

**EXHIBIT A**



**SCOPE OF SERVICES**

**FOR**

**CONTRACT 1**

**FINANCIAL PROJECT ID: 258355-1-32-07**

**CONTRACT 2**

**FINANCIAL PROJECT ID: 258355-1-32-08**

**FEDERAL PROJECT NO. TO BE DETERMINED**

**INTERSTATE PROGRAM MANAGER TAMPA INTERSTATE STUDY - CONTINUING SERVICES**

**DISTRICT SEVEN**

**Revised: 01/12/23  
01/10/23  
05/13/22  
05/12/22  
05/02/22**

## TABLE OF CONTENTS

1	PURPOSE _____	A-1
2	PROJECT DESCRIPTION _____	A-2
3	PROJECT COMMON AND PROJECT GENERAL TASKS _____	A-11
4	ROADWAY ANALYSIS _____	A-19
5	ROADWAY PLANS _____	A-23
6	DRAINAGE ANALYSIS _____	A-25
7	UTILITIES _____	A-31
8	ENVIRONMENTAL PERMITS _____	A-34
9	STRUCTURES – SUMMARY AND MISC. TASKS AND DRAWINGS _____	A-40
10	STRUCTURES – BRIDGE DEVELOPMENT REPORT _____	A-41
11	STRUCTURES – TEMPORARY BRIDGE _____	A-43
12	STRUCTURES – SHORT SPAN CONCRETE BRIDGE _____	A-43
13	STRUCTURES – MEDIUM SPAN CONCRETE BRIDGE _____	A-45
14	STRUCTURES – STRUCTURAL STEEL BRIDGE _____	A-47
15	STRUCTURES – SEGMENTAL CONCRETE BRIDGES _____	A-50
16	STRUCTURES – MOVABLE SPAN _____	A-53
17	STRUCTURES – RETAINING WALL _____	A-57
18	STRUCTURES - MISCELLANEOUS _____	A-58
19	SIGNING AND PAVEMENT MARKING ANALYSIS _____	A-60
20	SIGNING AND PAVEMENT MARKING PLANS _____	A-62
21	SIGNALIZATION ANALYSIS _____	A-63
22	SIGNALIZATION PLANS _____	A-65
23	LIGHTING ANALYSIS _____	A-66
24	LIGHTING PLANS _____	A-69
25	LANDSCAPE ARCHITECTURE ANALYSIS _____	A-70
26	LANDSCAPE ARCHITECTURE PLANS _____	A-73
27	SURVEY _____	A-74
28	PHOTOGRAMMETRY _____	A-78
29	MAPPING _____	A-79
30	TERRESTRIAL MOBILE LiDAR _____	A-82
31	ARCHITECTURE DEVELOPMENT – N/A _____	A-84
32	NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE _____	A-97
33	INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS _____	A-100
34	INTELLIGENT TRANSPORTATION SYSTEMS PLANS _____	A-107
35	GEOTECHNICAL _____	A-111

<b>36</b>	<b>3D MODELING</b>	<b>A-120</b>
<b>37</b>	<b>PROJECT REQUIREMENTS</b>	<b>A-120</b>
<b>38</b>	<b>INVOICING LIMITS</b>	<b>A-121</b>

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

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

Financial Project ID:       **Contract 1 - 258355-1-32-07**  
                                      **Contract 2 - 258355-1-32-08**  
Federal Aid Project No.:   **TBD**  
County Section No.:       **N/A**  
Description:                **Interstate Program Manager Tampa Interstate Study - Continuing Services**

### 1       **PURPOSE**

*CONSULTANT services are required for the design of various improvements and projects that will be assigned as individual Task Work Orders as the projects are identified. The purpose of this Exhibit is to describe the scope of work and the responsibilities of the CONSULTANT and the DEPARTMENT in connection with the design and preparation of a complete set of construction contract documents and incidental engineering services, as necessary, for each specific production project to be assigned to the CONSULTANT under this Agreement [hereinafter called the “project(s)” or the “assigned project(s)”].*

Major Work Mix includes: **3.1, 3.2, 3.3**

Minor Work Types include: **2.0, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 4.2.3, 6.1, 6.3.1, 6.3.2, 6.3.3, 7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 8.4, 9.1, 9.2, 9.4.1, 10.1, 14.0 and 15.0.**

*Each such assignment shall be made with the issuance of a Task Work Order authorization, which shall identify the assigned project, specify the services to be performed, and state the compensation for the services. No work shall begin on a specific production project until a Task Work Order for that project has been authorized in writing under this Agreement by the DEPARTMENT’s Procurement Services Manager. Individual projects may be assigned for a period of sixty (60) months from the date of this Agreement, or until a total accumulated fee of \$ 5,000,000 is reached.*

The general objective is for the CONSULTANT to prepare a set of contract documents including plans, specifications, supporting engineering analysis, calculations and other technical documents in accordance with FDOT policy, procedures and requirements. These Contract documents will be used by the **construction** contractor to build the project and test the project components. These Contract documents will be used by the DEPARTMENT or its Construction Engineering Inspection (CEI) representatives for inspection and final acceptance of the project. The CONSULTANT shall follow a systems engineering process to ensure that all required project components are included in the development of the Contract documents and the project can be built as designed and to specifications. **Task Work Orders may also include revising or updating previously completed construction plans and documents, and providing Post-Design Services, Construction Assistance Services and Expert Witness Testimony Services for assigned projects.**

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

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

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

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

*No services shall be performed on any authorized Task Work Order beyond the expiration date of the Agreement (contract). Before a Task Work Order is authorized, the CONSULTANT shall coordinate with the DEPARTMENT Project Manager to ensure that there will be adequate time between the projected Task Work Order authorization date and the Agreement expiration date within which to complete the services under that Task Work Order, regardless of its nature (this includes Task Work Orders for post-design construction assistance).*

## 2 PROJECT DESCRIPTION

The CONSULTANT shall investigate the status of the project and become familiar with concepts and commitments (typical sections, alignments, etc.) developed from prior studies and/or activities, **including applicable documents at <https://www.fdot7studies.com>**. If a Preliminary Engineering Report is available from a prior or current Project Development and Environmental (PD&E) study, the CONSULTANT shall use the approved concepts as a basis for the design unless otherwise **noted within the issued Task Work Order Scope of Services for the assigned project or** directed by the DEPARTMENT.

*Each Task Work Order Scope of Services to be issued will list the initial design considerations for each technical discipline or service applicable to the assigned project. The staff-hour estimates and negotiations for each Task Work Order shall follow the numerical hierarchy found in Sections 3 through 36 herein, or as otherwise utilized in the Task Work Order Scope of Services. The services described below are intended to indicate the major and most expansive possible efforts under this Agreement, but each such service and sub-activity described may be modified as the individual Task Work Orders are assigned. Some services described or referred to herein may never be authorized by a Task Work Order under this Agreement.*

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

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

*See the Task Work Order Scope of Services.*

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

*See the Task Work Order Scope of Services.*

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

***For this Agreement***, 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 ***under this Agreement. In this scope and in Task Work Order scopes***, this person shall be referred to as the Utility Coordination Manager and shall be identified in the CONSULTANT proposal ***using an approved classification in the FDOT Negotiation Handbook for Professional Services Contracts***. The Utility Coordination Manager shall be required to satisfactorily demonstrate to the FDOT District Utilities Administrator that they have the following knowledge, skills, and expertise:

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

The Utility Coordination Manager shall be responsible for managing all utility coordination ***provided by a Task Work Order***, including the following:

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

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

*See the Task Work Order Scope of Services for project-specific utility coordination services.*

**2.4 Environmental Permits and Environmental Clearances (Activities 8a and 8b)**

*See the Task Work Order Scope of Services.*

**2.5 Structures (Activities 9 – 18)**

*See the Task Work Order Scope of Services.*

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

*See the Task Work Order Scope of Services.*

**2.7 Signalization (Activities 21 & 22)**

*See the Task Work Order Scope of Services.*

**2.8 Lighting (Activities 23 & 24)**

*See the Task Work Order Scope of Services.*

**2.9 Landscape (Activities 25 & 26)**

*See the Task Work Order Scope of Services.*

**2.10 Survey (Activity 27a except as otherwise noted)**

*See the Task Work Order Scope of Services.*

**2.11 Photogrammetry (Activity 28)**

*See the Task Work Order Scope of Services.*

**2.12 Mapping (Activity 29)**

*See the Task Work Order Scope of Services.*

**2.13 Terrestrial Mobile LiDAR (Activity 30)**

*See the Task Work Order Scope of Services.*

**2.14 Architecture (Activity 31)**

*See the Task Work Order Scope of Services.*

**2.15 Noise Barriers (Activity 32)**

*See the Task Work Order Scope of Services.*

**2.16 Intelligent Transportation Systems (Activities 33 & 34)**

*See the Task Work Order Scope of Services.*

**2.17 Geotechnical (Activity 35)**

*See the Task Work Order Scope of Services.*

**2.18 3D Modeling (Activity 36)**

*See the Task Work Order Scope of Services.*

**2.19 Project Schedule**

Within ten (10) days after *issuance of a Task Work Order for an assigned project*, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production Date. The schedule shall be based upon *the anticipated “Submit Final ROW Requirements” date (if applicable) and the anticipated “Production Date”*. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a *four* week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

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

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

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

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

**2.20 Submittals**

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

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

*When required by the Task Work Order, the CONSULTANT shall provide a Constructability and Bidability review of the design with the Phase III or other designated plans submittal. The*



***CONSULTANT's comments and responses developed from this review shall be forwarded to the DEPARTMENT's Construction Services Unit.***

***The CONSULTANT shall have their Quality Control, Quality Assurance and applicable Constructability documents complete and available for review by the DEPARTMENT at the time of each phase submittal.***

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

## **2.21 Provisions for Work**

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

### **▪ General**

- Title 29, Part 1910, Standard 1910.1001, Code of Federal Regulations (29 C.F.R. 1910.1001) – Asbestos Standard for Industry, U.S. Occupational Safety and Health Administration (OSHA)
- 29 C.F.R. 1926.1101 – Asbestos Standard for Construction, OSHA
- 40 C.F.R. 61, Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP), Environmental Protection Agency (EPA)
- 40 C.F.R. 763, Subpart E – Asbestos-Containing Materials in Schools, EPA
- 40 C.F.R. 763, Subpart G – Asbestos Worker Protection, EPA
- Americans With Disabilities Act (ADA) Standards for Accessible Design
- AASHTO – A Policy on Design Standards Interstate System
- AASHTO – Roadside Design Guide
- AASHTO – Roadway Lighting Design Guide
- AASHTO – A Policy for Geometric Design of Highways and Streets
- AASHTO – Highway Safety Manual
- Rule Chapter 5J-17, Florida Administrative Code (F.A.C.), Standards of Practice for Professional Surveyors and Mappers
- Chapter 469, Florida Statutes (F.S.) – Asbestos Abatement
- Rule Chapter 62-257, F.A.C., Asbestos Program
- Rule Chapter 62-302, F.A.C., Surface Water Quality Standards
- Code of Federal Regulations (C.F.R.)
- Florida Administrative Codes (F.A.C.)
- Chapters 20, 120, 215, 455, Florida Statutes (F.S.) – Florida Department of Business & Professional Regulations Rules
- Florida Department of Environmental Protection Rules
- FDOT Basis of Estimates Manual
- FDOT Computer Aided Design and Drafting (CADD) Manual
- FDOT Standard Plans
- FDOT Flexible Pavement Design Manual
- FDOT - Florida Roundabout Guide
- FDOT Handbook for Preparation of Specifications Package
- FDOT Standard Plans Instructions
- FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways (“Florida Greenbook”)
- FDOT Materials Manual
- FDOT Pavement Type Selection Manual
- FDOT Design Manual
- FDOT Procedures and Policies
- FDOT Procurement Procedure 001-375-030, Compensation for Consultant Travel Time on

- Professional Services Agreements
- FDOT Project Development and Environmental Manual
- FDOT Project Traffic Forecasting Handbook
- FDOT Public Involvement Handbook
- FDOT Rigid Pavement Design Manual
- FDOT Standard Specifications for Road and Bridge Construction
- FDOT Utility Accommodation Manual
- Manual on Speed Zoning for Highways, Roads, and Streets in Florida
- Federal Highway Administration (FHWA) - Manual on Uniform Traffic Control Devices (MUTCD)
- FHWA – National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide
- FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook
- Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 2005
- Florida Statutes (F.S.)
- Florida's Level of Service Standards and Guidelines Manual for Planning
- Model Guide Specifications – Asbestos Abatement and Management in Buildings, National Institute for Building Sciences (NIBS)
- Quality Assurance Guidelines
- Safety Standards
- Any special instructions from the DEPARTMENT
- Roadway
  - FDOT – Florida Intersection Design Guide
  - FDOT - Project Traffic Forecasting Handbook
  - FDOT - Quality/Level of Service Handbook
  - Florida's Level of Service Standards and Highway Capacity Analysis for the SHS
  - Transportation Research Board (TRB) - Highway Capacity Manual
- Permits
  - Chapter 373, F.S. – Water Resources
  - US Fish and Wildlife Service Endangered Species Programs
  - Florida Fish and Wildlife Conservation Commission Protected Wildlife Permits
  - Bridge Permit Application Guide, COMDTPUB P16591.3C
  - Building Permit
- Drainage
  - FDOT Drainage *Design Guide*
  - FDOT Drainage Manual
  - *Florida* Erosion and Sediment Control Manual
  - FDOT Drainage Connection Permit Handbook
  - FDOT Bridge Scour Manual
- Survey and Mapping
  - All applicable Florida Statutes and Administrative Codes
  - Applicable Rules, Guidelines Codes and authorities of other Municipal, County, State and Federal Agencies.
  - Florida Department of Transportation Surveying and Mapping Procedure Topic 550-030-101
  - Florida Department of Transportation Surveying and Mapping Handbook
  - Florida Department of Transportation Right of Way Procedures Manual
- Traffic Engineering and Operations and ITS
  - AASHTO - An Information Guide for Highway Lighting
  - AASHTO - Guide for Development of Bicycle Facilities

