EXHIBIT A

SCOPE OF SERVICES

FOR

TRAFFIC SAFETY STUDIES & HIGHWAY DESIGN

STUDY FPID 237995-1-32-21

DISTRICT 5

DISTRICTWIDE

1 PURPOSE

SCOPE OF SERVICES FOR CONSULTING ENGINEERING SERVICES

SAFETY STUDY(S) & 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)……TBD……. (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as

follows:

Study(s) Financial Project ID: 237995-1-32-21

Highway Design Financial Project ID: as assigned by Department

Federal Aid Project No.: TBD

County Section No.: Districtwide

Description: Traffic Safety Study(s) and Highway Design

THE GENERAL AREA FOR THIS SAFETY PROGRAM IS ANY OF THE NINE COUNTIES WITHIN DISTRICT FIVE INCLUDING ALL CITIES WITHIN ITS BOUNDARIES.WORK EFFORTS INVOLVE STATE, COUNTY, AND CITY ROADS

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: 3.1
Major work groups include: 6.1
Minor work groups include: 4.1.1,4.1.2, 6.2, 6.3.1, 6.3.2, 6.3.3, 7.1,7.2,7.3,8.1,8.2,8.3,8.4,9.1,9.2,9.3,9.4.1,15.0

Known alternative construction contracting methods include: TBD

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.

SAFETY STUDY

Project(s) are for any of the Districtwide nine counties. It is anticipated that many miscellaneous (minor) projects may be identified by CTST Community's within the District.

The identified projects may be on State Highways, County and/or any City Streets within the nine Counties. The projects could be in the form of studies only and/or design prior to the preparation of necessary construction plans. All work on this project will be performed to Federal and State Standards.

The following are a few examples of some of the work types that are expected.

1. UNSIGNALIZED INTERSECTION STUDIES, etc.
2. SIGNALIZED INTERSECTION STUDIES, etc.
3. ARTERIAL STUDIES.
4. PEDESTRIAN & BICYCLE SAFETY IMPROVEMENTS.
5. OTHER SAFETY TYPE IMPROVEMENTS.

6. RIGHT OF WAY TITLE SEARCH.

The CONSULTANT shall perform those miscellaneous engineering services required to conduct studies and/or to design and prepare a set of contract plans which may include roadway, signing and pavement markings, signalization, lighting, sidewalk and/or bicycle ways. It shall be the CONSULTANT's responsibility to utilize the very best engineering judgment, practices and principles possible during the prosecution of the work commissioned under this contract. The CONSULTANT shall be aware that as the project is developed, certain modifications and/or improvements to the original recommendation may be required. The CONSULTANT is to incorporate these refinements into the design and will consider this effort to be an anticipated and integral part of the work. This will 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 to DEPARTMENT procedures.

The DEPARTMENT will provide contract administration, management services, and technical reviews of all work associated with the development and preparation of the contract plans. The DEPARTMENT will provide job specific information and/or functions as outlined in this contract.

- **STUDY OBJECTIVE**

1.1 General Objective:

The general objective is for the CONSULTANT to conduct studies and/or to prepare plans to be used by the contractor to build the project(s), and by the DEPARTMENTto ensure that projects are built as designed and to specifications. Elements of work shall include, as required, studies and/or design of roadways, minor structures, intersections, traffic control plans, geotechnical activities, surveys, drainage, signing and pavement markings, signalization, lighting, utility relocation and/or adjustments, sidewalk and/or bicycle path plans and cost estimates, environmental permits, environmental mitigation plans, when requested by the DEPARTMENT, and all necessary incidental items for a complete project. The CONSULTANT shall prepare necessary right of way documentation that will enable the District to certify off system right of way. The CONSULTANT shall also provide a letter of acknowledgment that the proposed construction improvements on state projects are located within existing right of way.

1.2 Specific Project Objective:

The CONSULTANT shall investigate the status of the project and become familiar with concepts (typical sections, alignments, etc.) developed from prior studies. If a Traffic Operational Study report and/or an Engineering Report is available from a prior or current FDOT, COUNTY, and/or CITY PD&E type study, the CONSULTANT shall use

the approved concepts as a basis for the design unless otherwise directed by the DEPARTMENT.

The Safety Studies shall be prepared using English scales. The Roadway Plans Package shall be prepared using English scales.

Safety Studies Operational Study report and/or an Engineering Report is available from a prior or current FDOT, COUNTY, and/or CITY PD&E type study, the CONSULTANT shall use the approved concepts as a basis for the design unless otherwise directed by the DEPARTMENT.

The Safety Studies shall be prepared using English scales. The Roadway Plans Package shall be prepared using English scales.

- **SAFETY STUDIES**

1.3 General:

The Roadway Plans Package shall be prepared by the CONSULTANT. This work effort includes the traffic safety studies, design and drainage analysis needed to prepare a set of Roadway Plans, Drainage Plans, Traffic Control Plans, Environmental Permits, sidewalk and/or bicycle path plans, and other necessary documents as required.

1.4 Safety Studies and Design Analysis:

3.2.1 Typical Section Package / Pavement Design Package - The CONSULTANT shall prepare a Typical Section Package and Pavement Design Package to be submitted to the DEPARTMENT for review and approval. The Typical Section package shall include the following:

- Transmittal letter
- Location Map(s)
- Typical Section(s) (including bridge sections)
- Data Sheet(s)
- Backup Traffic Data

The Typical Section Package and the Pavement Design Package shall be submitted to the DEPARTMENT for approval at the earliest possible date and prior to the 60% roadway plan submittal stage.

1.4.2 Geometrics - The CONSULTANT shall design the geometrics for the project using the design standards that are most appropriate with proper consideration given to the design traffic volumes, design speed, capacity and levels of service, functional classification, adjacent land

use, design and driver expectancy, aesthetics, pedestrian and bicycle concerns, ADA requirements, elder road user policy, access management, utility relocation costs, and scope of work.

The design elements shall include, but not be limited to, the horizontal and vertical alignments, lane widths, shoulder widths, cross slopes, borders, sight distance, side slopes and ditches, lane transitions, superelevation, features of intersections. The geometric design developed by the CONSULTANT shall be an engineering solution that is not merely an adherence to the minimum AASHTO and/or DEPARTMENT standards.

1.4.3 Update Access Management - The CONSULTANT shall be required to prepare an access management plan in coordination with DEPARTMENT staff. The CONSULTANT shall review the existing access conditions and prepare an access management plan according to the DEPARTMENT's proposed access management classification for the facility, and DEPARTMENT Rules 14-96 and 14-97. The management plan shall be added to the 30% plan sheets and submitted with supporting documentation for review with the 60% Roadway Plans submittal.

The DEPARTMENT shall provide proposed access management classification information and information derived from Project Development and Environmental studies, if available, and public hearings to be used by the CONSULTANT in the preparation of this plan.

1.4.4 Traffic Safety Studies (Traffic Safety Analysis)

(A) GENERAL REQUIREMENTS

The purpose of this section of the contract is to provide the DEPARTMENT with professional services for conducting needed traffic safety studies. The analysis and conceptual recommendations produced by the CONSULTANT will provide valuable input into the development of traffic safety improvement projects to be included in the proposed safety program.

A major objective of this section of the contract is to obtain study results as expeditiously as possible while maintaining a high degree of thoroughness and professionalism. Independent study types have been identified and work tasks for each have been specified.

The CONSULTANT shall ensure that all tasks and studies requiring field activities are

conducted professionally and in a manner that utilizes accepted safety methods and practices. The safety of the traveling public and the CONSULTANT's field staff shall be an essential goal of each field study activity.

Acronyms

HSIPG	**H**ighway **S**afety **I**mprovement **P**rogram **G**uideline
HSM	**H**ighway **S**afety **M**anual
MUTCD	**M**anual on **U**niform **T**raffic **C**ontrol **D**evices
MUTS	**M**anual on **U**niform **T**raffic **S**tudies published by the Bureau of Traffic Operations, Florida Department of Transportation
HCM	**H**ighway **C**apacity **M**anual
TEM	**T**raffic **E**ngineering **M**anual
DSPE	**D**istrict **S**afety **P**rogram **E**ngineer
NCHRP	**N**ational **C**ooperative **H**ighway **R**esearch **P**rogram Report **152 (WARRANTS FOR HIGHWAY LIGHTING)**

Personnel

The CONSULTANT's work shall be performed and/or directed by the key personnel identified in the technical/fee proposal presentations by the CONSULTANT. Any changes in the indicated personnel or the CONSULTANT's office in charge of the work as identified in the CONSULTANT's proposal shall be subject to review and approval by the DEPARTMENT.

Subcontracting

Should the CONSULTANT require the services of a specialist for specialty work, the CONSULTANT is authorized to subcontract these services under the provisions of Paragraph 7.00 of the Standard Professional Services Agreement. Firms selected for subcontracts must be approved in writing and qualified by the DEPARTMENT prior to the CONSULTANT authorizing any such work. The CONSULTANT shall be fully responsible for the satisfactory performance, conclusions, and recommendations of all subcontracted work.

Beginning and Length of Services

Services to be provided by the CONSULTANT under this agreement will be initiated and completed as directed by the Project Manager on each study type or task assigned under this agreement. Individual studies and plans preparation will be assigned during the twenty-four (24)

month period this agreement is in effect, or until the total accumulated fee is obligated (i.e., last work order issued), whichever occurs first. The duration of services may be extended by "Letter of Time Extension" if mutually agreed to in writing by the DEPARTMENT and the CONSULTANT provided the rate of compensation does not change and the maximum limiting fee for this agreement is not reached. Either party may terminate this agreement by notice in writing to the other part, such termination to be effective thirty (30) days from the date of such notice.

Issuance of Work Orders

Authorization to perform one or more of the studies described in this scope of services shall be conveyed to the CONSULTANT through a written work order issued by the DEPARTMENT. The work order shall specify the type of study to be conducted; the location and project limits of each study area; the desired tasks within the composite study; the date on which each study is to be completed and submitted to the DEPARTMENT; and the total price to be paid to the CONSULTANT for each study type or additive. Each work order issued by the District Consultant Management Engineer shall serve as formal notice to proceed, effective on the date of the work order or on a subsequent date, if specified.

Procedure for Payment

The CONSULTANT shall submit to the DEPARTMENT at the end **of each month** an invoice for each completed study type or, in the case of composite studies, for each completed study task. The invoice shall reference the work order number, date, study type, unit costs, number of project locations studied, and total invoice amount. Upon approval and acceptance of all procedures for a study type or products for individual study tasks the Project Manager shall recommend payment for further processing with the DEPARTMENT.

Preliminary Report

All tasks shall have a preliminary report submitted to the DSPE prior to the submittal of the Final Report.

Executive Summary

The report for each study type shall contain an executive summary providing a general overview of the contents of the report including general comments about the location, purpose, findings, conclusions and recommendations.

Sealing of Reports
All final reports (and copies) submitted to the DEPARTMENT's DSPE shall be signed, sealed, and dated by a Florida registered professional engineer of the **CONSULTANT** (including all subcontracted work).

(B) INDEX OF STUDY TYPES

This scope of work contains four (4) study types for which the CONSULTANT will be issued work orders. These study types and the work tasks associated with each study type are as follows:

Study Type I - Signal Warrant Analysis
- Task 1 - Qualitative Assessment
- Task 2 - 24-Hour Traffic Counts
- Task 3 - 8-Hour Turning Movement/ Ped Counts
- Task 4 - Field Intersection Inventory (Condition Diagram)
- Task 5 - Intersection Delay Analysis (Side Street Approaches)
- Task 6 - Collision Analysis
- Task 7 - *Warrant Analysis, Benefit to Cost Analysis, Conclusions and Recommendations (Including Utility Relocation Costs), Constructability Analysis for each alternative and a Step 1 Roundabout Screening analysis.*

Study Type II - Intersection Analysis
- Task 1 - Qualitative Assessment
- Task 2 - Traffic Volume Data
  - Sub-Task 2A - Existing Intersection
  - Sub-Task 2B - Proposed Intersection
- Task 3 - Crash Analysis
- Task 4 - Improvement Recommendations/BC Cost Analysis, Conclusions and Recommendations, (Including Utility Relocation Costs) Constructability Analysis for each alternative.

