EXHIBIT A

SCOPE OF SERVICES

FOR

FINANCIAL PROJECT ID: 445936-1-32-01 & 445392-1-32-01

FEDERAL PROJECT NOS. D722-049-B (DESIGN ONLY) & N/A (DESIGN ONLY)

US 301/SR 43 FROM S. OF BALM RD./PASEO AL MAR BLVD. TO S. OF WHITT RD. &

US 301/SR 43 AT SYMMES RD.

DISTRICT SEVEN

HILLSBOROUGH COUNTY

Revised: 06/16/22
06/13/22

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

This Exhibit forms an integral part of the agreement between the State of Florida Department of Transportation (hereinafter referred to as the DEPARTMENT or FDOT) and _____ (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID:	***445936-1-32-01 & 445392-1-32-01***
Federal Aid Project No.:	***D722-049-B & N/A (Design Only)***
County Section No.:	***10010 000***
Description:	***US 301/SR 43 from S. of Balm Rd./Paseo Al Mar Blvd. to S. of Whitt Rd. & US 301/SR 43 at Symmes Rd.*** ***Hillsborough County***
Bridge No(s):	***100009, 100736, 100737 for 445936-1; N/A for 445392-1***
Railroad Crossing No(s):	***N/A***
Context Classification:	***C3C (445936-1 MP 9.530-10.877, 11.455-12.133, 14.440-15.409); C3R (445936-1 MP 12.133-13.910); C4 Urban (445392-1 MP 13.910-14.440)***

1 PURPOSE

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

Major Work Mix includes: ***Resurfacing (445936-1); Rigid Pavement Rehabilitation (445392-1)***
Major Work Types include: ***3.1***
Minor Work Types include: ***4.1.1, 6.1*, 6.3.1*, 7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 9.1, 9.2, 9.4.1 *Optional Services only.***

Known Alternative/***Innovative*** Construction Contracting Methods: ***None at this time***

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

The Scope of Services establishes which items of work in the FDOT Design Manual and other pertinent manuals are specifically prescribed to accomplish the work included in this contract, and also indicates which items of work will be the responsibility of the CONSULTANT and/or the DEPARTMENT. ***Where a type of service is noted herein to be provided by the DEPARTMENT, the CONSULTANT shall communicate to the DEPARTMENT in writing the specific nature of such DEPARTMENT services as are necessary to support the CONSULTANT's responsibilities under this contract, and shall do so by such time as will support the DEPARTMENT's original project schedule or any subsequent DEPARTMENT-approved revisions thereto.***

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

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

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

2a PROJECT DESCRIPTION (445936-1-32-01)

The CONSULTANT shall investigate the status of the project and become familiar with concepts and commitments (typical sections, alignments, etc.) developed from prior studies and/or activities***, including applicable documents at http://fdotd7studies.com***. 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 ***noted herein or*** directed by the DEPARTMENT.

This segment of US 301/SR 43 from S. of Balm Rd./Paseo Al Mar Blvd. to S. of Whitt Rd. in Hillsborough County is an urban principle arterial other. Two segments are exempted out of this project FP ID and are included under FP ID 443428-1-52-01 and FP ID 445392-1-52-01. Project FP ID 443428-1-52-01 covers work at the Big Bend Road intersection. Project FP ID 445392-1-52-01 covers work at the Symmes Road intersection and is included with FP ID 445936-1-52-01 as a goes-with project. Project FP ID 445936-1-52-01 is the lead project. The improvements to this roadway segment, FP ID 445936-1-52-01, generally include milling and resurfacing and performing general safety modification work.

At the option of the CONSULTANT with the approval of the DEPARTMENT Project Manager, this project may be designed and delivered using a DEPARTMENT supported Autodesk CADD Platform or Bentley CADD Platform shown at the following link: https://www.fdot.gov/cadd/main/version/currentversions.shtm In either case, the project shall be designed, delivered and signed and sealed in compliance with the DEPARTMENT's CADD Manual. The DEPARTMENT provides a "State Kit" for both Autodesk and Bentley products that can be downloaded from https://www.fdot.gov/cadd/downloads/software/software.shtm.

The CONSULTANT shall deliver a Three-Dimensional (3D) Model of the design project in accordance with the specifications/criteria defined within the CADD Manual, specifically in Chapter 5 (Section 5.16).

In the event any of this project's proposed improvements are funded for construction with non-resurfacing funds (other than FM Program Code 05), those improvements alone shall be constructed under FP ID 445936-1-52-02 (Work Program Sequence* 02 or higher), while all other project improvements shall be constructed under FP ID 445936-1-52-01 (Work Program Sequence* 01). In this case, two or more separate LRE files and later two or more separate AASHTOWare Project Preconstruction files shall be prepared to accommodate this division of work. *Not to be confused with a Work Program Segment (seventh digit of the FP ID number); does not constitute separate projects, nor necessitate separate plans).

2a.1 Project General and Roadway (Activities 3, 4 and 5)

Public Involvement: ***The project's initial Community Awareness Plan is provided by the DEPARTMENT and located at***

https://www.ftp.fdot.gov/file/d/FTP/FDOT%20LTS/D7/Development/ProjMgmt/ProjectIntelligence/445936-1/PublicInv-CAP/.

The CONSULTANT does not need to prepare the initial Community Awareness Plan. See Section 3.1 for implementation of the Plan and other Public Involvement aspects of the project, including which entity is responsible for each such aspect.

Other Agency Presentations/Meetings: ***See Section 3.1.11***

Joint Project Agreements: ***N/A***

Specification Package Preparation: ***The CONSULTANT shall prepare the specifications package. The effort will be considered normal.***

Value Engineering: ***N/A***

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

Plan Type: ***The roadway plans shall be prepared in a Plan format. Profile sheets shall be provided, if necessary, to show the vertical controls that are needed for the construction of these projects. The plan (and profile) sheets shall be plotted at a horizontal scale of 1" = 40'.***

Limits: US 301/SR 43 from south of Balm Road/Paseo Al Mar Boulevard (MP 9.530) to south of Whitt Road (MP 15.409). The Big Bend Road intersection (MP 10.877 to MP 11.455) is exempted out. The Symmes Road intersection (MP 13.910 to MP 14.440) is exempted out. Project Length = 4.771 miles.

Typical Section:
Milling and resurfacing of US 301/SR 43 from south of Balm Road/Paseo Al Mar Boulevard to south of Whitt Road with 6 lane suburban divided roadway with paved shoulders. There are 12 foot travel lanes with 8-6 foot shoulders (6-4 foot paved) in both directions. Existing 5 foot sidewalk in southbound direction and 12 foot paved shared use path in northbound direction. The posted speed from south of Balm Road/Paseo Al Mar Boulevard to north of Ambleside Boulevard varies from 45-55 mph, the posted speed from south of Summerview Circle to south of Berner Lane is 55 mph, and the posted speed from south of Berner Lane to south of Whitt Road varies from 55-45 mph.

Any functional obsolescence issues associated with the bridge deck(s) (deficient typical section features; not to be confused with structural deficiency) must be resolved by the project, unless the necessary design variations/exceptions are granted; otherwise, the bridge(s) cannot be excepted out of the project limits to avoid the functional obsolescence issue, unless a separate Item-Segment number project (unique first seven FP ID digits) is created to address the issue (may be designed by others). The absence of any such functional obsolescence issues must be verified and documented in the project file. If any construction contractor work is proposed on the bridges, including new deck pavement markings (end treatment upgrades excluded), the bridge milepost range(s) must remain within the formal begin and end project limits.

For all urban designs, offset left-turn lanes should be employed where the median width is greater than 18 feet. A four foot wide traffic separator should be employed when possible to channelize the left-turn movements and provide separation from opposing traffic. At rural intersections where high turning movements occur, offset left-turn lanes should also be considered.

Where the median width is 30 feet or less, an offset left-turn lane parallel to the through lane should be employed, and the area between the left-turn lane and the through lane where vehicles are moving in the same direction should be channelized with pavement markings. Where the median width is greater than 30 feet, a tapered offset should be considered.

The CONSULTANT shall evaluate the Safety Assessment Report (SAR) prepared by the DEPARTMENT for the project and advise the DEPARTMENT in writing regarding the design feasibility of implementing each of the report's recommendations within the constraints of a resurfacing project and its funding source. The CONSULTANT shall then implement any DEPARTMENT-approved recommendations in the design of the project. The recommendations can be provided with the 3R Design Report.

Pavement Design: ***The CONSULTANT shall provide pavement designs for milling and resurfacing for the mainline.***

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

Cross Slope: ***The CONSULTANT shall evaluate the existing roadway cross slopes and make recommendations for correction.***

Access Management Classification: ***3***

Transit Route Features: ***On an existing or planned (adopted) bus route roadway, coordinate with the transit agency and design as requested their proposed engineering and right-of-way-feasible, ADA-compliant bus landing pads, rider shelter pads and incidental universal sidewalk connections, etc. All transit agency contact shall be coordinated in advance with the DEPARTMENT's Public Transit Coordinator.***

Major Intersections/Interchanges:

1. ***Paseo Al Mar Boulevard/Balm Road***
2. ***Summerfield Crossing Boulevard***
3. ***Southern Pointe Boulevard/Panther Trace Boulevard***
4. ***Rhodine Road***
5. ***Lake Montauk Drive***

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

Level of TTCP Plans: ***I***

Temporary Signals: ***N/A***

Temporary Lighting: ***N/A***

Temporary Drainage: ***N/A or Some activities proposed by this project will necessitate temporary drainage. Temporary drainage design shall be performed to ensure the project site drains adequately during all phases of construction. The placement of temporary traffic control devices shall be reviewed to ensure that conveyance of runoff is not impeded.***

Design Variations/Exceptions: ***Design variation and/or exception requests shall be prepared for any situations not meeting current DEPARTMENT and/or FHWA requirements, as appropriate. The CONSULTANT shall prepare design Variation and Exception reports for the purpose of estimating design and construction needs based on initial observations. The CONSULTANT shall recommend, to the DEPARTMENT, either correction of any deficiencies, or obtaining the appropriate design variations or exceptions, including applicable benefit-cost analyses, in***

accordance with DEPARTMENT procedures. Currently known or suspected features requiring analysis include: Front and back slope, shared use path and sidewalk separation from roadway, cross slope

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

Selective Clearing and Grubbing: ***N/A***

2a.2 Drainage (Activities 6a and 6b)

System Type:

This segment of US 301/SR 43 is from S. of Balm Rd./Paseo Al Mar Blvd. to S. of Whitt Rd. in Hillsborough County. Two segments are exempted out of this project FP ID and are included under FP ID 443428-1-52-01 and FP ID 445392-1-52-01. Project FP ID 443428-1-52-01 covers work at the Big Bend Road intersection. Project FP ID 445392-1-52-01 covers work at the Symmes Road intersection and is included with FP ID 445936-1-52-01 as a goes-with project. Project FP ID 445936-1-52-01 is the lead project. The improvements to this roadway segment, FP ID 445936-1-52-01, generally include milling and resurfacing and performing general safety modification work. The existing drainage consists of shoulder gutter with inlets, a minor section of curb and gutter with curb inlets and roadside ditches with DBI.

The project lies within Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) map numbers 12057C0515H, 12057C0504J and 12057C0502J. A small portion of the roadway from approximately Tucker Jones Road to Missouri Avenue is within the floodplain however the project improvements should not impact the floodplain. There are two FEMA floodways at Little Bullfrog Creek and Tadpole Creek. The final determination of any floodplain impacts shall be the responsibility of the CONSULTANT and shall be documented in the drainage report.

There are numerous cross drains within the project limits, ranging in size from 24" to 12' x 5' CBC in size. No cross drain extensions are anticipated due to the project improvements. The exact number of cross drains and potential cross drain extensions shall be determined by the CONSULTANT.

There are three active flooding complaints within the project limits; 100615200924, 1009162009280, and 1005042009874. The Consultant should evaluate these flooding areas and determine whether any drainage improvements can appropriately be incorporated to the project if necessary.

The CONSULTANT is responsible for the final determination of the number and size of cross drains, side drains, WBIDs, permitted SMF's, and permitting requirements within the project limits.

The CONSULTANT shall notify the DEPARTMENT if video inspection of the storm sewer system is recommended. Video inspection services will be performed by others under the DEPARTMENT's Districtwide video inspection contract. Within three weeks following the Notice-To-Proceed, the CONSULTANT shall provide to the DEPARTMENT figures showing the locations of the pipes to be inspected, and shall quantify the length and pipe sizes for the required work. Prior to the first phase submittal of plans, the CONSULTANT shall review the inspection report and provide to the DEPARTMENT recommendations and construction cost estimates for any pipe repair. The design implementation of any approved recommendations not included in this Scope of Services may be added to the Agreement as an Optional Service.

2a.3 Utilities Coordination (Activity 7)

Activities and requirements in this section will also apply to FPID 445392-1-32-01. See Section 2b.3.

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

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

The CONSULTANT may employ more than one individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. ***In this scope,*** this person shall be referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal ***using an approved classification in the FDOT Negotiation Handbook for Professional Services Contracts***. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the FDOT District Utilities Administrator that they have the following knowledge, skills, and expertise:

- A minimum of 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 District utility coordination process.
- A thorough knowledge of FDOT agreements, standards, policies, and procedures.

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

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

- Prepare, review and process all utility related reimbursable paperwork inclusive of betterment and salvage determination.

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

Utilities anticipated on the project: ***The DEPARTMENT's research found ten (10) UAOs: Spectrum, Kinder Morgan, Zayo, Frontier, Hillsborough County, CenturyLink, MCI, TECO Peoples Gas, Uniti, and TECO. The Sunshine 811 design ticket was used for reference, with the DEPARTMENT's Permit search used as a control for coordination. Other controls include field review, phone contacts and as-built plans for previous projects.***

The CONSULTANT EOR(s) shall develop a utility conflict matrix for each phase submittal to the potentially affected Utility Agency Owners.

The EORs for all disciplines that have the potential to affect utility facilities shall meet prior to any scheduled Utility Design Meeting to ensure that the potential conflicts are understood by the Utility Coordinator, that changes to the plans from the last submittal/Utility Design Meeting are understood, and that the project schedule and critical dates are adequately provided to the Utility Coordinator.

The CONSULTANT EOR shall review the draft Utility Work Schedules submitted to the Utility Coordinator prior to sending to the DEPARTMENT for review. The EOR shall sign all of the Utility Work Schedules.

For projects with SUE:

The EORs of all disciplines that have the potential to affect underground utility facilities shall meet with the SUE provider's team as well as the Utility Coordinator as soon as possible after the Notice-To-Proceed is issued to discuss the strategy for gathering SUE in a timely, efficient and calculated manner.

See Section 27.10 for the timing of obtaining designation on utility facilities, as well as when the EOR shall incorporate the information in the plans. The EOR shall begin using the Quality Level B information in the design as soon as it is available, in order to avoid conflicts with utility facilities to the extent practicable.

The SUE provider shall be invited to the utility design meetings.

2a.4 Environmental Permits and Environmental Clearances (Activities 8a and 8b) – *Optional Services*

Expected permits: ***The project is expected to qualify for a SWFWMD Exemption and will not require agency submittal for verification. A FDEP Section 404 permit is not required.***

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

No environmental permits are anticipated for this project.

2a.5 Structures (Activities 9 – 18)

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

Type of Bridge Structure Work:

- BDR – ***N/A***
- Temporary Bridge – ***N/A***
- Short Span Concrete – ***N/A***
- Medium Span Concrete – ***N/A***
- Structural Steel – ***N/A***
- Segmental Concrete – ***N/A***
- Movable Span – ***N/A***

Retaining Walls: ***N/A***

Noise Barrier Walls: ***N/A***

Miscellaneous: ***Evaluate one existing steel strain pole structure with changed loading conditions at US 301/Panther Trace Blvd/ Southern Pointe Blvd. -- Optional Services.***

Optional Services also for structure types listed in Section 18.

