June 18, 2019

EXHIBIT A

SCOPE OF SERVICES

FOR

FINANCIAL PROJECT ID(S). 440453-1-32-01

DISTRICT FOUR

BROWARD COUNTY

PALM BEACH COUNTY

MARTIN COUNTY

ST .LUCIE COUNTY

INDIAN RIVER COUNTY

1 PURPOSE

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 Erdman Anthony of Florida, Inc. (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID: 440453-1-32-01

Federal Aid Project No.: N/A

County Section No.: N/A

Description: District-wide Design Minor Projects

Bridge No(s).: ***N/A***

Rail Road Crossing No: ***N/A***

1 PURPOSE

The purpose of this Exhibit is to describe the scope of work and the responsibilities of the CONSULTANT and the DEPARTMENT in connection with the design and preparation of a complete set of construction contract *or conceptual plans,* documents, special provisions and incidental engineering services, as necessary, for *minor projects comprised of the following types, but not limited to: Resurfacing, Restoration, and Rehabilitation (RRR) Projects, Safety Projects, In-house Production Support, ITS Support, Architecture and other services that may include developing Concept Reports, 3D Modeling, Request for Proposals (RFP) on Design-Build Projects.*

Improvements to the transportation facility described herein.

Major work mix includes: ***N/A***
Major work groups include: ***3.2***
Minor work groups include: **3.3** (Controlled Access Highway Design) **4.1.1** (Miscellaneous Structures), **4.1.2** (Minor Bridge Design) **6.1** (Traffic Engineering Study), **6.2** (Traffic Signal Timing) **6.3.1** (ITS Analysis & Design), **6.3.1** (ITS Implementation) **7.1** (Signing, Pave. Marking), **7.2** (Lighting), **7.3** (Signalization), **8.1** (Control Survey), **8.2** (Design, R/W, & Const. Survey), **8.3** (Photogrammetric Mapping), **8.4** (Right of Way Mapping) **9.1** (Soil Exploration), **9.2, 9.3, 9.4.1** (Geotechnical), **14.0** (Architect), **15.0** (Landscape Architect)

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

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 contractor to build the project and test the project components. These Contract documents will be used by the DEPARTMENT or its Construction Engineering Inspection (CEI) representatives for inspection and final acceptance of the project. The CONSULTANT shall follow a systems engineering process to ensure that all required project components are included in the development of the Contract documents and the project can be built as designed and to specifications.

The Scope of Services establishes which items of work in the Plans Preparation Manual and other pertinent manuals are specifically prescribed to accomplish the work included in this contract, and also indicate which items of work will be the responsibility of the CONSULTANT and/or the DEPARTMENT.

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

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

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

1 PURPOSE

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. If a Preliminary Engineering Report is available from a prior or current Project Development and Environmental (PD&E) study, the CONSULTANT shall use the approved concepts as a basis for the design unless otherwise directed by the DEPARTMENT.

(Refer to individual Task Work Order for details)

2.1 Project General and Roadway (Activities 3, 4, and 5) (*On applicable Task Work Orders)*

Public Involvement:

Other Agency Presentations/Meetings:

Joint Project Agreements:

Specification Package Preparation:

Value Engineering:

Risk Assessment Workshop:

Plan Type:

Typical Section:

Pavement Design:

Pavement Type Selection Report(s):

Cross Slope:

Access Management Classification:

Transit Route Features:

Major Intersections/Interchanges:

Roadway Alternative Analysis:

Level of TCP Plans:

Temporary Lighting:

Temporary Signals:

Temporary Drainage:

Design Variations/Exceptions:

Back of Sidewalk Profiles:

2.2 Drainage (Activity 6) (*On applicable Task Work Orders)*

2.3 Utilities Coordination (Activity 7) (*On applicable Task Work Orders)*

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

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

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

A minimum of 4 years of experience performing utility coordination in accordance with FDOT, Federal Highway Administration (FHWA), and American Association of State Highway and Transportation Officials (AASHTO) standards, policies, and procedures.

A thorough knowledge of the FDOT plans production process and District utility coordination process.

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

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

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

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

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

unresolved issues.

Distributing all plans, conflict matrixes and changes to affected utility owners and making sure this information is properly coordinated and documented.

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

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

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

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

2.4 Environmental Permits, Compliances, and Clearances (Activity 8) (*On applicable Task Work Orders)*

E.g. USCG, COE, WMD, etc.

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

2.5 Structures (Activities 9 – 18) (*On applicable Task Work Orders)*

2.6 Signing and Pavement Markings (Activities 19 & 20) (*On applicable Task Work Orders)*

2.7 Signalization (Activities 21 & 22) (*On applicable Task Work Orders)*

2.8 Lighting (Activities 23 & 24) (*On applicable Task Work Orders)*

2.9 Landscape Architecture (Activities 25 & 26) (*On applicable Task Work Orders)*

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

2.10 Survey (Activity 27) (*On applicable Task Work Orders)*

2.11 Photogrammetry (Activity 28) (*On applicable Task Work Orders)*

2.12 Mapping (Activity 29) (*On applicable Task Work Orders)*

2.13 Terrestrial Mobile LiDAR (Activity 30) (Not applicable to this project)

2.14 Architecture (Activity 31) (*On applicable Task Work Orders)*

LEED (Leadership in Energy and Environmental Design)

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

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

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

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

2.15 Noise Barriers (Activity 32) (Not applicable to this project)

2.16 Intelligent Transportation Systems (Activities 33 & 34) (*On applicable Task Work Orders)*

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

For all projects with ITS activities, the CONSULTANT shall follow the Rule 940 requirements and use a Systems Engineering approach for the determining the requirements for the project. The CONSULTANT shall develop all necessary documents to support the Rule 940 requirements like Concept of Operations

(ConOPS), Systems Engineering Management Plan (SEMP), Requirements Traceability Verification Matrix (RTVM) and others as deemed necessary by the Department.

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

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

The CONSULTANT shall design the project subsystems such that they will be monitored and controlled from the FDOT's TMC facilities. The CONSULTANT shall ensure that all ITS field devices and ancillary components comply with the FDOT's Approved Product List (APL) / Qualified Product List (QPL) and the existing list of devices and components supported within the SunGuide software or other specified software, unless otherwise approved by the DEPARTMENT.

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

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

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

2.17 Geotechnical (Activity 35) (*On applicable Task Work Orders)*

2.18 Project Schedule

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

accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a *four (4)* week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

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

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

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

2.19 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.

2.20 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
  - ADA Standards for Accessible Design
  - AASHTO – A Policy for Geometric Design of Highways and Streets
  - AASHTO – Highway Safety Manual
  - Rule Chapter 5J-17, F.A.C., Minimum Technical Standards 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 CADD Manual
- FDOT CADD Production Criteria Handbook
- FDOT Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System
- FDOT Flexible Pavement Design Manual
- FDOT Handbook for Preparation of Specifications Package
- FDOT Instructions for Design Standards
- FDOT Instructions for Structures Related Design Standards
- FDOT Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways ("Florida Greenbook")
- FDOT Materials Manual
- FDOT Pavement Type Selection Manual
- FDOT Plans Preparation Manual
- FDOT Procedures and Policies
- FDOT Project Development and Environmental Manual
- FDOT Project Traffic Forecasting Handbook
- FDOT Public Involvement Handbook
- FDOT Rigid Pavement Design Manual
- FDOT Standard Specifications for Road and Bridge Construction
- FDOT Utility Accommodation Manual
- FHWA - Manual on Uniform Traffic Control Devices (MUTCD)
- FHWA - 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 Bridge Hydraulics Handbook
  - FDOT Culvert Handbook
  - FDOT Drainage Manual
  - FDOT Erosion and Sediment Control Manual
  - FDOT Exfiltration Handbook
  - FDOT Hydrology Handbook
  - FDOT Open Channel Handbook
  - FDOT Optional Pipe Materials Handbook
  - FDOT Storm Drain Handbook
  - FDOT Stormwater Management Facility Handbook
  - FDOT Temporary Drainage Handbook
- Survey and Mapping
  - All applicable Florida Statutes and Administrative Codes
  - Applicable Rules, Guidelines Codes and authorities of other Municipal, County, State and Federal Agencies.
  - FDOT Aerial Surveying Standards for Transportation Projects Topic 550-020-002
  - FDOT Right of Way Mapping Handbook
  - FDOT Surveying Procedure Topic 550-030-101
  - Florida Department of Transportation Right of Way Procedures Manual
  - Florida Department of Transportation Surveying Handbook
  - Right of Way Mapping Procedure 550-030-015
- Traffic Engineering and Operations and ITS
  - AASHTO - An Information Guide for Highway Lighting
  - AASHTO - Guide for Development of Bicycle Facilities
  - FHWA Standard Highway Signs Manual
  - FDOT - Florida Roundabout Guide
  - FDOT Manual on Uniform Traffic Studies (MUTS)
  - FDOT Median Handbook
  - FDOT Traffic Engineering Manual
  - Minimum Specifications for Traffic Control Signal Devices
  - National Electric Safety Code
  - National Electrical Code
- Florida's Turnpike Enterprise

2 PROJECT DESCRIPTION

- Florida's Turnpike Plans Preparation and Practices Handbook (TPPPH)
- Florida's Turnpike Traffic Pacing Design Guide Drawings
- 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

- 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 Structures Manual
  - FDOT Structures Design Office Temporary Design Bulletins (available on FDOT Structures web site only)
  - FDOT Preferred Details (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 – Flood Plain Management Criteria
  - Section 255.25, F.S., Approval Required Prior to Construction or Lease of Buildings
  - Rules of the Federal Emergency Management Agency (FEMA)
- Architectural – Other
  - Rule Chapter 64E-6, F.A.C., Standards for On Site Sewage Disposal Systems (Septic Tanks)
  - Rule Chapter 62-600, F.A.C., Domestic Wastewater Facilities
  - Rule Chapter 62-761, F.A.C., Underground Storage Tank Systems
  - American Concrete Institute
  - American Institute of Architects - Architect's Handbook of Professional Practice
  - American Society for Testing and Materials - ASTM Standards
  - Brick Institute of America
  - DMS - Standards for Design of State Facilities

- Florida Concrete Products Association
- FDOT – ADA/Accessibility Procedure
- FDOT – Building Code Compliance Procedure
- FDOT – Design Build Procurement and Administration
- LEED (Leadership in Energy and Environmental Design) Green Building Rating System
- National Concrete Masonry Association
- National Electrical Code
- Portland Cement Association - Concrete Masonry Handbook
- United State Green Building Council (USGBC)

2.21 Services to be Performed by the DEPARTMENT

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

- 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.
- 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 and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to *Constructability Phase* plans and completion of quantities, the DEPARTMENT's Long Range Estimate (L.R.E.) system will be used to produce a conceptual estimate, according to District policy. Once the quantities have been developed (beginning at *Constructability Phase* plans and no later than *Bidability Phase* plans) the CONSULTANT shall be responsible for inputting the pay items and quantities into TRNS*PORT PES (Proposal Estimating System) through the use of the DEPARTMENT's Designer Interface. A Summary of Pay Items sheet shall be prepared with all required *Constructability Phase*, *Bidability Phase,* and *Production* Plans submittals.