Study Type III - Arterial Study
- Task 1 - Field Inventory/Survey
- Task 2 - Crash Analysis
- Task 3 - Corridor Review Checklist
- Task 4 - Improvement Recommendations and Benefit to Cost Analysis (Including Utility Relocation Costs), Conclusions and Recommendations, Constructability Analysis for each alternative.
- Task 6 - Preparation and Submission of Report

Study Type IV - Composite Study (each of these studies is requested separately)
- Task 1 - 8-Hour Turning Movement Count (with pedestrians)
- Task 1a - 8-Hour TMC Additive
- Task 2 - 4-Hour Turning Movement Count (with pedestrians)
- Task 2a - 4-Hour TMC Additive
- Task 3 - 2-Hour Turning Movement Count (with pedestrians)
- Task 3a - 2-Hour TMC Additive
- Task 4 - 24-Hour Traffic Count (Intersection)
- Task 5 - 24-Hour Traffic Count (One Approach Additive)
- Task 6 - 24-Hour Traffic Count (One Isolated Location)
- Task 7 - 7-Day Continuous Traffic Count (Bi-directional)
- Task 7a - 7-Day Count Additive

Task 8 - Pedestrian Volume Count
Task 9 - Pedestrian Group Size
Task 10 - 8-Hour Bicycle Count
Task 11 - Intersection Inventory (Condition Diagram)
Task 12 – *Collision Analysis*
Task 13 - Qualitative Assessment of Intersection Operation
Task 14 - Traffic Conflict Study
Task 15 - Highway Lighting Justification
Task 16 - Development of Alternatives and Recommendations
Task 17 - Preparation and Submission of Report and Benefit to Cost Analysis (Including Utility Relocation Costs), *Net Present Value Analysis*, Conclusions and Recommendations, Constructability Analysis for each alternative.
Task 18 - Traffic Signal Optimization
Task 19 - Spot Speed Study
Task 19a - Spot Speed Study Additive
Task 19b - Speed Zone Study Report
Task 20 - Left Turns By Cycle
Task 21 - Travel Time and Delay Study (Basic Study Unit)
Task 21a - Additional two-hour study period
Task 22 - Post Construction Safety Evaluation
Task 23 - Fatal Crash Database and Data Review Forms
Task 24 - Fatal Crash Reviews (50 Reports)
Task 25 - Construction Cost Estimate
Task 26 - Study High Crash Segment (crashes <50/mile/year)
Task 27 - Study High Crash Segment (crashes >50/mile/year)
Task 28 - Safety Research (in office support)
Task 29 - Left Turn Phase Warrant
Task 29a - Additive LTW for the other 2 approaches of intersection (ie eb & wb)
Task 30 - Road Safety Audit
Task 31 - “5% List” Analysis

(C) DESCRIPTION OF STUDY TASKS

This section describes for each study type included in this scope the work required in each task and the task product(s). Also, the units of payment for each work task are defined for the purpose of payment, and the period of performance typically expressed as a function of the number of units to be studied by the CONSULTANT.

For Study Types I, II, and III, Supplemental Work tasks are set forth in Study Type IV, Composite Studies. These may be authorized by the DSPE for the CONSULTANT to perform in conjunction with the work tasks required for the study type. Payment for Supplemental Work Task is in addition to the payment for the study type.

Pre-Programing Checklist - the CONSULTANT will complete the scoping Pre-Programming Checklist for all studies that can result in a safety funded HSIP project or on a case by case basis as requested by the DEPARTMENT DSPE.

STUDY TYPE I: SIGNAL WARRANT ANALYSIS

- Purpose

  This study is intended to provide a specific determination as to whether or not a particular intersection meets warrants for signalization and, if so, whether or not a signal should be considered for installation or removal.

- Basis of Payment

  A signal warrant analysis shall be authorized by the DSPE on an intersection by intersection basis. The established unit price per intersection shall be considered full compensation for all work required to perform this study. However, additional established fees shall be earned for supplemental work task authorized by the DSPE.

- Period of Performance

  The normal period of performance allowed for completion of a Signal Warrant Analysis shall be three weeks for a single intersection, with an additional week for every two additional intersections to be studied. The DSPE may allow additional time beyond the normal period for supplemental work task or as other conditions warrant.

- Scope of Work

  This section specifies the work tasks to be performed by the CONSULTANT, the responsibilities of the CONSULTANT and the DEPARTMENT, the products and reports to be developed by the CONSULTANT and delivered to the DEPARTMENT at the completion of Signal Warrant Analysis.

Task 1: QUALITATIVE ASSESSMENT

A Professional Engineer of the firm shall visit all intersections under study during the morning and evening peak traffic periods, as determined from the 24-hour traffic counts and also during any period which a problem was indicated by the work order. The engineer shall make

qualitative assessment of intersection operation, particularly in terms of queue lengths, delays, conflicts, or any other operational characteristics that should be considered in evaluating the need for a traffic signal.

Colored photographs shall be taken of each approach. The photographs shall show the lane configuration and stop bar and shall be taken facing the approaching traffic. A minimum of one photograph shall be taken of each approach. More photos shall be taken if needed to show the physical, unusual or conditions needing to be repaired or maintained.

Additional photographs shall be taken of any geometric, traffic, or traffic control aspects about which the District Safety Engineer should be aware. The CONSULTANT shall recommend to the DEPARTMENT the need for supplemental work tasks prior to commencing work on such Tasks.

Task Products:

- Assessment of intersection operation.
- Photographs of intersection.
- Recommendation for supplemental work tasks.

Task 2: 24-HOUR TRAFFIC COUNTS (Intersection)

The CONSULTANT shall collect hourly traffic count data on each approach (up to 4 approaches) to the intersection for a minimum period of 24 hours during typical weekday traffic conditions. In conducting the counts, the CONSULTANT shall furnish an automatic traffic counter that produces a written record of the traffic volumes by time of day. This record may produce either directly or through subsequent interconnection and processing with external electronic hardware. The count data shall be presented in an acceptable tabular form showing 15-minute interval volumes and hourly summaries. Additional 24-hour counts may be authorized for additional approaches by the DSPE as a supplemental activity to this study. Price shall be as quoted in the price summary sheet for Study Type IV, Task 5.

Task 3: EIGHT-HOUR TURNING MOVEMENT COUNTS (with pedestrians)

Fifteen-minute turning movement volumes shall be taken for a total of eight hours encompassing the morning, midday, afternoon and other peak periods during which warranting volumes exist and an off-peak period. Each period shall normally consist of the eight (8) consecutive 15-minute intervals (2 hours) during each period that yields the highest total volume of vehicles entering the intersection as determined from the 24-hour traffic counts. Note that the 2-hour period could begin on any quarter hour. For example, the afternoon peak could be from 4:45 PM until 6:45 PM. The volumes shall include all movements (including pedestrians and heavy vehicles). The price shall be as quoted in the price summary sheet for Study Type IV, Task 1.

Task Products:

- Eight-hour turning movement volumes, all vehicles.
- Eight-hour heavy-vehicle volumes.
- Eight-hour pedestrian volumes.

Task 4: FIELD INTERSECTION INVENTORY (Condition Diagram)

The CONSULTANT shall conduct a field inventory of each intersection under study and prepare a condition diagram on standard DEPARTMENT forms contained in the Manual on Uniform Traffic Studies or in another format approved by the DEPARTMENT. Conditions diagram shall include intersection geometry, dimensions, all traffic control devices, and other roadway or roadside elements that contribute to the quality of intersection operation. This shall include but not be limited to pertinent features to traffic operations such as driveways, sidewalks, bicycle paths, fixed objects, buildings, utility and signal poles, major underground utilities, lighting, etc. *The condition diagram shall be a scaled drawing. If an aerial is used, a scaled drawing shall outline intersection features so that the diagram is independent of the aerial. Aerials used in diagrams shall be included in the electronic file submittal.*

Task Product:

- Scaled Condition Diagram

Task 5: INTERSECTION DELAY ANALYSIS (Side Street Approaches)

An intersection delay analysis of the side street approaches shall be made for a total of the three hours encompassing the morning, afternoon, and off-peak traffic periods as determined from the 24-hour counts. This study shall be performed in accordance with the Manual on Uniform Traffic Studies (MUTS Manual), Chapter XV, Intersection Delay Study. The study provides several parameters including the average stopped delay per approach vehicle presently existing at an intersection. If the average stopped delay per approach vehicle on a side-street approach is greater than 40 seconds for any 15-minute period, then an analysis using the procedures in the MUTS Chapter I, II, and III Traffic Signal Warrant Study, should be conducted. This must be approved as a supplemental task (Study Type IV, Tasks 21 and 21a).

Task Product:

- Intersection delay analysis

Task 6: CRASH ANALYSIS

The CONSULTANT shall obtain the collision reports via the DEPARTMENT'S Crash Analysis Reporting system (CARs) and any available collision database approved by the DEPARTMENT. The diagram shall depict the most recent full *5* years for which data is available. Collision diagrams shall be drawn on standard DEPARTMENT forms contained in the Manual on Uniform Traffic Studies or on another DEPARTMENT approved forms as indicated by the DSPE. *Collision shall not be drawn on aerials diagrams.* A crash analysis shall be performed based on the prepared collision diagram.

Task Products:

- Collision Summary
- Crash analysis
- Collision diagram

Task 7: WARRANT ANALYSIS AND RECOMMENDATION

The CONSULTANT shall analyze the collected data in light of the warranting conditions for all nine (9) warrants described in the Manual on Uniform Traffic Control Devices, the DEPARTMENT's Manual on Uniform Traffic Studies, HSIPG and accepted traffic engineering practice. From this analysis, a recommendation shall be formulated as to whether or not a traffic signal should be considered for installation or removal. The recommendation and justification for it shall be documented in a summary report. Attached to this report shall be completed Departmental warrant analysis forms, 24 hour counts, 8 hr. TMC, delay analysis, the condition diagram, the collision diagram, crash analysis, benefit to cost analysis, analysis of ability to construct alternatives within existing R/W, and the products of any authorized supplemental work tasks. *In addition to the signal warrant recommendations, the report should include a Step 1 and potentially Step 2 Roundabout Screening analysis found in the Florida Intersection Design Guide.* The intersection studies shall be documented in such a package. If a signal is recommended for installation, then additional phasing analysis shall be completed, and the phase warrant forms attached. If other recommendations are given, an improvement concept shall be included. The improvement concept shall be a scaled drawing.

Task Product:

- Final warrant analysis report that is signed, sealed, and dated by a registered professional engineer.

STUDY TYPE II: INTERSECTION ANALYSIS

1. Purpose

   This study involves the analysis of an existing or proposed intersection in order to develop a specific conceptual design recommendation in accordance with the HSIPG that can be utilized in preparing plans for the construction of a new or modified inter-section. This analysis may include geometric improvements to improve the safety.

2. Basis of Payment

   The basic unit of payment shall be for two types of roadway situations; i.e. an existing intersection or proposed intersection. Separate fees shall be established for the two. These two situations are defined as follows:

   Existing Intersection: The intersection exists and may be presently signalized or unsignalized.

   Proposed Intersection: The intersection does not presently exist.

   Additional established fees shall be earned for supplemental work tasks authorized by the DSPE.

3. Period of Performance

The normal period of performance allowed for completion of a signal operation analysis shall be one (1) month for a single intersection. Each additional intersection location in a work order shall add one week to the period of performance. The DSPE may allow additional time beyond the normal period for supplemental work tasks or as other conditions warrant.

4. Scope of Work

This section specifies the work tasks to be performed by the CONSULTANT, the responsibilities of the CONSULTANT and the DEPARTMENT, and the work task products to be developed by the CONSULTANT and delivered to the DEPARTMENT.

Task 1: QUALITATIVE ASSESSMENT

A Professional Engineer shall investigate the intersection during peak periods to identify any geometric, traffic safety, traffic operations, and traffic control conditions that may provide input to the determination of optimal signal control. The peak periods shall be determined by 24-hour traffic counts furnished by the DEPARTMENT or provided by the CONSULTANT (supplemental work, Study Type IV - Task 4). The CONSULTANT shall recommend to the DSPE the need for supplemental work tasks.

Colored photographs shall be taken of all intersection approaches with emphasis on obtaining visual information that would be of value to the DEPARTMENT during any subsequent project plans preparation activities. For example, utility conflicts, right-of-way constraints, obstructions, unusual geometrics, deficient pavement markings, etc., should be photographed or detailed. Photos and/or detailed graphics shall be included in the conceptual recommendation report to be developed in Task 3.

Task Products:

- Assessment of intersection operation
- Color Photographs
- Recommendations for supplemental work tasks

Task 2: TRAFFIC VOLUME DATA

Separate work task description exists for this task for an intersection analysis of either an existing or proposed intersection. The 8-hour turning movement data will include pedestrian and bicyclist count data.

Sub-Task 2A: Existing Intersection

Fifteen-minute turning movement volumes shall be taken for a total of eight hours encompassing

the morning, midday peak and afternoon traffic periods and/or peak periods during which warranting volumes exist and an off-peak period. Each period shall normally consist of the eight (8) consecutive 15-minute intervals (2 hours) during each period that yields the highest total volume of vehicles entering the intersection. Note that the 2-hour period could begin on any quarter hour. For example, the afternoon peak could be from 4:45 PM to 6:45 PM. The volumes shall include all movements (including pedestrians and heavy vehicles). The price shall be as quoted in the price summary sheet for Study Type IV, Task 1.

Task Products:

- Eight-hour turning movement volumes, all vehicles
- Eight-hour heavy-vehicle volumes
- Eight-hour pedestrian volumes

Sub-Task 2B: Proposed Intersection

The CONSULTANT shall develop 8 hours of traffic volume data appropriate for computerized analysis of the proposed intersection with available programs of the latest adopted version of the HCM. To estimate or project the required turning movement counts, the CONSULTANT shall utilize available network traffic and planning data furnished by the DEPARTMENT and shall apply appropriate factors as dictated by local trends and accepted practice.

The DEPARTMENT shall furnish the CONSULTANT with all available traffic data that is relevant to the intersection under study.

Task Product(s):

- 8-hour projected turning movement volumes, all vehicles
- 8-hour projected heavy-vehicle volumes
- 8-hour projected pedestrian volumes

Task 3: CRASH ANALYSIS

The CONSULTANT shall prepare a collision diagram for the intersection under study. The CONSULTANT shall obtain the collision reports via the DEPARTMENT'S **C**rash **A**nalysis **R**eporting system (CARs) and any available collision database approved by the DEPARTMENT. The diagram shall depict the most recent full 5 years for which data is available. Collision diagrams shall be drawn on standard DEPARTMENT forms contained in the Manual on Uniform Traffic Studies or on another DEPARTMENT approved forms as indicated by the DSPE. *Collision diagrams shall not be drawn on aerials.* A crash analysis shall be performed based on the prepared collision diagram.