2a.6 Signing and Pavement Markings (Activities 19 & 20)

Replace existing advance street name signs for the signalized intersections of Big Bend Rd (NB only), Panther Trace Blvd/ Southern Pointe Blvd, Rhodine Rd, Symmes Rd, and Gibsonton Dr/ Boyette Rd (NB only).

Install new advance street name signs for Balm Rd (SB only) and Summerfield Crossings Blvd intersections.

Replace the following guide signs within the project limits:

- ***Sun City Center/ Bradenton/ Sarasota distance sign (SB)***
- ***Univ of Fla/Gulf Coast Research Center directional sign (NB and SB)***
- ***Riverview city limit sign (NB)***
- ***Balm directional sign (SB)***

The CONSULTANT shall conduct an existing sign inventory and replace any signs that are deficient.

Install special emphasis crosswalks at all side streets and major driveways. Install a crosswalk on the north leg of Balm Rd/Paseo Al Mar Blvd. The CONSULTANT shall review wrong way signing and pavement marking needs per FDM criteria for the entire project corridor and implement as approved by the Department.

2a.7 Signalization (Activities 21 & 22)

Balm Rd/Paseo Al Mar Blvd: Add pedestrian signals for new cross walk on the north leg, update existing pedestrian features as necessary, update pedestrian and vehicle clearance timings.

Summerfield Crossing Blvd: Update existing pedestrian features as necessary, update pedestrian and vehicle clearance timings.

Panther Trace Blvd/ Southern Pointe Blvd: Add backplates for signal heads on all approaches, replace five-section signal heads on EB and WB approaches with four-section heads with flashing yellow arrows, replace internally illuminated signs, update existing pedestrian features as necessary, update pedestrian and vehicle clearance timings. The replacement of five-section

heads shall be confirmed with a structural analysis to ensure the structural capacity of the existing structures.

Rhodine Rd: Add backplates for signal heads on all approaches, replace internally illuminated signs, update existing pedestrian features as necessary, update pedestrian and vehicle clearance timings.

The CONSULTANT shall coordinate with the DEPARTMENT Project Manager to confirm that the local government with jurisdiction will commit to maintaining or funding the maintenance of the additional highway lighting provided by this project, and to confirm the required number of load centers in advance of initiating plans preparation. Such confirmation must come directly from the local government, not from a private power company. If the CONSULTANT fails to perform this coordination in a timely manner, any necessary re-design and plans revisions resulting therefrom shall be prepared by the CONSULTANT without additional compensation or extensions of schedule milestones.

Traffic Data Collection:

Under Optional services, the CONSULTANT may perform any traffic data collection necessary to support studies as recommended by the DEPARTMENT.

Traffic Studies:

Under Optional Services, the CONSULTANT may conduct traffic studies as requested by the DEPARTMENT. These studies may include, but are not limited to, traffic safety studies, access management studies, lane elimination studies, queue length analyses, pedestrian studies, signal warrant analyses.

Portable Traffic Monitoring Sites or Stations:

Add/replace cabinet, loops and piezo axle sensors as needed at the existing traffic monitoring sites within the project limits which include:

- ***PTMS 105362***
- ***TTMS 100446***

2a.8 Lighting (Activities 23 & 24)

Analyze the existing lighting at Balm Rd/Paseo Al Mar Blvd., Summerfield Crossing Blvd., Panther Trace Blvd./ Southern Pointe Blvd., and Rhodine Rd. intersections and upgrade as needed to meet FDM signalized intersection lighting criteria.

The CONSULTANT shall coordinate with the DEPARTMENT Project Manager to confirm that the local government with jurisdiction will commit to maintaining or funding the maintenance of the additional highway lighting provided by this project, and to confirm the required number of load centers in advance of initiating plans preparation. Such confirmation must come directly from the local government, not from a private power company. If the CONSULTANT fails to perform this coordination in a timely manner, any necessary re-design and plans revisions resulting therefrom shall be prepared by the CONSULTANT without additional compensation or extensions of schedule milestones.

2a.9 Landscape (Activities 25 & 26) – ***N/A***

2a.10 Survey (Activity 27a except as otherwise noted

Design Survey:

The DEPARTMENT will provide primary horizontal and vertical project control.

The CONSULTANT shall recover/re-establish the historic alignment; may provide targeting for remote sensing; shall reference the alignment and all control points; shall perform a topographic/DTM survey through the project limits including void area densification; shall provide DTM check cross sections; and shall perform a drainage survey as directed.

The methodology that is proposed to perform and prepare the topographic/DTM survey is the discretion of the CONSULTANT. This methodology must be approved by the District Surveying and Mapping Dept., the District Location Surveyor, or their designee. When utilizing conventional survey instruments and technologies, the CONSULTANT shall follow the Florida Department of Transportation Surveying and Mapping Procedure, Topic No. 550-030-101. If Terrestrial Static LiDAR instruments and technologies are utilized, the CONSULTANT shall follow the applicable FDOT Terrestrial Mobile LiDAR Surveying & Mapping Guidelines in the Surveying & Mapping Handbook.

Project Network Control (PNC) Sheets shall be prepared depicting the horizontal project control, the vertical project control, the alignment, and the alignment reference points. The sheet(s) shall be on a standard 24" x 36" FDOT title block. Upon DEPARTMENT acceptance, deliverables shall include a certified Specific Purpose Survey: Control Survey in the form of two hard copies and one digital copy.

Subsurface Utility Exploration ***(Activity 27b)***:

Basic SUE services shall be provided by the CONSULTANT at various locations throughout the project limits to minimize utility conflicts while maintaining the integrity of the DEPARTMENT'S design criteria such as near any proposed drainage structures, ditch grading, gravity walls, large sign foundations, pole foundations or anywhere there is a proposed design feature that will extend more than two feet into the ground where there is the possibility of utility in the area. Additional SUE services may be provided as needed with an Optional Services Authorization.

Right-of-Way Survey: ***N/A***

Vegetation Survey: ***N/A***

2a.11 Photogrammetry (Activity 28)

If photogrammetric instruments and technologies are utilized, the CONSULTANT shall follow the FDOT Surveying and Mapping Procedure, Topic No. 550-030-101. The CONSULTANT shall provide Low Altitude Mapping Photogrammetry for the project limits and deliverables as summarized in Section 2.10 above. The Surveyor shall furnish to the Photogrammetrist the target positions in x, y, and z, and station/offset format so the Photogrammetrist can obtain surface elevations as close as feasible to the stations the designer will use for cross slope correction.

2a.12 Mapping (Activity 29) – *N/A*

2a.13 Terrestrial Mobile LiDAR (Activity 30)

If Terrestrial Mobile LiDAR instruments and technologies are utilized, the CONSULTANT shall follow the FDOT Terrestrial Mobile LiDAR Surveying & Mapping Guidelines for the limits and deliverables as summarized in Section 2.10 above.

2a.14 Architecture (Activity 31) – *N/A*

2a.15 Noise Barriers (Activity 32) – *N/A*

2a.16 Intelligent Transportation Systems (Activities 33 & 34) – *Optional Services*

Work expected within project limits including all supporting infrastructure and equipment, short narrative for purpose, ITS hardware descriptions, communications design, need for test and acceptance procedures on the local subsystem, and system levels is to be provided if Optional Services are initiated. At such time, an overview of existing and proposed ITS devices, proposed ITS communications to the transportation management center (TMC), power requirements, operational requirements, and maintenance requirements will be provided. The description will include reference to the Regional ITS Architecture and Rule 940 requirements if federal funds are included.

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

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

The ITS shall operate from the ***[TBA]*** TMC located at ***[TBA]*** using the SunGuide® (SunGuide) Software, or if SunGuide is not in use at ***[TBA]*** TMC, using the appropriate ***[NAME SOFTWARE PACKAGE, TBA]*.**

Interchanges: ***TBA***

Traffic Data Collection: ***TBA***

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

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

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

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

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

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

2a.17 Geotechnical (Activity 35)

The Consultant shall be responsible for all Geotechnical and Pavement Evaluation services associated with this project.

The Consultant shall follow the Districts One and Seven Materials Office's Standard Operating Procedures for Pavement Survey Evaluations.

Before beginning each phase of investigation and after the Notice to Proceed is given, the consultant shall submit an investigation plan for approval and meet with the Department's Pavement Evaluation Engineer and Geotechnical Engineer to review the project scope and Department's requirements.

2a.18 3D Modeling (Activity 36)

The CONSULTANT will prepare a 3D model for design and development of cross sections. The final 3D model will not be sent to Construction.

2b PROJECT DESCRIPTION (445392-1-32-01)

The CONSULTANT shall investigate the status of the project and become familiar with concepts and commitments (typical sections, alignments, etc.) developed from prior studies and/or activitie***s, including applicable documents at*** ***http://fdotd7studies.com***. 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 ***noted herein or*** directed by the DEPARTMENT.

The purpose of this project is to reconstruct the intersection of US301 at Symmes Rd. with rigid pavement to provide a sustainable pavement with a longer service life. This rigid reconstruction project is part of a "goes with" design under FPID 445936-1-32-01 resurfacing (lead project). Concrete limits are defined by milepost for US301, concrete limits for Symmes will end at the end of the return. Existing cross section elements, such as curb and gutter, shared use path, shoulders and shoulder gutter shall be maintained or replaced in kind. The design speed in this section of the project is 55 mph with a posted speed of 50 mph.

At the option of the CONSULTANT with the approval of the DEPARTMENT Project Manager, this project may be designed and delivered using a DEPARTMENT supported Autodesk CADD Platform or Bentley CADD Platform shown at the following link: https://www.fdot.gov/cadd/main/version/currentversions.shtm In either case, the project shall be designed, delivered and signed and sealed in compliance with the DEPARTMENT's CADD Manual. The DEPARTMENT provides a "State Kit" for both Autodesk and Bentley products that can be downloaded from https://www.fdot.gov/cadd/downloads/software/software.shtm

The CONSULTANT shall deliver a Three-Dimensional (3D) Model of the design project in accordance with the specifications/criteria defined within the CADD Manual, specifically in Chapter 5 (Section 5.16).

2b.1 Project General and Roadway (Activities 3, 4 and 5)

Public Involvement: ***The project's initial Community Awareness Plan is provided by the DEPARTMENT and located at***

https://www.ftp.fdot.gov/file/d/FTP/FDOT%20LTS/D7/Development/ProjMgmt/ProjectIntelligence/445392-1/PublicInv-CAP/.

The CONSULTANT does not need to prepare the initial Community Awareness Plan. See Section 3.1 for implementation of the Plan and other Public Involvement aspects of the project, including which entity is responsible for each such aspect.

Other Agency Presentations/Meetings: ***N/A***

Joint Project Agreements: ***N/A***

Specification Package Preparation: ***The CONSULTANT shall prepare the specifications package. The effort is expected to be normal or typical. This project is currently designated as a goes-with letting with 445936-1-32-01 (Lead Project).***

Value Engineering: ***N/A***

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

Plan Type: ***The roadway plans shall be prepared in a Plan format. Profile sheets shall be provided, if necessary, to show the vertical controls that are needed for the construction of these projects. The plan (and profile) sheets shall be plotted at a horizontal scale of 1" = 40'.***

Limits: US301/SR 43/ at Symmes Rd (MP 13.910) to (MP 14.440). Project Length = 0.530 miles.

Typical Section:

US 301 Mainline:

1. ***Six lane divided with raised curbed median, 12-foot travel lanes, 4 to 7 foot paved shoulders outside with 5-foot sidewalk, side slopes, and ditch on the west side and 12 foot shared use path, side slopes, and ditch on the east side.***

2. ***This project proposes new concrete pavement for which District 7 made a concrete lane-mile commitment to Central Office based on the established mileposts. The lane-mile commitment for this project is 3.180 lane miles. Lane miles do not include turn lanes or off-state-system roadways.***

Pavement Design: ***Three pavement designs anticipated. Construct one rigid design for US 301 travel lanes and turn lanes, asphalt pavement for reconstructed shoulders, and surface milling and resurfacing of asphalt pavement for temporary traffic control shifts beyond concrete limits or damage from reconstruction. For Symmes Rd., mill and resurface the area where new concrete ends, including temporary traffic control shifts and where flexible pavement is to remain.***

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

Cross Slope: ***N/A (Rigid Pavement Reconstruction)***

Access Management Classification: ***#3***

Transit Route Features: ***On an existing or planned (adopted) bus route roadway, coordinate with the transit agency and design as requested their proposed engineering and right-of-way-feasible, ADA-compliant bus landing pads, rider shelter pads and incidental universal sidewalk connections, etc. All transit agency contact shall be coordinated in advance with the DEPARTMENT's Public Transit Coordinator.***

The CONSULTANT shall verify roadside shoulders and side slopes that display erosion and design for applicable shoulder and side slope treatment.

Major Intersections/Interchanges: ***N/A***

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

Level of TTCP Plans: ***III, including pedestrian details at intersection crossings.***

Temporary Signals: ***US 301 at Symmes Rd.***

Temporary Lighting: ***N/A***

Temporary Drainage: ***Some activities proposed by this project will necessitate temporary drainage. Temporary drainage design shall be performed to ensure the project site drains adequately during all phases of construction. The placement of temporary traffic control devices shall be reviewed to ensure that conveyance of runoff is not impeded.***

Design Variations/Exceptions: ***Design variation and/or exception requests shall be prepared for any situations not meeting current DEPARTMENT and/or FHWA requirements, as appropriate. The CONSULTANT shall prepare design Variation and Exception reports for the purpose of estimating design and construction needs based on initial observations. The CONSULTANT shall recommend, to the DEPARTMENT, either correction of any deficiencies, or obtaining the appropriate design variations or exceptions, including applicable benefit-cost analyses, in accordance with DEPARTMENT procedures. Currently known or suspected features requiring analysis include: Front and back slope, shared use path and sidewalk separation from roadway, cross slope, median width, sidewalk width, shoulder width, bike lane width and clear zone.***

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

Selective Clearing and Grubbing: ***N/A***

2b.2 Drainage (**Activities 6a and 6b)**

System Type:

The existing drainage system consists of shoulder gutter with inlets and roadside ditches with side drains and DBIs.

The Symmes Road intersection lies within Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) map number 12057C0504J dated October 7, 2021. A portion of the intersection is within the Zone AE floodplain, however the reconstruction should not impact the floodplain. The final determination of any floodplain impacts shall be the responsibility of the CONSULTANT and shall be documented in the drainage report.

The CONSULTANT shall perform a visual inspection of the existing drainage system and review the project during a rain event. Document any deficiencies and recommendations and present to the DEPARTMENT in a memorandum.

The CONSULTANT shall notify the DEPARTMENT if video inspection of the storm sewer system is recommended. Video inspection services will be performed by others under the DEPARTMENT's Districtwide video inspection contract. Within three weeks following the Notice-To-Proceed, the CONSULTANT shall provide to the DEPARTMENT figures showing the locations of the pipes to be inspected, and shall quantify the length and pipe sizes for the required work. Prior to the first phase submittal of plans, the CONSULTANT shall review the inspection report and provide to the DEPARTMENT recommendations and construction cost estimates for any pipe repair. The design implementation of any approved recommendations not included in this Scope of Services may be added to the Agreement as an Optional Service.

2b.3 Utilities Coordination (Activity 7)

Activities and requirements in this section will also apply to FPID 445936-1-32-01. See Section 2a.3.

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

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

The CONSULTANT may employ more than one individual or utility engineering consultant to provide utility coordination and engineering design expertise. The CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. ***In this scope,*** this person shall be referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal ***using an approved classification in the FDOT Negotiation Handbook for Professional Services Contracts***. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the FDOT District Utilities Administrator that they have the following knowledge, skills, and expertise:

- A minimum of 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 District utility coordination process.

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

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

- Assuring that Utility Coordination and accommodation is in accordance to the FDOT, FHWA, and AASHTO standards, policies, procedures, and design criteria.

- Assisting the engineer of record in identifying all existing utilities and coordinating any new installations. Assisting the Engineer of Record with resolving utility conflicts.

