

December 2019

EXHIBIT A



LEE COUNTY
SOUTHWEST FLORIDA

SCOPE OF SERVICES

FOR

ALICO EXTENSION (ALICO ROAD TO S.R.- 82)

DISTRICT ONE

LEE COUNTY

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DRAFT

**SCOPE OF SERVICES FOR PROJECT DEVELOPMENT AND ENVIRONMENT STUDY
AND DESIGN SERVICES**

HIGHWAY AND BRIDGE/STRUCTURAL DESIGN

This Exhibit forms an integral part of the agreement between the Board of County Commissioners of Lee County (hereinafter referred to as the COUNTY) and _____ (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: *Pending*

Federal Aid Project No.: *Pending*

Description: ***ALICO ROAD CONNECTOR from ALICO ROAD at AIRPORT HAUL ROAD TO NORTH of SR 82 at SUNSHINE BOULEVARD, Lee County.***

Bridge No(s): *N/A*

Railroad Crossing No.: *N/A*

Lead Agency: COUNTY

Current Context Classification: ***C-1 Natural and C-2 Rural***

1 PURPOSE AND PROJECT DESCRIPTION

The purpose of this Exhibit is to describe the scope of work and the responsibilities of the CONSULTANT and the COUNTY regarding the Project Development and Environment (PD&E) Study, 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.

The general objective is for the CONSULTANT to conduct a PD&E study and prepare a set of contract documents including plans, specifications, supporting engineering analysis, calculations and other technical documents in accordance with COUNTY policy, procedures and requirements. The PD&E Study will enable the COUNTY to obtain the Location and Design Concept Acceptance (LDCA) for the project concurrent with preparation of Phase II design plans. The contract documents will be used by the contractor to build the project. The contract documents will be used by the COUNTY 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 PD&E Manual, FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance (Florida Greenbook), and other pertinent manuals are specifically prescribed to accomplish the work included in this contract and indicates which items of work will be the responsibility of the CONSULTANT and/or the COUNTY.

1 PURPOSE AND PROJECT DESCRIPTION

The CONSULTANT shall be aware that as a project is developed, certain modifications and/or improvements to prior (planning) 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 COUNTY and others as necessary, management of time and resources, and documentation. In accordance with COUNTY procedures, the CONSULTANT shall set up a project contract file and maintain it throughout the PD&E Study and design of the project.

The CONSULTANT is expected to know the laws and rules governing their professions and is expected to provide services in accordance with all governing statutes, current regulations, codes and ordinances, and recognized standards applicable to such professional services. The CONSULTANT shall provide qualified technical and professional personnel to perform, to COUNTY standards and procedures, the duties and responsibilities assigned under the terms of this agreement. To the maximum extent possible, the CONSULTANT shall minimize the COUNTY's need to apply its own resources to assignments authorized by the COUNTY.

The COUNTY will provide contract administration, management services, and technical reviews of all work associated with the development and approval of the environmental document, and the development and preparation of contract documents, including construction documents. The COUNTY'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 COUNTY may provide job specific information and/or functions as outlined in this Scope of Services.

Major work mix includes: ***Group 2 Project Development and Environmental (PD&E) Studies and Group 3 Highway Design (Roadway).***

Major work groups include:

Group 2- Project Development and Environmental (PD&E) Studies;

Group 3.1 Minor Highway Design;

Minor work groups include:

Group 4.1.2 Minor Bridge Design;

Group 6.1 – Traffic Engineering Studies;

Group 7.1 – Signing, Pavement Marking and Channelization;

Group 7.2 – Lighting;

Group 7.3 Signalization;

Group 8.1 Control Surveying;

Group 8.2 – Design, Right of Way and Construction Surveying;

Group 8.4 – Right of Way Mapping;

Group 9.1 – Soil Exploration;

Group 9.2 Geotechnical Classification Laboratory Testing and

Group 9.4.1 Standard Foundation Studies.

Known alternative construction contracting methods include: *N/A*.

1.1 Project Description

Additional details to be provided in negotiated final Scope of Services.

1.2 Project General (Activities 2, 3, 4, and 5)

Public Involvement

Other Agency Presentations/Meetings

Joint Project Agreements

Specification Package Preparation

Value Engineering

Risk Assessment Workshop

Typical Section

Pavement Design

Pavement Type Selection Report(s)

Cross Slope

Access Management Classification

Transit Route Features

Major Intersections/Interchange

Roadway Alternative Analysis

Level of TTCP Plans: The CONSULTANT shall develop Temporary Traffic Control Plans (TTCP) for this project. The CONSULTANT shall schedule a meeting before Phase II to present the TTCP phasing with the District Construction Office. The consultant shall prepare Roll Plots 1"=100' to discuss the phasing in a workshop.

Traffic Management Plan

Temporary Lighting

Temporary Signals

Temporary Drainage

Design Variations/Exceptions

Back of Sidewalk Profiles

Selective Clearing and Grubbing

1.3 PD&E Study (Activities 2, 3, 4, 6a, 7, 10, and 32)

Participating and Cooperating Agencies

Anticipated Class of Action

Environmental Resource Involvement

Previously Studied Project Alternatives: Development of alternatives will consider previously completed planning products. **ADDITIONAL INFORMATION AVAILABLE IN THE ALICO ROAD CONNECTOR STUDY PREPARED BY McMAHON TRANSPORTATION ENGINEERS & PLANNERS DATED JULY 2009.**

Environmental Analysis: Prior to beginning environmental work, the CONSULTANT must review the ETDM Programming Screen Summary Report, resource agencies' comments, permits that may be required, and GIS information from the Environmental Screening Tool (EST). CONSULTANT activities to conduct and prepare environmental analysis and reports shall be done under the direction of the COUNTY Project Manager.

Preliminary Engineering Analysis: The CONSULTANT shall perform engineering activities essential to develop and evaluate Project alternatives as outlined in Part 2 Chapter 3 of the PD&E Manual. Based on engineering analysis, the public involvement process, and environmental analysis, the COUNTY will recommend a preferred design concept to advance to final design plans. Some of the tasks under Activity 4 Roadway Analysis, Activity 6a Drainage Analysis, Activity 7 Utilities, and Activity 10 Bridge Development Report will be used to perform preliminary engineering analysis for this project.

1.4 Drainage (Activities 6a and 6b)

System Type: The CONSULTANT shall develop the PD&E (preliminary design) and final design of a stormwater management system including but not limited to open conveyance ditches and swales, closed storm sewer systems, cross drains, retention/detention ponds, exfiltration systems and floodplain compensation sites as required to satisfy the regulations and criteria of the COUNTY and permitting agencies. The stormwater management systems shall be accurately depicted in the contract documents to the extent required for successful implementation by the contractor.

1.5 Utilities Coordination (Activity 7)

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

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

The CONSULTANT may employ more than one individual or utility engineering consultant to provide utility coordination and engineering design expertise. The

CONSULTANT shall identify a dedicated person responsible for managing all utility coordination activities. This person shall be contractually referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT's proposal. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the COUNTY Project Manager that they have the following knowledge, skills and expertise:

- A minimum of 4 years of experience performing utility coordination in accordance with FDOT, Federal Highway Administration (FHWA) and American Association of State Highway and Transportation Officials (AASHTO) standards, policies, and procedures.
- A thorough knowledge of the COUNTY and FDOT plans production process and utility coordination process.
- A thorough knowledge of COUNTY and 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 with the COUNTY, FDOT, FHWA, and AASHTO standards, policies, procedures, and design criteria.
- Assisting the Engineer of Record (EOR) in identifying all existing utilities and coordinating any new installations. Assisting the EOR with resolving utility conflicts, including new services (power, water, sewer, communications, etc.) serving COUNTY owned facilities.
- 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 matrices and changes to affected utility owners, and making sure this information is properly coordinated and documented.
- Identifying and coordinating the completion of any COUNTY or utility owner agreement that is required for reimbursement, or accommodation of the utility facilities associated with the project.
- Reviewing and certifying to the District Utilities Administrator that all Utility Work Schedules are correct and in accordance with the COUNTY's standards, policies, and procedures.
- Preparing, reviewing and processing all utility related reimbursable paper work inclusive of betterment and salvage determinations.

The CONSULTANT's utility coordination work shall be performed and directed by the Utility Coordination Manager that was identified and approved by COUNTY's Project Manager. Any proposed change of the approved Utility Coordination Manager shall be

subject to review and approval by COUNTY's Project Manager prior to any change being made in this contract.

1.6 Environmental Permits and Environmental Clearances (Activity 8)

1.7 Structures (Activities 9 – 18)

Bridge(s):

Type of Bridge Structure Work:

- BDR
- Temporary Bridge
- Short Span Concrete
- Medium Span Concrete
- Structural Steel

1.8 Signing and Pavement Markings (Activities 19 & 20)

Master Signage Plan

The CONSULTANT shall be responsible for identifying proposed signs (overhead and multipost) along the corridor within the study limits. The CONSULTANT shall be responsible for preparing the master signage plan for the preferred alternative.

1.9 Signalization (Activities 21 & 22)

1.10 Lighting (Activities 23 & 24)

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

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

The CONSULTANT shall also coordinate with the power utility company the design and costs of utility infrastructure as required for new power service points proposed for lighting facilities in the construction documents.

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

Services shall include, but are not limited to, lighting design analysis report, lighting plans for temporary and permanent facilities, lightning protection and grounding systems, layouts, typical sections, key sheet, quantities (including lighting quantities), lighting

computations, service point details, tabulation of pole data sheets, and any special detail sheets necessary.

The CONSULTANT shall also coordinate with the power utility company the design and costs of utility infrastructure as required for new power service points proposed for lighting facilities in the construction documents.

1.11 Landscape (Activities 25 & 26)

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

1.12 Survey (Activity 27)

1.13 Photogrammetry (Activity 28)

1.14 Mapping Activity (Activity 29)

1.15 Terrestrial Mobile LiDAR (Activity 30)

1.16 Architecture (Activity 31)

1.17 Noise Barriers (Activity 32)

1.18 Intelligent Transportation Systems (Activities 33 & 34)

PENDING RECOMMENDATION FROM PD&E STUDY

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 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 COUNTY.

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

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

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

Interchanges: *[List all existing and proposed interchanges and ITS field device requirements for tie in to arterials or N/A].*

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

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

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

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

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 operational 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.

1.19 Geotechnical (Activity 35)

1.20 3D Modeling (Activity 36)

1 PURPOSE AND PROJECT DESCRIPTION

1.21 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 COUNTY and CONSULTANT scheduled activities required to meet the current COUNTY Production Date. The schedule shall be based upon the **[FILL IN COUNTY SCHEDULE INFORMATION]**. The anticipated date for final approval of the Environmental Document is **[Month 00, 20XX]**. The current production date is **[Month 00, 20XX]**. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a **[fill in blank]** week review time for each phase submittal, Environmental Document, and any other submittals as appropriate.

The schedule shall indicate, at a minimum, proposed dates for Public Hearing, LDCA, Phase I plans, Phase II plans, Phase III plans, Phase IV plans, and all other appropriate milestones and required submittals.

The schedule shall reflect project-specific input from each affected COUNTY discipline, including Permits, Utilities, and Right-of-Way. The CONSULTANT shall be responsible for ensuring that such input is received and reviewed with the COUNTY Project Manager.

All fees and price proposals are to be based on the negotiated schedule of **[XX]** months for final construction contract documents. However, the contract deadline is **[XX]** months from the Notice to Proceed.

Periodically, throughout the life of the contract, the project schedule and payout and fiscal progress curves shall be reviewed and, with the approval of the COUNTY, adjusted as necessary to incorporate changes in the Scope of Services and progress to date.

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

The schedule shall be submitted in Primavera P6 format.

When Phase II plans are complete and approved, if the project includes federal funds or involves interstate right of way, the CONSULTANT shall await COUNTY approval before proceeding to Phase III plans. If the project is state-funded the CONSULTANT can proceed to Phase IV plans as directed by the COUNTY.

1.22 Submittals

The CONSULTANT shall furnish the technical reports and the Environmental Document as required by the PD&E Manual. Additionally, the CONSULTANT shall prepare or upload all final submittals and appropriate supporting project files to the StateWide Environmental Project Tracker (SWEPT) upon completion of technical reports and Environmental Document and as directed by the COUNTY.

The CONSULTANT shall submit all deliverables to the COUNTY electronically in Portable Document Format (PDF), unless notified by the COUNTY's Project Manager. Design files shall be submitted at Phase *I* and beyond. For each submittal,

the CONSULTANT shall include a Transmittal Memorandum that includes, at a minimum, the file name of each PDF file as well as the number of hardcopies (if any) as directed by the COUNTY's Project Manager.

A Google Earth ready .KMZ file will be developed and submitted for all plan or roll plot submittals to the COUNTY. The file will have both existing and proposed information for each discipline.

Each CONSULTANT document submittal shall be accompanied by a completed Quality Control Checklist form indicating the document submittal items that have been checked and back-checked. At the request of the COUNTY, the CONSULTANT shall provide evidence of said quality control review.

1.23 Provisions for Work

The services performed by the CONSULTANT must comply with all applicable COUNTY and Florida Department of Transportation (FDOT) manuals, procedure, policies, and guidelines. Specifically, the CONSULTANT shall comply with Florida Department of Transportation (FDOT) PD&E Manual, FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance (Florida Greenbook), Structures Manual and Computer Aided Design and Drafting Manual. The Florida Department of Transportation (FDOT) and COUNTY manuals and guidelines incorporate, by requirement or reference, all applicable federal and state laws, regulations, and Executive Orders. The CONSULTANT shall use the latest editions of the manuals, procedures, and guidelines to perform work for this project.

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

1.24 Services to be Performed by the COUNTY

When appropriate and/or available, the COUNTY will provide project data including:

- All COUNTY agreements with Utility Agency Owner (UAO).
- All certifications necessary for project letting.
- All information that may come to the COUNTY pertaining to future improvements.
- All future information that may come to the COUNTY during the term of the CONSULTANT's Agreement, which in the opinion of the COUNTY is necessary for the prosecution of the work.
- Available traffic and planning data.
- All approved utility relocations.
- Project utility certification to the COUNTY.
- Any necessary title searches.
- Engineering standards review services.
- All available information in the possession of the COUNTY pertaining to utility companies whose facilities may be affected by the proposed construction.
- All future information that may come to the COUNTY 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.
- Project traffic for 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.
- Design Reports.
- Letters of authorization designating the CONSULTANT as an agent of the COUNTY in accordance with F.S. 337.274.
- Phase reviews of plans and engineering documents.
- Regarding Environmental Permitting Services: Approved Permit Document when available, and Approval of all contacts with environmental agencies.
- General philosophies and guidelines of the COUNTY 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.
- Lead and participate in coordination efforts with Public Transit Office, Office of Environmental Management, Federal Transit Administration, environmental resource and regulatory agencies, the public and other stakeholders, as appropriate.
- Crash data.
- Traffic counts.
- Review of technical reports and Environmental Document.
- Right of way cost estimates.

2a PROJECT COMMON AND PROJECT GENERAL TASKS

2a.1 Project Common Tasks

Project Common Tasks, as listed below, are work efforts that are applicable to many project activities, 3 (PD&E Study) through 36 (3D Modeling). These tasks are to be included in the project scope in each applicable activity when the described work is to be performed by the CONSULTANT.

Cost Estimates: The CONSULTANT is responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to Phase II Plans or completion of quantities, the CONSULTANT shall prepare cost estimates for the comparison of alternatives. The CONSULTANT shall use the Florida Department of Transportation (FDOT) Long-Range Estimate (LRE) system to develop construction cost estimates. The CONSULTANT shall obtain right of way cost from the COUNTY for use in the comparison of alternatives.

A Summary of Pay Items sheet shall be prepared with all required Plans submittals as required.

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

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

The Technical Special Provisions shall provide a description of work, materials, equipment and specific requirements, method of measurement and basis of payment. Proposed Technical Special Provisions will be submitted to the Director of Lee County Department of Transportation for initial review at the time of the Phase III plans review submission to the COUNTY's Project Manager. This timing will allow for adequate processing time prior to final submittal. The Technical Special Provisions will be reviewed for suitability in accordance with the Handbook for Preparation of Specification Packages. 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 COUNTY's Project Manager 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.

2a PROJECT COMMON AND PROJECT GENERAL TASKS

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 COUNTY and/or Agency staff, between disciplines and subconsultants such as environmental resource agencies meetings, access management meetings, pavement design meetings, local governments meetings, railroads coordination meetings, airports coordination meetings, progress review meetings (phase review), and miscellaneous meetings. The CONSULTANT shall prepare, and submit to the COUNTY's Project Manager for review, the meeting minutes for all meetings attended by them. The meeting minutes are due within three (3) working days of attending the meeting.