Task Products:

- Collision summary
- Crash analysis
- Collision diagram

Task 4: IMPROVEMENT RECOMMENDATIONS

From the results of previous tasks and any supplemental work tasks, the CONSULTANT shall prepare a report that presents the conceptual recommendations for optimizing the intersection's safety by reducing crashes. As a minimum the report shall include geometrics, channelization, signalization phasing and operation and signal display improvement. The proposed intersection improvement shall be supported by a sketch, printouts, benefit to cost analysis, analysis of ability to construct alternatives within existing R/W, and explanations of the computerized operation analysis (where applicable) and peak period field investigation.

The CONSULTANT shall submit 3 copies of each intersection in an 8 1/2" x 11" format (or 11" x 17" format, as needed).

Task Product:

- The CONSULTANT shall submit copies of the conceptual recommendations report that are signed, dated, and sealed by a registered professional engineer.
- Short Term Recommendations – to include pay item(s), description and quantities table
- Mid Term Recommendation – to include pay item(s), description and quantities table
- Long Term Recommendations – to include pay item(s), description and quantities table

STUDY TYPE III: ARTERIAL STUDY

1. Purpose

   The Arterial Study involves a comprehensive, systematic review of a particular arterial from a safety perspective. The required product of this study is a "TOPICS" type report that sets forth specific improvements that may be used as a basis for the development of an arterial improvement program. Elements of the study report are intended to provide input to the plans preparation process for the recommended improvement projects.

2. Basis of Payment

   The basic unit of payment for this study shall be the number of two-way miles comprising the section to be studied. Composite mileage shall be rounded to the nearest tenth of a mile and shall be established by the DEPARTMENT prior to issuance of the work order. The minimum two-way mileage amount for any study shall be 1.0 mile. The established unit price for each two-way mile studied shall be considered full compensation for all work required to perform this study. However, additional established fees shall be earned for supplemental work tasks authorized by the DSPE Compensation for each signal operation analysis shall be at the established unit price for a Type II Study.

3. Period of Performance

The normal period allowed for completion of an Arterial Study shall be one month for the first 2.0 two-way miles plus two weeks for each additional 2.0 two-way miles or fraction thereof. Signal Operation Studies authorized by the DEPARTMENT and included as part of an Arterial Study are to be conducted concurrently with the Arterial Study and no additional time shall be allotted for their completion. The DSPE may allow additional time beyond the normal period for supplemental work tasks or as other conditions warrant.

4. Scope of Work

This section specifies the work tasks to be performed by the CONSULTANT, the responsibilities of the CONSULTANT and the DEPARTMENT, and the work task products to be developed by the CONSULTANT and delivered to the DEPARTMENT.

As a basic guide for the conduct of an Arterial Study, the CONSULTANT shall generally adhere to the procedures outlined in Federal Highway Administration publication entitled "Traffic Reviews for Operational Efficiency"; August 1982 (no document reference number) and the procedures outlined current HSIPG. Additional study activities not explicitly discussed in the FHWA publication are also required in the Arterial Study and are specified within the following task description.

Task 1: FIELD INVENTORY

The CONSULTANT shall conduct a field inventory of the arterial section(s) under study and shall prepare an inventory table similar to that depicted in Figure 1 of the FHWA document. Additional roadway features should be included as appropriate.

Task Product:

- Arterial inventory table

Task 2: CRASH ANALYSIS

The CONSULTANT shall prepare a collision diagram for the intersection under study. The CONSULTANT shall obtain the collision reports via the DEPARTMENT'S **C**rash **A**nalysis **R**eporting system (CARs) and any available collision database approved by the DEPARTMENT. The diagram shall depict the most recent full *5* years for which data is available. Collision diagrams shall be drawn on standard DEPARTMENT forms contained in the Manual on Uniform Traffic Studies or on another DEPARTMENT approved forms as indicated by the DSPE. *Collision diagrams shall not be drawn on aerials.* A crash analysis shall be performed based on the prepared collision diagram.

Task Products:

- Collision Summary

- Crash analysis
- Collision diagram

Task 3: CORRIDOR REVIEW CHECKLIST

The CONSULTANT shall make a thorough review of the arterial corridor to identify factors contributing to safety and shall complete a corridor review checklist similar to that shown in Figure 5 of the FHWA booklet. For any safety deficiencies discovered, the CONSULTANT shall prepare a descriptive narrative of the problem and shall develop recommendations for improvement of deficient corridor elements.

Task Products:

- Corridor review checklist and supporting documentation
- Corridor review narrative and developed recommendations

Task 4: IMPROVEMENT RECOMMENDATIONS

The products of previous tasks within this study shall be analyzed collectively and the CONSULTANT shall develop and submit to the DSPE for review and comment a coordinated sequence of improvements to improve the safety of the arterial corridor. Recommended improvements shall be based upon consideration of all relevant corridor elements and shall be directed at improving safety. Emphasis should be given to those projects having high benefit to cost analysis and analysis of ability to be constructed within existing R/W.

Task Products:

- Conceptual recommendations for arterial improvements
- Scaled Improvement Concept Plans
- Short Term Recommendations – to include pay item(s), Description and quantities table
- Mid Term Recommendation – to include pay item(s), Description and quantities table
- Long Term Recommendations – to include pay item(s), Description and quantities table

Task 5: PREPARATION AND SUBMISSION OF REPORT

The CONSULTANT shall document the results and recommendations from the Arterial Study in an 8" x 11" report (with 11” x 17” supporting documents, as needed) and submit the report to the DSPE for review and comment. The report shall include photos (and/or graphics), summaries of inventory data, results of signal operation studies, arterial coordination analysis, conceptual drawings of recommended improvements with supporting documentation, cost estimates, benefit to cost analysis, and a proposed sequential improvement plan.

A separate report shall be prepared and submitted to the DSPE for review and comment for each arterial studied and 3 signed/sealed copies shall be submitted upon completion. To the maximum extent possible, each report shall be organized in such a manner so as to facilitate disassembly and piecemeal presentation of specific conceptual recommendations to design and plans

preparation engineers.

Task Product:

- Final report containing the results and recommendations from each arterial studied that are signed, sealed, and dated by a registered professional engineer.

STUDY TYPE IV: COMPOSITE STUDY

1. Purpose

   The composite study is designed to supplement Study Types I thru III as needed and to enable the DEPARTMENT to utilize the services of the CONSULTANT in solving a variety of traffic safety problems. This study requires the DEPARTMENT and CONSULTANT to develop the study design for a particular traffic safety problem by selecting appropriate tasks defined herein.

2. Basis of Payment

   This study is designed to be flexible; therefore, each task shall be priced individually. Any combination of tasks may be selected for a particular composite study or as a supplement to Study Types I thru III. Payment for each composite study will be the summation of the individual prices for selected tasks.

3. Period of Performance

   The time period allowed for completion of a composite study shall be based on the types of tasks to be performed. The normal period allowed for other types of studies in this contract should be used as a general guide in determining the period of performance for a particular composite study. The DSPE and the CONSULTANT will determine a mutually acceptable performance period and due date.

4. Scope of Work

   This section specifies the work tasks that may be performed by the CONSULTANT for a particular composite study, the responsibilities of the CONSULTANT and the DEPARTMENT, and the work task products to be developed by the CONSULTANT and delivered to the DEPARTMENT.

Task 1: 8-HOUR TURNING MOVEMENT COUNT (with Pedestrians)

Fifteen-minute turning movement volumes shall be taken for a total of eight hours encompassing the morning, midday peak, and afternoon traffic periods and/or other peak periods during which warranting volumes exist and an off-peak period. Each period shall normally consist of the eight

(8) consecutive 15-minute intervals (2 hours) during each period that yield the highest total volume of vehicles entering the intersection as determined from the 24-hour traffic counts. Note that the 2-hour period could begin on any quarter hour. For example, the afternoon peak could be from 4:45 PM until 6:45 PM. The volumes shall include all movements (including pedestrians and heavy vehicles). The price shall be as quoted in the price summary sheet for Study Type IV, Task 1.

A sketch will be made of sufficient detail to show the approach lanes, left and right turn lanes, and whether there is a median or other type of separation. If the intersection is signalized the head arrangement should be shown. The sketch should show whether the intersection is a "Tee" or a "Plus" type intersection, any offset, and the approximate skew if one exists. To supplement the sketch, colored photos shall be taken of each approach. The photographs shall show the lane configuration along with stop bar detail. Photos should be taken facing the approaching traffic.

Task Products:

- Eight-hour turning movement volumes, all vehicles
- Eight-hour pedestrian volumes
- Eight-hour heavy-vehicle volumes
- Sketch of lane configurations
- Photos of all approaches to intersection

Task 1a: 8-Hour TMC Additive

Additional person to conduct TMC. One or more additional persons may be authorized by the DSPE for the conduct of TMC counts on an as needed basis.

Task 2: 4-HOUR TURNING MOVEMENT COUNT (with Pedestrians)

Fifteen-minute turning movement volumes shall be taken for a total of four hours encompassing the peak traffic periods, as specified by the DSPE during which warranting volumes exist. Each period shall normally consist of the eight (8) consecutive 15-minute intervals (2 hours) during each period that yields the highest total volume of vehicles entering the intersection as determined from the 24-hour traffic counts or as directed by the DSPE. Note that the 2-hour period could begin on any quarter hour. For example, the afternoon peak could be from 4:45 PM until 6:45 PM. The volumes shall include all movements (including pedestrians and heavy vehicles). The price shall be as quoted in the summary sheet for Study Type IV, Task 2.

A sketch will be made of sufficient detail to show the approach lanes, left and right turn lanes, and whether there is a median or other type of separation. The sketch should show whether the intersection is a "Tee" or a "Plus" type intersection, any offset, and the approximate skew if one exists. To supplement the sketch, colored photos shall be taken of each approach. The photographs shall show the lane configuration along with stop bar detail. Photos should be taken facing the approaching traffic.

Task Products:

- Four-hour turning movement volumes, all vehicles
- Four-hour pedestrian volumes
- Four-hour heavy-vehicle volumes
- Sketch of lane configurations
- Photos of all approaches to intersection

Task 2a: 4-Hour TMC Additive

Additional person to conduct TMC. One or more additional persons may be authorized by the DSPE for the conduct of TMC counts on an as needed basis.

Task 3: 2-HOUR TURNING MOVEMENT COUNT (with Pedestrians)

Fifteen-minute turning movement volumes shall be taken for a total of two hours encompassing the peak traffic periods, as specified by the DSPE, during which warranting volumes exist. Each period shall normally consist of the eight (8) consecutive 15-minute intervals (2 hours) during each period that yields the highest total volume of vehicles entering the intersection as determined from the 24-hour traffic counts or as directed by the DSPE. Note that the 2-hour period could begin on any quarter hour. For example, the afternoon peak could be from 4:45 PM until 6:45 PM. The price shall be as quoted in the summary sheet for Study Type IV, Task 3.

Task Products:

- Two-hour turning movement volumes, all vehicles
- Two-hour pedestrian volumes
- Two-hour heavy-vehicle volumes

Task 3a: 2-Hour TMC Additive

Additional person to conduct TMC. One or more additional persons may be authorized by the DSPE for the conduct of TMC counts on an as needed basis.

Task 4: 24-HOUR TRAFFIC COUNT (Intersection)

The CONSULTANT shall collect traffic count data on each approach to the intersection for a minimum period of 24 hours during typical weekday traffic conditions. In conducting the counts, the CONSULTANT shall utilize an automatic traffic counter that produces a written record of the traffic volumes and the time of day, either directly or through subsequent interconnection and processing with external electronic hardware. The count data shall be presented in an acceptable tabular form showing 15-minute interval volumes and hourly summaries.

Task Product:

- 24-hour approach (one way) volume counts

Task 5: 24-HOUR TRAFFIC COUNT (One Approach Additive)

When an intersection has more than 4 approaches or when there are adjacent legs or driveway openings that should be counted with the regular intersection, the DSPE may authorize the CONSULTANT to collect hourly traffic count data on one additional approach to an intersection for a minimum period of 24 hours. In conducting these supplemental counts, the CONSULTANT shall utilize an automatic traffic counter that produces a written record of the traffic volume and the time of day.

As defined in Task 4 above, this Task may be authorized only with Task 4.

Task 6: 24-HOUR TRAFFIC COUNT (One Isolated Location)

The CONSULTANT shall collect hourly traffic count data at one isolated location for a minimum period of 24 hours during typical weekday traffic conditions. In conducting the counts, the CONSULTANT shall utilize an automatic traffic counter, which produces a written record of the traffic volumes and the time of day, either directly or through subsequent interconnection and processing with external electronic hardware. The count data shall be presented in an acceptable tabular form showing 15-minute interval volumes and hourly summaries. A pair of one-way streets is considered as one (1) location.

Task Product:

- 24-hour two-way volume count at one specified location

Task 7: SEVEN-DAY CONTINUOUS TRAFFIC COUNT (Bi-directional)

A count station is one location, two directions, or in the case of one-way pairs, one count for each direction.

To determine the volume of traffic utilizing a road, the DSPE may authorize the collection of seven-day continuous traffic counts at select stations. In conducting the counts, the CONSULTANT shall utilize an automatic traffic counter that produces a written record of the traffic volume and the time of day, either directly or through subsequent interconnection and processing with external electronic hardware. From the count data, an acceptable tabular presentation of directional traffic volumes shall be developed showing 15-minute interval volumes and hourly summaries over the seven consecutive day period. A graphical presentation shall be developed showing hourly interval volumes over the seven consecutive day period. The seven-day period shall not include a holiday.

