EXHIBIT A

SCOPE OF SERVICES

FOR

FINANCIAL PROJECT ID(S). *To Be Determined by Task Work Order*

Districtwide Architectural, All Electronic Tolling, and Express Lanes Design Support Services

Florida's Turnpike Enterprise

July 24, 2018

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 _____ (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: *To be assigned under Task Work Order*

Federal Aid Project No.: *N/A*

County Section No.: *District-Wide*

Description: *Districtwide Architectural, All Electronic Tolling, and Express Lanes Design Support Services*

Bridge No(s).: *As identified in Task Work Order*

Rail Road Crossing No: *As identified in Task Work Order*

Context Classification: *As identified in Task Work Order*

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 *preparation* of *reports, design and development of* complete set of construction contract *plans and documents, special provisions and/or any incidental engineering services, as necessary, for improvements to the transportation facility(ies) described herein.*

This contract is a general services contract for Districtwide Architectural, All Electronic Tolling (AET), and Express Lanes Design Support 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, Suncoast and Suncoast 2 Parkway (SR 589), Western Beltway (SR 429), I-4 Connector, First Coast Expressway, Central Polk Parkway, Colonial Parkway and other DEPARTMENT toll facilities, including Alligator Alley, Garcon Point, Mid-Bay Bridge, Sunshine Skyway Bridge, Pinellas Bayway, and any other toll road or facility that may be under the jurisdiction of Florida's Turnpike Enterprise 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, 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 may include; development of studies, concepts, design memorandums, and/or construction plans in relation to the following elements: signing and pavement markings, roadway, drainage, Intelligent Transportation Systems (ITS), utilities, operations, structures, architecture, lighting, maintenance of traffic, tolling infrastructure and operations, cost estimates, environmental permits, environmental mitigations plans, all necessary incidental items related to AET conversion effort(s), and express lanes effort(s).

The general objective is for the CONSULTANT to provide a complete set of construction contract plans and special provisions related to architecture, AET conversion effort(s), and express lanes effort(s) in accordance with FDOT policy, procedures and requirements. Contract plans, if assigned for development, will be used by the contractor to build a 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.

Selected CONSULTANT will be responsible to study the Turnpike Enterprise (FTE) or DEPARTMENT System to gather data of existing roadway (civil) and tolling components that are currently deployed in the lane. The CONSULTANT will also provide an analysis of existing roadway (civil): pavement, geometrics, design speed, profile, lane widths, structures, ITS, Signing, Striping, Lighting, Utilities, Drainage and Environmental Permits. Additionally, an analysis of tolling components that are currently deployed in the lane will be required. CONSULTANT will evaluate the upstream/downstream traffic impacts at side streets, ramps, or other specified locations or on local stakeholders.

Architectural Work:
Due to the nature of the work at each of the plazas, an architectural analysis including (if needed) a structural, electrical, site civil, and mechanical engineering analysis of the canopies, roofs, lanes, buildings, sidewalks, means of egress, Americans With Disabilities Act (ADA) requirements, and other vertical / horizontal elements shall be required. (If Applicable). The CONSULTANT shall need to identify vertical and horizontal infrastructure, safety constraints, project impacts, and design requirements required where applicable.
CONSULTANT shall provide an assessment of existing infrastructure within the study limits,

evaluate existing geometric conditions against criteria, and shall determine what elements shall require a design variation/exception. Architectural work also includes, but not limited to, toll gantry modifications, toll gantry replacements, toll building or toll site improvements or enhancements, facility modifications, and tolling equipment design. The CONSULTANT shall study, assess or design enhancements, modifications to service plazas, provide modifications to FTE facilities including space studies. These modifications may include demolitions or repurposing of existing buildings/facilities.

AET Work:
CONSULTANT shall provide analysis of implementation options (by lane) to be considered by FTE management (AET Lite: directing traffic through dedicated lanes and closing cash lanes, FULL AET: tear down barrier plaza and install AET Gantry, OR combinations of the two options listed above). CONSULTANT shall investigate implementation by plaza, project, corridor or system wide. For DEPARTMENT owned facilities the CONSULTANT shall coordinate AET studies and designs with FTE and District staff.

Express Lanes Work:
CONSULTANT shall develop express lanes corridor implementations including but not limited to toll sites, ITS integration and operation, electric power and communications systems, pavement striping, signing, milling and resurfacing and express lane markers. CONSULTANT shall prepare geometric design and provide pavement design for ingress/egress slip ramps. The CONSULTANT shall analyze and document Intelligent Transportation Systems (ITS) for operations and/or improvements. ITS work includes the application of sensor, computer, electronics and communication technologies and management strategies, ITS includes, but not limited to, express lanes sign panels including the entrance one-line Dynamic Message Signs (DMS), Toll Amount Dynamic Message Signs (ADMS) and verification cameras, CCTV cameras, and supplemental Vehicle Detection System (VDS). CONSULTANT shall also provide analysis of sign structures exclusive to express lanes signs, stripping, milling and resurfacing, and express lanes markers. CONSULTANT shall analyze and design locations for speed enforcement, accident investigation sites and other unique traffic operational needs related to express lanes. The CONSULTANT shall analyze existing design criteria and identify gaps in Turnpike or DEPARTMENT criteria and assist in developing design criteria narrative or drawings as needed and directed by the DEPARTMENT.

As part of the analysis, the CONSULTANT shall develop cost estimates and schedule of activities for scopes of work at each location. CONSULTANT may be required to support PIO for inquiries from local stakeholders. CONSULTANT may be requested to complete final design plans for the approved AET or Express Lanes implementation locations.

CONSULTANT will NOT be responsible for revenue analysis for any of the AET conversions. CONSULTANT will not be responsible for developing the traffic volumes and numbers at each location. Both of these sets of information will be provided by the Turnpike. The DEPARTMENT will determine a design criteria and will approve all Variations and Exceptions. The DEPARTMENT will issue individual task work orders for the assignments

and will prioritize the areas to study.

The Scope of Services establishes which items of work described 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.

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

The CONSULTANT shall demonstrate good project management practices while working under this Agreement. 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 an assignment/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. It shall be the CONSULTANT's responsibility to utilize the very best architectural and engineering judgment, practices, and principles possible during the prosecution of the work commissioned under this Agreement.

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, if assigned. 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 under an assigned Task Work Order(s).

The DEPARTMENT has acquired the services of Atkins North America, Inc. and HNTB Corporation, P.O. Box 613069, Ocoee FL, 34761, to act in their behalf as General Consultants.

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

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

The CONSULTANT's services shall include, but are not limited to, the services described in the following sections:

Public Involvement: *To be determined for each project assigned under a Task Work Order*.

Other Agency Presentations/Meetings: *To be determined for each project assigned under a Task Work Order*.

Joint Project Agreements: *To be determined for each project assigned under a Task Work Order*.

Specifications Package Preparation: *To be determined for each project assigned under a Task Work Order*.

Value Engineering: *To be determined for each project assigned under a Task Work Order*.
Risk Assessment Workshop: *To be determined for each project assigned under a Task Work Order*.

Plan Type: *To be determined for each project assigned under a Task Work Order and produced with the indicated criteria specified within the Turnpike Design Handbook (TDH). All other plan sheets shall be prepared in accordance with the FDOT Design Manual (FDM).*
Typical Section*: To be determined for each project assigned under a Task Work Order*. *The CONSULTANT shall prepare and provide a Typical Section Design Package in accordance with the FDOT Design Manual (FDM) and Turnpike Design Handbook (TDH)*

Pavement Design*: To be determined for each project assigned under a Task Work Order*. *The CONSULTANT shall prepare and provide a Pavement Design in accordance with the current FDOT Flexible Pavement Design Manual and TDH.*

Pavement Type Selection Report(s): *To be determined for each project assigned under a Task Work Order*. *If applicable, Exception Memorandum to be developed and processed by the DEPARTMENT.*

Cross Slope: *To be determined for each project assigned under a Task Work Order*.

Access Management Classification: *To be determined for each project assigned under a Task Work Order*.

Transit Route Features: *To be determined for each project assigned under a Task Work Order*.

Major Intersections/Interchanges: *To be determined for each project assigned under a Task Work Order*.
Roadway Alternative Analysis: *To be determined for each project assigned under a Task Work Order*.
Level of Traffic Control Plans (TCP): *To be determined for each project assigned under a Task Work Order*. *When applicable, the CONSULTANT shall develop appropriate TCP plans as identified in Task Work Order.*

Temporary Lighting: *To be determined for each project assigned under a Task Work Order*.

Temporary Signals: *To be determined for each project assigned under a Task Work Order*.

Temporary Drainage: *To be determined for each project assigned under a Task Work Order*.

Design Variations/Exceptions/Technical Memorandums: *To be determined for each project assigned under a Task Work Order*. *When identified in a Task Work Order, the CONSULTANT shall prepare design Variations/Exceptions/Technical Memorandums in accordance with the FDM and the TDH.*

Back of Sidewalk Profiles: *To be determined for each project assigned under a Task Work Order*.

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 a Task Work Order, 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 subconsultants.

Notification of Work form is available at the following internet website:
http://www.floridasturnpike.com/content/Permits/Forms/FTE%20Notification%20of%20Work%20Form.pdf
Any lane closures on FTE's systems shall be in accordance with the FTE's Lane

Closure Policy; a copy of said policy is contained within the TDH, Chapter 240.

2.2 Drainage (Activity 6)

The CONSULTANT shall provide the required analysis, drainage design and stormwater management services and complete all the associated tasks necessary to prepare the assigned task, construction plans and/or documents including permit applications for all work within the limits of an assigned project(s).

If identified in Task Work Order, 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.

2.3 Utilities Coordination (Activity 7)

The CONSULTANT is responsible to certify that all necessary arrangements for utility work on an *assigned 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 and *Florida's Turnpike Enterprise's* standards, policies, procedures, practices, and design criteria are followed concerning utility coordination. *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.*

The CONSULTANT may employ more than one (1) individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. This person shall be contractually referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the *Florida's Turnpike Enterprise's Utilities Administrator* that they have the following knowledge, skills, and expertise:

- A minimum of four (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 the *Florida's Turnpike Enterprise's* utility coordination process.

- A thorough knowledge of FDOT's 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 *CONSULTANT* in identifying all existing utilities and coordinating any new installations. Assisting the *CONSULTANT* 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 an *assigned* Project.

- Review and certify to the *Florida's Turnpike Enterprise's 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 the DEPARTMENT's Project Manager. Any proposed change of the approved Utility Coordination Manager shall be subject to review and approval by DEPARMENT's Project Manager prior to any change being made in this contract.

The CONSULTANT will perform all of the coordination functions with each utility shown on the roadway plans for an assigned project(s). 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 one (1) computer disk (or hard copy if preferred by utility company) of the Phase III plans for each utility depicted on the plans. The computer disk shall be as described above.

2.4 Environmental Permits, Compliances, and Clearances (Activity 8)

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 electronic copies of the draft permit packages to the Florida's Turnpike Enterprise's Permits Coordinator and one (1) copy to the Florida's Turnpike Enterprise's Project Manager at the 45% Drainage submittal, or as directed by the Florida's Turnpike Enterprise's Project Manager. Electronic copies of the final permit packages shall be completed and delivered to the Florida's Turnpike Enterprise's Permits Coordinator prior to Plans Submittal indicated in Task Work Order.

The CONSULTANT will pay for all regulatory permit application fees required for an assigned project(s) 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 an assigned project(s). Mitigation, if required, will be in accordance with Chapter 373.4137 Florida Statutes, unless another mitigation option is chosen during the permitting process.

The DEPARTMENT will provide compensatory wetland mitigation in accordance with Section 373.4137 Florida Statutes (F.S.).

2.5 Structures (Activities 9 – 18)

The design work for structures will be determined for each project assigned under a Task Work Order. The required work may, or may not include the following items:

Bridge(s): *As identified in each project assigned under a Task Work Order.*

Type of Bridge Structure Work: *As identified in each project assigned under a Task Work Order*.

- Bridge Development Report (BDR)
- Temporary Bridge
- Short Span Concrete
- Medium Span Concrete
- Structural Steel
- Segmental Concrete
- Movable Span

Retaining Walls: *As identified in each project assigned under a Task Work Order*.
Noise Barrier Walls: *As identified in each project assigned under a Task Work Order*.
Miscellaneous: *As identified in each project assigned under a Task Work Order*.

2.6 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 the construction plans and/or documents for all signing and pavement marking work within the limits of a Project assigned under a Task Work Order.

The CONSULTANT's services shall include, but are not limited to, preparing notes, tabulation of quantities, plan sheets, details, guidesign worksheets, cross sections, sign structure designs and report of core borings in accordance with FDM Chapter 230, Signing and Pavement Marking Plans and the TDH.

2.7 Signalization (Activities 21 & 22)

The CONSULTANT shall provide the required signalization design and complete all the associated tasks necessary to prepare the construction plans and/or documents for all signalization work within the limits of a Project assigned under a Task Work Order.

Intersections: *As identified in each project assigned under a Task Work Order*.
Traffic Data Collection: *As identified in each project assigned under a Task Work Order*.
Traffic Studies: *As identified in each project assigned under a Task Work Order*.
Count Stations: *As identified in each project assigned under a Task Work Order*.
Traffic Monitoring Sites: *As identified in each project assigned under a Task Work Order*.

2.8 Lighting (Activities 23 & 24)

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 limits of a project assigned under a Task Work Order.

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.

2.9 Landscape Architecture (Activities 25 & 26)

Includes inventory and analysis of existing conditions in preparation for the development of Vegetation Disposition Plans, Landscape Opportunity Plans, Conceptual Landscape Plans, Construction Documents and Landscape Maintenance Plans. Also includes coordination of Outdoor Advertising Media (ODA) and existing and/or proposed utilities. Utilities include but are not limited to FDOT lighting, drainage and ITS. The CONSULTANT will closely coordinate Landscape Improvements with the other disciplines to ensure that aesthetics are addressed and all conflicts are identified, addressed and mitigated in the Contract Documents.
Planting Plans: *As identified in each project assigned under a Task Work Order*.
Irrigation Plans: *As identified in each project assigned under a Task Work Order*.
Hardscape Plans: *As identified in each project assigned under a Task Work Order*.
Outdoor Advertising: *As identified in each project assigned under a Task Work Order*.

2.10 Survey (Activity 27)

The CONSULTANT shall provide a complete design field survey to include topography, cross-sections, drainage and outfalls, utility location, Right-of-Way (R/W), and other surveys including field investigations.

Design Survey: *As identified in each project assigned under a Task Work Order*.

Subsurface Utility: *As identified in each project assigned under a Task Work Order*.

R/W Survey: *As identified in each project assigned under a Task Work Order*.

2.11 Photogrammetry (Activity 28)

As identified in each project assigned under a Task Work Order.

2.12 Mapping (Activity 29)

The CONSULTANT shall submit Key Maps, Detail Sheets and Legal Descriptions to the DEPARTMENT for review at various stages of completion as specified by the DEPARTMENT. The CONSULTANT shall prepare all the required information in a

format that allows fee appraisers to complete their assigned tasks according to the DEPARTMENT's Procedure 550-030-015, page 10, item a-26.

R/W key maps may be prepared on aerial photography.

R/W detail maps shall be line drawings prepared to DEPARTMENT size and format.

Control Survey Map: *As identified in each project assigned under a Task Work Order*.

R/W Map: *As identified in each project assigned under a Task Work Order*.

Legal Descriptions: *As identified in each project assigned under a Task Work Order*.

Maintenance Map: *As identified in each project assigned under a Task Work Order*.

Miscellaneous Items: *As identified in each project assigned under a Task Work Order*.

2.13 Terrestrial Mobile LiDAR (Activity 30)

As identified in each project assigned under a Task Work Order.

2.14 Architecture (Activity 31 and 31T)

As identified in each project assigned under a Task Work Order.

LEED (Leadership in Energy and Environmental Design)

The intent of the *US GREEN BUILDING COUNCIL (USGBC)* LEED 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 LEED includes are 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 (*2*) types of tasks required by LEED 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.

The State has set "Certified" as the minimum target level of certification for buildings, though several DEPARTMENT projects have strived for a LEED Green Building Rating of "Silver".

Hours include the efforts to design and receive certification for buildings. These hours include all disciplines involved in the effort.

The CONSULTANT shall coordinate with the DEPARTMENT's Architecture / LEED staff for additional requirements and associated tasks necessary for each project assigned under a Task Work Order.

Toll Equipment Buildings will be developed utilizing the Florida Turnpike Enterprise General Tolling Requirements (GTR) publication.

2.15 Noise Barriers (Activity 32)

As identified in each project assigned under a Task Work Order.

2.16 Intelligent Transportation Systems (Activities 33 & 34)

As identified in each project assigned under a Task Work Order.

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 *any* projects *involving Federal funds* with ITS activities, the CONSULTANT shall follow the Rule 940 requirements and use a Systems Engineering approach for the determining the requirements for the project. *For same projects*, 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.

The CONSULTANT shall be prepared to provide field and network design and analysis including communications, redundant fiber networks, detailed power analysis of existing and proposed systems, as well as support the DEPARTMENT in the evaluation of system and server arrangements as requested.

For all projects with express lanes (EL) or projects involving new roadways with ITS components, the CONSULTANT shall develop a project-level Concept of Operations (ConOps) to identify how the proposed express lanes systems and new ITS will be integrated with the existing ITS system.

The hardware configuration analysis and design including system architecture, interfaces, communications, equipment, devices and computers, shall be provided for each assigned Project. Any relevant prior reports done such as concept reports, etc., will be provided by the DEPARTMENT to the CONSULTANT as identified in each Task Work Order.

The ITS shall operate from the Traffic Management Centers (TMC) located in *Turnpike 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, *using the appropriate software package to be identified within each assigned project under a Task Work Order*.

Interchanges: *As identified in each project assigned under a Task Work Order*.

Traffic Data Collection: *As identified in each project assigned under a Task Work Order.*

Geographical Information System (GIS) Requirements: the CONSULTANT shall include in the design the GIS data collection requirements and deliverables for integration with SunGuide software and other DEPARTMENT's GIS based asset management applications like ITS *Facility Maintenance (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 R/W. This includes cabinets, poles, and support hardware. Utility conflicts shall be identified and resolved during the design phase. The design shall minimize theft and vandalism. The CONSULTANT shall include in the design vandal resistant mechanisms to minimize theft. The CONSULTANT shall provide additional redundant power and communications systems to minimize system downtime due to vandalism.

The CONSULTANT shall design the project subsystems such that they will be monitored and controlled from the *FTE's* TMC facilities *located at the previously mentioned locations*. The CONSULTANT shall ensure that all ITS field devices and ancillary components comply with the FDOT's Approved Product List (APL) / *Qualified Product List (QPL)* and the existing list of devices and components supported within the SunGuide software or other 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 DEPARTMENT's 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, National Electric Code (NEC) requirements or as directed by the *DEPARTMENT's* Project Manager and to make the subsystems fully operational from the TMC facilities.

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

2.17 Geotechnical (Activity 35)

As identified in each project assigned under a Task Work Order.