Quality Assurance/Quality Control: It is the intention of the COUNTY that the CONSULTANT, including their subconsultant(s), are held responsible for their work, including plans review. The purpose of CONSULTANT plan reviews is to ensure that the PD&E study and contract plans are prepared in accordance with the PD&E Manual and the plan preparation procedures outlined in the FDOT Design Manual. All subconsultant document submittals shall be submitted by the subconsultant directly to the CONSULTANT for their independent Quality Assurance/Quality Control (QA/QC) review and subsequent submittal to the COUNTY.

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

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

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review the Environmental Document, technical reports, maps, design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan shall be one specifically designed for the 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's 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 for engineering reports and design plans shall be a Florida Licensed Professional Engineer, Landscape Architect, or Professional Surveyor and Mapper fully prequalified under F.A.C. 14-75, F.A.C 5J-17, or 61G10-15.001 in the work type being reviewed. A marked-up set of prints from a Quality Control Review indicating the reviewers for each component (PD&E, 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 COUNTY, with each submittal. The responsible

Professional Engineer, Landscape Architect, or Professional Surveyor & Mapper that performed the Quality Control review will sign a statement certifying that the review was conducted and found to meet required specifications.

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

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

Independent Peer Review and a Constructability/Biddability 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/Biddability Review shall be performed by a person with experience working on COUNTY construction projects (CEI, Contractor, etc.).

The Independent Peer Review for design Phase Plans submittals shall ensure the plans meet the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance (Florida Greenbook), Standard Plans for Road and Bridge Construction, and CADD Manual. The Constructability/Biddability Review shall ensure the project can be constructed and paid for as designed. Constructability/Biddability 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/Biddability reviews.

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.

2a.2 Project General Tasks

Project General Tasks, described in Sections 2a.2.1 through 2a.2.12, 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.

2a.2.1 Joint Project Agreements

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

2a.2.2 Specifications Package Preparation

2a PROJECT COMMON AND PROJECT GENERAL TASKS

The CONSULTANT shall prepare and provide a specifications package in accordance with the Lee County Department of Transportation (LCDOT) Specifications Package Preparation and the Specifications Template. The Specifications Package shall be prepared using the Florida Department of Transportation's Standard Specifications. 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 COUNTY's Project Manager at least 30 days prior to the contract package due date. The CONSULTANT shall coordinate with the COUNTY 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 due date.

2a.2.3 Contract Management

The CONSULTANT is responsible for maintaining Project files, including copies of submittals and underlying data, electronic folders and documents, calculations, information and supporting documentation. The CONSULTANT is responsible for preparing 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; and includes uploading files to a portable storage devices to be hand delivered to the COUNTY's Project Manager.

2a.2.4 Value Engineering (Multi-Discipline Team) Review

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

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

Value Engineering is an event-related activity and should occur at a time when it will provide the greatest opportunity for value improvement, as determined by the COUNTY Project Manager and Value Engineering Coordinator. The VE study will be performed during preparation of Phase I design plans and prior to completion of Draft Environmental Documents. VE recommendations shall be included in the PD&E's comparative alternatives evaluation and the Environmental Document.

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

The CONSULTANT shall allow ample time for the appropriate knowledgeable members of their staff to present alternatives development, design documentation and data to the VE team.

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

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

- One copy of the Draft Environmental Document.
- One copy of the Draft Preliminary Engineering Report and all technical reports used to prepare the Environmental Document.
- Three sets of all plan drawings.
- Drainage alternatives information.
- One copy of Bridge Development Reports.
- One copy of Pavement Type Selection Report.
- One copy of Pavement Design Package.
- One copy of other miscellaneous reports.
- Project Cost Estimate.

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

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

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

2a.2.5 Prime Consultant Project Manager Meetings

For all meetings attended, the CONSULTANT shall be responsible for developing the agenda, sign-in sheets and preparation and submittal of the meeting minutes to the COUNTY's Project Manager for review. The CONSULTANT will not be reimbursed for travel expenses.

2a.2.6 Plans Update

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

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

2a.2.7 Post Design Services

Post Design Services are not included in this scope of services.

2a.2.8 Digital Delivery

As directed by the COUNTY, the CONSULTANT shall deliver all final submittals and appropriate project files that support the Environmental Document to the COUNTY on acceptable electronic media, as determined by the COUNTY.

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 COUNTY on acceptable electronic media, as determined by the COUNTY.

2a.2.9 Risk Assessment Workshop

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

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

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

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

phone inquiries. The CONSULTANT shall coordinate with subconsultants who need to attend the Workshop and associated meetings.

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

- One copy of the Draft Environmental Document.
- One copy of the Draft Preliminary Engineering Report and all technical reports used to prepare the Environmental Document.
- Three sets of all plan drawings.
- Drainage alternatives information.
- One copy of Bridge Development Reports.
- One copy of Pavement Type Selection Report.
- One copy of Pavement Design Package.
- One copy of other miscellaneous reports.
- Project Schedule.
- Project Cost Estimate.

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

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

2a.2.10 Railroad, Transit and/or Airport Coordination

Railroad

[Provide project specific information or N/A.]

Transit

[Provide project specific information or N/A.]

Aeronautical Evaluation

[Provide project specific information or N/A.]

The CONSULTANT shall be responsible for complying with the requirements of Title 14 of the Code of Federal Regulations (CFR) Part 77, if any portion of the project is within ten (10) nautical miles of the nearest point of the nearest runway of each airport/heliport described in 14 CFR Part 77.9(d). When appropriate the CONSULTANT shall be responsible for determining whether it is necessary to file a notice of construction or alteration, related to the project structures, with the Federal Aviation Administration (FAA), including the utilization of the FAA Notice Criteria Tool. The results of inquiries to the Notice Criteria Tool and copies of any required filings of FAA Form 7460-1 shall be provide to the COUNTY. All filings of 7460-1 shall be done electronically at the FAA website.

When appropriate the CONSULTANT shall obtain Determinations (aeronautical studies) from the FAA regarding the effect of project structures on the navigable airspace and provide copies to the COUNTY. The COUNTY shall be immediately notified of any Notice of Presumed Hazard which may require modifications to the project plans. The CONSULTANT shall be responsible for designating who will be responsible for compliance with the “conditions” and deadlines of the Determinations.

2a.2.11 Landscape and Existing Vegetation Coordination

Coordinate to ensure preservation and protection of existing vegetation. Relocation of existing vegetation may be necessary in some cases. Space for proposed landscape should be preserved and conflicts with drainage, utilities, ITS, and signage should be minimized. Coordination with the COUNTY’s Landscape Project Manager may be necessary as defined in section 1.11.

2a.2.12 Other Project General Tasks

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2b PUBLIC INVOLVEMENT

Public involvement includes communicating to and receiving input from all interested persons, groups, and government organizations information regarding the development of the project. The Public Involvement Activity covers both PD&E and Design phases of the Project. The CONSULTANT shall provide to the COUNTY drafts of all Public Involvement documents (i.e., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least ten (10) business days prior to printing and/or distribution.

2b.1 Public Involvement Plan

The CONSULTANT shall prepare the Public Involvement Plan (PIP) in accordance with Part 1, Chapter 11 of the PD&E Manual using existing work developed by the COUNTY as a starting reference. The PIP must include a public involvement schedule and identify potentially affected stakeholders and communities near the Project area, and establish the appropriate outreach methods. This includes consideration of the demographics of the Project area and any reasonable accommodations including, but not limited to, disabled, transit-dependent, limited English proficient (LEP), elderly, low income, or minority. The CONSULTANT shall review and attach the Sociocultural Data Report (SDR) to the PIP. A sample template for the PIP is located in Part 1, Chapter 11 of the PD&E Manual.

The PIP should be updated throughout the PD&E and Design for use during the construction phase in accordance with Florida Department of Transportation Florida Design Manual (FDM) Chapter 104. At the conclusion of the PD&E phase, the CONSULTANT shall update the PIP to include the following;

- Community concerns/issues,
- Discussion of construction schedule and TTCP,
- Public involvement level and,
- Proposed public involvement activities during construction.

2b.2 Public Involvement Data Collection

The CONSULTANT shall assist the COUNTY in collecting data specific to the public involvement process and preparing responses to any public inquiries received throughout the development of the Project. The Consultant shall maintain and regularly update the public involvement file, which will document a record of all public involvement activities for the Project.

The CONSULTANT shall obtain mailing labels of property owners using the the County Property Appraiser's Offices. At the beginning of the project, the CONSULTANT shall prepare a mailing list of all such entities and shall update the mailing list as needed during the life of the Project.

The CONSULTANT shall identify and include in the Project mailing list all impacted property owners and tenants located within a minimum of 300 feet of either side of the centerline of each Project alternative. The CONSULTANT also will identify and include in the Project mailing list local elected and appointed public officials; interested parties

(any person or institution expressing an interest in the project); local citizens who may be impacted by the project; and potential permit and review agencies.

2b.3 Scheduled Public Meetings

The CONSULTANT shall assist the COUNTY in conducting various public meetings, which may be conducted during weekends or after normal working hours. The CONSULTANT shall support the COUNTY in preparation, scheduling, attendance, note taking, documentation, and follow-up services for each meeting.

The following public meetings are anticipated to be scheduled to support the PD&E phase for this Project:

- Project Kick-off Meeting.
- Alternatives Public Meeting or Corridor Workshops.
- Public Information Meetings.
- Final Design Public Meeting.
- Other Meetings, as determined.

The CONSULTANT shall investigate potential meeting locations to advise the COUNTY of their suitability. The COUNTY will ultimately approve the meeting location. The CONSULTANT shall pay the cost for renting meeting venue and insurance (if required).

The CONSULTANT shall be responsible for logistics associated with setting up the meeting. The COUNTY will approve the meeting format developed by the CONSULTANT.

For any of the listed meetings, the CONSULTANT shall prepare the following:

- Agenda.
- PowerPoint slides and presentation scripts.
- Handouts.
- Graphics (creative design exhibits) for presentation.
- Meeting equipment set-up and tear-down.
- Display advertisements (Local Newspaper and Florida Administrative Register).
- Display boards (and / or use of Smart Screens).
- Letters for notification of elected and appointed officials, property owners, and other interested parties. The letters will be prepared by the CONSULTANT on COUNTY letterhead. After the COUNTY signs the letters, the CONSULTANT shall send them by First Class US Mail.
- News releases or project fact sheets. The COUNTY must review news releases and fact sheets at least two (2) weeks before the meeting or mail out.
- Meeting summaries provided to the COUNTY no later than five (5) business days after the meeting.
- Response letters for COUNTY signature on public comments.

Any materials prepared by the CONSULTANT for such meetings as listed above are subject to review and approval by the COUNTY. The CONSULTANT shall provide the

COUNTY with a draft of any proposed materials with lead time as determined by the Department's Project Manager, prior to the meeting.

The CONSULTANT shall assist the COUNTY when facilitating the public meetings or workshops to present Project results and obtain comments related to the Project. The CONSULTANT shall attend such meetings or workshops with a suitable number of personnel with appropriate technical expertise (based on project issues), as authorized by the COUNTY's Project Manager.

The CONSULTANT shall participate in briefing meetings with the COUNTY staff related to the scheduled public meetings.

The COUNTY may request the CONSULTANT to identify the effect of the Project to individual properties on aerial maps or plans in response to requests from property owners. The COUNTY may also request the CONSULTANT to meet with individual property owners with COUNTY representative in attendance as well.

2b.4 Other Public and Agency Meetings or Informal Meetings

In addition to scheduled public meetings the CONSULTANT may be required to participate in meetings with local governing authorities, Metropolitan Planning Organization (MPO), environmental resources agencies, Homeowner Associations, and Key Stakeholders. 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.

2b.5 Median Modification Letters

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

2b.6 Driveway Modification Letters

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

2b.7 Public Hearing

The CONSULTANT shall send notifications to the Lead Agency, local governments, and regulatory agencies at least 25 but no more than 30 calendar days prior to the public hearing date.

The CONSULTANT shall prepare the public hearing notifications on the COUNTY's letterhead for COUNTY review and signature 15 days prior to mailing or as directed by the COUNTY. The CONSULTANT shall first prepare an initial sample draft notification for review and approval by the COUNTY prior to submitting all notifications for review.

2b PRELIMINARY DESIGN AND PD&E PUBLIC INVOLVEMENT

Notifications to elected officials will be signed by the Director of Lee County Department of Transportation (LCDOT). All other notifications may be signed by the COUNTY's Project Manager. The notification letters must have the COUNTY's return address. After the COUNTY signs the notifications, the CONSULTANT shall send them by First Class US Mail. The COUNTY's Project Manager will also send the notification letters by email.

The CONSULTANT shall prepare the public hearing notifications to property owners on the COUNTY's letterhead for COUNTY review and signature 15 days prior to mailing or as directed by the COUNTY. After the COUNTY signs the letters, the CONSULTANT shall send them by First Class US Mail. The CONSULTANT shall obtain a list of names and addresses of property owners from the Property Appraisers' Offices. The letters must have the COUNTY's return address. The CONSULTANT shall send notification letters to property owners at least 17 to 24 calendar days prior to the public hearing.

The CONSULTANT shall provide the following:

- Public Hearing Notice and publication in the Florida Administrative Register.
- Public Notice provided by the CONSULTANT's Community Involvement staff.
- Identification of the website(s) and/or locations where the technical reports and Environmental Document will be available for public view.
- Voiceover presentation with script.
- Proposed typical sections and aerials depicting alternative corridors and alternative alignments, as specified by the COUNTY using display boards and/or Smart Screens.
- Hard copies of technical reports and Environmental Document.
- Meeting location signs.
- Brochures or handouts.
- Title VI compliance signs.
- NEPA Assignment compliance signs.
- Security (off-duty law enforcement), if needed.
- Display advertisements. Any press releases and/or advertisements will indicate that the meeting is a COUNTY activity; the CONSULTANT shall pay the cost of publishing.
- Expenses associated with arranging for a court reporter to be present and obtaining transcripts of comments made during the Public Hearing.
- Response to public comments.

The CONSULTANT shall participate in briefing and debriefing meetings with the COUNTY related to the Public Hearing. The CONSULTANT shall prepare response letters for COUNTY signature for all public comments. Any such response letters will be reviewed and approved by the COUNTY's Project Manager.

2b.8 Comments and Coordination Report

The CONSULTANT shall prepare Comments and Coordination Report containing Public Hearing transcript, errata, and signed certification, as well as documentation for all public involvement activities conducted to support Preliminary Design and the PD&E study, in accordance with Part 1, Chapter 11 of the PD&E Manual.

During Final Design phase of the project, the CONSULTANT shall prepare an addendum to the Comments and Coordination Report that will contain all public involvement activities conducted throughout the Design phase.

2b.9 Notification of Approved Environmental Document

The CONSULTANT shall prepare a display advertisement for the notification of the Approved Environmental Document. The CONSULTANT shall pay for the cost of publishing. The COUNTY must review and approve the notice prior to publication.

2b.10 Communication Aids

The CONSULTANT shall prepare materials to be used in the following communication aids:

- Newsletters: The CONSULTANT shall prepare newsletters for distribution to elected officials, public officials, property owners along the corridor and other interested parties. The letters will be sent by the CONSULTANT via First Class US Mail.
- Rendering and Fly Throughs: The CONSULTANT shall prepare renderings and fly-throughs for use in public meetings.
- Simulation Videos and Visualizations: The CONSULTANT shall prepare simulation videos and visualizations for use in public meetings.
- Frequently Asked Questions (FAQs): The CONSULTANT shall prepare FAQs for use in various public involvement activities per the COUNTY direction.
- Social Media: The CONSULTANT shall create materials that will be uploaded by the COUNTY to social media to facilitate project communication per the COUNTY direction.
- Web Site: The CONSULTANT shall develop public involvement materials and submit the information to be uploaded to the COUNTY project website. The CONSULTANT shall provide updates for the website content as necessary, and at the approval of the COUNTY. Content updates are usually completed on a set schedule, at project milestones, or when new information becomes available that should be made available to the public. The CONSULTANT is responsible for

posting to the website all COUNTY approved content updates as part of the website maintenance.

- Radio/Television: At the request of the COUNTY, the CONSULTANT shall be required to develop public informational materials for use in radio and television advertisements.

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3a PRELIMINARY ENGINEERING ANALYSIS

The CONSULTANT shall perform preliminary engineering and environmental analysis tasks required to obtain the approval of the Environmental Document in accordance with the PD&E Manual and all applicable procedures and guidelines. The PD&E Manual satisfies state and federal processes and incorporates the requirements of the National Environmental Policy Act (NEPA); federal law, regulations, and Executive Orders included in the FHWA Federal-Aid Policy Guide; and applicable state laws and regulations including Section 339.155 of the Florida Statutes and Rule Chapter 14 of the Florida Administrative Code.

