTANT shall provide the RA Team meeting materials that are deemed necessary by the DEPARTMENT Project Manager to conduct the Workshop and associated meetings. The meeting materials include the following:

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- One copy of all plan drawings (three copies if a Workshop is applicable)
- Drainage alternatives information
- One copy of Bridge Development Reports

- One copy of Pavement Type Selection Report
- One copy of Pavement Design Package
- One copy of other miscellaneous reports
- Project Schedule
- Project Cost Estimate

Project Cost Estimate shall include a tabulation of estimated construction costs for the proposed design, and a breakdown of costs for each major element of the design, such as Right of Way, Design, CEI, Utilities, JPA/LAP funds, etc.

The CONSULTANT shall allow ample time for the appropriate knowledgeable members of their staff to prepare and provide current design documentation and data. All reports provided by the CONSULTANT will be returned after the RA Workshop has been completed; however, copies of plans and drawings may be kept by the RA team. The CONSULTANT will be responsible for providing follow-up actions as necessary.

3.11 Railroad, Transit and/or Airport Coordination

[*Provide project-specific information*]

3.11.1 Aeronautical Evaluation

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

3.12 Landscape and Existing Vegetation Coordination

Coordinate to ensure preservation and protection of existing vegetation. Relocation of existing vegetation may be necessary in some cases. Space for proposed landscape should be preserved and conflicts with drainage, utilities, ITS, and signage should be minimized. Coordination with the District Landscape Architect may be necessary as defined in 6c ***(Selective Clearing and Grubbing)***. 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

3.13.1 DEPARTMENT Owned Underground Facilities

DEPARTMENT-OWNED underground facilities shall be designated and located, as needed, by the CONSULTANT. The Department will not locate its underground facilities as the result of a call to Sunshine 811 (Sunshine State One-Call). CONSULTANT may determine the locations of existing DEPARTMENT-OWNED underground facilities using SUE, reviewing as-built plans, field investigations, or other means. This requirement also applies to Utility Agency/Owner underground facilities located in service plazas and other DEPARTMENT-OWNED properties that have utilities serving the building(s), EV chargers, lift stations, irrigation pumps, etc.

3.13.2 New Power Services Coordination

CONSULTANT shall coordinate with the design team, Lighting, Signals, Tolls, Signs, and ITS to determine the location for new service points; the cost to provide power service to the service point locations; and schedules for providing the new service.

CONSULTANT shall review and confirm that the power company's estimate is accurate and includes the required components needed for the individual systems (voltage, transformer size, location, clearing and grubbing, etc.) and provide the cost estimate and a written request to utilize the Do-Not-Bid pay item (639-8-ABC) to the Project Manager and the District Utility Administrator.

3.13.3 FGT Specified Width

CONSULTANT shall review and become familiar with the August 21, 2013, Agreement and Global Settlement between FDOT and Florida Gas Transmission (FGT) which describes the dimensions of the FGT Specified Width associated with FGT facilities within the Turnpike (SR 91) right of way. For all design submittals up to and including Phase IV, show label, shade or hatch, and dimension the FGT Specified Width on applicable sheets in the component plan sets. Applicable sheets include, but are not limited to, roadway, signing, selective clearing and grubbing, lighting, ITS, architecture, structures, landscape, and toll facility plans. The requirement applies to, but is not limited to, plan sheets, roll plots, typical sections, details, cross sections, drainage structures, and utility adjustment sheets. Do not include the FGT Specified Width on the final signed and sealed contract plans.

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 ***and submit to the DEPARTMENT.***

4.2 Pavement Type Selection Report

Pavement Type Selection Reports are required for every project one mile or greater in length where work includes a modification to the base materials. The Pavement Type Selection decision will again be reviewed by ***Florida's Turnpike Enterprise*** Design ***Office*** at the time the pavement is designed to warrant reconsideration. A letter to the Project Design File documenting the pavement type decision is required.

4.3 Pavement Design Package

The CONSULTANT shall prepare a Pavement Design Package ***and submit to the DEPARTMENT***.

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 Report

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 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.