- FHWA Standard Highway Signs Manual
- FDOT Manual on Uniform Traffic Studies (MUTS)
- FDOT Median Handbook
- FDOT Traffic Engineering Manual
- National Electric Safety Code
- National Electrical Code
- Florida's Turnpike Enterprise
  - Florida's Turnpike **Design** Handbook (**TDH**)
  - Florida's Turnpike Lane Closure Policy
  - Florida's Turnpike Drainage Manual Supplement
  - Rigid Pavement Design Guide for Toll Locations with Electronic Toll Collection
  - Flexible Pavement Design Guide for Toll Locations with Electronic Toll Collection
  - Florida's Turnpike General Tolling Requirements (GTR)
  - Additional Florida's Turnpike Enterprise standards, guides, and policies for design and construction can be found on the FTE Design Website:  
*<https://floridasturnpike.com/business-opportunities/design>*
- Traffic Monitoring
  - American Institute of Steel Construction (AISC) Manual of Steel Construction, referred to as "AISC Specifications"
  - American National Standards Institute (ANSI) RP-8-00 Recommended Practice for Roadway Lighting
  - AASHTO AWS D1.1/ANSI Structural Welding Code – Steel
  - AASHTO D1.5/AWS D1.5 Bridge Welding Code
  - FHWA Traffic Detector Handbook
  - FDOT General Interest Roadway Data Procedure
  - FHWA Traffic Monitoring Guide
  - FDOT's Traffic/Polling Equipment Procedures
- Structures
  - AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims
  - AASHTO LRFD Movable Highway Bridge Design Specifications and Interims
  - AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and Interims.
  - AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code
  - AASHTO Guide Specifications for Structural Design of Sound Barriers
  - AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges
  - FDOT Bridge Load Rating Manual
  - FDOT Structures Manual
  - FDOT Structures Design Bulletins (available on FDOT Structures web site only)
- Geotechnical
  - FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications
  - Manual of Florida Sampling and Testing Methods
  - Soils and Foundation Handbook
- Landscape Architecture
  - Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants
- Architectural

- Building Codes
- Florida Building Code:
  - Building
  - Fuel Gas
  - Mechanical
  - Plumbing
  - Existing Building
- Florida Accessibility Code for Building Construction
- Rule Chapter 60D, F.A.C., Division of Building Construction
- Chapter 553, F.S. – Building Construction Standards
- ANSI A117.1 2003 Accessible and Usable Building and Facilities
- Titles II and III, Americans With Disabilities Act (ADA), Public Law 101-336; and the ADA Accessibility Guidelines (ADAAG)
- Architectural – Fire Codes and Rules
  - National Fire Protection Association (NFPA) - Life Safety Code
  - NFPA 70 - National Electrical Code
  - NFPA 101 - Life Safety Code
  - NFPA 10 - Standard for Portable Fire Extinguishers
  - NFPA 11 - Standard for Low-Expansion Foam Systems
  - NFPA 11A - Standard for High- and Medium-Expansion Foam Systems
  - NFPA 12 - Standard for Carbon Dioxide Extinguishing Systems
  - NFPA 13 - Installation of Sprinkler Systems
  - NFPA 30 - Flammable and Combustible Liquids Code
  - NFPA 54 - National Gas Fuel Code
  - NFPA 58 - LP-Gas Code
  - Florida Fire Prevention Code as adopted by the State Fire Marshal –  
Consult with the Florida State Fire Marshal’s office for other frequently used codes.
- Architectural – Extinguishing Systems
  - NFPA 10 - Fire Extinguishers
  - NFPA 13 - Sprinkler
  - NFPA 14 - Standpipe and Hose System
  - NFPA 17 - Dry Chemical
  - NFPA 20 - Centrifugal Fire Pump
  - NFPA 24 - Private Fire Service Mains
  - NFPA 200 - Standard on Clean Agent Fire Extinguishing Systems
- Architectural – Detection and Fire Alarm Systems
  - NFPA 70 - Electrical Code
  - NFPA 72 - Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems
  - NFPA 72E - Automatic Fire Detectors
  - NFPA 72G - Installation, Maintenance, and Use of Notification Appliances
  - NFPA 72H - Testing Procedures for Remote Station and Proprietary Systems
  - NFPA 74 - Household Fire Warning Equipment
  - NFPA 75 - Protection of Electronic Computer Equipment
- Architectural – Mechanical Systems
  - NFPA 90A - Air Conditioning and Ventilating Systems
  - NFPA 92A - Smoke Control Systems
  - NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
  - NFPA 204M - Smoke and Heating Venting

- Architectural – Miscellaneous Systems
  - NFPA 45 - Laboratories Using Chemicals
  - NFPA 80 - Fire Doors and Windows
  - NFPA 88A - Parking Structures
  - NFPA 105- Smoke and Draft-control Door Assemblies
  - NFPA 110 - Emergency and Standby Power Systems
  - NFPA 220 - Types of Building Construction
  - NFPA 241 - Safeguard Construction, Alteration, and Operations
  - Rule Chapter 69A-47, F.A.C., Uniform Fire Safety For Elevators
  - Rule Chapter 69A-51, F.A.C., Boiler Safety
- Architectural – Energy Conservation
  - Rule Chapter 60D-4, F.A.C., Rules For Construction and Leasing of State Buildings To Insure Energy Conservation
  - Section 255.255, F.S., Life-Cycle Costs
- Architectural – Elevators
  - Rule Chapter 61C-5, F.A.C., Florida Elevator Safety Code
  - ASME A-17.1, Safety Code for Elevators and Escalators
  - Architectural – Floodplain Management Criteria
  - Section 255.25, F.S., Approval Required Prior to Construction or Lease of Buildings
  - Rules of the Federal Emergency Management Agency (FEMA)
- Architectural – Other
  - Rule Chapter 64E-6, F.A.C., Standards for On Site Sewage Disposal Systems (Septic Tanks)
  - Rule Chapter 62-600, F.A.C., Domestic Wastewater Facilities
  - Rule Chapter 62-761, F.A.C., Underground Storage Tank Systems
  - American Concrete Institute
  - American Institute of Architects - Architect's Handbook of Professional Practice
  - American Society for Testing and Materials - ASTM Standards
  - Brick Institute of America
  - DMS - Standards for Design of State Facilities
  - Florida Concrete Products Association
  - FDOT – ADA/Accessibility Procedure
  - FDOT – Building Code Compliance Procedure
  - FDOT – Design Build Procurement and Administration
  - LEED (Leadership in Energy and Environmental Design) Green Building Rating System
  - National Concrete Masonry Association
  - National Electrical Code
  - Portland Cement Association - Concrete Masonry Handbook
  - United State Green Building Council (USGBC)

## **2.22 Services To Be Performed By The DEPARTMENT**

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

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

- All information that may come to the DEPARTMENT pertaining to future improvements.
- All future information that may come to the DEPARTMENT during the term of the CONSULTANT's Agreement, which in the opinion of the DEPARTMENT is necessary for the prosecution of the work.
- Available traffic and planning data.
- All approved utility relocations.
- Project utility certification to the DEPARTMENT's Central Office.
- Any necessary title searches.
- Engineering standards review services.
- All available information in the possession of the DEPARTMENT pertaining to utility companies whose facilities may be affected by the proposed construction.
- All future information that may come to the DEPARTMENT pertaining to subdivision plans so that the CONSULTANT may take advantage of additional areas that can be utilized as part of the existing right of way.
- Systems traffic for Projected Design Year, with K, D, and T factors.
- Previously constructed Highway Beautification or Landscape Construction Plans
- Landscape Opportunity Plan(s)
- Existing right of way maps.
- Existing cross slope data for all RRR projects.
- Existing pavement evaluation report for all RRR projects.
- PD&E Documents
- Design Reports
- Letters of authorization designating the CONSULTANT as an agent of the DEPARTMENT in accordance with F.S. 337.274.
- Phase reviews of plans and engineering documents.
- Regarding Environmental Permitting Services:
  - Approved Permit Document when available.
  - Approval of all contacts with environmental agencies.
  - General philosophies and guidelines of the DEPARTMENT to be used in the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the Project Manager.
- Appropriate signatures on application forms.

### 3 PROJECT COMMON AND PROJECT GENERAL TASKS

#### PROJECT COMMON TASKS

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

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

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

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

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

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

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

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

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

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

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

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

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

*shall prepare timely meeting minutes for attendee approval, so that all parties are aware of project expectations and limitations.*

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

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

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

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

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

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

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

The Independent Peer Review for design Phase Plans submittals shall ensure the plans **comply with** the **FDOT Design Manual**, Standard Plans and CADD Manual. The Constructability/Bidability Review shall ensure the project can be constructed and paid for as designed. Constructability/Bidability Reviews should be conducted prior to the Phase III and Phase IV submittals, using the Phase Review Checklist (Guidance Document 1-1-A) from the Construction Project Administration Manual (CPAM) as a minimum guideline.



The CONSULTANT shall submit this checklist, as well as the “marked-up” set of plans during this review, and review comments and comment responses from any previous Constructability/Bidability reviews. These items will be reviewed by District Design and District Construction.

Supervision: The CONSULTANT shall supervise all technical design activities.

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

### **Project General Tasks**

*See the Task Work Order Scope of Services for the following Section 3 subsections that apply to the assigned project.*

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

### **3.1 Public Involvement**

Public Involvement, *of which Community Awareness is a component*, includes communicating to all interested persons, groups, and government organizations information regarding the development of the project. The CONSULTANT shall provide to the DEPARTMENT drafts of all Public Involvement documents (i.e., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least **ten (10)** business days prior to printing and / or distribution.

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

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

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

*The project's initial Community Awareness Plan has been prepared by the DEPARTMENT and provided in the text of Section 2.1 of this Scope of Services. The CONSULTANT does not need to prepare the initial Plan, although the Plan shall be reviewed and updated periodically by the CONSULTANT throughout the life of the project as directed by the DEPARTMENT. The following Section 3.1 subsections cover*

*implementation of the Community Awareness Plan and other aspects of Public Involvement, including which entity is responsible for each such aspect.*

**3.1.2 Notifications – By the DEPARTMENT**

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

**3.1.3 Preparing Mailing Lists**

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

**3.1.4 Median Modification Letters**

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. *Upon approval by the DEPARTMENT*, the letters *shall* be sent on DEPARTMENT letterhead by the *DEPARTMENT or CONSULTANT*.

**3.1.5 Driveway Modification Letters**

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

**3.1.6 Newsletters**

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

**3.1.7 Renderings and Fly-Throughs**

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

**3.1.8 PowerPoint Presentations**

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

**3.1.9 Public Meeting Preparations**

The CONSULTANT shall prepare the necessary materials for use in public meetings. The CONSULTANT *shall* investigate potential meeting sites *in order* to advise the DEPARTMENT on their suitability. The *Task Work Order Scope of Services will indicate who will* pay all costs for meeting site rents and insurance. No DEPARTMENT meetings *shall* be held on public school system properties.

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

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

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

*The estimated number of public meetings during the design will be specified in the Task Work Order Scope of Services.*

### **3.1.11 Other Agency Meetings**

In addition to scheduled public meetings, the CONSULTANT may be required to participate in meetings with *the* local governing authorities and/or Metropolitan Planning Organization (MPO). The CONSULTANT's participation may include, but not be limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file. *The estimated number of meetings during the design will be specified in the Task Work Order Scope of Services.*

### **3.1.12 Web Site**

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

## **3.2 Joint Project Agreements**

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

## **3.3 Specifications & Estimates**

### **3.3.1 Specifications Package Preparation**

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

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

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

### 3.3.2 Estimated Quantities Report Preparation

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

### 3.4 Contract Maintenance and Project Documentation

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

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

The design for *the* project *may* be subjected to a Value Engineering (VE) review. The VE review will be conducted by a multi-disciplined independent team of DEPARTMENT and CONSULTANT personnel for the purpose of the improving the value of the project.