The CONSULTANT will provide subsurface investigation and prepare geotechnical reports providing recommendations to support the design of proposed pavement. Provide recommendations addressing vibration induced by demolition work and construction activities.

2.18 Project Schedule

Within ten (10) days after the Notice-To-Proceed on *a Task Work Order*, 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's Production Date *for a project assigned under a Task Work Order.* The production date is *per Task Work Order*. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a *four (4)* 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)*
Plans Review (Including independent submittals; i.e. Typical Section Package, Pavement design, Lane Closure Analysis / 45% Traffic Control Plan (TCP), 45% Drainage, and Design Variations/Exceptions/Technical Memorandums)	*4*
CTL Sheets Review	*1*
Phase I, II, III, IV	*2*
Final	*2*
Prepare/Execute Utility Agreements Activity	*16*

All fees and price proposals are to be based on the negotiated schedule of months *identified in a Task Work Order*.

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 *on an assigned Task Work Order*.

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.

2.19 Submittals

The CONSULTANT shall furnish construction contract documents as required by the DEPARTMENT to adequately control, coordinate, and approve the work concepts. *Document Submittals are defined as design documentation, Plan submittals, Engineering Document submittals, Right of Way Map submittals, etc.*

Each CONSULTANT document submittal shall be accompanied by a completed Quality Control Checklist form indicating the document submittal items that have been checked and back-checked, and shall be signed by the CONSULTANT''s Project Manager, Quality Control Checker, and the Quality Control Back-checker. Each subconsultant document submittal shall be checked by a Quality Control Independent Peer Review by the CONSULTANT. The CONSULTANT's Project Manager and the responsible Professional Engineer or Professional Surveyor that performed the Quality Control Peer Review will sign a statement certifying that the review was conducted.

The CONSULTANT shall submit all deliverables to the DEPARTMENT electronically in Portable Document Format (PDF), unless notified by the DEPARTMENT's Project Manager. Design files shall be submitted as identified in a Task Work Order. 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 review with the design Concept Plans and/all plan or roll plot submittals to the DEPARTMENT, and/or as described under a Task Work Order. The file will have both existing and proposed information for each discipline and shall follow FTE's KMZ Standards available on Design website.

2.20 Provisions for Work

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

- General
  - Title 29, Part 1910, Standard 1910.1001, Code of Federal Regulations (29

C.F.R. 1910.1001) – Asbestos Standard for Industry, U.S. Occupational Safety and Health Administration (OSHA)

- 29 C.F.R. 1926.1101 – Asbestos Standard for Construction, OSHA
- 40 C.F.R. 61, Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP), Environmental Protection Agency (EPA)
- 40 C.F.R. 763, Subpart E – Asbestos-Containing Materials in Schools, EPA
- 40 C.F.R. 763, Subpart G – Asbestos Worker Protection, EPA
- American Disability Act (ADA) Standards for Accessible Design
- AASHTO – A Policy for Geometric Design of Highways and Streets
- AASHTO – Highway Safety Manual
- AASHTO's A Policy on Design Standards Interstate System
- AASHTO's Roadside Design Guide
- AASHTO's Roadway Lighting Design Guide
- Rule Chapter 5J-17, Florida Administrative Code (F.A.C.), Standards of Practice for Professional Surveyors and Mappers
- Chapter 469, Florida Statutes (F.S.) – Asbestos Abatement
- Rule Chapter 62-257, F.A.C., Asbestos Program
- Rule Chapter 62-302, F.A.C., Surface Water Quality Standards
- Code of Federal Regulations (C.F.R.)
- Florida Administrative Codes (F.A.C.)
- Chapters 20, 120, 215, 455, Florida Statutes (F.S.) – Florida Department of Business & Professional Regulations Rules
- Florida Department of Environmental Protection Rules
- FDOT Basis of Estimates Manual
- FDOT Computer Aided Design and Drafting (CADD) Manual
- FDOT Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System
- FDOT Flexible Pavement Design Manual
- FDOT Florida Roundabout Guide
- FDOT Handbook for Preparation of Specifications Package
- FDOT Instructions for Design Standards
- FDOT Instructions for Structures Related Design Standards
- FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways ("Florida Greenbook")
- FDOT Materials Manual
- FDOT Pavement Type Selection Manual
- FDOT FDOT Design Manual
- FDOT Procedures and Policies
- FDOT Project Development and Environmental Manual
- FDOT Project Traffic Forecasting Handbook
- FDOT Public Involvement Handbook
- FDOT Rigid Pavement Design Manual
- FDOT Standard Specifications for Road and Bridge Construction
- FDOT Utility Accommodation Manual
- *FDOT – Statewide Express Lanes Handbook*
- *FDOT – Practical Design Handbook*

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

▪ Roadway

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

▪ Permits

- Chapter 373, F.S. – Water Resources
- US Fish and Wildlife Service Endangered Species Programs
- Florida Fish and Wildlife Conservation Commission Protected Wildlife Permits
- Bridge Permit Application Guide, COMDTPUB P16591.3C
- Building Permit
- *Site Plan, Land Development, Zoning*
- *Water and Sewer Municipal Permits*
- *FDEP Water and/or Wastewater Permits*

▪ Drainage

- FDOT Bridge Hydraulics Handbook
- FDOT Culvert Handbook
- FDOT Drainage Manual
- FDOT Erosion and Sediment Control Manual
- FDOT Exfiltration Handbook
- FDOT Hydrology Handbook
- FDOT Open Channel Handbook
- FDOT Optional Pipe Materials Handbook
- FDOT Storm Drain Handbook
- FDOT Stormwater Management Facility Handbook
- FDOT Temporary Drainage Handbook

- FDOT Drainage Connection Permit Handbook
- FDOT Bridge Scour Manual

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

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

- Florida's Turnpike Enterprise
  - Florida's Turnpike Design Handbook (TDH)
  - Florida's Turnpike Lane Closure Policy
  - Florida's Turnpike Drainage Manual Supplement
  - *Florida's Turnpike Enterprise's General Tolling Requirements (GTR)*
  - *Additional Florida's Turnpike Enterprise standards, guides, and policies for design and construction can be found on the FTE Design Website: http://design.floridasturnpike.com*

- Traffic Monitoring
  - American Institute of Steel Construction (AISC) Manual of Steel Construction, referred to as "AISC Specifications"
  - American National Standards Institute (ANSI) RP-8-00 Recommended Practice for Roadway Lighting
  - AASHTO AWS D1.1/ANSI Structural Welding Code – Steel
  - AASHTO D1.5/AWS D1.5 Bridge Welding Code
  - FHWA Traffic Detector Handbook
  - FDOT General Interest Roadway Data Procedure
  - FHWA Traffic Monitoring Guide
  - FDOT's Traffic/Polling Equipment Procedures

- Structures

- AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims
- AASHTO LRFD Movable Highway Bridge Design Specifications and Interims
- *AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interims*
- AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code
- AASHTO Guide Specifications for Structural Design of Sound Barriers
- AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges
- FDOT Bridge Load Rating Manual
- FDOT Structures Manual
- FDOT Structures Design Bulletins (available on FDOT Structures website only)

- Geotechnical
  - FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications
  - Manual of Florida Sampling and Testing Methods
  - Soils and Foundation Handbook
- Landscape Architecture
  - *Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants, latest edition.*
  - *FDOT Beautification Policy.*
  - *Florida Highway Landscape Guide*
  - *Florida's Turnpike Landscape Brand Guidelines*
- Architectural
  - Building Codes
  - Florida Building Code:
    - Building
    - Fuel Gas
    - Mechanical
    - Plumbing
    - Existing Building
  - Florida Accessibility Code for Building Construction
  - Rule Chapter 60D, F.A.C., Division of Building Construction
  - Chapter 553, F.S. – Building Construction Standards
  - ANSI A117.1 2003 Accessible and Usable Building and Facilities
  - Titles II and III, Americans With Disabilities Act (ADA), Public Law 101-336; and the ADA Accessibility Guidelines (ADAAG)
- Architectural – Fire Codes and Rules
  - National Fire Protection Association (NFPA) - Life Safety Code

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

- Architectural – Extinguishing Systems
  - NFPA 10 - Fire Extinguishers
  - NFPA 13 - Sprinkler
  - NFPA 14 - Standpipe and Hose System
  - NFPA 17 - Dry Chemical
  - NFPA 20 - Centrifugal Fire Pump
  - NFPA 24 - Private Fire Service Mains
  - NFPA 200 - Standard on Clean Agent Fire Extinguishing Systems
- Architectural – Detection and Fire Alarm Systems
  - NFPA 70 - Electrical Code
  - NFPA 72 - Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems
  - NFPA 72E - Automatic Fire Detectors
  - NFPA 72G - Installation, Maintenance, and Use of Notification Appliances
  - NFPA 72H -Testing Procedures for Remote Station and Proprietary Systems
  - NFPA 74 - Household Fire Warning Equipment
  - NFPA 75 - Protection of Electronic Computer Equipment
- Architectural – Mechanical Systems
  - NFPA 90A - Air Conditioning and Ventilating Systems
  - NFPA 92A - Smoke Control Systems
  - NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
  - NFPA 204M - Smoke and Heating Venting
- Architectural – Miscellaneous Systems
  - NFPA 45 - Laboratories Using Chemicals
  - NFPA 80 - Fire Doors and Windows
  - NFPA 88A - Parking Structures
  - NFPA 105- Smoke and Draft-control Door Assemblies
  - NFPA 110 - Emergency and Standby Power Systems
  - NFPA 220 - Types of Building Construction

- NFPA 241 - Safeguard Construction, Alteration, and Operations
- Rule Chapter 69A-47, F.A.C., Uniform Fire Safety For Elevators
- Rule Chapter 69A-51, F.A.C., Boiler Safety

▪ Architectural – Energy Conservation

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

▪ Architectural – Elevators

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

▪ Architectural – Other

- Rule Chapter 64E-6, F.A.C., Standards for On Site Sewage Disposal Systems (Septic Tanks)
- Rule Chapter 62-600, F.A.C., Domestic Wastewater Facilities
- Rule Chapter 62-761, F.A.C., Underground Storage Tank Systems
- American Concrete Institute
- American Institute of Architects - Architect's Handbook of Professional Practice
- American Society for Testing and Materials - ASTM Standards
- Brick Institute of America
- DMS - Standards for Design of State Facilities
- Florida Concrete Products Association
- FDOT –ADA/Accessibility Procedure
- FDOT – Building Code Compliance Procedure
- FDOT – Design Build Procurement and Administration
- LEED (Leadership in Energy and Environmental Design) Green Building Rating System
- National Concrete Masonry Association
- National Electrical Code
- Portland Cement Association - Concrete Masonry Handbook
- United State Green Building Council (USGBC)

The codes, standards and guidelines indicated in the Architecture sections above must utilize the latest adopted editions of each specific code, standard and/or guideline referenced.

2.21 Services to be performed by the DEPARTMENT when appropriate and /or available, the DEPARTMENT will provide project data including:

▪ *Additional items as identified in a Task Work Order*
▪ *Submit environmental permit applications*

- Numbers for field books; *(Note: if applicable, field books provided by the CONSULTANT shall be of a type approved by the FTE's Surveyor)*
- Access for the CONSULTANT to utilize the DEPARTMENT's Information Technology Resources
- All DEPARTMENT agreements with Utility Agency Owner (UAO).
- All certifications necessary for project letting.
- Building Construction Permit Coordination (Florida's Turnpike Enterprise)
- All information that may come to the DEPARTMENT pertaining to future improvements.
- All future information that may come to the DEPARTMENT during the term of the CONSULTANT's Agreement, which in the opinion of the DEPARTMENT is necessary for the prosecution of the work.
- Available traffic and planning data.
- All approved utility relocations.
- Project utility certification to the DEPARTMENT's Central Office.
- Any necessary title searches.
- Engineering standards review services.
- All available information in the possession of the DEPARTMENT pertaining to utility companies whose facilities may be affected by the proposed construction.
- All future information that may come to the DEPARTMENT pertaining to subdivision plans so that the CONSULTANT may take advantage of additional areas that can be utilized as part of the existing R/W.
- Systems traffic for Projected Design Year, with K, D, and T factors.
- Existing R/W maps.
- Existing cross slope data for all Resurfacing, Restoration and Rehabilitation (RRR) projects.
- PD&E Documents
- Design Reports
- Existing pavement evaluation report for all RRR projects. *When available, Florida's Turnpike Enterprise's Roadway Engineer will provide the pavement coring and evaluation, along with the pavement composition report of the existing pavement, to the CONSULTANT. Any additional coring needs beyond those provided shall be requested through the Florida's Turnpike Enterprise's Roadway Engineer.*
- Letters of authorization designating the CONSULTANT as an agent of the DEPARTMENT in accordance with F.S. 337.274.
- Phase reviews of plans and engineering documents.
- Regarding Environmental Permitting Services:
  - Approved Permit Document when available.
  - Approval of all contacts with environmental agencies.
  - General philosophies and guidelines of the DEPARTMENT to be used in the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the DEPARTMENT's Project Manager.
  - Appropriate signatures on application forms.

3 PROJECT COMMON AND PROJECT GENERAL TASKS

Project Common Tasks

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, Activity 4 Roadway Analysis through Activity 35 Geotechnical. These tasks are to be included in the *assigned Project scope under a Task Work Order* when the described work is to be performed by the CONSULTANT.

Cost Estimates: The CONSULTANT shall be responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of an *assigned* Project. Prior to 60% plans and 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's policy*. Once the quantities have been developed (beginning at 60% plans and no later than 90% plans) the CONSULTANT shall be responsible for *providing* the pay items and quantities *for the DEPARTMENT to input* into TRNS*PORT PES (Proposal Estimating System) through the use of the DEPARTMENT's Designer Interface. A Summary of Pay Items sheet(s) shall be prepared with all required Phase Plans submittals, *as identified in a Task Work Order*.

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

A Technical Special Provision shall not modify the first nine (9) sections of the Standard Specifications and implemented modifications in any way. All modifications to other sections must be justified to the *Florida's Turnpike Enterprise's* Specifications Office to be included in the Project's specifications package.

The Technical Special Provisions shall be technical in nature and 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 *Florida's Turnpike Enterprise's* 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 *Florida's Turnpike Enterprise's* Specifications Office will forward the Technical Special Provisions to the *Florida's Turnpike Enterprise's* 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 electronically signed and sealed in accordance with applicable Florida Statutes.

The CONSULTANT shall contact the *Florida's Turnpike Enterprise's* Specifications Office for details of the current format to be used before starting preparations of Technical Special Provisions.

Field Reviews: The CONSULTANT shall make as many trips to the project site as required to obtain necessary data for all elements of the project*(s) assigned under a Task Work*

Order.

Technical Meetings: The CONSULTANT shall attend all technical meetings necessary to execute the Scope of Services of this *Agreement*. 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 will be responsible for; developing agenda and sign-in sheets, preparation and submittal of the meeting minutes, for all meetings attended, to the DEPARTMENT's Project Manager for review*. The meeting minutes are due within five (5) 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. *Detailed checking of the CONSULTANT plans or assisting in designing portions of the project for the CONSULTANT, is not the intent of having external design consultants.* The purpose of CONSULTANT plan reviews is to ensure that consultant plans follow the plan preparation procedures outlined in the *FDM and TDH*, that state, federal, and system design criteria are followed with the DEPARTMENT's concept, and that the CONSULTANT's submittals are complete. All subconsultant document submittals shall be submitted by the subconsultant directly to the CONSULTANT for their independent Quality Assurance/Quality Control (QA/QC) review and subsequent submittal to the DEPARTMENT.

It is the CONSULTANT's responsibility to independently and continually *QA*/QC their plans and other deliverables. The CONSULTANT should regularly communicate with the DEPARTMENT's 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 *Agreement*.

The CONSULTANT shall provide a Quality Control Plan (QCP) 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 *Agreement*. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The QCP shall be one specifically designed for *an assigned Project, or it may be one utilized by the CONSULTANT as part of their normal operation.* The CONSULTANT shall submit a QCP 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 QCP shall include the names of the CONSULTANT's staff that will perform the quality control reviews. The Quality Control reviewer shall be a Florida Licensed Professional Engineer fully prequalified under F.A.C. 14-75 in the work type being reviewed. A marked up set of prints from a Quality Control Review indicating the reviewers for each component (structures, roadway, drainage, signals, geotechnical, signing and marking, lighting, surveys,

etc.) and a written resolution of comments on a point-by-point basis will be required, if requested by the DEPARTMENT, with each phase submittal. The responsible Professional Engineer, Landscape Architect, or Professional Surveyor and Mapper that performed the Quality Control review will sign a statement certifying that the review was conducted and found to meet required specifications.

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

The TDH contains a QA/QC method and sample QA/QC plan. The CONSULTANT shall use this method or any other method that provides the same or better level of QA/QC.

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

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 may be required under this *Agreement*. 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 Construction Engineering Inspection firm (CEI). It does not include persons who have knowledge of the day-to-day design efforts. The Constructability/Bidability Review shall be performed by a person with experience working on DEPARTMENT construction projects (CEI, Contractor, etc.).

The Independent Peer Review for design Phase Plans submittals shall ensure the plans meet the FDM, Design Standards and Computer Aided Design and Drafting (CADD) Manual. The Constructability/Bidability Review shall ensure the *assigned project(s)* 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 Checklists (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 *Florida's Turnpike Enterprise's* Design and Construction Offices.

Supervision: The CONSULTANT shall supervise all technical design activities.

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

Project General Tasks

Project General Tasks, described in Sections 3.1 through 3.7 below, represent work efforts that are applicable to an *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 identified for an *assigned under a Task Work Order* scope.

3.1 Public Involvement

Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of an *assigned* Project. The CONSULTANT shall provide to the DEPARTMENT drafts of all Public Involvement documents (i.e., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least 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 30 calendar days after receiving Notice to Proceed *on a Task Work Order*. 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 an *assigned* Project. The CAP will also document all public involvement activities conducted throughout an *assigned* 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 an *assigned* Project.

3.1.2 Notifications

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

3.1.3 Preparing Mailing Lists

At the beginning of an *assigned* Project, the CONSULTANT shall identify all impacted property owners and tenants (within a minimum of 300 feet of the project corridor). The CONSULTANT shall prepare a mailing list of all such entities and shall update the mailing list as needed throughout the life of *an assigned* 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 shall be sent on DEPARTMENT letterhead *and mailing of letters will be in*

accordance with direction received by the DEPARTMENT's Project Manager.

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 *and mailing of letters will be in accordance with direction received by the DEPARTMENT's Project Manager*.

3.1.6 Newsletters

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

3.1.7 Renderings and Fly-Throughs

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

3.1.8 PowerPoint Presentations

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

3.1.9 Public Meeting Preparations

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

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

3.1.10 Public Meeting Attendance and Follow-up

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

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

The CONSULTANT will investigate potential meeting sites to advise the DEPARTMENT on their suitability. The DEPARTMENT will pay all costs for meeting site rents and insurance.

The CONSULTANT will coordinate with the DEPARTMENT on any responses to written questions from the public. The CONSULTANT may be required to draft responses to comments/questions for DEPARTMENT review and official response.