The CONSULTANT shall analyze the impact to the customer for any proposed detours. If the detour routes customers to a toll site with a higher toll, multiple toll sites, or closes tolled cash options and forces customers through electronic toll collection lanes, then provide options to

mitigate the impact to customers. This analysis shall be included in the Detour Tolls Analysis Memorandum and submitted for review and approval.

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

The CONSULTANT shall submit cost estimates at each phase submittal.

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/Modal 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 ***the Drainage Report and Pavement Design 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

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

6a.6 Temporary Drainage Analysis

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

6a.7 Pond Siting Analysis and Report

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

6a.8 Analysis of Pipe Video Inspection Report

Analyze the pipe video inspection report provided by the District.

6a.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***. Include existing and proposed pile alignments (substructure) in the Preliminary Line and Grade submittal (approximately 15%).***

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

6a.17 French Drain Systems

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

Evaluation of Existing French Drain Systems

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

6a.18 Design of Drainage Wells

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

6a.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.

Perform an office review of as-built plans, inspection reports, and project survey for existing pipes and cross drains to remain based on the proposed roadway and drainage design plans and summarize in a matrix (grouped by pipe size) the length of pipe to be video inspected (to be performed by the DEPARTMENT). Also, provide on aerial view, existing labeled pipes that are to remain with a structure number corresponding to the matrix. Only pipes under pavement that are to remain in service should be included on the list.

Based on the video inspection report performed by the DEPARTMENT, provide recommendations for repair or replacement of pipes and cross drains in the plans.

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

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.

The CONSULTANT will identify all existing utilities, perform utility coordination with the Utility Agency Owner(s), and certify there are no utility conflicts within the project limits.

In addition, the CONSULTANT shall determine the locations of all existing DEPARTMENT-owned utility facilities (i.e., power, telephone, water, sewer, roadway lighting, data, and internal communication lines).

LANDSCAPE projects will generally not require utility relocations. The CONSULTANT will identify existing utilities and prepare their design to avoid all utility conflicts, including Florida's Turnpike Enterprise preferred offset guidance.

The CONSULTANT will perform all of the coordination functions with each utility shown on the roadway plans for this Project. After the CONSULTANT has corrected the Phase I roadway plans per the DEPARTMENT's comments, the CONSULTANT will provide each utility company with a copy of the plans and schedule a meeting with the utility companies. The CONSULTANT shall chair this meeting and provide all attendees with a copy of the minutes of the meeting.

After preparation of the Phase II plans and correction thereof per the DEPARTMENT's comments, the CONSULTANT shall submit a hard copy of the corrected plans to those utility companies that are not computer automated and an electronic copy to those that are automated. The computer files shall be in a format that can be readily adapted by the utility company to their own unique system. In addition, the CONSULTANT shall furnish the DEPARTMENT two (2) sets of corrected plans for use by the DEPARTMENT. At this time, the DEPARTMENT will schedule a utility pre-design conference with the utility companies. The CONSULTANT shall attend this meeting and provide all attendees minutes of the meeting.

At the completion of the Phase III plans and at the time of submission of the plans to the DEPARTMENT, the CONSULTANT shall submit to the DEPARTMENT an electronic copy of the Phase III plans for each utility depicted on the plans.

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.

The CONSULTANT shall utilize Project Suite Enterprise Edition for Utility (PSEE).

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 (***FTE's)*** 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/ ***Red Green Brown*** (RGB) plans and work schedules. The CONSULTANT is responsible for motivating the UAO to complete and return the necessary documents after each utility contact or Meeting.

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

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

7.8 Subordination of Easements Coordination

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

7.9 Utility Design Meeting

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

with the UAOs to recommend potential resolution between known utility conflicts with proposed construction plans as may be deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.8 (Cross Section Design Files) for utility conflict location identification and adjustments.

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

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

The CONSULTANT shall provide monthly UAO's status and activity sheet update.

7.12 Utility Constructability Review

The CONSULTANT shall review utility schedules against construction Contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the construction office. See Task 4.11 (Horizontal/Vertical Master Design File) and Task 5.13 (Cross Section) for utility conflict identification and adjustments.