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

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

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

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

The CONSULTANT Project Manager and other key members of the design team shall meet with the VE team to explain the development of design features and how and why they were selected. The information *shall* be provided in the form of a personal verbal presentation and the submittal of a package containing current plans and other documentation. This presentation *shall* 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 is not limited to the following:

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

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

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

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

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

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

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

### **3.7 Plans Update**

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

### **3.8 Post Design Services**

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

### **3.9 Digital Delivery**

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

### **3.10 Risk Assessment Workshop**

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

#### **3.11.1 Aeronautical Evaluation**

The CONSULTANT shall be responsible for complying with the requirements of Title 14 of the Code of Federal Regulations Part 77 (14 CFR Part 77), and for determining whether it is necessary to file any Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the Federal Aviation administration (FAA), utilizing the FAA Notice Criteria Tool. Place a copy of all pertinent documentation in the Project Documentation folder structure, such as Notice Criteria Tool inquires and responses, FAA Form 7460-1 filed with the FAA, Letter of Determination, any records demonstrating compliance with the conditions and deadlines, etc. Report any Letters of

Determination designated other than “Does Not Exceed” to the Airspace and Land Use Manager of the Central Office Aviation Office. *All such CONSULTANT correspondence with the FAA or Central Office shall be coordinated in advance with the DEPARTMENT’s District Aviation Office.*

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

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

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

*The CONSULTANT may be authorized to perform, support or assist with activities related to contract procurement for Design-Build projects and other alternative project delivery methods, including all activities incidental thereto. Such activities may include, but are not limited to, assessing project feasibility; reviewing, preparing and coordinating the development of a Request-For-Proposal (RFP) and the addendums thereto; preparing and collecting RFP attachments and reference documents; preparing advertisement text; preparing Conceptual Design Plans; processing Alternative Technical Concepts (ATC’s); developing project cost estimates; working with Design Variation and Exception issues; processing Bid Questions and Answers; reviewing and commenting on Technical Proposals; obtaining approvals from the Federal Highway Administration (FHWA) and the Department’s State Construction Office; and attending and assisting with related meetings, including ATC Meetings, Page-Turn Meetings, Technical Review Committee Meetings, Pre-Proposal Meetings, Industry Forums and Procurement Status Meetings.*

*If the CONSULTANT participates in the preparation of a project’s RFP, the CONSULTANT is not allowed to propose as a prime consultant or subconsultant for any of the services described therein.*

## **4 ROADWAY ANALYSIS**

*See the Task Work Order Scope of Services for the following Section 4 subsections that apply to the assigned project.*

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

### **4.1 Typical Section Package**

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

### **4.2 Pavement Type Selection Report**

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 FDOT Design at the time the pavement is designed to warrant reconsideration. A letter to the Project Design File documenting the pavement type decision is required, even if no report is *prepared*.

### **4.3 Pavement Design Package**

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

#### 4.4 Cross-Slope Correction

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

#### 4.5 Horizontal/Vertical Master Design Files

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

#### 4.6 Access Management

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

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

#### 4.7 Roundabout Evaluation

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

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

The CONSULTANT shall perform a **Roundabout Benefit/Cost** (B/C) Evaluation comparing a roundabout with a traditional intersection (stop controlled or signal controlled). The B/C analysis *shall* consider 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. *The* roundabout geometric and operational analysis *shall* be documented in a preliminary report *to include* data collection, conceptual layout, crash analysis, traffic counts, traffic forecast, and future design and opening year analysis.

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

#### 4.8 Roundabout Final Design Analysis

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

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

#### 4.9 Cross Section Design Files

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

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

#### 4.10 Temporary Traffic Control (TTCP) Analysis

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

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

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

The CONSULTANT shall consider the local impact of any lane closures or alternate routes. When the need to close a road is identified during this analysis, the CONSULTANT shall notify the DEPARTMENT's Project Manager as soon as possible. Proposed road closings must be reviewed and approved by the DEPARTMENT. Diligence shall be used to minimize negative impacts by appropriate specifications, recommendations or plans development. Local impacts to consider *shall include emergency vehicle response time*, local events, holidays, peak seasons, detour route deterioration, *transit agency routes and features*, and other eventualities. The CONSULTANT shall be responsible *for* obtaining the local authorities' permission for use of detour routes not on state highways. *Affected transit agencies shall be notified in advance about bus route lane closures and detours via the DEPARTMENT. The DEPARTMENT's Construction Services Unit will provide the lane closure calculations to the CONSULTANT.*

#### 4.11 Master TTCP Design Files



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

#### **4.12 Selective Clearing and Grubbing**

##### **a. Selective Clearing and Grubbing of Existing Vegetation Field Assessment**

The CONSULTANT shall review information from the DEPARTMENT and conduct a project field assessments(s) of existing vegetation. At least one field assessment visit is to be attended by the District Landscape Architect. The Result of the Field Assessments(s) will determine the course of action for Selective Clearing and Grubbing and the extent of the Vegetation Survey under Task 2.10.

##### **b. Selective Clearing and Grubbing Site Inventory Analysis of Existing Vegetation and Cross-Discipline Coordination**

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

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

##### **c. Selective Clearing and Grubbing- Existing Vegetation Maintenance Report**

The CONSULTANT *shall* include in the plan's 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 tree 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 Plans**

*The* CONSULTANT *shall* prepare a Tree Disposition Plan outlining the requirements for the relocation and protection of trees located within the project boundaries, *and* utilize the information collected from the Vegetation Survey and under *Section 4.12* for Selective Clearing and Grubbing.

#### **4.14 Design Variations and Exceptions**

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

#### **4.15 Design Report**

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

#### **4.16 Quantities for EQ Report**

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

**4.17 Cost Estimate**

**4.18 Technical Special Provisions and Modified Special Provisions**

**4.19 Other Roadway Analyses**

*All existing driveways shall be analyzed for conformance with Standard Index 515. The findings shall be summarized in a driveway matrix to be submitted to the DEPARTMENT for concurrence.*

*Multi Line .gen files shall be provided for the following features, for projects with cross sections and earthwork, and no 3D deliverables:*

- 1) Existing Ground*
- 2) Bottom of Proposed Roadway Template*
- 3) Top of Proposed Subsoil Limits\**
- 4) Bottom of Proposed Subsoil Limits\**

*\*Substituted for any other measured earthwork lines such as Channel Excavation.*

**4.20 Field Reviews**

**4.21 Monitor Existing Structures**

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

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**

*See the Task Work Order Scope of Services for the following Section 5 subsections that apply to the assigned project.*

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

**5.1 Key Sheet**

**5.2 Typical Section Sheets**

5.2.1 Typical Sections

5.2.2 Typical Section Details

**5.3 General Notes/Pay Item Notes**

**5.4 Project Layout**

**5.5 Plan/Profile Sheet**

**5.6 Profile Sheet**

**5.7 Plan Sheet**

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

**5.8 Special Profile**

**5.9 Back-of-Sidewalk Profile Sheet**

**5.10 Interchange Layout Sheet**

**5.11 Ramp Terminal Details (Plan View)**

**5.12 Intersection Layout Details**

**5.13 Special Details**

*For projects with required right-of-way acquisition, the CONSULTANT shall provide a set of visual aid maps. These maps shall provide a clean and clear view of the DEPARTMENT's intentions for the Project's development. The following map features are required: Baseline/Centerline call-out with bearing and curve information; Begin and End Project with stations; North arrow and scale/ratio; label existing and proposed right-of-way with station and offset; labeling of existing and proposed sidewalks (if applicable), existing and proposed driveways, proposed curb and gutter (Urban) or shoulders (Rural), proposed traffic separators (if applicable), directional arrows for each travel lane; shading of all property takings/impacts and labeled by parcel ID; legend for proposed design indicated in red; existing features in black; property lines in magenta; and a "FOR VISUAL AID ONLY" stamp on each sheet.*

*The CONSULTANT shall furnish a minimum of one set of prints for the Phase II review. Two sets shall be required for the Phase IV submittal. At each submittal the CONSULTANT shall submit the CADD design files in Micro Station format in a medium acceptable to the DEPARTMENT.*

**5.14 Cross-Section Pattern Sheet(s)**

**5.15 Roadway Soil Survey Sheet(s)**

**5.16 Cross Sections**

**5.17 Temporary Traffic Control Plan Sheets**

**5.18 Temporary Traffic Control Cross Section Sheets**

**5.19 Temporary Traffic Control Detail Sheets**

**5.20 Utility Adjustment Sheets**

**5.21 Selective Clearing and Grubbing Sheet(s)**

5.21.1 Selective Clearing and Grubbing

5.21.2 Selective Clearing and Grubbing Details

**5.22 Tree Disposition Plan Sheet(s)**

5.22.1 Tree Disposition Plan Sheet(s)

Tree Disposition Plan Sheets *shall* be signed and sealed drawings showing the location and vertical/horizontal landscape design of the vegetation to be relocated. The Tree Disposition Plans *shall* be produced at the scale of the roadway drawings or at a scale that best depicts the information. Interchange and details *shall* be shown at no larger than a 1"=50' scale.

5.22.2 Tree Disposition Plan Tables and Schedules

**5.23 Project Control Sheets**

**5.24 Environmental Detail Sheets**

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

**5.25 Utility Verification Sheet(s) (SUE Data)**

**5.26 Quality Assurance/Quality Control**

**5.27 Supervision**

**6a DRAINAGE ANALYSIS**

*See the Task Work Order Scope of Services for the following Section 6a subsections that apply to the assigned project.*

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

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

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

**6a.1 Drainage Map Hydrology**

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

**6a.2 Base Clearance Calculations**

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

**6a.3 Pond Siting Analysis and Report**

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

*The Pond Siting Report is formally known and submitted as the "Stormwater Management Facility (SMF) & Floodplain Compensation (FPC) Site Alternatives Report" (hereinafter referred to as the "Report").*

*The CONSULTANT shall follow the DEPARTMENT's process in developing alternative SMF & FPC sites. The CONSULTANT shall include this work effort and its component activities in the Project Schedule as "Key Milestones."*

*In coordination with the DEPARTMENT Project Manager, the CONSULTANT shall schedule and conduct two (2) SMF and/or FPC Siting Alternative Meetings with the DEPARTMENT's interdisciplinary multi-functional team (the SMF & FPC Siting Team), hereinafter referred to as the "Team". The first meeting will be the SMF & FPC Siting Long List Meeting and shall be held no earlier than 15 business days after the Task Work Order authorization and no later than 60 business days after the same. The second meeting will be the SMF & FPC Siting Short List Meeting and shall be held within 120 business days after the NTP.*

*The Team shall consist of the CONSULTANT and DEPARTMENT representatives from the following sections: Drainage & Environmental Permitting, Right-of-way, Project Management, Maintenance, Landscaping, Legal, Planning and Environmental and the Court Engineer. Depending on other project specific issues, the CONSULTANT and the Project Manager may invite additional DEPARTMENT sections as deemed appropriate.*

*At the first meeting and based on preliminary data collection, field reviews and Environmental Look Arouds (ELA-regional stormwater approach), the CONSULTANT shall discuss sites which appear to be appropriate for a SMF and/or FPC facilities. Furthermore, the CONSULTANT shall include maintenance access, if not on FDOT right-of-way. This meeting requires the CONSULTANT to prepare roll plots containing R/W and property lines, and an aerial background.*

*The DEPARTMENT may also identify additional sites for consideration. Any alternative PD&E SMF and/or FPC sites shall also be considered, and if not utilized, shall be documented as to why it has been superseded by a different site or location. Sites differing from the approved PD&E preferred alternatives may require a PD&E Reevaluation and shall be coordinated with the DEPARTMENT's Project Manager. All of the sites discussed, including those deemed not viable, shall be documented in the Report, with narratives and exhibits showing why the sites are not viable.*

*As a result of the first meeting, the CONSULTANT shall review all of the alternatives discussed and develop three (3) recommended SMF and/or FPC sites per basin or combination of basins, and conduct the second meeting.*

*At the second meeting, the CONSULTANT shall present the three (3) recommended alternatives per basin or combination of basins utilizing the same presentation requirements as for the first meeting. At the conclusion of the meeting, the Team shall provide the CONSULTANT with the final three (3) alternatives per basin or combination of basins to be fully analyzed.*

*The CONSULTANT shall fully analyze the final three (3) alternatives for the following factors. The CONSULTANT shall develop and include these factors in a checklist with accompanying comments as applicable. The checklist shall be submitted with the first draft Report.*

- |  |  |
|--|--|
| • Safety   | • Roadway low edge of pavement               |
| • Right-of-way costs, including easements                  | • Floodplain impacts/mitigation              |
| • Long-term corridor                                       | • Existing land use                          |
| • Environmental factors                                    | • Water quality requirements                 |
| • Available FDOT right-of-way                              | • Existing permits                           |
| • Number of parcels impacted                               | • Public opinion                             |
| • Partial or whole parcel take                             | • Aesthetics                                 |
| • Wetlands   | • Landscaping                                |
| • Archaeological/historical sites                          | • Hazardous/contaminated materials           |
| • Threatened and endangered species                        | • Long-term maintenance costs                |
| • Water supply wells                                       | • Construction costs                         |
| • Septic Systems   | • Ground topography                          |
| • Utility locations  | • Section 4(f) properties                    |
| ▪ Existing to remain                                       | • Federally-owned properties                 |
| ▪ Relocations  | • Cemeteries                                 |
| • Conveyance impacts to existing utilities                 | • Highly complex sites (atypical properties) |
| • Access impact to other parcels                           | • Railroads and airports                     |
| • Constructability   | • Sidewalks and trails                       |
| • Geotechnical factors (SHWL, permeability, seepage, etc.) | • Other project-specific issues              |