During the term of this contract, attendance at any Public Meeting by the CONSULTANT will be determined by the DEPARTMENT's Project Manager and identified in a Task Work Order.

3.1.11 Other Agency Meetings

In addition to scheduled public meetings, the CONSULTANT may be required to participate in meetings with the local governing authorities and/or Metropolitan Planning Organization(s) (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.

During the term of this contract, attendance at any meeting with local governing authorities and/or MPO(s) by the CONSULTANT will be determined by the DEPARTMENT's Project Manager and identified in a Task Work Order.

3.1.12 Web Site

The CONSULTANT shall create and/or maintain a web site for *an assigned* project *as identified in a Task Work Order*.

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 electronic delivery package.

3.3 Specifications Package Preparation

The CONSULTANT shall prepare and provide a specifications package prepared in accordance with the DEPARTMENT's Handbook for the Preparation of Specification Packages and associated training. The CONSULTANT shall provide the DEPARTMENT names of at least two (2) team members who have successfully completed the Specifications Package Preparation Training and will be responsible for preparing the Specifications Package for the Project. The Specifications Package shall be prepared using the DEPARTMENT's Specs on the Web application. The CONSULTANT shall be able to document that the procedure defined in the Handbook for the Preparation of Specifications Packages is followed, which includes the quality assurance/quality control procedures. The specifications package shall address all items and areas of work and include any Mandatory Specifications, Modified Special Provisions, and Technical Special Provisions.

The draft specifications package shall be submitted for review as part of the Phase IV Submittal. This submittal does not require signing and sealing and shall be coordinated through the DEPARTMENT's Project Manager. The submittal shall

consist of; (1) the complete specifications package, (2) a copy of the marked-up workbook used to prepare the package, (3) a copy of the final project plans, and (4) a copy of the Initial and Final reviewers marked-up workbook(s) as outlined in the DEPARTMENT's Handbook for the Preparation of Specification Packages.

The signed and sealed specification package shall be submitted as part of the Digital Delivery.

3.4 Contract Maintenance and Electronic Document Management System (EDMS)

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

3.5 Value Engineering (VE) (Multi-Discipline Team) Review

As identified in a Task Work Order.

The VE review will be conducted by a multi-disciplined independent team of DEPARTMENT and CONSULTANT personnel for the purpose of the 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.

If required for a project assigned under a Task Work Order, The design for this Project will be subjected to a Value Engineering (VE) review. The VE review will be conducted by a multi-disciplined independent team of DEPARTMENT and CONSULTANT personnel for the purpose of the improving the value of the project.

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's Project Manager and Value Engineering Coordinator. This opportune time during the design phase of an *assigned* 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 *an assigned* 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's 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 (1) copy of all environmental documents
- One (1) copy of the Preliminary Engineering Report
- Three (3) copies of all plan drawings
- One (1) copy of the Drainage Alternatives Report
- One (1) copy of Bridge Development Reports
- One (1) copy of Pavement Type Selection Report
- One (1) copy of Pavement Design Package
- One (1) 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 *Consultant* Project Manager Meetings

Includes only the 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. *The CONSULTANT will be responsible for; developing agenda and sign-in sheets, preparation and submittal of the meeting minutes, for all meetings attended, to the DEPARTMENT's Project Manager for review*.

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 *for an assigned project under a Task Work Order*.

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. Post Design Services will be authorized and negotiated as necessary *through the issuance of a Task Work Order*.

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

3.9 Digital Delivery

The DEPARTMENT's Digital Delivery procedure will be used to sign and seal engineering documents, including, but not limited to plans, specifications, design reports, calculations, and design documentation.

3.10 Risk Assessment Workshop

Assigned project(s) may 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 a project assigned under a Task Work Order will be managed by the DEPARTMENT's Project Manager and supported by a multi-disciplined team (RA Team) of DEPARTMENT and CONSULTANT personnel and subject-matter experts (SMEs). The DEPARTMENT's Project Manager will be the lead for the RA Team.

Should there be a Risk Assessment (RA) Workshop and workshop related meetings during the design of *a project*, 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's Project Manager. The DEPARTMENT's Project Manager will develop a Risk Register following the Workshop, and utilize the Risk Register throughout the life of the *assigned* 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 a *required* Project. This will involve a Risk Preparatory Session (half-day to one (1) day plus information assessment), a Risk Assessment Workshop (one (1) to three (3) days), and Risk Follow-Up Meeting (half-day to one (1) day).

The CONSULTANT and other key members of the design team will attend and participate in associated follow-up RA meetings (approximately one (1) meeting every three (3) to six (6) 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.

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

- One (1) copy of all environmental documents
- One (1) copy of the Preliminary Engineering Report
- One (1) copy of all plan drawings (three (3) copies if a workshop is applicable)
- One (1) copy of the Drainage Alternatives Report
- One (1) copy of Bridge Development Reports
- One (1) copy of Pavement Type Selection Report
- One (1) copy of Pavement Design Package
- One (1) copy of other miscellaneous reports
- Project Schedule

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 R/W, Design, CEI, Utilities, Joint Participation Agreement (JPA)/Local Agency Program (LAP) funds, etc.

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

3.11 Railroad, Transit and/or Airport Coordination

As identified in each project assigned under a Task Work Order.

3.12 Other Project General Tasks

As identified in a Task Work Order:

3.12.1 The CONSULTANT shall provide engineering assistance in answering bid questions and/or clarifications, as requested by DEPARTMENT's Project Manager, during Construction Bid solicitation period, award and selection.

3.12.2 3D Design – refer to section 4.5.1 - 4.5.4.

3.12.3 Within the Design Report submittal(s), the CONSULTANT shall develop, manage, and provide a Design Decision Matrix documenting assigned project(s) decisions for all disciplines., The Matrix and Journal should be included as an Appendix within the Roadway Design Report, refer to 4.13.

4 ROADWAY ANALYSIS

As identified in a Task Work Order:

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

4.1 Typical Section Package

The CONSULTANT shall provide a preliminary Typical Section Package as early as possible prior to the Phase I plans submittal. Final signed and sealed Typical Section Package shall be approved prior to the Phase II plans submittal.

4.2 Pavement Type Selection Report

Pavement Type Selection Reports are required for every project one (1) mile or greater in length where work includes a modification to the base materials. The Pavement Type Selection decision will be reviewed by *Florida's Turnpike Enterprise's* 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, even if no report is performed, *to be performed by the DEPARTMENT*.

4.3 Pavement Design Package

The CONSULTANT shall provide a Pavement Design Package in accordance with applicable FDOT pavement design manuals as early as possible prior to the Phase I plans submittal. Final signed and sealed Pavement Design Package shall be approved prior to the Phase II plans submittal.

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 Turnpike Enterprise's Roadway Engineer regarding all work and requests, original and additional, associated with the pavement coring information used in the Pavement Design Report.

4.4 Cross-Slope Correction

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

4.5 Horizontal/Vertical Master Design Files

The CONSULTANT shall design the geometrics using the design standards that are most appropriate with proper consideration given to the design traffic volumes, design speed, capacity and levels of service, functional classification, adjacent land use, design consistency and driver expectancy, aesthetics, pedestrian and bicycle concerns, ADA requirements, elder road user policy, access management, PD&E documents and scope of work. The CONSULTANT shall also develop utility conflict information to be provided to project Utility Coordinator in the format requested by the DEPARTMENT, and shall review Utility Work Schedules.

The CONSULTANT shall submit preliminary (approximately 15%) alignment and grade sketches/computer plots depicting the proposed geometric design. The submittal shall include horizontal geometry for all mainline roadways, ramps, cross streets and side roads. As a minimum, vertical geometry shall be provided for all mainline roadways and cross streets. Vertical geometry for ramps and side roads will be provided where critical to the project. The sketches or computer plots can be in sheet or roll form and will be at a reasonable and useable scale.

Supporting calculations/computer printouts shall also be submitted. Specific elements which should be addressed in the supporting documentation include but are not limited to design speed, lane widths, shoulder widths, bridge widths, horizontal and vertical clearances, stopping sight distance, intersection sight distance, aesthetics, access management and base clearance.

The various elements should be developed to a level of detail consistent with the objectives of the preliminary (15%) submittal as described below. Continued development and refinement of the geometric elements for subsequent Phase submittals is anticipated.

The primary objectives of the Preliminary (15%) Geometric Submittal are to:

- *Check consistency with the intent and scope of the Project Concept Report.*
- *Evaluate the impacts of changes to the Project Concept, resulting from the normal design development process as well as those due to changes in scope, identification of adverse site conditions, etc.*
- *Verify the geometric viability of the project for the desired design speed(s) and traffic volumes.*
- *Provide a basis for early coordination with other disciplines (drainage, structures, etc.) and for early identification of design constraints or problems.*
- *Document off-site and pavement drainage constraints; such as flood plain elevations and seasonal high water table.*
- *Design Criteria specific to the project.*
- *Anticipated variations and exceptions that are associated with horizontal and vertical alignment.*

4.5.1 3D Surface Design Model Creation, Quality Control, and Delivery Files

The CONSULTANT shall prepare a 3D model using the latest FDOT SS4 software in accordance with the FDOT CADD Manual. Includes all efforts required for developing files for 3D deliverables supporting automated machine guidance for design models. This includes importing survey data and creation of existing 3D surface features and models, and developing proposed corridor models with necessary detail of features to depict the proposed project in 3D to comply with the DEPARTMENT CADD Manual.

4.5.2 Corridor and Refinement Surface Model Development for 3D Design Model

The CONSULTANT shall add detail to the corridor and design model for 3D design. Includes many elements that contribute to this including but not limited to slope

transitions, typical section transitions, changes in pavement depth, berms, swales/ditches, and other feature transitions. Extra corridor structure leads to extra assemblies, extra targeting, etc. Dynamic relationships must be maintained. Frequency must be increase to achieve a useable model.

4.5.3 Intersection Pavement and Curb Return Modeling (Lane profiles, curb profiles, and proper target assignments)

The CONSULTANT shall create an accurate roadway design model which includes modeling the intersections. Benefits may include, but are not limited to, better definition of intersection sight triangles, more accurate slope intercepts, improve drainage designs, etc.

4.5.4 Special 3D Surface Detail Required for Driveways, ADA Curb Ramps, Guardrail Terminal Locations, Etc.

The CONSULTANT shall provide sufficient detail in the 3D model to account for driveways, ADA Curb Ramps, Guardrail Terminal Locations, etc. and other graded areas where surface triangles are delivered as break lines.

4.6 Access Management

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

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

4.7 Roundabout Evaluation

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

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

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

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

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

4.8 Roundabout Final Design Analysis

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

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

4.9 Cross Section Design Files

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

4.10 Traffic Control Analysis

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

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

Final Traffic Control Plan efforts.

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

The CONSULTANT shall submit preliminary Traffic Control deliverables (approximately 45% including Lane Closure Analysis) in accordance with the requirements in the TDH. This submittal shall be made after Phase I review and prior to Phase II submittal dates and should include, at a minimum, the Lane Closure Analysis, allowable work days and hours, major construction activities. It shall also include concept MOT for all activities including, but not limited to, resurfacing sequence, construction phasing, cross slope correction, drop off protection, etc. The Traffic Control Plan shall be prepared by a certified designer who has completed training as required by the DEPARTMENT.

This submittal will be required, but not limited, to the following items:

1. Traffic Pacing
2. Traffic Detours, including lengths and impacts on toll revenue
3. Traffic Crossovers
4. Resurfacing Sequencing

The preliminary submittal should be on Roll Plots, in electronic format, and should include, but not limited to:

1. Documentation of off-site and pavement drainage constraints
2. Critical Cross Sections at temporary traffic shifts
3. Typical Sections for each proposed phase
4. Traffic Pacing and Detour analysis as appropriate for the project

4.11 Master TCP Design Files

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

4.12 Design Variations, Exceptions *and Technical Memorandums*

If available, the DEPARTMENT shall furnish the Variation/Exception/*Technical Memorandums* Report(s). The CONSULTANT shall prepare the documentation necessary to gain DEPARTMENT approval of all appropriate Design Variations, Design Exceptions, and/or *Technical Memorandums as identified, as early as possible for approval prior to the Phase II submittal.*

4.13 Design Report

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

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

The design notes, data, and computations shall be recorded on size 8½"x11" sheets, fully titled, numbered, dated, indexed and signed by the designer and the checker. Computer output forms and other oversized sheets *are allowed. The CONSULTANT shall submit all deliverables to the DEPARTMENT electronically in PDF file format, unless notified by the DEPARTMENT's Project Manager*.

4.14 Quantities

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

4.15 Cost Estimate

The CONSULTANT shall submit cost estimates at each phase submittal.

4.16 Technical Special Provisions

4.17 Other Roadway Analysis

4.18 Field Reviews

4.19 Monitor Existing Structures

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

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

4.20 Technical Meetings

4.21 Quality Assurance/Quality Control

4.22 Independent Peer Review

4.23 Supervision

4.24 Coordination

5 ROADWAY PLANS

*As identified in a Task Work Order**:***

The CONSULTANT shall prepare Roadway, Traffic Control, Utility Adjustment Sheets, plan sheets, notes, and details. The plans shall include the following sheets necessary to convey the intent and scope of the project *assigned under a Task Work Order*.

5.1 Key Sheet

5.2 Summary of Pay Items *Obtained from* Quantity Input

5.3 Typical Section Sheets

5.3.1 Typical Sections

5.3.2 Typical Section Details

5.4 General Notes/Pay Item Notes

5.5 Summary of Quantities

5.6 Project Layout

5.7 Plan/Profile Sheet

5.8 Profile Sheet

5.9 Plan Sheet

5.10 Special Profile

5.11 Back-of-Sidewalk Profile Sheet

5.12 Interchange Layout Sheet

5.13 Ramp Terminal Details (Plan View)

5.14 Intersection Layout Details

5.15 Special Details

5.16 Cross-Section Pattern Sheet(s)

5.17 Roadway Soil Survey Sheet(s)

5.18 Cross Sections

5.19 Temporary Traffic Control Plan Sheets

5.20 Temporary Traffic Control Cross Section Sheets

5.21 Temporary Traffic Control Detail Sheets

5.22 Utility Adjustment Sheets

5.23 Selective Clearing and Grubbing Sheet(s)

5.24 Project Network Control Sheet(s)

5.25 Environmental Detail Sheets

Preparation of detail sheets for potential environmental issues such as, underground fuel tanks and monitoring wells, septic tanks within the proposed right of way. All piping and pumps in association with the above referenced issues shall also be located and identified by the survey. The CONSULTANT shall relay to the DEPARTMENT any findings of contaminated soil, monitoring wells, or any features (particularly springs or sinks) relating to contamination or hazardous material.

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

5.26 Utility Verification Sheet(s) (SUE Data)

5.27 Quality Assurance/Quality Control

5.28 Supervision

6a DRAINAGE ANALYSIS

As identified in a Task Work Order:

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

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

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

6a.1 Drainage Map Hydrology

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

6a.2 Base Clearance Report

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

6a.3 Pond Siting Analysis and Report

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

6a.4 Design of Cross Drains

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

6a.5 Design of Ditches

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

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

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

6a.7 Design of Stormwater Management Facility (Roadside Ditch as Linear Pond)

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

structure

6a.8 Design of Flood Plain Compensation

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

6a.9 Design of Storm Drains

Develop a "working drainage map", determine runoff, inlet locations, and spread. Calculate hydraulic losses (friction, utility conflict and, if necessary, minor losses). Determine Design Tailwater and, if necessary, outlet scour protection.

6a.10 Optional Culvert Material

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

6a.11 French Drain Systems

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

6a.12 Drainage Wells

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

6a.13 Drainage Design Documentation Report

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

6a.14 Bridge Hydraulic Report

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

6a.15 Temporary Drainage Analysis

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

6a.16 Cost Estimate

6a.17 Technical Special Provisions

6a.18 Other Drainage Analysis

Identify existing pipes to remain within the project right-of-way and provide that information to FTE. Review pipe video inspection report provided by FTE's pipe video inspection general consultant and update plans to indicate which pipes shall remain and which must be replaced.

6a.19 Field Reviews

6a.20 Technical Meetings

6a.21 Environmental Look-Around Meeting

6a.22 Quality Assurance/Quality Control

6a.23 Independent Peer Review

6a.24 Supervision

6a.25 Coordination

6b DRAINAGE PLANS

As identified in a Task Work Order:

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 Summary of Drainage Structures

6b.4 Optional Pipe/Culvert Material

6b.5 Drainage Structure Sheet(s) (Per Structure)

6b.6 Miscellaneous Drainage Detail Sheets

6b.7 Lateral Ditch Plan/Profile

6b.8 Lateral Ditch Cross Sections

6b.9 Retention/Detention Pond Detail Sheet(s)

6b.10 Retention Pond Cross Sections

6b.11 Erosion Control Plan Sheet(s)

6b.12 SWPPP Sheet(s)

6b.13 Quality Assurance/Quality Control

6b.14 Supervision

7 UTILITIES

As identified in a Task Work Order:

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. *When applicable, the CONSULTANT shall utilize the Department's PSEE Utilities Module for utility coordination. See Task 2.3 (Utilities Coordination).*

The CONSULTANT shall insure FDOT standards, policies, procedures, and design criteria are followed concerning utility coordination. The CONSULTANT shall be knowledgeable in the use of the PSEE Utility Module. The CONSULTANT shall utilize the module to the maximum extent possible to coordinate with the UAOs. The CONSULTANT may employ more than one (1) individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. This person shall be contractually referred to as the Utility Coordination Manager. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the Florida's Turnpike Enterprise's Utilities Administrator that they have the following knowledge, skills, and expertise:

1. A minimum of four (4) years of experience performing utility coordination in accordance with FDOT, FHWA, and AASHTO standards, policies, and procedures.

2. A thorough knowledge of FDOT plans production process and Turnpike Enterprise utility coordination practices.

3. A thorough knowledge of FDOT agreements, standards, policies, and procedures.

7.1 Kickoff Meeting

Before any contact with the UAO(s), the CONSULTANT shall meet with the *DEPARTMENT's* Utility Office (DUO) to receive guidance, as may be required, to

assure that all necessary coordination will be accomplished in accordance with DEPARTMENT procedures. The CONSULTANT shall bring a copy of the design project work schedule reflecting utility activities.

7.2 Identify Existing Utility Agency Owners (UAO)

The CONSULTANT shall identify all utilities within and adjacent to the Project limits that may be impacted by the Project; *check with Maintenance for Permits, Sunshine State One Call, Subsurface Utility Engineering (SUE) Report, Design Location Survey, and Existing Plans. Please be advised that FTE is not a member of Sunshine State One Call. The CONSULTANT shall be responsible for the designation and/or location of the DEPARTMENT-owned utilities.*

7.3 Make Utility Contacts

First Contact: The CONSULTANT shall send letters and *one (1)* set of plan to each utility, one (1) set for the utility office, and one (1) set each to the DEPARTMENT Construction and Maintenance Offices as determined by the DEPARTMENT's Project Manager. 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 four (4) weeks advance notice.