7.13 Additional Utility Services

The CONSULTANT shall provide additional utility services. Additional services will be determined when the services are required and requested ***by the DEPARTMENT's Project Manager***. [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 ***scope of services*** 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 task. ***Additional utility services not included in an assigned Project's TWO will be negotiated and approved through an amendment to the TWO*** on a case-by-case basis.

8 ENVIRONMENTAL PERMITS and ENVIRONMENTAL CLEARANCES

The CONSULTANT shall notify the DEPARTMENT Project Manager, ***DEPARTMENT*** 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 ***DEPARTMENT*** Project Manager and the DEPARTMENT 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 2.5, ***Environmental Permits and Environmental Clearances***.

8.1 Preliminary Project Research

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

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

8.2 Field Work

8.2.1 Pond Site Alternatives:

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

8.2.2 Establish Wetland Jurisdictional Lines and Assessments:

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

- Determine landward extent of wetlands and other surface waters as detailed in Rule Chapter 62-340, F.A.C., as ratified in Section 373.4211, F.S..; United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Technical Report Y-87-1); Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (ERD/EL TR-10-20).
- Collect all data and information necessary to determine the jurisdictional boundaries of wetlands and other surface waters as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Set seasonal high-water levels in adjacent wetlands with biological indicators

- Obtain a jurisdictional determination as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Prepare aerial maps showing the jurisdictional boundaries of wetlands and other surface waters. Aerial maps shall be reproducible, of a scale of 1"=400'or more detailed and be recent photography. The maps shall show the jurisdictional boundaries of each agency. 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.

100% gopher tortoise surveys for work areas. Bat presence/absence surveys for work associated with bridge and sign structures.

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.

8.4.2 Complete and Submit all Required Species Permit Applications:

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

8.5 Coordinate and Review Dredge and Fill Sketches

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

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

The CONSULTANT shall be responsible for 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

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

8.14 Technical Support to the DEPARTMENT for Environmental Clearances and Re-evaluations

As assigned under TWO 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 Level I 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 CONSULTANT shall include a reevaluation of risk ratings assigned to potential contamination sources identified during the PD&E within the final design project area of interest and assign risk ratings for any new identified potential contamination sources, A draft Contamination Screening Evaluation Report Update shall be submitted to the DEPARTMENT′s Project Manager for ERC review and final approval.

The CONSULTANT shall review final design plans and inform the DEPARTMENT′s Project Manager and District Contamination Impact Coordinator of anticipated construction activities proximal to potential contamination risks rated High or Medium in the Contamination Screening Evaluation Report Update. The DEPARTMENT will provide Level II Contamination Impact to Construction Assessment, if needed. If contamination is identified within the limits of construction, the CONSULTANT shall coordinate with the DEPARTMENT′s District Contamination Impact Coordinator to identify contamination areas on plans and develop or modify specifications or special provisions as appropriate.

8.17 Asbestos Survey

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

The CONSULTANT shall coordinate with the DEPARTMENT′s District Contamination Impact Coordinator to mark plans include general notes, or to develop or modify specifications or special provisions as appropriate.

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 2.21, 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 2.21, 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 – *NOT REQUIRED*

11 STRUCTURES - TEMPORARY BRIDGE – *NOT REQUIRED*

12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE – *NOT REQUIRED*

13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE – *NOT REQUIRED*

14 STRUCTURES - STRUCTURAL STEEL BRIDGE – *NOT REQUIRED*

15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE -*NOT REQUIRED*

16 STRUCTURES - MOVABLE SPAN – *NOT REQUIRED*

17 STRUCTURES - RETAINING WALLS – *NOT REQUIRED*

18 STRUCTURES - MISCELLANEOUS

The CONSULTANT shall prepare plans for Miscellaneous Structure(s) as specified in Section 2.6.

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. The CONSULTANT shall 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 Signing & Pavement Marking 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)

The CONSULTANT shall provide sign cross sections in the Plans for all proposed overhead sign structures and existing to remain overhead sign structures where overhead sign panels are to be installed or replaced. The CONSULTANT shall provide sign cross sections in the plans for multi-post Toll Schedule signs.