*The CONSULTANT shall submit the first draft Report concurrently with the Phase I plans submittal. It shall be a standalone document with its own ERC Submittal Distribution Form identified under Item 18 (Other "SMF & FPC, Site Alternatives Report"). The ERC distribution shall consist of the Team for review and comment. Without prior approval from the District Drainage Engineer, a Phase I plans submittal without a concurrent first draft Report submittal shall be deemed incomplete and will be rejected by the DEPARTMENT without being reviewed. At the discretion of the DEPARTMENT, no extensions of the project's subsequent schedule milestones will be granted to accommodate such an unapproved delay and any plans revisions resulting therefrom shall be prepared by the CONSULTANT without additional compensation.*

*The CONSULTANT shall address all of the DEPARTMENT's first draft review comments and upon acceptance of the comment responses shall incorporate the applicable comments into the*

*development of the second draft Report. The second draft of the Report shall be submitted within 60 business days after the Phase I plans submittal date utilizing ERC and following the same submittal process as for the first draft submittal. Furthermore, the CONSULTANT shall, at a minimum, include the same reviewers who provided comments on the first draft.*

*The CONSULTANT shall respond to the second draft ERC review comments and incorporate the accepted responses, as applicable, into the final draft Report. The CONSULTANT shall submit the final draft Report utilizing ERC and following the same submittal process as for the previous submittals. The final draft Report shall include an itemized and detailed listing of the changes from the second draft, particularly right-of-way changes.*

*Upon the DEPARTMENT's acceptance of the final draft Report, the CONSULTANT shall submit a signed and sealed PDF of the accepted Report for documentation, along with an itemized and detailed listing of the changes from the second and final drafts, particularly right-of-way changes. The submittal shall include one (1) electronic file in PDF format. The CONSULTANT shall then proceed with the Phase II drainage design based on the preferred SMF and/or FPC sites.*

*The Report is not considered completed or finalized and is subject to change until all right-of-way has been acquired for the Stormwater Management Facility and/or Floodplain Compensation Site. Any addendums or revisions beyond the signed and sealed report shall be approved by the DEPARTMENT.*

**6a.4 Design of Cross Drains**

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

**6a.5 Design of Ditches**

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

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

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

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

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

**6a.8 Design of Floodplain Compensation**

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

**6a.9 Design of Storm Drains**

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

**6a.10 Optional Culvert Material**

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

**6a.11 French Drain Systems**

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

**6a.11a Existing French Drain Systems**

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

**6a.12 Drainage Wells**

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

**6a.13 Drainage Design Documentation Report**

Compile drainage design documentation into report format. Include documentation for all the drainage design tasks and associated meetings and decisions, except for stand-alone reports, such as the Pond Siting Analysis Report and Bridge Hydraulics Report. *The report shall include in an appendix a copy of the project scope, negotiated staff-hours and the Long Range Estimate (LRE).*

**6a.14 Bridge Hydraulic Report**

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

**6a.15 Temporary Drainage Analysis**

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

**6a.16 Quantities for EQ Report**

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

**6a.17 Cost Estimate**

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

**6a.18 Technical Special Provisions / Modified Special Provisions**

**6a.19 Hydroplaning Analysis**



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

**6a.20 Existing Permit Analysis**

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

**6a.21 Other Drainage Analysis**

**6a.22 Noise Barrier Evaluation**

**6a.23 Field Reviews**

**6a.24 Technical Meetings**

**6a.25 Environmental Look-Around Meetings**

**6a.26 Quality Assurance/Quality Control**

**6a.27 Independent Peer Review**

**6a.28 Supervision**

**6a.29 Coordination**

**6b DRAINAGE PLANS**

*See the Task Work Order Scope of Services for the following Section 6b subsections that apply to the assigned project.*

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

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

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

**6b.3 Drainage Structures**

**6b.4 Lateral Ditch Plan/Profile**

**6b.5 Lateral Ditch Cross Sections**

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

**6b.7 Retention Pond Cross Sections**

**6b.8 Erosion Control Plan Sheet(s)**

*If applicable, the scope and staff-hours for this activity shall be covered under Section 8.4.*

**6b.9 SWPPP Sheet(s)**

*If applicable, the scope and staff-hours for this activity shall be covered under Section 8.4.*

**6b.10 Quality Assurance/Quality Control**

**6b.11 Supervision**

**7 UTILITIES**

*See the Task Work Order Scope of Services for the following Section 7 subsections that apply to the assigned project.*

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

**7.1 Kickoff Meeting**

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

**7.2 Identify Existing UAO(s)**

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

**7.3 Make Utility Contacts**

First Contact: The CONSULTANT shall send letters and **an electronic set of plans (both pdf and dgn files)**, to each utility. **Hard copies of plans shall be sent upon request of a utility.** Includes contact by phone for meeting coordination. Request type, size, location, easements, and cost for relocation if reimbursement is claimed. Request the voltage level for power lines in the project area. Send **the** UAO requests for reimbursement to the **DEPARTMENT** for a legal opinion. Include the meeting schedule (if applicable) and the design schedule. Include **a** typical meeting agenda. If scheduling a meeting, give four weeks advance notice.

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

Pre-Phase III Utility Conflict Resolution/Constructability Meeting: [Only for multi-lane reconstruction or highly complex projects]: At a minimum of four weeks prior to the meeting, the CONSULTANT shall transmit an electronic set (both pdf and dgn files) of the Pre-Phase III plans, List of Plan Changes since previous contact and the Utility Conflict Matrix to each UAO having facilities located within the project limits. Hard copies of plans shall be sent upon request of a utility.

Third Contact: Identify agreements and assemble packages. At a minimum of four weeks prior to the meeting, the CONSULTANT shall transmit an electronic set (both pdf and dgn files) of **the** Phase III plans, agreements, List of Plan Changes since previous contact and the Utility Conflict

Matrix to each UAO having facilities located within the project limits. Hard copies of plans shall be sent upon request of a utility.

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

Not all projects will have all contacts as described above.

#### **7.4 Exception Processing**

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

#### **7.5 Preliminary Utility Meeting**

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

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

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

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

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

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

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

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

The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s). The CONSULTANT shall be prepared to discuss impacts to existing trees/vegetation and proposed landscape, drainage, traffic signalization, temporary traffic control plans (TTCP) (construction phasing), review the current design schedule and letting date,

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

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

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

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

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

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

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

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

The CONSULTANT shall provide additional utility services. Additional services will be determined when the services are required and requested

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

This includes coordination of utility design effort between the DEPARTMENT and the UAO(s). The CONSULTANT shall conduct additional coordination meetings, prepare and process the agreements, review tabulation of quantities, perform UWHC constructability and bidability review, review pay items, cost estimates and Technical Special Provisions (TSP) or Modified Special Provision (MSP) prepared by the UAO. This does not include utility the utility design effort.

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

If requested by the District:

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

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

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

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

OR

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

OR

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

#### **7.17 Other Utilities**

The CONSULTANT 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**

*See the Task Work Order Scope of Services for the following Section 8 subsections that apply to the assigned project.*

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

#### **8.1 Preliminary Project Research**

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

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

#### **8.2 Field Work**

### 8.2.1 Pond Site Alternatives

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

### 8.2.2 Establish Wetland Jurisdictional Lines and Assessments

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

- Determine landward extent of wetlands and other surface waters as defined in Rule Chapter 62-340, F.A.C. as ratified in Section 373.4211, F.S.; United States Army Corps of Engineers (USACE) Wetland Delineation Manual (Technical Report Y-87-1); Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (ERD/EL TR-10-20).
- Collect all data and information necessary to determine the jurisdictional boundaries of wetlands and other surface waters as defined by the rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Set seasonal high water levels in adjacent wetlands with biological indicators
- Obtain a jurisdictional determination as defined by rules or regulations of each permitting agency processing a DEPARTMENT permit application for the project.
- Prepare aerial maps showing the jurisdictional boundaries of wetlands and other surface waters. Aerial maps shall be reproducible, of a scale no greater than 1"= 400' or more detailed and be recent photography. The maps shall show the jurisdictional boundaries of each agency. Photo copies of aerials are not acceptable. When necessary, a wetland-specific survey *shall* be prepared by a registered surveyor and mapper. All surveyed jurisdictional boundaries shall be tied to the project's baseline of survey.
- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form, which includes the ID number for each wetland (and other surface water, if necessary) impacted, size of wetland to be impacted, type of impact and identification of any wetland (by ID number and size) within the project limits that will not be impacted by the project.
- Prepare appropriate agency forms to obtain required permits. Forms may include, but are not limited to, the USACE "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; the Uniform Mitigation Assessment Method forms; and/or project specific data forms.

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

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

### 8.2.3 Species Surveys

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

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

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

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

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

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

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

Local Permits: ***See Task Work Order scope of services.***

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

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

##### **8.4.2 Prepare Species Permit Applications**

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

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

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

**8.4.4 Storm Water Pollution Prevention Plan (SWPPP)**

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

**8.4.5 Prepare Wetland Protection Plan**

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

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

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

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

**8.6 Prepare USCG Permit Application**

**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 for the Florida Department of Environmental Protection (FDEP). Legal advertisements shall be published one time in a newspaper that meets the notification requirements of the FDEP.

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

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

**8.10 Compensatory Mitigation Plan**

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

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



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

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

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

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

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

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

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

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

#### **8.12 Other Environmental Permits**

#### **Environmental Clearances, Reevaluations and Technical Support**

#### **8.13 Technical Support To The Department For Environmental Clearances and Re-evaluations**

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

**8.13.1 NEPA or SEIR Reevaluation:** During the development of the final design plans, the CONSULTANT shall be responsible for coordinating with the District Project Manager to provide necessary engineering information required in the preparation of the re-evaluation by the DEPARTMENT. The preparation of all environmental re-evaluations includes those listed in Part

1, Chapter 13 of the DEPARTMENT's PD&E Manual: Right of Way, Design Change, and Construction Advertisement.

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

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

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

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

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

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

#### **8.14 Preparation of Environmental Clearances and Re-evaluations**

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

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

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

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

**8.14.4 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.

**8.14.5 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.

#### **8.15 Contamination Impact Analysis**

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

The DEPARTMENT will provide Level II assessment services. If contamination is identified within the limits of construction, the CONSULTANT shall coordinate with the District Contamination Impact Coordinator to properly mark identified contamination areas in the plans and develop specifications as appropriate.

#### **8.16 Asbestos Survey**

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

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

#### **8.17 Technical Meetings**

#### **8.18 Quality Assurance/Quality Control**

#### **8.19 Supervision**

#### **8.20 Coordination**

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

*See the Task Work Order Scope of Services for the following Section 9 subsections that apply to the assigned project.*

The CONSULTANT shall analyze, design and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.21, Provisions for Work. Individual tasks identified in Sections 9 through 18 are defined in the Staff Hour Estimation Handbook and within the provision defined in Section 2.21, Provisions for Work. Contract documents shall display economical solutions for the given conditions *and be of such quality that they may be reproduced and used by the DEPARTMENT as bid documents for construction.*

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

- 9.1 Key Sheet and Index of Drawings**
- 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 *Quantities for EQ Report***
- 9.9 Cost Estimate**
- 9.10 Technical Special Provisions and Modified Special Provisions**
- 9.11 Field Reviews**
- 9.12 Technical Meetings**
- 9.13 Quality Assurance/Quality Control**
- 9.14 Independent Peer Review**
- 9.15 Supervision**
- 9.16 Coordination**

## **10 STRUCTURES – BRIDGE DEVELOPMENT REPORT**

*See the Task Work Order Scope of Services for the following Section 10 subsections that apply to the assigned project.*

### **General Requirements**

- 10.1 Bridge Geometry**
- 10.2 Ship Impact Data Collection**
- 10.3 Ship Impact Criteria**

### **Superstructure Alternatives**

- 10.4 Short Span Concrete**
- 10.5 Medium-Span Concrete**
- 10.6 Long Span Concrete**
- 10.7 Structural Steel**

**Foundation and Substructure Alternatives**

- 10.8 Pier/Bent**
- 10.9 Shallow Foundations/GRS Abutments**
- 10.10 Deep Foundations**

**Movable Span**

- 10.11 Data Collection and Design Criteria**
- 10.12 Movable Span Geometrics and Clearances**
- 10.13 Deck System Evaluation**
- 10.14 Framing Plan Development**
- 10.15 Main Girder Preliminary Design**
- 10.16 Conceptual Span Balance/Counterweight**
- 10.17 Support System Development**
- 10.18 Drive Power Calculations**
- 10.19 Drive System Development**
- 10.20 Power and Control Development**
- 10.21 Conceptual Pier Design**
- 10.22 Foundation Analysis (FL PIER)**
- 10.23 Tender Visibility Study**

**Other BDR Issues**

- 10.24 Aesthetics**
- 10.25 TTCP/Staged Construction Requirements**
- 10.26 Constructability Requirements**
- 10.27 Load Rating For Damaged/Widened Structures**
- 10.28 Quantity and Cost Estimates**

**10.29 Quantity and Cost Estimates – Movable Span**

**10.30 Wall Type Justification**

**Report Preparation**

**10.31 Exhibits**

**10.32 Exhibits – Movable Span**

**10.33 Report Preparation**

**10.34 Report Preparation – Movable Span**

**10.35 BDR Submittal Package**

**Preliminary Plans**

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

**11 STRUCTURES – TEMPORARY BRIDGE**

*See the Task Work Order Scope of Services for the following Section 11 subsections that apply to the assigned project.*

**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**

*See the Task Work Order Scope of Services for the following Section 12 subsections that apply to the assigned project.*