Task Products:

- Seven-day graphs and tables

Subtask 7a: 7-Day Count Additive

Additional 7-Day Continuous Traffic Count Stations requested for the same route and or study.

Task 8: PEDESTRIAN VOLUME COUNT

A pedestrian volume count shall be made for a total of eight hours encompassing the morning and evening peak traffic periods and/or the peak pedestrian volume periods. A mid-block study will be counted and treated as one location. An intersection will be counted and treated as one location.

Task Product:

- Eight-hour pedestrian volume count

Task 9: PEDESTRIAN GROUP SIZE

A pedestrian group size study shall be made for a total of eight hours encompassing the morning and evening peak traffic periods and/or the peak pedestrian volume periods. A mid-block study will be counted as one location. An intersection will be counted and treated as one location.

Task Product:

- Eight-hour pedestrian group size study

Task 10: 8-HOUR BICYCLE COUNT

Bicycle volumes shall be collected for a total of 8 hours which include the morning and evening peak bicycle periods, or during other peak time periods specified by the DSPE. The CONSULTANT will present this data on an approved form or format.

Task Product:

- Eight-hour bicycle volumes

Task 11: INTERSECTION INVENTORY (Condition Diagram)

The CONSULTANT shall conduct a field inventory of each intersection under study and prepare a condition diagram on standard DEPARTMENT forms contained in the Manual on Uniform Traffic Control Studies or in another format approved by the DEPARTMENT.

Condition diagrams shall include intersection geometry, all traffic control devices, and other roadway or roadside elements that contribute to the quality of an intersection's operation. This shall include, but not be limited to, pertinent features to traffic operations such as driveways, sidewalks, bicycle paths, fixed objects, buildings, utility and signal poles, major underground utilities, lighting, trees and shrubbery (if they affect visibility), etc. *The condition diagram shall be a scaled drawing. If an aerial is used, a scaled drawing shall outline intersection features so that the diagram is independent of the aerial. Aerials used in diagrams shall be included in the electronic file submittal.*

Colored photographs shall be taken of each approach. The photographs shall show the lane configuration and stop bar and shall be taken facing the approaching traffic. A minimum of one photograph shall be taken of each approach. More photos shall be taken if needed to show the physical conditions. Additional photographs shall be taken of any geometric, traffic, or traffic

control aspects about which the District Safety Engineer should be aware.

Task Products:
- Condition diagram
- Colored photographs

Task 12: ***COLLISION ANALYSIS***

The CONSULTANT will locate collision records and shall prepare a collision diagram and summary for the intersection or corridor under study. The CONSULTANT shall obtain the collision reports via the DEPARTMENT'S **C**rash **A**nalysis **R**eporting system (CARs) and any available collision database approved by the DEPARTMENT. *The diagram shall depict the most recent full 5 years for which data is available. Collision diagrams shall be drawn on standard DEPARTMENT forms contained in the Manual on Uniform Traffic Studies or on another DEPARTMENT approved forms as indicated by the DSPE. Collision diagrams shall not be drawn on aerials. A crash analysis shall be performed based on the prepared collision diagram.*

Task Products:

- *Collision Summary*
- *Crash analysis*
- *Collision diagram*

Task 12a: One (1) year of collision data additive

Additional one (1) year of collision data review, plotting and summary for the same study.

Task 13: QUALITATIVE ASSESSMENT OF INTERSECTION OPERATION

A Professional Engineer of the firm shall visit the intersection/interchange under study during the morning and evening peak traffic periods, as determined from the 24-hour traffic counts. This will also include any period during which a problem was indicated by the work order. The Engineer shall make qualitative assessments of the intersection's operation, particularly in terms of queue lengths, delays, conflicts or any operational characteristics that should be considered in recommending the need for a traffic signal or other operational improvements.

The CONSULTANT shall conduct a field inventory of each intersection under study and prepare a condition diagram on standard DEPARTMENT forms contained in the MUTS or in another format approved by the DEPARTMENT. The condition diagram shall show the intersection geometry and dimensions, including but not limited to, auxiliary turn lane lengths, lane widths, taper lengths, and turning and curb radii. The condition diagram shall show all traffic control

devices and other roadway or roadside elements that contribute to the quality of the intersection's operation, including but not limited to driveways, sidewalks, signs, pavement markings, drainage inlets, buildings, utility and signal poles, lighting, and other fixed objects. The condition diagram shall be a scale drawing.

Color photographs shall be taken of each approach. The photographs shall show the lane configuration, STOP sign/bar location and condition, traffic signals and other special beacons or devices used to control traffic. The photographs shall be taken facing the approaching traffic. A minimum of 1 photograph shall be taken of each approach. More photographs shall be taken if needed to show the physical conditions. Additional photographs shall be taken of any geometric, traffic, or traffic control aspects about which the DTOE should be aware.

The CONSULTANT shall recommend to the DSPE the need for appropriate supplemental work tasks.

The CONSULTANT shall prepare an improvement diagram detailing the study recommendations. This diagram shall include, but is not limited to, proposed sign locations, proposed pavement marking locations, and proposed turn lane locations/dimensions.

Task Products:
- Assessment of intersection operation
- Condition Diagram
- Color photographs of intersection
- Final recommendation for intersection improvement(s) and for supplemental work tasks
- An improvement diagram detailing intersection improvements

Task 14: TRAFFIC CONFLICT STUDY

The CONSULTANT shall conduct a Traffic Conflict Study as defined in Chapter X of the MUTS Manual. Four (4) hours of data shall be collected for each approach. This should include at least one hour during morning peak and afternoon peak periods. The CONSULTANT will then analyze the data for statistical significance as outlined in Chapter X of the MUTS Manual.

Task Products:
- Traffic Conflict Study
- Statistical analysis

Task 15: HIGHWAY LIGHTING JUSTIFICATION

A Professional Engineer of the firm shall perform a highway lighting justification report in

accordance with Chapter XIV of the MUTS Manual. The procedures for roadway lighting justification are based on FHWA guidelines contained in the August 2012 FHWA Lighting Handbook. In Florida, the predictive methodologies contained in Part C of the Highway Safety Manual (HSM) are given priority and should be used for the lighting justification crash cost analysis where applicable. The safety impact of existing or proposed lighting projects can be quantified with predictive equations (safety performance functions – SPFs) available in the HSM. These formulas allow for the prediction of crash frequency for a given facility with and without lighting. The crash benefit of lighting installation is then converted to dollars and a benefit/cost (B/C) ratio and/or net present value (NPV) is computed using the cost of the lighting project. The report shall also include a summary of operational, and environmental factors on the roadway which may contribute to the need for lighting with special emphasis given to pedestrian and bicyclist safety.

Task Product:

- Highway lighting justification report that is signed, sealed, and dated by a registered professional engineer.

Task 16: DEVELOPMENT OF ALTERNATIVES AND RECOMMENDATIONS

Utilizing the products from other tasks in a composite study, the CONSULTANT will develop and analyze feasible and appropriate alternatives, which address solutions to the defined problem(s). A minimum of three practical alternatives with benefit to cost analyses will be developed and analyzed for each composite study. Analyzing the ability to construct alternatives within existing R/W should also be done. If three practical alternatives do not exist, the CONSULTANT shall make a statement to this effect. Based on this analysis the CONSULTANT shall recommend one of the alternatives. This task is based on utilizing a minimum of three other tasks, one of which shall be Task 17, Preparation of Reports.

Task Products:

- Development of alternatives
- Analysis of alternatives
- Recommended alternative
- Short Term Recommendations – to include pay item(s), Description and quantities table
- Mid Term Recommendation – to include pay item(s), Description and quantities table
- Long Term Recommendations – to include pay item(s), Description and quantities table

Task 17: PREPARATION AND SUBMISSION OF REPORT AND BENEFIT TO COST ANALYSIS

The CONSULTANT shall document the results and recommendations from all tasks in a Composite Study in a bound, written report.

Task Product:

- Final report that is signed, sealed, and dated by a registered professional engineer.

Task 18: TRAFFIC SIGNAL OPTIMIZATION

The CONSULTANT shall analyze various signal control alternatives using SOAP, TRANSYT 7F, PASSER II, Synchro/SimTraffic, or in the case of a diamond interchange, PASSER III. The CONSULTANT shall determine the optimal strategy as expressed by the measures of effectiveness produced by the program. This analysis may be used to compare average stopped delay per stopped vehicle existing at an intersection, to the average stopped delay per stopped vehicle if a traffic signal were optimized. Controller type, phasing, cycle length, and splits shall be determined for all hours of the day. Use of the Micro (PC) computer for analysis is permissible as long as the software used for the analysis is approved by the DTOE. In developing the optimal control parameters, the CONSULTANT shall take into consideration the nature, proximity and influence of any adjacent signalized intersections. Optimization of the signal operation shall be evaluated for each practical geometric configuration, including the existing one. Also, the CONSULTANT shall analyze the potential for nighttime flashing of the traffic signal.

Task Products:

- Optimal signal control strategy for each geometric configuration
- Practical geometric configuration including the existing one
- Analysis of potential for nighttime flashing

Task 19: SPOT SPEED STUDY

The CONSULTANT shall conduct a Spot Speed Study as set forth in the manual on Uniform Traffic Studies (MUTS Manual). The Study shall include a minimum sample of 100 vehicles for each direction of travel. The CONSULTANT will present this data on an approved form or format.

Task Product:

- Spot speed data for one site

Task 19a: Additive

Additional Spot Speeds requested for same route and or study.

Task 19b: Speed Zone Study Report

Under this supplemental task the CONSULTANT shall prepare a Speed Zone Study report based on the spot speed study data and the FDOT manual, SPEED ZONING FOR HIGHWAYS, ROADS AND STREETS IN FLORIDA, 1989. Using these guidelines, the CONSULTANT shall prepare a report and recommendations on changes to existing speed zones.

Task Product:

- Final speed zone study report that is signed, sealed, and dated by a registered professional engineer.

Task 20: LEFT TURNS BY CYCLE

The CONSULTANT shall conduct a study of left turn movements by cycle for a specified approach. This data will be presented on a form furnished by the DSPE. This will be performed during a specified 2-hour period.

Task Product:

- Left turn movements by cycle

Task 21: TRAVEL TIME AND DELAY STUDY (Basic Study Unit) (One Arterial)

The CONSULTANT shall perform standard travel time and delay studies along the arterial. In the interest of efficiency, the CONSULTANT shall employ only DEPARTMENT approved, automated electronic distance and time measuring devices and data analysis software - Traffic Analyzer (TA-88) and Moving Vehicle Run Analysis Package (MVRAP). Other techniques considered for use must receive prior approval by the DTOE. This study shall be performed in accordance with the Manual on Uniform Traffic Studies (MUTS Manual).

Travel time and delay studies shall be conducted in each direction of travel during the morning and afternoon peak traffic periods as determined from 24-hour traffic counts, and also during a daytime off-peak period. The number of runs to be made for each direction and time shall be determined by the procedure in Chapter VIII of the MUTS Manual. From the travel time and delay data, a Traffic System Performance Evaluation, Link Performance Profile, and a Speed Profile, shall be generated by computer for each period and direction. These printouts shall be supplemented with a written analysis of the route location giving possible causes of the measured stops, delays, and contained travel speeds.

Basis of Payment:

- "Basic" study that consists of three (3) 2-hour study periods; AM Peak; Off Peak,

and PM Peak. The number of runs required for statistical significance will be determined based on travel during these study periods.

- If the statistical sample requires more runs than can be accomplished during the Basic study one (1) or more additive study period will be authorized by the DTOE to permit accomplishing the required study effort.

- An Arterial Travel Time and Delay Report (Arterial Report) will include a separate discussion of each combination of direction of travel and time period (six hours). The Arterial Travel Time and Delay Report shall also include an overall summary that consolidates the findings of each of the separate discussions.

Task Products:

- Traffic system performance evaluation
- Link performance profile
- Speed profile
- Travel time and delay analysis
- Arterial travel time and delay report

Task 21a: Additive

Additional two-hour study period to supplement the “Basic” study.

Task 22: POST CONSTRUCTION SAFETY EVALUATION

The CONSULTANT shall compare crash data and conditions for the 3 years prior to the construction (report prepared by a previous assignment) to the 3 years post construction in the justification report to determine if there have been any reductions in the type of crash targeted for reduction or an overall reduction. The CONSULTANT shall consider the increase to development in an area or changes to the AADT, as appropriate. The CONSULTANT shall perform a field review and summarize the findings in a short narrative (normally one or two pages). The final report shall be signed and sealed by a registered professional engineer.

Task 23: FATAL CRASH DATABASE AND DATA REVIEW FORMS

The CONSULTANT shall maintain a database of all fatal crashes. As a minimum, the database will record Section; Subsection; US; SR; milepost; number killed; number injured; type of crash;

special category for pedestrian and bicycle; day/night; wet/dry pavement conditions; physical location of crash (nearest street reference for non-limited access roads or mile marker for limited access); crash report number; crash date; date report received from the DEPARTMENT; date CONSULTANT started review; date review completed and returned to the DEPARTMENT; corrective actions recommended; date corrective action implemented in the field (this information will be supplied by FDOT as available); CONSULTANT review time (in days). Database will have sort and extract capabilities on any field.

Task Product:

- Updated database with all fatal crashes reviewed including recommendations.