3a.1 Existing Conditions

3a.1.1 Previous Studies

The CONSULTANT shall review and summarize previously completed or concurrent planning studies and other studies that are related to the Project and appropriately incorporate their results in the analysis of the Project as described in the PD&E Manual.

The following studies were conducted for this project: **ALICO ROAD CONNECTOR STUDY PREPARED BY McMAHON TRANSPORTATION ENGINEERS & PLANNERS DATED JULY 2009.**

The CONSULTANT shall review the adequacy of existing traffic data from planning studies to carry out traffic analysis for the project. If there are data gaps, the CONSULTANT must collect additional data for the study area.

The CONSULTANT shall review and document the location and condition of existing pedestrian, bicycle, and public transit accommodations and freight services in the study area. This activity includes reviewing existing plans, reports, and studies that outline strategies or define projects associated with each alternative.

3a.1.2 Existing Conditions Analysis

The CONSULTANT shall conduct field observations to determine existing field conditions, verify desktop data, and obtain additional data required to understand the Project area, assess Project needs, identify physical and environmental constraints, develop and analyze Project alternatives, and assess constructability issues.

The CONSULTANT shall collect data describing existing conditions and characteristics of the project including roadway geometrics, typical section elements, signalization, other operational features, access features, and right of way requirements, and other data applicable to modes and sub-modes of transportation including walking/pedestrians, bicyclists, public transit users (including transit vehicles and riders), paratransit users, freight (including loading/unloading and parking, emergency response vehicles, service vehicles, and freight handler vehicles).

The CONSULTANT shall analyze the existing conditions to identify and verify current transportation deficiencies as they relate to the needs and objectives of the Project.

3a.1.3 Base Maps

The CONSULTANT shall produce a base map of the project area using the COUNTY's CADD standards.

The base map will contain an aerial photo and existing characteristics for the project. The base map must show location of environmental issues that are specific to the study area such as cemeteries, wetlands, historic properties, drainage, contamination sites, public parks, and property lines.

3a.2 Travel Demand Forecasting

The CONSULTANT shall collect data, develop methodology and forecast future year volumes according to the COUNTY Project Traffic Forecast procedure.

The development of future forecast volumes will use the most currently adopted version of the 2045 Florida Department of Transportation (FDOT) District 1 Model. In addition, the COUNTY shall retain the authority to identify, approve, and prepare, as needed, all models and tools used to complete the evaluations required to support the PDE Study and Design phase.

No-Build Volumes: The CONSULTANT shall develop opening year and design year hourly volumes for the No-Build Alternative in accordance with the Project Traffic Forecasting Procedure, Topic No. 525-030-120. The need for interim year analysis will be determined in the traffic analysis methodology.

Build Alternatives Volumes: The CONSULTANT shall develop opening year and design year design hour volumes only for viable or feasible Build Alternatives.

3a.3 Traffic Analysis

The CONSULTANT shall collect traffic data for existing conditions, forecast future year volumes, and analyze safety and operational characteristics of the Project alternatives according to the COUNTY procedures.

3a.3.1 Traffic Analysis Methodology

The CONSULTANT shall perform traffic analysis in accordance with guidance from the PD&E Manual, Traffic Analysis Handbook, and Project Traffic Forecasting Handbook. The CONSULTANT shall prepare a project traffic forecast and analysis methodology as agreed upon by the COUNTY prior to beginning any analysis. The methodology will state the type of documentation required, define the Project study area to be analyzed, and identify method and assumptions that will be used to analyze existing and future traffic conditions.

Capacity analysis will be based on the latest Highway Capacity Manual (HCM) procedures. Use of micro-simulation traffic analysis software may be required

for this project. Calibration and validation are required when a microscopic simulation approach is used. Data should be gathered in accordance with the Traffic Analysis Handbook.

Traffic analysis methodology will include an approach or procedure to evaluate safety performance of the project alternatives.

All traffic analysis documentation must be written in plain language and in a format that can be easily followed. The CONSULTANT shall submit all traffic analysis files for assumptions, inputs, outputs, network data, calculation, and results to the COUNTY.

3a.3.2 Traffic Counts

The CONSULTANT shall collect the following traffic data:

- Current corridor traffic counts;
- 24-72-hour traffic machine counts as deemed necessary by the COUNTY;
- 4-hour manual vehicle turning movement counts for peak hours;
- Traffic counts as necessary for the Project and;
- Travel patterns or origin-destination data.

3a.3.3 Vehicle Classification Counts on Roadway Segments and Ramps

The CONSULTANT shall collect the following existing classification data:

- Corridor traffic counts;
- 72-hour machine counts.

3a.3.4 Pedestrian, Bicycle, and Other Multimodal Data

The CONSULTANT shall collect multimodal data for this project.

- Pedestrian counts.
- Bicycle counts.
- Travel patterns or origin-destination (OD) survey.
- Transit data.
- Freight movement.

3a.3.5 Speed and Delay Studies

The CONSULTANT shall collect data and perform speed and delay studies for the project.

3a.3.6 Calibration and Validation Data

The CONSULTANT shall collect calibration and validation data for the Project analysis in accordance with the FDOT PD&E Manual and FDOT Traffic Analysis Handbook.

3a.3.7 Existing Traffic Operational Analysis

The CONSULTANT shall conduct existing (base year) traffic operational analysis and report the operational performance measures as agreed upon in the analysis methodology. The analysis must include bicycle, pedestrian, and transit (if applicable) operations. The manual count data will be used to obtain the existing design hourly volumes using historical and seasonal adjustments as appropriate. All existing design hourly volumes must be balanced before being used in the analysis. Oversaturated conditions and locations with complex geometry or operations might require microsimulation.

3a.3.8 Calibration and Validation

The CONSULTANT shall calibrate and validate the microsimulation model using data and methodology as agreed upon in the analysis methodology.

3a.3.9 No-Build Analysis

The CONSULTANT shall analyze the operational performance of the No-Build Alternative for the analysis years to identify deficiencies related to the purpose and need for the project. The CONSULTANT shall evaluate the operational effectiveness of the No-Build Alternative using agreed upon performance measures of effectiveness (MOEs). The analysis should include multimodal evaluation for pedestrian, bicycle, freight, and transit modes, as appropriate.

3a.3.10 Development and Screening of Alternatives

The CONSULTANT shall prepare design controls and criteria for developing Project alternatives according to the FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance (Florida Greenbook).

The CONSULTANT shall identify, develop, assess, and screen preliminary or potential alternatives that would meet the purpose and need for the Project in accordance with Part 2, Chapter 3 of the PD&E Manual. The CONSULTANT shall prepare concept plans for all viable Project alternatives in appropriate scales overlaid on the base map to show important design features, right of way requirements, and environmental and geometric design constraints including physical features such as railroad crossing and utilities. The CONSULTANT shall include in the sketches only the minimum information needed to establish feasibility of each design concept as a Project alternative.

By considering Project purpose and need, results of the ETDM Programming screening event, and constructability issues, the CONSULTANT in consultation with the COUNTY will identify and document (in the alternatives evaluation memorandum) unfeasible alternatives to be eliminated from further detailed analysis. Only viable or feasible alternatives should be carried forward for detailed analysis.

3a.3.11 Operational Evaluation of Build Alternatives

The CONSULTANT shall analyze the operational performance of viable or feasible alternative(s) for opening and design years and any interim years as appropriate. The analysis must include multimodal evaluation for pedestrian, bicycle, and transit modes, as appropriate. The analysis will also include evaluation of access management and refinement of design concepts in relation to traffic safety and operational efficiency within the study area. The CONSULTANT shall evaluate the operational effectiveness of Build Alternatives using agreed upon performance MOEs.

3a.3.12 Project Traffic Analysis Report

The CONSULTANT shall prepare a Project Traffic Analysis Report as described in Part 2, Chapters 2 and 6 of the PD&E Manual.

3a.4 Interchange Access Request

3a.5 Traffic Data for Noise Study

The CONSULTANT shall provide the following data for each road segment (i.e. intersection to intersection), ramps, cross streets, and frontage roads, for the existing year, opening year, and the design year for Build and No-Build Alternatives;

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

3a.6 Traffic Data for Air Quality Analysis

The CONSULTANT shall collect traffic data required for the air quality analysis which will include the following:

- Intersection type and approach speed.
- Intersections – peak hour volumes for each approach.
- Interchanges – peak hour volumes for each ramp (on or off) regardless of percent turning volumes.
- Toll plaza – peak hour volumes for each approach.

3a.7 Traffic Analysis near Railroad Crossings : N/A

3a.8 Tolling Concepts

3a.9 Safety Analysis

3a.9.1 Crash Data

The CONSULTANT shall obtain the most recent five (5) years of available data from the COUNTY's crash database and other local sources for this project. The crash data will include the number and type of crashes, crash locations, number of fatalities and injuries, and estimates of property damage and economic loss.

3a.9.2 Data Driven Safety Analysis

The CONSULTANT shall perform safety analysis in accordance with Part 2, Chapter 2 of the PD&E Manual. Based on the information obtained from the crash data, the CONSULTANT shall identify project safety needs associated with the existing and future conditions. The CONSULTANT shall use the Highway Safety Manual (HSM) procedures to estimate the safety performance of the Project alternatives as agreed upon in the Traffic Analysis Methodology.

3a.9.3 Safety Analysis Documentation

The CONSULTANT shall document the results of the safety analysis in the Preliminary Traffic Analysis Report (PTAR) or a standalone Safety Analysis Memorandum.

3a.10 Alternatives Evaluation

The CONSULTANT shall analyze Build Alternatives to a level of detail sufficient to evaluate and compare their performance against the No-Build Alternative. Preliminary engineering analysis of the Build Alternative is covered in Activity 4.

The CONSULTANT shall compare the existing right of way width with the proposed right of way requirements to estimate the amount of right of way that the COUNTY must acquire. The CONSULTANT shall submit concept plans for the Build Alternative that include the parcel identification number, existing right of way lines, proposed right of way lines and acreage of property required. Additionally, the CONSULTANT shall provide a spreadsheet with the following parcel information: owner, address, acreage of parent parcel and required amount of property for the Project, estimated business damages and right of way property costs. The COUNTY will provide right of way cost estimates.

3a.10.1 Comparative Alternatives Evaluation

The CONSULTANT shall establish evaluation criteria at the beginning of the Project, which must be agreed upon with the COUNTY before use in the comparative evaluation of alternatives. After developing the viable alternatives, analyzing alternatives and estimating costs, the CONSULTANT shall prepare a matrix which compares the impacts, performance, and costs of the alternatives evaluated in detail in the PD&E Study. The matrix will include the performance of the No-Build Alternative as the baseline for comparison.

3a.10.2 Selection of the Preferred Alternative

The COUNTY will select the preferred alternative based on review and analysis of engineering, environmental, and public involvement issues related to this Project.

3a.11 Alternatives Analysis Documentation

The CONSULTANT shall document the results of alternatives analysis in the Preliminary Engineering Report (PER) that will be signed and sealed by a Professional Engineer. The CONSULTANT shall inform the COUNTY on content and progress as necessary during development of the PER. The PER will be delivered in appropriate electronic format and included in the project design documentation.

The CONSULTANT shall include (in the project file) sufficient backup information comprised of all computer programs, calculations, and parameters used in the alternatives analyses and progression of the recommended alternative to final design phase of the Project.

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3b ENVIRONMENTAL ANALYSIS AND REPORTS

Tasks described within this section are work efforts applicable to the environmental analysis and documentation for this Project. The CONSULTANT shall analyze all viable Build Alternatives and the No-Build Alternative with respect to impacts to natural, cultural, social and physical resources and document all analyses. Wherever appropriate the CONSULTANT shall describe proposed measures to avoid, minimize, or mitigate project impacts on environmental resources. Additionally, the CONSULTANT shall summarize results of the environmental analysis in the Environmental Document. The CONSULTANT shall summarize in the Environmental Document the results of analysis of environmental resources that were completed as part of another study or performed by others concurrent with this project.

3b.1 Sociocultural Effects

The CONSULTANT shall conduct a Sociocultural Effects (SCE) evaluation in accordance with Part 2, Chapter 4 of the PD&E Manual. The CONSULTANT shall document the results of the SCE evaluation in the Environmental Document and in the Project file or in a stand-alone SCE report if required. If no involvement for a specific issue is indicated, then standard statements to that effect from Part 2, Chapter 4 of the PD&E Manual will be included in the Environmental Document.

3b.1.1 Social

- Community Cohesion: The CONSULTANT shall identify and assess potential Project impacts on physical barriers, traffic pattern changes, social pattern changes, and loss of connectivity to community features and facilities.
- Special Community Designation: The CONSULTANT shall identify and assess potential Project impacts on schools, churches, parks, emergency facilities, social services, daycare facilities, retirement centers, community centers, and retail locations.
- Safety/Emergency Response: The CONSULTANT shall identify and assess potential project impacts on the creation of isolated areas; emergency response time changes; and location of police, fire, emergency medical services, healthcare facilities, and government offices.
- Demographics: The CONSULTANT shall identify and assess potential Project impacts on minority, LEP persons, disabled persons, low-income populations, and/or special populations within the Project area.
- Community Goals and Quality of Life: The CONSULTANT shall identify and assess potential Project impacts on social value changes and compatibility with community goals and vision.

3b.1.2 Economic

- Business and Employment: The CONSULTANT shall assess potential Project impacts to business and employment activity in the project area, including industries with special needs or significance, economic-oriented land use, economic development plans, special designations, and community development priorities. Assessment will also include

identification of changes to routes, access, parking, or visibility that could benefit or impair businesses, employment centers, community facilities, or population.

- Property Values and Tax Base: The CONSULTANT shall assess potential Project impacts on the tax base, employment opportunities, and property values.

3b.1.3 Land Use

The CONSULTANT shall evaluate the Project's consistency with the physical character of the area, state-managed lands, and applicable community plans.

3b.1.4 Mobility

The CONSULTANT shall evaluate potential Project impact on mobility and accessibility regarding all transportation modes (i.e. pedestrian, bicycle, transit, freight and vehicle) in the study area.

3b.1.5 Aesthetics

The CONSULTANT shall evaluate and summarize the Project's effect on viewshed and vista, community focal points, historic structures, landmarks, and community character in accordance with Part 2, Chapter 5 of the PD&E Manual.

3b.1.6 Relocation Potential

The CONSULTANT shall identify residences, businesses, and institutional or community facilities that may require relocation to accommodate the Project. The CONSULTANT shall obtain additional site-specific information needed to evaluate the effect of each Project alternative on the displacement of residences and businesses.

The CONSULTANT shall collect the data and perform the analysis necessary to complete a Conceptual Stage Relocation Plan (CSRP) for the proposed alternatives according to Chapter 9 of the Right of Way Procedures Manual and Part 2, Chapter 4 of the PD&E Manual.

3b.1.7 Farmland

If applicable, the CONSULTANT shall evaluate the data and document potential farmland impacts in accordance with Part 2, Chapter 6 of the PD&E Manual.

3b.2 Cultural Resources

The CONSULTANT shall prepare a Research Design and Survey Methodology for the project, to be submitted to the COUNTY for approval prior to the initiation of field work. The CONSULTANT shall identify and map the zones of probability for the Project Study Area, and identify any previously recorded resources. The Area of Potential Effect (APE) will be determined (including pond sites). The CONSULTANT shall summarize each of the cultural resource issues in the Environmental Document. If there is no involvement for a particular issue, then a statement to that effect will be included. The

CONSULTANT shall use a professional qualified under the provisions of 36 CFR 61 in compliance with the National Historic Preservation Act of 1966 (Public Law 89-665, as amended) and the implementing regulations (36 CFR 800), as well as with the provisions contained in Chapter 267, Florida Statutes, to perform all work in this task.

The CONSULTANT shall assess the direct and indirect effects of the alternatives and will document the severity of the following items in the Environmental Document and project file:

3b.2.1 Archaeological and Historic Resources

The CONSULTANT shall identify and analyze impacts to archaeological sites and historic resources within the Project's Area of Potential Effect (APE). The APE must include potential pond sites. The CONSULTANT shall prepare a research design and survey methodology and perform a Cultural Resources Assessment Survey (CRAS) in accordance with Part 2, Chapter 8 of the PD&E Manual. All work will be documented and coordinated with appropriate agencies as per Part 2 Chapter 8 of the PD&E Manual and the Florida Department of Transportation's Cultural Resource Management Handbook. In addition, attendance at public meetings may be required. The CONSULTANT shall review and address any resource issues or comments by the State Historic Preservation Officer (SHPO) listed in the Programming Screen Summary Report. The CONSULTANT shall assist the COUNTY in preparing documents for tribal coordination to be provided to Florida Department of Transportation, if needed.

The CONSULTANT shall assist the COUNTY in meetings by providing technical support in Section 106 Meetings, such as the Cultural Resource Committee Meeting.