**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**

*See the Task Work Order Scope of Services for the following Section 13 subsections that apply to the assigned project.*

**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 List**

**Continuous Concrete Girder Design**

**13.32 Section Properties**

**13.33 Material Properties**

**13.34 Construction Sequence**

**13.35 Tendon Layouts**

**13.36 Live Load Analysis**

**13.37 Temperature Gradient**

**13.38 Time Dependent Analysis**

- 13.39 Stress Summary
- 13.40 Ultimate Moments
- 13.41 Ultimate Shear
- 13.42 Construction Loading
- 13.43 Framing Plan
- 13.44 Girder Elevation, Including Grouting Plan and Vent Locations
- 13.45 Girder Details
- 13.46 Erection Sequence
- 13.47 Splice Details
- 13.48 Girder Deflections and Camber

**Simple Span Concrete Design**

- 13.49 Prestressed Beam
- 13.50 Prestressed Beam Schedules
- 13.51 Framing Plan

**Beam Stability**

- 13.52 Beam/Girder Stability

**Bearing**

- 13.53 Bearing Pad and Bearing Plate Design
- 13.54 Bearing Pad and Bearing Plate Details

**Load Rating**

- 13.55 Load Ratings

**14 STRUCTURES – STRUCTURAL STEEL BRIDGE**

*See the Task Work Order Scope of Services for the following Section 14 subsections that apply to the assigned project.*

**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 List**

**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**

**15 STRUCTURES – SEGMENTAL CONCRETE BRIDGE**

*See the Task Work Order Scope of Services for the following Section 15 subsections that apply to the assigned project.*

**General Layout Design and Plans**

- 15.1 Final Bridge Geometry**
- 15.2 Casting Geometry Calculation**
- 15.3 Finish Grade Geometry Calculation**
- 15.4 Finish Grade Elevations**
- 15.5 Construction Schedule**
- 15.6 General Plan and Elevation**
- 15.7 Approach Slab Plan and Details**
- 15.8 Miscellaneous Details**
- 15.9 Existing Bridge Plans**

**End Bent Design and Plans**

- 15.10 End Bent Geometry**
- 15.11 Wingwall Geometry and Design**
- 15.12 End Bent Structural Design**

**15.13 End Bent Plan and Elevation**

**15.14 End Bent Details**

**Pier Design and Plans**

**15.15 Pier Geometry**

**15.16 Pier Stability Analysis**

**15.17 Pier Construction Loads**

**15.18 Pier Structural Design**

**15.19 Pier Plan and Elevation**

**15.20 Pier Details**

**Miscellaneous Substructure Design and Plans**

**15.21 Foundation Layout**

**Longitudinal Analysis**

**15.22 Section Properties**

**15.23 Material Properties**

**15.24 Superimposed Dead Loads**

**15.25 Construction Sequence**

**15.26 Tendon Layouts**

**15.27 Live Load Analysis**

**15.28 Temperature Gradient**

**15.29 Time Dependent Analysis**

**15.30 Stress Summary**

**15.31 Ultimate Moments**

**15.32 Ultimate Shear**

**15.33 Construction Loading**

**Transverse Analysis**

**15.34 Time Dependent Analysis**

**15.35 Live Load Analysis**

**15.36 Temperature Gradient**

**15.37 Stress Summary**

**15.38 Ultimate Moments**

**15.39 Construction Loading**

**Superstructure Design**

**15.40 Typical Segment**

**15.41 Pier Segment**

**15.42 Expansion Joint Segment**

**15.43 Blister Details**

**15.44 Deviator Blocks**

**15.45 Bearings**

**15.46 Expansion Joints**

**15.47 Special Analysis**

**Superstructure Plans**

**15.48 Typical Sections**

**15.49 Finish Grade Elevations**

**15.50 Segment Layout / Designations**

**15.51 Typical Segments**

**15.52 Variable Depth Segments**

**15.53 Pier Segments**

**15.54 Expansion Joint Segments**

**15.55 CIP Closure Joint Details**

**15.56 Casting Geometry**

**15.57 Integrated 3-D Drawings**

**Post-Tensioning Details**

**15.58 Bulkhead Details**

**15.59 Transverse Tendon Layout**

**15.60 Longitudinal Tendon Layout**

**15.61 Temporary Post-Tensioning**

**15.62 Quantities and Stressing Schedule**

**15.63 Future Post-Tensioning**

**15.64 Anchorage Blisters**

**15.65 Deviation Blocks**

**15.66 PT Grouting Plan Details**

**Miscellaneous Details**

**15.67 Erection Sequence and Details**

**15.68 Access Opening Details**

**15.69 Bearings**

**15.70 Expansion Joints**

**15.71 Vermin Screen Details**

**15.72 Railing Details**

**15.73 Lighting and Luminaries**

**15.74 Architectural Details**

**15.75 Special Systems**

**Reinforcing Bar Lists**

**15.76 Preparation of Reinforcing Bar Lists**

**Load Rating**

**15.77 Load Rating (LRFR)**

**16 STRUCTURES – MOVABLE SPAN**

*See the Task Work Order Scope of Services for the following Section 16 subsections that apply to the assigned project.*

**Final Design Bascule Pier**

**16.1 Pier Deck**

**16.2 Leaf/Pier Clearance Diagrams**

**16.3 Load Shoe Columns**

**16.4 Trunnion Columns**

**16.5 Foundations**

**16.6 Footing**



- 16.7 Seal**
- 16.8 Back Wall (Approach Span Bearings) - Closed Piers Only**
- 16.9 Bascule Pier Deck Elevations**

**Bascule Pier Dimensions – Detailing**

- 16.10 Pier Plan Views**
- 16.11 Pier Elevations Views**
- 16.12 Pier Sections**

**Bascule Pier Reinforcing Details**

- 16.13 Pier Reinforcing**

**Bascule Pier Miscellaneous Details**

- 16.14 Pier Barrier Details**
- 16.15 Stair Details**
- 16.16 Handrail Details**
- 16.17 Ladder and Hatch Details**
- 16.18 Pier Equipment**
- 16.19 Bascule Pier Notes and Summary of Quantities**
- 16.20 Miscellaneous Details**

**Bascule Leaf Design**

- 16.21 Deck Design**
- 16.22 Sidewalk Design**
- 16.23 Stringer Design**
- 16.24 Typical Floorbeam Design**
- 16.25 End Floorbeam Design**
- 16.26 Deep Floorbeam Design**
- 16.27 Sidewalk Bracket Design**
- 16.28 Roadway Bracket Design**
- 16.29 Main Girder Influence Lines**
- 16.30 Main Girder Design**

- 16.31 Trunnion Girder Design**
- 16.32 Main Girder Camber Data**
- 16.33 Leaf Lateral Bracing Design**
- 16.34 Counterweight Design**
- 16.35 Live Load Shoe Design**
- 16.36 Barrier Design**
- 16.37 Deck Elevations**
- 16.38 Balance Calculations**
- Bascule Leaf Detailing**
- 16.39 Bascule GP&E**
- 16.40 Bascule Leaf Notes**
- 16.41 Framing Plan**
- 16.42 Flooring Plan and Details**
- 16.43 Typical Section and Finish Grade Elevations**
- 16.44 Girder Elevation**
- 16.45 Girder Details**
- 16.46 Camber Layout**
- 16.47 Floor Beams**
- 16.48 Counterweight Girder/Box**
- 16.49 Trunnion Girder**
- 16.50 Cylinder Girder**
- 16.51 Lateral Bracing Details**
- 16.52 Counterweight Bracing Details**
- 16.53 Joint Details**
- 16.54 Traffic Barrier Details**
- 16.55 Pedestrian Rail and Support Details**
- 16.56 Curb and Sidewalk Details**
- 16.57 Barrier and Sidewalk Bracket Details**

**16.58 Counterweight Details**

**16.59 Stress Table or Influence Lines**

**Mechanical Design**

**16.60 Final Power Requirements**

**16.61 Trunnion Assembly**

**16.62 Span Locks**

**16.63 Sump Pumps**

**Mechanical Drive Design**

**16.64 Drive Shafts, Couplings, Keys, Bearings and Supports**

**16.65 Rack and Pinion, Bearings and Supports**

**16.66 Drive Train**

**16.67 Motor Brakes and Machinery Brakes**

**Hydraulic Drive Design**

**16.68 Hydraulic Drive**

**Machinery Detailing**

**16.69 Machinery Layout**

**16.70 Machinery Elevation**

**16.71 Machinery Section**

**16.72 Trunnion Assembly**

**16.73 Drive Details**

**16.74 Span Locks**

**Electrical Design**

**16.75 Load Analysis**

**16.76 Power Distribution**

**16.77 Drive Equipment**

**16.78 Bridge Controls**

**16.79 Grounding**

**16.80 Lightning and Surge Suppression**

**16.81 Pier Lighting**

**Electrical Detailing**

**16.82 Electrical Plan and Elevation**

**16.83 Electrical Symbols and Abbreviations**

**16.84 Single/Three Line Diagram**

**16.85 Panel Board and Light Fixture Schedules**

**16.86 Wire and Conduit Schedules and Diagrams**

**16.87 Control Desk/Panel Layout**

**16.88 Control Schematics**

**16.89 PLC Logic**

**16.90 Communication System**

**16.91 Navigation Lighting Details**

**16.92 Pedestrian Gate, Traffic Gate, and Barrier Details**

**16.93 Submarine Cable**

**16.94 Miscellaneous Details**

**Control House**

**16.95 Architectural Design**

**16.96 Architectural Details**

**16.97 Structural Design**

**16.98 Structural Details**

**16.99 HVAC/Plumbing Design**

**16.100 HVAC/Plumbing/Electrical Cables**

**Reinforcing Bar Lists**

**16.101 Preparation of Reinforcing Bar List**

**Load Rating**

**16.102 Load Rating**

**17 STRUCTURES – RETAINING WALLS**

*See the Task Work Order Scope of Services for the following Section 17 subsections that apply to the assigned project.*

**General Requirements**

**17.1 Key Sheet**

**17.2 Horizontal Wall Geometry**

**Permanent Proprietary Walls**

**17.3 Vertical Wall Geometry**

**17.4 Semi-Standard Drawings**

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

**17.6 Details**

**Temporary Proprietary Walls**

**17.7 Vertical Wall Geometry**

**17.8 Semi-Standard Drawings**

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

**17.10 Details**

**Cast-In-Place Retaining Walls**

**17.11 Design**

**17.12 Vertical Wall Geometry**

**17.13 General Notes**

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

**17.15 Sections and Details**

**17.16 Reinforcing Bar List**

**Other Retaining Walls and Bulkheads**

**17.17 Design**

**17.18 Vertical Wall Geometry**

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

**17.20 Wall Plan and Elevations**

**17.21 Details**

**18 STRUCTURES – MISCELLANEOUS**

*See the Task Work Order Scope of Services for the following Section 18 subsections that apply to the assigned project.*

**Concrete Box Culverts**

- 18.1 Concrete Box Culverts**
- 18.2 Concrete Box Culverts Extensions**
- 18.3 Concrete Box Culvert Data Table Plan Sheets**
- 18.4 Concrete Box Culvert Special Details Plan Sheets**

**Strain Poles**

- 18.5 Steel Strain Poles**
- 18.6 Concrete Strain Poles**
- 18.7 Strain Pole Data Table Plan Sheets**
- 18.8 Strain Pole Special Details Plan Sheets**

**Mast Arms**

- 18.9 Mast Arms**
- 18.10 Mast Arms Data Table Plan Sheets**
- 18.11 Mast Arms Special Details Plan Sheets**

**Overhead/Cantilever Sign Structure**

- 18.12 Cantilever Sign Structures**
- 18.13 Overhead Span Sign Structures**
- 18.14 Special (Long Span) Overhead Sign Structures**
- 18.15 Monotube Overhead Sign Structure**
- 18.16 Bridge Mounted Signs (Attached to Superstructure)**
- 18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets**
- 18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets**

**High Mast Lighting**

- 18.19 Non-Standard High Mast Lighting Structures**
- 18.20 High Mast Lighting Special Details Plan Sheets**

**Noise Barrier Walls (Ground Mount)**

- 18.21 Horizontal Wall Geometry**
- 18.22 Vertical Wall Geometry**

- 18.23 Summary of Quantities – Aesthetic Requirements**
- 18.24 Control Drawings**
- 18.25 Design of Noise Barrier Walls Covered by Standards**
- 18.26 Design of Noise Barrier Walls Not Covered by Standards**
- 18.27 Aesthetic Details**

**Special Structures**

- 18.28 Fender System**
- 18.29 Fender System Access**
- 18.30 Special Structures**
- 18.31 Other Structures**

**Ancillary Structures Report**

- 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**

*See the Task Work Order Scope of Services for the following Section 19 subsections that apply to the assigned project.*

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

**19.1 Traffic Data Analysis**

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

**19.2 No Passing Zone Study**

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

The CONSULTANT shall submit the signed and sealed report to the DEPARTMENT for review and approval *prior to commencing the production of plans.*

