EXHIBIT A

SCOPE OF SERVICES

FOR

FINANCIAL PROJECT ID(S). 437793-1-32-01

FEDERAL PROJECT NO.

DISTRICT FOUR

BROWARD COUNTY
1 PURPOSE

2 PROJECT DESCRIPTION

2.1 Project General and Roadway (Activities 3, 4, and 5)
2.2 Drainage (Activities 6a and 6b)
2.3 Utilities Coordination (Activity 7)
2.4 Environmental Permits, Compliances, and Environmental Clearances (Activity 8)
2.5 Structures (Activities 9–18)
2.6 Signing and Pavement Markings (Activities 19 & 20)
2.7 Signalization (Activities 21 & 22)
2.8 Lighting (Activities 23 & 24)
2.9 Landscape Architecture (Activities 25 & 26)
2.10 Survey (Activity 27)
2.11 Photogrammetry (Activity 28)
2.12 Mapping (Activity 29)
2.13 Terrestrial Mobile LiDAR (Activity 30) (Not applicable to this project)
2.14 Architecture (Activity 31) (Not applicable to this project)
2.15 Noise Barriers (Activity 32) (Not applicable to this project)
2.16 Intelligent Transportation Systems (Activities 33 & 34) (Not applicable for this project)
2.17 Geotechnical (Activity 35)
2.18 3D Modeling (Activity 36)
2.19 Project Schedule
2.20 Submittals
2.21 Provisions for Work
2.22 Services to be Performed by the DEPARTMENT When appropriate and/or available, the DEPARTMENT will provide project data including:

3 PROJECT COMMON AND PROJECT GENERAL TASKS

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3.1.1 Community Awareness Plan
3.1.2 Notifications
3.1.3 Preparing Mailing Lists
3.1.4 Median Modification Letters (Not applicable to this project)
3.1.5 Driveway Modification Letters
3.1.6 Newsletters (Not applicable to this project)
3.1.7 Renderings and Fly-Throughs
3.1.8 PowerPoint Presentations
3.1.9 Public Meeting Preparations
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SCOPE OF SERVICES FOR CONSULTING ENGINEERING SERVICES

HIGHWAY AND BRIDGE/STRUCTURAL DESIGN

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

Financial Project ID:   457793-1-32-01

Federal Aid Project No.:  

County Section No.:  86524500

Description:  Pompano Park Pl/SW 3rd Street from Powerline Rd to Cypress creek Rd, MP 0.006 / 2.078 in Broward County

Bridge No(s).   860233

Rail Road Crossing No:  SFRTA and FEC

Context Classification:  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 documents and incidental engineering services, as necessary, for improvements to the transportation facility described herein.

Major work mix includes:  Bike lane/Sidewalk

Major work groups include:  3.2

Minor work groups include:  4.1.1, 6.1, 6.2, 7.1, 7.2, 7.3, 8.2, 8.3, 9.1, 9.2 15.0

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 FDOT Design 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.

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.

Adding new bike lanes, filling missing sidewalk sections, bringing ramps at intersections to ADA compliance, adding/modifying signals, drainage and pavement markings to implement the "Complete Street Concept" to this corridor.
New decorative street/pedestrian lighting throughout the corridor. (optional service)

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

Public Involvement: CAP Level 2

Other Agency Presentations/Meetings: Broward County, City of Pompano Beach, Broward MPO

Joint Project Agreements: 1

Specification Package Preparation: 1

Value Engineering: N/A

Risk Assessment Workshop: N/A

Plan Type: plan and profile

Typical Section: 4

Pavement Design: 1

Pavement Type Selection Report(s): N/A

Cross Slope: N/A

Access Management Classification: N/A

Transit Route Features: N/A

Major Intersections/Interchanges: N/A

Roadway Alternative Analysis: N/A

Level of TCP Plans: Level 3

Temporary Lighting: N/A

Temporary Signals: 1

Temporary Drainage: N/A

Design Variations/Exceptions: N/A

Back of Sidewalk Profiles: As directed by the DEPARTMENT

Selective Clearing and Grubbing:
2.2 Drainage (Activities 6a and 6b)

System Type: *Open system with some drainage structures and ditches.*

*29 cross drains (58 inlets)*

2.3 Utilities Coordination (Activity 7)

The CONSULTANT is responsible to certify that all necessary arrangements for utility work on this project have been made and will not conflict with the physical construction schedule. The CONSULTANT 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 Environmental Clearances (Activity 8)

Local Water Control District Right of Way Occupancy Permit

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

2.5 Structures (Activities 9 – 18)

Bridge(s): N/A

Type of Bridge Structure Work:

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

Retaining Walls: N/A

Noise Barrier Walls: N/A

Miscellaneous: Strain Poles

2.6 Signing and Pavement Markings (Activities 19 & 20)
2.7 Signalization (Activities 21 & 22)

Intersections: 5 intersections are expected to have signalization work.

Traffic Data Collection: N/A

Traffic Studies: (Optional Services)

Count Stations: N/A

Traffic Monitoring Sites: N/A

2.8 Lighting (Activities 23 & 24)

(Optional Services)

2.9 Landscape Architecture (Activities 25 & 26)

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.

Planting Plans: N/A

Irrigation Plans: Sleeves only

Hardscape Plans: N/A

Outdoor Advertising: N/A

2.10 Survey (Activity 27)

Design Survey: As described in Activity 27

Subsurface Utility Exploration: As described in Activity 27

Right of Way Survey: As described in Activity 27

Vegetation Survey: As described in Activity 27

2.11 Photogrammetry (Activity 28)

As described in Activity 28

2.12 Mapping (Activity 29)
Control Survey Map: *As described in Activity 29*

Right of Way Map: *N/A*

Legal Descriptions: *N/A*

Maintenance Map: *N/A*

Miscellaneous Items: *N/A*

2.13 Terrestrial Mobile LiDAR (Activity 30)

2.14 Architecture (Activity 31) (Not applicable to this project)

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

2.16 Intelligent Transportation Systems (Activities 33 & 34) (Not applicable for this project)

2.17 Geotechnical (Activity 35)

*CONSULTANT is responsible for geotechnical services, which include:*

- 8 pavement cores
- 5 percolation tests
- 28 soil borings
- 2 SPT

2.18 3D Modeling (Activity 36)

2.19 Project Schedule

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production Date. The current production date is *October 05, 2020*. The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a 2 week review time for each phase submittal and any other submittals as appropriate.
The schedule shall indicate all required submittals.

All fees and price proposals are to be based on the negotiated schedule of 24 months for final construction contract documents. However, the contract deadline is 72 months from the Notice to Proceed.

Periodically, throughout the life of the contract, the project schedule and payout and fiscal progress curves shall be reviewed and, with the approval of the 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. 20 Submittals

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

2. 21 Provisions for Work

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

- General
  - 29 C.F.R. 1926.1101 – Asbestos Standard for Construction, OSHA
  - 40 C.F.R. 61, Subpart M - National Emission Standard for Hazardous Air Pollutants (NESHAP), Environmental Protection Agency (EPA)
  - 40 C.F.R. 763, Subpart E – Asbestos-Containing Materials in Schools, EPA
  - 40 C.F.R. 763, Subpart G – Asbestos Worker Protection, EPA
  - Americans with Disabilities Act (ADA) Standards for Accessible Design
  - AASHTO – A Policy on Design Standards Interstate System
  - AASHTO – Roadside Design Guide
  - AASHTO – Roadway Lighting Design Guide
  - AASHTO – A Policy for Geometric Design of Highways and Streets
  - AASHTO – Highway Safety Manual
  - Rule Chapter 5J-17, Florida Administrative Code (F.A.C.), Standards of Practice for Professional Surveyors and Mappers
  - Chapter 469, Florida Statutes (F.S.) – Asbestos Abatement
o Rule Chapter 62-257, F.A.C., Asbestos Program
o Rule Chapter 62-302, F.A.C., Surface Water Quality Standards
o Code of Federal Regulations (C.F.R.)
o Florida Administrative Codes (F.A.C.)
o Chapters 20, 120, 215, 455, Florida Statutes (F.S.) – Florida Department of Business & Professional Regulations Rules
o Florida Department of Environmental Protection Rules
o FDOT Basis of Estimates Manual
o FDOT Computer Aided Design and Drafting (CADD) Manual
o FDOT Standard Plans
o FDOT Flexible Pavement Design Manual
o FDOT - Florida Roundabout Guide
o FDOT Handbook for Preparation of Specifications Package
o FDOT Standard Plans Instructions
o FDOT Materials Manual
o FDOT Pavement Type Selection Manual
o FDOT Design Manual
o FDOT Procedures and Policies
o FDOT Procurement Procedure 001-375-030, Compensation for Consultant Travel Time on Professional Services Agreements
o FDOT Project Development and Environmental Manual
o FDOT Project Traffic Forecasting Handbook
o FDOT Public Involvement Handbook
o FDOT Rigid Pavement Design Manual
o FDOT Standard Specifications for Road and Bridge Construction
o FDOT Utility Accommodation Manual
o Manual on Speed Zoning for Highways, Roads, and Streets in Florida
o Federal Highway Administration (FHWA) - Manual on Uniform Traffic Control Devices (MUTCD)
o FHWA – National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide
o FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook
o Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 2005
o Florida Statutes (F.S.)
o Florida’s Level of Service Standards and Guidelines Manual for Planning
o Model Guide Specifications – Asbestos Abatement and Management in Buildings, National Institute for Building Sciences (NIBS)
o Quality Assurance Guidelines
o Safety Standards
o Any special instructions from the DEPARTMENT

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

- Permits
  o Chapter 373, F.S. – Water Resources
  o US Fish and Wildlife Service Endangered Species Programs
  o Florida Fish and Wildlife Conservation Commission Protected Wildlife
    Permits
  o Bridge Permit Application Guide, COMDTPUB P16591.3C
  o Building Permit

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

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

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

- Florida’s Turnpike Enterprise
  - Florida’s Turnpike Plans Preparation and Practices Handbook (TPPPH)
  - Florida’s Turnpike Lane Closure Policy
  - Florida’s Turnpike Drainage Manual Supplement
  - Rigid Pavement Design Guide for Toll Locations with Electronic Toll Collection
  - Flexible Pavement Design Guide for Toll Locations with Electronic Toll Collection
  - Florida’s Turnpike General Tolling Requirements (GTR)
  - Additional Florida’s Turnpike Enterprise standards, guides, and policies for design and construction can be found on the FTE Design Website: [http://design.floridasturnpike.com](http://design.floridasturnpike.com)