- Scheduling and performing utility coordination meetings, keeping and distribution of minutes/action items of all utility meetings, and ensuring expedient follow-up on all unresolved issues.

- Distributing all plans, conflict matrixes and design changes to the affected utility owners, collecting utility work schedules and making sure that this information is properly coordinated ***and documented in ProjectSuite***.

- Identifying and coordinating the completion of any FDOT or utility owner agreement that is required for reimbursement, or accommodation of the utility facilities associated with the project.

- Review and certify to the District Utilities Administrator that all Utility Work Schedules are correct and in accordance with the Department's standards, policies, and procedures.

- Prepare, review and process all utility related reimbursable paperwork inclusive of betterment and salvage determination.

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

Utilities anticipated on the project: ***The DEPARTMENT found*** eight (8) UAOs: Spectrum, Zayo, Frontier, Hillsborough County, CenturyLink, MCI, TECO Peoples Gas, TECO Electric**.** ***The Sunshine 811 design ticket was used for reference, with the DEPARTMENT's Permit search used as a control for coordination. Other controls include field review, phone contacts and as-built plans for previous projects.***

The CONSULTANT EOR(s) shall develop a utility conflict matrix for each phase submittal to the potentially affected Utility Agency Owners.

The CONSULTANT EOR shall review the draft Utility Work Schedules submitted to the Utility Coordinator prior to sending to the DEPARTMENT for review. The EOR shall sign all of the Utility Work Schedules.

For projects with SUE:

The EORs of all disciplines that have the potential to affect underground utility facilities shall meet with the SUE provider's team as well as the Utility Coordinator as soon as possible after the Notice-To-Proceed is issued to discuss the strategy for gathering SUE in a timely, efficient and calculated manner.

See Section 27.10 for the timing of obtaining designation on utility facilities, as well as when the EOR shall incorporate the information in the plans. The EOR shall begin using the Quality Level B information in the design as soon as it is available, in order to avoid conflicts with utility facilities to the extent practicable.

The SUE provider shall be invited to the utility design meetings

2b.4 Environmental Permits and Environmental Clearances (Activities 8a and 8b) – *Optional Services*

Expected permits: ***The project is expected to qualify for a SWFWMD Exemption and will not require agency submittal for verification. A FDEP Section 404 permit is not required.***

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

No environmental permits are anticipated for this project.

2b.5 Structures (Activities 9 – 18)

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

Type of Bridge Structure Work:

- BDR – ***N/A***
- Temporary Bridge – ***N/A***
- Short Span Concrete – ***N/A***
- Medium Span Concrete – ***N/A***
- Structural Steel – ***N/A***
- Segmental Concrete – ***N/A***
- Movable Span – ***N/A***

Retaining Walls: ***N/A***

Noise Barrier Walls: ***N/A***

Miscellaneous: ***Evaluate one existing steel strain pole structure with changed loading conditions at US 301/ Symmes Rd. -- Optional Services***

Optional Services also for structure types listed in Section 18.

2b.6 Signing and Pavement Markings (Activities 19 & 20)

The CONSULTANT shall conduct an existing sign inventory and replace any signs that are deficient within the project limits. Update pavement markings within the project limits.

The CONSULTANT shall review wrong way signing and pavement marking needs per FDM criteria for the entire project corridor and implement as approved by the Department.

2b.7 Signalization (Activities 21 & 22)

Symmes Rd: Replace five-section signal heads on EB and WB approaches with four-section heads with flashing yellow arrows, replace internally illuminated signs, update existing pedestrian features as necessary, update pedestrian and vehicle clearance timings. The replacement of five-section heads shall be confirmed with a structural analysis to ensure the structural capacity of the existing structures.

The CONSULTANT shall coordinate with the DEPARTMENT Project Manager to confirm that the local government with jurisdiction will commit to maintaining or funding the maintenance of the additional highway lighting provided by this project, and to confirm the required number of load centers in advance of initiating plans preparation. Such confirmation must come directly from the local government, not from a private power company. If the CONSULTANT fails to perform this coordination in a timely manner, any necessary re-design and plans revisions resulting therefrom shall be prepared by the CONSULTANT without additional compensation or extensions of schedule milestones.

Traffic Data Collection: ***Under Optional services, the CONSULTANT may perform any traffic data collection necessary to support studies as recommended by the DEPARTMENT.***

Traffic Studies: ***Under Optional Services, the CONSULTANT may conduct traffic studies as requested by the DEPARTMENT. These studies may include, but are not limited to, traffic safety studies, access management studies, lane elimination studies, queue length analyses, pedestrian studies, signal warrant analyses.***

Portable Traffic Monitoring Sites or Stations: ***N/A***

2b.8 Lighting (Activities 23 & 24)

Analyze the existing lighting at Symmes Rd. intersection and upgrade as needed to meet FDM signalized intersection lighting criteria.

The CONSULTANT shall coordinate with the DEPARTMENT Project Manager to confirm that the local government with jurisdiction will commit to maintaining or funding the maintenance of the additional highway lighting provided by this project, and to confirm the required number of load centers in advance of initiating plans preparation. Such confirmation must come directly from the local government, not from a private power company. If the CONSULTANT fails to perform this coordination in a timely manner, any necessary re-design and plans revisions resulting therefrom shall be prepared by the CONSULTANT without additional compensation or extensions of schedule milestones.

2b.9 Landscape (Activities 25 & 26) – ***N/A***

2b.10 Survey (Activity 27a, except as otherwise noted)

Design Survey:

The DEPARTMENT will provide primary horizontal and vertical project control.

The CONSULTANT shall recover/re-establish the historic alignment; may provide targeting for remote sensing; shall reference the alignment and all control points; shall perform a topographic/DTM survey through the project limits including void area densification; shall provide DTM check cross sections; and shall perform a drainage survey as directed.

The methodology that is proposed to perform and prepare the topographic/DTM survey is the discretion of the CONSULTANT. This methodology must be approved by the District Surveying and Mapping Dept., the District Location Surveyor, or their designee. When utilizing conventional survey instruments and technologies, the CONSULTANT shall follow the Florida Department of Transportation Surveying and Mapping Procedure, Topic No. 550-030-101. If Terrestrial Static LiDAR instruments and technologies are utilized, the CONSULTANT shall follow the applicable FDOT Terrestrial Mobile LiDAR Surveying & Mapping Guidelines in the Surveying & Mapping Handbook.

Project Network Control (PNC) Sheets shall be prepared depicting the horizontal project control, the vertical project control, the alignment, and the alignment reference points. The sheet(s) shall be on a standard 24" x 36" FDOT title block. Upon DEPARTMENT acceptance, deliverables shall include a certified Specific Purpose Survey: Control Survey in the form of two hard copies and one digital copy.

Subsurface Utility Exploration ***(Activity 27b)***:

Basic SUE services shall be provided by the CONSULTANT at various locations throughout the project limits to minimize utility conflicts while maintaining the integrity of the DEPARTMENT'S design criteria. Additional SUE services may be provided as needed with an Optional Services Authorization.

Right-of-Way Survey: ***N/A***

Vegetation Survey: ***N/A***

2b.11 Photogrammetry (Activity 28)

If photogrammetric instruments and technologies are utilized, the CONSULTANT shall follow the FDOT Surveying and Mapping Procedure, Topic No. 550-030-101. The CONSULTANT shall provide Low Altitude Mapping Photogrammetry for the project limits and deliverables as summarized in Section 2.10 above. The Surveyor shall furnish to the Photogrammetrist the target positions in x, y, and z, and station/offset format so the Photogrammetrist can obtain surface elevations as close as feasible to the stations the designer will use for cross slope correction.

2b.12 Mapping (Activity 29) – *N/A*

2b.13 Terrestrial Mobile LiDAR (Activity 30)

If Terrestrial Mobile LiDAR instruments and technologies are utilized, the CONSULTANT shall follow the FDOT Terrestrial Mobile LiDAR Surveying & Mapping Guidelines for the limits and deliverables as summarized in Section 2.10 above.

2b.14 Architecture (Activity 31) – *N/A*

2b.15 Noise Barriers (Activity 32) – *N/A*

2b.16 Intelligent Transportation Systems (Activities 33 & 34) -- *Optional Services*

Work expected within project limits including all supporting infrastructure and equipment, short narrative for purpose, ITS hardware descriptions, communications design, need for test and acceptance procedures on the local subsystem, and system levels is to be provided if Optional Services are initiated. At such time, an overview of existing and proposed ITS devices, proposed ITS communications to the transportation management center (TMC), power requirements, operational requirements, and maintenance requirements will be provided. The description will include reference to the Regional ITS Architecture and Rule 940 requirements if federal funds are included.

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

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

The ITS shall operate from the ***[TBA]*** TMC located at ***[TBA]*** using the SunGuide® (SunGuide) Software, or if SunGuide is not in use at ***[TBA]*** TMC, using the appropriate ***[NAME SOFTWARE PACKAGE, TBA].***

Interchanges: ***TBA***

Traffic Data Collection: ***TBA***

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

All design efforts shall be based on deploying "open architecture" subsystems, while remaining

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

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

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

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

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

2b.17 Geotechnical (Activity 35)

The Consultant shall be responsible for all Geotechnical and Pavement Evaluation services associated with this project.

The Consultant shall follow the District Materials' Standard Operating Procedures for Pavement Survey Evaluations.

Before beginning each phase of investigation and after the Notice to Proceed is given, the consultant shall submit an investigation plan for approval and meet with the Department's Pavement Evaluation Engineer and Geotechnical Engineer to review the project scope and Department's requirements.

2b.18 3D Modeling (Activity 36)

The CONSULTANT shall prepare the 3D model during design in order to provide cross sections and earthwork throughout the limits of the rigid pavement reconstruction project.

Unless otherwise noted, the remaining Section 2 subsections apply to both FPID numbers.

2.19 Project Schedule

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production

Date. The schedule shall be based upon ***the current anticipated "Production Date" of 5/28/24 for 445936-1 and 7/24/24 for 445392-1 (Each subject to change, to match the other to support a goes-with construction letting).*** The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a ***four*** week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

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***, project milestones*** and progress to date.

The approved schedule and schedule status report, along with progress and payout curves, shall be submitted with the monthly progress report.

The schedule shall be submitted in an FDOT system-compatible format.

The above schedule submittal shall reflect project-specific input from each affected DEPARTMENT discipline, including Permits, Utilities, Right-of-Way, and Modal Planning and Development (noise walls, etc.). The CONSULTANT shall be responsible for ensuring that such input is received and reviewed with the DEPARTMENT Project Manager in advance.

2.20 Submittals

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

All plans and specifications deliverables provided for herein shall support a fully electronic advertisement, bidding and letting process for the construction contract in a manner acceptable to the DEPARTMENT, including compliance with Section 131 of the FDOT Design Manual and with the FDOT CADD Manual. In addition to any required hard copies, the CONSULTANT shall provide .pdf files for all plans phase submittals thru Phase III. Beginning with the Phase IV submittal, the CONSULTANT shall provide the electronic CADD files. In addition to any required hard-copies, all other documents that require DEPARTMENT review shall be submitted in an electronic medium acceptable to the DEPARTMENT Project Manager, including processing through the Department's Electronic Review and Comment system (ERC).

The CONSULTANT shall provide a Constructability and Bidability review of the design with the Phase III or other designated plans submittal. The CONSULTANT's comments and responses developed from this review shall be forwarded to the DEPARTMENT's Construction Services Unit.

All documentation for QA/QC and independent peer review, including check prints, design calculations, etc., shall be submitted in electronic format with each deliverable and kept on file until construction of the project is complete at a minimum.

The DEPARTMENT reserves the right to visit the premises of the CONSULTANT at any time to review the project's status, upon one-hour's notice.

2.21 Provisions for Work

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

- General
  - Title 29, Part 1910, Standard 1910.1001, Code of Federal Regulations (29 C.F.R. 1910.1001) – Asbestos Standard for Industry, U.S. Occupational Safety and Health Administration (OSHA)
  - 29 C.F.R. 1926.1101 – Asbestos Standard for Construction, OSHA
  - 40 C.F.R. 61, Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP), Environmental Protection Agency (EPA)
  - 40 C.F.R. 763, Subpart E – Asbestos-Containing Materials in Schools, EPA
  - 40 C.F.R. 763, Subpart G – Asbestos Worker Protection, EPA
  - Americans With Disabilities Act (ADA) Standards for Accessible Design
  - AASHTO – A Policy on Design Standards Interstate System
  - AASHTO – Roadside Design Guide
  - AASHTO – Roadway Lighting Design Guide
  - AASHTO – A Policy for Geometric Design of Highways and Streets
  - AASHTO – Highway Safety Manual
  - Rule Chapter 5J-17, Florida Administrative Code (F.A.C.), Standards of Practice for Professional Surveyors and Mappers
  - Chapter 469, Florida Statutes (F.S.) – Asbestos Abatement
  - Rule Chapter 62-257, F.A.C., Asbestos Program
  - Rule Chapter 62-302, F.A.C., Surface Water Quality Standards
  - Code of Federal Regulations (C.F.R.)
  - Florida Administrative Codes (F.A.C.)
  - Chapters 20, 120, 215, 455, Florida Statutes (F.S.) – Florida Department of Business & Professional Regulations Rules
  - Florida Department of Environmental Protection Rules
  - FDOT Basis of Estimates Manual
  - FDOT Computer Aided Design and Drafting (CADD) Manual
  - FDOT Standard Plans
  - FDOT Flexible Pavement Design Manual
  - FDOT - Florida Roundabout Guide
  - FDOT Handbook for Preparation of Specifications Package
  - FDOT Standard Plans Instructions
  - FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (“Florida Greenbook”)
  - FDOT Materials Manual
  - FDOT Pavement Type Selection Manual
  - FDOT Design Manual
  - FDOT Procedures and Policies
  - FDOT Procurement Procedure 001-375-030, Compensation for Consultant Travel Time on Professional Services Agreements
  - FDOT Project Development and 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
  - Manual on Speed Zoning for Highways, Roads, and Streets in Florida
  - Federal Highway Administration (FHWA) - Manual on Uniform Traffic Control Devices (MUTCD)
  - FHWA – National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide
  - FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook
  - Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 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
- Drainage
  - FDOT Drainage ***Design Guide***
  - FDOT Drainage Manual
  - ***Florida*** Erosion and Sediment Control Manual
  - FDOT Drainage Connection Permit Handbook
  - FDOT Bridge Scour Manual
- Survey and Mapping
  - All applicable Florida Statutes and Administrative Codes
  - Applicable Rules, Guidelines Codes and authorities of other Municipal, County, State and Federal Agencies.
  - Florida Department of Transportation Surveying and Mapping Procedure Topic 550-030-101
  - Florida Department of Transportation Surveying and Mapping Handbook
  - Florida Department of Transportation Right of Way Procedures Manual
- Traffic Engineering and Operations and ITS
  - AASHTO - An Information Guide for Highway Lighting
  - AASHTO - Guide for Development of Bicycle Facilities
  - FHWA Standard Highway Signs Manual
  - FDOT Manual on Uniform Traffic Studies (MUTS)
  - FDOT Median Handbook
  - FDOT Traffic Engineering Manual
  - National Electric Safety Code
  - National Electrical Code
- Florida's Turnpike Enterprise
  - Florida's Turnpike ***Design*** Handbook (***TDH***)
  - Florida's Turnpike Lane Closure Policy
  - Florida's Turnpike Drainage Manual Supplement
  - Rigid Pavement Design Guide for Toll Locations with Electronic Toll Collection
  - Flexible Pavement Design Guide for Toll Locations with Electronic Toll Collection
  - Florida's Turnpike General Tolling Requirements (GTR)

- Additional Florida's Turnpike Enterprise standards, guides, and policies for design and construction can be found on the FTE Design Website: ***https://floridasturnpike.com/business-opportunities/design***

- Traffic Monitoring
  - American Institute of Steel Construction (AISC) Manual of Steel Construction, referred to as "AISC Specifications"
  - American National Standards Institute (ANSI) RP-8-00 Recommended Practice for Roadway Lighting
  - AASHTO AWS D1.1/ANSI Structural Welding Code – Steel
  - AASHTO D1.5/AWS D1.5 Bridge Welding Code
  - FHWA Traffic Detector Handbook
  - FDOT General Interest Roadway Data Procedure
  - FHWA Traffic Monitoring Guide
  - FDOT's Traffic/Polling Equipment Procedures
- Structures
  - AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims
  - AASHTO LRFD Movable Highway Bridge Design Specifications and Interims
  - AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and Interims.
  - AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code
  - AASHTO Guide Specifications for Structural Design of Sound Barriers
  - AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges
  - FDOT Bridge Load Rating Manual
  - FDOT Structures Manual
  - FDOT Structures Design Bulletins (available on FDOT Structures web site only)
- Geotechnical
  - FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications
  - Manual of Florida Sampling and Testing Methods
  - Soils and Foundation Handbook
- Landscape Architecture
  - Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants
- Architectural
  - Building Codes
  - Florida 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 – Floodplain Management Criteria
  - Section 255.25, F.S., Approval Required Prior to Construction or Lease of Buildings
  - Rules of the Federal Emergency Management Agency (FEMA)

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

2.22 Services To Be Performed By The DEPARTMENT

When appropriate and/or available, the DEPARTMENT will provide project data, including ***the following, except as otherwise noted herein***:

- Numbers for field books.
- Preliminary Horizontal Network Control.
- Access for the CONSULTANT to utilize the DEPARTMENT's Information Technology Resources.
- All Department agreements with Utility Agency Owner (UAO).
- All certifications necessary for project letting.
- Building Construction Permit Coordination (Turnpike)
- All information that may come to the DEPARTMENT pertaining to future improvements.
- All future information that may come to the DEPARTMENT during the term of the CONSULTANT's Agreement, which in the opinion of the DEPARTMENT is necessary for the prosecution of the work.
- Available traffic and planning data.
- All approved utility relocations.
- Project utility certification to the DEPARTMENT's Central Office.
- Any necessary title searches.
- Engineering standards review services.
- All available information in the possession of the DEPARTMENT pertaining to utility companies whose facilities may be affected by the proposed construction.
- All future information that may come to the DEPARTMENT pertaining to subdivision plans so that the CONSULTANT may take advantage of additional areas that can be utilized as part of the existing right of way.
- Systems traffic for Projected Design Year, with K, D, and T factors.