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

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

**19.4 Multi-Post Sign Support Calculations**

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

**19.5 Sign Panel Design Analysis**

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

**19.6 Sign Lighting/Electrical Calculations**

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

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

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

**19.7 Quantities for EQ Report**

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

**19.8 Cost Estimate**

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

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

**19.10 Other Signing and Pavement Marking Analysis**

**19.11 Field Reviews**

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

**19.12 Technical Meetings**

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

**19.13 Quality Assurance/Quality Control**

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



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

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

**19.14 Independent Peer Review**

**19.15 Supervision**

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

**19.16 Coordination**

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

**20 SIGNING AND PAVEMENT MARKING PLANS**

*See the Task Work Order Scope of Services for the following Section 20 subsections that apply to the assigned project.*

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

**20.1 Key Sheet**

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

**20.2 General Notes/Pay Item Notes**

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

**20.3 Project Layout**

**20.4 Plan Sheet**

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

**20.5 Typical Details**

**20.6 Guide Sign Work Sheet(s)**

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

- 20.7 Traffic Monitoring Site**
- 20.8 Cross Sections**
- 20.9 Special Service Point Details**
- 20.10 Special Details**
- 20.11 Interim Standards**

*The CONSULTANT shall list web address for FDOT interim standards in the key sheet.*

**20.12 Quality Assurance/Quality Control**

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

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

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

**20.13 Supervision**

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

**21 SIGNALIZATION ANALYSIS**

*See the Task Work Order Scope of Services for the following Section 21 subsections that apply to the assigned project.*

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

**21.1 Traffic Data Collection**

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

**21.2 Traffic Data Analysis**

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

**21.3 Signal Warrant Study**

**21.4 Systems Timings**

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

**21.5 Reference and Master Signalization Design File**

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

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

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

**21.7 Overhead Street Name Sign Design**

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

**21.8 Pole Elevation Analysis**

**21.9 Traffic Signal Operation Report**

*[As defined by the District]*

**21.10 Quantities for EQ Report**

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

**21.11 Cost Estimate**

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

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

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

**21.13 Other Signalization Analysis**

**21.14 Field Reviews**

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

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

- Controller Timing Data

#### **21.15 Technical Meetings**

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

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

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

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

*The CONSULTANT shall utilize the District's quality control checklist for traffic design drawings. The responsible Professional Engineer that performed the Quality Control review shall sign a statement certifying that the review was conducted.*

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

#### **21.17 Independent Peer Review**

#### **21.18 Supervision**

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

#### **21.19 Coordination**

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

### **22 SIGNALIZATION PLANS**

*See the Task Work Order Scope of Services for the following Section 22 subsections that apply to the assigned project.*

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

#### **22.1 Key Sheet**

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

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

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

- 22.3 Plan Sheet**
- 22.4 Interconnect Plans**
- 22.5 Traffic Monitoring Site**
- 22.6 Guide Sign Worksheet**
- 22.7 Special Details**
- 22.8 Special Service Point Details**
- 22.9 Mast Arm/Monotube Tabulation Sheet**
- 22.10 Strain Pole Schedule**
- 22.11 TTCP Signal (Temporary)**
- 22.12 Temporary Detection Sheet**
- 22.13 Utility Conflict Sheet**
- 22.14 Interim Standards**
- 22.15 Quality Assurance/Quality Control**

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

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

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

**22.16 Supervision**

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

**23 LIGHTING ANALYSIS**

*See the Task Work Order Scope of Services for the following Section 23 subsections that apply to the assigned project.*

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

### **23.1 Lighting Justification Report**

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

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

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

### **23.2 Lighting Design Analysis Report**

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

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

### **23.3 Voltage Drop Calculations**

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

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

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

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

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

### **23.6 Temporary Highway Lighting**

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

#### **23.7 Design Documentation**

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

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

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

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

#### **23.9 Cost Estimate**

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

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

#### **23.11 Other Lighting Analysis**

#### **23.12 Field Reviews**

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

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

#### **23.13 Technical Meetings**

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

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

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

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

*followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operations, or it may be one specifically designed for this project. The CONSULTANT shall utilize the District's quality control checklist for traffic design drawings. The responsible Professional Engineer that performed the Quality Control review shall sign a statement certifying that the review was conducted.*

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

**23.15 Independent Peer Review**

**23.16 Supervision**

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

**23.17 Coordination**

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

**24 LIGHTING PLANS**

*See the Task Work Order Scope of Services for the following Section 24 subsections that apply to the assigned project.*

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**

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

**24.2 General Notes/Pay Item Notes**

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

**24.3 Pole Data, Legend & Criteria**

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

**24.4 Service Point Details**

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

**24.5 Project Layout**

**24.6 Plan Sheet**



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

**24.7 Special Details**

**24.8 Temporary Highway Lighting Detail Sheets**

**24.9 Temporary Highway Lighting Plan Sheets**

**24.10 Interim Standards**

**24.11 Quality Assurance/Quality Control**

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

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

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

**24.12 Supervision**

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

**25 LANDSCAPE ANALYSIS**

*See the Task Work Order Scope of Services for the following Section 25 subsections that apply to the assigned project.*

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

*The CONSULTANT shall coordinate* with existing and/or proposed underground utilities, including, but not limited to, FDOT lighting, *signalization*, drainage and ITS. Landscape coordination with *these disciplines* shall include both underground conflicts and above-ground impacts to *their* existing and/or proposed *features*. The CONSULTANT shall closely coordinate with *these* DEPARTMENT units to ensure that all conflicts are identified, addressed and mitigated in the Contract Documents.

**25.1 Data Collection**

All research required to collect data necessary to complete the initial design analysis. Includes identifying local ordinances, *DEPARTMENT polices, commitments within the environmental document* 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 planting types *by location*, scheme development, preliminary *per square foot costs with extensions*, and reports. ***Includes revisions necessary for DEPARTMENT approval.*** 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 *genus*-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**

Conceptual Design: Typically not done in master design file. Includes determination of water and power sources. ***Provide general location and description of pumps, pump stations, meters, mainlines, lateral line irrigation heads, valves, filters, backflow preventers, sensors, and controllers.*** 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

25.4b4 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, and 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, fountains, walls, pedestrian bridges, non-regulatory signs or project graphics, roadway aesthetics, and site furnishings.

**25.6 Roll Plots**

**25.7 Quantities for EQ Report**

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

**25.8 Cost Estimates**

**25.9 Technical Special Provisions and Modified Special Provisions**

**25.10 Inspection Services**

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

**25.11 Other Landscape Services**

**25.12 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.

**25.13 Field Reviews**

**25.14 Technical Meetings/Public Meetings**

**25.15 Quality Assurance/Quality Control**

**25.16 Independent Peer Review**

**25.17 Supervision**

**25.18 Project Coordination**

**25.19 Interdisciplinary Coordination**

**26 LANDSCAPE PLANS**

*See the Task Work Order Scope of Services for the following Section 26 subsections that apply to the assigned project.*

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

**26.1 Key Sheet**

**26.2 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 (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 warranty period. This maintenance plan *shall* be developed in performance-based language in coordination with the local government entity *that* assumes the maintenance obligation.

**26.14 Quality Assurance/Quality Control**

**26.15 Supervision**

## 27 SURVEY

*See the Task Work Order Scope of Services for the following Section 27 subsections that apply to the assigned project.*

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

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

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

### 27.1 Horizontal Project Control (HPC)

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

### 27.2 Vertical Project Control (VPC)

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

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

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

### 27.4 Aerial Targets

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

### 27.5 Reference Points

Reference Horizontal Project 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 tasks of this document as applicable.

**27.10 Underground Utilities**

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

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

**27.11 Outfall Survey**

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

**27.12 Drainage Survey**

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

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

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

**27.14 Channel Survey**

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

**27.15 Pond Site Survey**

Refer to tasks of this document as applicable.

**27.16 Mitigation Survey**

Refer to tasks of this document as applicable.

**27.17 Jurisdiction Line Survey**

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

**27.18 Geotechnical Support**

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

**27.19 Sectional/Grant Survey**

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

**27.20 Subdivision Location**

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

**27.21 Maintained R/W**

Perform field location (two-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, and preparation of reports.

**27.22 Boundary Survey**

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

**27.23 Water Boundary Survey**

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

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

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

**27.25 Right-of-Way Monumentation**

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

**27.26 Line Cutting**

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

**27.27 Work Zone Safety**

Provide work zone as required by DEPARTMENT standards.

**27.28 Vegetation Survey**

Locate vegetation within the project limits.

**27.29 Tree Survey**

Locate individual trees or palms within the project limits.

**27.30 Miscellaneous Surveys**

**27.31 Supplemental Surveys**

**27.32 Document Research**

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

**27.33 Field Review**

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

**27.34 Technical Meetings**

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

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

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

**27.36 Supervision**

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

**27.37 Coordination**

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



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

## **28 PHOTOGRAMMETRY**

*See the Task Work Order Scope of Services for the following Section 28 subsections that apply to the assigned project.*

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

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

### **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 LiDAR**

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

### **28.6 Aerial Triangulation**

Measure and adjust control within aerial images.

### **28.7 Surfaces**

Includes collection of break lines and spot elevations.

### **28.8 Ortho Generation**

Includes creation of final images.

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

Create the rectified digital image.

### **28.10 Mosaicking – N/A**

### **28.11 Sheet Clipping**

Create plot files for sheets from the database.

**28.12 Topographics (3D)**

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

**28.13 Planimetrics (2D)**

Prepare 2D planimetric map.

**28.14 Drainage Basin**

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

**28.15 CADD Edit**

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

**28.16 Data Merging**

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

**28.17 Miscellaneous**

Other tasks not specifically addressed in this document.

**28.18 Field Review**

Perform on-site review of maps.

**28.19 Technical Meetings**

Attend meetings as required.

**28.20 Quality Assurance/Quality Control (QA/QC)**

Establish and implement a QA/QC plan.

**28.21 Supervision**

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

**28.22 Coordination**

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

**29 MAPPING**

*See the Task Work Order Scope of Services for the following Section 29 subsections that apply to the assigned project.*

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 DEPARTMENT Manuals, Procedures, Handbooks, District-specific requirements, and Florida Statutes. All maps, surveys and legal descriptions *shall* be prepared under the direction of a Florida Professional Surveyor and Mapper (PSM) to DEPARTMENT size and format requirements utilizing DEPARTMENT approved software, and *shall* 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 for this project to the DEPARTMENT for review at stages of completion as negotiated.

#### **Master CADD File**

##### **29.1 Alignment**

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

##### **29.3 Subdivisions / Property Lines**

##### **29.4 Existing Right-of-Way**

##### **29.5 Topography**

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

##### **29.7 Proposed Right-of-Way Requirements**

The ENGINEER OF RECORD (EOR) *shall* 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 *shall* be specified in writing.

##### **29.8 Limits of Construction**

The limits of construction DGN file as provided by the EOR *shall* be imported or referenced to the master CADD file. Additional labeling *shall* 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**

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

#### **Sheet Files**

##### **29.10 Control Survey Cover Sheet**

##### **29.11 Control Survey Key Sheet**

##### **29.12 Control Survey Detail Sheet**

##### **29.13 Right-of-Way Map Cover Sheet**

##### **29.14 Right-of-Way Map Key Sheet**

##### **29.15 Right-of-Way Map Detail Sheet**

**29.16 Maintenance Map Cover Sheet**

**29.17 Maintenance Map Key Sheet**

**29.18 Maintenance Map Detail Sheet**

**29.19 Reference Point Sheet**

This sheet(s) *shall* 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 Ownerships Sheet**

**Miscellaneous Surveys and Sketches**

**29.22 Parcel Sketches**

**29.23 TITF Sketches**

**29.24 Other Specific Purpose Survey(s) – N/A**

**29.25 Boundary Survey(s) Map**

**29.26 Right-of-Way Monumentation Map**

**29.27 Title Search Map**

**29.28 Title Search Report**

**29.29 Legal Descriptions**

**29.30 Final Map/Plans Comparison**

The PSM *shall* 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 *shall* 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**

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

#### **29.36 Supplemental Mapping**

### **30 TERRESTRIAL MOBILE LiDAR**

*See the Task Work Order Scope of Services for the following Section 30 subsections that apply to the assigned project.*

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

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

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

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

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

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

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

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

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

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

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

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

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

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

#### **30.7 Transformation / Adjustment**

Adjust LiDAR point cloud data to Project Control points. Create point cloud data file(s) in approved digital format. Prepare required reports of precision and accuracy achieved. If this task is performed by

separate firm, or is the final product to be delivered, include effort for Survey Report.

**30.8 Classification / Editing**

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

**30.9 Specific Surface Reporting**

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

**30.10 Topographic (3D) Mapping**

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

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

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

**30.12 CADD Edits**

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

**30.13 Data Merging**

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

**30.14 Miscellaneous**

Other tasks not specifically addressed in this document.

**30.15 Field Reviews**

Perform on site review of maps.

**30.16 Technical Meetings**

Attend meetings as required.

**30.17 Quality Assurance/ Quality Control**

Establish and implement a QA/QC plan.