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

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

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

21.2 Traffic Data Analysis

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

21.10 Quantities for EQ Report

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

21.11 Cost Estimate

21.12 Technical Special Provisions and Modified Special Provisions

21.13 Other Signalization Analysis

21.14 Field Reviews

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

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

21.15 Technical Meetings

21.16 Quality Assurance/Quality Control

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

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

21.17 Independent Peer Review

21.18 Supervision

21.19 Coordination

22 SIGNALIZATION PLANS

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

22.1 Key Sheet & 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.

The CONSULTANT shall coordinate with the Utility Power Company(ies) for new service primary power extension to and/or modification of existing service equipment to each lighting load center from the nearest existing or proposed Utility power point of presence. The CONSULTANT shall coordinate with ITS & Tolls consultants to ensure that Utility power points of service are shared where possible. The CONSULTANT shall design the primary power extension from the Limited Access (LA) R/W to each lighting load center primary transformer, including the utility service routing in the construction documents. The CONSULTANT shall provide an Engineer's Estimate with any Utility's Special Construction costs for the full Utility primary power extension or modification, coordinate with District Specifications & Estimates (as required), and include pay item in the Contract plans per DEPARTMENT requirements.

Refer to Florida's Turnpike Enterprise Design Website link (https://floridasturnpike.com/business-opportunities/design***) for Lighting Load Center, Wiring Criteria, Electrical System Analysis, and Lighting Design reference documents.***

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 ***Average Daily Traffic*** (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. The report shall provide analyses for each signalized intersection lighting design and each typical section of the mainline, typical section for the ramps (one and/or two lanes), interchanges, underdeck lighting, and arterial roads. Each lighting calculation shall be properly identified as to the area that it covers.

The report shall include all authorized jurisdictional Lighting Design Criteria that will be used. For projects with corridor lighting, the report shall include the evaluation of at least three lighting design alternatives. The report shall provide a recommendation on the alternative to use. Each alternative shall be properly described; the alternatives shall consider different pole heights, lamp wattage, and arm lengths. Each alternative shall be provided with a cost estimate that includes initial cost in addition to operations and maintenance cost for one year.

The report shall also include the lighting calculations for each lighted sign where lighted signs are applicable to the Project.

The design of conventional roadway lighting luminaires must be pole top style unless otherwise directed by the District.

The design must include mainline transition lighting to allow a reasonable reduction in lighting levels from a lighted roadway to an unlighted roadway and provides guidance on transition design. The mainline transition lighting must extend the lighting limits by approximately four-to six-pole spacing. The mainline transition illumination levels must be 1.0-foot candle average initial intensity (horizontal foot candles) with uniformity ratios as specified in FDM Table 231.2.1.

After approval of the preliminary report, the CONSULTANT shall submit a revised report for each submittal. The Lighting Design Analysis Report shall include, yet not be limited to:

Voltage drop calculations

Load analysis calculations for each branch circuit

Arc Flash Hazard analysis

Short Circuit analysis and Device Coordination

Luminaire Data

Photometric Data

Photometric analysis

Project coordination correspondence (i.e., utility, FAA, etc.)

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 maximum allowable voltage drop for determining the conductor sizes for the lighting branch circuits shall be 6 percent.***

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

Load analysis calculations shall be submitted for each branch circuit breaker and main breaker.

23.4 FDEP Coordination and Report

23.5 Reference and Master Design Files

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

23.6 Temporary Highway Lighting

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

The CONSULTANT shall provide temporary lighting requirements for all affected phases of construction to light all detour roadways in areas where required.

23.7 Design Documentation

The CONSULTANT shall submit Design Documentation with each plan′s 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. Submitted as part of the Structural Calculations (Phase III and IV submittals)***
- ***Structural calculations for the high mast pole foundations. Submitted as part of the Structural Calculations (Phase III and IV submittals)***
- ***Correspondence with the power company concerning new electrical service. Services and/or modifications to existing circuits, existing loads, and fault currents- Submitted as part of the Lighting Design Analysis Report (Phase IV submittal)***
- ***Voltage drop calculations. Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals)***
- ***Load analysis calculations Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals)***

- ***Arc flash hazard analysis - Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals)***
- ***Short circuit analysis and device coordination - Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals)***

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

If applicable, Existing Roadway Conditions Assessment Report (ERCAR) - Report shall be prepared in accordance with Florida's Turnpike Enterprise ERCAR Sample Table of Contents.