The CONSULTANT shall prepare a CRAS detailing the results of the survey and assessments of resource significance, including a Florida Master Site File (FMSF) form.

3b.2.2 Recreational Section 4(f)

CONSULTANT shall complete the documentation and coordination required for a Section 4(f) Determination of Applicability in accordance with Part 2, Chapter 7 of the PD&E Manual.

The CONSULTANT shall prepare Section 4(f) "de minimis" documentation in accordance with Part 2, Chapter 7 of the PD&E Manual.

The CONSULTANT shall complete the documentation for Section 4(f) requirements in accordance with Part 2, Chapter 7 of the PD&E Manual.

3b.3 Natural Resources

The CONSULTANT shall assess and summarize each of the natural resource issues in the Environmental Document. The CONSULTANT shall identify the natural resource evaluation area. The CONSULTANT shall assess the direct and indirect effects and will

document the severity of the impact on environmental resources in the Natural Resources Evaluation (NRE), Environmental Document and project file.

3b.3.1 Protected Species and Habitat

The CONSULTANT shall perform research, field reviews, appropriate seasonal surveys, and coordination necessary to determine Project involvement with, and any potential impacts to, federal and state protected, threatened or endangered species and their habitats. Additionally, the CONSULTANT shall develop a study design (which will be approved by the COUNTY) to evaluate the magnitude of Project involvement with wildlife and their habitat. If required, the CONSULTANT shall prepare the Biological Assessment as a part of the NRE.

The CONSULTANT shall assess the Project's potential impacts to wildlife and habitat in accordance with Part 2, Chapter 16 of the PD&E Manual. The CONSULTANT shall assist the COUNTY in agency consultations, if required.

The COUNTY will provide a description of the habitat conservation measures to be considered. The CONSULTANT shall provide an analysis of wildlife and habitat conservation measures and mitigation plan.

3b.3.2 Wetlands and Other Surface Waters

The CONSULTANT shall perform an analysis of the Project's potential impacts on wetlands and other surface waters in accordance with Part 2, Chapter 9 of the PD&E Manual. The CONSULTANT shall identify the type, quality, and function of representative wetlands in accordance with Rule 62-345, F.A.C., Uniform Mitigation Assessment Method. The CONSULTANT shall evaluate alternatives that avoid wetland impacts and, where unavoidable, identify practicable measures to minimize impacts. Any impact to wetlands requires development of a Conceptual Mitigation Plan. The CONSULTANT shall document the results of the Wetlands Evaluation in the Natural Resources Evaluation (NRE) including all coordination activities with resource agencies, wetland impact assessment and mitigation analysis.

During final design, the CONSULTANT shall collect all data and information necessary to determine the boundaries of wetlands and other surface waters defined by the rules or regulation of each agency processing or reviewing a permit application necessary to construct the project.

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

- Determine landward extent of wetlands and other surface waters as defined in Rule Chapter 62-340 F.A.C. as ratified in Section 373.4211, F.S.
- Determine the jurisdictional boundaries and obtain a jurisdictional determination of wetlands and other surface waters as defined by rules or regulations of any permitting authority that is processing a COUNTY permit application.

- Prepare aerial maps showing the jurisdictional boundaries of wetlands and surface waters. Aerial maps shall be reproducible, of a scale no greater than 1''=200' and be recent photography. The maps shall show the jurisdictional limits of each agency. Photo copies of aerials are not acceptable. All jurisdictional boundaries are to be tied to the project's baseline of survey. When necessary, a wetland specific survey will be prepared by a registered surveyor and mapper.
- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form which includes the ID number for each wetland impacted, size of wetland to be impacted, type of impact, and identify any wetland within the project limits that will not be impacted by the project.
- Prepare appropriate Agency Forms to obtain required permits. Forms may include but are not limited to the United States Army Corps of Engineers (USACE) "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; Uniform Mitigation Assessment Method forms and/or project specific data forms.

3b.3.3 Essential Fish Habitat

If applicable the CONSULTANT shall conduct field reviews, surveys, and appropriate coordination with resource agencies to assess impacts to essential fish habitat (EFH) in accordance with Part 2, Chapter 17 of the PD&E Manual. The CONSULTANT shall prepare the EFH Assessment as a component of the NRE to document potential adverse effects to EFH and measures to address those effects. The CONSULTANT shall assist the COUNTY in consultations, if required.

3b.3.4 Natural Resource Evaluation (NRE) Report

The CONSULTANT shall document the results of the Wetlands, EFH, and Wildlife and Habitat evaluations in the Natural Resources Evaluation (NRE) report in accordance with Part 2, Chapter 9, Chapter 16 and Chapter 17 of the PD&E Manual.

3b.3.5 Water Quality

The CONSULTANT shall evaluate and document the Project's impact on water quality in the Water Quality Impact Evaluation (WQIE) Checklist, in accordance with Part 2, Chapter 11 of the PD&E Manual.

3b.3.6 Special Designations

The CONSULTANT shall evaluate and document the Project's involvement with the following special designations if applicable: Scenic Highways, Aquatic Preserves, Outstanding Florida Waters, Wild and Scenic Rivers, and Coastal Barrier Resources, in accordance with Part 2, Chapters 5, 10, 12, and 15 of the PD&E Manual.

3b.3.7 Permit Needs

3b ENVIRONMENTAL ANALYSIS AND REPORTS

The CONSULTANT shall review the Programming Screen Summary Report and identify permits required for the project.

The CONSULTANT shall perform activities that will inform and accelerate the environmental permitting process, including activities to acquire permits during PD&E (as required by the COUNTY).

3b.4 Physical Effects

The CONSULTANT shall identify the physical effect evaluation area. The CONSULTANT shall summarize each of the physical effect issues in the Environmental Document. The CONSULTANT shall assess the Project's direct and indirect effects and will document the severity of the following:

3b.4.1 Air Quality

The CONSULTANT shall gather data, perform the air quality screening analysis, and prepare the Air Quality Technical Memorandum to document the results of the screening analysis in accordance with Part 2, Chapter 19 of the PD&E Manual.

3b.4.2 Construction Impact Analysis

The CONSULTANT shall evaluate and document the potential impacts of construction of the Project alternatives in accordance with Part 2, Chapter 3 of the PD&E Manual.

3b.4.3 Contamination

The CONSULTANT shall gather data, review data, and investigate contamination issues within the limits of the project and identify potentially contaminated sites in accordance with Part 2, Chapter 20 of the PD&E manual.

The CONSULTANT shall document data reviewed, findings, risk ratings of potential contamination sites, and recommendations for additional assessment actions in the Contamination Screening Evaluation Report (CSER).

The CONSULTANT shall include an evaluation of any new contamination impacts due to changes to the PD&E design concept, if applicable, and/or any new discharges or new potential contamination impacts not evaluated in any previously completed Contamination Screening Evaluation. The project impacts, conclusions and recommendations, figures, tables and appendices will be provided in a Level I Contamination Screening Evaluation Report.

The COUNTY will provide Level II assessment services. If contamination is identified within the limits of construction, the CONSULTANT shall coordinate with the COUNTY's Project Manager (and District Contamination Impact Coordinator if State or Federal Funding is present) to properly mark identified contamination areas in the plans and develop specifications as appropriate.

3b.4.4 Asbestos and Metal Based Coating

3b ENVIRONMENTAL ANALYSIS AND REPORTS

The COUNTY will provide asbestos and metal based coatings survey services.

If asbestos or metal based coatings above threshold levels are found on the bridge(s), the CONSULTANT shall coordinate with the COUNTY's Project Manager (and District Contamination Impact Coordinator if State or Federal Funding is present) to obtain plan notes, general notes, specifications, pay item notes, and Operation and Maintenance (O&M) plan for any asbestos to remain in place.

3b.4.5 Navigation

The CONSULTANT shall collect data that will assist the COUNTY to evaluate potential project impacts to navigation according to Part 1, Chapter 12 of the PD&E Manual.

3b.5 Cumulative Effects Evaluation

The CONSULTANT shall perform and document a cumulative effects evaluation on each resource of concern identified based on context and in consultation with the COUNTY as per the process outlined in the FDOT Cumulative Effects Evaluation Handbook. The cumulative effects evaluation should build upon information derived from the direct and indirect effects analyses.

3b.6 Project Commitments Record

The CONSULTANT shall provide a list of project commitments to include in the Commitments Section of the Environmental Document. The CONSULTANT shall assist the COUNTY in filling out Form No. 700-011-35 Project Commitments Record (PCR) in accordance with FDOT Procedure 700-011-035.

3c ENVIRONMENTAL DOCUMENT

3c.1 Environmental Document

The CONSULTANT shall assist the COUNTY in completing the Type 2 Categorical Exclusion Determination Form, Topic No. 650-000-001, and all attachments in accordance with Part 1 Chapter 5 of the PD&E Manual.

The CONSULTANT shall assist the COUNTY in preparing a State Environmental Impact Report (SEIR) and any attachments that will be required per Part 1, Chapter 10 of the PD&E Manual.

3c.2 Planning Consistency

3c.2.1 Review of Transportation Plans and Programs

The CONSULTANT shall coordinate with the COUNTY to obtain and review transportation plans and programs applicable to this Project.

3c.2.2 Documentation

The CONSULTANT shall assist the COUNTY in the preparation of the Planning Consistency documentation.

3c.3 PD&E Re-evaluation

During the development of the final design plans, the CONSULTANT shall complete re-evaluation form and provide associated supporting information in accordance with Part 1, Chapter 13 of the PD&E Manual. The CONSULTANT shall review environmental commitments and document updates to the status of the commitments.

3c.3.1 Re-evaluation

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

3c.3.2 Archaeological and Historical Resources

The CONSULTANT shall collect data necessary to completely analyze the impacts, due to changes in the project or project area, to all cultural and historic resources, and prepare a Cultural Resource Assessment Survey Report, in accordance with Part 2, Chapter 8 of the PD&E Manual.

3c.3.3 Wetland Impact Analysis

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

3c.3.4 Essential Fish Habitat Impact Analysis

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

3c.3.5 Protected Species and Habitat Impact Analysis

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

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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 Design Controls and Criteria

The CONSULTANT shall prepare design controls and criteria for developing Project alternatives and designing roadway geometric and other roadway elements according to the COUNTY standards.

4.2 Typical Section

4.2.1 Typical Section Analysis

The CONSULTANT shall develop conceptual typical sections for the Project alternatives which address project purpose and needs and roadway context classification. Development of typical sections must consider Context Sensitive Solutions and Complete Streets approaches and the needs of all Project users.

4.2.2 Typical Section Package

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

4.3 Pavement Type Selection Report

Pavement Type Selection Reports are required for every project one mile or greater in length where work includes a modification to the base materials. The Pavement Type Selection decision will again be reviewed by the COUNTY's Project Manager at the time the pavement is designed to warrant reconsideration.

4.4 Pavement Design Package

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

4.5 Cross Slope Correction

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

4.6 Geometric Design

4.6.1 Development of Design Options

The CONSULTANT shall develop the Build Alternative, screened in Task 3a.10, to a level of geometric design sufficient to identify and evaluate alignment

(horizontal and vertical) constraints; nonstandard design features that will require Design Variation or Exception; potential environmental impact and mitigation measures; traffic flow and safety characteristics; drainage; structures; drainage and stormwater management; right of way needs; multimodal accommodation; constructability; Temporary Traffic Control Plan (TTCP) during construction; and construction cost factors.

4.6.2 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, concepts from previous studies and the 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 COUNTY.

4.6.3 Alternatives Concept Plans

The CONSULTANT shall prepare concepts by overlaying viable alternatives evaluated in detail on the base map. The concept plan must show potential location for bridges, culverts, retaining walls, right of way lines (existing and proposed), environmental issues, major utility facilities, intersections, critical driveways, and median openings, among other roadway elements, at an appropriate scale according to the Florida Department of Transportation (FDOT) CADD Manual.

4.7 Access Management

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

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

4.8 Intersections and Interchanges

4.8.1 Intersection and Interchange Concepts Evaluation

The CONSULTANT shall develop intersection and interchange concepts/layouts based on the results of traffic operational analysis. The layouts will include through lanes, turn lanes, ramps, auxiliary lanes, storage lengths, ramp terminals, ramp junctions, and other geometric details.

The CONSULTANT shall propose appropriate intersection controls and intersection/interchange footprint for the proposed intersections within the project.

4.8.2 Roundabout Evaluation

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

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

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

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

4.8.3 Roundabout Final Design Analysis

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

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

4.9 Cross Section Design Files

The CONSULTANT shall establish and develop cross section design files in accordance with the Florida Department of Transportation (FDOT)'s CADD manual.

Note: If the cross sections are prepared using a 3D model, use Task 36.5 instead of Task 4.9 for the cross section design files.

4.10 Temporary Traffic Control Plan (TTCP) Analysis

During analysis of the Build Alternatives, the CONSULTANT shall evaluate constructability issues and the ability to maintain traffic during construction according to Part 2, Chapter 3 of the PD&E Manual. The CONSULTANT shall include the estimated cost to maintain traffic in the construction cost estimate in the comparative alternatives evaluation.

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

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

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

The CONSULTANT shall prepare the Transportation Management Plan in accordance with Part 2, Chapter 3 of the PD&E Manual and Part 2, Chapter 240 of the FDM.

4.11 Master TTCP Files

The CONSULTANT shall develop master TTCP files (for Level II and Level III only) showing each phase of the TTCP. This includes all work necessary for designing lane configurations, diversions, lane shifts, signing and pavement markings, temporary traffic control devices, and temporary pedestrian ways.

4.12 Selective Clearing and Grubbing

a. Selective Clearing and Grubbing of Existing Vegetation Field Assessment

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

The Result of the Field Assessment(s) will determine the course of action for Selective Clearing and Grubbing and the extent of the Vegetation Survey under Task 2a.2.11.

b. Selective Clearing and Grubbing Site Inventory Analysis of Existing Vegetation and Cross-Discipline Coordination (OPTIONAL SERVICES)

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

c. Selective Clearing and Grubbing- Existing Vegetation Maintenance Report

The CONSULTANT may be required to include in the plans instructions for the care and maintenance of the plant preservation areas, and selective clearing and grubbing areas throughout the construction period. The CONSULTANT shall coordinate with the District Landscape Architect to ensure that the intent of the plant preservation areas is in alignment with future highway landscape plans. The CONSULTANT should be knowledgeable in arboricultural practices to the extent that they are able to deliver detailed and informed Selective Clearing and Grubbing Plans.

4.13 Tree Disposition Plan

4.14 Design Variations and Exceptions

The CONSULTANT shall prepare the documentation necessary to gain COUNTY approval of all appropriate Design Variations and/or Design Exceptions before the first submittal.

4.15 Design Report

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

4.16 Quantities

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

4.17 Cost Estimate

The CONSULTANT shall develop construction cost estimates using the FDOT'S Long Range Estimate (LRE) program. The CONSULTANT shall be responsible for reviewing and updating the cost estimate when scope changes occur, at project milestones, and

during the COUNTY's annual CIP Program development cycle. Construction costs must include traffic management and right of way costs.

The COUNTY's Right of Way Office staff and CONSULTANT shall conduct an interactive field trip to review conditions in the corridor as they pertain to actual conditions that might impact the cost of right of way acquisition for the Project.

The CONSULTANT shall develop engineer's estimates of the probable cost and provide required updates.

4.18 Technical Special Provisions and Modified Special Provisions

4.19 Other Roadway Analyses

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 FDM Chapter 307. The CONSULTANT shall identify the necessary pay items to be included in the bid documents to monitor existing structures.

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

4.22 Technical Meetings

4.23 Quality Assurance/Quality Control

4.24 Independent Peer Review

4.25 Supervision

4.26 Coordination

5 ROADWAY PLANS

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

5.1 Key Sheet

5.2 Summary of Pay Items Including Quantity Input

5.3 Typical Section Sheets

5.3.1 Typical Sections

5.3.2 Typical Section Details

5.4 General Notes/Pay Item Notes

5.5 Summary of Quantities Sheets

5.6 Project Layout

5.7 Plan/Profile Sheet

5.8 Profile Sheet

5.9 Plan Sheet

5.10 Special Profile

5.11 Back-of-sidewalk Profile Sheet

5.12 Interchange Layout Sheet

5.13 Ramp Terminal Details (Plan View)

5.14 Intersection Layout Details

5.15 Special Details

5.16 Cross-Section Pattern Sheet(s)

5.17 Roadway Soil Survey Sheet(s)

5.18 Cross Sections

5.19 Temporary Traffic Control Plan Sheets

5.20 Temporary Traffic Control Cross Section Sheets

5.21 Temporary Traffic Control Detail Sheets

5.22 Utility Adjustment Sheets

5.23 Selective Clearing and Grubbing Sheets

5.23.1 Selective Clearing and Grubbing

5.23.2 Selective Clearing and Grubbing Details

5.24 Tree Disposition Plan Sheets

5.24.1 Tree Disposition Plan Sheets

5.24.2 Tree Disposition Plan Tables and Schedules

5.25 Project Control Sheets

5.26 Environmental Detail Sheets

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

Coordination with Permit/Environmental staff and preparing Dredge & Fill sheets where applicable.