**30.18 Supervision**

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

**30.19 Coordination**

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

## 31 ARCHITECTURE DEVELOPMENT

*See the Task Work Order Scope of Services for the following Section 31 subsections that apply to the assigned project.*

### **PHASE I - 30% DESIGN DEVELOPMENT**

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

#### **Documents**

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

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

- Floor plan drawn at an architectural scale that will allow the entire facility to be shown on one sheet, without breaklines, and which indicates project phasing as applicable to the Scope.
- Floor plans drawn at 3/32 inch or larger scale showing typical occupied spaces or special rooms with dimensions, sanitary facilities, stairs, elevators, identification of accessible areas for the disabled and other program requirements.
- Floor plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, indicating door and window layouts and other relevant features.
- For alterations or additions to an existing facility: Indicate the connections and tie-ins to the existing facilities, including all existing spaces, exits, plumbing fixtures and locations and any proposed changes thereto. Distinguish between new and existing areas for renovation, remodeling, or an addition and show demolition plans of areas to be removed.
- Furniture and Equipment plans drawn at 1/8 inch or larger scale showing typical spaces or special rooms with dimensions, equipment and furnishing layouts and other relevant features.
- Reflected ceiling plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, major lighting equipment and ceiling panel layouts.
- Roof and miscellaneous plans to be drawn at 3/32 inch or larger scale showing dimensioned features penetrations, equipment and other relevant features.
- Plumbing fixture locations and fixture unit calculations, isometrics, one line diagram and riser details, schedule of common fixtures and other relevant features.
- All exterior building elevations to illustrate and indicate the scale, finish, size and fenestration of the facility.
- Sufficient building and wall sections to show dimensions, proposed construction material, and relationship of finished floor to finished grades.
- Preliminary Structural Drawings to include plans and sections indicating systems, connections and foundations.
- Mechanical Drawings to include ceiling plans with a single line duct layout, location of grease trap(s), LP gas tank location, natural gas piping to existing utilities. Provide narrative description to include a description of proposed HVAC system equipment including the chiller, pumps, AHUs, cooling tower, electric duct heaters and other relevant features.

- Electrical Drawings include plans with lighting layouts for outdoors and major interior spaces and electrical outlets for all major spaces. Show location of electrical rooms, transformers, emergency generator. Also show locations of mechanical equipment such as chillers, compressors and air handler units and their respective electrical connections and other relevant features.
- Equipment and Furnishing Schedules to indicate major equipment that will be provided by the Contractor and those that will be provided by the DEPARTMENT or others.

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

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

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

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

#### **Outline Specifications**

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

#### **Other Requirements**

- Provide a Life-Cycle Cost Analysis (LCCA) for review and approval. LCCA shall be by a commercially available life-cycle cost analysis program and as required by the State of Florida and the DEPARTMENT.
- Design to meet or exceed Florida Energy Efficiency Code for Building Construction (FEEC). Submit completed FEEC forms, including calculations for mechanical systems, documenting energy efficiency ratio rating of HVAC equipment, electrical systems, insulation, and building envelope shall be submitted to the DEPARTMENT for review and approval.
- The Design Professional shall advise the DEPARTMENT of any adjustments to the budget and shall submit a fully detailed Phase I estimate of probable construction cost, projected to the expected time of bid and containing sufficient detail to provide information necessary to evaluate compliance with the Construction Budget set for this project. Format estimate and provide detail matching the organization and content of the project's Outline Specifications complete for Divisions 2 through 16.
- Provide an updated Project Development Schedule reflecting development and anticipated schedules for all subsequent project activities.
- Preliminary color boards to review two color selection schemes.

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

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



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

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

### **Documents**

- Updated Florida Energy Efficiency Code for Building Construction (FEEC) compliance forms.
- Calculations: Provide preliminary calculations for structural, mechanical and electrical systems.
- Review of anticipated LEED points and certification level; adjust attempted points as needed to meet target certification level.

### **Drawings**

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

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

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

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

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

### **Floor plans to include the following:**

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

### **Demolition Plans**

Indicate required demolition activities.

- Provide separate demolition plan(s) and other drawings (elevations, sections, etc.) if the scope of work

includes demolition which is too excessive to indicate in drawings depicting new construction.

- Indicate notes on the extent of the demolition: address dimensions at locations where partial walls are being removed or altered, existing room names and numbers, existing partitions, equipment, plumbing, HVAC or electrical elements,
- Include notes dealing with protection of existing areas as a result of demolition.
- Delineate any modifications to existing buildings involving structural elements within the structural documents rather than on the architectural.

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

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

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

### **Roof Plans**

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

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

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

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

### **Details of the following:**

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

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

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

### **Mechanical Drawings**

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

### **Electrical**

Provide drawings for the following systems:

- Lighting including, circuiting and luminaire identification and switching. Also provide illuminance computer printout for all indoor typical indoor spaces and parking lots.
- Convenience outlets and circuiting, special outlets and circuiting, and power systems and equipment. Provide riser diagrams for all electrical systems including master clock, intercom, fire alarm, ITV, computer networking/telephone. Also, provide for emergency and normal power distribution. Provide light fixture schedule.
- Panel schedule may be in preliminary form but circuitry must be included.
- Applicable installation details.
- General legend and list of abbreviations.
- Voltage drop computations for all main feeders.
- Short circuit analysis
- Provide 1/2" scale floor plan and wall elevations for all electrical rooms.
- Indicate surge protector for main switchboard and electrical panels.

### **Specifications**

- Provide preliminary Project Manual including front-end documents. Completion of fill-in items in Bidding documents and other "Division 0" documents is not required.
- Provide a preliminary Division 1 based upon the standard documents provided by the Owner and edited by the Design Professional after consultation with the Owner to establish project specific requirements.
- Include progress set of all other Sections in Divisions 2-16 with each section developed to demonstrate to the Owner an understanding of the project and an appropriate level of developmental progress comparable to that of the drawings.
- Specification sections shall be organized to follow the Construction Specification Institute's (CSI) current edition of Master Format with each section developed to include CSIs standard 3-part section and page formats with full paragraph numbering.

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

Colorboards illustrating color selections, finishes, textures and aesthetic qualities for all finish materials for final review and approval by the DEPARTMENT, and to establish a final palette of material selections for development of subsequent specifications, schedules and other requirements for incorporation into the Contract Documents.

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

corrected.

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

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

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

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

#### **General Requirements**

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

#### **Drawings**

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

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

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

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

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

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

##### **General Requirements**

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

##### **Drawings**

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

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

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

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

**Architectural Plans**

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

- 31.26 Miscellaneous Detail(s)**
- 31.27 Repetitive Sheets**
- 31.28 Design Narrative Reports**
- 31.29 Permitting**
- 31.30 Other Pertinent Project Documentation**
- 31.31 Cost Estimate**
- 31.32 Technical Special Provisions and Modified Special Provisions Package**
- 31.33 Field Reviews**
- 31.34 Technical Meetings**
  - 31.34.1 FDOT
  - 31.34.2 Local Governments (cities)
  - 31.34.3 Local Governments (counties)
  - 31.34.4 Other Meetings
  - 31.34.5 Progress Meetings
  - 31.34.6 Phase Review Meetings
- 31.35 Quality Assurance/Quality Control**
- 31.36 Meeting with Independent Peer Review**
- 31.37 Supervision**
- 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 Package**
- 31.63 Field Reviews**
- 31.64 Technical Meetings**
  - 31.64.1 FDOT
  - 31.64.2 Local Governments (cities)
  - 31.64.3 Local Governments (counties)
  - 31.64.4 Other Meetings
  - 31.64.5 Progress Meetings
  - 31.64.6 Phase Review Meetings
- 31.65 Quality Assurance/Quality Control**
- 31.66 Independent Peer Review**
- 31.67 Supervision**
- 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 Detail(s)**



- 31.72 Section(s)**
- 31.73 Piping Schematic(s)**
- 31.74 Control Plan(s)**
- 31.75 Schedule(s)**
- 31.76 HVAC Calculations**
- 31.77 Life Cycle Cost Analysis**
- 31.78 Repetitive Sheets**
- 31.79 Other Pertinent Project Documentation**
- 31.80 Cost Estimate**
- 31.81 Technical Special Provisions and Modified Special Provisions Package**
- 31.82 Field Reviews**
- 31.83 Technical Meetings**
  - 31.83.1 FDOT
  - 31.83.2 Local Governments (cities)
  - 31.83.3 Local Governments (counties)
  - 31.83.4 Other Meetings
  - 31.83.5 Progress Meetings
  - 31.83.6 Phase Review Meetings
- 31.84 Quality Assurance/Quality Control**
- 31.85 Independent Peer Review**
- 31.86 Supervision**
  - Plumbing Plans**
- 31.87 General Notes, Abbreviations, Symbols, Legend, and Code Issues**
- 31.88 Plan(s) (Small Scale)**
- 31.89 Plan(s) (Large Scale)**
- 31.90 Isometric(s) (Large Scale)**
- 31.91 Riser Diagram(s)**
- 31.92 Detail(s)**
- 31.93 Repetitive Sheets**
- 31.94 Other Pertinent Project Documentation**

- 31.95 Cost Estimate**
- 31.96 Technical Special Provisions and Modified Special Provisions Package**
- 31.97 Field Reviews**
- 31.98 Technical Meetings**
  - 31.98.1 FDOT
  - 31.98.2 Local Governments (cities)
  - 31.98.3 Local Governments (counties)
  - 31.98.4 Other Meetings
  - 31.98.5 Progress Meetings
  - 31.98.6 Phase Review Meetings
- 31.99 Quality Assurance/Quality Control**
- 31.100 Independent Peer Review**
- 31.101 Supervision**
  - 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 Package**
- 31.110 Field Reviews**
- 31.111 Technical Meetings**
  - 31.111.1 FDOT
  - 31.111.2 Local Governments (cities)
  - 31.111.3 Local Governments (counties)
  - 31.111.4 Other Meetings
  - 31.111.5 Progress Meetings
  - 31.111.6 Phase Review Meetings
- 31.112 Quality Assurance/Quality Control**
- 31.113 Independent Peer Review**
- 31.114 Supervision**

**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 Lightning Protection Plan(s)**
- 31.121 Lightning Protection Details**
- 31.122 Power Plan(s)**
- 31.123 Power Distribution Riser Diagram(s)**
- 31.124 Panel Board Schedule(s)**
- 31.125 Data Plan(s)**
- 31.126 Data Detail(s)**
- 31.127 Communication Plan(s)**
- 31.128 Communication Detail(s)**
- 31.129 Security Alarm System Plan(s)**
- 31.130 Miscellaneous Detail(s)**
- 31.131 Repetitive Sheets**
- 31.132 Energy Analysis**
- 31.133 Other Pertinent Project Documentation**
- 31.134 Cost Estimate**
- 31.135 Technical Special Provisions and Modified Special Provisions Package**
- 31.136 Field Reviews**
- 31.137 Technical Meetings**
  - 31.137.1 FDOT
  - 31.137.2 Local Governments (cities)
  - 31.137.3 Local Governments (counties)
  - 31.137.4 Other Meetings
  - 31.137.5 Progress Meetings
  - 31.137.6 Phase Review Meetings

**31.138 Quality Assurance/Quality Control**

**31.139 Independent Peer Review**

**31.140 Supervision**

**31.141 LEED Certification**

**31.142 Coordination**

**31.143 Building Information Modeling (BIM)**

**32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE**

*See the Task Work Order Scope of Services for the following Section 32 subsections that apply to the assigned project*

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

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

**32.1 Noise Barrier Analysis**

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

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

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

The CONSULTANT shall review the commitments made during the PD&E phase regarding noise barrier concepts determined to be potentially feasible and reasonable. The CONSULTANT *shall* update the analysis of feasibility and reasonableness for noise barriers recommended for further consideration during the design phase and for any additional noise barriers required, using design

information (e.g., profile data, horizontal alignment data, etc.) and incorporate into the analysis any new conditions or additional costs related to noise barrier construction that have been identified during design. A design phase noise analysis **shall** be performed at any additional locations required (based on DPK requirements or roadway design changes). Additional survey may also be required at proposed barrier locations.

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

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

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

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

## 32.2 Noise Barrier Evaluation

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

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

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

The CONSULTANT shall re-analyze noise barrier(s) for feasibility and reasonableness and re-

establish barrier height and length if design constraints require alteration in a barrier's location or dimensions.

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

### **32.3 Public Involvement**

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

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

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

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

### **32.4 Outdoor Advertising Identification**

The CONSULTANT shall identify potential noise barriers that may block the view of an existing lawfully erected sign that is governed by and conforms to state and federal requirements for land

use, size, height and spacing consistent with the requirements of Florida Statute (FS) 479.25 and the FDOT Noise Policy (Part 2, Chapter 17 of the PD&E Manual). The CONSULTANT shall notify the Department's Project Manager of a potential noise barrier(s) that may affect the visibility of a legally permitted outdoor advertising sign. Resolution of the potential conflict shall be documented in the NSR and included in the environmental document.

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

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

### **32.6 Technical Meetings**

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

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

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

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

### **32.8 Supervision**

### **32.9 Coordination**

## **33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS**

*See the Task Work Order Scope of Services for the following Section 33 subsections that apply to the assigned project.*

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

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

In instances where the CONSULTANT performs analysis or prepares the design packages for the deployment

of ITS, the CONSULTANT will not be allowed to compete as a proposing firm, or participate as a subconsultant to a proposing firm during subsequent advertisements involving work performed under this contract.

### 33.1 ITS Analysis

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

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

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

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

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

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

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

#### **Closed Circuit Television (CCTV) Camera Assembly**

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

The camera subsystem shall be designed to provide additional benefits such as the monitoring of DMS operations and security surveillance of critical infrastructure elements. ***A stand-alone DMS confirmation camera shall be designed and installed to support TMC operations to verify and confirm the posted DMS messages (if desired by the DEPARTMENT)***. The position, height, and



design of each camera pole shall be finalized during the design phase of the project. Each site shall be designed for overall monitoring capability, as well as designed to provide safe and effective maintenance conditions.