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.

The CONSULTANT shall provide all of the professional services and complete all of the associated tasks necessary to prepare the lighting portion of the construction plans and documents for all work within the Project limits.

Services shall include, but are not limited to, preparation of the lighting justification report, lighting design analysis report, temporary roadway lighting plans, lighting plans for temporary and permanent facilities, lightning protection and grounding systems, layouts, typical sections, key sheet, quantities (including lighting quantities), lighting computations, service point details, tabulation of pole data sheets, and any special detail sheets necessary.

24.1 Key Sheet & Signature Sheet

24.2 General Notes/Pay Item Notes

24.3 Pole Data, Legend & Criteria

24.4 Project Layout

24.56 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 – *NOT REQUIRED*

26 LANDSCAPE PLANS – *NOT REQUIRED*

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, furnished by the CONSULTANT. The field books shall be furnished by the CONSULTANT and certified by the surveyor in responsible charge of work being performed before the final product is submitted. (Note: it is anticipated that PDF copies of the field notes will be submitted in lieu of original field book hard copies with attached certified survey report.)

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.

A database of the processed survey data, including control points, benchmarks, and alignments will be provided to the DEPARTMENT as approved by the Florida's Turnpike Enterprise's Surveyor. (Note: it is anticipated that a final surveying package of all survey information will be submitted prior to final construction plan submittal by the Engineer of Record.)

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 pavement cross-slope analysis and/or for comparison with DTM.

27.9 Side Street Surveys

Refer to tasks of this document as applicable.

27.10 Underground Utilities

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

DEPARTMENT-owned utility lines will be designated and located, as needed, by the CONSULTANT. The DEPARTMENT will not locate its facilities as the result of a call to Sunshine State One-Call.

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 ***safety*** as required by DEPARTMENT standards.

27.28 Vegetation Survey

Locate vegetation within the project limits.

27.29 Tree Survey

Locate individual trees or palms within the project limits.

27.30 Miscellaneous Surveys

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

27.31 Supplemental Surveys

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

27.32 Document Research

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

27.33 Field Review

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

27.34 Technical Meetings

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

27.35 Quality Assurance/Quality Control (QA/QC)

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

27.36 Supervision

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

27.37 Coordination

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

28 PHOTOGRAMMETRY

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

The use of any Unmanned Aircraft System (UAS), Unmanned Aerial Vehicle (UAV), drone, or similar system to accomplish Contract activities must comply with all federal, state, and local laws and regulations.

For FDOT Projects, if a drone is used for Surveying & Mapping, the CONSULTANT must be pre-qualified in Work Type 8.3. That being said, the use of a drone has not provided enough efficiency and accuracy when performing Design Surveys for The Florida Turnpike Enterprise.

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 Topography (3D)

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

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

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, ***and may be substituted for the Reference Point Sheet as determined by the Florida's Turnpike Enterprise's Surveyor (may also be called the CTL sheet, to Engineering CADD standards suitable for inclusion in the plans).***

29.22 Table of Ownerships Sheet

Miscellaneous Surveys and Sketches

29.23 Parcel Sketches

29.24 TIITF 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

The CONSULTANT shall perform Terrestrial Mobile ***(Light Detection and Ranging)*** 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; i.e., 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

Note: This 10% phase section is NOT APPLICABLE for Toll Equipment Buildings that will be developed utilizing the Florida's Turnpike Enterprise General Tolling Requirements (GTR) publication (unless directed by the DEPARTMENT's Project Manager otherwise).

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Pre-Phase I (10%) Programming and Schematic Design documents, comprised of, but not limited to the following:

A. Architectural Programming Pre-schematic Phase (5%).

1. Data Collection (Site and Building).

2. Data Analysis (Site and Building).

3. Data Organization and Development of Architectural Concepts.

4. Architectural Site and Space Plan Diagrams and Recommendations.

5. Project Cost Verification and Project Schedule Verification.

6. Preliminary Building/Zoning (if applicable) Code Review.

7. The deliverable is an Architectural Programming Report.

B. Architectural Schematic Design Phase (10%).

1. Validation of Architectural Pre-Schematic Program Analysis (site and space).

2. Schematic Design Plans/Narratives (Architectural, Interior Design, and including demolition if applicable).

3. Schematic Design Engineering Plans/Project Narratives (Civil, Structural, Mechanical, Electrical, LEED (if applicable), and including demolition if applicable).