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

- Structures
  - AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims
  - AASHTO LRFD Movable Highway Bridge Design Specifications and Interims
  - AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code
  - AASHTO Guide Specifications for Structural Design of Sound Barriers
  - AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges
  - FDOT Bridge Load Rating Manual
  - FDOT Structures Manual
  - FDOT Structures Design Bulletins (available on FDOT Structures web site only)
Geotechnical
- FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications
- Manual of Florida Sampling and Testing Methods
- Soils and Foundation Handbook

Landscape Architecture
- Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants

Architectural
- Building Codes
  - Florida Building Code:
    - Building
    - Fuel Gas
    - Mechanical
    - Plumbing
    - Existing Building
  - Florida Accessibility Code for Building Construction
  - Rule Chapter 60D, F.A.C., Division of Building Construction
  - Chapter 553, F.S. – Building Construction Standards
  - ANSI A117.1 2003 Accessible and Usable Building and Facilities
  - Titles II and III, Americans With Disabilities Act (ADA), Public Law 101-336; and the ADA Accessibility Guidelines (ADAAG)

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

Architectural – Extinguishing Systems
- NFPA 10 - Fire Extinguishers
- NFPA 13 - Sprinkler
- NFPA 14 - Standpipe and Hose System
- NFPA 17 - Dry Chemical
- NFPA 20 - Centrifugal Fire Pump
- NFPA 24 - Private Fire Service Mains
- NFPA 200 - Standard on Clean Agent Fire Extinguishing Systems

- Architectural – Detection and Fire Alarm Systems
  - NFPA 70 - Electrical Code
  - NFPA 72 - Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems
  - NFPA 72E - Automatic Fire Detectors
  - NFPA 72G - Installation, Maintenance, and Use of Notification Appliances
  - NFPA 72H - Testing Procedures for Remote Station and Proprietary Systems
  - NFPA 74 - Household Fire Warning Equipment
  - NFPA 75 - Protection of Electronic Computer Equipment

- Architectural – Mechanical Systems
  - NFPA 90A - Air Conditioning and Ventilating Systems
  - NFPA 92A - Smoke Control Systems
  - NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
  - NFPA 204M - Smoke and Heating Venting

- Architectural – Miscellaneous Systems
  - NFPA 45 - Laboratories Using Chemicals
  - NFPA 80 - Fire Doors and Windows
  - NFPA 88A - Parking Structures
  - NFPA 105 - Smoke and Draft-control Door Assemblies
  - NFPA 110 - Emergency and Standby Power Systems
  - NFPA 220 - Types of Building Construction
  - NFPA 241 - Safeguard Construction, Alteration, and Operations
  - Rule Chapter 69A-47, F.A.C., Uniform Fire Safety For Elevators
  - Rule Chapter 69A-51, F.A.C., Boiler Safety

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

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

- Architectural – Other
2.22 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.
- Previously constructed Highway Beautification or Landscape Construction
Plans
- Landscape Opportunity Plan(s)
- Existing right of way maps.
- Existing cross slope data for all RRR projects.
- Existing pavement evaluation report for all RRR projects.
- PD&E Documents
- Design Reports
- Letters of authorization designating the CONSULTANT as an agent of the DEPARTMENT in accordance with F.S. 337.274.
- Phase reviews of plans and engineering documents.
- Regarding Environmental Permitting Services:
  - Approved Permit Document when available.
  - Approval of all contacts with environmental agencies.
  - General philosophies and guidelines of the DEPARTMENT to be used in the fulfillment of this contract. Objectives, constraints, budgetary limitations, and time constraints will be completely defined by the Project Manager.
  - Appropriate signatures on application forms.

3 PROJECT COMMON AND PROJECT GENERAL TASKS

Project Common Tasks

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

Cost Estimates: The CONSULTANT shall be responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to 60% 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 60% plans and no later than 90% plans) the CONSULTANT shall be responsible for inputting the pay items and quantities into AASHTOWare Project Preconstruction through the use of the DEPARTMENT’s Designer Interface for generating the summary of quantities and the FDOT’s in-house estimates. A Summary of Pay Items sheet shall be prepared with all required Phase II, III, and IV 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 Standard Specifications and implemented modifications in any way.

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

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

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

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

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

**Technical Meetings:** The CONSULTANT shall attend all technical meetings necessary to execute the Scope of Services of this contract. This includes meetings with DEPARTMENT and/or Agency staff, between disciplines and subconsultants, such as access management meetings, pavement design meetings, local governments, railroads, airports, progress review meetings (phase review), and miscellaneous meetings. The CONSULTANT shall prepare, and submit to the DEPARTMENT’s Project Manager for review, the meeting minutes for all meetings attended by them. The meeting minutes are due within five (5) working 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. The purpose of CONSULTANT plan reviews is to ensure that CONSULTANT plans follow the plan preparation procedures outlined in the FDOT Design Manual, that state and federal design criteria are followed with the DEPARTMENT concept, and that the CONSULTANT submittals are complete. All subconsultant document submittals shall be submitted by the subconsultant directly to the CONSULTANT for their independent Quality Assurance/Quality Control review and subsequent submittal to the DEPARTMENT.

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

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

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all maps, design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The Quality Control Plan shall be one specifically designed for this project. The CONSULTANT shall submit a Quality Control Plan for approval within twenty (20) business days of the written Notice to Proceed and it shall be signed by the CONSULTANT’s Project Manager and the CONSULTANT QC Manager. The Quality Control Plan shall include the names of the CONSULTANT’s staff that will perform the quality control reviews. The Quality Control reviewer shall be a Florida Licensed Professional Engineer fully prequalified under F.A.C. 14-75 in the work type being reviewed. A marked up set of prints from a Quality Control Review indicating the reviewers for each component (structures, roadway, drainage, signals, geotechnical, signing and marking, lighting, landscape, surveys, etc.) and a written resolution of comments on a point-by-point basis will be required, if requested by the DEPARTMENT, with each phase submittal. The responsible Professional Engineer, Landscape Architect, or Professional Surveyor & Mapper that performed the Quality Control review 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 products and 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 FDM, Standard Plans and CADD Manual. The Constructability/Bidability Review shall ensure the project can be constructed and paid for as designed. Constructability/Bidability Reviews should be conducted prior to the Phase III and Phase IV submittals, using the Phase
Review Checklist (Guidance Document 1-1-A) from the Construction Project Administration Manual (CPAM) as a minimum guideline. The CONSULTANT shall submit this checklist, as well as the “marked-up” set of plans during this review, and review comments and comment responses from any previous Constructability/Bidability reviews. These items will be reviewed by District Design and District Construction.

**Supervision:** The CONSULTANT shall supervise all technical design activities.

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

### Project General Tasks

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

#### 3.1 Public Involvement

Public involvement 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 20 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

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

3.1.4 Median Modification Letters (Not applicable to this project)

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.

3.1.6 Newsletters (Not applicable to this project)

3.1.7 Renderings and Fly-Throughs (Not applicable to this project)

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 CONSULTANT will pay all costs for meeting site rents and insurance. No DEPARTMENT meetings will be held on public school system properties.

3.1.10 Public Meeting Attendance and Follow-up

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

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

It is estimated for this project there will be 1 Public meetings during the design.

3.1.11 Other Agency Meetings
In addition to scheduled public meetings the CONSULTANT may be required to participate in meetings with local governing authorities and/or Metropolitan Planning Organization (MPO). The CONSULTANT’s participation may include, but not be limited to, presentations during the meeting, note taking, and summarizing the meeting in a memo to the file. It is estimated for this project there will be 10 meetings with local governing authorities and/or MPOs during the design.

3.1.12 Web Site (Not applicable to this project)

3.2 Joint Project Agreements

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

3.3 Specifications Package Preparation

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

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

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

3.4 Contract Maintenance and Electronic Document Management System (EDMS)

Contract maintenance includes project management effort for complete setup and maintenance of files, electronic folders and documents developing technical monthly
progress reports and schedule updates.

3.5 **Value Engineering (Multi-Discipline Team) Review** (Not applicable to this project)

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 **Digital Delivery**

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

3.10 **Risk Assessment Workshop** (Not applicable to this project)

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

*BCT, Fort Lauderdale Executive Airport and Pompano Beach Airpark, FEC and SFRTA railroads.*

3.12 **Landscape and Existing Vegetation Coordination**

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

3.13 Other Project General Tasks

4 ROADWAY ANALYSIS

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

4.1 Typical Section Package

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

4.2 Pavement Type Selection Report (Not applicable to this project)

4.3 Pavement Design Package

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

4.4 Cross-Slope Correction (Not applicable to this project)

4.5 Horizontal/Vertical Master Design Files

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

Note: When the project includes a 3D Model deliverable, also include Activity 36 3D Modeling.

4.6 Access Management (Not applicable to this project)
4.7 Roundabout Evaluation (Not applicable to this project)

4.8 Roundabout Final Design Analysis (Not applicable to this project)

4.9 Cross Section Design Files

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

Note: If the Cross Sections are prepared using a 3D model, use Task 36.5 instead of Task 4.9 for the Cross Section Design Files.

4.10 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.

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

4.12 Selective Clearing and Grubbing

a. Selective Clearing and Grubbing of Existing Vegetation Field Assessment

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

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

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

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

c. Selective Clearing and Grubbing- Existing Vegetation Maintenance Report

The CONSULTANT shall include in the plans instructions for the care and maintenance of the tree preservation areas, and selective clearing and grubbing areas throughout the construction period. The CONSULTANT will coordinate with the District Landscape Architect to ensure that the intent of the tree preservation areas is in alignment with future highway landscape plans. It is understood the contractor will be responsible for coordination with an arborist for the care of vegetation during construction and during root and branch pruning, however, the CONSULTANT should be knowledgeable in arboricultural practices to the extent that they are able to deliver detailed and informed Selective Clearing and Grubbing Plans.

4.13 Tree Disposition Plans

Consultant will prepare a Tree Disposition Plan outlining the requirements for the removal, relocation, and remaining trees located within the project boundaries. Will utilize the information collected from the Vegetation Survey and information collected under task 4.12 for Selective Clearing and Grubbing.

4.14 Design Variations and Exceptions

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

4.15 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.