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

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.

Quality Assurance/Quality Control: It is the intention of the DEPARTMENT that design CONSULTANTS, including their subconsultant(s), are held responsible for their work, including plans review. Detailed checking of CONSULTANT plans or assisting in designing portions of the project for the CONSULTANT is not the intent of having external design consultants. The purpose of CONSULTANT plan reviews is to ensure that CONSULTANT plans follow the plan preparation procedures outlined in the Plans Preparation 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 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 names of the CONSULTANT's staff that will perform the quality control reviews shall be included in the Quality Control Plan. The Quality Control reviewer shall be a Florida Registered Professional Engineer.* The Quality Control Plan shall be one specifically designed for this project, and it 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 submit a Quality Control Plan for approval within *10 (ten)* calendar days of the written Notice to Proceed and it shall be signed by the CONSULTANT's Project Manager and the CONSULTANT QC Manager. The Quality Control Plan shall include the names of the CONSULTANT's staff that will perform the quality control reviews. The Quality Control reviewer shall be a Florida Licensed Professional Engineer fully prequalified under F.A.C. 14-75 in the work type being reviewed. A marked up set of prints from a Quality Control Review indicating the reviewers for each component (structures, roadway, drainage, signals, geotechnical, signing and marking, lighting, surveys, etc.) and a written resolution of

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

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

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

Independent Peer Review and a Constructability/Bidability Review for design Phase Plans document submittals are required on this project. These separate reviews shall be completed by someone who has not worked on the plan component that is being reviewed. These could include, but are not limited to a separate office under the Prime'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 meet the PPM, Design Standards 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 Bidability Phase and Production Phase submittals, using the Phase Review Checklist (Guidance Document 1-1-A) from the Construction Project Administration Manual (CPAM) as a minimum guideline. The CONSULTANT shall submit this checklist, as well as the "marked-up" set of plans during this review, and review comments and comment responses from any previous Constructability/Bidability reviews. These items will be reviewed by District Design and District Construction.

Supervision: The CONSULTANT shall supervise all technical design activities.

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

Project General Tasks

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

3.1 Public Involvement

Public involvement includes communicating to all interested persons, groups, and government organizations information regarding the development of the project. The

CONSULTANT shall provide to the DEPARTMENT drafts of all Public Involvement documents (i.e., newsletters, property owner letters, advertisements, etc.) associated with the following tasks for review and approval at least five (5) business days prior to printing and / or distribution.

3.1.1 Community Awareness Plan

Prepare a Community Awareness Plan (CAP) for review and approval by the DEPARTMENT within 30 calendar days after receiving Notice to Proceed. The objective of the plan is to notify local governments, affected property owners, tenants, and the public of the DEPARTMENT'S proposed construction and the anticipated impact of that construction. The CAP shall address timeframes for each review and shall include tentative dates for each public involvement requirement for the project. The CAP will also document all public involvement activities conducted throughout the project's duration. In addition to the benefits of advance notification, the process should allow the DEPARTMENT to resolve controversial issues during the design phase. This item shall be reviewed and updated periodically as directed by the DEPARTMENT throughout the life of the project.

3.1.2 Notifications

In addition to public involvement data collection, the CONSULTANT shall assist the DEPARTMENT or prepare 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 *CONSULTANT* to ensure that they are addressed to the correct and current public officials.

3.1.3 Preparing Mailing Lists

When requested by the DEPARTMENT, the CONSULTANT shall identify all impacted property owners and tenants (within a minimum of 500 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. The letters will be sent on DEPARTMENT letterhead by the DEPARTMENT.

3.1.5 Driveway Modification Letters

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

3.1.7 Renderings and Fly-Throughs

The CONSULTANT shall prepare renderings and fly-throughs for use in public meetings *and other specifics functions needed by the DEPARTMENT*.

3.1.8 PowerPoint Presentations

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

3.1.9 Public Meeting Preparations

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

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

3.1.10 Public Meeting Attendance and Follow-up

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

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

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 limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file.

3.1.12 Web Site

When requested by the DEPARTMENT, 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 electronic delivery package.

3.3 Specifications Package Preparation

The CONSULTANT shall prepare and provide a specifications package prepared in accordance with the DEPARTMENT'S Handbook for the Preparation of Specification Packages and associated training. The CONSULTANT shall provide the DEPARTMENT names of at least two 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.

A final signed and sealed specifications package shall be submitted to the DEPARTMENT as part of the Production Complete package. These submittals shall be electronically signed, dated, and sealed in accordance with applicable Florida Statues.

3.4 Contract Maintenance and Electronic Document Management System (EDMS)

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

3.5 Value Engineering (Multi-Discipline Team) Review

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

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

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

Initial Engineering Phase design plans and completion of Constructability Phase design plans, but may occur at anytime during the development of a project.

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

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

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

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

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- Three copies of all plan drawings
- One copy of the Drainage Alternatives Report
- One copy of Bridge Development Reports
- One copy of other miscellaneous reports
- Project Cost Estimate

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

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

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

3.6 Prime Consultant Project Manager Meetings

Includes only the Prime Consultant Project Manager's time for travel and attendance at Activity Technical Meetings and other meetings listed in the meeting summary for Task 3.6 on tab 3 Project General Task of the staff hour forms. Staff hours for other personnel attending Activity Technical Meetings are included in the meeting task for that specific Activity.

3.7 Plans Update

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

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

3.8 Post Design Services

Post Design Services may include, but not limited to, meetings, construction assistance, plans revisions, shop drawing review, survey services, as-built drawings, and load ratings. Specific services will be negotiated at a later date as necessary as a contract amendment.

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

3.9 Electronic/Digital Delivery

The CONSULTANT shall deliver final contract plans in electronic/digital format using the DEPARTMENT's Electronic/Digital Delivery software. The final contract plans shall be digitally signed and sealed files delivered to the DEPARTMENT on acceptable electronic media, as determined by the DEPARTMENT.

3.10 Risk Assessment Workshop

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

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

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

The CONSULTANT and other key members of the design team will attend and

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

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

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- One copy of all plan drawings (three copies if a workshop is applicable)
- One copy of the Drainage Alternatives Report
- One copy of Bridge Development Reports
- One copy of other miscellaneous reports
- Project Schedule
- Project Cost Estimate

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

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

3.11 Railroad, Transit and/or Airport Coordination

3.12 Other Project General Tasks

This includes all efforts for a project general task not covered by an existing defined task.

4 ROADWAY ANALYSIS (On applicable Task Work Orders)

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 Initial Engineering Phase plans submittal date.

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 performed.

4.3 Pavement Design Package

The CONSULTANT shall provide an approved Pavement Design Package in accordance with applicable FDOT pavement design manuals prior to the Constructability Phase plans submittal date.

4.4 Cross-Slope Correction

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

4.5 Horizontal/Vertical Master Design Files

The CONSULTANT shall design the geometrics using the design standards that are most appropriate with proper consideration given to the design traffic volumes, design speed, capacity and levels of service, functional classification, adjacent land use, design consistency and driver expectancy, aesthetics, pedestrian and bicycle concerns, ADA requirements, elder road user policy, access management, PD&E documents and scope of work.

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 Initial Engineering Phase 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 Cross Section Design Files

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

4.8 Traffic Control Analysis

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

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

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

4.9 Master TCP Design Files

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

4.10 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 Initial Engineering Phase submittal.

4.11 Design Report

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

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

The design notes, data, and computations shall be recorded on size 8½"x11" sheets, fully titled, numbered, dated, indexed and signed by the designer and the checker. Computer output forms and other oversized sheets shall be folded to 8½"x11" size. The data shall be in a hardback folder for submittal to the DEPARTMENT.

4.12 Quantities

The CONSULTANT shall prepare all required summary of quantities sheets. This includes all efforts required to develop accurate quantities and the supporting documentation, including construction days when required.