Task 24: FATAL CRASH REVIEW (50 Reports)

Each fatal crash location study shall consist of a review of the fatal crash report, an assessment of the area's 5-year crash history, a review of relevant Traffic Operations files (if required to obtain additional data), to determine if there is anything that does not meet the MUTCD's or DEPARTMENT's standards. Locations that do not indicate any deficiency or have unusual crash patterns should not normally require additional review. Any location the CONSULTANT suspects has possible significant deficiencies will be discussed with DEPARTMENT before submitting recommendations. After discussions, the deficiencies will be documented on the Disposition of Fatal Crash form and sent to the District Safety Program Engineer for action. The CONSULTANT is anticipated to perform field reviews and take site photographs as deemed necessary. The CONSULTANT shall have the reviewing engineer sign the completed form, if no recommendations are being made. If the CONSULTANT is making recommendations, the package is submitted unsigned to the DSPE to appropriately address the recommendations. A copy of the signed form and comments will be provided to the CONSULTANT to update the status in the database.

Task Products:

- Fatal Crash Review Form
- Recommendation
- Photographs of the Area of concern

Task 25: CONSTRUCTION COST ESTIMATE

The CONSULTANT shall estimate the construction costs for the recommended improvements. Cost estimates shall be calculated using the most current publication of the FDOT's Transportation Costs. The costs estimates must be accepted by the District's Estimates Engineer. An electronic version of the Transportation Costs is available on http:/www.dot.state.fl.us/planning under Policy Planning.

Task Product:

- Estimate of Construction Costs

- LRE as part of the Pre-Programing Checklist

Task 26: STUDY HIGH CRASH SEGMENT (Crashes <50/Mile/Year)

The CONSULTANT shall perform a study on each high crash segment identified for this group. The study shall include a location description, all roadway characteristics, color photos of each major characteristic (minimum of one-color photo per segment) and a straight-line diagram (SLD) crash plot using the most recent 5 years of crash data. The CONSULTANT shall analyze the crash plots to determine crash reduction potential and rank the segments (high, medium, low) for developing safety crash reduction projects. The CONSULTANT will then determine the need for further study.

Task Product:

- High Crash Segment Report

Task 27: STUDY HIGH CRASH SEGMENT (Crashes >50/Mile/Year)

The CONSULTANT shall perform a study on each high crash segment identified for this group. The study shall include a location description, all roadway characteristics, color photos of each major characteristic (minimum of one-color photo per segment) and a straight-line diagram (SLD) crash plot using the most recent 3 years of crash data. The CONSULTANT shall analyze the crash plots to determine crash reduction potential and rank the segments (high, medium, low) for developing safety crash reduction projects. The CONSULTANT will then determine the need for further study.

Task Product:

- High Crash Segment Report

Task 28: SAFETY RESEARCH (in office support)

The CONSULTANT shall assign one (1) staff person to work under the direct management and supervision of the District Safety Engineer. This staff person shall be familiar with the design standards, MUTS manual, MUTCD, and HSIPG. The CONSULTANT staff shall perform field reviews, gather local crash data, plot crashes, and research DEPARTMENT files and databases as required by the District Safety Engineer. Research items can include safety concerns identified by management, citizen complaints, or the Community Traffic Safety Teams.

Task 29: LEFT TURN PHASE WARRANT

The CONSULTANT shall conduct a left turn phase warrant analysis for two (2) approaches of the intersection (i.e., northbound and southbound). This study shall result in a recommendation for the appropriate left turn treatment. This task shall include all studies necessary to complete the left turn phase warrant form to be provided by the DEPARTMENT. This shall include an on-site review, a 4-hour TMC, an intersection sketch, a left turn phase warrant form, and a collision review.

Fifteen-minute turning movement volumes shall be taken for a total of 4 hours encompassing the peak traffic periods, as specified by the DSE, during which warranting volumes exist. Each period shall normally consist of eight (8) consecutive 15-minute intervals (2-hours) during each period which yields the highest total volume of vehicles entering the intersection as determined from the 24-hour traffic counts or as directed by the DSE. Note that the 2-hour period could begin on any quarter hour. For example, the afternoon peak could be from 4:45 PM until 6:45 PM

The CONSULTANT shall prepare a collision summary and collision diagram for the intersection under study. The summary and diagram shall depict as a minimum the most recent 12 months for which data is available. Collision diagrams shall be drawn on standard DEPARTMENT forms contained in the MUTS or on other DEPARTMENT approved forms. A collision analysis shall be performed based on the prepared collision summary and diagram.

Task Products:

- On-Site Review
- 4-Hour TMC
- Intersection Sketch
- Collision Analysis
- Left Turn Phase Warrant Form

If this data is provided as a separate document, it should include a title page, location map, the data presented on standard FDOT forms or as provided by the DEPARTMENT, and any narrative necessary for the understanding or interpretation of the data.

Task 29a: Additive

The CONSULTANT shall conduct a left turn phase warrant analysis for the other 2 approaches.

Task 30: ROAD SAFETY AUDIT

The Traffic Operations office is responsible for the implementation of the FL-SHSP. The DEPARTMENT believes that RSAs, because of their proactive and low-cost/high-value nature of their recommendations, are instrumental in addressing the emphasis areas of the FL-SHSP. In general, RSAs aim to answer the following two questions:

1. What elements of the road may present a safety concern: to what extent, to which road users, and under what circumstances?
2. What opportunities exist to eliminate or mitigate identified safety concerns?

The goal of an RSA is to develop recommendations that enhance safety, while minimizing impact, if any, on traffic flow. As part of this assignment, the CONSULTANT shall complete the following steps consistent with the procedures and guidelines outlined in the FDOT MUTS Manual, MUTCD, HSIP, AASHTO, and FHWA RSA guidelines:

1. **Identify project or existing road to be audited**.
2. **Select RSA team**. The CONSULTANT team must provide a qualified and multidisciplinary team of experts suitable for the specific RSA to be conducted – each

RSA will likely require the participation of different areas of expertise. While in the ideal RSA some of the expertise is provided by the local agency and/or the DEPARTMENT, there may be occasions in which these agencies are unable to provide the necessary expertise. For these cases, the consultant team shall have access to experts within the necessary fields of expertise. Typical fields of expertise necessary to conduct an RSA are:

a. Road safety specialist. The road safe specialist shall act as the leader of all RSAs. As the RSA team leader, the road safety specialist shall sign and seal the final RSA document – the road safety specialist shall be a licensed engineer in the State of Florida.
b. Traffic operations engineer.
c. Road design engineer.
d. Local contact person.
e. Other areas of expertise. Some of the areas of expertise that may be required in some RSAs may include (this is not intended to be a comprehensive list):
    i. Human factors
    ii. Maintenance
    iii. Enforcement
    iv. First response
    v. Pedestrian & bicycle treatment
    vi. Transit operations
    vii. ITS

3. **Conduct a pre-audit meeting to review project information**. This meeting shall bring together the maintaining agency, the design team (if any) and the audit team to discuss the context and scope of the RSA and to review all project information available.
4. **Office review of crash data and other available information**. This step aims to help identify areas of safety concerns. The RSA team should restrict its comments to those issues having a bearing on the safety of road users. Comments may be either specific to a particular location or broad-based. Issues related to aesthetics, amenities, or congestion should also be commented upon if they lead to less-safe conditions.
5. **Perform field reviews under various conditions**. For typical RSAs, at least 3 field reviews should be performed: one during night-time, one during the day-time peak period, and one during day-time off-peak period. The number/time of field reviews may be modified if the RSA study location justifies it. The objectives of the field reviews are:

    a. Gain insight into the project or existing road
    b. Verify/identify areas of safety concerns

6. **Conduct audit analysis and prepare report findings**. As a result, the safety issues are identified and prioritized, and suggestions are made for reducing the degree of safety risk. Suggestions to enhance safety are to be prioritized using a Cartesian plane where the X

axis represents “feasibility”, and the Y axis represents “value”. RSA suggestions should be appropriate to the stated RSA and the elements being examined (e.g., the suggestions of a construction phase RSA would be different than those made in a preliminary design RSA). The RSA results are then succinctly summarized in the formal RSA report.

7. **Present audit findings to project owner, design team, RSA steering committee, or Safety Review Committee**. The audit team will orally report the key RSA findings to the maintaining agency, design team, RSA steering committee, or Safety Review Committee in order to facilitate the understanding of the RSA.
8. **Record/Prepare Formal Response**. The CONSULTANT team will summarize the feedback provided by the maintaining agency, design team, RSA steering committee, or the Safety Review Committee to each safety issue/recommendation listed in the RSA report.

Task products:

An RSA will be deemed completed after the following submittals are received and approved by the DEPARTMENT:

1. **RSA report**. In general, the RSA report shall follow the following sample outline:
    a. Introduction
        i. Scope and purpose of the RSA
        ii. Identification of project stage or existing road and items reviewed (and not reviewed)
        iii. Project limits
    b. Background
        i. Audit team, affiliation and qualifications of team members
        ii. Commentary on data received from maintaining agency and design team
        iii. General observations regarding the site visits
    c. Findings and suggestions
        i. List of safety issues
            1. Safety issue 1 – description of issue, evaluation of safety risk, suggestions
            2. Safety issue 2 – etc.
        ii. Prioritization of safety issues based on value and feasibility using Cartesian plane
    d. Formal statement. This is a concluding statement signed by the RSA team members indicating that they have participated in the RSA and agreed or reached consensus on its findings. The RSA team leader – the Road Safety Specialist – who is required to be a licensed engineer in the State of Florida, shall sign and seal the final report.

2. **Crash summary tables**. Each submission of the draft and the final technical

memorandum shall be submitted with the supporting crash summary tables. The crash summary tables shall be developed using a spreadsheet compatible with MS-Office Excel 2007 and submitted to the Department in an electronic format.

Performance time

When a single Road Safety Audit is issued in a task work order, the CONSULTANT shall be provided 30 calendar days to conduct the RSA, submit a first draft to the DEPARTMENT, and make the presentation of findings. The calendar days begin on the day the task work order is issued.

The DEPARTMENT will prioritize the RSAs whenever multiple ones are issued in the same task work order. The CONSULTANT, however, shall have enough qualified staff to simultaneously conduct up to two RSAs.

Format of Submittals

All submittals, drafts and final document shall be submitted to the DEPARTMENT in the following manner, unless directed otherwise by the DSPE:

1. Three (3) hard copies (i.e., print), and
2. Electronic formats, which are:
    a. pdf, and
    b. the documents' native format (ex., MS-Word, MS-Excel, etc.).

Task 31: "5% LIST" ANALYSIS

The DEPARTMENT is responsible for assessing the locations (spots and segments) that ranked among the top 5% locations according to the number of crashes.

The CONSULTANT will be tasked with reviewing the two 5% lists (spots and segments) provided by the DEPARTMENT and:

1. Review crash history at each location
2. Identify crash patterns, if any
3. Identify actions the DEPARTMENT has taken, is currently taking, or plans to take at such locations
4. If crash patterns are identified, identify applicable safety engineering countermeasures with the potential to:
    a. Reduce the probability that crashes of a specific crash pattern occur again, or
    b. Reduce the severity of crashes occurring in a specific crash pattern
5. Identify if the recommended safety engineering countermeasures are implementable
6. Recommend whether an additional safety study is needed. The additional safety study would identify the crash reduction factors of the countermeasures identified in the previous steps, the costs of the countermeasures as well as the operational consequences.

SCOPE OF SERVICES FOR HIGHWAY 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 Consultant. (hereinafter referred to as the CONSULTANT) relative to the transportation facility described as follows:

Financial Project ID and or Federal Aid Project No: As specified by the Department in each assigned Task Work Order.

2 PROJECT DESCRIPTION- HIGHWAY DESIGN TASK WORK ORDERS

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.

Highway Design Contract

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

Public Involvement: As defined by each Task Work Order

Other Agency Presentations/Meetings: As defined by each Task Work Order

Joint Project Agreements: As defined by each Task Work Order

Specification Package Preparation: As defined by each Task Work Order

Value Engineering: As defined by each Task Work Order

Risk Assessment Workshop: As defined by each Task Work Order

Plan Type: As defined by each Task Work Order

Typical Section: As defined by each Task Work Order

Pavement Design As defined by each Task Work Order

Pavement Type Selection Report(s): As defined by each Task Work Order

Cross Slope: As defined by each Task Work Order

Access Management Classification: As defined by each Task Work Order

Transit Route Features: As defined by each Task Work Order

Major Intersections/Interchanges: As defined by each Task Work Order

Roadway Alternative Analysis: As defined by each Task Work Order

Level of TCP Plans: As defined by each Task Work Order

Temporary Lighting As defined by each Task Work Order

Temporary Signals: As defined by each Task Work Order

Temporary Drainage: As defined by each Task Work Order

Design Variations/Exceptions: As defined by each Task Work Order

Back of Sidewalk Profiles: As defined by each Task Work Order

2.2 Drainage (Activities 6a and 6b)

System Type: As defined by each Task Work Order

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.

As defined by each Task Work Order

2.4 Environmental Permits, Compliances, and Clearances (Activity 8)

As defined by each Task Work Order

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

2.5 Structures (Activities 9 – 18)

Type of Bridge Structure Work: As defined by each Task Work Order

Retaining Walls As defined by each Task Work Order.

Noise Barrier Walls: As defined by each Task Work Order

Miscellaneous: As defined by each Task Work Order

2.6 Signing and Pavement Markings (Activities 19 & 20)

As defined by each Task Work Order

2.7 Signalization (Activities 21 & 22)

Intersections: As defined by each Task Work Order

Traffic Data Collection: As defined by each Task Work Order

Traffic Studies: As defined by each Task Work Order

Count Stations: As defined by each Task Work Order

Traffic Monitoring Sites: As defined by each Task Work Order.