- Previously constructed Highway Beautification or Landscape Construction Plans
- Landscape Opportunity Plan(s)
- Existing right of way maps.
- Existing cross slope data for all RRR projects.
- Existing pavement evaluation report for all RRR projects.
- PD&E Documents
- Design Reports
- Letters of authorization designating the CONSULTANT as an agent of the DEPARTMENT in accordance with F.S. 337.274.
- Phase reviews of plans and engineering documents.
- Regarding Environmental Permitting Services:
  - Approved Permit Document when available.
  - Approval of all contacts with environmental agencies.
  - General philosophies and guidelines of the DEPARTMENT to be used in the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the Project Manager.
  - Appropriate signatures on application forms.

3 PROJECT COMMON AND PROJECT GENERAL TASKS

PROJECT COMMON TASKS

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, 4 Roadway Analysis through 35 Geotechnical. These tasks are to be included in the project scope in each applicable activity when the described work is to be performed by the CONSULTANT.

Cost Estimates: The CONSULTANT shall be responsible for producing a construction cost estimate ***(Engineer's Estimate and LRE or AASHTOWare Project Preconstruction estimate)*** and reviewing and updating ***those*** cost estimate***s within twenty-one (21) days after Notice-To-Proceed,*** when scope changes occur, at ***production*** milestones of the project***, for the annual Work Program Update Cycle, and when directed by the DEPARTMENT Project Manager***. Prior to 60% plans or completion of quantities, the DEPARTMENT's Long Range Estimate (L.R.E.) system ***shall*** be used to produce a conceptual estimate, according to District policy. Once the quantities have been developed (beginning at 60% plans and no later than 90% plans) the CONSULTANT shall be responsible for ***completing the Estimated Quantities Report while*** inputting the pay items and quantities into AASHTOWare Project Preconstruction ***as approved by the DEPARTMENT*** through the use of the DEPARTMENT's Designer Interface. ***Each Engineer's Estimate and LRE/AASHTOWare submittal shall be accompanied by an equal number of copies of the Preliminary Project Report (PPR) updated by the CONSULTANT in the District standard format, including the updated Record Page.***

At each plans phase submittal and for the annual Work Program Update Cycle, the CONSULTANT shall provide a copy of the plans and the most current Right-of-Way Maps to the District Right-of-Way Cost Estimate Coordinator.

Construction Duration: The CONSULTANT shall develop an estimate of construction contract duration based on the guidelines set forth in Chapter 1.2 of the DEPARTMENT's Construction Project Administration Manual (CPAM). This estimate shall be based on quantities per TTCP phase and submitted to the Construction Services Unit with the Phase III or other designated submittal package.

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

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

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

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

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

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

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

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

The CONSULTANT shall coordinate with the DEPARTMENT Project Manager to arrange a Local Government Coordination Meeting for discussion of the plans and solicitation of local government input. The meeting shall coincide with a Plans Phase Submittal or other submittal as directed by the DEPARTMENT's Project Manager. As a minimum, attendees shall include the Project Manager, local government representatives (preferably Director of Public Works/Municipal Engineer level) and the CONSULTANT. The CONSULTANT, via the DEPARTMENT's Project Manager, shall give adequate advance notification to the DEPARTMENT's District Public Information Office of the meeting's time, date, place and participants, so that local elected officials are aware of the meeting. The CONSULTANT shall prepare timely meeting minutes for attendee approval, so that all parties are aware of project expectations and limitations.

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

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

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

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

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

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

An Independent Peer Review and a Constructability/Bidability Review for design Phase Plans document submittals are required on this project. These separate reviews shall be completed by someone who has not worked on the plan component that is being reviewed. These could include but are not limited to a separate office under the Prime ***CONSULTANT's*** umbrella, a subconsultant that is qualified in the work group being reviewed, or a CEI. It does not include persons who have knowledge of the day-to-day design efforts. The Constructability/Bidability Review shall be performed by a person with experience working on DEPARTMENT construction projects (CEI, Contractor, etc.).

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

Supervision: The CONSULTANT shall supervise all technical design activities.

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

Project General Tasks

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

3.1 Public Involvement

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

In accordance with F.S. 335.199, if the project is on the State Highway System and will divide a highway, erect median barriers that modify currently available vehicle turning movements, or have the effect of closing or modifying an existing access to an abutting property owner, then 1) all affected property owners and local governments shall be so notified at least 180 days before the project design is finalized, 2) the applicable local government shall be consulted with regarding the final project design in a manner that allows such government to present alternatives to relieve impacts to commercial business properties, and 3) at least one advertised and recorded public hearing shall be held to determine how the project will affect access to businesses and the potential economic impact of the project on the local business community. All comments from such public hearing shall be taken into consideration in the final design of the project. The CONSULTANT shall support the DEPARTMENT in implementing the above activities.

In accordance with the Community Awareness Plan provided by the DEPARTMENT in Section 2.1, the CONSULTANT shall prepare and mail notification letters and necessary graphics to abutting property owners along those portions of the project where construction activity is proposed outside of the existing roadway pavement and no right-of-way will be acquired. The letters shall inform the owners about the proposed construction and the DEPARTMENT's intent to utilize the existing right-of-way, including border areas, to the fullest extent possible, notwithstanding any existing amenities, such as parking, landscaping, walls, etc. The letter format shall be reviewed and approved by the DEPARTMENT prior to the mailings.

3.1.1 Community Awareness Plan

The project's initial Community Awareness Plan has been prepared by the DEPARTMENT and is referenced via link in Sections 2a.1 and 2b.1 of this Scope of Services. The CONSULTANT does not need to prepare the initial Plan, although the Plan shall be reviewed and updated periodically by the CONSULTANT throughout the life of the project as directed by the DEPARTMENT. The following Section 3.1 subsections cover implementation of the Community Awareness Plan and other aspects of Public Involvement, including which entity is responsible for each such aspect.

3.1.2 Notifications – *By the DEPARTMENT*

In addition to public involvement data collection, ***if requested by the DEPARTMENT Project Manager,*** the CONSULTANT shall ***assist the DEPARTMENT in preparing*** 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 – *Optional Services*

3.1.4 Median Modification Letters – *Optional Services*

3.1.5 Driveway Modification Letters – *Optional Services*

3.1.6 Newsletters – *Optional Services*

3.1.7 Renderings and Fly-Throughs – *N/A*

3.1.8 PowerPoint Presentations – *Optional Services*

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

3.1.9 Public Meeting Preparations – *Optional Services*

3.1.10 Public Meeting Attendance and Follow-up – *Optional Services*

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 (MPO). The CONSULTANT's participation may include, but not be limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file. It is estimated for this project, there will be ***two (2)*** meetings with local governing authorities and/or ***the*** MPO during the design.

3.1.12 Web Site – *N/A*

3.2 Joint Project Agreements – *N/A*

3.3 Specifications & Estimates

3.3.1 Specifications Package Preparation

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

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

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

3.3.2 Estimated Quantities Report Preparation

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

3.4 Contract Maintenance and Project Documentation

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

3.5 Value Engineering (Multi-Discipline Team) Review – *N/A*

3.6 Prime Consultant Project Manager Meetings

Includes only the Prime CONSULTANT Project Manager's time for travel and attendance at Activity Technical Meetings and other meetings listed in the meeting summary for Task 3.6 on tab 3.0 Project General Task of the staff hour forms. Staff hours for other personnel attending Activity Technical Meetings are included in the meeting task for that specific Activity.

3.7 Plans Update *(Optional Services)*

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."

3.8 Post Design Services *(Optional Services)*

Post Design Services ***shall be deemed to begin after the construction contract advertisement and*** may include, but ***are*** not limited to, meetings, construction assistance, plans revisions, shop drawing review, survey services, as-built drawings, ***expert witness testimony*** and load ratings. ***These*** services are not intended for instances of CONSULTANT errors and/or omissions.

3.9 Digital Delivery

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

3.10 Risk Assessment Workshop – *N/A*

3.11 Railroad, Transit and/or Airport Coordination

The CONSULTANT shall coordinate with the DEPARTMENT Transit Coordinator. Peter O. Knight Airport is 8.5 miles from the project, however, it does not require aviation coordination. Railroad coordination is also not required.

3.11.1 Aeronautical Evaluation –*Optional Services for 445936-1; N/A for 445392-1*

The CONSULTANT shall be responsible for complying with the requirements of Title 14 of the Code of Federal Regulations Part 77 (14 CFR Part 77), and for determining whether it is necessary to file any Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the Federal Aviation administration (FAA), utilizing the FAA Notice Criteria Tool. Place a copy of all pertinent

documentation in the Project Documentation folder structure, such as Notice Criteria Tool inquires and responses, FAA Form 7460-1 filed with the FAA, Letter of Determination, any records demonstrating compliance with the conditions and deadlines, etc. Report any Letters of Determination designated other than "Does Not Exceed" to the Airspace and Land Use Manager of the Central Office Aviation Office. ***All such CONSULTANT correspondence with the FAA or Central Office shall be coordinated in advance with the DEPARTMENT's District Aviation Office.***

3.12 Landscape and Existing Vegetation Coordination – *N/A*

3.13 Other Project General Tasks – *Optional Services*

4 ROADWAY ANALYSIS

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

4.1 Typical Section Package

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

4.2 Pavement Type Selection Report – *N/A*

4.3 Pavement Design Package

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

4.4 Cross-Slope Correction

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

4.5 Horizontal/Vertical Master Design Files

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

4.6 Access Management – *Optional Services*

4.7 Roundabout Evaluation – *N/A*

4.8 Roundabout Final Design Analysis – *N/A*

4.9 Cross Section Design Files *(445392-1 only; N/A for 445936-1)*

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

If the Cross Sections are prepared using a 3D model, use Task 36.5, ***rather than*** Task 4.9 for the Cross Section Design Files.

4.10 Temporary Traffic Control (TTCP) Analysis

The CONSULTANT shall design a safe and effective Temporary Traffic Control Plan (TTCP) to move vehicular and pedestrian traffic during all phases of construction. The design shall include construction phasing of ***the*** roadways' ingress and egress to existing property owners and businesses, routing, signing and pavement markings, detour quantity tabulations, roadway pavement, drainage structures, ditches, front slopes, back slopes, drop offs within clear zone, ***transit agency features (bus stops, etc.),*** 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 CONSULTANT may need to provide a temporary drainage design).*** The design shall include construction phasing of roadways to accommodate the construction or relocation of utilities when the contract includes Joint Project Agreements (JPAs) ***or Utility Work By Highway Contractor (UWHC)***.

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

Every effort shall be made to maintain signal detection throughout the life of the construction. The type of detection and the location shall be included in the TTCP.

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 ***shall include emergency vehicle response time,*** local events, holidays, peak seasons, detour route deterioration***, transit agency routes and features,*** and other eventualities. The CONSULTANT shall be responsible ***for*** obtain***ing*** the local authorities' permission for use of detour routes not on state highways. ***Affected transit agencies shall be notified in advance about bus route lane closures and detours via the DEPARTMENT. The DEPARTMENT's Construction Services Unit will provide the lane closure calculations to the CONSULTANT.***

4.11 Master TTCP Design Files

The CONSULTANT shall develop master Temporary Traffic Control Plan (TTCP) files showing each phase of the TTCP, including all work necessary for designing lane configurations, diversions, lane shifts, signing and pavement markings, temporary traffic control devices and temporary pedestrian ***travel*** ways.

4.12 Selective Clearing and Grubbing – ***N/A***

4.13 Tree Disposition Plans – ***N/A***

4.14 Design Variations and Exceptions

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

4.15 Design Report

The CONSULTANT shall prepare all applicable report(s) as listed in the Project Description section of this scope. Reports shall be delivered as a signed and sealed pdf file.

4.16 *Quantities for EQ Report*

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

4.17 Cost Estimate

4.18 Technical Special Provisions and Modified Special Provisions – *Optional Services*

4.19 Other Roadway Analyses

All existing driveways shall be analyzed for conformance with FDOT Design Manual Section 214. The findings shall be summarized in a driveway matrix to be submitted to the DEPARTMENT for concurrence.

4.20 Field Reviews

4.21 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 the ***FDOT Design Manual*** Chapter 307. The CONSULTANT shall identify the necessary pay items to be included in the bid documents to monitor existing structures.

Optional Services: The CONSULTANT shall coordinate with and assist the geotechnical engineer and/or structural engineer to develop mitigation strategies (when applicable).

4.22 Technical Meetings

4.23 Quality Assurance/Quality Control

4.24 Independent Peer Review – *N/A*

4.25 Supervision

4.26 Coordination

5 ROADWAY PLANS

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

5.1 Key Sheet

5.2 Typical Section Sheets

5.2.1 Typical Sections

5.2.2 Typical Section Details

5.3 General Notes/Pay Item Notes

5.4 Project Layout – *N/A*

5.5 Plan/Profile Sheet – *N/A*

5.6 Profile Sheet (*445392-1 only)*

5.7 Plan Sheet

The CONSULTANT shall depict all lane lines for the entire plan portion of the roadway plans to include all intersections with directional arrows preceding and following the intersection proper. In addition, directional arrows should be indicated at the beginning and end of each sheet to provide ease of reviewing. A note shall be added to the first plan sheet stating that these lane lines and directional arrows are for informational purposes only. All phase submittals shall include this information except for the final contract documents.