4. (3D) Three-Dimensional Perspective Sketches, and/or 3D Computer generated Exterior/Interior Renderings. The use of BIM Building Information Modeling is allowed to be used.

5. Schematic Design Interior Design Plans (Space and Furniture).

6. Schematic Design Architectural Interior and Exterior finishes and materials evaluations, recommendations, and plans.

The evaluation shall define various types of architectural - interior and exterior finishes and materials used, and their relative effectiveness from construction, economic, aesthetic and maintenance (serviceability) standpoints.

The evaluation shall be utilized as a tool to determine the most appropriate architectural interior and exterior finishes and materials for buildings to be used for the design.

The summary evaluation and the CONSULTANT's recommendations for the architectural interior and exterior finishes and materials shall be prepared and submitted to the DEPARTMENT for review and approval.

7. Schematic Design Cost Estimate/Verification.

8. Preliminary Project Schedule Verification.

9. Preliminary Site and Building Code Analysis and Report.

10. Building Permitting Coordination and Verification.

11. The schematic design is intended to provide sufficient preliminary design information for the DEPARTMENT to be assured that the development of detailed construction documents will be performed. This includes coordination between civil, architectural, and engineering disciplines.

12. The deliverable for this phase is an Architectural and Engineering Schematic Design (10%) Report with plans, schedule, cost estimate, and LEED information (if applicable).

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, Civil***, and Electrical*** 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.

    - ***For all alterations, the CONSULTANT shall validate and show compliance by utilizing the applicable Florida Building Code, latest adopted edition.***

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 break lines, 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 wheelchair 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.

    - ***Provide preliminary Fire Sprinkler floor plans (if applicable).***

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 ***17*** 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.
- Deign 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.

- ***The CONSULTANT is responsible for researching local and/or state requirements for obtaining building permit.***

- ***The CONSULTANT shall utilize surveys done by the DEPARTMENT for asbestos containing materials, lead based paint or other potentially hazardous materials to determine what mitigation will be required prior to or during construction of the project. The CONSULTANT shall establish and confirm responsibility for removing the asbestos, lead based paint or other hazardous materials in the design development documents and coordinate with Project Development Schedule, Statement of Probable Construction Cost and other documentation.***

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 ***electronic*** 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 SUBMITTAL:

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.
- ***Provide Fire sprinkler hydraulic Engineering calculations and report as required.***
- 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.

- ***Demolition inventory and photo/video documentation, as applicable.***

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 pre manufactured 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 Fire Sprinkler floor plans; sections; details; riser diagrams.***
- 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 ***electronic*** 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.
    - ***Fire Sprinkler floor plans; sections; details; riser diagrams***
    - 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, ***Fire Sprinkler Hydraulic,*** 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.
- ***Fire Sprinkler floor plans; sections; details; riser diagrams.***

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/*schematic Design* 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 GBSR 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)

31T TOLL FACILITY DEVELOPMENT – NOT REQUIRED

32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE – *NOT REQUIRED*

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS

The CONSULTANT shall analyze and document Intelligent Transportations System (ITS) Analysis Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, existing ITS standard operating procedures, ITS master and strategic plans, Florida's SEMP guidelines, National and 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 attributes, facilities, infrastructure, ITS devices, systems, and associated work ***as assigned under TWO. Florida's Turnpike Enterprise operates two (2) Traffic Management Centers (TMCs); one (1) in the Turkey Lake Service Plaza, the other within the Pompano Beach Operations Center. In addition, Florida's Turnpike Enterprise supports the technology needs of the Lake Worth Dispatch Center, which includes a video wall and minor network presence.***

The system-wide communications system consists of primarily fiber optic backbone along a 10- gigabit Ethernet network composed of layer 2 and layer 3 switches. In addition, the DEPARTMENT utilizes some wireless connections and leased lines to provide device connectivity and redundancy.