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

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

The CONSULTANT shall be responsible for the design of the grounding and lightning protection system based on FDOT criteria.

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

### **Vehicle Detection Subsystem**

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

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

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

The vehicle detectors must meet the Project requirements under all environmental and traffic conditions expected for the corridors. The detection system shall produce accurate volume, speed and occupancy data for all corridor traffic operation conditions. The CONSULTANT design must limit the likelihood of occlusions, other blocking of vehicles and adjacent lanes detection that degrade the detection system performance below specified accuracy. Design the system so that signs, walls, guardrails, and other physical elements do not degrade detection performance.

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

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

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

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

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

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

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

#### **Dynamic Message Sign Subsystem**

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

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

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

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

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

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

#### **Roadway Weather Information Systems (RWIS)**

The CONSULTANT shall develop Technical Special Provisions or Modified Special Provisions for RWIS based upon the unique needs of the project. The CONSULTANT shall ensure that each RWIS site consists of a remote Processing Unit (RPU), communication hardware, and determine the site-specific components as required from below;

Fog/Smoke Detection sensor;

Classifying Precipitation;

Precipitation Occurrence Sensor;

Air Temperature/Relative Humidity Sensor;

Wind Speed and Direction Sensor;

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

Communication hardware.

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

### **33.2 Communications**

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

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

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

### **33.3 Grounding and Lightning Protection**

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

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

### **33.4 Power Subsystem**

The CONSULTANT shall be responsible for an electrical design in accordance with all NEC requirements. No solar power should be utilized as a power solution for the Project unless otherwise approved by the DEPARTMENT. To enhance power reliability, the CONSULTANT shall design a

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

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

### **33.5 Voltage Drop Calculations**

See FDM Section 233.3.6 for voltage drop design requirements. The electrical design shall address allowable voltage drops per the NEC. The CONSULTANT shall submit voltage drop calculations for any electrical circuit providing power to the ITS field devices beyond the electric utility service point. The calculations shall document the length of each circuit, its load, the size 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:

- Quantities and engineers estimate for all applicable items on plans.
- Phase submittal checklist.
- Three-way quantity check list
- Structural calculations for all structures
- Power Design Analysis, voltage drop calculations, and load analysis calculations.
- Correspondences including utility design meeting and conflict resolutions.
- Electrical Power Service Letter of Confirmation.
- Subsurface Utility Exploration tables for each ITS support structure.

### **33.7 Existing ITS**

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

### **33.8 Queue Analysis**

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

### **33.9 Reference and Master ITS Design File**

The CONSULTANT shall prepare the ITS design file to include all necessary design elements and the reference files for topo, R/W roadway, utilities files, etc. This effort includes the design and layout of proposed ITS devices, including but not limited to: CCTV / Detection poles, DMS, detection devices, advanced traffic controllers, conduit, cabinet-related pull boxes, service points, fiber optic sizing, and communications hubs. All existing ITS infrastructure shall be referenced to the new ITS plan sheets (if applicable).

### **33.10 Reference and Master Communications Design File**

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

### **33.11 Pole Elevation Analysis**

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

### **33.12 Sign Panel Design Analysis**

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

### **33.13 Quantities for EQ Report**

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

### **33.14 Cost Estimate**

The CONSULTANT shall prepare an engineer's cost estimate for the project using historical data from the FDOT or from other Industry sources. The CONSULTANT shall also load the pay items and quantities into AASHTOWare Project Preconstruction for generating the summary of quantities 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 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 Driver
- Condition of Structure(s), cabinets, and other above-ground infrastructure and devices
- Type of Detection as Compared With Current District Standards
- Underground Infrastructure
- Proximity of other utilities
- Traffic Operations
- Any other field reconnaissance as necessary to develop a complete ITS design package

### **33.18 Technical Meetings**

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

### **33.19 Quality Assurance / Quality Control**

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

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

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

### **33.20 Supervision**

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

### **33.21 Coordination**

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

## **34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS**

*See the Task Work Order Scope of Services for the following Section 34 subsections that apply to the assigned project.*

### **34.1 Key Sheet**

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

- MUTCD
- Standard Specifications
- Standard Index

#### **34.2 General Notes / Pay Item Notes**

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

#### **34.3 Project Layout**

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

#### **34.4 Typical and Special Details**

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

#### **34.5 Plan Sheet**

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

#### **34.6 ITS Communications Plans**

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

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

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

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

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

### **34.7 Fiber Optic Splice Diagrams**

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

### **34.8 Grounding and Lightning Protection Plans**

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

### **34.9 Cross Sections**

The CONSULTANT shall prepare cross sections for ITS devices.

### **34.10 Guide Sign Work Sheet(s)**

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

### **34.11 Special Service Point Details**

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

### **34.12 Strain Pole Schedule**

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

### **34.13 Overhead / Cantilever Sign Structure**

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

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

### **34.14 Other Overhead Sign Structures (Long Span, Monotube, etc.)**

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



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

#### **34.15 Temporary Traffic Control Plans**

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

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

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

#### **34.16 Interim Standards**

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

#### **34.17 GIS Data and Asset Management Requirements**

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

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

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

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

#### **34.18 Quality Assurance / Quality Control**

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

#### **34.19 Supervision**

The CONSULTANT shall supervise all technical design activities.

### **35 GEOTECHNICAL**

*See the Task Work Order Scope of Services for the following Section 35 subsections that apply to the assigned project.*

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

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

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

#### **35.1 Document Collection and Review**

*The* CONSULTANT *shall* review printed literature including topographic maps, county agricultural maps, aerial photography (including historic photos), ground water resources, geology bulletins, potentiometric maps, pile driving records, historic construction records and other geotechnical related resources. Prior to field reconnaissance, the CONSULTANT shall review U.S.G.S., S.C.S. and potentiometric maps, and identify areas with problematic soil and groundwater conditions.

#### **Roadway**

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

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

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

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

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

### **35.2 Develop Detailed Boring Location Plan**

Develop a detailed boring location plan. Meet with the DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program *is expected* to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

### **35.3 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

### **35.4 Muck Probing**

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

### **35.5 Coordinate and Develop TTCP Plans for Field Investigation**

Coordinate and develop Maintenance of Traffic (TTCP) plan. All work zone traffic control *shall* be performed in accordance with the DEPARTMENT's Roadway and Traffic Design Standards Index 600 series.

### **35.6 Drilling Access Permits**

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

### **35.7 Property Clearances**

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

### **35.8 Groundwater Monitoring**

Monitor groundwater using piezometers.

### **35.9 LBR / Resilient Modulus Sampling**

Collect appropriate samples for Limerock Bearing Ratio (LBR) *or Resilient Modulus* testing *as directed by the District Geotechnical Office*. Deliver Resilient Modulus samples to the District Materials Office or the State Materials Office in Gainesville, as directed by the DEPARTMENT.

**35.10 Coordination of Field Work**

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

**35.11 Soil and Rock Classification – Roadway**

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

**35.12 Resilient Modulus or Design LBR**

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

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

**35.13 Laboratory Data**

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

**35.14 Seasonal High Water Table**

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

**35.15 Parameters for Water Retention Areas**

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

**35.16 Delineate Limits of Unsuitable Material**

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

**35.17 Electronic Files for Cross-Sections**

Create electronic files of boring data for cross-sections.

**35.18 Embankment Settlement and Stability**

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

**35.19 Monitor Existing Structures**

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

Identify existing structures in need of settlement, vibration and/or groundwater monitoring by the contractor during construction and coordinate with the EOR and structural engineer (when applicable) to develop mitigation strategies. When there is risk of damage to the structure or facility,

provide recommendations in the geotechnical report addressing project specific needs and coordinate those locations with the EOR. See the *FDOT Design Manual* Chapter 307 and Chapter 9 of the Soils and Foundations Handbook.

#### **35.20 Stormwater Volume Recovery and/or Background Seepage Analysis**

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

#### **35.21 Geotechnical Recommendations**

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

#### **35.22 Pavement Condition Survey and Pavement Evaluation Report**

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

#### **35.23 Preliminary Roadway Report**

If a preliminary roadway investigation is performed, submit a preliminary roadway report before the Phase I plans submittal. The purpose of the preliminary roadway report will be to assist in setting road grades and locating potential problems. ***The report shall include, but not be limited to:***

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculations/graphs, and other pertinent calculations.
- The CONSULTANT ***shall*** respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

#### **35.24 Final Report**

The Final Roadway Report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT ***shall*** respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

**35.25 Auger Boring Drafting**

Draft auger borings as directed by the DEPARTMENT.

**35.26 SPT Boring Drafting**

Draft SPT borings as directed by the DEPARTMENT.

**Structures**

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

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

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

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

**35.27 Develop Detailed Boring Location Plan**

Develop a detailed boring location plan. Meet with the DEPARTMENT Geotechnical Project Manager for boring plan approval. If the drilling program *is expected* to encounter artesian conditions, the CONSULTANT shall submit a methodology(s) for plugging the borehole to the DEPARTMENT for approval prior to commencing with the boring program.

**35.28 Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

**35.29 Coordinate and Develop TTCP Plans for Field Investigation**

Coordinate and develop TTCP plan. All work zone traffic control *shall* be performed in accordance with the DEPARTMENT's Roadway and Traffic Design Standards Index 600 series.

**35.30 Drilling Access Permits**

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

**35.31 Property Clearances**

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

**35.32 Collection of Corrosion Samples**

Collect corrosion samples for determination of environmental classifications *for soil and water, when appropriate.*

**35.33 Coordination of Field Work**

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

**35.34 Soil and Rock Classification – Structures**

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

**35.35 Tabulation of Laboratory Data**

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

**35.36 Estimate Design Groundwater Level for Structures**

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

**35.37 Selection of Foundation Alternatives (BDR)**

Evaluation and selection of foundation alternative, including the following:

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

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

**35.38 Detailed Analysis of Selected Foundation Alternate(s)**

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

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

**35.39 Bridge Construction and Testing Recommendations**

Provide construction and testing recommendations, including potential constructability problems.

**35.40 Lateral Load Analysis**

Perform lateral load analyses as directed by the DEPARTMENT.

#### **35.41 Walls**

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

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

Provide wall construction recommendations.

#### **35.42 Sheet Pile Wall Analysis**

Analyze sheet pile walls as directed by the DEPARTMENT.

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

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

#### **35.44 Box Culvert Analysis**

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

#### **35.45 Preliminary Report – BDR**

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

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

#### **35.46 Final Report – Bridge and Associated Walls**



The final structures report shall include the following:

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

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

The final reports shall include the following:

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

Final reports **shall** incorporate comments from the DEPARTMENT and contain any additional field or laboratory test results, recommended foundation alternatives along with design parameters and special provisions for the contract plans. These reports **shall** be submitted to the District Geotechnical Engineer for review prior to project completion. After review by the District Geotechnical Engineer, the reports **shall** be submitted to the District Geotechnical Engineer in final form and **shall** include the following:

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

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

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

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

**35.48 SPT Boring Drafting**

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

**35.49 Other Geotechnical**

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

**35.50 Technical Special Provisions and Modified Special Provisions**

**35.51 Field Reviews**

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

**35.52 Technical Meetings**

**35.53 Quality Assurance/Quality Control**

**35.54 Supervision**

**35.55 Coordination**

**36 3D MODELING**

*See the Task Work Order Scope of Services for the following Section 36 subsections that apply to the assigned project.*

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

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

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

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

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

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

**36.1 Phase I 3D Design Model**

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

#### **36.2 Phase II 3D Design Model**

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

#### **36.3 Phase III 3D Design Model**

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

#### **36.4 Final 3D Model Design**

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

#### **36.5 Cross Section Design Files**

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

#### **36.6 Template and Assembly Development**

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

#### **36.7 Quality Assurance/Quality Control**

#### **36.8 Supervision**

#### **36.9 Coordination**

### **37 PROJECT REQUIREMENTS**

#### **37.1 Liaison Office**

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

### **37.2 Key Personnel**

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

### **37.3 Progress Reporting**

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

### **37.4 Correspondence**

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

### **37.5 Professional Endorsement**

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

### **37.6 Computer Automation**

The project *shall* be developed utilizing Computer Aided Drafting and Design (CADD) systems. The DEPARTMENT makes available software to help assure quality and conformance with policy and procedures regarding CADD. It is the responsibility of the CONSULTANT to meet the requirements in the DEPARTMENT's CADD Manual *and CADD Production Criteria Handbook (including the minimum 95% compliance threshold for all design files)*. The CONSULTANT *shall* submit final documents and files as described therein.

### **37.7 Coordination With Other Consultants**

The CONSULTANT *firm* shall coordinate *its* 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.

## **38 INVOICING LIMITS**

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

The CONSULTANT *shall* provide a list of key events and the associated total percentage of work considered to be complete at each event. This list will be used to control invoicing. Payments will not be made that

exceed the percentage of work for any event until those events have actually occurred and the results are acceptable to the DEPARTMENT.

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

***For Task Work Orders with lump sum invoicing for Basic Services, a 100% complete payout will not be approved before the "Plans Package In Tallahassee" or "Plans To District Contracts" schedule milestone is achieved and the DEPARTMENT's Central Office or District Contracts Office has approved that package.***