4.13 Cost Estimate

4.14 Technical Special Provisions

4.15 Other Roadway Analysis

4.16 Field Reviews

4.17 Technical Meetings

4.18 Quality Assurance/Quality Control

4.19 Independent Peer Review (Not applicable to this project)

4.20 Supervision

4.21 Coordination

5 ROADWAY PLANS (On applicable Task Work Orders)

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

5.1 Key Sheet

5.2 Summary of Pay Items Including Quantity Input

5.3 Drainage Map (Including Interchanges)

5.4 Typical Section Sheets

5.4.1 Typical Sections

5.4.2 Typical Section Details

5.5 General Notes/Pay Item Notes

5.6 Summary of Quantities

5.7 Box Culvert Data Sheet

5.8 Bridge Hydraulics Recommendation Sheets

5.9 Summary of Drainage Structures

5.10 Optional Pipe/Culvert Material

5.11 Project Layout

5.12 Plan/Profile Sheet

5.13 Profile Sheet

5.14 Plan Sheet

5.15 Special Profile

5.16 Back-of-Sidewalk Profile Sheet

5.17 Interchange Layout Sheet

5.18 Ramp Terminal Details (Plan View)

5.19 Intersection Layout Details

5.20 Special Details

5.21 Drainage Structure Sheet (Per Structure)

5.22 Miscellaneous Drainage Detail Sheets

5.23 Lateral Ditch Plan/Profile

5.24 Lateral Ditch Cross Sections

5.25 Retention/Detention Ponds Detail Sheet

5.26 Retention Pond Cross Sections

5.27 Cross-Section Pattern Sheet

5.28 Roadway Soil Survey Sheet

5.29 Cross Sections

5.30 Temporary Traffic Control Plan Sheets

5.31 Temporary Traffic Control Cross Section Sheets

5.32 Temporary Traffic Control Detail Sheets

5.33 Utility Adjustment Sheets

5.34 Selective Clearing and Grubbing

5.35 Erosion Control Plan

5.36 SWPPP

5.37 Project Network Control Sheet

5.38 Environmental Detail Sheets

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

5.39 Utility Verification Sheet (SUE Data)

5.40 Quality Assurance/Quality Control

5.41 Supervision

6 DRAINAGE ANALYSIS (On applicable Task Work Orders)

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:

6.1 Determine Base Clearance Water Elevation

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

6.2 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.

6.3 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.

6.4 Design of Ditches

Design roadway conveyance and outfall ditches. This includes determining ditch cross sections, grades, selecting suitable channel lining, designing the side drain pipes, and documentation. (Design of linear stormwater management facilities in separate task.)

6.5 Design of Stormwater Management Facility (Offsite or Infield Pond)

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

6.6 Design of Stormwater Management Facility (Roadside Ditch as Linear Pond)

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

6.7 Design of Flood Plain Compensation

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

6.8 Design of Storm Drains

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

6.9 Optional Culvert Material

Determine acceptable options for pipe materials.

6.10 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.

6.11 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.

6.12 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.

6.13 Bridge Hydraulic Report

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

6.14 Temporary Drainage Analysis

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

6.15 Cost Estimate

6.16 Technical Special Provisions

6.17 Other Drainage Analysis

6.18 Field Reviews

6.19 Technical Meetings

6.20 Quality Assurance/Quality Control

6.21 Independent Peer Review (Not applicable to this project)

6.22 Supervision

6.23 Coordination

7 UTILITIES (On applicable Task Work Orders)

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

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. 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.

7.3 Make Utility Contacts

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

Second Contact: At a minimum of 4 weeks prior to the meeting, the CONSULTANT shall transmit two complete sets of Constructability Phase plans and the Utility Conflict Matrix (when applicable) to each UAO having facilities located within the project limits, and one set to the DEPARTMENT Offices as required by the District.

Third Contact: Identify agreements and assemble packages. The Consultant shall send agreements, letters, the Utility Conflict Matrix (when applicable) and two sets of plans to the UAO(s) including all component sets, one set for the utility office, one set to construction and maintenance if required. Include the design schedule.

Not all projects will have all contacts as described above.

7.4 Exception Processing

The CONSULTANT shall be responsible for transmitting/coordinating the appropriate design reports including, but not limited to, the Resurfacing, Restoration

and Rehabilitation (RRR) report, Preliminary Engineering Report, Project Scope and/or the Concept Report (if applicable) to each UAO to identify any condition that may require a Utility Exception. The CONSULTANT shall identify and communicate to the UAO any facilities in conflict with their location or project schedule. The CONSULTANT shall assist with the processing of design exceptions involving Utilities with the UAO and the DEPARTMENT. Assist with processing per the UAM.

7.5 Preliminary Utility Meeting

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

7.6 Individual/Field Meetings

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

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

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

7.8 Subordination of Easements Coordination

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

7.9 Utility Design Meeting

At a minimum of 4 weeks prior to the meeting, the CONSULTANT shall transmit two complete sets of contract plans to each UAO having facilities located within the

project limits, and one set to the DEPARTMENT Offices as required by the District. The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s) *no later than six weeks before the Constructability Phase submittal.* The CONSULTANT shall be prepared to discuss drainage, traffic signalization, maintenance of traffic (construction phasing), review the current design schedule and letting date, evaluate the utility information collected, provide follow-up information on compensable property rights from 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 maintenance of traffic with each UAO. The intent of this meeting shall be to assist the UAOs in identifying and resolving conflicts between utilities and proposed construction before completion of the plans, including utility adjustment details. Also to work with the UAOs to recommend potential resolution between known utility conflicts with proposed construction plans as may deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.7 (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 with the DUO the programming of necessary Work Program funds. *The Utility Coordinator/EOR is responsible for providing documented QC/QA to be submitted with each utility deliverable. This is to consist of written review comments with resolution.*

7.11 Utility Coordination/Follow-up

The CONSULTANT shall provide utility coordination and follow up. This includes follow-up, interpreting plans, and assisting the UAOs with completion of their work schedules and agreements. Includes phone calls, face-to-face meetings, etc., to motivate and ensure the UAO(s) complete and return the required documents in accordance with the project schedule. Ensure the resolution of all known conflicts. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees. This task can be applied to all phases of the project, *but no later than six (6) weeks prior to the Bidability Phase submittal.*

7.12 Utility Constructability Review

The CONSULTANT shall review utility schedules against construction contract time, and phasing for compatibility. Coordinate with and obtain written concurrence from the construction office. See Task 4.7 (Cross Section Design Files) for utility conflict identification and adjustments. *Once all Utility Work Schedules are*

received, some form of scheduling tool that shows the relationship of the Utility Work Schedules to each other and to the construction schedule shall be provided to the DEPARTMENT's Project Manager, the District Utilities Office, and the District Construction Office no later than four (4) weeks prior to the Bidability Phase submittal.

7.13 Additional Utility Services

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

7.14 Processing Utility Work by Highway Contractor (UWHC)

This includes coordination of utility design effort between the DEPARTMENT and the UAO(s). The CONSULTANT shall conduct additional coordination meetings, prepare and process the agreements, review tabulation of quantities, perform UWHC constructability and bidability review, review pay items, cost estimates and Technical Special Provisions (TSP) prepared by the UAO. This does not include utility the utility design effort. This item is not usually included in the scope at the time of negotiation. It is normally added as a supplemental agreement when the need is identified. Effort for the EOR is not included in this task, see Roadway Analysis Task Group 4.

7.15 Contract Plans to UAO(s)

If requested by the District, the CONSULTANT shall transmit the contract plans as processed for letting to the UAO(s). Transmittals to UAO(s) 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 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, COMPLIANCE AND CLEARANCES (*On applicable Task Work Orders)*

The CONSULTANT shall notify the DEPARTMENT Project Manager, Environmental Permit Coordinator and other appropriate personnel in advance of all scheduled meetings with the regulatory agencies to allow a DEPARTMENT representative to attend. The CONSULTANT shall copy in the Project Manager and the Environmental Permit Coordinator on all permit related correspondence and meetings.

8.1 Preliminary Project Research

The CONSULTANT shall perform preliminary project research and shall be responsible for early identification of and coordination with the appropriate regulatory agencies to assure that design efforts are properly directed toward permit requirements.

8.2 Complete Permit Involvement Form *(PIF) and Permits Required Memo (PRM)*

The CONSULTANT shall document proposed construction activities that may impact permit involvement by completing the Permit Involvement Form (PIF). Based on the data enumerated in the PIF, the CONSULTANT shall notify the DEPARTMENT's Project Manager and the DEPARTMENT's District Drainage Office of the permits planned for acquisition via the Permits Required Memorandum (PRM). The PIF and the PRM shall be submitted together to the DEPARTMENT's Project Manager and the DEPARTMENT's District Drainage Office at the Initial Engineering Phase submittal. When a subsequent change in project scope affecting the information provided on the PIF and/or the PRM occurs the CONSULTANT shall prepare and submit a revised PIF and/or PRM.

8.3 Field Work

8.3.1 Pond Site Alternatives:
The CONSULTANT shall review alternative pond sites as directed by the DEPARTMENT.

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

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

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

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

- Prepare aerial maps showing the jurisdictional boundaries of wetlands and surface waters. Aerial maps shall be reproducible, of a scale no greater than 1"=200' and be recent photography. The maps shall show the jurisdictional limits of each agency. Xerox copies of aerials are not acceptable. All jurisdictional boundaries are to be tied to the project's baseline of survey. When necessary, a survey will be prepared by a registered surveyor and mapper.
- Prepare a written assessment of the current condition and relative value of the function being performed by wetlands and surface waters. Prepare data in tabular form which includes the ID number for each wetland impacted, size of wetland to be impacted, type of impact and identify any wetland within the project limits that will not be impacted by the project. Prepare appropriate Agency Forms.

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

8.3.4 Archeological Surveys:
The CONSULTANT shall conduct Archeological field surveys as required, in accordance with Part 2, Chapter 12 of the PD&E Manual.

8.4 Agency Verification of Wetland Data

The CONSULTANT shall be responsible for verification of wetland data identified in Section 8.3 and coordinating regulatory agency field reviews, including finalization of wetland assessments with applicable agencies.

8.5 Complete and Submit All Required Permit Applications

The CONSULTANT shall prepare permit packages as identified in the Project Description section.

The CONSULTANT shall collect all of the data and information necessary to obtain the environmental permits required to construct a project. The CONSULTANT will complete field survey or agency required forms (such as the US Army Corps of Engineers (USACE) "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; UMAMs and/or project specific data forms, as required) for use in Permit Applications.