When providing patch panels for laterals at local hubs, use preloaded Standard Connector (SC) duplex single mode, 12-port splice cassette(s) with pre-routed factory polished fiber

pigtails and integral splice tray. Ensure the pigtailed splice cassette module(s) matches the appropriate patch panel housing.

When routing fiber optic backbone, terminate all fibers that enter a structure inside the rack. Bring the entire backbone fiber into and terminate all fibers inside the Equipment Shelter (Master Hub).

When the project work necessitates a break in the fiber cable, include provisions regarding allowable downtime. Provide any temporary splice drawings required during construction. Permanent fiber optic cable must include replacement of the entire cable from the nearest existing butt end splice to the next existing butt end splice removing all temporary splices. Make provisions for a minimum of 1 mile distance between butt end splices.

The existing field infrastructure is comprised of power and communications infrastructure as well as a range of ITS devices. The CONSULTANT shall coordinate with the Utility Power Company(ies) for the primary power extension to each ITS service point from the Utility's power point of presence. The CONSULTANT shall coordinate with Lighting & Tolls CONSULTANT to ensure that primary power points of service are shared where possible. The CONSULTANT shall provide an Engineer's Estimate with the Utility's Special Construction costs for the full primary power extension.

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 or ***other software utilized by the DEPARTMENT.***

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.

Refer to Florida's Turnpike Enterprise Design Website link (https://floridasturnpike.com/business-opportunities/design***) for ITS Guidelines documentation and apply the guidelines to design analysis and plans as applicable.***

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.

CCTV devices are prohibited to be mounted on light poles or sign structures.

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.

VDS devices are prohibited to be mounted on light poles or sign structures.

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 Tolls technical personnel.

The CONSULTANT shall coordinate with Florida's Turnpike Enterprise's Tolls Office Department to ensure that any vehicle detection equipment will not affect tolling equipment operation, at any existing or proposed toll gantries, through use of non-conflicting frequencies or physical separation.

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 ***21***-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 ***21***-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 in accordance with Traffic Engineering and Operations Bulletin ***21***-03.

The CONSULTANT shall be responsible for the design of a wrong way vehicle detection (WWVDS) system. The WWVDS alarm output shall indicate the ultimate direction of travel, once the Wrong Way vehicle is confirmed by the system. The system shall utilize the fiber optic backbone to communicate with the TMCs.

The CONSULTANT shall include WWVDS that is compatible with existing deployments.

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 TPAS 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 ***costs, as well as*** 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, water intrusion, ***vandalism, and theft.*** The CONSULTANT shall ensure that vandal resistant mechanisms for all electrical infrastructure shall be included as part of the Design.

The CONSULTANT shall submit ***a Power Design Analysis Report (PDAR) including*** the power system design voltage drop calculations ***and Arc Flash Hazard Analysis*** for the power distribution system as part of phase II, III, and IV design submittals***. An Arc Flash Hazard analysis shall be conducted for new or modified electrical distribution equipment (panelboards, transformers, load centers, disconnects, etc.), per the latest version of the Standard for Electrical Safety in the Workplace, NFPA 70E. Arc flash and shock warning labels must be field installed on each piece of new electrical distribution equipment. The labels must indicate the flash hazard boundary, the flash hazard at 18 inches, the PPE level***

requirements, and the approach restrictions. All labels proposed for use on electrical equipment must be provided (in .pdf format) as part of the report and in the plans.

The CONSULTANT shall ***also*** conduct a short circuit and protection coordination study for the designed power system and document the study as part of the ***PDAR. A short circuit analysis must determine maximum fault current on each piece of new electrical distribution equipment and proper fault current interrupting capacity. Provide documentation from the utility provider on the maximum available fault current at the utility transformer. This value must be used in the short circuit analysis. Software programs or hand methods used must be capable of calculating the maximum short circuits at all electrical equipment locations to ensure equipment ratings are adequate. The short circuit analysis must be updated when a major modification or renovation takes place or if electrical load is added to existing infrastructure. The AIC ratings for all equipment must be provided as part of the contract documents to meet or exceed the short circuit analysis results.***

Electrical distribution equipment must be designed as fully rated and selectively coordinated systems. The protective features of the electrical distribution system must automatically and selectively isolate a faulted or overloaded circuit from the remainder of the electrical system. Only the closest protective device to the fault must operate to isolate the fault without affecting other parts of the system.