5.27 Utility Verification Sheet(s) (SUE Data)

5.28 Quality Assurance/Quality Control

5.29 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 latest requirements of the appropriate regulatory agencies and the FDOT's Drainage Manual.

The CONSULTANT shall coordinate fully with the appropriate permitting agencies and the COUNTY's staff. All activities and submittals should be coordinated through the COUNTY's Project Manager.

6a.1 Drainage Map Hydrology

The CONSULTANT shall create a (pre- and 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 and Report

The CONSULTANT shall analyze, determine, and document high water elevations per basin which will be used to set roadway profile grade and roadway materials. The CONSULTANT shall determine surface water elevations at cross drains, floodplains, outfalls and adjacent stormwater ponds. This will include determining groundwater elevations (e.g. Seasonal High Groundwater Table elevations) at intervals between the above-mentioned surface waters. The CONSULTANT shall document findings in the Base Clearance Report.

6a.3 Pond Siting Analysis and Report

The CONSULTANT shall calculate the stormwater quality and attenuation requirements (for the requisite storm events), and estimate the stormwater management facility needs for each roadway alternative.

The CONSULTANT shall schedule an Environmental Look-Around (ELA) meeting (See Part 2, Chapter 24 of the PD&E Manual) with COUNTY staff, regulatory agencies, local governments, and other stakeholders to discuss regional stormwater needs and design and permitting approaches that benefit the watershed as a whole. During the meeting, the CONSULTANT shall document the meeting notes in the project file.

If the ELA reveals no regional pond sites within the Study Area, the CONSULTANT shall identify practical pond sites in each basin for each project alternative, estimate construction cost, compare the sites, and identify (in coordination with the COUNTY) a preferred pond site for each basin.

Additionally, the CONSULTANT shall identify inflow and outfall access and easement requirements for each pond site. If additional pond sites are revealed, they will be used as a potential option. The CONSULTANT shall evaluate pond sites using a preliminary hydrologic analysis. The CONSULTANT shall document the results and coordination for all the project's pond site analyses in accordance with the Drainage Manual. The CONSULTANT shall prepare a Pond Siting Report which shall document all right of way, existing and proposed, that is needed to accomplish the required storm water treatment and attenuation, as well as floodplain compensation that may be required for the project.

6a.4 Design of Cross Drains

Analyze the hydraulic design and performance of cross drains. Check existing cross drains to determine if they are structurally sound and can be extended. Document the design as required. Determine and provide flood data as required. Analysis should consider age of the existing cross drain and the number of times it has been extended.

6a.5 Design of Ditches

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

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

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

6a.7 Design of Stormwater Management Facility (Roadside Treatment Swales and Linear Ponds)

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

6a.8 Floodplain and Environmental Permit Drainage Data Collection

The CONSULTANT shall gather floodplain data from FEMA Flood Insurance Rate Maps, and other drainage related data needed to perform stormwater management analysis and obtain permits from relevant sources including local government, local agencies, and regulatory agencies. The CONSULTANT shall identify practical floodplain compensation sites for each floodplain impacted for each project alternative, estimate construction cost, compare the sites, and identify (in coordination with the COUNTY) a preferred floodplain compensation site for each floodplain. Additionally, the CONSULTANT shall identify inflow/outfall and access easement requirements for each

floodplain compensation site. If additional floodplain compensation sites are revealed, they will be used as a potential option.

6a.9 Floodplain Compensation Siting and Design

The CONSULTANT shall determine base floodplain elevations (i.e. 100-year, 24-hour rainfall events) from the floodplain data and 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. The CONSULTANT shall also document floodplain compensation site requirements into the Pond Siting Report.

6a.10 Design of Storm Drains

Delineate contributing drainage areas, determine runoff, inlet locations, and spread. Calculate hydraulic losses (friction, utility conflict and, if necessary, minor losses). Determine design tailwater and, if necessary, outlet scour protection. Analysis should consider age of the existing storm sewer and the number of times it has been modified when being incorporated into the design.

6a.11 Optional Culvert Material

N/A

6a.12 French Drain Systems

N/A

6a.12.1 Existing French Drain Systems

6a.13 Drainage Wells

6a.14 Drainage Design Documentation Report

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

6a.15 Location Hydraulics Report

The CONSULTANT shall prepare a Location Hydraulics Report for the project in accordance with Part 2, Chapter 13 of the PD&E Manual.

6a.16 Bridge Hydraulic Report

The CONSULTANT shall perform hydrology analysis and evaluate bridge hydraulics to determine the hydraulic length and low member elevation of the bridge or the length and low member elevation necessary to meet the minimum hydraulic opening requirement. The CONSULTANT shall evaluate deck drainage, scour, and appropriate counter measures. Prepare report and the information for the Bridge Hydraulics Recommendation Sheet.

6a.17 Temporary Drainage Analysis

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

6a.18 Cost Estimate

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

6a.19 Technical Special Provisions/Modified Special Provisions

6a.20 Hydroplaning Analysis

6a.21 Existing Permit Analysis

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

6a.22 Other Drainage Analysis

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

6a.23 Noise Barrier Evaluation

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

6a.24 Field Reviews

6a.25 Technical Meetings

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

6a.26 Quality Assurance/Quality Control

6a.27 Independent Peer Review

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)**
- 6b.2 Bridge Hydraulics Recommendation Sheets**
- 6b.3 Summary of Drainage Structures**
- 6b.4 Optional Pipe/Culvert Material**
- 6b.5 Drainage Structure Sheet(s) (Per Structure)**
- 6b.6 Miscellaneous Drainage Detail Sheets**
- 6b.7 Lateral Ditch Plan/Profile**
- 6b.8 Lateral Ditch Cross Sections**
- 6b.9 Retention/Detention Ponds Detail Sheet(s)**
- 6b.10 Retention Pond Cross Sections**
- 6b.11 Erosion Control Plan Sheet(s)**
- 6b.12 SWPPP Sheets(s)**
- 6b.13 Quality Assurance/Quality Control**
- 6b.14 Supervision**

7 UTILITIES

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

7.1 Utility Kickoff Meeting

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

It is anticipated that the following Utility Agency Owners (UAOs) are within or adjacent to the Project, but it is the responsibility of the CONSULTANT to determine the final list of UAOs within the project area:

7.2 Identify Existing Utility Agency Owner(s) (UAO(s))

The Consultant shall identify all utilities within and adjacent to the project limits that may be impacted by the project.

7.3 Make Utility Contacts

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

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

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

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 COUNTY. Assist with processing per the UAM.

7.5 Preliminary Utility Meeting

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

7.6 Individual/Field Meetings

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

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

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

7.8 Subordination of Easements Coordination

The CONSULTANT, if requested by the COUNTY, shall transmit to and secure from the UAO the executed subordination agreements prepared by the appropriate COUNTY office. The CONSULTANT shall notify the COUNTY Project Manager to coordinate the programming of the necessary Capital Improvement Program (CIP) funds to compensate the UAO.

7.9 Utility Design Meeting

The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s). The CONSULTANT shall be prepared to discuss impacts to existing trees/vegetation and proposed landscape, drainage, traffic signalization, 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 COUNTY Land Acquisition staff, discuss with each UAO the utility work by highway contractor option, discuss any future design issues that may impact utilities, etc., to the extent that they may have an effect on existing or proposed utility facilities with

particular emphasis on drainage and TTCP with each UAO. The intent of this meeting shall be to assist the UAOs in identifying and resolving conflicts between utilities and proposed construction before completion of the plans, including utility adjustment details. Also to work with the UAOs to recommend potential resolution between known utility conflicts with proposed construction plans as may be deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.9 (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 COUNTY office(s) such as survey, geotechnical, drainage, structures, lighting, roadway, signals, utilities, landscape architecture, municipalities, maintaining agency, and COUNTY Department of Transportation Operations staff for review and comment if required. Coordinate with the COUNTY Project Manager for execution. Distribute Executed Final Documents. Prepare Work Order for UAO(s). The CONSULTANT shall notify COUNTY Project Manager to coordinate the necessary Capital Improvement Program (CIP) funds.

7.11 Utility Coordination/Follow-up

The CONSULTANT shall provide utility coordination and follow up. This includes follow-up, interpreting plans, and assisting the UAOs with completion of their work schedules and agreements. Includes phone calls, face-to-face meetings, etc., to motivate and ensure the UAO(s) complete and return the required documents in accordance with the project schedule. Ensure the resolution of all 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 review utility schedules against construction contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the construction office. See Task 4.6.2 (Horizontal/Vertical Master Design Files) and 4.9 (Cross Section Design Files) for utility conflict identification and adjustments.

7.13 Additional Utility Services

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

7.14 Processing Utility Work by Highway Contractor (UWHC)

This includes coordination of utility design effort between the COUNTY and the UAO(s). The CONSULTANT shall conduct additional coordination meetings, prepare and process the agreements, review tabulation of quantities, perform UWHC constructability and bid-

ability review, review pay items, cost estimates and Technical Special Provisions (TSP) or Modified Special Provision (MSP) prepared by the UAO. This does not include the utility design effort. This item is not usually included in the scope at the time of negotiation. It is normally added as a supplemental agreement when the need is identified. Effort for the EOR is not included in this task, see Roadway Analysis Task Group 4.

7.15 Contract Plans to UAO(s)

If requested by COUNTY, 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 COUNTY Project Manager and preparation of the Utility Certification Letter. The CONSULTANT shall certify to the appropriate COUNTY representative the following:

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

OR

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

OR

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

7.17 Other Utilities

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

8 ENVIRONMENTAL PERMITS AND ENVIRONMENTAL CLEARANCES

The CONSULTANT shall notify the COUNTY Project Manager, Environmental Permit Coordinator, and other appropriate COUNTY personnel in advance of all scheduled meetings with the regulatory agencies to allow a COUNTY 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 1.6 and Section 3b.

8.1 Preliminary Project Research

The CONSULTANT shall perform preliminary project research and shall be responsible for regulatory agency coordination to assure that design efforts are properly directed toward permit requirements. The research shall include but should not be limited to a review of the project's PD&E documents including the Environmental Document, Natural Resources Evaluation, 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 property appraiser data. The CONSULTANT shall determine if any Sovereign Submerged Lands easements need to be modified or acquired. Any applicable information will be shown on the plans as appropriate.

8.2 Field Work

8.2.1 Establish Wetland Jurisdictional Lines and Assessments:

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

- Determine landward extent of wetlands and other surface waters as detailed in Rule Chapter 62-340, F.A.C., as ratified in Section 373.4211, F.S.; United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Technical Report Y-87-1); Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (ERD/EL TR-10-20).
- Collect all data and information necessary to determine the jurisdictional boundaries of wetlands and other surface waters as defined by the rules or regulations of each permitting agency processing a COUNTY permit application for the project.
- Set seasonal high-water levels in adjacent wetlands with biological indicators.
- Obtain a jurisdictional determination as defined by the rules or regulations of each permitting agency processing a COUNTY permit application for the project.
- Prepare aerial maps showing the jurisdictional boundaries of wetlands and other surface waters. Aerial maps shall be reproducible, of a scale of 1"=400' or more detailed and be recent photography. The maps shall show the jurisdictional boundaries of each agency. Photo copies of aerials are not acceptable. When

necessary, a wetland specific survey will be prepared by a registered surveyor and mapper. All surveyed jurisdictional boundaries are to be tied to the project's baseline of survey.

- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form which includes the ID number for each wetland (and other surface water, if necessary) impacted, size of wetland to be impacted, type of impact; and identify any wetland (by ID number and size) within the project limits that will not be impacted by the project.
- Prepare appropriate agency forms to obtain required permits. Forms may include, but are not limited to, the USACE "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; Uniform Mitigation Assessment Method forms and/or project specific data forms.

8.2.2 Species Surveys:

The CONSULTANT shall conduct wildlife surveys during appropriate season as defined by rules or regulations of any permitting agency or commenting agency that is processing a COUNTY permit. If species survey was completed under Task 3b.3.1, the CONSULTANT shall update species surveys as necessary to prepare species permit applications to the appropriate agencies.

8.3 Agency Verification of Wetland Data

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

8.4 Complete and Submit All Required Permit Applications

The CONSULTANT shall collect 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 Environmental 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 COUNTY prior to submittal to regulatory agencies.

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

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 completed applicable agency forms. The CONSULTANT shall prepare and respond to agency Requests for Additional Information (RAIs), including necessary revisions to the application package. All responses and completed application packages must be approved by the District Permit Coordinator prior to submittal to the regulatory agencies. Geotechnical permitting should also be prepared, submitted, and obtained.

8.4.2 Complete and Submit all Required Species Permit Applications

The CONSULTANT shall prepare, complete and submit required species permit applications to the appropriate agencies. This includes federal and state protected species permit application packages as required. The work includes completion of application package (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.

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

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

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

8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application

The CONSULTANT shall be responsible for the preparation of the CCCL permit application and acquire the final "Notice to Proceed" authorization from the Florida COUNTY 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

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 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 COUNTY's policies in proposing mitigation. The CONSULTANT shall develop a mitigation plan based upon the general guidelines provided by the COUNTY.

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

- Purchase of mitigation credits from a mitigation bank.
- Payment to DEP/WMD for mitigation services.
- Monetary participation in offsite regional mitigation plans.
- Creation/restoration 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 mitigation plans acceptable to all permitting agencies and commenting agencies who are processing or reviewing a permit application for a COUNTY 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 COUNTY/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 COUNTY personnel prior to approaching any environmental permitting or commenting agencies. Once a mitigation plan has been reviewed and approved by the COUNTY, 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.

8.12 Other Environmental Permits

8.13 Technical Meetings

8.14 Quality Assurance/Quality Control

8.15 Supervision

8.16 Coordination

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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 1b.21, Provisions for Work. Individual tasks identified in Section 9 through 18 are defined in the Staff Hour Estimation Guidelines and within the provision defined in Section 1b.21, Provisions for Work. Contract documents shall display economical solutions for the given conditions.

The CONSULTANT shall provide Design Documentation to the COUNTY 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 COUNTY's request, on 8½"x11" paper and all sheets shall be numbered. The final design calculations shall be signed and sealed by a Florida-licensed professional engineer. A cover sheet indexing the contents of the calculations shall be included and the engineer shall sign and seal that sheet. All computer programs and parameters used in the design calculations shall include sufficient backup information to facilitate the review task.

- 9.1 Key Sheet and Index of Drawings**
- 9.2 Project Layout**
- 9.3 General Notes and Bid Item Notes**
- 9.4 Miscellaneous Common Details**
- 9.5 Incorporate Report of Core Borings**
- 9.6 Standard Plans – Bridges**
- 9.7 Existing Bridge Plans**
- 9.8 Assemble Plan Summary Boxes and Quantities**
- 9.9 Cost Estimate**
- 9.10 Technical Special Provisions and Modified Special Provisions**
- 9.11 Field Reviews**
- 9.12 Technical Meetings**
- 9.13 Quality Assurance/Quality Control**
- 9.14 Independent Peer Review**
- 9.15 Supervision**
- 9.16 Coordination**

10 STRUCTURES - BRIDGE DEVELOPMENT REPORT

The CONSULTANT shall prepare a Bridge Development Report (BDR). This task includes evaluating various bridge concepts and estimating bridge limits, span lengths, vertical and horizontal clearance requirements, and bent locations. The CONSULTANT shall coordinate with the District Structures Design office regarding conceptual location and design recommendations for each bridge alternative, including cost and any benefit-cost analyses used for selecting or recommending structure alternatives.

The BDR shall be submitted as part of the Phase I Roadway Submittal, General Requirements.

General Requirements

10.1 Bridge Geometry

The CONSULTANT shall evaluate conceptual vertical and horizontal geometry, navigation requirements, and clearance requirements for the bridges. If the project involves replacement of a bridge that is considered historic, or has substantial community value, the CONSULTANT shall include a rehabilitation or repair alternative.

The CONSULTANT shall develop typical sections options for the bridges. These will include the COUNTY's standard typical sections, and any typical sections that may result in minimizing right of way and environmental impacts.

10.2 Ship Impact Data Collection

10.3 Ship Impact Criteria

Superstructure Alternatives

10.4 Short Span Concrete

10.5 Medium Span Concrete

10.6 Long Span Concrete

Not applicable

10.7 Structural Steel

Foundation and Substructure Alternatives

10.8 Pier/Bent

10.9 Shallow Foundations / GRS Abutments

10.10 Deep Foundations

Movable Span

10.11 Data Collection and Design Criteria

Not applicable.