Second Contact: At a minimum of four (4) weeks prior to the meeting, the CONSULTANT shall transmit two (2) complete sets of Phase II plans and the Utility Conflict *Matrix* (when applicable and in the format requested by the DEPARTMENT) to each UAO having facilities located within an *assigned project's* limits, and one (1) set to the DEPARTMENT Offices as required by the DEPARTMENT's Project Manager.

Third Contact: Identify agreements and assemble packages. The CONSULTANT shall send agreements, letters, the Utility Conflict *Matrix* (when applicable and in the format requested by the DEPARTMENT) and two (2) sets of plans to the UAO(s) including all component sets, one (1) set for the utility office, one (1) set each *to Florida's Turnpike Enterprise's Construction and Maintenance Offices,* if required. Include the design schedule.

Not all projects will have all contacts as described above.

7.4 Exception Processing

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

involving Utilities with the UAO and the DEPARTMENT. Assist with processing per the UAM.

7.5 Preliminary Utility Meeting

The CONSULTANT shall schedule (time and place), notify participants, and conduct a preliminary utility meeting with all UAO(s) having facilities located within the *assigned project's* limits for the purpose of presenting a project, review the current design schedule, evaluate the utility information collected, provide follow-up information on compensable property rights from the *Florida's Turnpike Enterprise'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 an *assigned* Project's design duration to provide guidance in the interpretation of plans, review changes to the plans and schedules, optional clearing and grubbing work, and assist in the development of the UAO(s) plans and work schedules. The CONSULTANT is responsible for motivating the UAO to complete and return the necessary documents after each Utility Contact or Meeting.

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

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

7.8 Subordination of Easements Coordination

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

7.9 Utility Design Meeting

At a minimum of three (3) weeks prior to the meeting, the CONSULTANT shall transmit two (2) complete sets of Phase II plans to each UAO having facilities located within the project limits, and one (1) set each to the DEPARTMENT Offices as required by the DEPARTMENT's Project Manager.

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/landscaping and proposed landscaping, drainage, traffic signalization, maintenance of traffic (construction phasing), review the current design schedule and letting date, evaluate the utility information collected, provide follow-up information on compensable property rights from *Florida's Turnpike Enterprise's* 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 maintenance of traffic 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 deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within three (3) days. See Task 4.5 (Horizontal/Vertical Master Design Files) and Task 4.9 (Cross Section Design Files) for utility conflict location identification and adjustments.

7.10 Review Utility Mark-ups & 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 CONSULTANT's Project Manager. 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 *Florida's Turnpike Enterprise*. Coordinate with the *Florida's Turnpike Enterprise* 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 *assigned* Project's schedule. Ensure the resolution of all known conflicts. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees. This task can be applied to all phases of an *assigned* Project.

7.12 Utility Constructability Review

The CONSULTANT shall review utility schedules against construction contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the *Florida's Turnpike Enterprise's* Construction Office. See Task 4.9 (Cross Section Design Files) for utility conflict identification and adjustments.

7.13 Additional Utility Services

The CONSULTANT shall provide additional utility services. Additional services will be determined when the services are required and requested *by DEPARTMENTs 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) prepared by the UAO. This does not include 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)

This task will be performed by the DEPARTMENT.

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 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 as defined by the DEPARTMENT's Project Manager. *Additional Utility services not included in an assigned Project's Task Work Order will be negotiated and approved through an Amendment to the Task Work Order*.

8 ENVIRONMENTAL PERMITS, COMPLIANCE AND CLEARANCES

As identified in a Task Work Order:

The CONSULTANT shall notify the DEPARTMENT's Project Manager, Environmental Permit Coordinator and other appropriate 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's* Project Manager and the Environmental Permit Coordinator on all permit-related correspondence and meetings.

8.1 Preliminary Project Research

The CONSULTANT shall perform preliminary project research and shall be responsible *for early identification of and coordination with the appropriate regulatory agency coordination to* assure that design efforts are properly directed toward permit requirements. The research shall include a review of the project's PD&E documents including, but not limited to, the Environmental Document, Wetland Evaluation Report, Endangered Species and Biological Assessment and Essential Fish and Habitat Report.

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

The CONSULTANT shall conduct appropriate environmental assessments relative to wildlife involvement for the proposed improvements.

The CONSULTANT shall document permit involvement in coordination with the FTE's Permit Coordinator and Project Manager. This is to be done upon completion of preliminary project research.

8.2 Field Work

<u>8.2.1 Pond Site Alternatives:</u>
The CONSULTANT shall review alternative pond sites as directed by the DEPARTMENT's *Project Manager*.

<u>8.2.2 Establish Wetland Jurisdictional Lines and Assessments:</u>
The CONSULTANT shall collect all data and information necessary to determine the boundaries of wetlands and surface waters defined by the rules or regulations of each agency processing or reviewing a permit application necessary to construct a DEPARTMENT project.

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

- Determine landward extent of state waters as defined in Rule Chapter 62-340, F.A.C. as ratified in Section 373.4211, F.S.
- Determine the jurisdictional boundaries of wetlands and surface waters as

defined by rules or regulations of any other permitting authority that is processing a DEPARTMENT permit application.

- Prepare aerial maps showing the jurisdictional boundaries of wetlands and surface waters. Aerial maps shall be reproducible, of a scale no greater than 1”=200’ and be recent photography. The maps shall show the jurisdictional limits of each agency. Photo copies of aerials are not acceptable. All jurisdictional boundaries are to be tied to the Project’s baseline of survey. When necessary, a wetland specific survey will be prepared by a registered Land Surveyor and Mapper.
- *Acquire written verification of jurisdictional lines from the appropriate environmental agencies.*
- 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 to be impacted, size of wetland to be impacted, type of impact and identify any wetland within the Project limits that will not be impacted by the Project.
- Prepare appropriate Agency Forms to obtain required permits. Forms may include, but are not limited to, the United States Army Corps of Engineers (USACE) “Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region”; the USACE “Approved Jurisdictional Determination Form”; Uniform Mitigation Assessment Method forms and/or project specific data forms.

8.2.3 Species Surveys:
The CONSULTANT shall conduct Wildlife surveys as defined by rules or regulations of any permitting authority that is processing a DEPARTMENT permit.

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

8.3 Agency Verification of Wetland Data

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

8.4 Complete and Submit All Required Permit Applications

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

The CONSULTANT shall collect all of the data and information necessary to obtain the environmental permits required to construct a project. *The CONSULTANT will complete field survey or agency required forms (such as the US Army Corps of Engineers (USACE) “Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region”; the USACE “Approved Jurisdictional Determination*

Form"; UMAMs and/or project specific data forms, as required) for use in Permit Applications.

The CONSULTANT shall prepare each permit application for DEPARTMENT approval in accordance with the rules and/or regulations of the environmental agency responsible for issuing a specific permit and/or authorization to perform work.

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

Local Permits:

As defined in each project assigned under a Task Work Order.

8.5 Prepare Dredge and Fill Sketches (as needed)

8.6 Prepare USCG Permit Sketches

8.7 Prepare Water Management District Right of Way Occupancy Sketches

8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application (as needed)

If a CCCL Permit is required, the CONSULTANT shall be responsible for the preparation of the legal advertisement required to acquire the final "Notice to Proceed" authorization for the Florida Department of Environmental Protection (FDEP). Legal advertisements shall be published one time in a newspaper that meets the notification requirements of the FDEP.

8.9 Prepare Tree Permit Information (as needed)

8.10 Mitigation Design

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

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

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

- Payment to Department of Environmental Protection (DEP)/*Water Management Districts (WMD) per acre of wetlands impacted* as defined in Section 373.4137 *and 338.250* F.S.

- Monetary participation in offsite regional mitigation plans
- Purchase of mitigation credits from a mitigation bank
- Creation/restoration on public lands
- Creation/restoration on R/W purchased by the DEPARTMENT
- Creation/restoration on existing DEPARTMENT R/W

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

Prior to selection of a final mitigation site, the CONSULTANT will provide the following services in the development of alternative mitigation plans:

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

8.11 Mitigation Coordination and Meetings

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or reviewing agencies. Once a mitigation plan has been reviewed and approved by the DEPARTMENT, the CONSULTANT will be responsible for coordinating the proposed mitigation plan with the environmental agencies.

8.12 Other Environmental Permits

Environmental Clearances, Reevaluations and Technical Support

8.13 Technical Support to DEPARTMENT for Environmental Clearances and Re-evaluations

The CONSULTANT shall provide engineering and environmental support for the *Florida's Turnpike Enterprise* to obtain clearances for all changes to an *assigned* Project after the PD&E study was completed. These changes include, but are not limited to, pond and/or mitigation sites identified, land use or environmental changes and significant design changes.

8.13.1 National Environmental Policy Act (NEPA) or State Environmental Impact Report (SEIR) Reevaluation: During the development of the final design plans, the CONSULTANT shall be responsible for coordinating with the DEPARTMENT's Project Manager to provide necessary engineering and *environmental* information required in the preparation of the reevaluation by the DEPARTMENT. The preparation of all environmental reevaluations on major

projects include the following types of reevaluations as listed in Chapter 13, Part 1 of the DEPARTMENT's Project Development and Environment Manual: Preliminary Engineering, R/W, Design Change, and Construction Advertisement Reevaluations.

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

It is the responsibility of the CONSULTANT to provide the DEPARTMENT's 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 *traffic* noise models.

8.13.2 Archaeological and Historical Features: The CONSULTANT shall provide necessary technical information to the DEPARTMENT's Project Manager necessary to analyze the impacts to all cultural and historic resources due to changes in the Project.

8.13.3 Wetland Impact Analysis: The CONSULTANT shall provide necessary technical information to the DEPARMENT's Project Manager to analyze the impacts to wetlands due to changes in the Project.

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

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

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

8.14 Preparation of Environmental Clearances and Reevaluations

The CONSULTANT shall *evaluate all* the changes to the project that occurred after the PD&E was completed. These changes could include, but are not limited to, pond and/or mitigation sites identified, land use or environmental changes, and significant design changes.

8.14.1 NEPA or SEIR Reevaluation: During the development of the final design plans, the CONSULTANT shall be responsible for *coordinating with the DEPARTMENT's Project Manager to provide necessary engineering and environmental information required in the preparation of the reevaluation by the DEPARTMENT*.

8.14.2 Archaeological and Historical Features: 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 Request Package, in accordance with Part 2, Chapter 8 of the PD&E Manual.

8.14.3 Wetland Impact Analysis: The CONSULTANT shall analyze the impacts to wetlands *due to the* changes *of an assigned* Project and *supply the information to the DEPARTMENT to be included in the reevaluation*.

8.14.4 Essential Fish Habitat: The CONSULTANT shall analyze the impacts to essential fish habitat due to changes to the Project and complete the Essential Fish Habitat Report, in accordance with Part 2, Chapter 17 of the PD&E Manual.

8.14.5 Wildlife and Habitat Impact Analysis: The CONSULTANT shall collect data necessary and perform an Endangered Species Biological Assessment, and analyze the impacts to wildlife and habitat by the changes due to *an assigned project*, in accordance with Part 2, Chapter 16 of the PD&E Manual.

8.14.6 Section 7 or Section 10 Consultation: The CONSULTANT shall perform the necessary analysis to complete a Section 7 or Section 10 Consultation, as applicable.

8.15 Contamination Impact Analysis

The CONSULTANT shall perform the necessary analysis to complete the Contamination Screening Evaluation for any changes to the project and complete the Contamination Screening Evaluation Report as described in Part 2, Chapter 20, of the PD&E Manual, *as necessary*.

8.16 Asbestos *and Lead Based Paint* Survey

The DEPARTMENT shall be responsible for testing Asbestos Containing Material (ACM)/Lead Based Paint (LBP).

The DEPARTMENT shall utilize its Contamination Assessment and Remediation (CAR) Contractor to perform a comprehensive ACM and LBP survey of all bridges and buildings proposed for impact on an assigned project. The surveys shall include sampling of all suspect ACM and paint screening for lead based paint. Copies of the final ACM and LBP survey reports along with any supporting documents shall be provided to the DEPARTMENT'S Project Manager and retained in the project's electronic files. In the event that ACM is identified on the bridge, the CONSULTANT shall prepare (in coordination with the DEPARTMENT'S Contamination Impact Coordinator) plans, specifications, general notes, pay item notes and an Operation and Maintenance (O&M) plan for any asbestos to remain in place.

8.17 Technical Meetings

8.18 Quality Assurance/Quality Control

8.19 Supervision

8.20 Coordination

9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS

As identified in a Task Work Order:

The CONSULTANT shall analyze, design, and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.20, Provisions for Work. Individual tasks identified in Sections 9 through 18 are defined in the Staff Hour Estimation Handbook and within the provision defined in Section 2.20, Provisions for Work. Contract documents shall display economical solutions for the given conditions.

The CONSULTANT shall provide Design Documentation to the DEPARTMENT with each submittal consisting of structural design calculations and other supporting documentation developed during the development of the plans. The design calculations submitted shall adequately address the complete design of all structural elements. These calculations shall be neatly and logically presented *electronically in PDF file format* and all sheets shall be numbered. The final design calculations shall be signed and sealed by a Florida registered Professional Engineer. A cover sheet indexing the contents of the calculations shall be included and the CONSULTANT's Engineer of Record 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 Existing Bridge Plans

9.7 Assemble Plan Summary Boxes and Quantities

9.8 Cost Estimate

9.9 Technical Special Provisions

9.10 Field Reviews

9.11 Technical Meetings

9.12 Quality Assurance/Quality Control

9.13 Independent Peer Review

9.14 Supervision

9.15 Coordination

10 STRUCTURES - BRIDGE DEVELOPMENT REPORT

As identified in a Task Work Order:

The CONSULTANT shall prepare a Bridge Development Report (BDR) *as specified in the Task Work Order Scope of Services*. The BDR shall be submitted as part of the Phase I Roadway Submittal, General Requirements.

General Requirements

10.1 Bridge Geometry

10.2 Ship Impact Data Collection

10.3 Ship Impact Criteria

Superstructure Alternatives

10.4 Short-Span Concrete

10.5 Medium-Span Concrete

10.6 Long Span Concrete

10.7 Structural Steel

Foundation and Substructure Alternatives

10.8 Pier/Bent

10.9 Shallow Foundations / GRS Abutments

10.10 Deep Foundations

Movable Span

10.11 Data Collection and Design Criteria

10.12 Movable Span Geometrics and Clearances

10.13 Deck System Evaluation

10.14 Framing Plan Development

10.15 Main Girder Preliminary Design

10.16 Conceptual Span Balance/Counterweight

10.17 Support System Development

10.18 Drive Power Calculations

10.19 Drive System Development

10.20 Power and Control Development

10.21 Conceptual Pier Design

10.22 Foundation Analysis (FL PIER)

10.23 Tender Visibility Study

Other BDR Issues

10.24 Aesthetics

10.25 TCP/Staged Construction Requirements

10.26 Constructability Requirements

10.27 Load Rating for Damaged/Widened Structures

10.28 Quantity and Cost Estimates

10.29 Quantity and Cost Estimates - Movable Span

10.30 Wall Type Justification

Report Preparation

10.31 Exhibits

10.32 Exhibits - Movable Span

10.33 Report Preparation

10.34 Report Preparation - Movable Span

10.35 BDR Submittal Package

Preliminary Plans

When ONLY 30% plans are final deliverable, use Task Nos. as shown for applicable bridge types for project Activities 12 thru 16. Staffhours to be negotiated and scaled appropriately.

11 STRUCTURES – TEMPORARY BRIDGE

As identified in a Task Work Order:

The CONSULTANT shall prepare plans for Temporary Bridge(s) at the location(s) as specified in *the Task Work Order Scope of Services*. The CONSULTANT shall contact FDOT Office of Maintenance to determine the type and availability of temporary before deciding on the temporary bridge type to be used.

General Layout Design and Plans

11.1 Overall Bridge Final Geometry

11.2 General Plan and Elevation

11.3 Miscellaneous Details

End Bent Design and Plans

11.4 End Bent Structural Design

11.5 End Bent Details

Intermediate Bent Design and Plans

11.6 Intermediate Bent Structural Design

11.7 Intermediate Bent Details

Miscellaneous Substructure Design and Plans

11.8 Foundation Layout

12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE

As identified in a Task Work Order:

The CONSULTANT shall prepare plans for Short Span Concrete Bridge(s) at the location(s) specified in *the Task Work Order Scope of Services*.

General Layout Design and Plans

12.1 Overall Bridge Final Geometry

12.2 Expansion/Contraction Analysis

12.3 General Plan and Elevation

12.4 Construction Staging

12.5 Approach Slab Plan and Details

12.6 Miscellaneous Details

<u>End Bent Design and Plans</u>

12.7 End Bent Geometry

12.8 End Bent Structural Design

12.9 End Bent Plan and Elevation

12.10 End Bent Details

<u>Intermediate Bent Design and Plans</u>

12.11 Bent Geometry

12.12 Bent Stability Analysis

12.13 Bent Structural Design

12.14 Bent Plan and Elevation

12.15 Bent Details

<u>Miscellaneous Substructure Design and Plans</u>

12.16 Foundation Layout

<u>Superstructure Design and Plans</u>

12.17 Finish Grade Elevation Calculation

12.18 Finish Grade Elevations

<u>Cast-In-Place Slab Bridges</u>

12.19 Bridge Deck Design

12.20 Superstructure Plan

12.21 Superstructure Sections and Details

<u>Prestressed Slab Unit Bridges</u>

12.22 Prestressed Slab Unit Design

12.23 Prestressed Slab Unit Layout

12.24 Prestressed Slab Unit Details and Schedule

12.25 Deck Topping Reinforcing Layout

12.26 Superstructure Sections and Details

<u>Reinforcing Bar Lists</u>

12.27 Preparation of Reinforcing Bar List

<u>Load Rating</u>

12.28 Load Rating

13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE

As identified in a Task Work Order:

The CONSULTANT shall prepare plans for Medium Span Concrete Bridge(s) at the location(s) specified in *the Task Work Order Scope of Services*.