2.8 Lighting (Activities 23 & 24)

As defined by each Task Work Order

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: As defined by each Task Work Order.

Irrigation Plans: As defined by each Task Work Order.

Hardscape Plans: As defined by each Task Work Order.

Outdoor Advertising: As defined by each Task Work Order.

2.10 Survey (Activity 27)

The CONSULTANT shall prepare a three-dimensional (3D) model Construction Deliverables using the latest FDOT SS4 software in accordance with the FDOT CADD Production Criteria Handbook, Current Edition.

Design Survey: As defined by each Task Work Order

Subsurface Utility Exploration: As defined by each Task Work Order.

Right of Way Survey: As defined by each Task Work Order.

2.11 Photogrammetry (Activity 28) N/A

As defined by each Task Work Order

2.12 Mapping (Activity 29)

Control Survey Map: As defined by each Task Work Order.

Right of Way Map: As defined by each Task Work Order.

Legal Descriptions: As defined by each Task Work Order

Maintenance Map As defined by each Task Work Order

Miscellaneous Items: As defined by each Task Work Order

2.13 Terrestrial Mobile LiDAR (Activity 30)

As defined by each Task Work Order

2.14 Architecture (Activity 31) N/A

As defined by each Task Work Order

LEED (Leadership in Energy and Environmental Design)

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

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

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

Hours include the efforts to design and receive certification for buildings. These hours

include all disciplines involved in the effort.

2.15 Noise Barriers (Activity 32)

As defined by each Task Work Order

2.16 Intelligent Transportation Systems (Activities 33 & 34)

As defined by each Task Work Order

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

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

The ITS shall operate from TMC as defined by each Task Work Order

Interchanges: As defined by each Task Work Order

Traffic Data Collection: As defined by each Task Work Order

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

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

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

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

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

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

2.17 Geotechnical (Activity 35)

As defined by each Task Work Order

2.18 Project Schedule

Within ten (10) days after the Notice-To-Proceed, and prior to the CONSULTANT beginning work, the CONSULTANT shall provide a detailed project activity/event schedule for DEPARTMENT and CONSULTANT scheduled activities required to meet the current DEPARTMENT Production Date. The schedule shall be based upon each Task Work Orders' production date**.** The schedule shall be accompanied by an anticipated payout and fiscal progress curve. For the purpose of scheduling, the CONSULTANT shall allow for a four (4) week review time for each phase submittal and any other submittals as appropriate.

The schedule shall indicate all required submittals.

All fees and price proposals are to be based on the negotiated schedule as applicable to each Task Work Order for final construction contract documents. However, the contract deadline will also be specified based on each Task Work Order's 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.

2.19 Submittals

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

2.20 Provisions for Work

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

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

Control Devices (MUTCD)
- FHWA – National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide
- FHWA Roadway Construction Noise Model (RCNM) and Guideline Handbook
- Florida Fish and Wildlife Conservation Commission - Standard Manatee Construction Conditions 2005
- Florida Statutes (F.S.)
- Florida's Level of Service Standards and Guidelines Manual for Planning
- Model Guide Specifications – Asbestos Abatement and Management in Buildings, National Institute for Building Sciences (NIBS)
- Quality Assurance Guidelines
- Safety Standards
- Any special instructions from the DEPARTMENT

- Roadway
  - FDOT – Florida Intersection Design Guide
  - FDOT - Project Traffic Forecasting Handbook
  - FDOT - Quality/Level of Service Handbook
  - Florida's Level of Service Standards and Highway Capacity Analysis for the SHS
  - Transportation Research Board (TRB) - Highway Capacity Manual
- Permits
  - Chapter 373, F.S. – Water Resources
  - US Fish and Wildlife Service Endangered Species Programs
  - Florida Fish and Wildlife Conservation Commission Protected Wildlife Permits
  - Bridge Permit Application Guide, COMDTPUB P16591.3C
  - Building Permit
- Drainage
  - FDOT Bridge Hydraulics Handbook
  - FDOT Culvert Handbook
  - FDOT Drainage Manual
  - FDOT Erosion and Sediment Control Manual
  - FDOT Exfiltration Handbook
  - FDOT Hydrology Handbook
  - FDOT Open Channel Handbook
  - FDOT Optional Pipe Materials Handbook
  - FDOT Storm Drain Handbook
  - FDOT Stormwater Management Facility Handbook
  - FDOT Temporary Drainage Handbook
  - FDOT Drainage Connection Permit Handbook
  - FDOT Bridge Scour Manual
-

2 PROJECT DESCRIPTION

- Survey and Mapping
  - All applicable Florida Statutes and Administrative Codes
  - Applicable Rules, Guidelines Codes and authorities of other Municipal, County, State and Federal Agencies.
  - FDOT Aerial Surveying Standards for Transportation Projects Topic 550-020-002
  - FDOT Right of Way Mapping Handbook
  - FDOT Surveying Procedure Topic 550-030-101
  - Florida Department of Transportation Right of Way Procedures Manual
  - Florida Department of Transportation Surveying Handbook
  - Right of Way Mapping Procedure 550-030-015
- Traffic Engineering and Operations and ITS
  - AASHTO - An Information Guide for Highway Lighting
  - AASHTO - Guide for Development of Bicycle Facilities
  - FHWA Standard Highway Signs Manual
  - FDOT Manual on Uniform Traffic Studies (MUTS)
  - FDOT Median Handbook
  - FDOT Traffic Engineering Manual
  - National Electric Safety Code
  - National Electrical Code
- Florida's Turnpike Enterprise
  - Florida's Turnpike 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
- 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

2 PROJECT DESCRIPTION

- Structures
  - AASHTO Load and Resistance Factor Design (LRFD) Bridge Design Specifications and Interims
  - AASHTO LRFD Movable Highway Bridge Design Specifications and Interims
  - AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, and Interims.
  - AASHTO/-AWS-D1. 5M/D1.5: An American National Standard Bridge Welding Code
  - AASHTO Guide Specifications for Structural Design of Sound Barriers
  - AASHTO Manual for Condition Evaluation and Load and Resistance Factor Rating (LRFR) of Highway Bridges
  - FDOT Bridge Load Rating Manual
  - FDOT Structures Manual
  - FDOT Structures Design Bulletins (available on FDOT Structures web site only)
  -
- Geotechnical
  - FHWA Checklist and Guidelines for Review of Geotechnical Reports and Preliminary Specifications
  - Manual of Florida Sampling and Testing Methods
  - Soils and Foundation Handbook
- Landscape Architecture
  - Florida Department of Agriculture and Consumer Services Grades and Standards for Nursery Plants
- Architectural
  - Building Codes
  - Florida Building Code:
    - Building
    - Fuel Gas
    - Mechanical
    - Plumbing
    - Existing Building
  - Florida Accessibility Code for Building Construction
  - Rule Chapter 60D, F.A.C., Division of Building Construction
  - Chapter 553, F.S. – Building Construction Standards
  - ANSI A117.1 2003 Accessible and Usable Building and Facilities
  - Titles II and III, Americans With Disabilities Act (ADA), Public Law 101-336; and the ADA Accessibility Guidelines (ADAAG)
- Architectural – Fire Codes and Rules
  - National Fire Protection Association (NFPA) - Life Safety Code

- NFPA 70 - National Electrical Code
- NFPA 101 - Life Safety Code
- NFPA 10 - Standard for Portable Fire Extinguishers
- NFPA 11 - Standard for Low-Expansion Foam Systems
- NFPA 11A - Standard for High- and Medium-Expansion Foam Systems
- NFPA 12 - Standard for Carbon Dioxide Extinguishing Systems
- NFPA 13 - Installation of Sprinkler Systems
- NFPA 30 - Flammable and Combustible Liquids Code
- NFPA 54 - National Gas Fuel Code
- NFPA 58 - LP-Gas Code
- Florida Fire Prevention Code as adopted by the State Fire Marshal – Consult with the Florida State Fire Marshal's office for other frequently used codes.

- Architectural – Extinguishing Systems
  - NFPA 10 - Fire Extinguishers
  - NFPA 13 - Sprinkler
  - NFPA 14 - Standpipe and Hose System
  - NFPA 17 - Dry Chemical
  - NFPA 20 - Centrifugal Fire Pump
  - NFPA 24 - Private Fire Service Mains
  - NFPA 200 - Standard on Clean Agent Fire Extinguishing Systems
- Architectural – Detection and Fire Alarm Systems
  - NFPA 70 - Electrical Code
  - NFPA 72 - Standard for the Installation, Maintenance and Use of Local Protective Signaling Systems
  - NFPA 72E - Automatic Fire Detectors
  - NFPA 72G - Installation, Maintenance, and Use of Notification Appliances
  - NFPA 72H -Testing Procedures for Remote Station and Proprietary Systems
  - NFPA 74 - Household Fire Warning Equipment
  - NFPA 75 - Protection of Electronic Computer Equipment
- Architectural – Mechanical Systems
  - NFPA 90A - Air Conditioning and Ventilating Systems
  - NFPA 92A - Smoke Control Systems
  - NFPA 96 - Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment
  - NFPA 204M - Smoke and Heating Venting
- Architectural – Miscellaneous Systems
  - NFPA 45 - Laboratories Using Chemicals
  - NFPA 80 - Fire Doors and Windows
  - NFPA 88A - Parking Structures
  - NFPA 105- Smoke and Draft-control Door Assemblies
  - NFPA 110 - Emergency and Standby Power Systems

- NFPA 220 - Types of Building Construction
- NFPA 241 - Safeguard Construction, Alteration, and Operations
- Rule Chapter 69A-47, F.A.C., Uniform Fire Safety For Elevators
- Rule Chapter 69A-51, F.A.C., Boiler Safety

- Architectural – Energy Conservation
  - Rule Chapter 60D-4, F.A.C., Rules For Construction and Leasing of State Buildings To Insure Energy Conservation
  - Section 255.255, F.S., Life-Cycle Costs
- Architectural – Elevators
  - Rule Chapter 61C-5, F.A.C., Florida Elevator Safety Code
  - ASME A-17.1, Safety Code for Elevators and Escalators
  - Architectural – Floodplain Management Criteria
  - Section 255.25, F.S., Approval Required Prior to Construction or Lease of Buildings
  - Rules of the Federal Emergency Management Agency (FEMA)
- Architectural – Other
  - Rule Chapter 64E-6, F.A.C., Standards for On Site Sewage Disposal Systems (Septic Tanks)
  - Rule Chapter 62-600, F.A.C., Domestic Wastewater Facilities
  - Rule Chapter 62-761, F.A.C., Underground Storage Tank Systems
  - American Concrete Institute
  - American Institute of Architects - Architect's Handbook of Professional Practice
  - American Society for Testing and Materials - ASTM Standards
  - Brick Institute of America
  - DMS - Standards for Design of State Facilities
  - Florida Concrete Products Association
  - FDOT – ADA/Accessibility Procedure
  - FDOT – Building Code Compliance Procedure
  - FDOT – Design Build Procurement and Administration
  - LEED (Leadership in Energy and Environmental Design) Green Building Rating System
  - National Concrete Masonry Association
  - National Electrical Code
  - Portland Cement Association - Concrete Masonry Handbook
  - United State Green Building Council (USGBC)

2.21 Services to be Performed by the DEPARTMENT When appropriate and /or available, the DEPARTMENT will provide project data including:

- Numbers for field books.
- Preliminary Horizontal Network Control.
- Access for the CONSULTANT to utilize the DEPARTMENT's Information Technology Resources.

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

3 PROJECT COMMON AND PROJECT GENERAL TASKS

Project Common Tasks

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

Cost Estimates: The CONSULTANT shall be responsible for producing a construction cost estimate and reviewing and updating the cost estimate when scope changes occur and/or at milestones of the project. Prior to 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 TRNS*PORT PES (Proposal Estimating System) 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 first nine sections of the Standard Specifications and implemented modifications in any way. All modifications to other sections must be justified to the appropriate District Specifications Office to be included in the project's specifications package.

The Technical Special Provisions shall provide a description of work, materials, equipment and specific requirements, method of measurement and basis of payment. Proposed Technical Special Provisions 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.

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 Plans Preparation Manual, that state and federal design criteria are followed with the DEPARTMENT concept, and that the CONSULTANT submittals are complete. All subconsultant document submittals shall be submitted by the subconsultant directly to the CONSULTANT for their independent Quality Assurance/Quality Control review and subsequent submittal to the DEPARTMENT.

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

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

The CONSULTANT shall provide a Quality Control Plan that describes the procedures to be utilized to verify, independently check, and review all maps, design drawings, specifications, and other documentation prepared as a part of the contract. The CONSULTANT shall describe how the checking and review processes are to be documented to verify that the required procedures were followed. The 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, 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 PPM, Design Standards and CADD Manual. The Constructability/Bidability Review shall ensure the project can be constructed and paid for as designed. Constructability/Bidability Reviews should be conducted prior to the 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 ten (10) 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 DEPARTMENT and or 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.

3.1.4 Median Modification Letters

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

3.1.5 Driveway Modification Letters

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

3.1.6 Newsletters

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

3.1.7 Renderings and Fly-Throughs

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

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.

The number of Public Meeting will be determined by each Task Work Order.

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. The number of Local Agency Meetings will be determined by each Task Work Order to include meetings with local governing authorities and/or MPOs during the design.

3.1.12 Web Site

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

3.2 Joint Project Agreements

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

3.3 Specifications Package Preparation

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

least two team members who have successfully completed the Specifications Package Preparation Training and will be responsible for preparing the Specifications Package for the project. The Specifications Package shall be prepared using the DEPARTMENT's Specs on the Web application. The CONSULTANT shall be able to document that the procedure defined in the Handbook for the Preparation of Specifications Packages is followed, which includes the quality assurance/quality control procedures. The specifications package shall address all items and areas of work and include any Mandatory Specifications, Modified Special Provisions, and Technical Special Provisions.