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

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

8.6 Prepare Dredge and Fill Sketches (as needed)

8.7 Prepare USCG Permit Sketches (as needed)

8.8 Prepare Water Management District Right of Way Occupancy Sketches

8.9 Prepare Coastal Construction Control Line (CCCL) Permit Application

8.10 Prepare Tree Permit Information

8.11 Mitigation Design

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

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

The CONSULTANT will be directed by the DEPARTMENT to investigate the following methods of mitigation:

- Payment to DEP/WMD per acre of wetlands impacted as defined in Section 373.4137, F.S.
- Monetary participation in offsite regional mitigation plans
- Monetary participation in a private mitigation bank
- Creation/restoration on public lands
- Creation/restoration on right of way purchased by the DEPARTMENT
- Creation/restoration on existing DEPARTMENT right of way

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

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

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

8.12 Mitigation Coordination and Meetings

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

8.13 Other Environmental Permits

Environmental Clearances, Reevaluations and Technical Support

8.14 Technical Support to Department for Environmental Clearances and Re-evaluations

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

8.14.1 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 reevaluation by the DEPARTMENT. The preparation of all environmental reevaluations on major projects include the following types of reevaluations as listed in Chapter 11, Part I of the DEPARTMENT's Project Development & Environment Manual: Preliminary Engineering, Right of Way, Design Change, and Construction Advertisement Reevaluations.

In particular, design change reevaluations are required when any design proposal that significantly changes the intent of the existing approved National Environmental Policy Act (NEPA) document. Commitments made in the approved NEPA document shall be honored by the CONSULTANT. A technical memorandum identifying the commitments and how they were addressed shall be submitted to the District Environmental Administrator by the CONSULTANT for incorporation into the reevaluation.

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

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.

The DEPARTMENT District's Planning and Environmental Management Office will coordinate with the DEPARTMENT's Project Manager and the CONSULTANT on the pond siting information necessary for the re-evaluation. The DEPARTMENT

District's Planning and Environmental Management Office shall prepare clearances for all pond and/or mitigation sites that were not identified or have been modified since the Project Development and Environment (PD&E) Study.

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

8.14.3 Wetland Impact Analysis: The CONSULTANT shall provide technical information to the Districts Project Manager necessary to analyze the impacts to wetlands due to changes in the project.

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

8.14.5 Wildlife and Habitat Impact Analysis: The CONSULTANT shall provide technical information to the Districts Project Manager necessary to analyze the impacts to all wildlife and habitat due to changes in the project.

8.14.6 Section 7 or Section 10 Consultation: The CONSULTATANT shall provide technical information to the District's Project Manager necessary to complete a Section 7 or Section 10 Consultation as applicable.

8.15 Preparation of Environmental Clearances and Reevaluations (Not applicable for this project)

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

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

8.15.2 Archaeological and Historical Features: The CONSULTANT shall collect data necessary to completely analyze the impacts, due to changes in the project or project area, to all cultural and historic resources, and prepare a Cultural Resource Assessment Request Package, in accordance with Part 2, Chapter 12 of the PD&E Manual.

8.15.3 Wetland Impact Analysis: The CONSULTANT shall analyze the impacts to wetlands for the changes to the project and complete the Wetlands Evaluation Report, in accordance with Part 2, Chapters 11 and 18 of the PD&E Manual.

8.15.4 Wildlife and Habitat Impact Analysis: The CONSULTANT shall collect data necessary and perform an Endangered Species Biological Assessment, and analyze the impacts to wildlife and habitat by the changes to the project, in

accordance with Part 2, Chapter 27 of the PD&E Manual.

8.15.5 Section 7 or Section 10 Consultation: The CONSULTATANT shall perform the necessary analysis to complete a Section 7 or Section 10 Consultation as applicable.

8.16 Contamination Impact Analysis

The CONSULTANT shall perform the necessary analysis to complete the Contamination Screening Evaluation for any changes to the project and complete the Contamination Screening Evaluation Report as described in Part 2, Chapter 22, of the PD&E Manual.

8.17 Asbestos Survey

The CONSULTANT shall secure the services of a Florida Licensed Asbestos Consultant to perform a comprehensive Asbestos Containing Materials (ACM) survey of all bridges on the project. The survey shall include sampling of all suspect ACM. In the event that ACM is found on the bridge, the CONSULTANT shall prepare (in coordination with the DEPARTMENT's District Asbestos Coordinator) plans, specifications, general notes, pay item notes and an Operation and Maintenance (O&M) plan for any asbestos to remain in place. The CONSULTANT shall submit four (4) hard copies and one (1) electronic copy of the final ACM survey, and the required copies of any additional supporting documents, to the DEPARTMENT's Project Manager and to the District Asbestos Coordinator at the time of the Initial Engineering Phase submittal.

8.18 Technical Meetings

8.19 Quality Assurance/Quality Control

8.20 Supervision

8.21 Coordination

9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS (*On applicable Task Work Orders)*

The CONSULTANT shall analyze, design, and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.19, 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 2.19, Provisions for Work. Contract documents shall display economical solutions for the given conditions.

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

9.1 Key Sheet and Index of Drawings

9.2 Project Layout

9.3 General Notes and Bid Item Notes

9.4 Miscellaneous Common Details

9.5 Incorporate Report of Core Borings

9.6 Existing Bridge Plans

9.7 Assemble Plan Summary Boxes and Quantities

9.8 Cost Estimate

9.9 Technical Special Provisions

9.10 Field Reviews

9.11 Technical Meetings

9.12 Quality Assurance/Quality Control

9.13 Independent Peer Review (Not applicable for this project)

9.14 Supervision

9.15 Coordination

10 STRUCTURES - BRIDGE DEVELOPMENT REPORT (Not applicable for this project)

11 STRUCTURES - TEMPORARY BRIDGE (Not applicable for this project)

12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE (Not applicable for this project)

13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE (Not applicable for this project)

14 STRUCTURES - STRUCTURAL STEEL BRIDGE (Not applicable for this project)

15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE (Not applicable for this project)

16 STRUCTURES - MOVABLE SPAN (Not applicable for this project)

17 STRUCTURES - RETAINING WALLS (Not applicable for this project)

18 STRUCTURES - MISCELLANEOUS (*On applicable Task Work Orders)*

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

Concrete Box Culverts

18.1 Concrete Box Culverts

18.2 Concrete Box Culverts Extensions

Strain Poles

18.3 Steel Strain Poles

18.4 Concrete Strain Poles

Mast Arms

18.5 Mast Arms

Overhead/Cantilever Sign Structure

18.6 Cantilever Sign Structures

18.7 Overhead Span Sign Structures

18.8 Special (Long Span) Overhead Sign Structures

18.9 Monotube Overhead Sign Structure

18.10 Bridge Mounted Signs (Attached to Superstructure)

High Mast Lighting

18.11 Non-Standard High Mast Lighting Structures

Noise Barrier Walls (Ground Mount)

18.12 Horizontal Wall Geometry

18.13 Vertical Wall Geometry

18.14 Summary of Quantities – Aesthetic Requirements

18.15 Control Drawings

18.16 Design of Noise Barrier Walls Covered by Standards

18.17 Design of Noise Barrier Walls not Covered by Standards

18.18 Aesthetic Details

Special Structures

18.19 Fender System

18.20 Fender System Access

18.21 Special Structures

18.22 Other Structures

19 SIGNING AND PAVEMENT MARKING ANALYSIS (*On applicable Task Work Orders)*

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.

19.3 Reference and Master Design File

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

19.4 Multi-Post Sign Support Calculations

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

19.5 Sign Panel Design Analysis

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

19.6 Sign Lighting/Electrical Calculations

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

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

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

19.7 Quantities

19.8 Cost Estimate

19.9 Technical Special Provisions

19.10 Other Signing and Pavement Marking Analysis

19.11 Field Reviews

19.12 Technical Meetings

19.13 Quality Assurance/Quality Control

19.14 Independent Peer Review (Not applicable for this project)

19.15 Supervision

19.16 Coordination

20 SIGNING AND PAVEMENT MARKING PLANS (*On applicable Task Work Orders)*

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

20.1 Key Sheet

20.2 Summary of Pay Items Including TRNS*Port Input

20.3 Tabulation of Quantities

20.4 General Notes/Pay Item Notes

20.5 Project Layout

20.6 Plan Sheet

20.7 Typical Details

20.8 Guide Sign Work Sheet(s)

20.9 Traffic Monitoring Site

20.10 Cross Sections

20.11 Special Service Point Details

20.12 Special Details

20.13 Interim Standards (Not applicable for this project)

20.14 Quality Assurance/Quality Control

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

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

20.15 Supervision

21 SIGNALIZATION ANALYSIS *(On applicable Task Work Orders)*

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

21.1 Traffic Data Collection

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

21.2 Traffic Data Analysis

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

21.3 Signal Warrant Study

21.4 Systems Timings

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

21.5 Reference and Master Signalization Design File

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

21.6 Reference and Master Interconnect Communication Design File

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

21.7 Overhead Street Name Sign Design

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

21.8 Pole Elevation Analysis

21.9 Traffic Signal Operation Report

(As defined by the District)

21.10 Quantities

21.11 Cost Estimate

21.12 Technical Special Provisions

21.13 Other Signalization Analysis

21.14 Field Reviews

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

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

21.15 Technical Meetings

21.16 Quality Assurance/Quality Control

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

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

21.17 Independent Peer Review (Not applicable for this project)

21.18 Supervision

21.19 Coordination

22 SIGNALIZATION PLANS *(On applicable Task Work Orders)*

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

22.1 Key Sheet

22.2 Summary of Pay Items Including TRNS*Port Input

22.3 Tabulation of Quantities

22.4 General Notes/Pay Item Notes

22.5 Plan Sheet

22.6 Interconnect Plans

22.7 Traffic Monitoring Site

22.8 Guide Sign Worksheet

22.9 Special Details

22.10 Special Service Point Details

22.11 Mast Arm/Monotube Tabulation Sheet

22.12 Strain Pole Schedule

22.13 TCP Signal (Temporary)

22.14 Temporary Detection Sheet

22.15 Utility Conflict Sheet

22.16 Interim Standards

22.17 Quality Assurance/Quality Control

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

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

documented to verify that the required procedures were followed. The Quality Control Plan may be one utilized by the CONSULTANT as part of their normal operation or it may be one specifically designed for this project.