5.8 Special Profile (*445392-1 only)*

5.9 Back-of-Sidewalk Profile Sheet – *N/A*

5.10 Interchange Layout Sheet – *N/A*

5.11 Ramp Terminal Details (Plan View) – *N/A*

5.12 Intersection Layout Details (*445392-1 only)*

5.13 Special Details (*445392-1 only)*

5.14 Cross-Section Pattern Sheet(s) – *N/A*

5.15 Roadway Soil Survey Sheet(s)

5.16 Cross Sections

5.17 Temporary Traffic Control Plan Sheets (*445392-1 only; Optional Services for 445936-1)*

5.18 Temporary Traffic Control Cross Section Sheets (*445392-1 only; Optional Services for 445936-1)*

5.19 Temporary Traffic Control Detail Sheets

5.20 Utility Adjustment Sheets (*445392-1 only)*

5.21 Selective Clearing and Grubbing Sheet(s) – *N/A*

5.22 Tree Disposition Plan Sheet(s) – *N/A*

5.23 Project Control Sheets

5.24 Environmental Detail Sheets – *N/A*

5.25 Utility Verification Sheet(s) (SUE Data) (*445392-1 only; Optional Services for 445936-1)*

5.26 Quality Assurance/Quality Control

5.27 Supervision

6a DRAINAGE ANALYSIS

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

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

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

6a.1 Drainage Map Hydrology – *Optional Services*

Create a (pre and/or post condition) working drainage basin map to be used in defining the system hydrology. This map shall incorporate drainage basin boundaries, existing survey and/or LiDAR and field observations, as necessary, to define the system. Basin delineations shall also include any existing collection systems in a logical manner to aid in the development of the hydraulic model. Include coordination hours needed to convey drainage hydrologic features onto produced drainage maps.

6a.2 Base Clearance Calculations – *N/A for 445936-1; Optional Services for 445392-1*

6a.3 Pond Siting Analysis and Report – *N/A*

6a.4 Design of Cross Drains – *Optional Services for 445936-1*

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 – *Optional Services*

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 ***is*** in separate task.)

6a.6 Design of Stormwater Management Facility (Offsite or Infield Pond) – *N/A*

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

6a.7 Design of Stormwater Management Facility (Roadside Treatment Swales and Linear Ponds) – *N/A*

Design stormwater management facilities to ***comply with*** requirements for stormwater quality treatment, attenuation and aesthetics. Develop proposed pond layout (contributing drainage basin,

shape, contours, slopes, volumes, tie-ins, etc.), perform routing, pollutant loading, and recovery calculations, and design the outlet control structure.

6a.8 Design of Floodplain Compensation – *Optional Services for 445936-1*

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

6a.9 Design of Storm Drains –*Optional Services*

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

6a.10 Optional Culvert Material – *Optional Services for 445936-1*

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

6a.11 French Drain Systems – *N/A*

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.11a Existing French Drain Systems – *N/A*

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

6a.12 Drainage Wells – *N/A*

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. ***The report shall include in an appendix a copy of the project scope, negotiated staff-hours and the Long Range Estimate (LRE).***

6a.14 Bridge Hydraulic Report – *N/A*

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

6a.15 Temporary Drainage Analysis

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

6a.16 *Quantities for EQ Report*

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

6a.17 Cost Estimate

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

6a.18 Technical Special Provisions / Modified Special Provisions – *N/A*

6a.19 Hydroplaning Analysis – *N/A*

6a.20 Existing Permit Analysis

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

6a.21 Other Drainage Analysis

6a.22 Noise Barrier Evaluation – *N/A*

6a.23 Field Reviews

6a.24 Technical Meetings

6a.25 Environmental Look-Around Meetings – *N/A*

6a.26 Quality Assurance/Quality Control

6a.27 Independent Peer Review – *N/A*

6a.28 Supervision

6a.29 Coordination

6b DRAINAGE PLANS

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

6b.1 Drainage Map (Including Interchanges) – *Optional Services*

6b.2 Bridge Hydraulics Recommendation Sheets – *N/A*

6b.3 Drainage Structures – *Optional Services*

6b.4 Lateral Ditch Plan/Profile – *N/A*

6b.5 Lateral Ditch Cross Sections – *N/A*

6b.6 Retention/Detention Pond Detail Sheet(s) – *N/A*

6b.7 Retention Pond Cross Sections – *N/A*

6b.8 Erosion Control Plan Sheet(s)

6b.9 SWPPP Sheet(s)

6b.10 Quality Assurance/Quality Control

6b.11 Supervision

7 UTILITIES

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

7.1 Kickoff Meeting

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

7.2 Identify Existing UAO(s)

The Consultant shall identify all utilities within and adjacent to the project limits that may be impacted by the project. The CONSULTANT shall identify interconnect communications and other DEPARTMENT joint use facilities and fully coordinate the relocation/adjustment of the affected UAO's.

7.3 Make Utility Contacts

First Contact: The CONSULTANT shall send letters and ***an electronic set of*** plans ***(both pdf and dgn files),*** to each utility. ***Hard copies of plans shall be sent upon request of a utility.*** 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 ***the*** UAO requests for reimbursement to the ***DEPARTMENT*** for a legal opinion. Include the meeting schedule (if applicable) and the design schedule. Include ***a*** typical meeting agenda. If scheduling a meeting, give four weeks advance notice.

Second Contact: At a minimum of four weeks prior to the meeting, the CONSULTANT shall transmit ***an electronic set (both pdf and dgn files)*** of ***the*** Phase II plans***, the List of Plan Changes since first contact*** and the Utility Conflict Matrix (when applicable) to each UAO having facilities located within the project limits. ***Hard copies of plans shall be sent upon request of a utility.***

Third Contact: Identify agreements and assemble packages. At a minimum of four weeks prior to the meeting, the CONSULTANT shall transmit an electronic set (both pdf and dgn files) of ***the*** Phase III plans, agreements, List of Plan Changes since previous contact and the Utility Conflict Matrix to each UAO having facilities located within the project limits. Hard copies of plans shall be sent upon request of a utility.

Final Contact (Phase IV): Transmit an electronic set (both pdf and dgn files) of Phase IV (100%) plans to each of the involved UAO(s).

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 in accordance with the UAM.

7.5 Preliminary Utility Meeting

The CONSULTANT shall schedule (time and place), notify participants about, and conduct a preliminary utility meeting with all UAO(s) having facilities located within the project limits for the purpose of presenting the project, reviewing the current design schedule, evaluating the utility information collected, providing follow-up information on compensable property rights from the DEPARTMENT's Legal Office, discussing the utility work by highway contractor option with each utility, and discussing any future design issues that may impact utilities. This meeting is also an opportunity for the UAO(s) to present proposed facilities. The CONSULTANT shall keep accurate minutes and distribute a copy to all attendees.

7.6 Individual/Field Meetings

The CONSULTANT shall meet with each UAO as necessary (separately or together) throughout the project design duration to provide guidance in the interpretation of plans, review changes to the plans and schedules, standard or selective clearing and grubbing work, and assist in the development of the UAO(s) 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. ***This includes any negotiated phase review office and field meetings.***

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

The CONSULTANT shall review utility marked plans and data individually as they are received for ***compliance with the information requested.*** Ensure the information from the UAO (utility type, material and size) is sent to the designer for inclusion in the plans. Forward all requests for utility reimbursement and supporting documentation to the DUO.

7.8 Subordination of Easements Coordination

The District Right of Way Office will handle processing of all Subordinations of Easements. The CONSULTANT shall refer all UAOs to the District Right of Way Office.

7.9 Utility Design Meeting

The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s). The CONSULTANT shall be prepared to discuss impacts to existing trees/vegetation and proposed landscape, drainage, traffic signalization, temporary traffic control plans (TTCP) (construction phasing), review the current design schedule and letting date, evaluate the utility information collected, provide follow-up information on compensable property rights from FDOT Legal Office, discuss with each UAO the utility work by highway contractor option, discuss any future design issues that may impact utilities, etc., to the extent that they may have an effect on existing or proposed utility facilities with particular emphasis on drainage and TTCP with each UAO. The intent of this meeting shall be to assist the UAOs in identifying and resolving conflicts between utilities and proposed construction before completion of the plans, including utility adjustment details. Also, to work with the UAOs to recommend potential resolution between known utility conflicts with proposed construction plans as may be deemed practical by the UAO. ***The CONSULTANT shall be prepared to discuss all findings from Utility Designating and Locating efforts, and the possible need for additional verification.*** The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.5 (Horizontal/Vertical Master Design Files) and Task 4.9 (Cross Section Design Files) for utility conflict location identification and adjustments.

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

The CONSULTANT shall review utility marked up plans and work schedules as they are received for content and coordinate review with the designer. Send color markups and schedules to the appropriate DEPARTMENT office(s) for review and comment if required by the District. Coordinate with the District for execution. Distribute Executed Final Documents. Prepare Work Order for UAO(s). The CONSULTANT shall coordinate the programming of necessary Work Program funds with the DUO.

7.11 Utility Coordination/Follow-up

The CONSULTANT shall provide utility coordination and follow up. This includes follow-up, interpreting plans, and assisting the UAOs with completion of their work schedules and agreements. Includes phone calls, face-to-face meetings, etc. to motivate and ensure the UAO(s) complete and return the required documents in accordance with the project schedule. The CONSULTANT shall 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 the project.

7.12 Utility Constructability Review

The CONSULTANT shall ***compare*** utility schedules ***to*** construction contract time and phasing for compatibility. Coordinate with and obtain written concurrence from the DEPARTMENT's construction office. See ***Section*** 4.5 (Horizontal/Vertical Master Design Files) and Section 4.9 (Cross Section Design Files) for utility conflict identification and adjustments.

7.13 Additional Utility Services *(Optional Services)*

7.14 Processing Utility Work by Highway Contractor (UWHC) *(Optional Services)?*

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 biddability review, review pay items, cost estimates and Technical Special Provisions (TSP) or Modified Special Provision (MSP) prepared by the UAO. This does not include utility the utility design effort.

7.15 Contract Plans to UAO(s)

If requested by the District:

The CONSULTANT shall transmit the contract plans as processed for letting to the UAO(s). Transmittals to UAO(s) may be by certified mail, return receipt requested.

7.16 Certification/Close-Out

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

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

OR

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

OR

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

7.17 Other Utilities

The CONSULTANT may be required to provide other miscellaneous utility services, such as reviewing utility permits submitted during design or post-design and coordination with those permittees on the design project. This includes all efforts for a utility task not covered by an existing defined task. Required work may be on a case-by-case basis.

8 ENVIRONMENTAL PERMITS AND ENVIRONMENTAL CLEARANCES – *Optional Services*

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

8.1 Preliminary Project Research

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

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

8.2 Field Work

8.2.1 Pond Site Alternatives

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

8.2.2 Establish Wetland Jurisdictional Lines and Assessments

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

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

- Prepare aerial maps showing the jurisdictional boundaries of wetlands and other surface waters. Aerial maps shall be reproducible, of a scale no greater than 1"= 400' or more detailed and be recent photography. The maps shall show the jurisdictional boundaries of each agency. Photo copies of aerials are not acceptable. When necessary, a wetland-specific survey ***shall*** be prepared by a registered surveyor and mapper. All surveyed jurisdictional boundaries shall be tied to the project's baseline of survey.
- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form, which includes the ID number for each wetland (and other surface water, if necessary) impacted, size of wetland to be impacted, type of impact and identification of any wetland (by ID number and size) within the project limits that will not be impacted by the project.
- Prepare appropriate agency forms to obtain required permits. Forms may include, but are not limited to, the USACE "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; the Uniform Mitigation Assessment Method forms; and/or project specific data forms.

The CONSULTANT shall provide the following at the time of the first plans submittal:

- ***Surveyed and approved jurisdictional boundaries on plan sheets.***
- ***Detailed estimate of wetland impacts, including, but not limited to, the acreage and type of impact. This shall be provided in writing to the District Environmental Permit Coordinator based on the approved jurisdictional boundaries.***
- ***For projects with one or more acres of wetland impact, WRAP or UMAM assessments (whichever is appropriate based on coordination with the agencies) shall be provided to District Environmental Permit Coordinator for submittal to SWFWMD.***

8.2.3 Species Surveys

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

8.3 Agency Verification of Wetland Data

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

8.4 Complete and Submit All Required Permit Applications

The CONSULTANT shall collect all of the data and information necessary to prepare the permit applications and obtain the environmental permits required to construct the project as identified in the Project Description and as described in 8.4.1, 8.4.2, and 8.12 (Other Permits). The CONSULTANT shall prepare each permit application in accordance with the rules and/or regulations of the regulatory agency responsible for issuing a specific permit and/or authorization to perform work. The permit application packages must be approved by the DEPARTMENT prior to submittal to regulatory agencies.

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

The CONSULTANT shall be responsible for the payment of all fees for permit applications and legal notices.

Local Permits:

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

8.4.2 Prepare Species Permit Applications

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

Evaluate the need for using a Special Provision when the project includes an Outstanding Florida Water (OFW), Surface Water, or listed species.

8.4.3 The CONSULTANT shall evaluate the project to determine if a "Storm Water Discharges Associated with Industrial Activity Permit" is required as defined in 40 CFR Part 122.26(b)(14)(x) and/or Chapter 62-621.300(4)(a) FAC. If no permit is required, this determination shall be documented to the Project Manager and the Environmental Permit Coordinator in writing.

8.4.4 Storm Water Pollution Prevention Plan (SWPPP)

If a permit is required, the CONSULTANT shall prepare a Storm Water Pollution Prevention Plan (SWPPP) for each project(s) application package.

8.4.5 Prepare Wetland Protection Plan

If a permit is required, the CONSULTANT shall prepare a Wetland/OSW Protection Plan (WPP) for each project(s) application package.

8.4.6 The CONSULTANT shall determine the pay items and quantities for erosion control devices. The Storm Water Pollution Prevention and "Plan/Work Sheets" shall be developed to a level to provide the erosion control pay items and quantities to be included in the Plans/Construction Documents and Engineers Estimate(s); however, Erosion Control "Plan/Work Sheets" do not need to be submitted with phase submittals or final plans.

8.5 Coordinate and Review Dredge and Fill Sketches

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

8.6 Prepare USCG Permit Application – *N/A*

8.7 Prepare Water Management District or Local Water Control District Right-of-Way Occupancy Permit Application – *N/A*

The CONSULTANT shall be responsible for the preparation of the ROW Occupancy permit application in accordance with the regulatory agency requirements. The CONSULTANT shall be responsible for acquiring the ROW Occupancy permit.

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

The CONSULTANT shall be responsible for the preparation of the CCCL permit application and 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 USACE Section 408 Application To Alter a Civil Works Project – *N/A*

The CONSULTANT shall be responsible for the preparation of the Section 408 (33 USC 408) application and obtaining Section 408 permission.

8.10 Compensatory Mitigation Plan

If wetland impacts cannot be avoided, the CONSULTANT shall prepare a mitigation plan to be included as a part of the applications.

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

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

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

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

Prior to selection of a final creation/restoration mitigation site, the CONSULTANT ***shall*** provide the following services in the development of a mitigation plan:

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

8.11 Mitigation Coordination and Meetings

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or reviewing agencies. Once a mitigation plan has been reviewed and approved by the DEPARTMENT, the CONSULTANT ***shall*** be responsible for coordinating the proposed mitigation plan with the environmental agencies. The CONSULTANT shall provide mitigation information needed to update the FDOT Environmental Impact Inventory.

The CONSULTANT shall provide complete and timely responses to the DEPARTMENT's semi-annual requests for updated information for the project regarding whether or not it will have, or potentially have impacts to be mitigated for using the Seventh District Wetland Impact Inventory (F.S. 373.4137). The CONSULTANT shall inform the DEPARTMENT immediately of wetland impact changes that could affect the project's status on the mitigation inventory between formal update requests. The CONSULTANT shall communicate to the DEPARTMENT any design or jurisdictional review issues that may impact their wetland impact estimates as the project progresses through design.

8.12 Other Environmental Permits

Environmental Clearances, Reevaluations and Technical Support

8.13 Technical Support To The Department For Environmental Clearances and **Re-evaluations –** ***N/A***

8.14 Preparation of Environmental Clearances and Re-evaluations – ***N/A***

8.15 Contamination Impact Analysis

The DEPARTMENT will provide all such necessary services.

8.16 Asbestos Survey

The DEPARTMENT will provide all such necessary services.