4.16 Quantities

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

4.17 Cost Estimate

4.18 Technical Special Provisions and Modified Special Provisions (Not applicable to this project)

4.19 Other Roadway Analyses (Not applicable to this project)

4.20 Field Reviews

4.21 Monitor Existing Structures

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

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

4.22 Technical Meetings

4.23 Quality Assurance/Quality Control

4.24 Independent Peer Review (Not applicable to this project)

4.25 Supervision
4.26 Coordination

5 ROADWAY PLANS

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

5.1 Key Sheet

5.2 Summary of Pay Items Including Quantity Input

5.3 Typical Section Sheets
   5.3.1 Typical Sections
   5.3.2 Typical Section Details

5.4 General Notes/Pay Item Notes

5.5 Summary of Quantities Sheets

5.6 Project Layout (Not applicable to this project)

5.7 Plan/Profile Sheet (Not applicable to this project)

5.8 Profile Sheet

5.9 Plan Sheet

5.10 Special Profile

5.11 Back-of-Sidewalk Profile Sheet

5.12 Interchange Layout Sheet (Not applicable to this project)

5.13 Ramp Terminal Details (Plan View) (Not applicable to this project)

5.14 Intersection Layout Details

5.15 Special Details

5.16 Cross-Section Pattern Sheet(s)

5.17 Roadway Soil Survey Sheet(s)

5.18 Cross Sections

5.19 Temporary Traffic Control Plan Sheets
5.20  Temporary Traffic Control Cross Section Sheets

5.21  Temporary Traffic Control Detail Sheets

5.22  Utility Adjustment Sheets

5.23  Selective Clearing and Grubbing Sheet(s)
  5.23.1  Selective Clearing and Grubbing
  5.23.2  Selective Clearing and Grubbing Details

5.24  Tree Disposition Plan Sheet(s)
  5.24.1  Tree Disposition Plan Sheet(s)
  5.24.2  Tree Disposition Plan Tables and Schedules

5.25  Project Network Control Sheet(s)

5.26  Environmental Detail Sheets

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

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

5.27  Utility Verification Sheet(s) (SUE Data)

5.28  Quality Assurance/Quality Control

5.29  Supervision

6a  DRAINAGE ANALYSIS

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

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

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

6a.1 Drainage Map Hydrology

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

6a.2 Base Clearance Calculations (Not applicable to this project)

6a.3 Pond Siting Analysis and Report (Not applicable to this project)

6a.4 Design of Cross Drains

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

6a.5 Design of Ditches

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

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

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

6a.7 Design of Stormwater Management Facility (Roadside Treatment Swales and Linear Ponds) (Not applicable to this project)
6a.8 Design of Floodplain Compensation (Not applicable to this project)

6a.9 Design of Storm Drains

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

6a.10 Optional Culvert Material

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

6a.11 French Drain Systems

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

6a.11a Existing French Drain Systems (Not applicable to this project)

6a.12 Drainage Wells (Not applicable to this project)

6a.13 Drainage Design Documentation Report

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

6a.14 Bridge Hydraulic Report (Not applicable to this project)

6a.15 Temporary Drainage Analysis (Not applicable to this project)

6a.16 Cost Estimate

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

6a.17 Technical Special Provisions and Modified Special Provisions (Not applicable to this project)

6a.18 Hydroplaning Analysis (Not applicable to this project)

6a.19 Existing Permit Analysis

Data gathering including desktop analysis of local, state and federal Drainage permits.
6a.20 Other Drainage Analysis

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

6a.21 Field Reviews

6a.22 Technical Meetings

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

6a.23 Environmental Look-Around Meetings

Convene a meeting with Department staff, regulatory agencies, local governments and other stakeholders to explore watershed wide stormwater needs and alternative permitting approaches.

6a.24 Quality Assurance/Quality Control

6a.25 Independent Peer Review

6a.26 Supervision

6a.27 Coordination

6b DRAINAGE PLANS

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

6b.1 Drainage Map (Including Interchanges)

6b.2 Bridge Hydraulics Recommendation Sheets (Not applicable to this project)

6b.3 Summary of Drainage Structures

6b.4 Optional Pipe/Culvert Material

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

6b.6 Miscellaneous Drainage Detail Sheets (Not applicable to this project)

6b.7 Lateral Ditch Plan/Profile

6b.8 Lateral Ditch Cross Sections
6b.9 Retention/Detention Pond Detail Sheet(s) (Not applicable to this project)

6b.10 Retention Pond Cross Sections (Not applicable to this project)

6b.11 Erosion Control Plan Sheet(s)

6b.12 SWPPP Sheet(s)

6b.13 Quality Assurance/Quality Control

6b.14 Supervision

7 UTILITIES

The CONSULTANT shall identify utility facilities and secure agreements, utility work schedules, and plans from the Utility Agency Owners (UAO) ensuring all conflicts that exist between utility facilities and the 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 Utility 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 Utility Agency Owner(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 Phase II plans and the utility conflict information (when applicable and in the format requested by the DEPARTMENT) 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 information (when applicable and in the format requested by the DEPARTMENT) 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 (Not applicable for this project)

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 (Not applicable for this project)

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.

7.8 Subordination of Easements Coordination (Not applicable for this project)

7.9 Utility Design Meeting

The CONSULTANT shall schedule (time and place), notify participants, and conduct a Utility meeting with all affected UAO(s). The CONSULTANT shall be prepared to discuss impacts to existing trees/vegetation and proposed landscape, drainage, traffic signalization, 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 be deemed practical by the UAO. The CONSULTANT shall keep accurate minutes of all meetings and distribute a copy to all attendees within 3 days. See Task 4.5 (Horizontal/Vertical Master Design File) and Task 4.8 (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) such as survey, geotechnical, drainage, structures, lighting, roadway, signals, utilities, landscape architecture, municipalities, maintaining agency, and District Traffic Operations for review and comment if required by 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.

7.11 Utility Coordination/Follow-up

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

7.12 Utility Constructability Review

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

7.13 Additional Utility Services (Not applicable for this project)

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) or Modified Special Provisions (MSP) 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 or 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 ENVIRONMENTAL CLEARANCES

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

8.1 Preliminary Project Research

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

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

8.2 Field Work

8.2.1 Pond Site Alternatives: (Not applicable for this project)

8.2.2 Establish Wetland Jurisdictional Lines and Assessments: (Not applicable for this project)

8.2.3 Species Surveys: (Not applicable for this project)

8.3 Agency Verification of Wetland Data (Not applicable for this project)

8.4 Complete and Submit All Required Permit Applications

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

8.4.1 Complete and Submit all Required Wetland Permit Applications (Not applicable for this project)

8.4.2 Complete and Submit all Required Species Permit Applications (Not applicable for this project)

8.5 Coordinate and Review Dredge and Fill Sketches (Not applicable for this project)
8.6 Prepare USCG Permit Application (Not applicable for this project)

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

8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application (Not applicable for this project)

8.9 Prepare Tree Permit Information (Not applicable for this project)

8.10 Compensatory Mitigation Plan

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

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

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

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

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

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

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

8.11 Mitigation Coordination and Meetings

The CONSULTANT shall coordinate with DEPARTMENT personnel prior to approaching any environmental permitting or commenting 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. The CONSULTANT will provide mitigation
information needed to update the FDOT Environmental Impact Inventory

8.12 Other Environmental Permits

8.13 Technical Support to the DEPARTMENT for Environmental Clearances, and Re-evaluations (Not applicable for this project)

8.13.1 NEPA or SEIR Reevaluation: (Not applicable to this project)

8.13.2 Archaeological and Historical Features: (Not applicable for this project)

8.13.3 Wetland Impact Analysis: (Not applicable for this project)

8.13.4 Essential Fish Habitat Impact Analysis: (Not applicable for this project)

8.13.5 Protected Species and Habitat Impact Analysis: (Not applicable for this project)

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

8.14.1 NEPA or SEIR Re-evaluation: (Not applicable for this project)

8.14.2 Archaeological and Historical Features: (Not applicable for this project)

8.14.3 Wetland Impact Analysis: (Not applicable for this project)

8.14.4 Essential Fish Habitat Impact Analysis: (Not applicable for this project)

8.14.5 Protected Species and Habitat Impact Analysis: (Not applicable for this project)

8.15 Contamination Impact Analysis (Not applicable for this project)

8.16 Asbestos Survey (Not applicable for this project)

8.17 Technical Meetings (Not applicable for this project)

8.18 Quality Assurance/Quality Control (Not applicable for this project)

8.19 Supervision (Not applicable for this project)

8.20 Coordination (Not applicable for this project)

9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS

and task 9.1 – 9.15 are not applicable for this project.

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

10 STRUCTURES - BRIDGE DEVELOPMENT REPORT and tasks 10.1 – 10.35 are not applicable for this project.

General Requirements and tasks 10.1 – 10.3 are not applicable for this project.

10.1 Bridge Geometry (Not applicable for this project)
10.2 Ship Impact Data Collection (Not applicable for this project)
10.3 Ship Impact Criteria (Not applicable for this project)

Superstructure Alternatives and tasks 10.4 – 10.7 are not applicable for this project.

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

Foundation and Substructure Alternatives and tasks 10.8 – 10.10 are not applicable for this project.

10.8 Pier/Bent

10.9 Shallow Foundations / GRS Abutments

10.10 Deep Foundations

Movable Span and tasks 10.11 – 10.23 are not applicable for this project.

10.11 Data Collection and Design Criteria

10.12 Movable Span Geometrics and Clearances

10.13 Deck System Evaluation

10.14 Framing Plan Development

10.15 Main Girder Preliminary Design

10.16 Conceptual Span Balance/Counterweight

10.17 Support System Development

10.18 Drive Power Calculations

10.19 Drive System Development

10.20 Power and Control Development

10.21 Conceptual Pier Design

10.22 Foundation Analysis (FL PIER)

10.23 Tender Visibility Study

Other BDR Issues

10.24 Aesthetics

10.25 TCP/Staged Construction Requirements

10.26 Constructability Requirements

10.27 Load Rating for Damaged/Widened Structures
10.28 Quantity and Cost Estimates
10.29 Quantity and Cost Estimates - Movable Span
10.30 Wall Type Justification

Report Preparation

10.31 Exhibits
10.32 Exhibits - Movable Span
10.33 Report Preparation
10.34 Report Preparation - Movable Span
10.35 BDR Submittal Package

Preliminary Plans

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

11 STRUCTURES - TEMPORARY BRIDGE and tasks 11.1 – 11.8 are not applicable for this project.

General Layout Design and Plans

11.1 Overall Bridge Final Geometry
11.2 General Plan and Elevation
11.3 Miscellaneous Details

End Bent Design and Plans

11.4 End Bent Structural Design
11.5 End Bent Details

Intermediate Bent Design and Plans

11.6 Intermediate Bent Structural Design
11.7 Intermediate Bent Details

Miscellaneous Substructure Design and Plans
12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE and tasks 12.1 – 12.28 are not applicable for this project.