22.18 Supervision

23 LIGHTING ANALYSIS *(On applicable Task Work Orders)*

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

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

23.2 Lighting Design Analysis Report

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

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

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

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

Voltage drop calculations

Load analysis calculations for each branch circuit

23.3 Aeronautical Evaluation

The CONSULTANT shall prepare an Aeronautical Evaluation/Airspace Analysis Report for those projects within *a distance* of an airport *defined by the DEPARTMENT*. It shall be submitted for approval by the DEPARTMENT and by FAA prior to Constructability Phase plans submittal.

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

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

23.4 Voltage Drop Calculations

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

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

23.5 FDEP Coordination and Report

23.6 Reference and Master Design Files

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

23.7 Temporary Lighting

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

23.8 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:

Lighting Calculations

- Back up sheet for each bid item quantity total on each lighting plan sheet (*Bidability Phase* and *Production Phase* submittals).
- Phase submittal checklist.
- Three-way quantity check list (*Bidability Phase* and Production submittals).
- Structural calculations for special conventional pole concrete foundations.
- Structural calculations for the high mast pole foundations.
- Correspondence with the power company concerning new electrical service.
- Power company confirmation letter on the requested services (*Bidability Phase* and *Production Phase* submittals).
- Voltage drop calculations (*Bidability Phase* and *Production Phase* submittals).
- Load analysis calculations (*Bidability Phase* and *Production Phase* submittals).

23.9 Quantities

23.10 Cost Estimate

23.11 Technical Special Provisions

23.12 Other Lighting Analysis

23.13 Field Reviews

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

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

23.14 Technical Meetings

23.15 Quality Assurance/Quality Control

23.16 Independent Peer Review (Not applicable for this project)

23.17 Supervision

23.18 Coordination

24 LIGHTING PLANS *(On applicable Task Work Orders)*

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

24.1 Key Sheet

24.2 Summary of Pay Item Sheet Including TRNS*Port Input

24.3 Tabulation of Quantities

24.4 General Notes/Pay Item Notes

24.5 Pole Data, Legend & Criteria

24.6 Service Point Details

24.7 Project Layout

24.8 Plan Sheet

24.9 Special Details

24.10 Temporary Lighting Data and Details

24.11 Traffic Control Plan Sheets

24.12 Interim Standards (Not applicable for this project)

24.13 Quality Assurance/Quality Control

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

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

24.14 Supervision

25 LANDSCAPE ARCHITECTURE ANALYSIS (*On applicable Task Work Orders)*

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

25.1 Data Collection

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

25.2 Site Inventory and Analysis

Includes identification of opportunities and constraints for the proposed project based on existing site conditions. Summary of analysis, if required, is included in conceptual design.

25.3 Planting Design

Conceptual Design: Includes delineation of all proposed planting types, scheme development and preliminary costs, and areas and reports. The design shall be submitted with the Initial Engineering Phase plans.

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

25.4 Irrigation Design

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

Conceptual Design: Typically not done in master design file. Includes determination of water and power sources. Initial Engineering Phase design level.

Final 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.

25.5 Hardscape Design

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

Final Design: Includes all work in master design files. Hardscape Design includes, but is not limited to, sidewalks, plazas, Steps, Fountains, Walls, Pedestrian bridges, non-regulatory signs or project graphics, roadway aesthetics, site furnishings *and specialty surfacing: concrete pavers, stamped concrete or stamped asphalt.*

25.6 Plan Summary Boxes

25.7 Cost Estimates

25.8 Technical Special Provisions

25.9 Other Landscape Architecture

25.10 Outdoor Advertising

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

25.11 Field Reviews

25.12 Technical Meetings

25.13 Quality Assurance/Quality Control

25.14 Independent Peer Review (Not applicable for this project)

25.15 Supervision

25.16 Coordination

26 LANDSCAPE ARCHITECTURE PLANS

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

26.1 Key Sheet

26.2 Tabulation of Quantities

26.3 General Notes

26.4 Tree and Vegetation Inventory, Protection and Relocation Plans

26.5 Planting Plans for Linear Roadway Projects

26.6 Planting Plans (Interchanges and Toll Plazas)

26.7 Planting Details and Notes

The CONSULTANT shall include a written or graphic guide for care and maintenance of the irrigation system after the warranty period. This Maintenance Plan will be developed in *performance based language and will be in* coordination with the local government entity who assumes the maintenance obligation.

26.8 Irrigation Plans for Linear Roadway Project

26.9 Irrigation Plans for Interchange and Toll Plazas

26.10 Irrigation Details and Notes

The CONSULTANT shall include a written plan for care and maintenance of the irrigation system after the warranty period. This Maintenance Plan will be developed in performance based language and will be in coordination with the local government entity who assumes the maintenance obligation.

26.11 Hardscape Plans

26.12 Hardscape Details and Notes

26.13 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 will be developed in performance based language and will be in coordination with the local government entity who assumes the maintenance obligation.

26.14 Cost Estimate

26.15 Quality Assurance/Quality Control

26.16 Supervision

27 SURVEY *(On applicable Task Work Orders)*

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 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.

Total station equipment used shall be compatible with the DEPARTMENT's Electronic Field Book processing standards. Data for review must be delivered on disk for input into the DEPARTMENT'S Electronic Field Book Software.

All work shall be accomplished in accordance with the criteria established by the Departments Highway Field Specifications, Survey Handbook (Survey Procedure Topic No. 550-030-101a) (Chapter 20, sec 23 (3)(a), F.S.),CADD Production Criteria Handbook and must comply with the Minimum Technical Standards for Land Surveyors Rule 61G17-6 F.A.C., Florida Statue 472.027, the latest's addition of the DEPARTMENT's Survey Standards and Guidelines and any special instructions.

The surveyor shall comply at all times with applicable Federal, State, local laws and provisions and policies governing safety and health. This includes Title 29, Code of Federal regulations, Parts 1910 and 1976, Occupational safety and Health Regulations, including any subsequent revisions and updates. In order to conduct the public through the work area, full compliance with the current Department Roadway and Traffic Design Standards (600 Series), Survey Safety Handbook and current Maintenance of Traffic Training D.O.T. Topic No.625-010-010-a is a minimum requirement.

It will be the aerial firm's responsibility, not the surveyors, to walk the project identifying and locating any missing items and describing the items such as sanitary sewer manholes, FPL manholes, etc. marking all of this information on the check plots. Then the surveyor can take those check plots and locate the missing items marked on the plots that the aerial cannot locate.

At the completion of all survey and aerial work it is the responsibility of the CONSULTANT to furnish to the DEPARTMENT's District Survey Office one CD or DVD with all the

surveying and mapping information (GPS, topography, digital terrain model, project network control, target control, XYZ etc.) with exception of Raster Images, signed in the DEPARTMENT's Professional's Electronic Data Delivery System (PEDDS) by the Surveyor and Aerial Mapper with one hard copy of the PEDDS document.

Also, a Surveying and Mapping Report must accompany all of the above information along with an electronic copy of the report placed on the electronic information (file) supplied to the DEPARTMENT.

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. *The Horizontal Datum to be used is NAD 1983/1990. The primary control points must be set near or outside the R/W Lines. The minimum distance between primary control points is 2000 feet and the maximum distance is 3000 feet. The primary control points must, also be inter-visible between each other. Concrete monuments with discs will be used for primary control. All concrete monuments must have a steel rod placed in the concrete for location purposes. Iron rods with caps will be used for secondary control. The Consultant must supply FDOT approved discs, field books and other required items. The Department will supply the stamping information for the disks. The field books must be delivered to the Department first so that they can be numbered correctly.* Includes analysis and processing of all field collected data, and preparation of forms.

27.2 Vertical Project Control (VPC)

Establish or recover VCP, for the purpose of establishing vertical control on datum approved by the District Surveyor (DS); *will* include primary or secondary vertical control points. *The Vertical Datum to be used is the NAVD 1988. All concrete monuments must have a steel rod placed in the concrete for location purposes. The primary vertical control points must be set outside the limits of construction, at no greater than 1000 feet intervals.* 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

Compute the Historic Baseline of Survey on the Project. These lines must be placed in the TOPO file, PNC sheet and the survey database. 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. In areas where it is apparent that roadway improvements are outside the computed existing R/W lines the surveyor set up a meeting to discuss this with the Project Manager. If reconstruction is to take place in these areas then R/W Reports will be ordered and plotted to verify the existing R/W. Prior to stationing or

use of the project alignment, it must be approved in writing by the District IV Survey Office.

The Historical Baseline will not be staked in the field on this Project.

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 (Not applicable for this project)

27.10 Underground Utilities

First, the quadrants will be designated; then each utility will be potholed to identify where the utility enters and exits the quadrant, the depth, size, material and owner. Only the pot holes will be surveyed in and be accompanied by a station offset report, along with an electronic drawing file identifying the horizontal location of the potholes, depth of cover, ground elevation, owner and where and how the utility lines pass through the quadrant. This information will be supplied to the designer, signed and sealed by the surveyor and they (the designer) will determine where the contractor will place the new pole for the mast arm. A CD or DVD with the Surveyors Report, station and offset report and the electronic drawing file, signed in PEDD's will be delivered to the DEPARTMENT for review and filing.

Includes analysis and processing of all field collected data, and delivery of all appropriate electronic files.

Perform test holes per the latest Subsurface Utility Exploration (SUE) Guidelines dated 1/9/08 for designating and locating.