8.17 Technical Meetings

8.18 Quality Assurance/Quality Control

8.19 Supervision

8.20 Coordination

9 STRUCTURES – SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS

The CONSULTANT shall analyze, design and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.***21***, Provisions for Work. Individual tasks identified in Sections 9 through 18 are defined in the Staff Hour Estimation Handbook and within the provision defined in Section 2.***21***, Provisions for Work. Contract documents shall display economical solutions for the given conditions ***and be of such quality that they may be reproduced and used by the DEPARTMENT as bid documents for construction.***

The CONSULTANT shall provide Design Documentation to the DEPARTMENT with each submittal consisting of structural design calculations and other supporting documentation developed during the development of the plans. The design calculations submitted shall adequately address the complete design of all structural elements. These calculations shall be neatly and logically presented on digital media or, at the DEPARTMENT's request, on 8 ½"x11" paper and all sheets shall be numbered. The final design

calculations shall be signed and sealed by a Florida-licensed professional engineer. A cover sheet indexing the contents of the calculations shall be included and the engineer shall sign and seal that sheet. All computer programs and parameters used in the design calculations shall include sufficient backup information to facilitate the review task.

9.1 Key Sheet and Index of Drawings -- *N/A*

9.2 Project Layout -- *N/A*

9.3 General Notes and Bid Item Notes -- *N/A*

9.4 Miscellaneous Common Details -- *N/A*

9.5 Incorporate Report of Core Borings -- *N/A*

9.6 Standard Plans - Bridges -- *N/A*

9.7 Existing Bridge Plans -- *N/A*

9.8 *Quantities for EQ Report -- N/A*

9.9 Cost Estimate -- *N/A*

9.10 Technical Special Provisions and Modified Special Provisions -- *N/A*

9.11 Field Reviews

9.12 Technical Meetings

9.13 Quality Assurance/Quality Control

9.14 Independent Peer Review -- *N/A*

9.15 Supervision

9.16 Coordination

10 STRUCTURES – BRIDGE DEVELOPMENT REPORT -- *N/A*

11 STRUCTURES – TEMPORARY BRIDGE -- *N/A*

12 STRUCTURES – SHORT SPAN CONCRETE BRIDGE -- *N/A*

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

14 STRUCTURES – STRUCTURAL STEEL BRIDGE -- *N/A*

15 STRUCTURES – SEGMENTAL CONCRETE BRIDGE -- *N/A*

16 STRUCTURES – MOVABLE SPAN -- *N/A*

17 STRUCTURES – RETAINING WALLS -- *N/A*

18 STRUCTURES – MISCELLANEOUS

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

Concrete Box Culverts ***(18.1 – 18.4) -- N/A***

Strain Poles **–** ***Optional Services***

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 **–** ***Optional Services***

18.9 Mast Arms

18.10 Mast Arms Data Table Plan Sheets

18.11 Mast Arms Special Details Plan Sheets

Overhead/Cantilever Sign Structure **–** ***Optional Services***

18.12 Cantilever Sign Structures

18.13 Overhead Span Sign Structures

18.14 Special (Long Span) Overhead Sign Structures

18.15 Monotube Overhead Sign Structure

18.16 Bridge Mounted Signs (Attached to Superstructure)

18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets

18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets

High Mast Lighting **–** ***Optional Services***

18.19 Non-Standard High Mast Lighting Structures

18.20 High Mast Lighting Special Details Plan Sheets

Noise Barrier Walls (Ground Mount) **–** ***N/A***

18.21 Horizontal Wall Geometry

18.22 Vertical Wall Geometry

18.23 Summary of Quantities – Aesthetic Requirements

18.24 Control Drawings

18.25 Design of Noise Barrier Walls Covered by Standards

18.26 Design of Noise Barrier Walls Not Covered by Standards

18.27 Aesthetic Details

Special Structures

18.28 Fender System – *N/A*

18.29 Fender System Access – *N/A*

18.30 Special Structures – *Optional Services*

18.31 Other Structures – *Optional Services*

Ancillary Structures Report

18.32 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles –*Optional Services*

18.33 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles (No As-Built or Design Plans Available) – *Optional Services*

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

18.35 Ancillary Structures Report

19 SIGNING AND PAVEMENT MARKING ANALYSIS

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

19.1 Traffic Data Analysis

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

19.2 No Passing Zone Study – *N/A*

19.3 Signing and Pavement Marking Master Design File

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

19.4 Multi-Post Sign Support Calculations – *445936-1 only*

The CONSULTANT shall determine the appropriate column size from the DEPARTMENT's Multi-Post Sign Program(s). ***Multi-post Sign Support Calculations are required for advanced street name signs approaching the signalized intersections. The CONSULTANT shall provide the sign support calculations using the DEPARTMENT's software and the actual cross section of the proposed sign location.***

19.5 Sign Panel Design Analysis – *445936-1 only*

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

19.6 Sign Lighting/Electrical Calculations – *N/A*

19.7 ***Quantities for EQ Report***

The CONSULTANT shall determine pay items and quantities and the supporting documentation for the project at phases III, IV, and final for the signing and pavement-marking component of the entire project.

19.8 Cost Estimate

The CONSULTANT shall be responsible for producing an accurate engineer's construction cost estimate for the signing and pavement marking component at phases III, IV and final.

19.9 Technical Special Provisions and Modified Special Provisions – ***N/A***

19.10 Other Signing and Pavement Marking Analysis – ***N/A***

19.11 Field Reviews

The CONSULTANT shall conduct field reviews of the project. This includes all trips required to obtain necessary data for all elements of the project.

19.12 Technical Meetings

The CONSULTANT shall attend phase review meetings for the plan submittal phases of the project with a representative from the District Traffic Design Engineer's office to resolve technical issues during the design process.

19.13 Quality Assurance/Quality Control

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

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

19.14 Independent Peer Review – ***N/A***

19.15 Supervision

The CONSULTANT shall provide all efforts required to supervise all technical design activities including the work of the subconsultants.

19.16 Coordination

The CONSULTANT shall provide all efforts to coordinate with all disciplines of the project to produce a final set of construction documents and to ensure high degree of accuracy for the design plans is achieved.

20 SIGNING AND PAVEMENT MARKING PLANS

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

20.1 Key Sheet

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

20.2 General Notes/Pay Item Notes

The CONSULTANT shall include all pertinent general notes and pay item notes as deemed fit and as established by the District Traffic Design Engineer's office.

20.3 Project Layout – *N/A*

20.4 Plan Sheet

The CONSULTANT shall prepare the Signing & Marking plan sheets utilizing the Design file to include all necessary information related to the project design elements and all associated reference files. All traffic plans shall be prepared at a scale of 1" = 40'.

20.5 Typical Details – *N/A*

20.6 Guide Sign Work Sheet(s) – *445936-1 only*

The CONSULTANT shall prepare Guide Sign Work Sheet for the advanced street name signs approaching the signalized intersections utilizing the District's Traffic Design Guidelines. The CONSULTANT shall utilize the guide sign design software approved by the DEPARTMENT.

20.7 Traffic Monitoring Site – *N/A*

20.8 Cross Sections – *N/A*

20.9 Special Service Point Detail – *N/A*

20.10 Special Details – *N/A*

20.11 Interim Standards – *N/A*

20.12 Quality Assurance/Quality Control

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

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed.

The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

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

20.13 Supervision

The CONSULTANT shall provide all efforts required to supervise all technical design activities including the work of the sub-consultants.

21 SIGNALIZATION ANALYSIS

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

21.1 Traffic Data Collection – *Optional Services*

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

21.2 Traffic Data Analysis

The CONSULTANT shall update pedestrian and vehicle clearance timings.

21.3 Signal Warrant Study -- *N/A*

21.4 Systems Timings -- *N/A*

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 – *N/A*

21.7 Overhead Street Name Sign Design

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

21.8 Pole Elevation Analysis -- *N/A*

21.9 Traffic Signal Operation Report – *N/A*

21.10 *Quantities for EQ Report*

The CONSULTANT shall determine pay items and quantities and the supporting documentation for the project at phases III, IV and final for the signalization component of the entire project.

21.11 Cost Estimate

The CONSULTANT shall be responsible for producing an accurate engineer's construction cost estimate for the signalization component at phase III, IV and final.

21.12 Technical Special Provisions and Modified Special Provisions – *N/A*

The CONSULTANT shall prepare Technical Special Provisions as necessary for any pay items that are not covered by the Florida Department of Transportation Standard Specifications for Road and Bridge Construction or by Special Provisions. Technical Special Provisions will be required for the fiber optic cable, conduit, innerduct cell, and the fiber optic pull box. The DEPARTMENT will provide the TSP to the CONSULTANT for review and use in this contract.

21.13 Other Signalization Analysis – *N/A*

21.14 Field Reviews

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

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

21.15 Technical Meetings

The CONSULTANT shall attend phase review meetings for the plan submittal phases of the project with a representative from the District Traffic Design Engineer's office to resolve technical issues during the design process.

21.16 Quality Assurance/Quality Control

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

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

The CONSULTANT shall utilize the District's quality control checklist for traffic design drawings. 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 the designs, maps, drawings, specifications and/or other services.

21.17 Independent Peer Review -- *N/A*

21.18 Supervision

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

21.19 Coordination

The CONSULTANT shall provide all efforts to coordinate with all disciplines of the project to produce a final set of construction documents and to ensure a high degree of accuracy for the design plans is achieved.

22 SIGNALIZATION PLANS

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

22.1 Key Sheet

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

22.2 General Notes/Pay Item Notes

The CONSULTANT shall include all pertinent general notes and pay item notes as deemed fit and as established by the District Traffic Design Engineer's office.

22.3 Plan Sheet

22.4 Interconnect Plans -- *N/A*

22.5 Traffic Monitoring Site -- *445936-1 only*

22.6 Guide Sign Worksheet

22.7 Special Details – *N/A*

22.8 Special Service Point Details -- *N/A*

22.9 Mast Arm/Monotube Tabulation Sheet -- *N/A*

22.10 Strain Pole Schedule -- *N/A*

22.11 TTCP Signal (Temporary)

22.12 Temporary Detection Sheet – *N/A*

22.13 Utility Conflict Sheet -- *N/A*

22.14 Interim Standards -- *N/A*

22.15 Quality Assurance/Quality Control

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

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

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

22.16 Supervision

The CONSULTANT shall provide all efforts required to supervise all technical design activities including the work of the subconsultants.

23 LIGHTING ANALYSIS

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

23.1 Lighting Justification Report -- *N/A*

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

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

23.2 Lighting Design Analysis Report (LDAR)

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

23.3 Voltage Drop Calculations

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

The Voltage Drop Calculations shall be submitted as part of the Lighting Design Analysis Report. ***All electrical calculations for sizing the conductors, conduit, load centers, main breaker, branch circuit breakers shall be signed and sealed by an electrical engineer licensed by examination by the State of Florida with expertise in electrical engineering.***

23.4 FDEP Coordination and Report -- *N/A*

23.5 Reference and Master Design Files

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

23.6 Temporary Highway Lighting -- *N/A*

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

23.7 Design Documentation

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

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

23.8 *Quantities for EQ Report*

The CONSULTANT shall determine pay items and quantities and the supporting documentation for the project at phases III, IV and final for the lighting component of the entire project.

23.9 Cost Estimate

The CONSULTANT shall be responsible for producing an accurate engineer's construction cost estimate for the lighting component at phases III, IV and final.

23.10 Technical Special Provisions and Modified Special Provisions -- *N/A*

23.11 Other Lighting Analysis – *N/A*

23.12 Field Reviews

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

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

23.13 Technical Meetings

The CONSULTANT shall attend phase review meetings for the plan submittal phases of the project with a representative from the District Traffic Design Engineer's office to resolve technical issues during the design process.

23.14 Quality Assurance/Quality Control

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

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

23.15 Independent Peer Review -- *N/A*

23.16 Supervision

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

23.17 Coordination

The CONSULTANT shall provide all efforts to coordinate with all disciplines of the project to produce a final set of construction documents, and to ensure a high degree of accuracy for the design plans is achieved.

24 LIGHTING PLANS

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

24.1 Key Sheet – *N/A*

24.2 General Notes/Pay Item Notes

The CONSULTANT shall include all pertinent general notes and pay item notes as deemed fit and as established by the District Traffic Design Engineer's Office.

24.3 Pole Data, Legend & Criteria

The CONSULTANT shall complete the Pole Data and Legend Criteria sheets in the standard format as necessary to provide a complete lighting design.

24.4 Service Point Details

The CONSULTANT shall prepare any service point details necessary to provide a complete lighting design. The CONSULTANT shall identify the power source after coordination with the local power company and provide the necessary details from the power source to the load center.

24.5 Project Layout – *N/A*

24.6 Plan Sheet

The CONSULTANT shall prepare the Roadway Lighting plan sheets utilizing the Design file to include all necessary information related to the project design elements and all associated reference files. The roadway lighting plan sheet scale shall be 1"=40'.

24.7 Special Details – *N/A*

24.8 Temporary Highway Lighting Detail Sheets -- *N/A*

24.9 Temporary Highway Lighting Plan Sheets -- *N/A*

24.10 Interim Standards -- *N/A*

24.11 Quality Assurance/Quality Control

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

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

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

24.12 Supervision

The CONSULTANT shall provide all efforts required to supervise all technical design activities including the work of the subconsultants.

25 LANDSCAPE ANALYSIS – *N/A*

26 LANDSCAPE PLANS –*N/A*

27 SURVEY

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

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

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

27.1 Horizontal Project Control (HPC) - *primary to be provided by the DEPARTMENT*

27.2 Vertical Project Control (VPC) - *primary to be provided by the DEPARTMENT*

27.3 Alignment and Existing Right-of-Way (R/W) Lines

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

This Survey Line should be established by recovering the tangent lines of existing DEPARTMENT Right of Way maps if such maps exist, or in the center of dedicated Right of Way as per subdivision plats, or in the center of the pavement when no Right of Way map or dedication exists. Note: This alignment shall be approved by the District Location Surveyor and/or their designee before being placed on the ground. No other phases of the Location Survey shall be performed until this Survey Line has been approved by the DEPARTMENT, placed on the ground by the CONSULTANT, and reviewed in the field by the DEPARTMENT and the CONSULTANT's Surveyor in responsible charge. The DEPARTMENT alignment approval process includes the delivery of the ALGNRDxx CADD file by the CONSULTANT.

Tie all major Survey Line control points (every PC, PI if possible, PT, POT, and POC) to primary HPC to establish Florida State Plane Coordinates on each respective point. The DEPARTMENT's expectation is that distances between Survey Line control points will not exceed 1,000 feet, though moving up-station or down-station to avoid obstructions, including reference points and lines, is encouraged. Offset control points may be utilized if conditions deter Survey Line monumentation, however every reasonable and safe effort shall be made to set the point on the Survey Line. The stationing assigned to an offset control point shall be radial and/or symmetrical to the Survey Line.

The Project RWDTRDxx CADD file shall be prepared and delivered concurrent with the SURVRDxx CADD file and other required deliverables, in their proper file structure as required for final deliverables.

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.

Aerial or terrestrial LiDAR targets may be placed right and left of alignment on flat surfaces visible from above. Targets are spaced along the project as directed by the photogrammetrist or remote sensor. Target size is specified by the photogrammetrist or remote sensor and should have a contrasting black and white pattern. Horizontal values, stations and offsets and Vertical elevations are required on all targets.

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 (G.L.O.) corners as required.

Reference points shall be found or set for all Survey Line control points and shall be in-line and extend outside of the existing and proposed Right of Way. It is preferred that the alignment reference points be at a 90° angle to the Survey line in a tangent, a bisecting angle at a non-curve PI, and radial in curves. These shall be recorded in a field book, and depict all monumentation, stationing, angles, and distances.