<u>General Layout Design and Plans</u>

13.1 Overall Bridge Final Geometry

13.2 Expansion/Contraction Analysis

13.3 General Plan and Elevation

13.4 Construction Staging

13.5 Approach Slab Plan and Details

13.6 Miscellaneous Details

<u>End Bent Design and Plans</u>

13.7 End Bent Geometry

13.8 Wingwall Design and Geometry

13.9 End Bent Structural Design

13.10 End Bent Plan and Elevation

13.11 End Bent Details

Intermediate Bent Design and Plans

13.12 Bent Geometry

13.13 Bent Stability Analysis

13.14 Bent Structural Design

13.15 Bent Plan and Elevation

13.16 Bent Details

Pier Design and Plans

13.17 Pier Geometry

13.18 Pier Stability Analysis

13.19 Pier Structural Design

13.20 Pier Plan and Elevation

13.21 Pier Details

Miscellaneous Substructure Design and Plans

13.22 Foundation Layout

Superstructure Deck Design and Plans

13.23 Finish Grade Elevation (FGE) Calculation

13.24 Finish Grade Elevations

13.25 Bridge Deck Design

13.26 Bridge Deck Reinforcing and Concrete Quantities

13.27 Diaphragm Design

13.28 Superstructure Plan

13.29 Superstructure Section

13.30 Miscellaneous Superstructure Details

Reinforcing Bar Lists

13.31 Preparation of Reinforcing Bar List

Continuous Concrete Girder Design

13.32 Section Properties

13.33 Material Properties

13.34 Construction Sequence

13.35 Tendon Layouts

13.36 Live Load Analysis

13.37 Temperature Gradient

13.38 Time Dependent Analysis

13.39 Stress Summary

13.40 Ultimate Moments

13.41 Ultimate Shear

13.42 Construction Loading

13.43 Framing Plan

13.44 Girder Elevation, including Grouting Plan and Vent Locations

13.45 Girder Details

13.46 Erection Sequence

13.47 Splice Details

13.48 Girder Deflections and Camber

Simple Span Concrete Design

13.49 Prestressed Beam

13.50 Prestressed Beam Schedules

13.51 Framing Plan

Beam Stability

13.52 Beam/Girder Stability

Bearing

13.53 Bearing Pad and Bearing Plate Design

13.54 Bearing Pad and Bearing Plate Details

Load Rating

13.55 Load Ratings

14 STRUCTURES - STRUCTURAL STEEL BRIDGE

As identified in a Task Work Order:

The CONSULTANT shall prepare plans for Structural Steel Bridge(s) at the location(s) specified in *in the Task Work Order Scope of Services*.

General Layout Design and Plans

14.1 Overall Bridge Final Geometry

14.2 Expansion/Contraction Analysis

14.3 General Plan and Elevation

14.4 Construction Staging

14.5 Approach Slab Plan and Details

14.6 Miscellaneous Details

End Bent Design and Plans

14.7 End Bent Geometry

14.8 Wingwall Design and Geometry

14.9 End Bent Structural Design

14.10 End Bent Plan and Elevation

14.11 End Bent Details

Intermediate Bent Design and Plans

14.12 Bent Geometry

14.13 Bent Stability Analysis

14.14 Bent Structural Design

14.15 Bent Plan and Elevation

14.16 Bent Details

<u>Pier Design and Plans</u>

14.17 Pier Geometry

14.18 Pier Stability Analysis

14.19 Pier Structural Design

14.20 Pier Plan and Elevation

14.21 Pier Details

<u>Miscellaneous Substructure Design and Plans</u>

14.22 Foundation Layout

<u>Superstructure Deck Design and Plans</u>

14.23 Finish Grade Elevation (FGE) Calculation

14.24 Finish Grade Elevations

14.25 Bridge Deck Design

14.26 Bridge Deck Reinforcing and Concrete Quantities

14.27 Superstructure Plan

14.28 Superstructure Section

14.29 Miscellaneous Bridge Deck Details

<u>Reinforcing Bar Lists</u>

14.30 Preparation of Reinforcing Bar List

<u>Structural Steel Plate Girder Design</u>

14.31 Unit Modeling

14.32 Section Design

14.33 Stiffener Design and Locations

14.34 Cross-frame Design

14.35 Connections

14.36 Bearing Assembly Design and Detailing (With Jacking Analysis)

14.37 Splice Design

14.38 Shear Stud Connectors

14.39 Deflection Analysis

14.40 Framing Plan

14.41 Girder Elevation

14.42 Structural Steel Details

14.43 Splice Details

14.44 Girder Deflections and Camber

<u>Structural Steel Box Girder Design</u>

14.45 Unit Modeling

14.46 Section Design

14.47 Stiffener Design and Locations

14.48 Interior Cross-Frame Design

14.49 Exterior Cross-Frame Design

14.50 Connections

14.51 Bearing Assembly Design and Detailing (with Jacking Analysis)

14.52 Splice Design

14.53 Shear Stud Connectors

14.54 Deflection Analysis

14.55 Framing Plan

14.56 Girder Elevation

14.57 Structural Steel Details

14.58 Splice Details

14.59 Girder Deflections and Camber

Erection Scheme

14.60 Erection Scheme Analysis

14.61 Erection Scheme

Load Rating

14.62 Load Rating

15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE

As identified in a Task Work Order:

The CONSULTANT shall prepare plans for Segmental Concrete Bridge(s) at the location(s) specified in *in the Task Work Order Scope of Services.*

General Layout Design and Plans

15.1 Final Bridge Geometry

15.2 Casting Geometry Calculation

15.3 Finish Grade Geometry Calculation

15.4 Finish Grade Elevations

15.5 Construction Schedule

15.6 General Plan and Elevation

15.7 Approach Slab Plan and Details

15.8 Miscellaneous Details

15.9 Existing Bridge Plans

End Bent Design and Plans

15.10 End Bent Geometry

15.11 Wingwall Geometry and Design

15.12 End Bent Structural Design

15.13 End Bent Plan and Elevation

15.14 End Bent Details

Pier Design and Plans

15.15 Pier Geometry

15.16 Pier Stability Analysis

15.17 Pier Construction Loads

15.18 Pier Structural Design

15.19 Pier Plan and Elevation

15.20 Pier Details

Miscellaneous Substructure Design and Plans

15.21 Foundation Layout

Longitudinal Analysis

15.22 Section Properties

15.23 Material Properties

15.24 Superimposed Dead Loads

15.25 Construction Sequence

15.26 Tendon Layouts

15.27 Live Load Analysis

15.28 Temperature Gradient

15.29 Time Dependent Analysis

15.30 Stress Summary

15.31 Ultimate Moments

15.32 Ultimate Shear

15.33 Construction Loading

Transverse Analysis

15.34 Time Dependent Analysis

15.35 Live Load Analysis

15.36 Temperature Gradient

15.37 Stress Summary

15.38 Ultimate Moments

15.39 Construction Loading

<u>Superstructure Design</u>

15.40 Typical Segment

15.41 Pier Segment

15.42 Expansion Joint Segment

15.43 Blister Details

15.44 Deviator Blocks

15.45 Bearings

15.46 Expansion Joints

15.47 Special Analysis

<u>Superstructure Plans</u>

15.48 Typical Sections

15.49 Finish Grade Elevations

15.50 Segment Layout / Designations

15.51 Typical Segments

15.52 Variable Depth Segments

15.53 Pier Segments

15.54 Expansion Joint Segments

15.55 CIP Closure Joint Details

15.56 Casting Geometry

15.57 Integrated 3-D Drawings

*As identified in a Task Work Order**:***

The CONSULTANT shall prepare plans for Movable Span Bridge(s) at the location(s) specified in Section *in the Task Work Order Scope of Services.*

Final Design Bascule Pier

16.1 Pier Deck

16.2 Leaf/Pier Clearance Diagrams

16.3 Load Shoe Columns

16.4 Trunnion Columns

16.5 Foundations

16.6 Footing

16.7 Seal

16.8 Back Wall (Approach Span Bearings) Closed Piers only

16.9 Bascule Pier Deck Elevations

Bascule Pier Dimensions - Detailing

16.10 Pier Plan Views

16.11 Pier Elevations Views

16.12 Pier Sections

Bascule Pier Reinforcing Details

16.13 Pier Reinforcing

Bascule Pier Miscellaneous Details

16.14 Pier Barrier Details

16.15 Stair Details

16.16 Handrail Details

16.17 Ladder and Hatch Details

16.18 Pier Equipment

16.19 Bascule Pier Notes and Summary of Quantities

16.20 Miscellaneous Details

<u>Bascule Leaf Design</u>

16.21 Deck Design

16.22 Sidewalk Design

16.23 Stringer Design

16.24 Typical Floorbeam Design

16.25 End Floorbeam Design

16.26 Deep Floorbeam Design

16.27 Sidewalk Bracket Design

16.28 Roadway Bracket Design

16.29 Main Girder Influence Lines

16.30 Main Girder Design

16.31 Trunnion Girder Design

16.32 Main Girder Camber Data

16.33 Leaf Lateral Bracing Design

16.34 Counterweight Design

16.35 Live Load Shoe Design

16.36 Barrier Design

16.37 Deck Elevations

16.38 Balance Calculations

<u>Bascule Leaf Detailing</u>

16.39 Bascule GP&E

16.40 Bascule Leaf Notes

16.41 Framing Plan

16.42 Flooring Plan and Details

16.43 Typical Section and Finish Grade Elevations

16.44 Girder Elevation

16.45 Girder Details

16.46 Camber Layout

16.47 Floor Beams

16.48 Counterweight Girder/Box

16.49 Trunnion Girder

16.50 Cylinder Girder

16.51 Lateral Bracing Details

16.52 Counterweight Bracing Details

16.53 Joint Details

16.54 Traffic Barrier Details

16.55 Pedestrian Rail and Support Details

16.56 Curb and Sidewalk Details

16.57 Barrier and Sidewalk Bracket Details

16.58 Counterweight Details

16.59 Stress Table or Influence Lines

Mechanical Design

16.60 Final Power Requirements

16.61 Trunnion Assembly

16.62 Span Locks

16.63 Sump Pumps

Mechanical Drive Design

16.64 Drive Shafts, Couplings, Keys, Bearings and Supports

16.65 Rack and Pinion, Bearings and Supports

16.66 Drive Train

16.67 Motor Brakes and Machinery Brakes

Hydraulic Drive Design

16.68 Hydraulic Drive

Machinery Detailing

16.69 Machinery Layout

16.70 Machinery Elevation

16.71 Machinery Section

16.72 Trunnion Assembly

16.73 Drive Details

16.74 Span Locks

Electrical Design

16.75 Load Analysis

16.76 Power Distribution

16.77 Drive Equipment

16.78 Bridge Controls

16.79 Grounding

16.80 Lightning and Surge Suppression

16.81 Pier Lighting

Electrical Detailing

16.82 Electrical Plan and Elevation

16.83 Electrical Symbols and Abbreviations

16.84 Single/Three Line Diagram

16.85 Panel Board and Light Fixture Schedules

16.86 Wire and Conduit Schedules and Diagrams

16.87 Control Desk/Panel Layout

16.88 Control Schematics

16.89 PLC Logic

16.90 Communication System

16.91 Navigation Lighting Details

16.92 Pedestrian Gate, Traffic Gate, and Barrier Details

16.93 Submarine Cable

16.94 Miscellaneous Details

Control House

16.95 Architectural Design

16.96 Architectural Details

16.97 Structural Design

16.98 Structural Details

16.99 HVAC/Plumbing Design

16.100 HVAC/Plumbing/Electrical Cables

Reinforcing Bar Lists

16.101 Preparation of Reinforcing Bar List

Load Rating

16.102 Load Rating

17 STRUCTURES – RETAINING WALLS

As identified in a Task Work Order:

The CONSULTANT shall prepare plans for Retaining Wall(s) as specified in *the Task Work Order Scope of Services*.

General Requirements

17.1 Key Sheet

17.2 Horizontal Wall Geometry

<u>Permanent Proprietary Walls</u>

17.3 Vertical Wall Geometry

17.4 Semi-Standard Drawings

17.5 Wall Plan and Elevations (Control Drawings)

17.6 Details

<u>Temporary Proprietary Walls</u>

17.7 Vertical Wall Geometry

17.8 Semi-Standard Drawings

17.9 Wall Plan and Elevations (Control Drawings)

17.10 Details

<u>Cast-In-Place Retaining Walls</u>

17.11 Design

17.12 Vertical Wall Geometry

17.13 General Notes

17.14 Wall Plan and Elevations (Control Drawings)

17.15 Sections and Details

17.16 Reinforcing Bar List

<u>Other Retaining Walls and Bulkheads</u>

17.17 Design

17.18 Vertical Wall Geometry

17.19 General Notes, Tables and Miscellaneous Details

17.20 Wall Plan and Elevations

17.21 Details

18 STRUCTURES - MISCELLANEOUS

*As identified in a Task Work Order**:***

The CONSULTANT shall prepare plans for Miscellaneous Structure(s) as specified in Section *in the Task Work Order Scope of Services*.

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

<u>High Mast Lighting</u>

18.19 Non-Standard High Mast Lighting Structures

18.20 High Mast Lighting Special Details Plan Sheets

<u>Noise Barrier Walls (Ground Mount)</u>

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

<u>Special Structures</u>

18.28 Fender System

18.29 Fender System Access

18.30 Special Structures

18.31 Other Structures

19 SIGNING AND PAVEMENT MARKING ANALYSIS

As identified in a Task Work Order:

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 *as identified in Task Work Order Scope of Services*.

19.1 Traffic Data Analysis

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

19.2 No Passing Zone Study

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

The CONSULTANT shall submit the signed and sealed report to the DEPARTMENT's Project Manager for review and approval.

19.3 Reference and Master Design File

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

19.4 Multi-Post Sign Support Calculations

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

19.5 Sign Panel Design Analysis

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

19.6 Sign Lighting/Electrical Calculations

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

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

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

19.7 Quantities

19.8 Cost Estimate

19.9 Technical 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

As identified in a Task Work Order:

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 and *as identified in a Task Work Order Scope of Services:*

20.1 Key Sheet

20.2 Summary of Pay Items *Obtained from* TRNS*Port Input

20.3 Tabulation of Quantities

20.4 General Notes/Pay Item Notes

20.5 Project Layout

20.6 Plan Sheet

The CONSULTANT shall include plan sheets showing signing and striping improvements.

20.7 Typical Details

20.8 Guide Sign Work Sheet(s)

20.9 Traffic Monitoring Site

20.10 Cross Sections

20.11 Special Service Point Details

20.12 Special Details

20.13 Interim Standards

20.14 Quality Assurance/Quality Control

20.15 Supervision

21 SIGNALIZATION ANALYSIS

As identified in a Task Work Order:

The CONSULTANT shall analyze and document Signalization Analysis Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums *as identified in Task Work Order Scope of Services.*

21.1 Traffic Data Collection

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

21.2 Traffic Data Analysis

The CONSULTANT shall determine signal operation plan, intersection geometry, local signal timings, pre-emption phasing and 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

21.11 Cost Estimate

21.12 Technical 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 *DEPARTMENT* Standards
- Interconnect Media
- Controller Timing Data

21.15 Technical Meetings

21.16 Quality Assurance/Quality Control

21.17 Independent Peer Review

21.18 Supervision

21.19 Coordination

22 SIGNALIZATION PLANS

*As identified in a Task Work Order**:***

The CONSULTANT shall prepare a set of Signalization Plans in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums, *as identified in Task Work Order Scope*:

22.1 Key Sheet

22.2 Summary of Pay Items *Obtained from* TRNS*Port Input

22.3 Tabulation of Quantities

22.4 General Notes/Pay Item Notes

22.5 Plan Sheet

22.6 Interconnect Plans

22.7 Traffic Monitoring Site

22.8 Guide Sign Worksheet

22.9 Special Details

22.10 Special Service Point Details

22.11 Mast Arm/Monotube Tabulation Sheet

22.12 Strain Pole Schedule

22.13 TCP Signal (Temporary)

22.14 Temporary Detection Sheet

22.15 Utility Conflict Sheet

22.16 Interim Standards

22.17 Quality Assurance/Quality Control

22.18 Supervision

23 LIGHTING ANALYSIS

As identified in a Task Work Order:

The CONSULTANT shall analyze and document Lighting Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums *as identified in Task Work Order Scope of Services*.

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 Design Analysis Report. The report shall provide analyses for mainlines, interchanges, and arterial roads and shall include all back-up data such that the report stands on its own. Back up data shall include current ADT's, general crash data average cost from the Florida Highway Safety Improvement Manual, crash details data from the last three (3) 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 *FDM and the* FDOT Manual on Uniform Traffic Studies (MUTS), which utilize ADT, Three (3) Year Crash Data, night/day crash ratio, percentage of night ADT, etc.

23.2 Lighting Design Analysis Report

The CONSULTANT shall prepare a Preliminary Lighting Design Analysis Report. The report shall be submitted under a separate cover with the Phase II plans submittal. The report shall provide analyses for each typical section of the mainline, typical section for the ramps (one and/or two lanes), interchanges, underdeck

lighting, and arterial roads. Each lighting calculation shall be properly identified as to the area that it covers.

The report shall include all authorized jurisdictional Lighting Design Criteria that will be used, an evaluation of a minimum of three (3) lighting design alternatives and a recommendation as to which alternative is preferred. Each alternative shall be properly described; the alternatives shall consider different pole heights, lamp wattage, arm lengths, *and underdeck lighting*. Each alternative shall be provided with a cost estimate that includes initial cost in addition to operations and maintenance cost for one (1) year.

The report shall also include the lighting calculations for each lighted sign, *where lighted signs are applicable to the assigned project(s)*.

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

- Voltage drop calculations
- Load analysis calculations for each branch circuit
- *Photometric Data*

23.3 Aeronautical Evaluation

The CONSULTANT shall prepare an *Aeronautical Evaluation/Airspace Analysis Report, as applicable, for project(s) adjacent to nearby airport(s).* It shall be submitted for approval by the DEPARTMENT and by FAA prior to Phase II plans submittal.

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

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

23.4 Voltage Drop Calculations

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 *DEPARTMENT*.

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.

23.5 FDEP Coordination and Report

23.6 Reference and Master Design Files

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

23.7 Temporary Lighting

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

23.8 Design Documentation

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

- Phase submittal checklist.
- Structural calculations for special conventional pole concrete foundations. *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 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).*

23.9 Quantities

23.10 Cost Estimate

23.11 Technical Special Provisions

23.12 Other Lighting Analysis

23.13 Field Reviews

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

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

23.14 Technical Meetings

23.15 Quality Assurance/Quality Control

23.16 Independent Peer Review

23.17 Supervision

23.18 Coordination

24 LIGHTING PLANS

As identified in a Task Work Order:

The CONSULTANT shall prepare a set of Lighting Plans in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums *as identified in Task Work Order Scope of Services*.

24.1 Key Sheet

24.2 Summary of Pay Item Sheet *Obtained from* TRNS*Port Input

24.3 Tabulation of Quantities

24.4 General Notes/Pay Item Notes

24.5 Pole Data, Legend & Criteria

24.6 Service Point Details

24.7 Project Layout

24.8 Plan Sheet

24.9 Special Details

24.10 Temporary Lighting Data and Details

24.11 Traffic Control Plan Sheets

24.12 Interim Standards

24.13 Quality Assurance/Quality Control

24.14 Supervision

25 LANDSCAPE ARCHITECTURE ANALYSIS

*As identified in a Task Work Order**:***

The CONSULTANT shall analyze and document Landscape Architecture Tasks in accordance with all applicable manuals, guidelines, standards, handbooks, procedures, and current design memorandums *as identified in Task Work Order Scope of Services*.

The CONSULTANT LA's services shall include, but are not limited to, providing Data Collection, Site Inventory, Site Analysis, a Vegetation Disposition Plan, a Conceptual Landscape Opportunity Plan (LOP) and relocation planting plan if necessary.

25.1 Data Collection

All research required to collect data necessary to complete the initial design analysis. Includes identifying local ordinances and collection of other project data. Master Design File base information shall be provided by the Prime Consultant.