10.12 Movable Span Geometrics and Clearances

Not applicable.

10.13 Deck System Evaluation

Not applicable.

10.14 Framing Plan Development

Not applicable.

10.15 Main Girder Preliminary Design

Not applicable.

10.16 Conceptual Span Balance/Counterweight

Not applicable.

10.17 Support System Development

Not applicable.

10.18 Drive Power Calculations

Not applicable.

10.19 Drive System Development

Not applicable.

10.20 Power and Control Development

Not applicable.

10.21 Conceptual Pier Design

Not applicable.

10.22 Foundation Analysis (FL PIER)

Not applicable.

10.23 Tender Visibility Study

Not applicable.

Other BDR Issues

10.24Aesthetics

10.25TTCP/Staged Construction Requirements

10.26Constructability Requirements

10.27Load Rating for Damaged/Widened Structures

10.28Quantity and Cost Estimates

10.29Quantity and Cost Estimates (Movable Span)

Not applicable.

10.30Wall Type Justification

Report Preparation: The CONSULTANT shall document structural design calculations and design assumptions used in the analysis which will be later used in the Bridge Development Report (BDR).

10.31Exhibits

10.32Exhibits (Movable Span)

Not applicable.

10.33Report Preparation

10.34Report Preparation (Movable Span)

Not applicable.

10.35BDR Submittal Package

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

11 STRUCTURES – TEMPORARY BRIDGE

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

General Layout Design and Plans

11.1 Overall Bridge Final Geometry

11.2 General Plan and Elevation

11.3 Miscellaneous Details

End Bent Design and Plans

11.4 End Bent Structural Design

11.5 End Bent Details

Intermediate Bent Design and Plans

11.6 Intermediate Bent Structural Design

11.7 Intermediate Bent Details

Miscellaneous Substructure Design and Plans

11.8 Foundation Layout

12 STRUCTURES – SHORT SPAN CONCRETE BRIDGE

The CONSULTANT shall prepare plans for Short Span Concrete Bridge(s) at the location(s) specified in Section 2.5.

General Layout Design and Plans

12.1 Overall Bridge Final Geometry

12.2 Expansion/Contraction Analysis

12.3 General Plan and Elevation

12.4 Construction Staging

12.5 Approach Slab Plan and Details

12.6 Miscellaneous Details

End Bent Design and Plans

12.7 End Bent Geometry

12.8 End Bent Structural Design

12.9 End Bent Plan and Elevation

12.10 End Bent Details

Intermediate Bent Design and Plans

12.11 Bent Geometry

12.12 Bent Stability Analysis

12.13 Bent Structural Design

12.14 Bent Plan and Elevation

12.15 Bent Details

Miscellaneous Substructure Design and Plans

12.16 Foundation Layout

Superstructure Design and Plans

12.17 Finish Grade Elevation Calculation

12.18 Finish Grade Elevations

Cast-In-Place Slab Bridges

12.19 Bridge Deck Design

12.20 Superstructure Plan

12.21 Superstructure Sections and Details

Prestressed Slab Unit Bridges

12.22 Prestressed Slab Unit Design

12.23 Prestressed Slab Unit Layout

12.24 Prestressed Slab Unit Details and Schedule

12.25 Deck Topping Reinforcing Layout

12.26 Superstructure Sections and Details

Reinforcing Bar Lists

12.27 Preparation of Reinforcing Bar List

Load Rating

12.28 Load Rating

13 STRUCTURES – MEDIUM SPAN CONCRETE BRIDGE

The CONSULTANT shall prepare plans for Medium Span Concrete Bridge(s) at the location(s) specified in section 2.5.

General Layout Design and Plans

13.1 Overall Bridge Final Geometry

13.2 Expansion/Contraction Analysis

13.3 General Plan and Elevation

13.4 Construction Staging

13.5 Approach Slab Plan and Details

13.6 Miscellaneous Details

End Bent Design and Plans

13.7 End Bent Geometry

13.8 Wingwall Design and Geometry

13.9 End Bent Structural Design

13.10 End Bent Plan and Elevation

13.11 End Bent Details

Intermediate Bent Design and Plans

13.12 Bent Geometry

13.13 Bent Stability Analysis

13.14 Bent Structural Design

13.15 Bent Plan and Elevation

13.16 Bent Details

Pier Design and Plans

13.17 Pier Geometry

13.18 Pier Stability Analysis

13.19 Pier Structural Design

13.20 Pier Plan and Elevation

13.21 Pier Details

Miscellaneous Substructure Design and Plans

13.22 Foundation Layout

Superstructure Deck Design and Plans

13.23 Finish Grade Elevation (FGE) Calculation

13.24 Finish Grade Elevations

13.25 Bridge Deck Design

13.26 Bridge Deck Reinforcing and Concrete Quantities

13.27 Diaphragm Design

13.28 Superstructure Plan

13.29 Superstructure Section

13.30 Miscellaneous Superstructure Details

Reinforcing Bar Lists

13.31 Preparation of Reinforcing Bar Lists

Continuous Concrete Girder Design

13.32 Section Properties

13.33 Material Properties

13.34 Construction Sequence

13.35 Tendon Layouts

13.36 Live Load Analysis

13.37 Temperature Gradient

13.38 Time Dependent Analysis

13.39 Stress Summary

13.40 Ultimate Moments

13.41 Ultimate Shear

13.42 Construction Loading

13.43 Framing Plan

13.44 Girder Elevation, Including Grouting Plan and Vent Locations

13.45 Girder Details

13.46 Erection Sequence

13.47 Splice Details

13.48 Girder Deflections and Camber

Simple Span Concrete Design

13.49 Prestressed Beam

13.50 Prestressed Beam Schedules

13.51 Framing plan

Beam Stability

13.52 Beam/Girder Stability

Bearing

13.53 Bearing Pad and Bearing Plate Design

13.54 Bearing Pad and Bearing Plate Details

Load Rating

13.55 Load Ratings

14 STRUCTURES – STRUCTURAL STEEL BRIDGE

The CONSULTANT shall prepare plans for Structural Steel Bridge(s) at the location(s) specified in Section 2.5.

General Layout Design and Plans

14.1 Overall Bridge Final Geometry

14.2 Expansion/Contraction Analysis

14.3 General Plan and Elevation

14.4 Construction Staging

14.5 Approach Slab Plan and Details

14.6 Miscellaneous Details

End Bent Design and Plans

14.7 End Bent Geometry

14.8 Wingwall Design and Geometry

14.9 End Bent Structural Design

14.10 End Bent Plan and Elevation

14.11 End Bent Details

Intermediate Bent Design and Plans

14.12 Bent Geometry

14.13 Bent Stability Analysis

14.14 Bent Structural Design

14.15 Bent Plan and Elevation

14.16 Bent Details

Pier Design and Plans

14.17 Pier Geometry

14.18 Pier Stability Analysis

14.19 Pier Structural Design

14.20 Pier Plan and Elevation

14.21 Pier Details

Miscellaneous Substructure Design and Plans

14.22 Foundation Layout

Superstructure Deck Design and Plans

14.23 Finish Grade Elevation (FGE) Calculation

14.24 Finish Grade Elevations

14.25 Bridge Deck Design

14.26 Bridge Deck Reinforcing and Concrete Quantities

14.27 Superstructure Plan

14.28 Superstructure Section

14.29 Miscellaneous Bridge Deck Details

Reinforcing Bar Lists

14.30 Preparation of Reinforcing Bar Lists

Structural Steel Plate Girder Design

14.31 Unit Modeling

14.32 Section Design

14.33 Stiffener Design and Locations

14.34 Cross-Frame Design

14.35 Connections

14.36 Bearing Assembly Design and Detailing (with Jacking Analysis)

14.37 Splice Design

14.38 Shear Stud Connectors

14.39 Deflection Analysis

14.40 Framing Plan

14.41 Girder Elevation

14.42 Structural Steel Details

14.43 Splice Details

14.44 Girder Deflections and Camber

Structural Steel Box Girder Design

14.45 Unit Modeling

14.46 Section Design

14.47 Stiffener Design and Locations

14.48 Interior Cross-Frame Design

14.49 Exterior Cross-Frame Design

14.50 Connections

14.51 Bearing Assembly Design and Detailing (with Jacking Analysis)

14.52 Splice Design

14.53 Shear Stud Connectors

14.54 Deflection Analysis

14.55 Framing Plan

14.56 Girder Elevation

14.57 Structural Steel Details

14.58 Splice Details

14.59 Girder Deflections and Camber

Erection Scheme

14.60 Erection Scheme Analysis

14.61 Erection Scheme

Load Rating

14.62 Load Rating

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15 STRUCTURES – SEGMENTAL CONCRETE BRIDGE

Segmental Concrete Bridge is not applicable to this scope.

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16 STRUCTURES – MOVABLE SPAN

Movable Span Structures are not applicable to this scope.

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17 STRUCTURES – RETAINING WALLS

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

General Requirements

17.1 Key Sheet

17.2 Horizontal Wall Geometry

Permanent Proprietary Walls

17.3 Vertical Wall Geometry

17.4 Semi-Standard Drawings

17.5 Wall Plan and Elevations (Control Drawings)

17.6 Details

Temporary Proprietary Walls

17.7 Vertical Wall Geometry

17.8 Semi-Standard Drawings

17.9 Wall Plan and Elevations (Control Drawings)

17.10 Details

Cast-In Place Retaining Walls

17.11 Design

17.12 Vertical Wall Geometry

17.13 General Notes

17.14 Wall Plan and Elevations (Control Drawings)

17.15 Sections and Details

17.16 Reinforcing Bar List

Other Retaining Walls and Bulkheads

17.17 Design

17.18 Vertical Wall Geometry

17.19 General Notes, Tables, and Miscellaneous Details

17.20 Wall Plan and Elevations

17.21 Details

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18 STRUCTURES – MISCELLANEOUS

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

Concrete Box Culverts

18.1 Concrete Box Culverts

18.2 Concrete Box Culvert Extensions

18.3 Concrete Box Culvert Data Table Plan Sheets

18.4 Concrete Box Culvert Special Details Plan Sheets

Strain Poles

18.5 Steel Strain Poles

18.6 Concrete Strain Poles

18.7 Strain Pole Data Table Plan Sheets

18.8 Strain Pole Special Details Plan Sheets

Mast Arms

18.9 Mast Arms

18.10 Mast Arms Data Table Plan Sheets

18.11 Mast Arms Special Details Plan Sheets

Overhead/Cantilever Sign Structure

18.12 Cantilever Sign Structures

18.13 Overhead Span Sign Structures

18.14 Special (Long Span) Overhead Span Sign Structures

18.15 Monotube Overhead Sign Structure

18.16 Bridge Mounted Signs (Attached to Superstructure)

18.17 Overhead and Cantilever Sign Structures Data Table Plan Sheets

18.18 Overhead and Cantilever Sign Structures Special Details Plan Sheets

High Mast Lighting

18.19 Non-Standard High Mast Lighting Structures

18.20 High Mast Lighting Special Details Plan Sheets

Noise Barrier Walls (Ground Mount)

18.21 Horizontal Wall Geometry

18.22 Vertical Wall Geometry

18.23 Summary of Quantities – Aesthetic Requirements

18.24 Control Drawings

18.25 Design of Noise Barrier Walls Covered by Standards

18.26 Design of Noise Barrier Walls not Covered by Standards

18.27 Aesthetic Details

Special Structures

18.28 Fender System

18.29 Fender System Access

18.30 Special Structures

18.31 Other Structures

Ancillary Structures Reports

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

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

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

18.35 Ancillary Structures Report

19 SIGNING AND PAVEMENT MARKING ANALYSIS

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

19.1 Traffic Data Analysis

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

19.2 No Passing Zone Study

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

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

19.3 Reference and Master Design File

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

19.4 Multi-Post Sign Support Calculations

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

19.5 Sign Panel Design Analysis

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

19.6 Sign Lighting/Electrical Calculations

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

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

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

19.7 Quantities

19.8 Cost Estimate

19.9 Technical Special Provisions and Modified Special Provisions

19.10 Other Signing and Pavement Markings Analysis

19.11 Field Reviews

19.12 Technical Meetings

19.13 Quality Assurance/Quality Control

19.14 Independent Peer Review

19.15 Supervision

19.16 Coordination

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20 SIGNING AND PAVEMENT MARKINGS PLANS

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

20.1 Key Sheet

20.2 Summary of Pay Items Including Designer Interface Quantity Input

20.3 Tabulation of Quantities

20.4 General Notes/Pay Item Notes

20.5 Project Layout

20.6 Plan Sheet

20.7 Typical Details

20.8 Guide Sign Worksheet(s)

20.9 Traffic Monitoring Site

20.10 Cross Sections

20.11 Special Service Point Details

20.12 Special Details

20.13 Interim Standards

20.14 Quality Assurance/Quality Control

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 part of the contract. The CONSULTANT shall describe how the check 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 specifically designated for this project.

20.15 Supervision

21 SIGNALIZATION ANALYSIS

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

21.1 Traffic Data Collection

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

21.2 Traffic Data Analysis

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

21.3 Signal Warrant Study

21.4 Systems Timings

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

21.5 Reference and Master Signalization Design File

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

21.6 Reference and Master Interconnection Communication Design File

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

21.7 Overhead Street Name Sign Design

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

21.8 Pole Elevation Analysis

21.9 Traffic Signal Operation Report

21.10 Quantities

21.11 Cost Estimate

21.12 Technical Special Provisions and Modified Special Provisions

21.13 Other Signalization Analysis

21.14 Field Reviews

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

- Existing Signal and Pedestrian Phasing
- Controller Make, Model, Capabilities and Conditions/Age
- Controller Cabinet Make, Model, and load bay type
- Condition of Signal Structure(s)
- Type of Detection as Compared with Current District Standards
- Interconnection Media
- Controller Timing Data
- Presence of LED Vehicular and Pedestrian Signal Indicators
- Presence of Signal Backplates
- Presence of Pedestrian Countdown Type Heads
- Presence of Accessible vs. Standard Pedestrian Detectors

21.15 Technical Meetings

21.16 Quality Assurance/Quality Control

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

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all design drawings, specifications and other services prepared as 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 designated for this project.

21.17 Independent Peer Review

21.18 Supervision

21.19 Coordination

22 SIGNALIZATION PLANS

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

22.1 Key Sheet

22.2 Summary of Pay Items Including Designer Interface Quantity Input

22.3 Tabulation of Quantities

22.4 General Notes/Pay Item Notes

22.5 Plan Sheet

22.6 Interconnect Plans

22.7 Traffic Monitoring Site

22.8 Guide Sign Worksheet

22.9 Special Details

22.10 Special Service Point Details

22.11 Mast Arm/Monotube Tabulation Sheet

22.12 Strain Pole Schedule

22.13 TTCP Signal (Temporary)

22.14 Temporary Detection Sheet

22.15 Utility Conflict Sheet

22.16 Interim Standards

22.17 Quality Assurance/Quality Control

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

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

CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

22.18 Supervision

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23 LIGHTING ANALYSIS

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

23.1 Lighting Justification Report

The CONSULTANT shall prepare a Lighting Justification Report. The report shall be submitted under a separate cover with the Phase I plans submittal, titled Lighting Justification Report. The reports 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) which utilizes ADT, Three Year Crash Data, night/day crashes ratio, percentages of night ADT, etc.

23.2 Lighting Design Analysis Report

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

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

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

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

Voltage drop calculations

Load analysis calculation for each branch circuit

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 COUNTY.

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

23.4 FDEP Coordination and Report

23.5 Reference and Master Design File

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

23.6 Temporary Lighting

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

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. Submitted as part of the Structural Calculations (Phase III and IV submittals).
- Structural calculations for the high mast pole foundations. Submitted as part of the Structural Calculations (Phase III and IV submittals).
- Correspondence with the power company concerning new electrical service and/or modifications to existing circuits, existing loads, and fault currents- Submitted as part of the Lighting Design Analysis Report (Phase IV submittal).
- Voltage drop calculations. Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals).
- Load analysis calculations Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals).
- Arc flash hazard analysis - Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals).
- Short circuit analysis and device coordination - Submitted as part of the Lighting Design Analysis Report (Phase III and IV submittals).

23.8 Quantities

23.9 Cost Estimate

23.10 Technical Special Provisions and Modified Special Provisions

23.11 Other Lighting Analysis

The CONSULTANT shall perform a power design analysis for each new load center and shall include the analysis in the Lighting Design Analysis Report.