General Layout Design and Plans

12.1 Overall Bridge Final Geometry
12.2 Expansion/Contraction Analysis
12.3 General Plan and Elevation
12.4 Construction Staging
12.5 Approach Slab Plan and Details
12.6 Miscellaneous Details

End Bent Design and Plans

12.7 End Bent Geometry
12.8 End Bent Structural Design
12.9 End Bent Plan and Elevation
12.10 End Bent Details

Intermediate Bent Design and Plans

12.11 Bent Geometry
12.12 Bent Stability Analysis
12.13 Bent Structural Design
12.14 Bent Plan and Elevation
12.15 Bent Details

Miscellaneous Substructure Design and Plans

12.16 Foundation Layout

Superstructure Design and Plans

12.17 Finish Grade Elevation Calculation
12.18 Finish Grade Elevations

Cast-In-Place Slab Bridges

12.19 Bridge Deck Design

12.20 Superstructure Plan

12.21 Superstructure Sections and Details

Prestressed Slab Unit Bridges

12.22 Prestressed Slab Unit Design

12.23 Prestressed Slab Unit Layout

12.24 Prestressed Slab Unit Details and Schedule

12.25 Deck Topping Reinforcing Layout

12.26 Superstructure Sections and Details

Reinforcing Bar Lists

12.27 Preparation of Reinforcing Bar List

Load Rating

12.28 Load Rating

13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE and tasks 13.1 – 13. 55 are not applicable for this project.

General Layout Design and Plans

13.1 Overall Bridge Final Geometry

13.2 Expansion/Contraction Analysis

13.3 General Plan and Elevation

13.4 Construction Staging

13.5 Approach Slab Plan and Details

13.6 Miscellaneous Details

End Bent Design and Plans
13.7 End Bent Geometry
13.8 Wingwall Design and Geometry
13.9 End Bent Structural Design
13.10 End Bent Plan and Elevation
13.11 End Bent Details

Intermediate Bent Design and Plans
13.12 Bent Geometry
13.13 Bent Stability Analysis
13.14 Bent Structural Design
13.15 Bent Plan and Elevation
13.16 Bent Details

Pier Design and Plans
13.17 Pier Geometry
13.18 Pier Stability Analysis
13.19 Pier Structural Design
13.20 Pier Plan and Elevation
13.21 Pier Details

Miscellaneous Substructure Design and Plans
13.22 Foundation Layout

Superstructure Deck Design and Plans
13.23 Finish Grade Elevation (FGE) Calculation
13.24 Finish Grade Elevations
13.25 Bridge Deck Design
13.26 Bridge Deck Reinforcing and Concrete Quantities
13.27 Diaphragm Design
13.28 Superstructure Plan
13.29 Superstructure Section
13.30 Miscellaneous Superstructure Details

Reinforcing Bar Lists
13.31 Preparation of Reinforcing Bar List

Continuous Concrete Girder Design
13.32 Section Properties
13.33 Material Properties
13.34 Construction Sequence
13.35 Tendon Layouts
13.36 Live Load Analysis
13.37 Temperature Gradient
13.38 Time Dependent Analysis
13.39 Stress Summary
13.40 Ultimate Moments
13.41 Ultimate Shear
13.42 Construction Loading
13.43 Framing Plan
13.44 Girder Elevation, including Grouting Plan and Vent Locations
13.45 Girder Details
13.46 Erection Sequence
13.47 Splice Details
13.48 Girder Deflections and Camber

Simple Span Concrete Design
13.49 Prestressed Beam
13.50 Prestressed Beam Schedules
13.51 Framing Plan

Beam Stability
13.52 Beam/Girder Stability

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

Load Rating
13.55 Load Ratings

14 STRUCTURES - STRUCTURAL STEEL BRIDGE and tasks 14.1 – 14.60 are not applicable for this project.

General Layout Design and Plans
14.1 Overall Bridge Final Geometry
14.2 Expansion/Contraction Analysis
14.3 General Plan and Elevation
14.4 Construction Staging
14.5 Approach Slab Plan and Details
14.6 Miscellaneous Details

End Bent Design and Plans
14.7 End Bent Geometry
14.8 Wingwall Design and Geometry
14.9 End Bent Structural Design
14.10 End Bent Plan and Elevation
14.11 End Bent Details

Intermediate Bent Design and Plans
14.12 Bent Geometry
14.13 Bent Stability Analysis
14.14 Bent Structural Design
14.15 Bent Plan and Elevation
14.16 Bent Details

Pier Design and Plans
14.17 Pier Geometry
14.18 Pier Stability Analysis
14.19 Pier Structural Design
14.20 Pier Plan and Elevation
14.21 Pier Details

Miscellaneous Substructure Design and Plans
14.22 Foundation Layout

Superstructure Deck Design and Plans
14.23 Finish Grade Elevation (FGE) Calculation
14.24 Finish Grade Elevations
14.25 Bridge Deck Design
14.26 Bridge Deck Reinforcing and Concrete Quantities
14.27 Superstructure Plan
14.28 Superstructure Section
14.29 Miscellaneous Bridge Deck Details

Reinforcing Bar Lists
14.30 Preparation of Reinforcing Bar List

Structural Steel Plate Girder Design
14.31 Unit Modeling
14.32 Section Design
14.33 Stiffener Design and Locations
14.34 Cross-frame Design
14.35 Connections
14.36 Bearing Assembly Design and Detailing (With Jacking Analysis)
14.37 Splice Design
14.38 Shear Stud Connectors
14.39 Deflection Analysis
14.40 Framing Plan
14.41 Girder Elevation
14.42 Structural Steel Details
14.43 Splice Details
14.44 Girder Deflections and Camber

Structural Steel Box Girder Design
14.45 Unit Modeling
14.46 Section Design
14.47 Stiffener Design and Locations
14.48 Interior Cross-Frame Design
14.49 Exterior Cross-Frame Design
14.50 Connections
14.51 Bearing Assembly Design and Detailing (with Jacking Analysis)
14.52 Splice Design
14.53 Shear Stud Connectors
14.54 Deflection Analysis
14.55 Framing Plan
14.56 Girder Elevation
14.57 Structural Steel Details
14.58 Splice Details
14.59 Girder Deflections and Camber

Erection Scheme
14.60 Erection Scheme Analysis
14.61 Erection Scheme

Load Rating
14.62 Load Rating

15 STRUCTURES - SEGMENTAL CONCRETE BRIDGE

The CONSULATANT shall prepare plans for Segmental Concrete Bridge(s) at the location(s) specified in Section 2.5.

General Layout Design and Plans and tasks 15.1 – 15.9 are not applicable for this project.

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

End Bent Design and Plans
15.10 End Bent Geometry
15.11 Wingwall Geometry and Design

15.12 End Bent Structural Design

15.13 End Bent Plan and Elevation

15.14 End Bent Details

Pier Design and Plans

15.15 Pier Geometry

15.16 Pier Stability Analysis

15.17 Pier Construction Loads

15.18 Pier Structural Design

15.19 Pier Plan and Elevation

15.20 Pier Details

Miscellaneous Substructure Design and Plans

15.21 Foundation Layout

Longitudinal Analysis

15.22 Section Properties

15.23 Material Properties

15.24 Superimposed Dead Loads

15.25 Construction Sequence

15.26 Tendon Layouts

15.27 Live Load Analysis

15.28 Temperature Gradient

15.29 Time Dependent Analysis

15.30 Stress Summary

15.31 Ultimate Moments

15.32 Ultimate Shear
15.33 Construction Loading

Transverse Analysis

15.34 Time Dependent Analysis

15.35 Live Load Analysis

15.36 Temperature Gradient

15.37 Stress Summary

15.38 Ultimate Moments

15.39 Construction Loading

Superstructure Design

15.40 Typical Segment

15.41 Pier Segment

15.42 Expansion Joint Segment

15.43 Blister Details

15.44 Deviator Blocks

15.45 Bearings

15.46 Expansion Joints

15.47 Special Analysis

Superstructure Plans

15.48 Typical Sections

15.49 Finish Grade Elevations

15.50 Segment Layout / Designations

15.51 Typical Segments

15.52 Variable Depth Segments

15.53 Pier Segments

15.54 Expansion Joint Segments
15.55  CIP Closure Joint Details
15.56  Casting Geometry
15.57  Integrated 3-D Drawings
Post-Tensioning Details
15.58  Bulkhead Details
15.59  Transverse Tendon Layout
15.60  Longitudinal Tendon Layout
15.61  Temporary Post-Tensioning
15.62  Quantities and Stressing Schedule
15.63  Future Post-Tensioning
15.64  Anchorage Blisters
15.65  Deviation Blocks
15.66  PT Grouting Plan Details
Miscellaneous Details
15.67  Erection Sequence and Details
15.68  Access Opening Details
15.69  Bearings
15.70  Expansion Joints
15.71  Vermin Screen Details
15.72  Railing Details
15.73  Lighting and Luminaries
15.74  Architectural Details
15.75  Special Systems
Reinforcing Bar Lists
15.76  Preparation of Reinforcing Bar Lists
Load Rating

15.77 Load Rating (LRFR)

16 STRUCTURES - MOVABLE SPAN and tasks 16.1 – 16.102 are not applicable for this project.

Final Design Bascule Pier and tasks 16.1- 16.9 are not applicable for this project.

16.1 Pier Deck

16.2 Leaf/Pier Clearance Diagrams

16.3 Load Shoe Columns

16.4 Trunnion Columns

16.5 Foundations

16.6 Footing

16.7 Seal

16.8 Back Wall (Approach Span Bearings) Closed Piers only

16.9 Bascule Pier Deck Elevations

Bascule Pier Dimensions - Detailing and tasks 16.10- 16.12 are not applicable for this project.

16.10 Pier Plan Views

16.11 Pier Elevations Views

16.12 Pier Sections

Bascule Pier Reinforcing Details

16.13 Pier Reinforcing

Bascule Pier Miscellaneous Details and tasks 16.14 – 16.20 are not applicable for this project.

16.14 Pier Barrier Details

16.15 Stair Details

16.16 Handrail Details
16.17 Ladder and Hatch Details

16.18 Pier Equipment

16.19 Bascule Pier Notes and Summary of Quantities

16.20 Miscellaneous Details

Bascule Leaf Design and tasks 16.21 – 16.38 are not applicable for this project.

16.21 Deck Design

16.22 Sidewalk Design

16.23 Stringer Design

16.24 Typical Floorbeam Design

16.25 End Floorbeam Design

16.26 Deep Floorbeam Design

16.27 Sidewalk Bracket Design

16.28 Roadway Bracket Design

16.29 Main Girder Influence Lines

16.30 Main Girder Design

16.31 Trunnion Girder Design

16.32 Main Girder Camber Data

16.33 Leaf Lateral Bracing Design

16.34 Counterweight Design

16.35 Live Load Shoe Design

16.36 Barrier Design

16.37 Deck Elevations

16.38 Balance Calculations

Bascule Leaf Detailing and tasks 16.39 – 16.59 are not applicable for this project.