25.2 Site Inventory and Analysis

Inventory shall include the Global Positioning System (GPS) location, identification and condition rating of existing vegetation and a recommendation for preservation, relocation or removal (Vegetation Disposition Plan). The Vegetation Disposition Plan shall be produced at 1"=100' scale, maximum. The Vegetation Disposition Plan shall be included in the Prime Consultant's Selective Clearing and Grubbing Plans.

Includes identification of opportunities and constraints (EG: slope erosion, desirable/undesirable views, etc.) for the proposed project based on existing site conditions. Summary of analysis in a graphic and written format, shall be included in task 25.3 conceptual design. **25.3 Planting Design**

Landscape Opportunity Plan (LOP): Includes the delineation of areas designated for future landscape plantings. The LOP shall be designed in accordance with the FTE Landscape Brand Document delineating areas suitable for High, Medium and Low intensity landscapes, areas for buffering objectionable views, areas for stabilization of embankment, etc. The LOP shall be produced in a roll plot format, 1" = 200' maximum.

The LOP shall include the following:

1. Proposed improvements and existing elements to remain associated with the project limits.

2. Vegetation disposition showing existing plant material, condition and whether plant material is to be removed, relocated or to remain.

3. Wetland jurisdictional lines.

4. Proposed drainage retention areas.

5. Label all existing to remain and proposed utilities.

6. Objectionable and desired views.

7. Locations of landscape opportunity planting areas in a bubble format which identifies various vegetation groupings in a hatched or colorized manner. Examples are: "trees/palms/shrubs", "shrubs only", "buffer plantings", etc.

8. Provide and label all applicable clear zone, horizontal clearance, horizontal sight distance, intersection sight distances, stopping sight distance and setback dimensions on the plans and in chart form which reflect AASHTO, FDOT and Department guidelines for landscape installation and maintenance operations, including those that have been coordinated with other disciplines.

9. Indicate potential areas for wildflower plantings.

Conceptual Design: If the Vegetation Disposition Plan requires relocation of plant materials the Landscape Architect (LA) shall prepare a planting plan to be approved by the District Landscape Architect. Final Design: Includes identifying the species/type, size, location, spacing, and quality of all new plants. *N/A*

25.4 Irrigation Design

Feasibility Report: *Includes analysis of applicable codes, regulations, methods, and materials associated with proposed irrigation system design.*

Conceptual Design: Typically not done in master design file. Includes determination of water and power sources, *potential locations for Point of Connection, well, pump and controller*. Phase I design level. *N/A*

Final Design: Includes all work in master design files. Irrigation Design includes, but is not limited to, the locations and sizes of *electrical service connections*, pumps, pump stations, mainlines, lateral lines, irrigation heads, valves, backflow and control devices. *N/A*

25.5 Hardscape Design *N/A*

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

Final Design: Includes all work in master design files. Hardscape design includes, but is not limited to, sidewalks, plazas, steps, fountains, walls, pedestrian bridges, non-regulatory signs or project graphics, roadway aesthetics, site *furnishings and landscape lighting*.

25.6 Plan Summary Boxes *N/A*

25.7 Cost Estimates

25.8 Technical Special Provisions

25.9 Other Landscape Architecture

25.10 Outdoor Advertising

Includes all work required to determine locations of all outdoor advertising permitted within 1000 feet of the roadway project limits. Includes all work required to determine the proposed view zones and the supporting documentation.

25.11 Field Reviews

The CONSULTANT LA shall, at a minimum, attend two (2) field reviews - one (1) field review at project initiation of design and one (1) field review at plans -in -hand (LOP) with the FTE's LA at final submittal. Plan revisions based on field reviews to be included as part of 25.3 Planting Design.

25.12 Technical Meetings / Public Meetings

25.13 Quality Assurance/Quality Control

25.14 Independent Peer Review *N/A*

25.15 Supervision

25.16 Project Coordination *N/A*

25.17 Interdisciplinary Coordination

26 LANDSCAPE ARCHITECTURE PLANS

As identified in a Task Work Order:

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

26.1 Key Sheet

26.2 Tabulation of Quantities

26.3 General Notes

26.4 Tree and Vegetation Inventory, Protection and Relocation Plans

26.5 Planting Plans for Linear Roadway Projects

26.6 Planting Plans (Interchanges and Toll Plazas)

26.7 Planting Details and Notes

26.8 Irrigation Plans for Linear Roadway Project

26.9 Irrigation Plans for Interchange and Toll Plazas

26.10 Irrigation Details and Notes

26.11 Hardscape Plans

26.12 Hardscape Details and Notes

26.13.*1*Maintenance Plan

The CONSULTANT shall include a written and graphic guide for care and maintenance of the landscape plantings and irrigation system during and after the warranty period. Erosion Control Plan: The CONSULTANT shall include a written and graphic plan for care and maintenance of the plants and beds, hardscape, and irrigation system during and after the establishment period. This maintenance plan will be developed in performance based language and will be in coordination with the entity who assumes the maintenance obligation.

26.13.2Erosion Control Plan

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

26.14 Cost Estimate

26.15 Quality Assurance/Quality Control

26.16 Supervision

27 SURVEY

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

The CONSULTANT shall submit all survey notes and computations to document the surveys. All field survey work shall be recorded in approved media and submitted to the DEPARTMENT. Field books submitted to the DEPARTMENT must be of an approved type. The field books shall be *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.

Survey requirements shall be as described for each project assigned under a Task Work Order.

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 *Florida's Turnpike Enterprise's Surveyor*; 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 *Florida's Turnpike Enterprise's Surveyor*; 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 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 Network Control (HPNC) points, project alignment, vertical control points, section, ¼ section, center of section corners and General Land Office (GLO.) corners as required.

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

Locate all aboveground features and improvements for the limits of the *assigned 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 aboveground 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* comparison with DTM.

27.9 Side Street Surveys

Refer to tasks of this document as applicable.

27.10 Underground Utilities

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

27.11 Outfall Survey

Locate all aboveground features and improvements for the limits of an *assigned 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 aboveground features and improvements for the limits of a bridge if included within limits of an *assigned project*. 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 an *assigned 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 CONSULTANT. 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 Miscellaneous Surveys

Refer to tasks of this document, as applicable, to perform surveys not described in *the individual Task Work Order*. This item can only be used if authorized in writing by the *Florida's Turnpike Enterprise's Surveyor* or the *DEPARMENT's Project Manager*.

27.29 Supplemental Surveys

Supplemental survey days and hours are to be approved in advance by *Florida's Turnpike Enterprise's Surveyor*. Refer to tasks of this document, as applicable, to perform surveys not described herein.

27.30 Document Research

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

27.31 Field Review

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

27.32 Technical Meetings

Attend meetings as required by the DEPARTMENT's Project Manager.

27.33 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.

27.34 Supervision

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

27.35 Coordination

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

28 PHOTOGRAMMETRY

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

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

28.1 Flight Preparation

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

28.2 Control Point Coordination

Determine photo identifiable control points, and mark contact prints.

28.3 Mobilization

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

28.4 Flight Operations

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

28.5 Film Processing

Process, check, and annotate the aerial film.

28.6 Photo Products

Prepare contact prints, contact diapositives, and photo enlargements.

28.7 Scanning

Scan photographic images.

28.8 LiDAR

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

28.9 Aerial Triangulation

Measure and adjust control within aerial images.

28.10 Surfaces

Includes collection of break lines and spot elevations.

28.11 Ortho Generation

Includes creation of final images.

28.12 Rectified Digital Imagery (Georeferenced)

Create the rectified digital image.

28.13 Mosaicking

Create the mosaic.

28.14 Sheet Clipping

Create plot files for sheets from the database.

28.15 Topographics (3D)

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

28.16 Planimetrics (2D)

Prepare 2D planimetric map.

28.17 Drainage Basin

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

28.18 CADD Edit

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

28.19 Data Merging

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

28.20 Miscellaneous

Other tasks not specifically addressed in this document.

28.21 Field Review

Perform on site review of maps.

28.22 Technical Meetings

Attend meetings as required.

28.23 Quality Assurance/Quality Control

Establish and implement a QA/QC plan.

28.24 Supervision

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

28.25 Coordination

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

29 MAPPING

The CONSULTANT will be responsible for the preparation of control survey maps, R/W

maps, maintenance maps, sketches, other miscellaneous survey maps, and legal descriptions as required for an *assigned 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 (P.S.M.) 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 an *assigned* project to the DEPARTMENT for review at stages of completion as negotiated.

Master CADD File

29.1 Alignment

29.2 Section and 1/4 Section Lines

29.3 Subdivisions / Property Lines

29.4 Existing Right of Way

29.5 Topography

29.6 Parent Tract Properties and Existing Easements

29.7 Proposed Right of Way Requirements

The CONSULTANT will provide the proposed requirements. The P.S.M. is responsible for calculating the final geometry. Notification of final R/W requirements along with the purpose and duration of all easements will be specified in writing.

29.8 Limits of Construction

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

29.9 Jurisdictional/Agency Lines

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

Sheet Files

29.10 Control Survey Cover Sheet

29.11 Control Survey Key Sheet

29.12 Control Survey Detail Sheet

29.13 Right-of-Way Map Cover Sheet

29.14 Right-of-Way Map Key Sheet

29.15 Right-of-Way Map Detail Sheet

29.16 Maintenance Map Cover Sheet

29.17 Maintenance Map Key Sheet

29.18 Maintenance Map Detail Sheet

29.19 Reference Point Sheet

This sheet(s) will be included with the Control Survey Map, R/W Map and Maintenance Map.

29.20 Project Network Control Sheet (*CTL 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, R/W Map and Maintenance Map, *and may be substituted for the Reference Point Sheet as determined by the Florida's Turnpike Enterprise's Surveyor (Note: may also be called the CTL sheet, and prepared to Engineering CADD standards suitable for inclusion in Construction plan sets).*

29.21 Table of Ownerships Sheet

<u>Miscellaneous Surveys and Sketches</u>

29.22 Parcel Sketches

29.23 TIITF Sketches

29.24 Other Specific Purpose Survey(s)

29.25 Boundary Survey(s) Map

29.26 Right of Way Monumentation Map

29.27 Title Search Map

29.28 Title Search Report

29.29 Legal Descriptions

29.30 Final Map/Plans Comparison

The P.S.M. will perform a comparison of the final R/W maps with the available construction plans to review the correctness of the type of parcel to be acquired and the stations/offsets to the required R/W. The P.S.M. will coordinate with the *Engineer of Record* to resolve any conflicts or discrepancies and provide documentation of the review.

29.31 Field Reviews

29.32 Technical Meetings

29.33 Quality Assurance/Quality Control

29.34 Supervision

29.35 Coordination

29.36 Supplemental Mapping

Supplemental Mapping Tasks and hours are to be approved in advance by Florida's Turnpike Enterprise's Surveyor. Refer to tasks of this document, as applicable, to perform Mapping Tasks not described herein.

30 TERRESTRIAL MOBILE LiDAR

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

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

30.1 Terrestrial Mobile LiDAR Mission Planning

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

30.2 Project Control Point Coordination

All efforts necessary to coordinate the proper placement of project ground control 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, and effort for Survey Effort.

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 and 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 Scope of Services.

30.15 Field Reviews

Perform on site review of maps.

30.16 Technical Meetings

Attend meetings as required by DEPARTMENT's Project Manager.

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 an assigned project to produce a final product.

31 ARCHITECTURE DEVELOPMENT

*As identified in a Task Work Order**: Refer to 31.T for AET and express lanes toll facilities design criteria per the current General Tolling Requirements (GTR).***

PRE-PHASE I - 10% DESIGN DEVELOPMENT

Note: This 10% Design Development phase section is NOT APPLICABLE for Toll Equipment Buildings that will be developed utilizing the Florida Turnpike Enterprise General Tolling Requirements (GTR) publication (unless directed by the DEPARTMENT with a Task Work Order).

Upon receipt of written authorization to proceed for a task work order from the DEPARTMENT, and based on the inclusion within Task Work Order Scope of Services, 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. *Unless otherwise provided, the CONSULTANT shall be responsible for achieving Silver level certification (or higher) under the LEED v4 BD+C standard. If LEED is not required for the project, this and all of the following LEED references will not be applicable.*
   8. *The DEPARTMENT, as a portion of the credits to be pursued and achieved, mandates the achievement of the following LEED Credit Points:*
      - ***a.*** *Credit: Integrative Process – Achieve one (1) point*
      - ***b.*** *WE Credit: Outdoor Water Use Reduction – Achieve two (2) points*
      - ***c.*** *WE Credit: Indoor Water Use Reduction - Achieve six (6) points (50% reduction).*
      - ***d.*** *EA Credit: Enhanced Commissioning – Achieve five (5) points (Option 1, Path1 and Option 2).*
      - ***e.*** *EA Credit Optimize Energy Performance – Achieve 15 points (a minimum of 38% energy savings).*
      - ***f.*** *MR Credit: Building Product Disclosure and Optimization, Environmental Product Declarations – Achieve one (1) point.*
      - ***g.*** *MR Credit: Building Product Disclosure and Optimization, Sourcing of Raw Materials – Achieve one (1) point.*
      - ***h.*** *MR Credit: Building Product Disclosure and Optimization, Material Ingredients – Achieve one (1) point.*
      - ***i.*** *MR Credit: Construction and Demolition Waste Management – Achieve two (2) points (75% waste diversion).*
      - ***j.*** *EQ Credit: Enhanced Indoor Air Quality Strategies – Achieve two (2) points.*
      - ***k.*** *EQ Credit: Low Emitting Materials – Achieve four (4) points.*
      - ***l.*** *EQ Credit: Construction Indoor Air Quality Management Plan – Achieve one (1) point.*
      - ***m.*** *EQ Credit Indoor Air Quality Assessment – Achieve two (2) points.*
      - ***n.*** *EQ Credit: Interior Lighting – Achieve two (2) points.*
      - ***o.*** *IN Credit: LEED Accredited Professional – Achieve one (1) point.*
   9. *Review and provide a Summary of LEED certification requirements.*
   10. *Develop LEED Owners Project Requirements (OPR) document.*
   11. *The deliverable is an Architectural Programming Report including LEED Documents.*

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, and including demolition if applicable).*
4. *Provide LEED Simple Box Energy Modeling and Preliminary Water Budget Analysis.*
5. *Conduct LEED Design Charrette. Provide meeting summary document.*
6. *Provide LEED Basis of Design (BOD) document.*
7. *Provide LEED Checklist indicating credits to be pursued.*
8. *Three Dimensional (3D) Perspective Sketches, and/or 3D Computer generated Exterior/Interior Renderings. The use of Building Information Modeling (BIM) is allowed to be used.*
9. *Schematic Design Interior Design Plans (Space and Furniture).*
10. *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 LEED requirement 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.

11. *Schematic Design Cost Estimate/Verification.*
12. *Preliminary Project Schedule Verification.*
13. *Preliminary Site and Building Code Analysis and Report.*
14. *Site and Building Permitting Coordination and Verification.*
15. *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.*
16. *The deliverable for this phase is an Architectural and Engineering Schematic Design (10%) Report with plans, schedule, cost estimate, and LEED information and LEED credit checklist.*

17. The site plan(s) shall be consistent with the land development requirements of the agency having jurisdiction, the programming and schematic architectural design and LEED analysis. The site plans shall be drawn at a standard civil scale and shall include

but not be limited to:

a. The location of all proposed improvements such as buildings, stormwater facilities, fueling facilities, vehicular parking and vehicular and pedestrian traffic circulation.

b. Site geometry, limits of pavement types, pavement markings and parking counts

c. Schematic water and sewer layouts depicting the locations of proposed building, site amenity and municipal connections.

d. Autoturn analysis for required vehicle movements

PHASE I - 30% DESIGN DEVELOPMENT

After receipt of written authorization to proceed *for a Task Work Order* from the DEPARTMENT and based on the approvals and any authorized adjustments to the Project Scope, Project Schedule or Budget, the *CONSULTANT* 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, *Interior Design, Structural, Electrical, and Mechanical* 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.
- Site plan with the LEED Boundary shown.
- A statement on the site plan signed and dated by the *CONSULTANT* or the *CONSULTANT's* 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 *CONSULTANT's* 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 LEED points and certification level; adjust attempted points as needed to meet target certification level, *as applicable*. *Provide updated Pre-Phase (10%) LEED documents*.

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

- Floor plan drawn at an architectural scale that will allow the entire facility to be shown on one sheet, without breaklines, and which indicates project phasing as applicable to the Scope.
- Floor plans drawn at 3/32 inch or larger scale showing typical occupied spaces or special rooms with dimensions, sanitary facilities, stairs, elevators, identification of

accessible areas for the disabled and other program requirements.

- Floor plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, indicating door and window layouts and other relevant features.
- For alterations or additions to an existing facility: Indicate the connections and tie-ins to the existing facilities, including all existing spaces, exits, plumbing fixtures and locations and any proposed changes thereto. Distinguish between new and existing areas for renovation, remodeling, or an addition and show demolition plans of areas to be removed.
- Furniture and Equipment plans drawn at 1/8 inch or larger scale showing typical spaces or special rooms with dimensions, equipment and furnishing layouts and other relevant features.
- Reflected ceiling plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, major lighting equipment and ceiling panel layouts.
- Roof and miscellaneous plans to be drawn at 3/32 inch or larger scale showing dimensioned features penetrations, equipment and other relevant features.
- Plumbing fixture locations and fixture unit calculations, isometrics, one line diagram and riser details, schedule of common fixtures and other relevant features.
- 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.
- Provide preliminary Fire Sprinkler floor plans.
- Mechanical Drawings to include ceiling plans with a single line duct layout, location of grease trap(s), LP gas tank location, natural gas piping 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 and electrical outlets for all major spaces. Show location 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.
- 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, *as applicable*.

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

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

- Floor plans of proposed vertical platform lifts including layout drawings showing corridor widths and exiting from the affected facility.
- Sketches of proposed inclined wheel chair lift to include layout drawings showing clear and affected areas of the following conditions stairway width in the folded and unfolded position, the upper and lower platform storage locations, and the means of egress from the affected areas of the facility.
- For all alterations, the CONSULTANT shall validate and show compliance by utilizing the applicable Florida Building Code, latest adopted edition.

- *Civil Site plan drawn at a standard civil scale to include but not be limited to:*
    - *Overall Site Plan(s) as noted in the Pre-Phase 1 10% Section above with any comments incorporated.*
    - *Geometry Plans that depict the site dimensional geometry, signing and pavement markings for the proposed improvement.*
    - *Grading Plans that depict the preliminary drainage patterns for the proposed improvements to include rough grading and flow arrows, the location of inlets and conveyance system elements such as piping and swales. The drawings shall also include the location and preliminary layout of stormwater management facilities and the location of the proposed control structure(s).*
    - *Utility Plans that depict the layout for water distribution and wastewater collection facilities. This shall include but not be limited to all lift stations, water and sewer piping, force mains, water wells and water storage tanks as necessary. Utility main sizes shall not be included.*
    - *General Notes*

Outline Specifications

- Organized to conform to the formats for outline specifications as established by the Construction Specifications Institute's (*CSI*) current edition of Master Format on the date of execution of the Contract.
- Complete for Divisions 2 through 16 for finishes, material, and systems including *LEED*, structural, HVAC, electrical, plumbing and specialty items, including fire sprinklers, alarm systems, electronic controls and computer networking components.