23.12 Field Reviews

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

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

23.13 Technical Meetings

23.14 Quality Assurance/Quality Control

23.15 Independent Peer Review

23.16 Supervision

23.17 Coordination

24 LIGHTING PLANS

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

24.1 Key Sheet

24.2 Summary of Pay Item Sheet Including Designer Interface Quantity Input

24.3 Tabulation of Quantities

24.4 General Notes/Pay Item Notes

24.5 Pole Data, Legend and Criteria

24.6 Service Point Details

24.7 Project Layout

24.8 Plan Sheet

24.9 Special Details

24.10 Temporary Lighting Data and Details

24.11 Temporary Traffic Control Plan Sheets

24.12 Interim Standards

24.13 Quality Assurance/Quality Control

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

The CONSULTANT shall provide 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 part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

24.14 Supervision

25 LANDSCAPE ANALYSIS

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

25.1 Data Collection

All research required to collect data necessary to complete the initial design analysis. Includes identifying local ordinances and collection of other project data.

25.2 Site Inventory and Analysis for Proposed Landscape

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

25.2a Selective Clearing and Grubbing Site Inventory

25.2b Inventory and Analysis

25.2c1 Vegetation Disposition Plan- Mainline

25.2c2 Vegetation Disposition Plan- Interchange

25.3 Planting Design

25.3a Conceptual Planting Design

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

25.3a1 Report Preparation

25.3a2 Mainline

25.3a3 Interchanges, Intersections, and Rest Areas

25.3a4 Toll Plazas

25.3b Final Planting Design

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

25.3b1 Master Design File Creation

25.3b2 Mainline

25.3b3 Interchanges, Intersections, and Rest Areas

25.3b4 Toll Plazas

25.4 Irrigation Design

25.4a Conceptual Irrigation Design

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

25.4a1 Feasibility Report: Includes analysis of methods, materials and operation costs associated with proposed irrigation system design

25.4a2 Mainline

25.4a3 Interchanges, Intersections, and Rest Areas

25.4a4 Toll Plazas

25.4b Final Irrigation Design

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

25.4b1 Mainline

25.4b2 Interchanges, Intersections, and Rest Areas

25.4b3 Toll Plazas

25.5 Hardscape Design

25.5a Conceptual Hardscape Design

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

25.5b Final Hardscape Design

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

25.6 Roll Plots

Task includes any roll plots for the project to aid in developing final plans (landscape opportunity, disposition, site inventory and analysis, etc.)

25.7 Cost Estimates

25.8 Technical Special Provisions and Modified Special Provisions

25.9 Inspection Services

Services may include: on-site inspection, construction, observation, monitoring, supervision, and any reporting requirements.

25.10 Other Landscape Services

25.11 Outdoor Advertising

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

25.12 Field Reviews

25.13 Technical Meetings/Public Meetings

25.14 Quality Assurance/Quality Control

25.15 Independent Peer Review

25.16 Supervision

25.17 Project Coordination

25.18 Interdisciplinary Coordination

26 LANDSCAPE PLANS

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

26.1 Key Sheet

26.2 Tabulations of Quantities and Plant Schedule

26.3 General Notes

26.4 Tree and Vegetation Protection and Relocation Plans and Tree Disposition Plans

26.5 Planting Plans for Linear Roadway Projects

26.6 Planting Plans for Interchanges and Toll Plazas

26.7 Planting Details and Notes

26.8 Irrigation Plans for Linear Roadway Project

26.9 Irrigation Plans for Interchange and Toll Plazas

26.10 Irrigation Details and Notes

26.11 Hardscape Plans

26.12 Hardscape Details and Notes

26.13 Landscape Maintenance Plan

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

26.14 Quality Assurance/Quality Control

26.15 Supervision

27 SURVEY

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

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

The survey notes shall include documentation of decisions reached from meetings, telephone conversations or site visits. All like work (such as bench lines, reference points, etc.) shall be recorded contiguously. The COUNTY 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 COUNTY may instead require that these points be surveyed by true line, traverse or parallel offset.

27.1 Horizontal Project Control (HPC)

Establish or recover HPC, for the purpose of establishing horizontal control on the Florida State Plane Coordinate system or datum approved by the COUNTY may include primary or secondary control points. Includes analysis and processing of all field collected data, and preparation of forms.

27.2 Vertical Project Control (VPC)/Bench Line

Establish or recover VPC, for the purpose of establishing vertical control on datum approved by the COUNTY; may include primary or secondary vertical control points. Includes analysis and processing of all field collected data, and preparation of forms.

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

Establish, recover or re-establish project alignment. Also includes analysis and processing of 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 COUNTY R/W Maps, platted or dedicated rights of way.

27.4 Aerial Targets

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

27.5 Reference Points

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

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

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

27.7 Planimetric (2D)

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

27.8 Roadway Cross Sections/Profiles

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

27.9 Side Street Surveys

Refer to task of this document as applicable.

27.10 Underground Utilities

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

27.11 Outfall Survey

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

27.12 Drainage Survey

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

27.13 Bridge Survey (Minor/Major)

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

27.14 Channel Survey

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

27.15 Pond Site Survey

Refer to tasks of this document as applicable.

27.16 Mitigation Survey

Refer to tasks of this document as applicable.

27.17 Jurisdiction Line Survey

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

27.18 Geotechnical Support

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

27.19 Sectional/Grant Survey

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

27.20 Subdivision Location

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

27.21 Maintained R/W

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

27.22 Boundary Survey

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

27.23 Water Boundary Survey

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

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

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

27.25 Right of Way Monumentation

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

27.26 Line Cutting

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

27.27 Work Zone Safety

Provide work zone as required by COUNTY standards.

27.28 Vegetation Survey

Locate vegetation within the project limits.

27.29 Tree Survey

Locate individual trees or palms within the project limits.

27.30 Miscellaneous Surveys

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

27.31 Supplemental Surveys

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

27.32 Document Research

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

27.33 Field Reviews

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

27.34 Technical Meetings

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

27.35 Quality Assurance/Quality Control (QA/QC)

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

27.36 Supervision

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

27.37 Coordination

Coordinate survey activities with other disciplines. These activities must be performed by the project supervisor a Florida P.S.M. on their delegate as approved by the COUNTY.

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28 PHOTOGRAMMETRY

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

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

28.1 Flight Preparation

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

28.2 Control Point Coordination

Determine photo identifiable control points, and mark contact prints.

28.3 Mobilization

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

28.4 Flight Operations

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

28.5 Film Processing

Process, check, and annotate the aerial film.

28.6 Photo Products

Prepare contact prints, contact diapositives, and photo enlargements.

28.7 Scanning

Scan photographic images.

28.8 LiDAR

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

28.9 Aerial Triangulation

Measure and adjust control within aerial images.

28.10 Surfaces

Includes collection of break lines and spot elevations.

28.11 Ortho Generation

Includes creation of final images.

28.12 Rectified Digital Imagery (Georeferenced)

Create the rectified digital image.

28.13 Mosaicking

Create the mosaic.

28.14 Sheet Clipping

Create plot files for sheets from the database.

28.15 Topographics (3D)

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

28.16 Planimetrics (2D)

Prepare 2D planimetric map.

28.17 Drainage Basin

Includes preparing drainage basin maps in clipped “sheet” format.

28.18 CADD Edit

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

28.19 Data Merging

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

28.20 Miscellaneous

Other tasks not specifically addressed in this document.

28.21 Field Reviews

Perform on site review of maps.

28.22 Technical Meetings

Attend meetings as required.

28.23 Quality Assurance/Quality Control

Establish and implement a QA/QC plan.

28.24 Supervision

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

28.25 Coordination

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

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29 MAPPING

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

Master CADD File

29.1 Alignment

29.2 Section and ¼ Section Lines

29.3 Subdivision/Property Lines

29.4 Existing Right of Way

29.5 Topography

29.6 Parent Track Properties and Existing Easements

29.7 Proposed Right of Way Requirements

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

29.8 Limits of Construction

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

29.9 Jurisdictional/Agency Lines

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

Sheet Files

29.10 Control Survey Cover Sheet

29.11 Control Survey Key Sheet

29.12 Control Survey Detail Sheet

29.13 Right of Way Map Cover Sheet

29.14 Right of Way Map Key Sheet

29.15 Right of Way Map Detail Sheet

29.16 Maintenance Map Cover Sheet

29.17 Maintenance Map Key Sheet

29.18 Maintenance Map Detail Sheet

29.19 Reference Point Sheet

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

29.20 Project Control Sheet

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

29.21 Table of Ownership Sheet

Miscellaneous Surveys and Sketches

29.22 Parcel Sketches

29.23 TITF Sketches

29.24 Other Specific Purpose Survey(s)

29.25 Boundary Survey(s) Map

29.26 Right of Way Monumentation Map

29.27 Title Search Map

29.28 Title Search Report

29.29 Legal Descriptions

29.30 Final Maps/Plans Comparison

The PSM will perform a comparison of the final right of way maps with the available construction plans to review the correctness of the type of parcel to be acquired and the stations/offsets to the required right of way. The PSM will coordinate with the EOR to resolve any conflicts or discrepancies and provide documentation of the review.

29.31 Field Reviews

29.32 Technical Meetings

29.33 Quality Assurance/Quality Control

29.34 Supervision

29.35 Coordination

29.36 Supplemental Mapping

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

30 TERRESTRIAL MOBILE LIDAR

The CONSULTANT shall perform Terrestrial Mobile LiDAR tasks in accordance with all applicable statutes, manuals, guideline, 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 the 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 digitation 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 maps(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

Order 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.

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- 31 ARCHITECTURE DEVELOPMENT**
- 31.1 Architectural Program Review/Verification**
 - 31.2 Key Sheet and Index of Sheets**
 - 31.3 General Notes, Abbreviations, Symbols, and Legend**
 - 31.4 Life Safety Plan(s)**
 - 31.5 Site Plan(s)**
 - 31.6 Floor Plan(s) (Small Scale)**
 - 31.7 Floor Plan(s) (Large Scale)**
 - 31.8 Exterior Elevation(s)**
 - 31.9 Roof Plan(s)**
 - 31.10 Roof Details**
 - 31.11 Interior Elevation (s)**
 - 31.12 Rest Room Floor Plan(s) (Enlarged)**
 - 31.13 Rest Room Elevation (s)**
 - 31.14 Building Section(s)**
 - 31.15 Stair Section, Enlarged Stair Plan and Details**
 - 31.16 Reflective Ceiling Plan(s)**
 - 31.17 Room Finish Schedule or Finish Plan**
 - 31.18 Door and Window Finish Schedule**
 - 31.19 Door Jamb Details(s) and Window Details**
 - 31.20 Exterior Wall Section(s)**
 - 31.21 Interior Wall Section(s)**
 - 31.22 Overhead Door Detail(s)**
 - 31.23 Curtain Wall Detail(s)**
 - 31.24 Fascia, Soffit and Parapet Details**

- 31.25 Signage Detail(s)**
- 31.26 Miscellaneous Detail(s)**
- 31.27 Repetitive Sheets**
- 31.28 Design Narrative Reports**
- 31.29 Permitting**
- 31.30 Other Pertinent Project Documentation**
- 31.31 Cost Estimate**
- 31.32 Technical Special Provisions and Modified Special Provisions Packages**
- 31.33 Field Reviews**
- 31.34 Technical Meetings**
 - FDOT**
 - Local Governments (cities)**
 - Local Governments (counties)**
 - Other Meetings**
 - Progress Meetings**
 - Phase Review Meetings**
- 31.35 Quality Assurance/Quality Control**
- 31.36 Meeting with Independent Peer Review**
- 31.37 Supervision**
 - Structural Plans
- 31.38 General Notes, Abbreviations, Symbols, and Legend**
- 31.39 Foundation Plan(s) (Small Scale)**
- 31.40 Foundation Plan(s) (Large Scale)**
- 31.41 Slab Plan(s) (Small Scale)**
- 31.42 Slab Plan(s) (Large Scale)**

- 31.43 Slab Placement Plan(s)**
- 31.44 Slab Placement Detail(s)**
- 31.45 Foundation Section(s)**
- 31.46 Foundation Detail(s)**
- 31.47 Slab Section(s)**
- 31.48 Slab Detail(s)**
- 31.49 Roof Framing Plan(s) (Small Scale)**
- 31.50 Roof Framing Plan(s) (Large Scale)**
- 31.51 Roof Loading Plan(s) and Detail(s)**
- 31.52 Roof Section(s)**
- 31.53 Roof Detail (s)**
- 31.54 Bearing Wall Section(s)**
- 31.55 Bearing Wall Detail(s)**
- 31.56 Column Section(s)**
- 31.57 Column Detail(s)**
- 31.58 Miscellaneous Sections**
- 31.59 Repetitive Sheets**
- 31.60 Other Pertinent Project Documentation**
- 31.61 Cost Estimate**
- 31.62 Technical Special Provisions and Modified Special Provisions Packages**
- 31.63 Fields Reviews**
- 31.64 Technical Meetings**
 - FDOT**
 - Local Governments (cities)**
 - Local Governments (counties)**

Other Meetings

Progress Meetings

Phase Review Meetings

31.65 Quality Assurance/Quality Control

31.66 Independent Peer Reviews

31.67 Supervision

Mechanical Plans

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

31.69 Plan(s) (Small Scale)

31.70 Plan(s) (Large Scale)

31.71 Details(s)

31.72 Section(s)

31.73 Piping Schematic(s)

31.74 Control Plan(s)

31.75 Schedule(s)

31.76 HVAC Calculations

31.77 Life Cycle Cost Analysis

31.78 Repetitive Sheets

31.79 Other Pertinent Project Documentation

31.80 Cost Estimate

31.81 Technical Special Provisions and Modified Special Provisions Packages

31.82 Field Reviews

31.83 Technical Meetings

FDOT

Local Governments (cities)

Local Governments (counties)

Other Meetings

Progress Meetings

Phase Review Meetings

31.84 Quality Assurance/Quality Control

31.85 Independent Peer Review

31.86 Supervision

Plumbing Plans

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

31.88 Plan(s) (Small Scale)

31.89 Plans(s) (Large Scale)

31.90 Isometric(s) (Large Scale)

31.91 Riser Diagram(s)

31.92 Details(s)

31.93 Repetitive Sheets

31.94 Other Pertinent Project Documentation

31.95 Cost Estimate

31.96 Technical Special Provisions and Modified Special Provisions Packages

31.97 Field Reviews

31.98 Technical Meetings

FDOT

Local Governments (cities)

Local Governments (counties)

Other Meetings

Progress Meetings

Phase Review Meetings

31.99 Quality Assurance/Quality Control

31.100 Independent Peer Review

31.101 Supervision

Fire Protection Plans

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

31.103 Fire Protection Plan

31.104 Riser Diagram, Details, and Partial Plans

31.105 Hydraulic Calculation

31.106 Repetitive Sheets

31.107 Other Pertinent Project Documentation

31.108 Cost Estimate

31.109 Technical Special Provisions and Modified Special Provisions Packages

31.110 Field Reviews

31.111 Technical Meetings

Local Governments (cities)

Local Governments (counties)

Other Meetings

Progress Meetings

Phase Review Meetings

31.112 Quality Assurance/Quality Control

31.113 Independent Peer Review

31.114 Supervision

Electrical Plans

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

31.116 Electrical Site Plan

- 31.117 Lighting Plan(s)**
- 31.118 Lighting Fixtures Schedule(s)**
- 31.119 Lighting Fixtures Detail(s)**
- 31.120 Lighting Protection Plan(s)**
- 31.121 Lighting Protection Details**
- 31.122 Power Plan(s)**
- 31.123 Power Distribution Riser Diagram(s)**
- 31.124 Panel Board Schedule(s)**
- 31.125 Data Plan(s)**
- 31.126 Data Detail(s)**
- 31.127 Communication Plan(s)**
- 31.128 Communication Detail(s)**
- 31.129 Security Alarm System Plan(s)**
- 31.130 Miscellaneous Detail(s)**
- 31.131 Repetitive Sheets**
- 31.132 Energy Analysis**
- 31.133 Other Pertinent Project Documentation**
- 31.134 Cost Estimate**
- 31.135 Technical Special Provisions and Modified Special Provisions Packages**
- 31.136 Fields Reviews**
- 31.137 Technical Meetings**

FDOT

Local Governments (cities)

Local Governments (counties)

Other Meetings

Progress Meetings

Phase Review Meetings

31.138 Quality Assurance/Quality Control

31.139 Independent Peer Review

31.140 Supervision

31.141 LEED Certification

31.142 Coordination

31.143 Building Information Modeling (BIM)

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32 NOISE ANALYSIS AND NOISE BARRIER DESIGN

32.1 Noise Study

The CONSULTANT shall perform this task to enable the COUNTY to obtain the Project's LDCA. If the Project is determined to be a Type III project (based on 23 CFR §772.5), the CONSULTANT shall state that in the Environmental Document.

The CONSULTANT shall perform noise analysis, noise abatement evaluation, and assessment of construction noise and vibration in accordance with Part 2, Chapter 18 of the PD&E Manual and the FDOT's Traffic Noise Modeling and Analysis Practitioners Handbook. Analysis of special use locations shall be performed using the FDOT'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 attend a noise study methodology meeting with the COUNTY prior to beginning analysis.