16.39 Bascule GP&E
16.40  Bascule Leaf Notes
16.41  Framing Plan
16.42  Flooring Plan and Details
16.43  Typical Section and Finish Grade Elevations
16.44  Girder Elevation
16.45  Girder Details
16.46  Camber Layout
16.47  Floor Beams
16.48  Counterweight Girder/Box
16.49  Trunnion Girder
16.50  Cylinder Girder
16.51  Lateral Bracing Details
16.52  Counterweight Bracing Details
16.53  Joint Details
16.54  Traffic Barrier Details
16.55  Pedestrian Rail and Support Details
16.56  Curb and Sidewalk Details
16.57  Barrier and Sidewalk Bracket Details
16.58  Counterweight Details
16.59  Stress Table or Influence Lines

Mechanical Design and tasks 16.60 – 16.63 are not applicable for this project.

16.60  Final Power Requirements
16.61  Trunnion Assembly
16.62  Span Locks
16.63  Sump Pumps
Mechanical Drive Design and tasks 16.64 – 16.67 are not applicable for this project.

16.64 Drive Shafts, Couplings, Keys, Bearings and Supports

16.65 Rack and Pinion, Bearings and Supports

16.66 Drive Train

16.67 Motor Brakes and Machinery Brakes

Hydraulic Drive Design

16.68 Hydraulic Drive

Machinery Detailing

16.69 Machinery Layout

16.70 Machinery Elevation

16.71 Machinery Section

16.72 Trunnion Assembly

16.73 Drive Details

16.74 Span Locks

Electrical Design

16.75 Load Analysis

16.76 Power Distribution

16.77 Drive Equipment

16.78 Bridge Controls

16.79 Grounding

16.80 Lightning and Surge Suppression

16.81 Pier Lighting

Electrical Detailing and tasks 16.82 – 16.94 are not applicable for this project.

16.82 Electrical Plan and Elevation

16.83 Electrical Symbols and Abbreviations
16.84  Single/Three Line Diagram
16.85  Panel Board and Light Fixture Schedules
16.86  Wire and Conduit Schedules and Diagrams
16.87  Control Desk/Panel Layout
16.88  Control Schematics
16.89  PLC Logic
16.90  Communication System
16.91  Navigation Lighting Details
16.92  Pedestrian Gate, Traffic Gate, and Barrier Details
16.93  Submarine Cable
16.94  Miscellaneous Details

Control House and tasks 16.95 – 16.100 are not applicable for this project.

16.95  Architectural Design
16.96  Architectural Details
16.97  Structural Design
16.98  Structural Details
16.99  HVAC/Plumbing Design
16.100 HVAC/Plumbing/Electrical Cables

Reinforcing Bar Lists

16.101 Preparation of Reinforcing Bar List

Load Rating

16.102 Load Rating

17  STRUCTURES - RETAINING WALLS and tasks 17.1 – 17.21 are not applicable for this project.

General Requirements
17.1 Key Sheet

17.2 Horizontal Wall Geometry (Not applicable for this project)

Permanent Proprietary Walls and tasks 17.3 – 17.6 are not applicable for this project.

17.3 Vertical Wall Geometry

17.4 Semi-Standard Drawings

17.5 Wall Plan and Elevations (Control Drawings)

17.6 Details

Temporary Proprietary Walls

17.7 Vertical Wall Geometry

17.8 Semi-Standard Drawings

17.9 Wall Plan and Elevations (Control Drawings)

17.10 Details

Cast-In-Place Retaining Walls

17.11 Design

17.12 Vertical Wall Geometry

17.13 General Notes

17.14 Wall Plan and Elevations (Control Drawings)

17.15 Sections and Details

17.16 Reinforcing Bar List

Other Retaining Walls and Bulkheads

17.17 Design

17.18 Vertical Wall Geometry

17.19 General Notes, Tables and Miscellaneous Details

17.20 Wall Plan and Elevations

17.21 Details
18 STRUCTURES - MISCELLANEOUS

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

Strain Poles

18.5 Steel Strain Poles (Not applicable for this project)

18.6 Concrete Strain Poles

18.7 Strain Pole Data Table Plan Sheets

18.8 Strain Pole Special Details Plan Sheets

Mast Arms and task 18.5 are not applicable for this project.

18.9 Mast Arms

18.10 Mast Arms Data Table Plan Sheets

18.11 Mast Arms Special Details Plan Sheets

Overhead/Cantilever Sign Structure and tasks 18.6 – 18.10 are not applicable for this project.

18.12 Cantilever Sign Structures

18.13 Overhead Span Sign Structures

18.14 Special (Long Span) Overhead Sign Structures

18.15 Monotube Overhead Sign Structure

18.16 Bridge Mounted Signs (Attached to Superstructure)

18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets

18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets

High Mast Lighting and task 18.11 are not applicable for this project.

18.19 Non-Standard High Mast Lighting Structures

18.20 High Mast Lighting Special Details Plan Sheets

Noise Barrier Walls (Ground Mount) and tasks 18.12 – 18.18 are not applicable for this project.
18.21 Horizontal Wall Geometry (Not applicable for this project)

18.22 Vertical Wall Geometry

18.23 Summary of Quantities – Aesthetic Requirements

18.24 Control Drawings

18.25 Design of Noise Barrier Walls Covered by Standards

18.26 Design of Noise Barrier Walls not Covered by Standards

18.27 Aesthetic Details

Special Structures

18.31 Other Structures

18.32 Condition Evaluation of Signal and Sign Structures, and High Mast Light Poles (Not applicable for this project)

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

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

18.35 Ancillary Structures Report (Not applicable for this project)

19 SIGNING AND PAVEMENT MARKING ANALYSIS

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

19.1 Traffic Data Analysis

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

19.2 No Passing Zone Study (Not applicable for this project)

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 (Not applicable for this project)

19.7 Quantities

19.8 Cost Estimate

19.9 Technical Special Provisions and Modified Special Provisions (Not applicable for this project)

19.10 Other Signing and Pavement Marking Analysis (Not applicable for this project)

19.12 Technical Meetings (Not applicable for this project)

19.14 Independent Peer Review (Not applicable for this project)

19.15 Supervision

19.16 Coordination

20 SIGNING AND PAVEMENT MARKING PLANS

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

20.1 Key Sheet

20.2 Summary of Pay Items Including Quantity Input

20.3 Tabulation of Quantities

20.4 General Notes/Pay Item Notes

20.5 Project Layout (Not applicable for this project)

20.6 Plan Sheet

20.7 Typical Details
20.8 Guide Sign Work Sheet(s)
20.9 Traffic Monitoring Site (Not applicable for this project)
20.10 Cross Sections
20.11 Special Service Point Details
20.12 Special Details (Not applicable for this project)
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

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 (Not applicable for this project)
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 (Not applicable for this project)

21.7 Overhead Street Name Sign Design (Not applicable for this project)

21.8 Pole Elevation Analysis

21.9 Traffic Signal Operation Report (Not applicable for this project)

21.10 Quantities

21.11 Cost Estimate

21.12 Technical Special Provisions and Modified Special Provisions (Not applicable for this project)

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

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 Designer Interface Quantity Input

22.3 Tabulation of Quantities

22.4 General Notes/Pay Item Notes

22.5 Plan Sheet

22.6 Interconnect Plans (Not applicable for this project)

22.7 Traffic Monitoring Site (Not applicable for this project)

22.8 Guide Sign Worksheet

22.9 Special Details

22.10 Special Service Point Details (Not applicable for this project)

22.11 Mast Arm/Monotube Tabulation Sheet (Not applicable for this project)

22.12 Strain Pole Schedule

22.13 TCP Signal (Temporary)

22.14 Temporary Detection Sheet

22.15 Utility Conflict Sheet
22.16 **Interim Standards** (Not applicable for this project)

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 (OPTIONAL SERVICES)**

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** (Not applicable for this project)

23.2 **Lighting Design Analysis Report**

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

The report shall include the Lighting Design Criteria that will be used. For projects with corridor lighting, the report shall include the evaluation of at least three lighting design alternatives. The report shall provide a recommendation on the alternative to use. Each alternative shall be properly described; the alternatives shall consider different pole heights, lamp wattage, and arm lengths. Each alternative shall be provided with 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:
23.3 Aeronautical Evaluation

The CONSULTANT shall prepare an Aeronautical Evaluation/Airspace Analysis Report for those projects within 3.8 miles of an airport. It shall be submitted for approval by the DEPARTMENT and by FAA prior to Phase II plans submittal.

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

The report shall include a profile drawing 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 (Not applicable for this project)

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:
23.9 Quantities

23.10 Cost Estimate


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 (OPTIONAL SERVICES)

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

24.1 Key Sheet

24.2 Summary of Pay Item Sheet Including Designer Interface Quantity Input

24.3 Tabulation of Quantities

24.4 General Notes/Pay Item Notes

24.5 Pole Data, Legend & Criteria

24.6 Service Point Details
24.7 Project Layout (Not applicable for this project)

24.8 Plan Sheet

24.9 Special Details

24.10 Temporary Lighting Data and Details (Not applicable for this project)

24.11 Traffic Control Plan Sheets (Not applicable for this project)

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

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

25.1 Data Collection

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

25.2 Site Inventory and Analysis for Proposed Landscape (Not applicable for this project)

25.3 Planting Design (Not applicable for this project)

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. Phase I 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** (Not applicable for this project)

25.6 **Plan Summary Boxes**

25.7 **Cost Estimates**

25.8 **Technical Special Provisions and Modified Special Provisions**

25.9 **Other Landscape Architecture** (Not applicable for this project)

25.10 **Outdoor Advertising** (Not applicable for this project)

25.11 **Field Reviews**

25.12 **Technical Meetings / Public Meetings**

25.13 **Quality Assurance/Quality Control**

25.14 **Independent Peer Review** (Not applicable for this project)

25.15 **Supervision**

25.16 **Project Coordination**

25.17 **Interdisciplinary Coordination**

26 **LANDSCAPE ARCHITECTURE PLANS**

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

26.1 **Key Sheet** (Not applicable for this project)

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** (Not applicable for this project)

26.6 **Planting Plans (Interchanges and Toll Plazas)** (Not applicable for this project)
26.7 Planting Details and Notes (Not applicable for this project)

26.8 Irrigation Plans for Linear Roadway Project

26.9 Irrigation Plans for Interchange and Toll Plazas (Not applicable for this project)

26.10 Irrigation Details and Notes (Not applicable for this project)

26.11 Hardscape Plans (Not applicable for this project)

26.12 Hardscape Details and Notes (Not applicable for this project)

26.13 Landscape Maintenance Plan (Not applicable for this project)

26.14 Cost Estimate

26.15 Quality Assurance/Quality Control

26.16 Supervision

27 SURVEY (04-2-18 PED) FM# 437793-1 Pompano Park Rd (Racetrack Rd) from Powerline Rd to S Cypress Rd 2.08 Miles

Project Limits:

Pompano Park Rd (Racetrack Rd) from Powerline Rd to S Cypress Rd 2.08 Miles

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 Standards of Practice by the Florida Board of Professional Surveyors and Mappers, in Chapter 5J-17.050-052, Florida Administrative Code pursuant to Section 472.027, Florida Statutes, 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.