Location (Level A as described in the DEPARTMENT's Plans Preparation Manual and Utility Accommodations Manual) includes non-destructive excavation to determine size, type and location of existing utility, as necessary for final 3-dimensional verification. Designation (Level B as described in the DEPARTMENT's Plans Preparation Manual and Utility Accommodations Manual) includes 2-dimensional collection of existing utilities and selected 3-dimensional verification as needed for designation

All final SUE deliveries must be an electronic drawing file showing the horizontal location of all designates and horizontal and vertical locations of all locates along with the owners name depth of cover, ground elevation and where and how the utility lines pass through the quadrant on a CD or on a DVD with the Surveyor's Report along with any other information needed, supplied to the Department for final delivery. The CD or DVD must be created using the DEPARTMENT's Professional's Electronic Data Delivery System and delivered to the District Survey Office along with all PEDDs documents for **all** SUE work

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) (Not applicable for this project)

27.14 Channel Survey (Not applicable for this project)

27.15 Pond Site Survey (Not applicable for this project)

27.16 Mitigation Survey (Not applicable for this project)

27.17 Jurisdiction Line Survey

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

27.18 Geotechnical Support

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

27.19 Sectional/Grant Survey (Not applicable for this project)

27.20 Subdivision Location (Not applicable for this project)

27.21 Maintained R/W

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

27.22 Boundary Survey

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

27.23 Water Boundary Survey

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

27.24 Right of Way Staking, Parcel / Right of Way Line (Not applicable for this project)

27.25 Right of Way Monumentation (Not applicable for this project)

27.26 Line Cutting (Not applicable for this project)

27.27 Work Zone Safety (Not applicable for this project)

27.28 Miscellaneous Surveys (Not applicable for this project)

27.29 Supplemental Surveys (Not applicable for this project)

27.30 Document Research

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

27.31 Field Review

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

27.32 Technical Meetings

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

27.33 Quality Assurance/Quality Control (QA/QC)

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

27.34 Supervision

Perform all activities required to supervise and coordinate 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.

27.35 Coordination

Coordinate survey activities with other disciplines. Unit is based on 3 percent of office support hours from tasks 1 through 28, where applicable. These activities must be performed by the project supervisor, a Florida P.S.M. or their delegate as approved by the District Surveying Office.

28 PHOTOGRAMMETRY *(On applicable Task Work Orders)*

Provide aerial planimetrics to be used for 1"=40' scale mapping from the Beginning of Survey to the End of Survey. Extend the aerial planimetrics from 25' north of the North R/W Line of to 25' south of the South R/W Line.

Provide aerial planimetrics to be used for 1"=40' scale mapping from 500' north and south on all Side Streets within the project limits. Extend the aerial planimetrics from 25' west of the West R/W Line of each Side Street to 25' east of the East R/W Line of each Side Street.

Perform a DTM using LAMP from the Beginning of Survey to the End of Survey. Extend the DTM from 25' north of the North R/W Line to 25' south of the South R/W Line.

Perform a DTM using LAMP from 500' north and south on all Side Streets within the Project. Extend the DTM from 25' west of the West R/W Line of each Side Street to 25' east of the East R/W Line of each Side Street.

Hard surfaces only will be accepted when using the LAMP. Grass areas must be ground surveyed. Effort includes field edits, analysis and processing of all field collected data, existing maps, and/or reports.

NOTE: All hard surfaces DTM'S will be performed by the aerial firm and all ground DTM'S will be performed by the ground surveyor. The Ground DTM'S include grass areas and obscured areas on hard surfaces.

NOTE: All LAMP DTM and cross sections along with ground survey DTM information must be merged together by the aerial firm and delivered as one file to the Prime and the Survey Department along with a Mapper's Report and a PEDD'S signature.

Rasters in color are requested on from the Beginning of Survey to the End of Survey. Extend the rasters from 500 north of the centerline to 500' south of the centerline .

It will be the responsibility of the aerial firm to merge all survey and aerial data.

A flight plan must be delivered along with the cost/staff hours.

Submit two CDs or DVDs and two copies of all the FGDC Compliant Metadata to the District Survey Office prior to the Initial Engineering submittal.

Furnish both TIFF and HMR files.

Submit all the original film/digital images to the District Survey Office along with a flight plan, scale, date of photography, calibration report, make of camera, and all control (X,Y & Z) used to control the photography along with a Surveying report for the targets when the aerial firm has completed their work.

The CONSULTANT shall perform photogrammetric tasks in accordance with all applicable

statues, manuals, guidelines, standards, handbooks, procedures, and current design memoranda.

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

28.1 Flight Preparation

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

28.2 Control Point Coordination

Determine photo identifiable control points, and mark contact prints.

28.3 Mobilization

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

28.4 Flight Operations

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

28.5 Film Processing

Process, check, and annotate the aerial film.

28.6 Photo Products

Prepare contact prints, contact diapositives, and photo enlargements.

28.7 Scanning

Scan photographic images.

28.8 LiDAR

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

28.9 Aerial Triangulation

Measure and adjust control within aerial images.

28.10 Surfaces (Not applicable for this project)

28.11 Ortho Generation (Not applicable for this project)

28.12 Rectified Digital Imagery (Georeferenced) (Not applicable for this project)

28.13 Mosaicking (Not applicable for this project)

28.14 Sheet Clipping

Create plot files for sheets from the database.

28.15 Topographics (3D)

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

28.16 Planimetrics (2D) (Not applicable for this project)

28.17 Drainage Basin

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

28.18 CADD Edit

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

28.19 Data Merging

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

28.20 Miscellaneous

Other tasks not specifically addressed in this document.

28.21 Field Review

Perform on site review of maps.

28.22 Technical Meetings

Attend meetings as required.

28.23 Quality Assurance/Quality Control

Establish and implement a QA/QC plan.

28.24 Supervision

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

28.25 Coordination

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

29 MAPPING *(On applicable Task Work Orders)*

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

Master CADD File

29.1 Alignment

29.2 Section and 1/4 Section Lines

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

29.8 Limits of Construction

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

29.9 Jurisdictional/Agency Lines

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

Sheet Files

29.10 Control Survey Cover Sheet

29.11 Control Survey Key Sheet

29.12 Control Survey Detail Sheet

29.13 Right of Way Map Cover Sheet

29.14 Right of Way Map Key Sheet

29.15 Right of Way Map Detail Sheet

29.16 Maintenance Map Cover Sheet

29.17 Maintenance Map Key Sheet

29.18 Maintenance Map Detail Sheet

29.19 Reference Point Sheet

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

29.20 Project Network 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.

The Project Network Control Sheet will be used primarily with the construction plans and thus must be legible when plotted on an 11’ X 17” paper. The CONSULTANT shall contact the DEPARTMENT District Surveyor if the electronic drawing cell and the requirements for the Project Network Control Sheet are needed.

Final delivery of one CD or DVD containing an electronic drawing file and post script file shall be submitted to the DEPARTMENT. The electronic drawing file must be secured and the post script file certified.

29.21 Table of Ownerships Sheet

Miscellaneous Surveys and Sketches

29.22 Parcel Sketches

29.23 TIITF Sketches

29.24 Other Specific Purpose Survey(s)

29.25 Boundary Survey(s) Map

29.26 Right of Way Monumentation Map

29.27 Title Search Map

29.28 Title Search Report

29.29 Legal Descriptions

29.30 Final Map/Plans Comparison

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

29.31 Field Reviews

29.32 Technical Meetings

29.33 Quality Assurance/Quality Control

29.34 Supervision

29.35 Coordination

29.36 Supplemental Mapping

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

30 TERRESTRIAL MOBILE LiDAR *(Not applicable on this project)*

31 ARCHITECTURE DEVELOPMENT *(On applicable Task Work Orders)*

INITIAL ENGINEERING PHASE - 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, Initial Engineering Phase (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.
- Deign 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 Initial Engineering Phase 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.
- A letter indicating, the extent of any known or suspected asbestos containing materials or other potentially hazardous materials which might require mitigation by the Owner prior to or during construction of the Project. Establish and confirm responsibility for removing the asbestos or other hazardous materials in the design development documents and coordinate with Project Development Schedule, Statement of Probable Construction Cost and other documentation.
- Preliminary color boards to review two 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.

CONSTRUCTABILITY PHASE - 60% DOCUMENTS:

After written Authorization to Proceed from DEPARTMENT and based on the approved Initial Engineering Phase 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, Constructability Phase (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. Constructability Phase 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 Initial Engineering Phase 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 Constructability Phase 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 print out for all indoor typical indoor spaces and parking lots.
- Convenience outlets and circuiting, special outlets and circuiting, and power systems and equipment. Provide riser diagrams for all electrical systems including master clock,

intercom, fire alarm, ITV, computer networking/telephone. Also, provide for emergency and normal power distribution. Provide light fixture schedule.

- Panel schedule may be in preliminary form but circuitry must be included.
- Applicable installation details.
- General legend and list of abbreviations.
- Voltage drop computations for all main feeders.
- Short circuit analysis
- Provide 1/2" scale floor plan and wall elevations for all electrical rooms.
- Indicate surge protector for main switchboard and electrical panels.

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.

BIDABILITY PHASE - 100% CONSTRUCTION DOCUMENTS SUBMITTAL

After written Authorization to Proceed from DEPARTMENT and based on the approved Constructability Phase 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, Bidability Phase (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. Bidability Phase 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 Bidability Phase 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.

PRODUCTION FINAL CONSTRUCTION DOCUMENTS SUBMITTAL:

After written Authorization to Proceed from DEPARTMENT and based on the approved Bidability Phase 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, Production (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. Production 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 Production 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 Production documents for submission to the DEPARTMENT for review and approval.