The CONSULTANT shall document methodology and results of noise analysis and noise abatement evaluation in the Noise Study Report (NSR). The CONSULTANT shall provide an electronic copy of the NSR, in PDF format, as well as all TNM input/output files, and "readme" file that support the information documented in the report.

32.2 Noise Barrier Evaluation

After LDCA is granted and during preparation of final design plans, the CONSULTANT shall review the PD&E commitments regarding feasible and reasonable noise barriers. The CONSULTANT shall coordinate with the COUNTY Project Manager prior to initiating any noise analysis to discuss possible effects of design changes on the validity of the PD&E noise study commitments.

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. The CONSULTANT shall perform a noise analysis on new noise sensitive sites meeting DPK requirements that were not considered during the PD&E noise study.

After coordination with the COUNTY Project Manager, the CONSULTANT shall perform analysis of special use using the FDOT's "A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Use Locations" document.

The CONSULTANT shall identify any design changes that would affect noise barrier feasibility and reasonableness determination documented in the Environmental Document and NSR. The CONSULTANT shall evaluate proposed noise barriers (locations, barrier heights and lengths) to identify any engineering conflicts or constraints.

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. 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 will not exceed the cost criteria and will only be performed when it is appropriate and in the public interest. The CONSULTANT shall document in the NSR Addendum any resolutions to engineering conflicts or issues that require modification to or preclude construction of a noise barrier.

After reestablishing the recommended height and length of the barrier(s), the CONSULTANT shall coordinate with design engineers and the COUNTY Project Manager to include the barrier(s) on the roadway plan and detail sheets.

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 COUNTY whether 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.

At 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 recipient's 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 logistics (including arranging the meeting location, advertisements, displays, etc.).
- Responding to public inquiries on an individual basis in coordination with the COUNTY.

The CONSULTANT shall bring to the attention of the COUNTY 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 COUNTY. 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 18 of the PD&E Manual). The CONSULTANT shall notify the COUNTY'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 NSR Addendum, and summarized in the environmental document, as appropriate.

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). The NSR Addendum shall include the results of the computer modeling (submitted 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 COUNTY staff and the District Environmental Management Office staff. The purpose of this discussion will be for the COUNTY 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 COUNTY Project Manager and the District Environmental Management Office staff is kept informed of the noise analysis efforts so that these tasks are accomplished in a manner that will enhance the overall success of the project.

32.7 Quality Assurance/Quality Control

QA/QC reviews will be performed for all NSR Addendums submitted to the COUNTY. Documentation of the QA/QC will be provided to the COUNTY 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

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33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS

The CONSULTANT shall analyze and document Intelligent Transportation 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 shall 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 System Engineering Management Plan (PSEMP), RTVM, and other documents as necessary for conformance with Federal Highway Administration (FHWA) requirements. The CONSULTANT shall use all applicable FDOT requirements and guidelines, including, but not limited to, the FDM, Standard Plans, and Standard Specifications for Road and Bridge Construction in the design of ITS. The CONSULTANT design is expected to include the following attributes, facilities, infrastructure, ITS devices, systems, and associated work. *[Insert project specifics (e.g. TMC facilities; communications system design; SunGuide® software system installation or expansion; development of ITS device such as DMS, CCTV cameras, vehicle detection systems, etc.).]*

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 ConOps and as approved by the COUNTY.

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 COUNTY.

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 COUNTY. All

FDOT FDM requirements shall be met for DMS locations. DMS locations shall be designated in conjunction with the Project's master signage 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 (if desired by the District).

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

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

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 COUNTY).* 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 videography study at each proposed camera site. The study shall include video at the proposed camera location and elevation with respect to the roadway elevation. The CONSULTANT shall identify the final number and locations of the camera assemblies based on the videography study.

The camera system design shall ensure that the video quality is not degraded due to wind or vibration. The CONSULTANT shall be responsible for the design of the poles and foundation to minimize the potential for vibration. The CONSULTANT shall prepare cross 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 lighting 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 COUNTY.

The CONSULTANT shall be responsible for the design of non-intrusive vehicle detection subsystem for the roadway facilities. The detectors shall be positioned near the 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 TMS for functions including detecting incidents, determining travel times, estimating traffic conditions for dissemination to travelers, sharing information with other agencies, and data archiving for transportation planning and historical data analysis. The vehicle detection subsystem shall allow for connectivity to the TMC.

Vehicle detectors must meet the 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 provide 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 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 interchange 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 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 systems 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 System (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 lighting 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 Plan Analysis

The CONSULTANT shall be responsible for the development of a communication 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 the TMCs, and any other communication links or connections required to meet the 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 communication 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 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 COUNTY. To ensure 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 a 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 System

The CONSULTANT shall research any required legacy system or system components that may be impacted by 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 motorist.

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 and panel that includes changeable message elements. Expressway and arterial full size DMS shall not be co-located with other static signs. *[If desired by the District.]*

33.13 Quantities

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

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 for generating the Summary of Pay Items and the FDOT's in-house estimates.

33.15 Technical Special Provisions and Modified Special Provisions

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

33.16 Other ITS Analyses

[Add detailed project needs for any other ITS-related Analyses here.]

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 Drive
- 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 to support the project.

33.19 Quality Assurance/Quality Control

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

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

responsible Professional Engineer that performed the Quality Control review shall sign a statement certifying that the review was conducted.

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

33.20 Supervision

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

33.21 Coordination

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

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34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS

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 a key sheet in accordance with the latest format depicted in the FDOT Design Manual.

MUTCD

Standard Specs

Standard Plans

34.2 Summary of Pay Items Including Designer Interface Quantity Input

The CONSULTANT shall include quantity input into Designer Interface and create the CADD generated sheet.

34.3 Tabulation of Quantities

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

34.4 General Notes/Pay Item Notes

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

34.5 Project Layout

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

34.6 Typical and Special Details

The CONSULTANT shall prepare typical and/or special details for conditions in the project not addressed by the COUNTY's Standard Plans for Design Construction, Maintenance, and Utility Operation 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.

34.7 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 locations of pull boxes, splice boxes, conduit runs and device locations with setbacks from the travel way. Devices shall be located by station and offset.

34.8 ITS Communications Plans

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

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

[Discuss any needs or allowance for temporary communication connectivity options here.]

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

The CONSULTANT is responsible for the design of the communication infrastructure and its integration with the COUNTY'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 *[insert location]*.

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

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

34.9 Fiber Optic Splice Diagrams

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

34.10 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 communication hubs, etc., if not already addressed in the FDOT's Standard Plans for Design, Construction, Maintenance and Utility Operations on the State Highway System.

34.11 Cross Sections

The CONSULTANT shall prepare cross sections for ITS devices.

34.12 Guide Sign Work Sheet(s)

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

34.13 Special Service Point Details

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

34.14 Strain Pole Schedule

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

34.15 Overhead/Cantilever Sign Structures

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 requirements as per Chapter 2e – Guide Signs - Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and COUNTY of Transportation FDOT Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

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

For other overhead sign structures, the CONSULTANT shall evaluate pertinent data and information to develop layout for locating and mounting device to the horizontal element of the structure, and coordinate the design of the structures with the 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 requirements as per Chapter 2e – Guide Signs - Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and COUNTY of Transportation FDOT Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

34.17 Temporary Traffic Control Plans

The CONSULTANT shall prepare TTCPs to minimize impacts to traffic during the construction of ITS field devices and associated communication 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 services requirements as necessary to support during the Construction Phase of the Project. The CONSULTANT shall coordinate with District's Traffic Operations ITS Office for additional information regarding existing Incident Management and TMC Operational Procedures.

34.18 Interim Standards

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

34.19 GIS Data and Asset Management Requirements

The CONSULTANT is responsible for providing Geographic Information System (GIS) spatial data, for the ITS components design. This information is required to integrate ITS components to the SunGuide® software. A coordinate point compatible with the Florida Plane System or FDOT's current coordinate plane systems shall be collected for all ITS components as 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 locations for:

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

34.20 Quality Assurance/Quality Control

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

34.21 Supervision

The CONSULTANT shall supervise all technical design activities.

35 GEOTECHNICAL

The CONSULTANT shall, be responsible for complete geotechnical investigation. All work performed by the CONSULTANT shall be in accordance with FDOT and COUNTY standards. COUNTY Project Manager will make interpretations and changes regarding geotechnical standards, policies and procedures and provide guidance to the CONSULTANT.

The investigation plan shall include, but not be limited to, the proposed borings 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 other meetings necessary to facilitate the project.

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

35.1 Document Collection and Review

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, 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 COUNTY Project Manager.

Obtain pavement cores as directing in writing by the COUNTY Project Manager.

If required by the COUNTY Project Manager, a preliminary roadway exploration shall be performed before the Phase I plans submittal. The preliminary roadway exploration will be performed and results provided to the Engineer of Record to assist in setting roadway grades and locating potential problem areas.

CONSULTANT shall perform specialized field testing as required by project needs.

All laboratory testing and classification will be performed in accordance with applicable COUNTY and FDOT 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 COUNTY Project Manager for boring plan approval. If the drilling program expects to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the COUNTY 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 TTCPs for Field Investigation

Coordinate and develop TTCP. All work zone traffic control will be performed in accordance with the FDOT's Roadway and Traffic Standard Plans Index 102 series.

35.6 Drilling Access Permits

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

35.7 Property Clearances

Notify property tenants in person of drilling and field activities, if applicable. Written notification to property owners/tenants is the responsibility of the COUNTY's Project Manager.

35.8 Groundwater Monitoring

Monitor groundwater, using piezometers.

35.9 LBR/Resilient Modulus Sampling

Collect appropriate samples for Limerock Bearing Ratio (LBR) testing. Deliver Resilient Modulus samples for testing at an FDOT accredited materials laboratory as directed by the COUNTY.

35.10 Coordination of Field Work

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

35.11 Soil and Rock Classification – Roadway

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

35.12 Design LBR

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

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 of stability failure.

35.19 Monitor Existing Structures

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

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

35.20 Stormwater Volume Recovery and/or Background Seepage Analysis

Perform stormwater volume recovery analysis as directed by the COUNTY.

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 bases, 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 report is performed, submit the report in accordance with Section 3.2 of the Materials Manual. Flexible Pavement Coring and Evaluation. Enter all core information into the Pavement Coring and Reporting (PCR) system.

35.23 Preliminary Roadway Report

If a preliminary roadway investigation is performed, submit a preliminary roadway report before the Phase I plans submittal. The purpose of the preliminary roadway report will be to assist in setting road grades and locating potential problems.

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheets that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plan Indices 120-001 and 120-002.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT shall be respond in writing to any changes and/or comments from the COUNTY and submit any responses and revised reports.

35.24 Final Report

The final Road Report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.
 - The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
 - An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs and other pertinent calculations.
 - The CONSULTANT shall respond in writing to any changes and/or comments from the COUNTY and submit any responses and revised reports.

35.25 Auger Boring Drafting

Draft Auger borings as directed by the COUNTY.

35.26 SPT Boring Drafting

Draft SPT borings as directed by the COUNTY.

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 COUNTY Project Manager.

CONSULTANT shall perform specialized field-testing as required by needs of the project and as directed in writing by the COUNTY Project Manager.

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

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

35.27 Develop Detailed Boring Location Plan

Develop a detailed boring location plan. Meet with the COUNTY Project Manager for boring plan approval. If the drilling program expects to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the COUNTY 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 TTCPs for Field Investigation

Coordinate and develop TTCP. All work zone traffic control will be performed in accordance with the FDOT's Roadway and Traffic Standard Plans Index 102 series.

35.30 Drilling Access Permits

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

35.31 Property Clearances

Notify property tenants in person of drilling and field activities, if applicable. Written notification to property owners/tenants is the responsibility of the COUNTY's Project Manager.

35.32 Collection of Corrosion Samples

Collect corrosion samples for determination of environmental classification.

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 COUNTY methods. Assist in selection of the most economical, feasible foundation alternative.

35.38 Detailed Analysis of Selected Foundation Alternative(s)

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

- GRS-IBS (including the parameters identified in the Instructions for Development Design Standard D6025 to be provide by the Geotechnical Engineer)
- Spread footings (including soil bearing capacity, minimum footing width, and minimum embedment depth).
- For pile and drilled shaft foundations, provide graphs of ultimate axial soil resistance versus tip elevations. Calculate scour resistance and/or downdrag (negative skin friction), if applicable.

- CONSULTANT shall assist the Engineer of Record in preparing the Pile Data Table (including test pile lengths, scour resistance, downdrag, minimum tip elevation, etc.)
- Provide the design soil profile(s), which include the soil model/type of each layer and all soil-engineering properties required for the Engineer of Record to run the FBPIer computer program. Review lateral analysis of selected foundation for geotechnical compatibility.
- Estimated maximum driving resistance anticipated for pile foundations.
- Provide settlement analysis.

35.39 Bridge Construction and Testing Recommendations

Provide construction and testing recommendations including potential constructability problems.

35.40 Lateral Load Analysis (Optional)

Perform lateral load analyses as directed by the COUNTY.

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 COUNTY.

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 and 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 FDOT's and COUNTY'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).

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 FDOT's and COUNTY'S Standard specification.
- An Appendix which includes SPT and CPT borings/sounding profiles, data from any specialized field test, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drill shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

35.47 Final Reports – Sign, 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 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 FDOT's and COUNTY'S Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized fields 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), any other pertinent information.

Final reports will incorporate comments from the COUNTY and contain any additional field or laboratory test results, recommended foundation alternatives along with design parameters and special provisions for the contract plans. These reports will be submitted to the Engineer of Record for review prior to project completion. After review by the Engineer of Record, the reports will be submitted to the COUNTY Project Manager in a final form and will include the following:

- All original plan sheets (11'x17")
- One set of all plan and specification documents, in electronic format, according to FDOT and COUNTY requirements
- Two sets of record prints
- Six sets of any special provisions
- All reference and support documentation used in preparation of contract plan package

Additional final reports (up to four), aside from stated above, may be needed and requested for the COUNTY's Project Manager and other disciplines.

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

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

35.48 SPT Boring Drafting

Prepare a complete set of drawings to include all SPT borings, auger borings and other pertinent soils information in the plans. Include these drawings in the Final Geotechnical Report. Draft borings, location map, S.C.S. map and U.S.D.A map as directed by the COUNTY. 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 specially required for the project as determined by the COUNTY, and included in the geotechnical upset limit.

35.50 Technical Special Provisions and Modified Special Provisions

35.51 Fields 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

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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 COUNTY, 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 COUNTY, 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.

[List optional service to be included, i.e. Curb Ramps, Closed Drainage Network, Bridge Modeling, Bridge Abutment, Overhead sign post/structures with foundation, Toll gantry and overhead DMS structures with foundation, proposed utilities (pressure pipe/gravity), etc.].

36.3 Phase III 3D Design Model

The CONSULTANT shall prepare, submit and present for approval by the COUNTY, Phase III 3D model and deliverables 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 COUNTY, the 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 COUNTY's CADD manual and FDOT 'Green Book'. 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 COUNTY, project specific templates/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 COUNTY 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 COUNTY 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 COUNTY.

37.3 Progress Reporting

The CONSULTANT shall meet with the COUNTY as required and shall provide a written monthly progress report and approved schedule, schedule status, and payout curve or by using the earned value method that describes 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 COUNTY 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 COUNTY 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 and Modified Special Provisions, and plans as required by COUNTY standards.

37.6 Computer Automation

The project will be developed utilizing Computer Aided Drafting and Design (CADD) systems. The COUNTY 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 of the COUNTY's CADD Manual. The CONSULTANT shall submit final documents and files as described therein.

37.7 Coordination with Other Consultants

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

37.8 Optional Services

At the COUNTY'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 fair, competitive and reasonable costs, considering the scope and complexity of the project(s). Additional services may be authorized by Change Order to the Professional Service Agreement. The additional services may include re-evaluation of previous PD&E studies, cumulative impact evaluation, support the COUNTY in preparation of Design-Build package, Construction Assistance, Review of Shop Drawings, Final Bridge Load Rating, update (Category II) bridge plans electronically (CADD) for the Final "As-Built" conditions, based on documents provided by the COUNTY (CADD Services Only) or other Services as required.

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38 INVOICING LIMITS

Payment for the work accomplished shall be in accordance with Method of Compensation of this contract. Invoices shall be submitted to the COUNTY, in a format prescribed by the COUNTY. The COUNTY 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 COUNTY.

The CONSULTANT shall provide a list of key events and the associated total percentage of work considered to be complete at each event. This list shall be used to control invoicing. Payments will not be made that exceed the percentage of work for any event until those events have actually occurred and the results are acceptable to the COUNTY.

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