27.1 Horizontal Project Control (HPC)

Set approximately 6 BLC points and any needed secondary points

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); will include primary or secondary control points. The Horizontal Datum to be used is NAD 1983/1990. A minimum of 3 NGS points of 2nd Order or better must be used. 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 or PK Nail and Washers. (Washers stamped with secondary control number) 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 (VCP)

Set approximately 6 Bench marks every 1000’ +/-

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. The bench run must start and end on NGS points of 2nd Order or better. 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 Lines

Compute the Historic Baseline of Survey on and all major side streets. These lines must be placed on the 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.

ONCE THE R/W LINES HAVE BEEN DETERMINED BY THE SURVEYOR; THOSE LINES MUST BE OVERLAID ON THE TOPO/RASTER FILES TO DETERMINE IF ANY IMPROVEMENTS FALL OUTSIDE THE R/W LINE. THIS INCLUDES BUILDING OVERHANGS. THE SURVEYOR MUST FLAG THE AREAS’S IN QUESTION AND SEND THAT INFORMATION TO THE FDOT SURVEY DEPARTMENT FOR REVIEW. AFTER OUR REVIEW WE WILL MAKE THE DETERMINATION OF WHETHER TITLE SEARCHES ARE NEEDED IN THOSE AREAS. THEN WE WILL ASK THE DOT PM FOR OPTIONAL SERVICES MONEY TO TAKE A LOOK AT THE SEARCHES AND DETERMINE IF INDEED THE IMPROVEMENTS ARE INSIDE OR OUTSIDE OF OUR R/W.

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

27.4 Aerial Targets

Set 60 LAMP or TML targets per aerial firm request
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.

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 (Not applicable on this project)

27.6 Topography/DTM (3D)

Provide Soft Shots and Obscured areas for aerial or TML firm

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.

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.

Optional Services:

Obtain TOPO information which the aerial firm could not obtain. Effort includes field edits, analysis and processing of all field collected data.

27.8 Roadway Cross Sections/Profiles

One day to check DTM

Perform cross sections or profiles every 500’. This may include analysis and processing of all field-collected data for comparison with DTM.

27.9 Side Street Surveys (Not applicable on this project)
Refer to tasks of this document as applicable.

27.10 Underground Utilities Provide Designates/ Test Holes Optional

The SUE consultant, working directly with the Design Engineer of Record (EOR), must clear all sites i.e. quadrants for mast arms, light pole locations, catch basin locations, etc. To help complete this task, the following process will be followed:

Working directly with the Design EOR, the SUE consultant will create Design boundary shapes for each type of utility investigation based on scope of project. (See red border in attachments.)

Designate all tonable and non-tonable utilities running through the above areas using standard designation equipment and Ground Penetrating Radar (GPR) to determine where the utilities are located.

(Show the verified utility information at any location that intersects the boundary borders.)

If the GPR identifies any area that may contain a utility; a letter must be sent to the Department along with a DGN file showing the utility designates and the GPR line.

Staff hours will be provided for potholes/locates work on the designates and the GPR lines to determine if a utility exists. Holes on the GPR indications will be paid for even though no utility is found (a dry hole).

Pothole all utilities as per the attached drawings.

All locate/pothole information along with the type, size and utility owner information must be placed on a CD/DVD with X, Y & Z coordinates. This file must be PEDD’s (signed & sealed) by the PLS in charge of the field work and delivered to the District IV Survey Office for placement on the District IV GIS.

If a utility is identified but cannot be physically found, that needs to be identified on the design boundary and the EOR and Utility owner need to be notified of this issue.

Keep the lines of communication open with the EOR. When in doubt, talk with EOR about the intent of the search and location process.

27.11 Outfall Survey (Not applicable on this project)

27.12 Drainage Survey

Provide Drainage survey 60 structures +/-

Locate underground data (XYZ, pipe size, type, condition and flow line) (top of structure, bottom of structure) that relates to above ground data. Includes field edits,
analysis and processing of all field collected data, existing maps, and/or reports. 85+-

Structures

27.13 Bridge Survey (Minor/Major)

27.14 Channel Survey (Not applicable on this project)

27.15 Pond Site Survey (Not applicable on this project)

27.16 Mitigation Survey (Not applicable on this project)

27.17 Jurisdiction Line Survey (Not applicable on this project)

27.18 Geotechnical Support (Not applicable on this project)

27.19 Sectional/Grant Survey

Includes field location, placement and referencing of section corners, ¼ section corners, and fractional corners where pertinent. Includes analysis and processing of all field collected data and/or reports. *Includes delivery of all appropriate electronic files, forms, and/or field notes. Prepare and submit to appropriate agencies.*

*Tie in approximately 10 section corners and ¼ section corners on the Project to the Survey.*

27.20 Subdivision Location

30 block corners +/-

Survey all existing recorded subdivision/condominium boundaries, tracts, units, phases, blocks, street R/W lines, and common areas. Includes analysis and processing of all field collected data and/or reports. *Includes delivery of all appropriate electronic files, forms, and/or field notes.* If unrecorded subdivision is on file in the public records of the subject county, *survey* the beginning and end of unrecorded subdivision. *(For staff hour negotiations, each unrecorded subdivision is equivalent to one block of a recorded subdivision.)*

27.21 Maintained R/W (Not applicable on this project)

27.22 Boundary Survey (Not applicable on this project)

27.23 Water Boundary Survey (Not applicable on this project)

27.24 Right of Way Staking / Right of Way Line (Not applicable on this project)

27.25 Right of Way Monumentation (Not applicable on this project)
27.26 Line Cutting (Not applicable on this project)

27.27 Work Zone Safety

Provide work zone as required by DEPARTMENT standards.

27.28 Miscellaneous Surveys

Provide Tree survey

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

27.29 Supplemental Surveys

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

27.30 Document Research

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

27.31 Field Review

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

27.32 Technical Meetings

Attend meetings as required and negotiated by the Surveying and Mapping Department. Attend one Survey Kickoff Meeting with the FDOT Survey Department.

27.33 Quality Control/Quality Assurance

Establish and implement a QAQC plan. Also includes sub-consultant 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

**Provide Rasters and LAMP Survey**

*Provide Aerial Planimetrics to be used for 1”=40’ scale mapping and Rasters in color are requested on.*

*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.*

Furnish both TIFF and HMR files.

The AERIAL CONSULTANT must have the ability to perform all tasks associated with the Standard Scope of Services and Staff Hour Estimation form Tab 28. Also, establish state plane coordinates (X, Y & Z if necessary) for targets and or picture points (Survey Spread Sheet # 27.4) on the ground using Global Positioning System (GPS) equipment, place conventional elevations on aerial targets and or picture points, field up-date digital mapping (Survey Spread Sheet # 27.6), field check aerial Digital Terrain Models (DTM’s), field check aerial cross sections (Survey Spread Sheet # 27.8), acquire elevations using a prism-less instrument or identify a sub-consultant who will perform these tasks.

At the completion of all of the survey and aerial work it is the responsibility of the CONSULTANT to furnish to the District IV Survey Office two CD’s with all the surveying and mapping information (GPS, TOPO, DTM, PNC, Target control XYZ etc.) with exception of Raster Images.

Furnish both TIFF and HMR files.

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.

**28.1 Flight Preparation**

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

**28.2 Control Point Coordination**

A-106
Determine photo identifiable control points, and mark contact prints.

28.3 Mobilization

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

28.4 Flight Operations

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

28.5 Film Processing

Process, check, and annotate the aerial film.

28.6 Photo Products

Prepare contact prints, contact diapositives, and photo enlargements.

28.7 Scanning

Scan photographic images.

28.8 LiDAR

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

28.9 Aerial Triangulation

Measure and adjust control within aerial images.

28.10 Surfaces

Includes collection of break lines and spot elevations.

28.11 Ortho Generation

Includes creation of final images.

28.12 Rectified Digital Imagery (Georeferenced)

Create the rectified digital image.

28.13 Mosaicking

Create the mosaic.

28.14 Sheet Clipping
Create plot files for sheets from the database.

28.15 Topographics

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

28.16 Planimetrics (2D)

Prepare 2D planimetric map.

28.17 Drainage Basin

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

28.18 CADD Edit

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

28.19 Data Merging

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

28.20 Miscellaneous

Other tasks not specifically addressed in this document.

28.21 Field Review

Perform on site review of maps.

28.22 Technical Meetings

Attend meetings as required.

28.23 Quality Control/Quality Assurance

Establish and implement a QC/QA 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

Master CADD File

29.1  Alignment (Not applicable on this project)

29.2  Section and 1/4 Section Lines (Not applicable on this project)

29.3  Subdivisions / Property Lines (Not applicable on this project)

29.4  Existing Right of Way (Not applicable on this project)

29.5  Topography (Not applicable on this project)

29.6  Parent Tract Properties and Existing Easements (Not applicable on this project)

29.7  Proposed Right of Way Requirements (Not applicable on this project)

29.8  Limits of Construction (Not applicable on this project)

29.9  Jurisdictional/Agency Lines (Not applicable on this project)

Sheet Files

29.10  Control Survey Cover Sheet (Not applicable on this project)

29.11  Control Survey Key Sheet (Not applicable on this project)

29.12  Control Survey Detail Sheet (Not applicable on this project)

29.13  Right of Way Map Cover Sheet (Not applicable on this project)

29.14  Right of Way Map Key Sheet (Not applicable on this project)

29.15  Right of Way Map Detail Sheet (Not applicable on this project)

29.16  Maintenance Map Cover Sheet (Not applicable on this project)

29.17  Maintenance Map Key Sheet (Not applicable on this project)

29.18  Maintenance Map Detail Sheet (Not applicable on this project)

29.19  Reference Point Sheet (Not applicable on this project)

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.

29.21 Table of Ownerships Sheet (Not applicable on this project)

Miscellaneous Surveys and Sketches (Not applicable on this project)

29.22 Parcel Sketches (Not applicable on this project)

29.23 TIITF Sketches (Not applicable on this project)

29.24 Other Specific Purpose Survey(s) (Not applicable on this project)

29.25 Boundary Survey(s) Map (Not applicable on this project)

29.26 Right of Way Monumentation Map (Not applicable on this project)

29.27 Title Search Map (Not applicable on this project)

29.28 Title Search Report (Not applicable on this project)

29.29 Legal Descriptions (Not applicable on this project)

29.30 Final Map/Plans Comparison (Not applicable on this project)

29.31 Field Reviews (Not applicable on this project)

29.32 Technical Meetings (Not applicable on this project)

29.33 Quality Assurance/Quality Control (Not applicable on this project)

29.34 Supervision (Not applicable on this project)

29.35 Coordination (Not applicable on this project)

29.36 Supplemental Mapping (Not applicable on this project)

30 TERRESTRIAL MOBILE LiDAR  FM# 437793-1 Pompano Park Rd from Powerline to Cypress Rd

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

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

30.1 Terrestrial Mobile LiDAR Mission Planning

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

30.2 Project Control Point Coordination

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

30.3 Terrestrial Mobile LiDAR Mobilization

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

30.4 Terrestrial Mobile LiDAR Mission

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

30.5 Terrestrial Mobile LiDAR Processing

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

30.6 Terrestrial Mobile Photography Processing

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

30.7 Transformation / Adjustment

Adjust LiDAR point cloud data to Project Control points. Create point cloud data file(s) in approved digital format. Prepare required reports of precision and accuracy achieved. If this task is performed by separate firm, or is the final product to be delivered, include effort for Survey Report.