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, developing monthly progress reports, schedule updates, work effort to develop and execute subconsultant agreements, etc.

3.5 Value Engineering (Multi-Discipline Team) Review

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

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

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

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

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

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

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

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- Three copies of all plan drawings
- Drainage alternatives information
- One copy of Bridge Development Reports
- One copy of Pavement Type Selection Report
- One copy of Pavement Design Package
- One copy of other miscellaneous reports
- Project Cost Estimate

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

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

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

3.6 Prime Consultant Project Manager Meetings

Includes only the Prime Consultant Project Manager's time for travel and attendance at Activity Technical Meetings and other meetings listed in the meeting summary for Task 3.6 on tab 3 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

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

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

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

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

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

- One copy of all environmental documents
- One copy of the Preliminary Engineering Report
- One copy of all plan drawings (three copies if a workshop is applicable)
- Drainage alternatives information
- One copy of Bridge Development Reports
- One copy of Pavement Type Selection Report
- One copy of Pavement Design Package

- One copy of other miscellaneous reports
- Project Schedule
- Project Cost Estimate

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

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

3.11 Railroad, Transit and/or Airport Coordination

As specified by each Task Work Order

3.12 Other Project General Tasks

As specified by each Task Work Order

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

Pavement Type Selection Reports are required for every project one mile or greater in length where work includes a modification to the base materials. The Pavement Type Selection decision will again be reviewed by FDOT Design at the time the pavement is designed to warrant reconsideration. A letter to the Project Design File documenting the pavement type decision is required, even if no report is performed.

4.3 Pavement Design Package

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

4.4 Cross-Slope Correction

The CONSULTANT shall coordinate with the DEPARTMENT to obtain existing cross slope data, determine roadway limits where cross slope is potentially out of tolerance and determine a resolution as specified by each Task Work Order.

4.5 Horizontal/Vertical Master Design Files

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

4.6 Access Management

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

5 ROADWAY PLANS

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

4.7 Roundabout Evaluation

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

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

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

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

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

4.8 Roundabout Final Design Analysis

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

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

4.9 Cross Section Design Files

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

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 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.

4.13 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.

4.14 Quantities

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

4.15 Cost Estimate

4.16 Technical Special Provisions

4.17 Other Roadway Analyses

The Consultant shall develop 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 Departments CADD Manual and Microstation Select Series 4 (SS4) format. Many elements contribute to this (slope transitions, typical section transitions, changes in pavement depth, berm and other feature transitions). The intersections must also be modeled. Dynamic relationships must be maintained. The 3D model files will be provided to the CONTRACTOR for use in constructing the project.

4.18 Field Reviews

4.19 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 PPM Volume I Chapter 34. 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).

4.20 Technical Meetings

4.21 Quality Assurance/Quality Control

4.22 Independent Peer Review

4.23 Supervision

4.24 Coordination

5 ROADWAY PLANS

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

5.1 Key Sheet

5.2 Summary of Pay Items Including Quantity Input

5.3 Typical Section Sheets

5.3.1 Typical Sections

5.3.2 Typical Section Details

5.4 General Notes/Pay Item Notes

5.5 Summary of Quantities Sheets

5.6 Project Layout

5.7 Plan/Profile Sheet

5.8 Profile Sheet

5.9 Plan Sheet

5.10 Special Profile

5.11 Back-of-Sidewalk Profile Sheet

5.12 Interchange Layout Sheet

5.13 Ramp Terminal Details (Plan View)

5.14 Intersection Layout Details

5.15 Special Details

5.16 Cross-Section Pattern Sheet(s)

5.17 Roadway Soil Survey Sheet(s)

5.18 Cross Sections

5.19 Temporary Traffic Control Plan Sheets

5.20 Temporary Traffic Control Cross Section Sheets

5.21 Temporary Traffic Control Detail Sheets

5.22 Utility Adjustment Sheets

5.23 Selective Clearing and Grubbing Sheet(s)

5.24 Project Network Control Sheet(s)

5.25 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.

5.26 Utility Verification Sheet(s) (SUE Data)

5.27 Quality Assurance/Quality Control

5.28 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

Accurately delineate drainage basin boundaries to be used in defining the system hydrology. Basin delineation shall incorporate existing survey and/or LiDAR and shall be supplemented, as necessary, with other appropriate data sources (such as permitted site plans) and field observations. Basin delineations shall also include any existing collection systems in a logical manner to aid in the development of the hydraulic model. Prepare the Drainage Maps in accordance with the Plans Preparation Manual.

6a.2 Base Clearance Report

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

6a.3 Pond Siting Analysis and Report

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

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 and attenuation. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tie-ins, etc.), perform routing, pollutant 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 Ditch as Linear Pond)

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

6a.8 Design of Floodplain Compensation

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

6a.9 Design of Storm Drains

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

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.12 Drainage Wells

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

6a.13 Drainage Design Documentation Report

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

6a.14 Bridge Hydraulic Report

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

6a.15 Temporary Drainage Analysis

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

6a.16 Cost Estimate

6a.17 Technical Special Provisions

6a.18 Other Drainage Analysis

6a.19 Field Reviews

6a.20 Technical Meetings

6a.21 Environmental Look-Around Meetings

6a.22 Quality Assurance/Quality Control

6a.23 Independent Peer Review

6a.24 Supervision

6a.25 Coordination

6b DRAINAGE PLANS

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

6b.1 Drainage Map (Including Interchanges)

6b.2 Bridge Hydraulics Recommendation Sheets

6b.3 Summary of Drainage Structures

6b.4 Optional Pipe/Culvert Material

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

6b.6 Miscellaneous Drainage Detail Sheets

6b.7 Lateral Ditch Plan/Profile

6b.8 Lateral Ditch Cross Sections

6b.9 Retention/Detention Pond Detail Sheet(s)

6b.10 Retention Pond Cross Sections

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

The CONSULTANT shall be responsible for transmitting/coordinating the appropriate design reports including, but not limited to, the Resurfacing, Restoration and Rehabilitation (RRR) report, Preliminary Engineering Report, Project Scope and/or the Concept Report (if

applicable) to each UAO to identify any condition that may require a Utility Exception. The CONSULTANT shall identify and communicate to the UAO any facilities in conflict with their location or project schedule. The CONSULTANT shall assist with the processing of design exceptions involving Utilities with the UAO and the DEPARTMENT. Assist with processing per the UAM.

7.5 Preliminary Utility Meeting

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

7.6 Individual/Field Meetings

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

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

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

7.8 Subordination of Easements Coordination

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

7.9 Utility Design Meeting

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/landscaping and proposed landscaping, 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 4.9 (Cross Section Design Files) for utility conflict location identification and adjustments.

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

The CONSULTANT shall review utility marked up plans and work schedules as they are received for content and coordinate review with the designer. Send color markups and schedules to the appropriate DEPARTMENT office(s) 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 4.9 (Cross Section Design Files) for utility conflict identification and adjustments.

7.13 Additional Utility Services

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

7.14 Processing Utility Work by Highway Contractor (UWHC)

This includes coordination of utility design effort between the DEPARTMENT and the UAO(s). The CONSULTANT shall conduct additional coordination meetings, prepare and process the agreements, review tabulation of quantities, perform UWHC constructability and bidability review, review pay items, cost estimates and Technical Special Provisions (TSP) prepared by the UAO. This does not include utility the utility design effort. This item is not usually included in the scope at the time of negotiation. It is normally added as a

supplemental agreement when the need is identified. Effort for the EOR is not included in this task, see Roadway Analysis Task Group 4.

7.15 Contract Plans to UAO(s)

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

7.16 Certification/Close-Out

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

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

OR

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

OR

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

7.17 Other Utilities

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

8 ENVIRONMENTAL PERMITS, COMPLIANCE AND CLEARANCES

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.

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 a review of the project's PD&E documents including but not limited to the Environmental Document, Wetland Evaluation Report, Endangered Species and Biological Assessment and Essential Fish and Habitat Report.

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

8.2 Field Work

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

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

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

- Determine landward extent of wetlands and other surface waters as defined in Rule Chapter 62-340, F.A.C. as ratified in Section 373.4211, F.S.
- Determine the jurisdictional boundaries and obtain a jurisdictional determination of wetlands and other surface waters as defined by rules or regulations of any permitting authority that is processing a DEPARTMENT permit application.
- Prepare aerial maps showing the jurisdictional boundaries of wetlands and surface waters. Aerial maps shall be reproducible, of a scale no greater than 1"=200' and be recent photography. The maps shall show the jurisdictional limits of each agency. Photo copies of aerials are not acceptable. All jurisdictional boundaries are to be tied to the project's baseline of survey. When necessary, a wetland specific survey will be prepared by a registered surveyor and mapper.
- Prepare a written assessment of the current condition and functional value of the wetlands and other surface waters. Prepare data in tabular form which includes the ID number for each wetland impacted, size of wetland to be impacted, type of impact and

identify any wetland within the project limits that will not be impacted by the project.

- Prepare appropriate Agency Forms to obtain required permits Forms may include but are not limited to the United States Army Corps of Engineers (USACE) "Wetland Determination Data Form – Atlantic and Gulf Coastal Plain Region"; the USACE "Approved Jurisdictional Determination Form"; Uniform Mitigation Assessment Method forms and/or project specific data forms.

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

8.3 Agency Verification of Wetland Data

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

8.4 Complete and Submit All Required Permit Applications

The CONSULTANT shall prepare permit application packages as identified in the Project Description section. The permit application package must be approved by the DEPARTMENT prior to submittal to the regulatory agency.

The CONSULTANT shall collect all of the data and information necessary to obtain the environmental permits required to construct the project. The CONSULTANT shall prepare each permit application for DEPARTMENT approval in accordance with the rules and/or regulations of the environmental agency responsible for issuing a specific permit and/or authorization to perform work.

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

Local Permits:

As requested by DEPARTMENT.

8.5 Prepare Dredge and Fill Sketches (as needed)

8.6 Prepare USCG Permit

8.7 Prepare Water Management District Right of Way Occupancy Permit

8.8 Prepare Coastal Construction Control Line (CCCL) Permit Application (as needed)

If a CCCL Permit is required, the CONSULTANT shall be responsible for the preparation of the legal advertisement required to acquire the final "Notice to Proceed" authorization for the Florida Department of Environmental Protection (FDEP). Legal advertisements shall be published one time in a newspaper that meets

the notification requirements of the FDEP.

8.9 Prepare Tree Permit Information (as needed)

8.10 Mitigation Design

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

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

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

- Payment to DEP/WMD for mitigation services as defined in Section 373.4137, F.S.
- Monetary participation in offsite regional mitigation plans
- Purchase of mitigation credits from a mitigation bank
- Creation/restoration on public lands
- Creation/restoration on right of way purchased by the DEPARTMENT
- Creation/restoration on existing DEPARTMENT right of way

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

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

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

8.11 Mitigation Coordination and Meetings

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

8.12 Other Environmental Permits

Environmental Clearances, Reevaluations and Technical Support

8.13 Environmental Clearances and Re-evaluations

8.14 Archaeological and Historical Resources/ NEPA or SEIR

8.15 Contamination

8.16 Asbestos Survey

8.18 Quality Assurance/Quality Control

8.19 Supervision

8.20 Coordination

9 STRUCTURES - SUMMARY AND MISCELLANEOUS TASKS AND DRAWINGS

The CONSULTANT shall analyze, design, and develop contract documents for all structures in accordance with applicable provisions as defined in Section 2.19, Provisions for Work. Individual tasks identified in Sections 9 through 18 are defined in the Staff Hour Estimation Handbook and within the provision defined in Section 2. 20, Provisions for Work. Contract documents shall display economical solutions for the given conditions.

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

9.1 Key Sheet and Index of Drawings

9.2 Project Layout

9.3 General Notes and Bid Item Notes

9.4 Miscellaneous Common Details

9.5 Incorporate Report of Core Borings

9.6 Existing Bridge Plans

9.7 Assemble Plan Summary Boxes and Quantities

9.8 Cost Estimate

9.9 Technical Special Provisions

9.10 Field Reviews

9.11 Technical Meetings

9.12 Quality Assurance/Quality Control

9.13 Independent Peer Review

9.14 Supervision

9.15 Coordination

10 STRUCTURES - BRIDGE DEVELOPMENT REPORT

The Consultant shall prepare a Bridge Development Report (BDR). The BDR shall be submitted as part of the Phase I Roadway Submittal, General Requirements.

General Requirements

10.1 Bridge Geometry

10.2 Ship Impact Data Collection

10.3 Ship Impact Criteria

Superstructure Alternatives

10.4 Short-Span Concrete

10.5 Medium-Span Concrete

10.6 Long Span Concrete

10.7 Structural Steel

Foundation and Substructure Alternatives

10.8 Pier/Bent

10.9 Shallow Foundations / GRS Abutments

10.10 Deep Foundations

Movable Span

10.11 Data Collection and Design Criteria

10.12 Movable Span Geometrics and Clearances

10.13 Deck System Evaluation

10.14 Framing Plan Development

10.15 Main Girder Preliminary Design

10.16 Conceptual Span Balance/Counterweight

10.17 Support System Development

10.18 Drive Power Calculations

10.19 Drive System Development

10.20 Power and Control Development

10.21 Conceptual Pier Design

10.22 Foundation Analysis (FL PIER)

10.23 Tender Visibility Study

Other BDR Issues

10.24 Aesthetics

10.25 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. Staff hours to be negotiated and scaled appropriately.