Architectural Plans *(On applicable Task Work Orders)*

31.1 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 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 ***(On applicable Task Work Orders)***

31.38 General Notes, Abbreviations, Symbols, and Legend

31.39 Foundation Plan(s) (Small Scale)

31.40 Foundation Plan(s) (Large Scale)

31.41 Slab Plan(s) (Small Scale)

31.42 Slab Plan(s) (Large Scale)

31.43 Slab Placement Plan(s)

31.44 Slab Placement Detail(s)

31.45 Foundation Section(s)

31.46 Foundation Detail(s)

31.47 Slab Section(s)

31.48 Slab Detail(s)

31.49 Roof Framing Plan(s) (Small Scale)

31.50 Roof Framing Plan(s) (Large Scale)

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

31.52 Roof Section(s)

31.53 Roof Detail(s)

31.54 Bearing Wall Section(s)

31.55 Bearing Wall Detail(s)

31.56 Column Section(s)

31.57 Column Detail(s)

31.58 Miscellaneous Sections

31.59 Repetitive Sheets

31.60 Other Pertinent Project Documentation

31.61 Cost Estimate

31.62 Technical Special Provisions Package

31.63 Field Reviews

31.64 Technical Meetings

31.64.1 FDOT

31.64.2 Local Governments (cities)

31.64.3 Local Governments (counties)

31.64.4 Other Meetings

31.64.5 Progress Meetings

31.64.6 Phase Review Meetings

31.65 Quality Assurance/Quality Control

31.66 Independent Peer Review (Not applicable for this project)

31.67 Supervision

Mechanical Plans ***(On applicable Task Work Orders)***

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

31.69 Plan(s) (Small Scale)

31.70 Plan(s) (Large Scale)

31.71 Detail(s)

31.72 Section(s)

31.73 Piping Schematic(s)

31.74 Control Plan(s)

31.75 Schedule(s)

31.76 HVAC Calculations

31.77 Life Cycle Cost Analysis

31.78 Repetitive Sheets

31.79 Other Pertinent Project Documentation

31.80 Cost Estimate

31.81 Technical Special Provisions Package

31.82 Field Reviews

31.83 Technical Meetings

31.83.1 FDOT

31.83.2 Local Governments (cities)

31.83.3 Local Governments (counties)

31.83.4 Other Meetings

31.83.5 Progress Meetings

31.83.6 Phase Review Meetings

31.84 Quality Assurance/Quality Control

31.85 Independent Peer Review (Not applicable for this project)

31.86 Supervision

Plumbing Plans *(On applicable Task Work Orders)*

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

31.88 Plan(s) (Small Scale)

31.89 Plan(s) (Large Scale)

31.90 Isometric(s) (Large Scale)

31.91 Riser Diagram(s)

31.92 Detail(s)

31.93 Repetitive Sheets

31.94 Other Pertinent Project Documentation

31.95 Cost Estimate

31.96 Technical Special Provisions Package

31.97 Field Reviews

31.98 Technical Meetings

31.98.1 FDOT

31.98.2 Local Governments (cities)

31.98.3 Local Governments (counties)

31.98.4 Other Meetings

31.98.5 Progress Meetings

31.98.6 Phase Review Meetings

31.99 Quality Assurance/Quality Control

31.100 Independent Peer Review (Not applicable for this project)

31.101 Supervision

Fire Protection Plans ***(On applicable Task Work Orders)***

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

31.103 Fire Protection Plan

31.104 Riser Diagram, Details, and Partial Plans

31.105 Hydraulic Calculation

31.106 Repetitive Sheets

31.107 Other Pertinent Project Documentation

31.108 Cost Estimate

31.109 Technical Special Provisions Package

31.110 Field Reviews

31.111 Technical Meetings

31.111.1 FDOT

31.111.2 Local Governments (cities)

31.111.3 Local Governments (counties)

31.111.4 Other Meetings

31.111.5 Progress Meetings

31.111.6 Phase Review Meetings

31.112 Quality Assurance/Quality Control

31.113 Independent Peer Review (Not applicable for this project)

31.114 Supervision

Electrical Plans ***(On applicable Task Work Orders)***

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

31.116 Electrical Site Plan

31.117 Lighting Plan(s)

31.118 Lighting Fixtures Schedule(s)

31.119 Lighting Fixtures Detail(s)

31.120 Lightning Protection Plan(s)

31.121 Lightning Protection Details

31.122 Power Plan(s)

31.123 Power Distribution Riser Diagram(s)

31.124 Panel Board Schedule(s)

31.125 Data Plan(s)

31.126 Data Detail(s)

31.127 Communication Plan(s)

31.128 Communication Detail(s)

31.129 Security Alarm System Plan(s)

31.130 Miscellaneous Detail(s)

31.131 Repetitive Sheets

31.132 Energy Analysis

31.133 Other Pertinent Project Documentation

31.134 Cost Estimate

31.135 Technical Special Provisions Package

31.136 Field Reviews

31.137 Technical Meetings

31.137.1 FDOT

31.137.2 Local Governments (cities)

31.137.3 Local Governments (counties)

31.137.4 Other Meetings

31.137.5 Progress Meetings

31.137.6 Phase Review Meetings

31.138 Quality Assurance/Quality Control

31.139 Independent Peer Review (Not applicable for this project)

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 (Not applicable for this project)

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS (*On applicable Task Work Orders)*

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

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

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

33.1 ITS Analysis

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

CCTV camera system shall provide 100 percent coverage of all mainline lanes, entrance and exit ramps, interchanges (includes view of crossing arterials), blind spots (such as those caused due to existing and proposed bridges, existing and

proposed signage, vegetation, and horizontal and vertical curvatures). CCTV cameras shall be spaced to meet the Project requirements, guidance from the ConOps, and as approved by the DEPARTMENT.

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

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 PPM requirements shall be met for DMS locations. DMS locations shall be designed in conjunction with the Project's master signing design. Highway Advisory Radio (HAR) frequency information signs shall be located to meet the Project requirements, guidance from ConOps, and as approved by the DEPARTMENT

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

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

The CONSULTANT shall design the project such that all ITS field devices and ancillary components comply with FDOT's Approved Product List (APL) / Qualified Product List (QPL) and the existing list of devices and components supported within the SunGuide software or other approved software, unless otherwise approved by the DEPARTMENT.

Closed Circuit Television (CCTV) Camera Assembly

The CONSULTANT shall be responsible for the design and exact field locations for the CCTV camera assemblies. The CCTV camera subsystem shall provide full coverage of the roadway network, with overlapping coverage to ensure 100 percent coverage. The typical spacing shall be one mile with verification that there is no visual blockage. Effort should be made to provide viewing in all directions at interchanges. All CCTV camera assemblies shall include a camera lowering device (CLD) at all locations.

The CCTV 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 CCTV 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 CCTV site. The study shall include video of the proposed CCTV location and elevation with respect to the roadway level. The CONSULTANT shall identify the final number and locations of the camera assemblies based on the videography study.

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

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

The CCTV camera assembly shall be approved by the FDOT-TERL and be listed on the APL, as applicable, for use in the State of Florida.

The CCTV camera assembly shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 782.

Traffic Detection Subsystem

The CONSULTANT shall select traffic 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 traffic 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 traffic detection subsystem shall be able to collect and process volume, speed and occupancy data on a lane-by-lane basis for the corridor mainlines, in both directions of travel. If self-calibration feature is not specified, requirements for calibration shall be stated. 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 traffic detection subsystem shall allow for connectivity to the TMC.

The traffic detectors shall perform to meet the Project requirements under all environmental and traffic conditions expected for the corridors. The detectors shall detect volumes, speeds and occupancies for all corridor traffic operation conditions within the specified accuracy including all volume levels, all speed levels and traffic

compositions. Occlusions, other blocking of vehicles and adjacent lanes detection shall not degrade the detection system performance below specified accuracy. Signs, walls, guardrails, and other physical elements in the system shall not have a significant effect on the detection performance. Vibration and shocks shall not affect the performance of the system.

The detector technology / product shall be certified by the FDOT Traffic Engineering Research Lab (TERL) and be on the APL, as applicable, for use in the State of Florida. The traffic detection utilized shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Specification 786.

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 traffic detectors. The detector and associated cabinet locations shall be identified by the CONSULTANT. A detailed site survey shall be conducted by a factory trained and certified representative. The site survey shall be designed to identify the exact locations and details for each detection station.

Travel Time Detection Subsystem

The CONSULTANT shall be responsible for the design of a travel time detection subsystem for the roadway facilities. This travel time detection subsystem will enable the FDOT to capture vehicle travel times between pre-defined nodes. The travel time data shall utilize the project communications backbone in order to collect and distribute travel time data to the TMCs.

The travel time detection subsystem shall utilize the FDOT's SunPass Automatic Vehicle Identification (AVI) transponders that are properly mounted on vehicles traveling along the roadway being monitored or utilize other travel time technologies such as license plate readers (LPR).

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.

The travel time detection system 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.

Highway Advisory Radio Subsystem

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

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

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

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

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

All HAR subsystem functions shall be controllable from the TMC.

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

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

The CONSULTANT shall also be responsible for the design and location of remotely-operated static signs with flashing lights (one sign per direction) to alert motorists in both direction of travel of active HAR broadcasts. The signs shall be located at the outer edges of the transmission zone. The signs shall conform to the

appropriate guide sign guidelines as described in the MUTCD. The signs shall be retro-reflective in accordance with FDOT specifications. Flashing lights (beacons) on top of the signs shall be used to indicate to motorists that an urgent HAR message is being broadcast. The flashing beacons shall be activated from the FDOT's TMC facilities.

The HAR subsystems shall be designed in accordance with the FDOT Specifications for Road and Bridge Construction, Supplemental Specification 781.

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 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 certified by the FDOT TERL and be on the APL, as applicable, for use in the State of Florida

The DMS shall be designed in accordance with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 781.

Roadway Weather Information Systems (RWIS)

The CONSULTANT shall ensure that, each RWIS site consists of:

Remote Processing Unit (RPU);

Fog/Smoke Detection sensor;

Passive Pavement Sensor (PPS);

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 Design/Build Firm shall ensure that the RWIS subsystem shall include all hardware, software, and licenses to operate as follows:

RWIS Central Software including SQL database for the RTMC;

RWIS Central Hardware for RTMC;

Atmospheric sensors shall measure their respective weather parameters and communicate the signals from each to the RPU;

The RPU shall process and temporarily store the output from the pavement sensors and atmospheric sensors;

The RWIS server shall poll each RPU on a scheduled basis via communications telemetry as specified in the design plans. The RPU shall respond to the poll and transfer all of its data to the RWIS server;

All data transfers between the RWIS server and RPUs shall be compliant with the most current Federal and State of Florida standard NTCIP ESS protocols;

The RWIS server system shall store the RWIS data in a standard SQL Server database for access by Department users via SunGuide® software; and,

The RWIS user displays shall include all sensor and forecast data in a browser-based data display format.

The RWIS will comply with the FDOT Standard Specifications Section 781-5.