30.8 Classification / Editing

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

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

30.10 Topographic (3D) Mapping

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

30.11 Topographic (2D) Planimetric Mapping

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

30.12 CADD Edits

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

30.13 Data Merging

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

30.14 Miscellaneous

Other tasks not specifically addressed in this document.

30.15 Field Reviews

Perform on site review of maps.

30.16 Technical Meetings

Attend meetings as required.

30.17 Quality Assurance/ Quality Control

Establish and implement a QA/QC plan.

30.18 Supervision

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

30.19 Coordination

Coordinate with all elements of the project to produce a final product.
30.2 Project Control Point Coordination

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

30.3 Terrestrial Mobile LiDAR Mobilization

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

30.4 Terrestrial Mobile LiDAR Mission

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

30.5 Terrestrial Mobile LiDAR Processing

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

30.6 Terrestrial Mobile Photography Processing

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

30.7 Transformation / Adjustment

Adjust LiDAR point cloud data to Project Control points. Create point cloud data file(s) in approved digital format. Prepare required reports of precision and accuracy achieved. If this task is performed by separate firm, or is the final product to be delivered, include effort for Survey Report.

30.8 Classification / Editing

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

30.9 Specific Surface Reporting

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

30.10 Topographic (3D) Mapping

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

30.11 Topographic (2D) Planimetric Mapping

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

30.12 CADD Edits

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

30.13 Data Merging

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

30.14 Miscellaneous

Other tasks not specifically addressed in this document.

30.15 Field Reviews

Perform on site review of maps.

30.16 Technical Meetings

Attend meetings as required.

30.17 Quality Assurance/ Quality Control

Establish and implement a QA/QC plan.

30.18 Supervision

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

30.19 Coordination

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

31 ARCHITECTURE DEVELOPMENT and tasks 31.1 – 31.143 are not applicable for this project.

Architectural Plans and tasks 31.1 – 31.37 are not applicable for this project.

31.1 Architectural Program Review/Verification
31.2  Key Sheet and Index of Sheets
31.3  General Notes, Abbreviations, Symbols, and Legend
31.4  Life Safety Plan(s)
31.5  Site Plan(s)
31.6  Floor Plan(s) (small scale)
31.7  Floor Plan(s) (large scale)
31.8  Exterior Elevation(s)
31.9  Roof Plan(s)
31.10 Roof Details
31.11 Interior Elevation(s)
31.12 Rest Room Plan(s) (Enlarged)
31.13 Rest Room Elevation(s)
31.14 Building Section(s)
31.15 Stair Section, Enlarged Stair Plan and Details
31.16 Reflective Ceiling Plan(s)
31.17 Room Finish Schedule or Finish Plan
31.18 Door and Window Finish Schedule
31.19 Door Jamb Detail(s) and Window Details
31.20 Exterior Wall Section(s)
31.21 Interior Wall Section(s)
31.22 Overhead Door Detail(s)
31.23 Curtain Wall Detail(s)
31.24 Fascia, Soffit and Parapet Details
31.25 Signage Detail(s)
31.26 Miscellaneous Detail(s)
31.27 Repetitive Sheets
31.28 Design Narrative Reports
31.29 Permits
31.30 Other Pertinent Project Documentation
31.31 Cost Estimate
31.32 Technical Special Provisions and Modified Special Provisions Packages
31.33 Field Reviews
31.34 Technical Meetings
  31.34.1 FDOT
  31.34.2 Local Governments (cities)
  31.34.3 Local Governments (counties)
  31.34.4 Other Meetings
  31.34.5 Progress Meetings
  31.34.6 Phase Review Meetings
31.35 Quality Assurance/Quality Control
31.36 Meeting with Independent Peer Review
31.37 Supervision

Structural Plans
31.38 General Notes, Abbreviations, Symbols, and Legend
31.39 Foundation Plan(s) (Small Scale)
31.40 Foundation Plan(s) (Large Scale)
31.41 Slab Plan(s) (Small Scale)
31.42 Slab Plan(s) (Large Scale)
31.43 Slab Placement Plan(s)
31.44 Slab Placement Detail(s)
31.45 Foundation Section(s)
31.46 Foundation Detail(s)
31.47 Slab Section(s)
31.48 Slab Detail(s)
31.49 Roof Framing Plan(s) (Small Scale)
31.50 Roof Framing Plan(s) (Large Scale)
31.51 Roof Loading Plan(s) and Detail(s)
31.52 Roof Section(s)
31.53 Roof Detail(s)
31.54 Bearing Wall Section(s)
31.55 Bearing Wall Detail(s)
31.56 Column Section(s)
31.57 Column Detail(s)
31.58 Miscellaneous Sections
31.59 Repetitive Sheets
31.60 Other Pertinent Project Documentation
31.61 Cost Estimate
31.62 Technical Special Provisions and Modified Special Provisions Packages
31.63 Field Reviews
31.64 Technical Meetings
   31.64.1 FDOT
   31.64.2 Local Governments (cities)
   31.64.3 Local Governments (counties)
   31.64.4 Other Meetings
   31.64.5 Progress Meetings
31.64.6 Phase Review Meetings

31.65 Quality Assurance/Quality Control

31.66 Independent Peer Review

31.67 Supervision

Mechanical Plans

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

31.69 Plan(s) (Small Scale)

31.70 Plan(s) (Large Scale)

31.71 Detail(s)

31.72 Section(s)

31.73 Piping Schematic(s)

31.74 Control Plan(s)

31.75 Schedule(s)

31.76 HVAC Calculations

31.77 Life Cycle Cost Analysis

31.78 Repetitive Sheets

31.79 Other Pertinent Project Documentation

31.80 Cost Estimate

31.81 Technical Special Provisions and Modified Special Provisions Packages

31.82 Field Reviews

31.83 Technical Meetings

31.83.1 FDOT

31.83.2 Local Governments (cities)

31.83.3 Local Governments (counties)

31.83.4 Other Meetings
31.83.5 Progress Meetings
31.83.6 Phase Review Meetings

31.84 Quality Assurance/Quality Control
31.85 Independent Peer Review
31.86 Supervision

Plumbing Plans
31.87 General Notes, Abbreviations, Symbols, Legend, and Code Issues
31.88 Plan(s) (Small Scale)
31.89 Plan(s) (Large Scale)
31.90 Isometric(s) (Large Scale)
31.91 Riser Diagram(s)
31.92 Detail(s)
31.93 Repetitive Sheets
31.94 Other Pertinent Project Documentation
31.95 Cost Estimate
31.96 Technical Special Provisions and Modified Special Provisions Packages
31.97 Field Reviews

31.98 Technical Meetings
31.98.1 FDOT
31.98.2 Local Governments (cities)
31.98.3 Local Governments (counties)
31.98.4 Other Meetings
31.98.5 Progress Meetings
31.98.6 Phase Review Meetings

31.99 Quality Assurance/Quality Control
31.100 Independent Peer Review

31.101 Supervision

Fire Protection Plans

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

31.103 Fire Protection Plan

31.104 Riser Diagram, Details, and Partial Plans

31.105 Hydraulic Calculation

31.106 Repetitive Sheets

31.107 Other Pertinent Project Documentation

31.108 Cost Estimate

31.109 Technical Special Provisions and Modified Special Provisions Packages

31.110 Field Reviews

31.111 Technical Meetings

   31.111.1 FDOT

   31.111.2 Local Governments (cities)

   31.111.3 Local Governments (counties)

   31.111.4 Other Meetings

   31.111.5 Progress Meetings

   31.111.6 Phase Review Meetings

31.112 Quality Assurance/Quality Control

31.113 Independent Peer Review

31.114 Supervision

Electrical Plans

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

31.116 Electrical Site Plan
31.117 Lighting Plan(s)
31.118 Lighting Fixtures Schedule(s)
31.119 Lighting Fixtures Detail(s)
31.120 Lightning Protection Plan(s)
31.121 Lightning Protection Details
31.122 Power Plan(s)
31.123 Power Distribution Riser Diagram(s)
31.124 Panel Board Schedule(s)
31.125 Data Plan(s)
31.126 Data Detail(s)
31.127 Communication Plan(s)
31.128 Communication Detail(s)
31.129 Security Alarm System Plan(s)
31.130 Miscellaneous Detail(s)
31.131 Repetitive Sheets
31.132 Energy Analysis
31.133 Other Pertinent Project Documentation
31.134 Cost Estimate
31.135 Technical Special Provisions and Modified Special Provisions Packages
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
32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE and tasks 32.1 – 32.9 are not applicable for this project.

32.1 Noise Analysis

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

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

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

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

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

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

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

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

32.2 Noise Barrier Evaluation

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

An evaluation of proposed noise barriers will be performed to identify any engineering conflicts or constraints. The CONSULTANT will be responsible for documenting any resolutions to engineering conflicts or issues that require modification to or preclude construction of a noise barrier. At a minimum, the engineering review will consider the following:
Right of way needs including access rights (air, light, view, ingress/egress, outdoor advertising conflicts)
- Limited access issues
- Necessary construction and maintenance easements
- Safety issues (e.g., line of sight)
- Maintenance issues
- Structural and vegetative restrictions within easement
- Utility conflicts
- Drainage issues
- Environmental issues
- Other criteria as applicable

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

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

32.3 Public Involvement

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

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

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

32.4 Outdoor Advertising Identification

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

32.5 Noise Study Report (NSR) Addendum

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

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

32.7 Quality Assurance/Quality Control

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

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

32.8 Supervision

32.9 Coordination

33 INTELLIGENT TRANSPORTATION SYSTEMS ANALYSIS and tasks 33.1 – 33.21 are not applicable for this project.

33.1 ITS Analysis

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

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

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

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

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

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

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

Closed Circuit Television (CCTV) Camera Assembly

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

The camera subsystem shall be designed to provide additional benefits such as the monitoring of DMS operations and security surveillance of critical infrastructure elements. The position, height, and design of each camera pole shall be finalized during the design phase of the project. Each site shall be designed for overall monitoring capability, as well as designed to provide safe and effective maintenance conditions.