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

Locate all above ground features and improvements for the limits of the project by collecting the required data for the purpose of creating a DTM with sufficient density. Shoot all break lines; high

and low points. Effort includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

It is preferred that a field survey party perform field checks, such as for curb type, utility type and void area densification. Make a complete topographic survey including, but not limited to, apparent wells, trees if required, significant roof drains, visible utilities, lane lines, pavement striping for turn lanes, and passing/no passing lane changes. Incorporate R/W information for entire project in the final topography delivery as shown on DEPARTMENT R/W Maps (if such maps exist) that meets the roadway design CADD standards.

All features and improvements shall be labeled in CADD with sufficient frequency and in such a manner that positive identification can be easily made. Labels shall conform to the current specifications for desired text size and spacing.

27.7 Planimetric (2D) – *N/A*

27.8 Roadway Cross Sections/Profiles

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

The method, approach, and resulting deliverables, to obtain Topographic/DTM checks shall be discussed with and approved by the District Location Surveyor, or their designee.

27.9 Side Street Surveys – *N/A*

27.10 Underground Utilities

Designation includes two-dimensional collection of existing utilities and selected three-dimensional verification as needed for designation. Location includes non-destructive excavation to determine size, type and location of existing utility, as necessary for final three-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.

Soil removed for obtaining locates on utility lines shall be placed back in the excavation in a way that does not disturb or damage the utility. Locates through asphalt pavement shall be finished with cold pack asphalt to at least the same thickness as the base and asphalt that was removed. Locates through concrete pavement, sidewalks, etc. shall be finished using a high strength concrete mix to the same depth as what was removed. The cuts made in asphalt and concrete for locates shall be made in a manner that provides a patch with regular sides that will be level with no protruding or jagged edges.

27.11 Outfall Survey – *N/A*

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.

Perform drainage survey including pipe type, location, size and flow line elevations. If drainage system branches off the main line, survey should be extended to the next structure.

27.13 Bridge Survey (Minor/Major) – *N/A*

27.14 Channel Survey – *N/A*

27.15 Pond Site Survey – *N/A*

27.16 Mitigation Survey – *N/A*

27.17 Jurisdiction Line Survey – *Optional Services*

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

27.18 Geotechnical Support – *Optional Services*

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

27.19 Sectional/Grant Survey – *N/A*

27.20 Subdivision Location – *N/A*

27.21 Maintained R/W – *N/A*

27.22 Boundary Survey – *N/A*

27.23 Water Boundary Survey – *N/A*

27.24 Right-of-Way Staking, Parcel / Right of Way Line – *N/A*

27.25 Right-of-Way Monumentation – *N/A*

27.26 Line Cutting – *N/A*

27.27 Work Zone Safety

Provide work zone as required by DEPARTMENT standards.

27.28 Vegetation Survey – *N/A*

27.29 Tree Survey – *N/A*

27.30 Miscellaneous Surveys – *N/A*

27.31 Supplemental Surveys – *N/A*

27.32 Document Research

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

27.33 Field Review

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

27.34 Technical Meetings

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

27.35 Quality Assurance/Quality Control (QA/QC)

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

27.36 Supervision

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

27.37 Coordination

Coordinate survey activities with other disciplines and ***any and all adjacent and integral consultants so as to produce a final and complete survey product for the project(s) described herein***. These activities must be performed by the project supervisor, a Florida P.S.M. or their delegate as approved by the District Surveying Office.

28 PHOTOGRAMMETRY

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

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

Low Altitude Mapping Photography

Furnish all aerial photography, photogrammetry, and related products for the total project in accordance with the Florida Department of Transportation Surveying & Mapping Procedures, Topic No. 550-030-101.

The following procedures shall be utilized for this project: 3D topographic survey along main corridor and side streets.

1) Flight: Perform the flight utilizing helicopter at 350 feet above grade using a high precision aerial mapping camera with (FMC) forward motion compensation and with an average weighted resolution of 105 and above. Photography shall be at a negative scale of approximately 1" = 50'.

2) Field Survey: Aerial targets are placed right and left of the alignment and spaced along the project as directed by the photogrammetrist. Target size is specified by the photogrammetrist and should have a contrasting black and white pattern. Horizontal values and vertical elevations are required on all targets.

3) Analytical Triangulation: Normal A.T. procedures shall be used similar to that which is performed for other flight scales.

4) DTM Collection: Data shall be collected at spots and break lines similar to what is done with all photogrammetric projects. Scales of 1"=20' shall have data points collected at approximately 33 feet and 1"=50' at 65 feet intervals. All data shall be delivered as Microstation files on CD ROM conforming to DEPARTMENT mapping procedures.

5) Field Edit: Field checks performed by the field survey party is preferred, such as a curb type, utility type, and void area densification. This information shall be furnished to the photogrammetrist for inclusion in the planimetric file.

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 – *N/A*

28.14 Sheet Clipping

Create plot files for sheets from the database.

28.15 Topographics (3D)

Prepare topographic maps, including surface and planimetrics. (Photogrammetrist ***shall*** 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 (QA/QC)

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. ***The CONSULTANT shall coordinate their work with any and all adjacent and integral consultants so as to produce a final and complete mapping product for the project(s) described herein.***

29 MAPPING – *N/A*

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. If this task is performed by separate firm, or is the final product to be delivered, include effort for Survey Report.

30.8 Classification / Editing

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

points.

30.9 Specific Surface Reporting

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

30.10 Topographic (3D) Mapping

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

30.11 Topographic (2D) Planimetric Mapping

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

30.12 CADD Edits

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

30.13 Data Merging

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

30.14 Miscellaneous

Other tasks not specifically addressed in this document.

30.15 Field Reviews

Perform on site review of maps.

30.16 Technical Meetings

Attend meetings as required.

30.17 Quality Assurance/ Quality Control

Establish and implement a QA/QC plan.

30.18 Supervision

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

30.19 Coordination

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

31 ARCHITECTURE DEVELOPMENT – *N/A*

32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE

The CONSULTANT shall perform the services necessary to reassess noise abatement identified as reasonable and feasible during the Project Development and Environmental (PD&E) phase, as directed and clarified by the DEPARTMENT.

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

32.1 Noise Barrier Analysis

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

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

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

The CONSULTANT shall review the commitments made during the PD&E phase regarding noise barrier concepts determined to be potentially feasible and reasonable. The CONSULTANT ***shall*** update the analysis of feasibility and reasonableness for noise barriers recommended for further consideration during the design phase and for any additional noise barriers required, using design information (e.g., profile data, horizontal alignment data, etc.) and incorporate into the analysis any new conditions or additional costs related to noise barrier construction that have been identified during design. A design phase noise analysis ***shall*** be performed at any additional locations required (based on DPK requirements or roadway design changes). Additional survey may also be required at proposed barrier locations.

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

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

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

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

32.2 Noise Barrier Evaluation

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

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

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

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

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

32.3 Public Involvement

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

As a minimum, the following tasks shall be completed by the CONSULTANT for public involvement purposes:

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

The CONSULTANT shall bring to the attention of the DEPARTMENT unforeseen conditions and issues which are relevant to the project decision. Other than noise barrier length, height and location, the CONSULTANT shall abstain from indicating preferences for any of the barrier options prior to or during contact with the property owners unless specifically requested to do so by the DEPARTMENT. Following the public involvement process, the CONSULTANT shall produce a final noise barrier recommendation that identifies the starting and ending points for all noise barriers, the top elevation(s), and the aesthetic elements to be provided (e.g. – color, texture, graphics).

32.4 Outdoor Advertising Identification

The CONSULTANT shall identify potential noise barriers that may block the view of an existing lawfully erected sign that is governed by and conforms to state and federal requirements for land use, size, height and spacing consistent with the requirements of Florida Statute (FS) 479.25 and the FDOT Noise Policy (Part 2, Chapter 17 of the PD&E Manual). The CONSULTANT shall notify the Department's Project Manager of a potential noise barrier(s) that may affect the visibility of a legally permitted outdoor advertising sign. Resolution of the potential conflict shall be documented in the NSR and included in the environmental document.

32.5 Noise Study Report (NSR) Addendum

The results of noise barrier evaluations performed by the CONSULTANT shall be documented in the NSR Addendum (in accordance with Chapter 264 of the FDOT Design Manual (FDM)) and shall include the results of the computer modeling (electronically), public involvement activities and final noise abatement commitments.

32.6 Technical Meetings

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

32.7 Quality Assurance/Quality Control

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

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

32.8 Supervision

32.9 Coordination

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS – *Optional Services*

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

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

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

33.1 ITS Analysis

The CONSULTANT shall review the approved preliminary engineering report, typical section package, traffic technical memorandum and proposed geometric design alignment to identify impacts to existing ITS components (if applicable) and proposed ITS field device placements. The CONSULTANT shall review all related District ITS plans and documentation for the project corridor to ensure all cited ITS elements are included in this project, and develop a Concept of Operations (ConOps), Project Systems Engineering Management Plan (PSEMP), RTVM, and other documents as necessary for conformance with Federal Highway Administration (FHWA) requirements. The CONSULTANT shall use all applicable DEPARTMENT requirements and guidelines, including, but not limited to, the ***FDOT Design Manual***, Standard Plans, and Standard Specifications for Road and Bridge Construction in the design of ITS. The CONSULTANT design

is expected to include the following attributes, facilities, infrastructure, ITS devices, systems, and associated work: ***TBA***

The 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). Cameras shall be spaced to meet the Project requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

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

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

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

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

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

Closed Circuit Television (CCTV) Camera Assembly

The CONSULTANT shall be responsible for the design and exact field locations for the camera assemblies. The camera subsystem shall provide overlapping coverage to overcome visual blockage. Camera assemblies may include a camera lowering device (CLD).

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 desired by the DEPARTMENT).*** The position, height, and design of each camera pole shall be finalized during the design phase of the project. Each site shall be designed for overall monitoring capability, as well as designed to provide safe and effective maintenance conditions.

The 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 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.

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 Project 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 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.

The vehicle detectors must meet the Project 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 ***shall*** coordinate and perform a detailed site survey with a factory-trained and certified representative of the detection system manufacturer being 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 CONSULTANT shall be responsible for the design of a vehicle detection system that allows travel times to be automatically calculated for the roadway facilities. The travel time system may utilize a variety of vehicle detection systems, including loop, video, microwave, wireless magnetometer and Automatic Vehicle Identification (AVI) systems. The system shall utilize the project communications backbone in order to collect and distribute travel time data to the TMCs.

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

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

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

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

Dynamic Message Sign Subsystem

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

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

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

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

The DMS shall be designed in accordance with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 700.

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 or Modified Special Provisions for RWIS based upon the unique needs of the project. The CONSULTANT shall ensure that each RWIS site consists of a remote Processing Unit (RPU), communication hardware, and determine the site-specific components as required from 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 project corridor. The plan shall be developed prior to submittal of Phase I plans. The plan shall identify communications media alternatives and provide a cost estimate that includes initial, operations and maintenance cost for the life cycle of the communications network. The plan shall ensure that video, voice, and data will be communicated in real-time between center-to-field and center-to-center (C2C) nodes as applicable. The communications system design must utilize non-proprietary, open-architecture, standards-based, robust, scalable, and proven technology. The communication plan analysis shall address communication and connections between field devices, communications and connections between field devices and the TMC, center-to-center communications between TMCs, and any other communication links or connections required to meet project goals. The plan must include bandwidth analysis and recommendations, needs assessment, and provide recommendations regarding minimum requirements, media, network devices, protocols, network topology, communication redundancy, future needs, spare capacity, and any communications or data sharing with other agencies.

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

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

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, 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 the Project unless otherwise approved by the DEPARTMENT. To enhance power reliability, the CONSULTANT shall design a power distribution and backup system consisting of, at a minimum, underground power conduits and conductors, transformers, generators, automatic transfer switches, UPS, and all associated equipment. The power backup system shall supply electrical power in event of commercial power supply failure for all system components. Power equipment shall be installed in areas to avoid wet locations. All connections and equipment shall be protected from moisture and water intrusion. The CONSULTANT shall ensure that vandal resistant mechanisms for all electrical infrastructure shall be included as part of the Design.

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

33.5 Voltage Drop Calculations

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

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 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 Project requirements, including field of view; elimination of occlusion; site access for maintenance vehicles and personnel; access to pole mounted equipment, such as CCTV cameras, traffic detectors, and cabinets; and probability of lightning strike.

33.12 Sign Panel Design Analysis

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 for EQ Report*

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

33.14 Cost Estimate

The CONSULTANT shall prepare an engineer's cost estimate for the project using historical data from the FDOT or from other Industry sources. The CONSULTANT shall also load the pay items and quantities into AASHTOWare Project Preconstruction.

33.15 Technical Special Provisions and Modified Special Provisions

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

33.16 Other ITS Analyses

33.17 Field Reviews

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

- Existing ITS Field Devices as compared with the latest FDOT standards and District requirements
- Device Make, Model, Capabilities, Condition / Age, Existence of SunGuide Software Driver
- Condition of Structure(s), cabinets, and other above-ground infrastructure and devices
- Type of Detection as Compared With Current District Standards
- 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 project.***

33.19 Quality Assurance / Quality Control

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

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

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

33.20 Supervision

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

33.21 Coordination

The CONSULTANT shall coordinate with Survey, Geotech, Drainage, Structures, Lighting, Roadway Design, Utilities, municipalities, maintaining agencies and Traffic Operations to produce a final set of construction contract documents and to ensure that a high degree of accuracy for the design plans is achieved.

34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS – *Optional Services*

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 Specifications
- Standard Index

34.2 General Notes / Pay Item Notes

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

34.3 Project Layout

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

34.4 Typical and Special Details

The CONSULTANT shall prepare typical and/or special details for conditions in the project not addressed by the DEPARTMENT’s Standard Plans for Design, Construction, Maintenance, and

Utility Operations on the State Highway System. The CONSULTANT shall prepare special details not addressed by FDOT Standard Plans, including block diagrams, hub cabinets, wiring diagrams, solar power service, and special mounting details.

34.5 Plan Sheet

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

34.6 ITS Communications Plans

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

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

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

The CONSULTANT ***shall be*** 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 ***TBA.***

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.

34.7 Fiber Optic Splice Diagrams

The CONSULTANT shall produce fiber optic cable splicing diagrams to show the connectivity of the fiber optic cable from its termini at field devices to the TMC. The diagrams shall denote new and existing fiber routes, splices and terminations involved in the work. The diagrams shall identify cables by size, tube color/number and stand colors/numbers. All cables shall be identified either by a numbering system ***shown in*** the plans or by bounding devices. The diagrams shall denote the types of connectors in the patch panels.

34.8 Grounding and Lightning Protection Plans

The CONSULTANT shall include efforts to design a complete and reliable lightning protection design for each pole and associated devices, ITS device installation, as well as device cabinets and communications hubs, etc. if not already addressed in the FDOT's Standard Plans for Design, Construction, Maintenance and Utility Operations on the State Highway System.

34.9 Cross Sections

The CONSULTANT shall prepare cross sections for ITS devices.

34.10 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 project corridor.

34.11 Special Service Point Details

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

34.12 Strain Pole Schedule

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

34.13 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 ***in accordance*** with Chapter 2e – Guide Signs-Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and FDOT Design Manual (FDM) and all other applicable manuals and guidelines ***in accordance with*** governing regulations.

34.14 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 roadway and structural engineers.

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

34.15 Temporary Traffic Control Plans

The CONSULTANT shall prepare Temporary Traffic Control Plans (TTCP) to minimize impact to traffic during the construction of ITS field devices and associated communications infrastructure that will be deployed along the project corridor.

The TTCP shall strive to maintain and sustain center-to-field device connectivity and operability to the ITS field devices previously deployed along the project corridor. The TTCP effort shall consider

and mitigate the impacts of the project's various construction phases so as to sustain center-to-field devices connectivity and operability, maintaining operational quality as a minimum at the level provided prior to construction start and minimizing down time as much as possible. The CONSULTANT shall develop the TTCP sheets for the project, providing temporary communications as necessary, notes, details, and direction applicable to the ITS elements and associated communications for inclusion in the TTCP.