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. *The CONSULTANT is responsible for verifying with the DEPARTMENT and/or applicable agency if this is still required and/or current.*

- Design to meet or exceed *Florida Building Code, Energy Conservation, latest adopted edition (FBCEC)*. Submit completed FBCEC compliance forms, including calculations for mechanical systems, documenting energy efficiency ratio rating of HVAC equipment, electrical systems, insulation, and building envelope shall be submitted to the DEPARTMENT for review and approval.
- Provide building specific LEED energy modeling results demonstrating compliance with the LEED energy credits.
- The *CONSULTANT* 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 *49 (as applicable)*.
- Provide an updated Project Development Schedule reflecting development and anticipated schedules for all subsequent project activities.
- A letter indicating, the extent of any known or suspected asbestos containing materials or other potentially hazardous materials which might require mitigation by the *DEPARTMENT* prior to or during construction of the Project. Establish and confirm responsibility for removing the asbestos or other hazardous materials in the design development documents and coordinate with Project Development Schedule, Statement of Probable Construction Cost and other documentation.
- Preliminary color boards to review two (2) color selection schemes.
- 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 *CONSULTANT's* major technical disciplines, and subconsultants shall attend coordination, review and presentation meetings with the *DEPARTMENT* to explain the design concept and technical resolution of their respective building or site systems.

The *CONSULTANT* shall submit five (5) sets of all documents required under this phase without additional charge, for approval by the *DEPARTMENT*. The *CONSULTANT* shall not proceed with the next phase until the completion of all required presentations and reports and receipt of a written Authorization to Proceed with the next phase.

PHASE II - 60% DOCUMENTS:

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 the DEPARTMENT, the *CONSULTANT* shall

prepare for approval by the DEPARTMENT, Phase II (60% Construction) Documents setting forth in detail the requirements for the construction of the Project. The *CONSULTANT* 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 Building Code, Energy Conservation, latest adopted edition (FBCEC)* compliance forms.
- Calculations: Provide preliminary calculations for structural, mechanical, electrical *and Fire Sprinkler Hydraulic, water/fire distribution and wastewater collection* systems.
- Review of anticipated LEED points and certification level; adjust attempted points as needed to meet target certification level, *as applicable*. *Provide updated Phase I (30%) LEED documents*.
- *Updated LEED energy modeling reports demonstrating compliance with LEED energy credits*.

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 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.
- Water and fire distribution and wastewater collection system designs to include detailed design of all bends, connections, services, etc.
- 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, *as applicable*.
- Details of all curbing, typical parking spaces (regular and handicap accessible), handicap ramps, directional signage, site lighting, *landscape islands*, flagpole and fence foundations, and any other site conditions pertinent to the scope of work.
- LEED site credit requirements.

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 *including LEED landscape/hardscape credits*.

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

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.
- Include notes related to LEED demolition credit requirements and construction waste recycling.
- Demolition inventory and photo/video documentation, as applicable.

Elevations

- *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.*

Sections and Details

- *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.*

- *Provide section and detail drawings demonstrating continuous thermal and air barrier from roof to foundation.*

Reflected Ceiling Plans

- *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.

Interior Design Plans

- Large scale building details as appropriate to this level of document development and as required, establishing 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 *and compliance with LEED material and finish credit requirements.*

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 Drawings

- *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 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.
- Provide plumbing fixture cut sheets demonstrating compliance with LEED credit requirements.
- 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:

- Lighting including, circuiting and luminary identification and switching. Also provide illuminance computer print out 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. Also, provide for 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.
- LEED LPD (Lighting Power Density) analysis demonstrating compliance with LEED credits.

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 *DEPARTMENT* and edited by the *CONSULTANT* after consultation with the *DEPARTMENT* to establish project specific requirements. *Include Division 1 LEED specifications*.
- Include progress set of all other Sections in Divisions 2 to *49* with each section developed to demonstrate to the *DEPARTMENT* 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.

Schedule

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

Colorboards 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.

Quality Control

A letter from the *CONSULTANT* 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 *CONSULTANT's* major technical disciplines, and subconsultants shall attend coordination, review and presentation meetings with the *DEPARTMENT* to explain the design concept and technical resolution of their respective building or site systems.

Document Submittal

The *CONSULTANT* shall submit five (5) sets of all documents required under this phase without additional charge, for approval by the *DEPARTMENT*. The *CONSULTANT* shall not proceed with the next phase until the completion of all required presentations and reports and receipt of a written Authorization to Proceed with the next phase.

PHASE III - 90% 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 *CONSULTANT* shall prepare for approval by the DEPARTMENT, Phase III (90% Construction) Documents setting forth in detail the requirements for the construction of the Project. The *CONSULTANT* 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

- Updated Florida *Building Code, Energy Conservation, latest adopted edition (FBCEC)* 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 LEED points and certification level; adjust attempted points as needed to meet target certification level. *Provide updated Phase II (60%) LEED documents.*

Documents

- Updated Florida Building Code, Energy Conservation, latest adopted edition (FBCEC) compliance forms.
- Calculations: Provide final calculations for structural, mechanical, electrical and Fire Sprinkler Hydraulic systems.
- Review of anticipated LEED points and certification level; adjust attempted points as needed to meet target certification level, as applicable. Provide updated Phase I (60%) LEED documents.
- Updated LEED energy modeling reports demonstrating compliance with LEED energy credits.

Drawings

The drawings shall include all previous phase review requirements, and the Phase III 90% 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:

- LEED site credit requirements.
- Drawings include at a minimum, the following:
- Key sheets including a table of contents and statement of compliance by the design professional. Each discipline shall have a list of abbreviations, schedule of material indications, and schedule of notations and symbols at the beginning of their section of the plans.
- Architectural drawings including floor plans, door, window and finish schedules, roof plans, elevations, sections, and details.
- Civil/Structural drawings including paving, traffic loops, service drives, parking; drainage; foundation plans; floor plans; roof plans; structural plans; sections; details; and, pipe, culvert, beam and column schedules.
- Mechanical drawings including floor plans; sections; details; riser diagrams; kitchen exhaust hoods; and, equipment, fan, and fixture schedules.
- Fire Sprinkler floor plans; sections; details; riser diagrams.
- 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 *FBCEC*/LCCA analysis, have been incorporated into the documents.

Quality Control

Staff from each of the *CONSULTANT'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.

Document Submittal

The *CONSULTANT* shall submit five (5) sets of all documents required under this phase without additional charge, for approval by the *DEPARTMENT*. The *CONSULTANT* shall not proceed with the next phase until the completion of all required presentations and reports and receipt of a written Authorization to Proceed with the next phase.

PHASE IV 100% FINAL CONSTRUCTION DOCUMENTS SUBMITTAL:

After written Authorization to Proceed from the 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 the DEPARTMENT, the *CONSULTANT* shall prepare for approval by the DEPARTMENT, Phase IV (Final Construction) Documents setting forth in detail the requirements for the construction of the Project: The *CONSULTANT* 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

- 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, structural, *and Fire Sprinkler Hydraulic* systems in a separately bound manual.
- Updated Florida Building Code, Energy Conservation, latest adopted edition (FBCEC) compliance forms.
- Updated LEED energy modeling reports demonstrating compliance with LEED energy credits.
- Update anticipated LEED points and certification level; adjust attempted points as needed to meet target certification level. *Provide updated Phase III (90%) LEED documents.*

Drawings

The drawings shall include all previous phase review requirements, and the Phase IV 100% 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.
- *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 *FBCEC*/LCCA analysis, have been incorporated into the documents.

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

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 and Documents

31.1 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 Plan(s)

31.5 Site Plan(s)

31.6 Floor Plan(s) (small scale)

31.7 Floor Plan(s) (large scale)

31.8 Exterior Elevation(s)

31.9 Roof Plan(s)

31.10 Roof Details

31.11 Interior Elevation(s)

31.12 Rest Room Plan(s) (Enlarged)

31.13 Rest Room Elevation(s)

31.14 Building Section(s)

31.15 Stair Section, Enlarged Stair Plan and Details

31.16 Reflective Ceiling Plan(s)

31.17 Room Finish Schedule or Finish Plan

31.18 Door and Window Finish Schedule

31.19 Door Jamb Detail(s) and Window Details

31.20 Exterior Wall Section(s)

31.21 Interior Wall Section(s)

31.22 Overhead Door Detail(s)

31.23 Curtain Wall Detail(s)

31.24 Fascia, Soffit and Parapet Details

31.25 Signage Detail(s)

31.26 Miscellaneous Detail(s)

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 Package

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

<u>Structural Plans and Documents</u>

31.38 General Notes, Abbreviations, Symbols, and Legend

31.39 Foundation Plan(s) (Small Scale)

31.40 Foundation Plan(s) (Large Scale)

31.41 Slab Plan(s) (Small Scale)

31.42 Slab Plan(s) (Large Scale)

31.43 Slab Placement Plan(s)

31.44 Slab Placement Detail(s)

31.45 Foundation Section(s)

31.46 Foundation Detail(s)

31.47 Slab Section(s)

31.48 Slab Detail(s)

31.49 Roof Framing Plan(s) (Small Scale)

31.50 Roof Framing Plan(s) (Large Scale)

31.51 Roof Loading Plan(s) and Detail(s)

31.52 Roof Section(s)

31.53 Roof Detail(s)

31.54 Bearing Wall Section(s)

31.55 Bearing Wall Detail(s)

31.56 Column Section(s)

31.57 Column Detail(s)

31.58 Miscellaneous Sections

31.59 Repetitive Sheets

31.60 Other Pertinent Project Documentation

31.61 Cost Estimate

31.62 Technical Special Provisions Package

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

<u>Mechanical Plans and Documents</u>

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

31.69 Plan(s) (Small Scale)

31.70 Plan(s) (Large Scale)

31.71 Detail(s)

31.72 Section(s)

31.73 Piping Schematic(s)

31.74 Control Plan(s)

31.75 Schedule(s)

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 Package

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

<u>Plumbing Plans and Documents</u>

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

31.88 Plan(s) (Small Scale)

31.89 Plan(s) (Large Scale)

31.90 Isometric(s) (Large Scale)

31.91 Riser Diagram(s)

31.92 Detail(s)

31.93 Repetitive Sheets

31.94 Other Pertinent Project Documentation

31.95 Cost Estimate

31.96 Technical Special Provisions Package

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

<u>Fire Protection Plans and Documents</u>

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 Package

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

<u>Electrical Plans and Documents</u>

31.115 General Notes, Abbreviations, Symbols, Legend, and Code Issues

31.116 Electrical Site Plan

31.117 Lighting Plan(s)

31.118 Lighting Fixtures Schedule(s)

31.119 Lighting Fixtures Detail(s)

31.120 Lightning Protection Plan(s)

31.121 Lightning Protection Details

31.122 Power Plan(s)

31.123 Power Distribution Riser Diagram(s)

31.124 Panel Board Schedule(s)

31.125 Data Plan(s)

31.126 Data Detail(s)

31.127 Communication Plan(s)

31.128 Communication Detail(s)

31.129 Security Alarm System Plan(s)

31.130 Miscellaneous Detail(s)

31.131 Repetitive Sheets

31.132 Energy Analysis

31.133 Other Pertinent Project Documentation

31.134 Cost Estimate

31.135 Technical Special Provisions Package

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 LEED Certification *(Submittal Documents, Design and Construction Application submittals, USGBC comments and CONSULTANT responses, and USGBC Certification Letter)*

31.142 Coordination

31.143 Building Information Modeling (BIM)

Civil Plans and Documents

31.144 General Notes, Abbreviations, Symbols, and Legends

31.145 Overall Site Plan(s)

31.146 Enlarged Site Plan(s)

31.147 Grading and Drainage Plan(s) w/Details

31.148 Utility Plan(s) w/Details, Calculations and Models

31.149 Signing & Pav't Marking Plan(s)

31.150 Site Details

31.151 Technical Design Memos

31.152 Cost Estimate

31.153 Technical Special Provisions Package

31.154 Field Reviews

31.155 Technical Meetings

31.156 Quality Assurance/Quality Control

31.157 Coordination

31.158 Supervision

31.T ARCHITECTURE DEVELOPMENT (Toll Equipment Buildings)

Note: Toll Equipment Buildings will be developed utilizing the Florida Turnpike Enterprise General Tolling Requirements (GTR) publication. Refer to this Section for AET and express lanes toll facilities design criteria per the current General Tolling Requirements (GTR).

It is assumed that these Toll Equipment Buildings will not be required to achieve LEED certification because they will be either less than 1000 sf in size or unoccupied based on LEED v4 BD+C minimum requirements. If the building is larger than 1000 sf and occupied by a minimum of 1 full time employee, then LEED certification will be required. Follow the LEED requirements as outlined in section 31 Architecture Development.

The Consultant shall provide professional design services for tolling infrastructure per the current Florida's Turnpike Enterprise General Tolling Requirements (GTR), which is by this reference hereby incorporated into and made part of this scope.

The table below is a complement to the GTR and contains infrastructure types and quantities that are to be determined (TBD) by the Consultant.

Infrastructure Type & Quantity	***Tolling Point(s)***
	TBD
Gantry Type	*TBD*
Gantry Quantity	*TBD*
Pavement Type	*TBD*
Building Type	*TBD*
Building Quantity	*TBD*
E6 Reader Location	*TBD*

Building Communication Type	*TBD*
End-to-End Testing	*TBD*

The Consultant shall be responsible for preparing any necessary building permit(s) plans as required to obtain permits required for toll equipment buildings per the current GTR.

32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE

*As identified in a Task Work Order**:***

The DEPARTMENT will perform the services necessary to finalize the Design Traffic Noise Study. The CONSULTANT shall assist the DEPARTMENT in the process of completing the Traffic Noise Study, as directed and clarified by the DEPARTMENT and identified in Task Work Order Scope of Services.

32.1 Noise Analysis

The CONSULTANT shall provide the DEPARTMENT with the following information prior to initiation of the Traffic Noise Study to assure that the design noise modeling is completed using final design data:

- *The most recent electronic aerial photographs and the roadway design showing lane lines, median locations and shoulders. Stationing utilized by the CONSULTANT must be included with this data.*
- *Street names and reference names for neighborhoods as they would appear on any aerials developed for public involvement.*
- *Elevation data (e.g. cross sections) for all features within the existing and proposed right-of-way. Elevation data for the adjacent residential communities from spot elevation survey, or Water Management District elevation contours as an overlay on aerials. The CONSULTANT shall review existing elevation data and elevation data to be provided under Section 27 (Survey) to determine if elevations for roadways, existing berms/privacy walls/noise barriers, receptor points and ground elevation where noise barriers will be evaluated, etc. are sufficient to accurately perform the Design Phase noise analysis. In coordination with the DEPARTMENT, the CONSULTANT shall be responsible for determining the number and location of additional spot elevations needed to adequately simulate site specific conditions to ensure that modeled elevations are accurate.*

- *Location of existing and proposed right of way lines, and identification of any homes to be relocated.*

- *Locations of Mechanically Stabilized Earth (MSE) walls and bridge structures that would limit noise barrier heights as stipulated by Chapter 264 of the FDOT Design Manual.*

Locations of construction conflicts that may affect barrier placement. The information shall include, but not be limited to, drainage and utility conflicts, maintenance issues, environmental (e.g. wetland impacts) and safety issues (e.g. line of site).

32.2 Noise Barrier Evaluation

The CONSULTANT shall review the recommended noise barrier locations, lengths and heights determined by the DEPARTMENT and provide the DEPARTMENT with a final determination that no construction conflicts exist. As part of the evaluation, the CONSULTANT will prepare a summary package for distribution to various disciplines involved in the review. The CONSULTANT will be responsible for documenting any resolutions to engineering conflicts or issues that precluded the construction of a noise barrier. At a minimum, the review will consider the following:

- R/W needs including access rights (air, light, view, ingress/egress, outdoor advertising conflicts)
- Limited access issues
- Adequate easement for maintenance
- Design Review for construction and/or maintenance issues
- Structural and vegetative restrictions within easement
- Utility conflicts
- Drainage issues
- Safety Issues (e.g., line of site)
- Environmental Issues (e.g., wetland impacts)

If conflicts do exist, the DEPARTMENT will work with the CONSULTANT on modifications to alleviate the construction conflicts.

Once noise barrier locations are approved by the CONSULTANT, the DEPARTMENT will finalize the Noise Study Report. The CONSULTANT will include the noise barriers on the construction plans as shown in the Noise Study Report.

The CONSULTANT shall make a determination as to the accuracy of the elevation data needed to perform the Design Phase analysis and any noise barrier evaluation (Section 32.3). The CONSULTANT shall review existing elevation data and elevation data to be provided under Section 27 (Survey) to determine if elevations for roadways, existing berms/walls, receiver points and ground elevation where noise barrier(s) are evaluated, etc. are sufficient to accurately perform the Design Phase analysis. In coordination with the DEPARTMENT, the CONSULTANT shall

be responsible for determining the number and location of additional spot elevations needed to adequately simulate site specific conditions in the noise model to ensure that entered model elevations are within ±2 feet of actual/proposed. Assume up to twenty (20) spot elevations will be required unless a different number is agreed to by the DEPARTMENT.

32.3 Public Involvement

If noise barriers are determined to be reasonable and cost feasible and a commitment to provide noise abatement is made, the CONSULTANT shall work with the DEPARTMENT to carry out the Public Involvement necessary to determine whether or not the majority of benefited receptors desire the construction of a noise barrier. The CONSULTANT shall also work with the DEPARTMENT to coordinate with local government officials, as necessary. If supported by the public, the CONSULTANT shall design the noise barrier.

The CONSULTANT may also be required to conduct Public Meetings or Workshops to address general noise issues with adjacent property owners. The number of meetings is project-specific, as detailed in Task Work Order.

For all meetings, The CONSULTANT is responsible for preparing all necessary display items or handouts, arranging meeting locations, notifying the public of the meetings and conducting the meetings. The number of meetings is project-specific, as detailed in the Task Work Order.

The CONSULTANT shall bring to the attention of the DEPARTMENT unforeseen information and issues which are relevant to the Project decision.

The CONSULTANT shall conduct a Public Hearing as identified in Section 32.4 of this Scope, as required.

32.4 Outdoor Advertising Identification

The CONSULTANT shall identify any outdoor advertising signs that may be affected by project noise barriers and follow all requirements of Chapter 479.25, Florida Statutes. The CONSULTANT shall use the Outdoor Advertising database found at http://www2.dot.state.fl.us/rightofway/default.aspx to determine if the sign is legally permitted by FDOT. If the sign is found to be legally permitted and the view of the sign from the highway will be obscured, then the CONSULTANT shall schedule and hold a public hearing in accordance with F.S. 335.02(1) within the boundaries of the affected local governments or local jurisdictions to receive input on the proposed noise attenuation barrier and its conflict with the local ordinance or land development regulation. This public hearing may be held concurrently with other public hearings scheduled for the assigned project or it may be scheduled separately. The CONSULTANT shall be responsible for all work efforts associated with this public hearing, including, but not limited to, preparation of survey forms, mailing lists, survey packages, display information, advertising the public hearing, procurement of a court reporter and notifying the local government or local jurisdiction of the date and time of the public hearing.