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

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

The CONSULTANT shall be responsible for the design of the grounding and lightning protection system based on FDOT criteria.
The CCTV camera assembly shall comply with the latest version of FDOT Standard Specifications for Road and Bridge Construction, Supplemental Specification 682.

Vehicle Detection Subsystem

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

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

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

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

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

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

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

When utilizing transponders, they will be read by AVI reader equipment placed at checkpoints along the roadway. As a transponder passes a checkpoint, its data shall be acquired by the AVI system. The AVI system shall automatically add the time, date, transponder reading antenna number, and the antenna location to the transponder identification code and store the data.
Systems that rely upon transponders shall utilize supplemental toll tag readers placed at appropriate existing device locations as applicable, as well as interchanges and at intermediate locations throughout the project as required to provide the required coverage to satisfy travel time measurement requirements. Using the designed communications, the transponder information shall be forwarded to the TMC for further processing.

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

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

Dynamic Message Sign Subsystem

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

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

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

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

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

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

Roadway Weather Information Systems (RWIS)

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

Fog/Smoke Detection sensor;
Classifying Precipitation;
Precipitation Occurrence Sensor;
Air Temperature/Relative Humidity Sensor;
Wind Speed and Direction Sensor;

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

Communication hardware.

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

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

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

The communications system components shall be in accordance with 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 thereto 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 phase II, III, and IV design submittals. The CONSULTANT shall conduct a short circuit and protection coordination study for the designed power system and document the study as part of the power system design report.

33.5 Voltage Drop Calculations

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

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

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

33.7 Existing ITS

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

33.8 Queue Analysis

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

33.9 Reference and Master ITS Design File

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

33.10 Reference and Master Communications Design File

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

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

33.12 Sign Panel Design Analysis

The CONSULTANT shall design all ITS signing in conjunction with the Roadway Master Signing. This includes any static sign panel 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 digital 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 AASHTOWare Project Preconstruction for generating the Summary of Pay Items and the FDOT’s in-house estimates.


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

33.16 Other ITS Analyses

N/A

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 SYSTEM PLANS and tasks 34.1 – 34.21 are not
applicable for this project.

34.1 Key Sheet

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

MUTCD

Standard Specs

Standard Plans

34.2 Summary of Pay Items Including Designer Interface Quantity Input

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

34.3 Tabulation of Quantities

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

34.7 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.

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 Standard Plans for Design, Construction, Maintenance and Utility
Operations on the State Highway System.

34.11 Cross Sections

The CONSULTANT shall prepare cross sections for ITS devices.

34.12 Guide Sign Work Sheet(s)

The CONSULTANT shall prepare the guide sign work sheets to include all necessary information related to the design of the static and dynamic 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) Design Manual (FDM) and all other applicable manuals and guidelines as per governing regulations.

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

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

The CONSULTANT shall be responsible for determining the requirements for other type of structures (long span, monotube, etc) used as part of the project for proper installation of the DMS, viewing angle and site distance 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) Design Manual (FDM) 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

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

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

If required by the District Geotechnical Engineer, a preliminary roadway exploration shall be performed before the Phase I plans submittal. The preliminary roadway exploration 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 Muck Probing (Not applicable for this project)

35.5 Coordinate and Develop MOT Plans for Field Investigation

Coordinate and develop Maintenance of Traffic (MOT) plan. All work zone traffic control will be performed in accordance with the DEPARTMENT’s Roadway and Traffic Standard Plans Index 102 series.

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

35.7 Property Clearances

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

35.8 Groundwater Monitoring

Monitor groundwater, using piezometers.

35.9 LBR / Resilient Modulus Sampling

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

35.10 Coordination of Field Work

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

35.11 Soil and Rock Classification - Roadway

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

35.12 Design LBR

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

35.13 Laboratory Data

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

35.14 Seasonal High Water Table

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

35.15 Parameters for Water Retention Areas

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

35.16 Delineate Limits of Unsuitable Material

Delineate limits of unsuitable material(s) in both horizontal and vertical directions.
35.17 Electronic Files for Cross-Sections

Create electronic files of boring data for cross-sections.

35.18 Embankment Settlement and Stability

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

35.19 Monitor Existing Structures

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

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

35.20 Stormwater Volume Recovery and/or Background Seepage Analysis

Perform stormwater volume recovery analysis as directed by the DEPARTMENT.

35.21 Geotechnical Recommendations

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

35.22 Pavement Condition Survey and Pavement Evaluation Report

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

35.23 Preliminary Roadway Report

If a preliminary roadway investigation is performed, submit a preliminary roadway report before the Phase I plans submittal. The purpose of the preliminary roadway report will be to assist in setting road grades and locating potential problems.
Copies of U.S.G.S. and S.C.S. maps with project limits shown.

A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.

The results of all tasks discussed in all previous sections regarding data interpretation and analysis.

An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.

The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.24 Final Report

The Final Roadway Report shall include the following:

Copies of U.S.G.S. and S.C.S. maps with project limits shown.

A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Plans Indices 120-001 and 120-002.

The results of all tasks discussed in all previous sections regarding data interpretation and analysis.

An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.

The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.25 Auger Boring Drafting

Draft auger borings as directed by the DEPARTMENT.

35.26 SPT Boring Drafting

Draft SPT borings as directed by the DEPARTMENT.

Structures

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

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:

35.27 **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.

35.28 **Stake Borings/Utility Clearance**

Stake borings and obtain utility clearance.

35.29 **Coordinate and Develop MOT Plans for Field Investigation**

Coordinate and develop MOT plan. All work zone traffic control will be performed in accordance with the DEPARTMENT’s Roadway and Traffic Standard Plans Index 102 series.

35.30 **Drilling Access Permits**

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

35.31 **Property Clearances**

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

35.32 **Collection of Corrosion Samples**

Collect corrosion samples for determination of environmental classifications.

35.33 **Coordination of Field Work**

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

35.34 **Soil and Rock Classification - Structures**

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

35.35 **Tabulation of Laboratory Data**

Laboratory test results should be tabulated for inclusion in the geotechnical report and for the necessary calculations and analyses.
35.36 Estimate Design Groundwater Level for Structures

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

35.37 Selection of Foundation Alternatives (BDR)

Evaluation and selection of foundation alternative, including the following:

- GRS-IBS
- Spread footings
- Prestressed concrete piling - various sizes
- Steel H-piles
- Steel pipe piles
- Drilled shafts
- Foundation analyses shall be performed using approved DEPARTMENT methods. Assist in selection of the most economical, feasible foundation alternative.

35.38 Detailed Analysis of Selected Foundation Alternate(s)

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

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

35.39 Bridge Construction and Testing Recommendations

Provide construction and testing recommendations including potential constructability problems.

35.40 Lateral Load Analysis (Optional)
Perform lateral load analyses as directed by the DEPARTMENT.

35.41 Walls

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

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

Provide wall construction recommendations.

35.42 Sheet Pile Wall Analysis (Optional)

Analyze sheet pile walls as directed by the DEPARTMENT.

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

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

35.44 Box Culvert Analysis

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

35.45 Preliminary Report - BDR (Not applicable for this project)

35.46 Final Report - Bridge and Associated Walls (Not applicable for this project)

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

The final reports shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- The results of all tasks discussed in all previous sections regarding data
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.

### 35.48 SPT Boring Drafting

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

### 35.49 Other Geotechnical

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

35.50 Technical Special Provisions and Modified Special Provisions

35.51 Field Reviews

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

35.52 Technical Meetings

35.53 Quality Assurance/Quality Control

35.54 Supervision

35.55 Coordination

36 3D Modeling

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

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

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

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

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

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

36.1 Phase I 3D Design Model (30% Plans)

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, 30% complete 3D interactive model, comprised of, but not limited to: Existing features (pavement, shoulders, sidewalk, curb/gutter, utilities-if required per scope, drainage - if required per scope) and proposed
36.2 Phase II 3D Design Model (60% Plans)

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, 60% complete 3D model, comprised of, but not limited to: Modification of 30% model to update the model to comply with changes based on 30% review comments and to include the addition of ponds, floodplain compensation sites, retaining walls, barrier walls, guardrail terminals, cross overs, gore areas, side street connections, roundabouts, and driveways.

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

36.3 Phase III 3D Design Model (90% Plans)

The CONSULTANT shall prepare, submit and present for approval by the DEPARTMENT, 90% complete 3D model, comprised of, but not limited to: Modification of 60% model to update the model to comply with changes based on 60% review comments and to further refine areas of transition between templates, detailed grading areas, bridge approaches and end bents, median noses, shoulder transition areas, retaining walls, barrier walls and guardrail.

36.4 Final 3D Model Design (100% Plans)

The CONSULTANT shall prepare for approval by DEPARTMENT, 100% complete 3D model, comprised of, but not limited to: Modification of 90% model to update the model to comply with changes based on 90% review comments and to accurately generate, export and otherwise prepare the final 3D deliverable files as described in the DEPARTMENT’s CADD Manual.

36.5 Cross Section Design Files

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

36.6 Template and Assembly Development (Optional)
The CONSULTANT shall prepare for approval by DEPARTMENT, specialty templates or assemblies needed to develop the features required to deliver the 3D model.

36.7 Quality Assurance/Quality Control

36.8 Supervision

36.9 Coordination

37 PROJECT REQUIREMENTS

37.1 Liaison Office (Not applicable for this project)

37.2 Key Personnel (Not applicable for this project)

37.3 Progress Reporting (Not applicable for this project)

37.4 Correspondence (Not applicable for this project)

37.5 Professional Endorsement (Not applicable for this project)

37.6 Computer Automation (Not applicable for this project)

37.7 Coordination with Other Consultants (Not applicable for this project)

37.8 Optional Services

At the DEPARTMENT’s option, the CONSULTANT may be requested to provide optional services. The fee for these services shall be negotiated in accordance with the terms detailed in Exhibit B, Method of Compensation, for a fair, competitive and reasonable cost, considering the scope and complexity of the project(s). Additional services may be authorized by Letter of Authorization or supplemental amendment in accordance with paragraph 2.00 of the Standard Consultant Agreement. The additional services may include Construction Assistance, Review of Shop Drawings, Final Bridge Load Rating, update (Category II) bridge plans electronically (CADD) for the Final "As-Built" conditions, based on documents provided by the DEPARTMENT (CADD Services Only) or other Services as required.

38 INVOICING LIMITS
Payment for the work accomplished shall be in accordance with Method of Compensation of this contract. Invoices shall be submitted to the 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 shall be used to control invoicing. Payments will not be made that exceed the percentage of work for any event until those events have actually occurred and the results are acceptable to the DEPARTMENT.