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

34.16 Interim Standards

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

34.17 GIS Data and Asset Management Requirements

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

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

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

- DMS location (mainline and arterial)
- Vehicle detection pole location
- 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)

34.18 Quality Assurance / Quality Control

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

34.19 Supervision

The CONSULTANT shall supervise all technical design activities.

35 GEOTECHNICAL

The CONSULTANT shall, for each project, be responsible for a complete geotechnical investigation. All work performed by the CONSULTANT shall be in accordance with DEPARTMENT standards, or as otherwise directed by the District Geotechnical Engineer. The District Geotechnical Engineer will make interpretations and changes regarding geotechnical standards, policies and procedures and provide guidance to the CONSULTANT.

Before beginning each phase of investigation and after the Notice to Proceed is given, the CONSULTANT shall submit an investigation plan for approval and meet with the DEPARTMENT's Geotechnical Engineer or representative to review the project scope and DEPARTMENT requirements ***(meeting can be waived at the discretion of the Geotechnical Engineer)***. The investigation plan shall include, but not be limited to, the proposed boring locations and depths, and all existing geotechnical information from available sources to generally describe the surface and subsurface conditions of the project site. Additional meetings may be required to plan any additional field efforts, review plans, resolve plans/report comments, resolve responses to comments, and/or any other meetings necessary to facilitate the project.

The CONSULTANT shall notify the DEPARTMENT in adequate time to schedule a representative to attend all related meetings and field activities.

35.1 Document Collection and Review

The CONSULTANT ***shall*** 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, the CONSULTANT shall review U.S.G.S., S.C.S. and potentiometric maps, and identify areas with problematic soil and groundwater conditions.

Roadway

The CONSULTANT shall be responsible for coordination of all geotechnical related field work activities. The CONSULTANT shall retain all samples until acceptance of Phase IV plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

Obtain pavement cores as directed in writing by the District Geotechnical Engineer.

If required by the District Geotechnical Engineer, a preliminary roadway exploration shall be performed before the Phase I plans submittal. The preliminary roadway exploration ***shall*** be performed and results provided to the Engineer of Record to assist in setting roadway grades and locating potential problem areas. The preliminary roadway exploration shall be performed as directed in writing by the District Geotechnical Engineer.

The CONSULTANT shall perform specialized field-testing as required by project needs and as directed in writing by the District Geotechnical Engineer.

All laboratory testing and classification ***shall*** 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 the DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program ***is expected*** to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

35.3 Stake Borings/Utility Clearance

Stake borings and obtain utility clearance.

35.4 Muck Probing

Probe standing water and surficial muck in a detailed pattern sufficient for determining removal limits to be shown in the Plans.

35.5 Coordinate and Develop TTCP Plans for Field Investigation

Coordinate and develop Maintenance of Traffic (TTCP) plan. All work zone traffic control ***shall*** 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) ***or Resilient Modulus*** testing ***as directed by the District Geotechnical Office***. Deliver Resilient Modulus samples to the District Materials Office or the State Materials Office in Gainesville, as directed by the DEPARTMENT.

35.10 Coordination of Field Work

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

35.11 Soil and Rock Classification – Roadway

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

35.12 *Resilient Modulus or* Design LBR

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

The Resilient Modulus will be provided from testing performed by the State Materials Office. Design LBR should only be determined when approved by the District Geotechnical Office.

35.13 Laboratory Data

Tabulate laboratory test results for inclusion in the geotechnical report, the report of tests sheet (Roadway Soil Survey Sheet), and for any necessary calculations and analyses.

35.14 Seasonal High Water Table

Review the encountered ground water levels and estimate seasonal high ground water levels. Estimate seasonal low ground water levels, if requested.

35.15 Parameters for Water Retention Areas

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

35.16 Delineate Limits of Unsuitable Material

Delineate limits of unsuitable material(s) in both horizontal and vertical directions. Assist the Engineer of Record with detailing these limits on the cross-sections. If requested, prepare a plan view of the limits of unsuitable material.

35.17 Electronic Files for Cross-Sections

Create electronic files of boring data for cross-sections.

35.18 Embankment Settlement and Stability

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

35.19 Monitor Existing Structures

Provide Roadway EOR guidance on the radius to review existing structures for monitoring.

Optional Services: 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 the ***FDOT Design Manual*** 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, ***and shall follow the Districts One and Seven Materials Office's Standard Operating Procedures for Pavement Survey Evaluations.*** 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. ***The report shall include, but not be limited to:***

- 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 calculations/graphs, and other pertinent calculations.
- The CONSULTANT ***shall*** 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 ***shall*** respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.25 Auger Boring Drafting

Draft auger borings as directed by the DEPARTMENT.

35.26 SPT Boring Drafting

Draft SPT borings as directed by the DEPARTMENT.

Structures

The CONSULTANT shall be responsible for coordination of all geotechnical related fieldwork activities. The CONSULTANT shall retain all samples until acceptance of Phase IV plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

The CONSULTANT shall perform specialized field testing as required by needs of project and as directed in writing by the District Geotechnical Engineer.

All laboratory testing and classification ***shall*** 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 the DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program ***is expected*** to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

35.28 Stake Borings/Utility Clearance

Stake borings and obtain utility clearance.

35.29 Coordinate and Develop TTCP Plans for Field Investigation

Coordinate and develop TTCP plan. All work zone traffic control ***shall*** 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 ***for soil and water, when appropriate.***

35.33 Coordination of Field Work

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

35.34 Soil and Rock Classification – Structures

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

35.35 Tabulation of Laboratory Data

Laboratory test results should be tabulated for inclusion in the geotechnical report and for the necessary calculations and analyses.

35.36 Estimate Design Groundwater Level for Structures

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

35.37 Selection of Foundation Alternatives (BDR)

Evaluation and selection of foundation alternative, including the following:

- GRS-IBS
- Spread footings
- Prestressed concrete piling – various sizes
- Steel H-piles
- Steel pipe piles
- Drilled shafts

Foundation analyses shall be performed using approved DEPARTMENT methods. Assist in selection of the most economical, feasible foundation alternative.

35.38 Detailed Analysis of Selected Foundation Alternate(s)

Detailed analysis and basis for the selected foundation alternative. Foundation analyses shall be performed using approved DEPARTMENT methods and shall include:

- GRS-IBS (including the parameters identified in the Instructions for Developmental Design Standard D6025 to be provided by the Geotechnical Engineer)
- Spread footings (including soil bearing capacity, minimum footing width, and minimum embedment depth)
- For pile and drilled shaft foundations, provide graphs of ultimate axial soil resistance versus tip elevations. Calculate scour resistance and/or downdrag (negative skin friction), if applicable.
- The CONSULTANT shall assist the Engineer of Record in preparing the Pile Data Table (including test pile lengths, scour resistance, downdrag, minimum tip elevation, etc.)
- Provide the design soil profile(s), which include the soil model/type of each layer and all soil engineering properties required for the Engineer of Record to run the FB-***Multi***Pier computer program. Review lateral analysis of selected foundation for geotechnical compatibility.
- Estimated maximum driving resistance anticipated for pile foundations.
- Provide settlement analysis.

35.39 Bridge Construction and Testing Recommendations

Provide construction and testing recommendations, including potential constructability problems.

35.40 Lateral Load Analysis (Optional)

Perform lateral load analyses as directed by the DEPARTMENT.

35.41 Walls

Provide the design soil profile(s), which include the soil model/type of each layer and all soil-engineering properties required by the Engineer of Record for conventional wall analyses and recommendations. Review wall design for geotechnical compatibility and constructability.

Evaluate the external stability of conventional retaining walls and retained earth wall systems. For retained earth wall systems, calculate and provide minimum soil reinforcement lengths versus wall heights, and soil parameters assumed in analysis. Estimate differential and total (long term and short term) settlements.

Provide wall construction recommendations.

35.42 Sheet Pile Wall Analysis (Optional)

Analyze sheet pile walls as directed by the DEPARTMENT.

35.43 Design Soil Parameters for Signs, Signals, High Mast Lights, and Strain Poles and Geotechnical Recommendations

Provide the design soil profile(s) that include the soil model/type of each layer and all soil properties required by the Engineer of Record for foundation design. Review design for geotechnical compatibility and constructability.

35.44 Box Culvert Analysis

- Provide the design soil profile(s) that include the soil model/type of each layer and all soil properties required by the Engineer of Record for foundation design. Review design for geotechnical compatibility and constructability.
- Provide lateral earth pressure coefficients.
- Provide box culvert construction and design recommendations.
- Estimate differential and total (long term and short term) settlements.
- Evaluate wingwall stability.

35.45 Preliminary Report – BDR

The preliminary structures report shall contain the following discussions as appropriate for the assigned project:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis).
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

35.46 Final Report – Bridge and Associated Walls

The final structures report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S, U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

35.47 Final Reports – Signs, Signals, Box Culvert, Walls, and High Mast Lights

The final reports shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.
- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

Final reports ***shall*** 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 ***shall*** be submitted to the District Geotechnical Engineer for review prior to project completion. After review by the District Geotechnical Engineer, the reports ***shall*** be submitted to the District Geotechnical Engineer in final form and ***shall*** include the following:

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

Additional final reports (up to four), ***in addition to those*** stated above, may be needed and requested for the DEPARTMENT's Project Manager and other disciplines.

The final reports and special provisions, as well as record prints, ***shall*** be signed and sealed by a Professional Engineer ***licensed*** in the State of Florida.

Draft the detailed boring/sounding standard sheet, including environmental classification results of laboratory testing, and specialized construction requirements, for inclusion in final plans.

35.48 SPT Boring Drafting

Prepare a complete set of drawings to include all SPT borings, auger borings and other pertinent soils information in the plans. Include these drawings in the Final Geotechnical Report. Draft borings, location map, S.C.S. map and U.S.D.A. map as directed by the DEPARTMENT. Soil symbols must be consistent with those presented in the latest Florida Department of Transportation Soils and Foundations Handbook.

35.49 Other Geotechnical

Other geotechnical effort specifically required for the project as determined by the Department, and included in the geotechnical upset limit.

35.50 Technical Special Provisions and Modified Special Provisions

35.51 Field Reviews

Identify and note surface soil and rock conditions, surface water conditions and locations, and preliminary utility conflicts. Observe and note nearby structures and foundation types.

35.52 Technical Meetings

35.53 Quality Assurance/Quality Control

35.54 Supervision

35.55 Coordination

36 3D MODELING

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

The CONSULTANT shall deliver all master design files, 3D surface design models, and all supporting digital files for the development of plans as required in the FDOT CADD Manual.

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

The CONSULTANT shall add detail to the corridor and design model for 3D design. Includes many elements that contribute to this, including but not limited to slope transitions, typical section transitions, changes in pavement depth, berms, swales/ditches, and other feature transitions. Extra corridor structure leads to extra assemblies, extra targeting, etc.

The CONSULTANT shall create an accurate roadway design model which includes modeling the intersections.

The CONSULTANT shall submit .dgn files associated with the 3D model and their respective components.

36.1 Phase I 3D Design Model

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase I 3D interactive model, comprised of, but not limited to: Existing features (pavement, shoulders, sidewalk, curb/gutter, utilities-if required per scope, drainage - if required per scope) and proposed corridor(s).

36.2 Phase II 3D Design Model

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase II 3D model, comprised of, but not limited to: Modification of the Phase I model to update the model to comply with changes based on the Phase I review comments and to include the addition of ponds, floodplain compensation sites, retaining walls, barrier walls, guardrail terminals, cross overs, gore areas, side street connections, roundabouts, and driveways.

36.3 Phase III 3D Design Model

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, Phase III 3D model and deliverable files for review, comprised of, but not limited to: Modification of the Phase II model to update the model to comply with changes based on the Phase II review comments and to further refine areas of transition between templates, detailed grading areas, bridge approaches and end bents, median noses, shoulder transition areas, retaining walls, barrier walls and guardrail.

36.4 Final 3D Model Design

The CONSULTANT shall prepare for approval by DEPARTMENT, Phase IV 3D model, comprised of, but not limited to: Modification of the Phase III model to update the model to comply with changes based on the Phase III review comments and to accurately generate, export and otherwise prepare the final 3D deliverable files as described in the FDOT CADD Manual.

36.5 Cross Section Design Files

The CONSULTANT shall establish and develop cross section design files in accordance with the DEPARTMENT's CADD manual and the FDOT Design Manual. Includes all work required to establish and utilize intelligent/automated methods for creating cross sections including determining the locations for which all cross sections will be shown, existing and proposed features, cross section refinement, placement of utilities and drainage, soil boxes, R/W lines, earthwork calculations, and other required labeling.

36.6 Template and Assembly Development (Optional)

The CONSULTANT shall prepare for approval by the DEPARTMENT, project-specific templates or assemblies needed to develop the features required to deliver the 3D model.

36.7 Quality Assurance/Quality Control

36.8 Supervision

36.9 Coordination

37 PROJECT REQUIREMENTS

37.1 Liaison Office

The DEPARTMENT and the CONSULTANT ***shall*** designate a Liaison Office and a Project Manager who shall be the representative of their respective organizations for the Project. While it is expected the CONSULTANT shall seek and receive advice from various state, regional, and local agencies, the final direction on all matters of this project remain with the DEPARTMENT Project Manager.

37.2 Key Personnel

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

37.3 Progress Reporting

The CONSULTANT shall meet with the DEPARTMENT as required and shall provide a written monthly progress report with approved schedule, schedule status, and payout curve or by using the earned value method that describe the work performed on each task. The report will include assessing project risk through monthly documentation of identifying and updating the risk category and approach for monitoring those tasks. Invoices shall be submitted after the DEPARTMENT approves the monthly progress report and the payout curve or with earned value analysis. The Project Manager will make judgment on whether work of sufficient quality and quantity has been accomplished by comparing the reported percent complete against actual work accomplished.

37.4 Correspondence

Copies of all written correspondence between the CONSULTANT and any party pertaining specifically to this contract shall be provided to the DEPARTMENT for their records within one (1) week of the receipt or mailing of said correspondence.

37.5 Professional Endorsement

The CONSULTANT shall have a Licensed Professional Engineer in the State of Florida sign and seal all reports, documents, Technical Special Provisions, Modified Special Provisions and plans as required by DEPARTMENT standards.

37.6 Computer Automation

The project ***shall*** 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 ***and CADD Production Criteria Handbook (including the minimum 95% compliance threshold for all design files).*** The CONSULTANT ***shall*** submit final documents and files as described therein.

37.7 Coordination With Other Consultants

The CONSULTANT ***firm*** shall coordinate ***their*** work with any and all adjacent and integral consultants so as to effect complete and homogenous plans and specifications for the project(s) described herein.

37.8 Optional Services

At the DEPARTMENT's option, the CONSULTANT may be requested to provide Optional Services. The fee for these services shall be negotiated in accordance with the terms detailed in Exhibit B, Method of Compensation, for a fair, competitive and reasonable cost, considering the scope and complexity of the project(s). Additional services may be authorized by a Supplemental Amendment in accordance with paragraph 2.00 of the Standard Consultant Agreement. The additional services may include***, but are not limited to,*** Construction Assistance, Review of Shop Drawings, ***Plans Update, Expert Witness Testimony,*** 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 ***noted as Optional Services herein***.

38 INVOICING LIMITS

Payment for the work accomplished ***shall*** be in accordance with the Method of Compensation of this contract. Invoices shall be submitted to the DEPARTMENT in a format prescribed by the DEPARTMENT. The DEPARTMENT Project Manager and the CONSULTANT shall monitor the cumulative invoiced billings to ensure the reasonableness of the billings compared to the project schedule and the work accomplished and accepted by the DEPARTMENT.

The CONSULTANT ***shall*** provide a list of key events and the associated total percentage of work considered to be complete at each event. This list will 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.

Each invoice shall be accompanied by a certification by the CONSULTANT's Project Manager, Engineer-of-Record or Project Principal that the invoicing is consistent with the project's progress and Prima Vera schedule.

For projects with lump sum invoicing for Basic Services, a 100% complete payout will not be approved before the date of the construction contract advertisement.