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 with allowable limits. The voltage drop incurred on each circuit (total volts and percentage of drop) shall be calculated, and all work necessary to calculate the voltage drop values for each circuit should be presented in such a manner as to be duplicated by the District. Load analysis calculations shall be submitted 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.

Conductor sizes shall not exceed #1/0 AWG, however larger conductor sizes may be permitted from utility service transformer to service disconnect and from service disconnect to main distribution panel to accommodate the total demand load calculated for all circuits.

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 engineering estimate for all applicable items on plans.
- Phase submittal checklist.
- Three-way quantity checklist
- 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 ***and perform field review/verification of*** 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 ***Center-to-Center*** (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 ***for the year determined by the DEPARTMENT***. 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 ***and may be forecasted as directed by the DEPARTMENT***.

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 Pole 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

To be assigned under TWO. Examples may include TMC work space analysis, Travel Time System layout and validation reports, or other similar efforts as identified by the DEPARTMENT.

33.17 Field Reviews

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

- Existing ITS Field Devices as compared with the latest FDOT standards and District requirements
- Device Make, Model, Capabilities, Condition / Age, Existence of SunGuide Software Driver
- Condition of Structure(s), cabinets, and other above-ground infrastructure and devices
- Type of Detection as compared with current district standards and preferences.
- Underground Infrastructure
- Proximity of other utilities
- Any other field reconnaissance as necessary to develop a complete ITS design package

33.18 Technical Meetings

The CONSULTANT shall attend meetings as necessary to support the project.

33.19 Quality Assurance / Quality Control

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

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

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

33.20 Supervision

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

33.21 Coordination

The CONSULTANT shall coordinate with Survey, Geotech, Drainage, Structures, Lighting, Roadway Design, Utilities, municipalities, maintaining agencies and Traffic Operations to produce a final set of construction Contract Documents and to ensure that a high degree of accuracy for the design plans is achieved. The CONSULTANT shall coordinate with the roadway Utility Adjustment Plan to incorporate all ITS support structural foundations symbols drawn to scale in the Utility Adjustment Plans and attend the utility design meetings conveying the information to all utility owners to preserve the location of the proposed foundations and avoid any conflicts.

34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS

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

34.1 Key Sheet 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, devices, device identification using SunGuide nomenclature, and plan sheet numbering and coverage.

32.4 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, conductors, and underground and overhead utilities, if applicable. ***Conductor information shall include number and size of ungrounded***

conductors, neutral conductors, and equipment grounding conductors on all ITS power conduit call-outs. 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 ITS Maintenance of Communications Plans

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 TMCs at ***specified locations mentioned in section 2.17.***

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 ***vehicles***.

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 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. ***The Consultant shall also prepare cross sections for all directional bores proposed under a canal. These cross sections shall be developed in support of the permit application to appropriate Water Management District.***

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, Project Common and Project General Tasks, herein.

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 CONSULTANT 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.

When required, all work shall be performed in accordance with current Florida DEPARTMENT of Environmental Regulation (DER) and Federal OSHA and EPA standards. The following work shall be included, but not limited to:

- ***A minimum of four (4) borings will be required per site***
- ***Soil gas analysis will be required by use of a flame ionization detector; e.g., Organic Vapor Analyzer (OVA)***
- ***Installation of monitoring wells may be required***
- ***Water sampling and laboratory analysis may be required. The State of Florida DEPARTMENT of Health shall certify the laboratory performing the analysis***
- ***Four (4) copies of the draft PCA report will be required for review and comment by the DEPARTMENT. After comments have been addressed, six (6) signed and sealed copies of the final PCA report shall be submitted to the DEPARTMENT. Copies of all documents will be additionally transmitted to the DEPARTMENT in electronic format in accordance with the DEPARTMENT's current standards***

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 the 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.