If a potential noise barrier is favored by the affected property owners following the public hearing, the CONSULTANT will be responsible for providing this information to the local government or local jurisdiction for their action.

32.5 Noise Study Report (NSR) Addendum

Once noise barrier locations are approved by the CONSULTANT, the DEPARTMENT will finalize the Design Phase Noise Study Report.

32.6 Technical Meetings

Prior to DEPARTMENT beginning the noise barrier analysis, the CONSULTANT shall meet with the DEPARTMENT's Project Manager and *FTE's Noise Specialist*. *The purpose of this meeting is to provide information to the CONSULTANT that will better coordinate the noise barrier analysis efforts. This meeting is MANDATORY and is to occur after the Notice to Proceed is given to the CONSULTANT and before beginning the noise barrier analysis. In addition, the CONSULTANT may be asked to participate in meetings with appropriate DEPARTMENT staff (Project Manager and Noise Specialist) to facilitate coordination of the noise barrier analysis decisions.*

32.7 Quality Assurance/Quality Control

32.8 Supervision

32.9 Coordination

32.10 Barrier Material

The CONSULTANT shall make a recommendation to the DEPARTMENT on proprietary products approved and included in the Qualified Products List that meet the project requirements and that will eventually be listed in the plans. *The plans should note the available noise barrier materials (approved for inclusion in the Qualified Products List) that will meet the project and aesthetic requirements.*

32.11 Other (Noise Barrier Analysis)

32.12 Field Reviews

Field reviews will be conducted by the CONSULTANT and shall include, but not be limited to:

Verify the appropriateness of providing noise barriers at a given location and to verify that the placement of a noise barrier will be consistent with DEPARTMENT requirements for sight distance, utility clearances, construction, and maintenance.

Verify land use changes and building permits with respect to an *assigned* Project's date of Public Knowledge.

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS

As identified in a Task Work Order:

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

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

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

33.1 ITS Analysis

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

FTE operates two (2) TMCs; one (1) in the Turkey Lake Service Plaza, the other within the Pompano Beach Operations Center. In addition, FTE 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. *The*

existing field infrastructure is comprised of power and communications infrastructure as well as a range of ITS devices including Highway Advisory Radio (HAR), Citizens Band Radio Advisory Subsystem (CBRAS), Travel Time System (TTS), Closed Circuit Television (CCTV), Dynamic Message Signs (DMS), Arterial Dynamic Message Signs (ADMS) and Vehicle Detection System (VDS).

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

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

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

The CONSULTANT shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the *assigned* Project. The CONSULTANT shall coordinate with *Florida's Turnpike Enterprise's* Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures.

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 an *assigned* project such that all ITS field devices and ancillary components comply with FDOT's Approved Product List (APL) / *Qualified Product List (QPL)* and the existing list of devices and components are supported within the SunGuide® software, *unless otherwise approved by the DEPARTMENT*.

Closed Circuit Television (CCTV) Camera Assembly

The CONSULTANT shall be responsible for the design and exact field locations for the CCTV camera assemblies. The camera subsystem shall provide overlapping coverage to overcome visual blockage. *Effort should be made to provide viewing in all directions at interchanges*. Camera assemblies may include a camera lowering device (CLD) *at all locations*.

The camera subsystem shall be designed to provide additional benefits such as the monitoring of DMS operations and security surveillance of critical infrastructure

elements. *A stand-alone DMS confirmation camera shall be designed and installed to support TMC operations to verify and confirm the posted DMS messages, if required by the DEPARTMENT*. The position, height, and design of each camera pole shall be finalized during the design phase of the *assigned* project. Each site shall be designed for overall monitoring capability, as well as designed to provide safe and effective maintenance conditions.

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

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

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

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

Vehicle Detection Subsystem

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

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

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

Vehicle detectors must meet the *assigned* Project's requirements under all environmental and traffic conditions expected for the corridors. The detection system shall produce accurate volume, speed and occupancy data for all corridor traffic operation conditions. The CONSULTANT design must limit the likelihood of

occlusions, other blocking of vehicles and adjacent lanes detection that degrade the detection system performance below specified accuracy. Design the system so that signs, walls, guardrails, and other physical elements do not degrade detection performance.

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

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

The detectors will be used to capture volume and speed information for each of the express lanes within the corridor. In addition, the detectors can be used to capture traffic information for the general use lanes.

The CONSULTANT shall be responsible for the design of a vehicle time detection system that allows travel times to be automatically calculated for roadway facilities. The travel time system may utilize a variety of vehicle detection systems, including loop, video and microwave. The system shall utilize the *assigned* project communications backbone in order to collect and distribute travel time data to the TMCs.

The CONSULTANT shall include Bluetooth based travel time systems for the corridor. Bluetooth travel time system devices shall be installed per manufacturer's recommendations.

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

Highway Advisory Radio Subsystem

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

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

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

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

The CONSULTANT shall submit maps to the FDOT indicating the coverage of the HAR stations for the proposed station locations. The site locations of the HAR stations shall consider all factors associated with the HAR system. The HAR coverage shall take into consideration interference from adjacent frequencies, the time required by the drivers to listen to the message, make decisions to change lanes, and change lanes to exit at the diversion point.

All HAR subsystem functions shall be controllable from the TMC.

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

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

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

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

Citizens Band Radio Advisory Subsystem (CBRAS)

The CONSULTANT shall be responsible for the design of the citizens band radio advisory system (CBRAS) subsystem to be managed from the FDOT TMC and broadcast to provide continuous coverage of the CB Radio Channel 19 with existing area stations. The system shall be designed to ensure against the transmission of erroneous data.

The CBRAS subsystem shall operate on a clear frequency without interference from

adjacent frequencies, during both daytime and nighttime conditions.

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

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

The CONSULTANT shall submit maps to FDOT indicating the coverage of the CBRAS stations for the proposed station locations. The site locations of the CBRAS stations shall consider all factors associated with the CBRAS system. The CBRAS coverage shall take into consideration interference from adjacent frequencies, the time required by the drivers to listen to the message, make decisions to change lanes, and change lanes to exit at the diversion point.

All CBRAS subsystem functions shall be controllable from the TMC. CBRAS locations shall require a dedicated power supply and radio controller, but shall be co-located with existing or proposed CCTV sites and will connect to the Turnpike TMC via existing or proposed fiber optic cable.

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

The CBRAS subsystems shall be designed in accordance with the applicable FDOT Specifications for Road and Bridge Construction.

Dynamic Message Sign Subsystem

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

The position of each DMS shall be finalized during the design phase of the *assigned* project. The CONSULTANT shall select DMS technology, type, and display to meet the *assigned* 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 *assigned* project communications system shall enable full control of the DMS from the TMC facilities. All DMS hardware, software and related infrastructure components shall be fully compatible SunGuide® software. All DMS shall include a dedicated confirmation camera that allows for visual verification of the messages posted on the DMS by a TMC Operator as required by *Florida's Turnpike Enterprise.*

All DMS/ADMS shall include a dedicated confirmation camera that can be mounted

to the DMS/ADMS structure; this will allow for visual verification of the messages posted on the DMS/ADMS by a TMC Operator as required by FTE.

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

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

Roadway Weather Information Systems (RWIS)

The CONSULTANT shall develop technical special provisions for RWIS based upon the unique needs of an *assigned* project. The CONSULTANT shall ensure that, each RWIS site consists of a Remote Procession Unit (RPU), communication hardware, and determine the site specific components as required below:

Fog/Smoke Detection sensor;

Classifying Precipitation;

Precipitation Occurrence Sensor;

Air Temperature/Relative Humidity Sensor;

Wind Speed and Direction Sensor;

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

Communication hardware.

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

33.2 Communications

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

analysis and recommendations, needs assessment, and provide recommendations regarding minimum requirements, media, network devices, protocols, network topology, communication redundancy, future needs, spare capacity, and any communications or data sharing with other agencies.

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

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

If the project will impact the Fiber Optic Cable backbone and there is a need to replace the conduits and cable along the corridor, the CONSULTANT shall discuss the fiber count with FTE to determine replacement upgrades to the backbone. In many cases, FTE will want to utilize 144 single-mode (SM) FOC (as an example).

33.3 Grounding and Lightning Protection

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

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

33.4 Power Subsystem

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

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

33.5 Voltage Drop Calculations

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

33.6 Design Documentation

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

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

33.7 Existing ITS

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

33.8 Queue Analysis

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

33.9 Reference and Master ITS Design File

The CONSULTANT shall prepare the ITS design file to include all necessary design elements and the reference files for topo, R/W roadway, utilities files, etc. This effort

includes the design and layout of proposed ITS devices, including but not limited to: CCTV / Detection poles, DMS, detection devices, advanced traffic controllers, conduit, cabinet-related pull boxes, service points, fiber optic sizing, and communications hubs. All existing ITS infrastructure shall be referenced to the new ITS plan sheets (if applicable).

33.10 Reference and Master Communications Design File

The CONSULTANT shall prepare the communication design file to include all necessary design elements and all associated reference files as well as reference files of topo, R/W, roadway, utilities files, existing ITS communications infrastructure, etc. This effort includes design and layout of proposed communications conduit, cabinet, pull boxes, splice boxes, standard route markers, communications plan overview, fiber optic splicing, connections, communications hubs, etc.

33.11 Pole Elevation Analysis

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

33.12 Sign Panel Design Analysis

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

33.13 Quantities

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

33.14 Cost Estimate

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

33.15 Technical Special Provisions

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

33.16 Other ITS Analyses

The CONSULTANT shall develop additional analysis as requested and detailed by the DEPARTMENT. Examples of this may include TMC work space analysis, Travel Time System layout and validation reports, or other similar efforts and will be identified in the Task Work Order scope.

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 an *assigned* project including, but not limited to, the following:

- Existing ITS Field Devices as compared with the latest FDOT standards and *Florida's Turnpike Enterprise's* 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 DEPARTMENT Standards
- Underground Infrastructure
- Proximity of other utilities
- Traffic Operations
- Any other field reconnaissance as necessary to develop a complete ITS design package

33.18 Technical Meetings

The CONSULTANT shall attend meetings as necessary support the *assigned* 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 this *Agreement*. 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 assigned project*. The CONSULTANT shall utilize the DEPARTMENT'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, Geotechnical, Drainage, Structures, Lighting, Roadway Design, Utilities, municipalities, maintaining agencies and Traffic Operations to produce a final set of construction contract documents and to ensure that a high degree of accuracy for the design plans is achieved.

34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS

As identified in a Task Work Order:

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

34.1 Key Sheet

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

MUTCD

Standard Specs

Standard Index

34.2 Summary of Pay Items *Obtained from* TRNS*PORT Input

The CONSULTANT shall include TRNS*PORT *provided data* and create the CADD generated sheet.

34.3 Tabulation of Quantities

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

34.4 General Notes / Pay Item Notes

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

34.5 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 with SunGuide nomenclature, and plan sheet coverage.

34.6 Typical and Special Details

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

34.7 Plan Sheet

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

34.8 ITS Communications Plans

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

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

Any work which will impact the network connectivity shall incorporate a Maintenance of Communications (MOC) Plan. *Coordinate with the DEPARTMENT to identify a suitable field infrastructure, weighing benefit costs for various alternatives, however, understand the MOC shall generally be in accordance with the requirements of the General Tolling Requirements (GTR), and shall not use wireless networks, improperly supported or protected fiber optic cabling, nor leased line services.*

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 *DEPARTMENT's* requirements.

The CONSULTANT is responsible for the design of the communication infrastructure and its integration with the DEPARTMENT's communication system. Additionally, the CONSULTANT shall determine the most cost effective, best performing, communication connectivity option. The communication system must allow command and control as well as data and video transmission between the field devices and the TMCs at location *as defined in a Task Work Order Scope of Services.*

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

34.9 Fiber Optic Splice Diagrams

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.

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

34.11 Cross Sections

The CONSULTANT shall prepare cross sections for ITS devices.

34.12 Guide Sign Work Sheet(s)

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

34.13 Special Service Point Details

The CONSULTANT shall design any special service point and electrical distribution system beyond the electric utility company's service point. The plan shall depict

with pay items, general and plan notes the locations of transformers, switches, disconnects, conduits, pull boxes and power conductors. The plans shall identify the location of underground and overhead service points with identifying pole and transformer numbers.

34.14 Strain Pole Schedule

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

34.15 Overhead / Cantilever Sign Structure

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

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

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

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

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

34.17 Traffic Control Plans

The CONSULTANT shall prepare Traffic Control Plans (TCP) to minimize impact to traffic during the construction of ITS field devices and associated communications infrastructure that will be deployed along the *assigned* Project's corridor.

The TCP shall strive to maintain and sustain center-to-field device connectivity and operability to the ITS field devices previously deployed along the *assigned* project corridor. The TCP effort shall consider and mitigate the impacts of the *assigned* Project's various construction phases so as to sustain center-to-field devices connectivity and operability, maintaining operational quality as a minimum at the

level provided prior to construction start and minimizing down time as much as possible. The CONSULTANT shall develop the TCP sheets for the *assigned* project, providing temporary communications as necessary, notes, details, and direction applicable to the ITS elements and associated communications for inclusion in the TCP.

The CONSULTANT shall review the existing TMC Operations and develop additional incident management service requirements as necessary to support during the Construction Phase of the *assigned* project. The CONSULTANT shall coordinate with *Florida's Turnpike Enterprise's* Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures.

34.18 Interim Standards

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

34.19 GIS Data and Asset Management Requirements

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

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

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

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

34.20 Quality Assurance / Quality Control

The CONSULTANT shall utilize the DEPARTMENT's quality control checklist for traffic design drawings in addition to the QC effort described in section 3.

34.21 Supervision

The CONSULTANT shall supervise all technical design activities.

35 GEOTECHNICAL

As identified in a Task Work Order:

The CONSULTANT shall, for each *assigned* 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 *Florida's Turnpike Enterprise's* Geotechnical Engineer. *Florida's Turnpike Enterprise's* 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 *Florida's Turnpike Enterprise'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 *assigned* 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

The 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 United States Geological Survey (U.S.G.S.), Soil Conservation Service (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 *Florida's Turnpike Enterprise's* Geotechnical Engineer.

Obtain pavement cores as directed in writing by the *Florida's Turnpike Enterprise's Geotechnical Engineer and coordinated with Florida's Turnpike Enterprise's Roadway Engineer*.

If required by the *Florida Turnpike Enterprise's* 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 CONSULTANT to assist in setting roadway grades and locating potential problem areas. The preliminary roadway exploration shall be performed as directed in writing by the *Florida's Turnpike Enterprise's* Geotechnical Engineer.

The CONSULTANT shall perform specialized field-testing as required by project needs and as directed in writing by the *Florida's Turnpike Enterprise's* 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 *Florida Turnpike Enterprise'*s Geotechnical Engineer 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 MOT Plans for Field Investigation

Coordinate and develop Maintenance of Traffic (MOT) plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Roadway and Traffic Design Standards Index 600 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 DEPARTMENT 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 an *assigned* 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 CONSULTANT 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 *Engineer of Record (EOR)* guidance on the radius to review existing structures for monitoring.

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

35.20 Stormwater Volume Recovery and/or Background Seepage Analysis

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

35.21 Geotechnical Recommendations

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

35.22 Pavement Condition Survey and Pavement Evaluation Report

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 Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.24 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 Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.25 Auger Boring Drafting

Draft auger borings as directed by the DEPARTMENT.

35.26 SPT Boring Drafting

Draft SPT borings as directed by the DEPARTMENT.

<u>Structures</u>

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 *Florida's Turnpike Enterprise's* Geotechnical Engineer.

The CONSULTANT shall perform specialized field-testing as required by the needs of project and as directed in writing by the *Florida's Turnpike Enterprise's* Geotechnical Engineer.

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

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

35.27 Develop Detailed Boring Location Plan

Develop a detailed boring location plan. Meet with *Florida's Turnpike Enterprise's* Geotechnical Engineer 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 MOT Plans for Field Investigation

Coordinate and develop MOT plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Roadway and Traffic Design Standards Index 600 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 an *assigned* 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:

- Geosynthetic Reinforced Soil Integrated Bridge System (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's* 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.
- The CONSULTANT shall assist the *CONSULTANT's Structural Engineer* 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 *CONSULTANT's Structural Engineer* 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 *CONSULTANT's Structural Engineer* 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 *CONSULTANT's Structural Engineer* 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 *CONSULTANT's Structural Engineer* 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 Standard Penetration Test (SPT) and Cone Penetrating Test (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 *Florida's Turnpike Enterprise's* Project Manager for review prior to project completion. After review by the *Florida's Turnpike Enterprise's* Geotechnical Engineer, the reports will be submitted to the *Florida's Turnpike Enterprise's* Project Manager in final form and will include the following:

- All original plan sheets (11" x 17")
- One (1) set of all plan and specification documents, in electronic format, according to DEPARTMENT requirements
- Two (2) sets of record prints
- Six (6) sets of any special provisions
- All reference and support documentation used in preparation of contract plans package

Additional final reports, up to four (4), 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

As identified in each project assigned under a Task Work Order.

35.50 Technical 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

35.56 Optional Preliminary Contamination Assessment

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*.

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 *Task Work Order assignments*. 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 *contract* remain with the DEPARTMENT's Project Manager.

36.2 Key Personnel

The CONSULTANT's work shall be performed and directed by the key personnel identified in the proposal presentations by the CONSULTANT. Any changes in the indicated personnel shall be subject to review and approval by DEPARTMENT.

36.3 Progress Reporting

The CONSULTANT shall meet with the DEPARTMENT as required and shall provide a written monthly progress report with approved schedule, schedule status, and payout curve or by using the earned value method that describe the work performed on each task. The report will include assessing project risk through monthly documentation of identifying and updating the risk category and approach for monitoring those tasks. Invoices shall be submitted after the DEPARTMENT approves the monthly progress report and the payout curve or with earned value analysis. The DEPARTMENT's 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 Agreement shall be provided to the DEPARTMENT for their records within one (1) week of the receipt or mailing of said correspondence.

36.5 Professional Endorsement

The CONSULTANT shall have a Licensed Professional Engineer in the State of Florida sign and seal all reports, documents, technical special provisions, and plans as required by DEPARTMENT standards.

36.6 Computer Automation

Each project assigned under a Task Work Order 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 DEPARTMENT's 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, if and when required, 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 a Task Work Order in accordance with paragraph 2.00 of the Standard Professional Services 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 Exhibit "B", Method of Compensation of this *Agreement.* Invoices shall be submitted to the DEPARTMENT, in a format prescribed by the DEPARTMENT. The DEPARTMENT's 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.