33.2 Communications Plan

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 Initial Engineering Phase 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 Section 783 of the latest FDOT Standard Specifications for Road and Bridge Construction (online edition).

33.3 Lightning Protection Analysis

The CONSULTANT shall be responsible for a complete and reliable lightning protection system design for each structure and pole and the devices attached therto as well as ITS field device cabinets and communications hubs if not addressed by the FDOT's Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System and the Interim Drawings. The ITS components of the project shall be protected from damage caused by lightning strikes, transient voltage surges, and induced current. The CONSULTANT shall design all grounding, lightning protection, and surge protection in accordance with Underwriters Lab (UL) 96A specifications.

The CONSULTANT shall include surge protection devices for all cables and conductors (power, video, and data). All Project ITS subsystems, devices and ancillary components with electrical interconnects shall be protected from voltage surges caused by lightning, transient voltage surges, and external electromagnetic fields at the time of installation of each device.

The lightning protection system shall be designed in accordance with the latest version of the FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 785.

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 Constructability Phase, III, and IV design submittals. The CONSULTANT shall conduct a short circuit and protection coordination study for the designed power system and document the study as part of the power system design report.

33.5 Voltage Drop Calculations

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

33.6 Design Documentation

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

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

33.7 Existing ITS

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

33.8 Queue Analysis

The CONSULTANT shall perform a queue analysis at high volume interchanges and high frequency conflict / crash locations to determine optimal placement of DMS

using project forecasted traffic volumes. This analysis shall be performed prior to submittal of the Initial Engineering Phase 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 design analysis where DMS is in-laid within a static sign or for HAR signage. Expressway and arterial full size DMS shall not be co-located with other static signs.

33.13 Quantities

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

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 TRNS*PORT for generating the summary of quantities and the FDOT's in-house estimates.

33.15 Technical Special Provisions

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

33.16 Other ITS Analyses

33.17 Field Reviews

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

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

33.18 Technical Meetings

The CONSULTANT shall attend meetings as necessary support the project.

33.19 Quality Assurance / Quality Control

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

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

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

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

33.20 Supervision

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

33.21 Coordination

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

34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS (*On applicable Task Work Orders)*

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

34.1 Key Sheet

The CONSULTANT shall prepare the key sheet in accordance with the latest format depicted in the Plans Preparation Manual.

MUTCD

Standard Specs

Standard Index

34.2 Summary of Pay Items Including TRNS*PORT Input

The CONSULTANT shall include input into TRNS*PORT and create the CADD generated sheet.

34.3 Tabulation of Quantities

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

34.4 General Notes / Pay Item Notes

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

34.5 Project Layout

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

34.6 Typical and Special Details

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

34.7 Plan Sheet

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

34.8 ITS Communications Plans

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

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

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

The CONSULTANT is responsible for the design of the communication infrastructure and its integration with the 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 DEPARTMENTS's TMCs.

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

34.9 Fiber Optic Splice Diagrams

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

34.10 Lightning Protection Plans

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

34.11 Cross Sections

The CONSULTANT shall prepare cross sections for ITS devices.

34.12 Guide Sign Work Sheet(s)

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

34.13 Special Service Point Details

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

34.14 Strain Pole Schedule

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

34.15 Overhead / Cantilever Sign Structure

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

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

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

For other overhead sign structures, the CONSULTANT shall evaluate pertinent data

and information to develop layout for locating and mounting device to the horizontal element of the structure, and coordinate the design of the structures with the 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 as per Chapter 2e – Guide Signs-Freeways and Expressways in the Manual on Uniform Traffic Control Devices (MUTCD) and Florida Department of Transportation (FDOT) Plans Preparation Manual and all other applicable manuals and guidelines as per governing regulations.

34.17 Traffic Control Plans

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

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

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

34.18 Interim Standards

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

34.19 GIS Data and Asset Management Requirements

The CONSULTANT is responsible for providing Geographic Information System (GIS), spatial data, for the ITS components design. This information is required to integrate ITS components to the SunGuide software. A coordinate point compatible with the Florida State Plane System or FDOT's current coordinate plane system shall be collected for all ITS components part of the 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
- HAR system components
- CCTV camera pole location
- Ground mounted cabinets
- Fiber optic cable path (fiber backbone)
- Communications hubs
- Standard route markers
- Lateral fiber optic cable connections
- Lateral power cable connections
- Pull boxes (power and fiber)
- Splice boxes
- Power drops (service point and cable path)

34.20 Quality Assurance / Quality Control

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

34.21 Supervision

The CONSULTANT shall supervise all technical design activities.

35 GEOTECHNICAL *(On applicable Task Work Orders)*

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

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

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

35.1 Document Collection and Review

CONSULTANT will review printed literature including topographic maps, county agricultural maps, aerial photography (including historic photos), ground water resources, geology bulletins, potentiometric maps, pile driving records, historic construction records and other geotechnical related resources. Prior to field reconnaissance, CONSULTANT shall review U.S.G.S., S.C.S. and potentiometric maps, and identify areas with problematic soil and groundwater conditions.

Roadway

The CONSULTANT shall be responsible for coordination of all geotechnical related field work activities. The CONSULTANT shall retain all samples until acceptance of Production 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 Initial Engineering Phase plans submittal. The preliminary roadway exploration will be performed and results provided to the Engineer of Record to assist in setting roadway grades and locating potential problem areas. The preliminary roadway exploration shall be performed as directed in writing by the District Geotechnical Engineer.

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

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

35.2 Develop Detailed Boring Location Plan

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

35.3 Stake Borings/Utility Clearance

Stake borings and obtain utility clearance.

35.4 Coordinate and Develop MOT Plans for Field Investigation

Coordinate and develop Maintenance of Traffic (MOT) plan. All work zone traffic control will be performed in accordance with the DEPARTMENT's Roadway and Traffic Design Standards Index 600 series.

35.5 Drilling Access Permits

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

35.6 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.

35.7 Groundwater Monitoring

Monitor groundwater, using piezometers.

35.8 LBR / Resilient Modulus Sampling

Collect appropriate samples for Limerock Bearing Ratio (LBR) testing. Deliver Resilient Modulus samples to the District Materials Office or the State Materials Office in Gainesville, as directed by the DEPARTMENT.

35.9 Coordination of Field Work

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

35.10 Soil and Rock Classification - Roadway

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

35.11 Design LBR

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

35.12 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.

35.13 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.

35.14 Parameters for Water Retention Areas

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

35.15 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.

35.16 Electronic Files for Cross-Sections

Create electronic files of boring data for cross-sections.

35.17 Embankment Settlement and Stability

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

35.18 Stormwater Volume Recovery and/or Background Seepage Analysis (Not applicable for this project)

35.19 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.

35.20 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.

35.21 Preliminary Roadway Report

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

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.22 Final Report

The Final Roadway Report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.23 Auger Boring Drafting

Draft auger borings as directed by the DEPARTMENT.

35.24 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 Production plans. Rock cores shall be retained as directed in writing by the District Geotechnical Engineer.

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

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

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

35.25 Develop Detailed Boring Location Plan

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

35.26 Stake Borings/Utility Clearance

Stake borings and obtain utility clearance.

35.27 Coordinate and Develop MOT Plans for Field Investigation

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

35.28 Drilling Access Permits

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

35.29 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.

35.30 Collection of Corrosion Samples (Not applicable for this project)

35.31 Coordination of Field Work

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

35.32 Soil and Rock Classification - Structures

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

35.33 Tabulation of Laboratory Data

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

35.34 Estimate Design Groundwater Level for Structures

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

35.35 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.

35.36 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.
- CONSULTANT shall assist the Engineer of Record in preparing the Pile Data Table (including test pile lengths, scour resistance, downdrag, minimum tip

elevation, etc.)
- Provide the design soil profile(s), which include the soil model/type of each layer and all soil-engineering properties required for the Engineer of Record to run the FBPier computer program. Review lateral analysis of selected foundation for geotechnical compatibility.
- Estimated maximum driving resistance anticipated for pile foundations.
- Provide settlement analysis.

35.37 Bridge Construction and Testing Recommendations (Not applicable for this project)

35.38 Lateral Load Analysis (Not applicable for this project)

35.39 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.

35.40 Sheet Pile Wall Analysis (*On applicable Task Work Orders)*

Analyze sheet pile walls as directed by the DEPARTMENT.

35.41 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.

35.42 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.

35.43 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.

35.44 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.

35.45 Final Reports - Signs, Signals, Box Culvert, Walls, and High Mast Lights

The final reports shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- Summary of structure background data, S.C.S., U.S.G.S., geologic and potentiometric data.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis).
- Recommendations for foundation installation, or other site preparation soils-related construction considerations with plan sheets as necessary.

- Any special provisions required for construction that are not addressed in the DEPARTMENT's Standard specification.
- An Appendix which includes SPT and CPT boring/sounding profiles, data from any specialized field tests, engineering analysis, notes/sample calculations, sheets showing ultimate bearing capacity curves versus elevation for piles and drilled shafts, a complete FHWA check list, pile driving records (if available), and any other pertinent information.

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

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

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

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

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

35.46 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.

35.47 Other Geotechnical

35.48 Technical Special Provisions

35.49 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.

35.50 Technical Meetings

35.51 Quality Assurance/Quality Control

35.52 Supervision

35.53 Coordination

35.54 Optional Preliminary Contamination Assessment (Not applicable for this project)

36 PROJECT REQUIREMENTS

36.1 Liaison Office

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

36.2 Key Personnel

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

36.3 Progress Reporting

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

36.4 Correspondence

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

36.5 Professional Endorsement

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

36.6 Computer Automation

The project will be developed utilizing Computer Aided Drafting and Design (CADD) systems. The DEPARTMENT makes available software to help assure quality and conformance with policy and procedures regarding CADD. It is the responsibility of the CONSULTANT to meet the requirements in the DEPARTMENT's CADD Manual. The CONSULTANT shall submit final

documents and files as described therein.

36.7 Coordination with Other Consultants

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

36.8 Optional Services (Not applicable for this project)

37 INVOICING LIMITS

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

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