11 STRUCTURES - TEMPORARY BRIDGE

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

General Layout Design and Plans

11.1 Overall Bridge Final Geometry

11.2 General Plan and Elevation

11.3 Miscellaneous Details

End Bent Design and Plans

11.4 End Bent Structural Design

11.5 End Bent Details

Intermediate Bent Design and Plans

11.6 Intermediate Bent Structural Design

11.7 Intermediate Bent Details

Miscellaneous Substructure Design and Plans

11.8 Foundation Layout

12 STRUCTURES - SHORT SPAN CONCRETE BRIDGE

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

General Layout Design and Plans

12.1 Overall Bridge Final Geometry

12.2 Expansion/Contraction Analysis

12.3 General Plan and Elevation

12.4 Construction Staging

12.5 Approach Slab Plan and Details

12.6 Miscellaneous Details

End Bent Design and Plans

12.7 End Bent Geometry

12.8 End Bent Structural Design

12.9 End Bent Plan and Elevation

12.10 End Bent Details

Intermediate Bent Design and Plans

12.11 Bent Geometry

12.12 Bent Stability Analysis

12.13 Bent Structural Design

12.14 Bent Plan and Elevation

12.15 Bent Details

Miscellaneous Substructure Design and Plans

12.16 Foundation Layout

Superstructure Design and Plans

12.17 Finish Grade Elevation Calculation

12.18 Finish Grade Elevations

Cast-In-Place Slab Bridges

12.19 Bridge Deck Design

12.20 Superstructure Plan

12.21 Superstructure Sections and Details

Prestressed Slab Unit Bridges

12.22 Prestressed Slab Unit Design

12.23 Prestressed Slab Unit Layout

12.24 Prestressed Slab Unit Details and Schedule

12.25 Deck Topping Reinforcing Layout

12.26 Superstructure Sections and Details

Reinforcing Bar Lists

12.27 Preparation of Reinforcing Bar List

Load Rating

12.28 Load Rating

13 STRUCTURES - MEDIUM SPAN CONCRETE BRIDGE

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

General Layout Design and Plans

13.1 Overall Bridge Final Geometry

13.2 Expansion/Contraction Analysis

13.3 General Plan and Elevation

13.4 Construction Staging

13.5 Approach Slab Plan and Details

13.6 Miscellaneous Details

End Bent Design and Plans

13.7 End Bent Geometry

13.8 Wingwall Design and Geometry

13.9 End Bent Structural Design

13.10 End Bent Plan and Elevation

13.11 End Bent Details

Intermediate Bent Design and Plans

13.12 Bent Geometry

13.13 Bent Stability Analysis

13.14 Bent Structural Design

13.15 Bent Plan and Elevation

13.16 Bent Details

Pier Design and Plans

13.17 Pier Geometry

13.18 Pier Stability Analysis

13.19 Pier Structural Design

13.20 Pier Plan and Elevation

13.21 Pier Details

Miscellaneous Substructure Design and Plans

13.22 Foundation Layout

Superstructure Deck Design and Plans

13.23 Finish Grade Elevation (FGE) Calculation

13.24 Finish Grade Elevations

13.25 Bridge Deck Design

13.26 Bridge Deck Reinforcing and Concrete Quantities

13.27 Diaphragm Design

13.28 Superstructure Plan

13.29 Superstructure Section

13.30 Miscellaneous Superstructure Details

Reinforcing Bar Lists

13.31 Preparation of Reinforcing Bar 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

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

General Layout Design and Plans

14.1 Overall Bridge Final Geometry

14.2 Expansion/Contraction Analysis

14.3 General Plan and Elevation

14.4 Construction Staging

14.5 Approach Slab Plan and Details

14.6 Miscellaneous Details

End Bent Design and Plans

14.7 End Bent Geometry

14.8 Wingwall Design and Geometry

14.9 End Bent Structural Design

14.10 End Bent Plan and Elevation

14.11 End Bent Details

Intermediate Bent Design and Plans

14.12 Bent Geometry

14.13 Bent Stability Analysis

14.14 Bent Structural Design

14.15 Bent Plan and Elevation

14.16 Bent Details

Pier Design and Plans

14.17 Pier Geometry

14.18 Pier Stability Analysis

14.19 Pier Structural Design

14.20 Pier Plan and Elevation

14.21 Pier Details

Miscellaneous Substructure Design and Plans

14.22 Foundation Layout

Superstructure Deck Design and Plans

14.23 Finish Grade Elevation (FGE) Calculation

14.24 Finish Grade Elevations

14.25 Bridge Deck Design

14.26 Bridge Deck Reinforcing and Concrete Quantities

14.27 Superstructure Plan

14.28 Superstructure Section

14.29 Miscellaneous Bridge Deck Details

Reinforcing Bar Lists

14.30 Preparation of Reinforcing Bar 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 – N/A

16 STRUCTURES - MOVABLE SPAN – N/A

17 STRUCTURES - RETAINING WALLS

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

General Requirements

17.1 Key Sheet

17.2 Horizontal Wall Geometry

Permanent Proprietary Walls

17.3 Vertical Wall Geometry

17.4 Semi-Standard Drawings

17.5 Wall Plan and Elevations (Control Drawings)

17.6 Details

Temporary Proprietary Walls

17.7 Vertical Wall Geometry

17.8 Semi-Standard Drawings

17.9 Wall Plan and Elevations (Control Drawings)

17.10 Details

Cast-In-Place Retaining Walls

17.11 Design

17.12 Vertical Wall Geometry

17.13 General Notes

17.14 Wall Plan and Elevations (Control Drawings)

17.15 Sections and Details

17.16 Reinforcing Bar List

Other Retaining Walls and Bulkheads

17.17 Design

17.18 Vertical Wall Geometry

17.19 General Notes, Tables and Miscellaneous Details

17.20 Wall Plan and Elevations

17.21 Details

18 STRUCTURES - MISCELLANEOUS

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

Concrete Box Culverts

18.1 Concrete Box Culverts

18.2 Concrete Box Culverts Extensions

18.3 Concrete Box Culvert Data Table Plan Sheets

18.4 Concrete Box Culvert Special Details Plan Sheets

Strain Poles

18.5 Steel Strain Poles

18.6 Concrete Strain Poles

18.7 Strain Pole Data Table Plan Sheets

18.8 Strain Pole Special Details Plan Sheets

Mast Arms

18.9 Mast Arms

18.10 Mast Arms Data Table Plan Sheets

18.11 Mast Arms Special Details Plan Sheets

Overhead/Cantilever Sign Structure

18.12 Cantilever Sign Structures

18.13 Overhead Span Sign Structures

18.14 Special (Long Span) Overhead Sign Structures

18.15 Monotube Overhead Sign Structure

18.16 Bridge Mounted Signs (Attached to Superstructure)

18.17 Overhead/Cantilever Sign Structures Data Table Plan Sheets

18.18 Overhead/Cantilever Sign Structures Special Details Plan Sheets

High Mast Lighting

18.19 Non-Standard High Mast Lighting Structures

18.20 High Mast Lighting Special Details Plan Sheets

Noise Barrier Walls (Ground Mount)

18.21 Horizontal Wall Geometry

18.22 Vertical Wall Geometry

18.23 Summary of Quantities – Aesthetic Requirements

18.24 Control Drawings

18.25 Design of Noise Barrier Walls Covered by Standards

18.26 Design of Noise Barrier Walls not Covered by Standards

18.27 Aesthetic Details

Special Structures

18.28 Fender System

18.29 Fender System Access

18.30 Special Structures

18.31 Other Structures

19 SIGNING AND PAVEMENT MARKING ANALYSIS

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

19.1 Traffic Data Analysis

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

19.2 No Passing Zone Study

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

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

19.3 Reference and Master Design File

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

19.4 Multi-Post Sign Support Calculations

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

19.5 Sign Panel Design Analysis

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

19.6 Sign Lighting/Electrical Calculations

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

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

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

19.7 Quantities

19.8 Cost Estimate

19.9 Technical Special Provisions

19.10 Other Signing and Pavement Marking Analysis

19.11 Field Reviews

19.12 Technical Meetings

19.13 Quality Assurance/Quality Control

19.14 Independent Peer Review

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 TRNS*Port Input

20.3 Tabulation of Quantities

20.4 General Notes/Pay Item Notes

20.5 Project Layout

20.6 Plan Sheet

20.7 Typical Details

20.8 Guide Sign Work Sheet(s)

20.9 Traffic Monitoring Site

20.10 Cross Sections

20.11 Special Service Point Details

20.12 Special Details

20.13 Interim Standards

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

21.4 Systems Timings

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

21.5 Reference and Master Signalization Design File

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

21.6 Reference and Master Interconnect Communication Design File

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

21.7 Overhead Street Name Sign Design

The CONSULTANT shall design Signal Mounted Overhead Street Name signs.

21.8 Pole Elevation Analysis

21.9 Traffic Signal Operation Report

As specified by each Task Work Order

21.10 Quantities

21.11 Cost Estimate

21.12 Technical Special Provisions

21.13 Other Signalization Analysis

21.14 Field Reviews

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

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

21.15 Technical Meetings

21.16 Quality Assurance/Quality Control

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

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

21.17 Independent Peer Review

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 (TRNS*Port) Input

22.3 Tabulation of Quantities

22.4 General Notes/Pay Item Notes

22.5 Plan Sheet

22.6 Interconnect Plans

22.7 Traffic Monitoring Site

22.8 Guide Sign Worksheet

22.9 Special Details

22.10 Special Service Point Details

22.11 Mast Arm/Monotube Tabulation Sheet

22.12 Strain Pole Schedule

22.13 TCP Signal (Temporary)

22.14 Temporary Detection Sheet

22.15 Utility Conflict Sheet

22.16 Interim Standards

22.17 Quality Assurance/Quality Control

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

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

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

22.18 Supervision

23 LIGHTING ANALYSIS

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

23.1 Lighting Justification Report

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

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

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 typical section of the mainline, typical section for the ramps (one and/or two lanes), interchanges, underdeck lighting, and arterial roads. Each lighting calculation shall be properly identified as to the area that it covers.

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

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

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

Voltage drop calculations

Load analysis calculations for each branch circuit

23.3 Aeronautical Evaluation

The CONSULTANT shall prepare an Aeronautical Evaluation/Airspace Analysis Report for those projects within 05 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

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

23.8 Design Documentation

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

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

23.9 Quantities

23.10 Cost Estimate

23.11 Technical Special Provisions

23.12 Other Lighting Analysis

23.13 Field Reviews

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

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

23.14 Technical Meetings

23.15 Quality Assurance/Quality Control

23.16 Independent Peer Review

23.17 Supervision

23.18 Coordination

24 LIGHTING PLANS

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

24.1 Key Sheet

24.2 Summary of Pay Item Sheet Including Designer Interface (TRNS*Port) Input

24.3 Tabulation of Quantities

24.4 General Notes/Pay Item Notes

24.5 Pole Data, Legend & Criteria

24.6 Service Point Details

24.7 Project Layout

24.8 Plan Sheet

24.9 Special Details

24.10 Temporary Lighting Data and Details

24.11 Traffic Control Plan Sheets

24.12 Interim Standards

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

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

25.3 Planting Design

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

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

25.4 Irrigation Design

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

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

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

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

25.6 Plan Summary Boxes

25.7 Cost Estimates

25.8 Technical Special Provisions

25.9 Other Landscape Architecture

25.10 Outdoor Advertising

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

25.11 Field Reviews

25.12 Technical Meetings / Public Meetings

25.13 Quality Assurance/Quality Control

25.14 Independent Peer Review

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

26.2 Tabulation of Quantities

26.3 General Notes

26.4 Tree and Vegetation Inventory, Protection and Relocation Plans

26.5 Planting Plans for Linear Roadway Projects

26.6 Planting Plans (Interchanges and Toll Plazas)

26.7 Planting Details and Notes

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

26.8 Irrigation Plans for Linear Roadway Project

26.9 Irrigation Plans for Interchange and Toll Plazas

26.10 Irrigation Details and Notes

26.11 Hardscape Plans

26.12 Hardscape Details and Notes

26.13 Maintenance Plan

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

26.14 Cost Estimate

26.15 Quality Assurance/Quality Control

26.16 Supervision

27 SURVEY

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.

27.1 Horizontal Project Control (HPC)

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

27.2 Vertical Project Control (VPC)

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

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

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

27.4 Aerial Targets

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

27.5 Reference Points

Reference Horizontal Project Network Control (HPNC) points, project alignment, vertical

control points, section, ¼ section, center of section corners and General Land Office (G.L.O.) corners as required.

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

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

27.7 Planimetric (2D)

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

27.8 Roadway Cross Sections/Profiles

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

27.9 Side Street Surveys

Refer to tasks of this document as applicable.

27.10 Underground Utilities

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

27.11 Outfall Survey

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

27.12 Drainage Survey

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

27.13 Bridge Survey (Minor/Major)

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

27.14 Channel Survey

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

27.15 Pond Site Survey

Refer to tasks of this document as applicable.

27.16 Mitigation Survey

Refer to tasks of this document as applicable.

27.17 Jurisdiction Line Survey

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

27.18 Geotechnical Support

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

27.19 Sectional/Grant Survey

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

27.20 Subdivision Location

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

27.21 Maintained R/W

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

27.22 Boundary Survey

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

27.23 Water Boundary Survey

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

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

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

27.25 Right of Way Monumentation

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

27.26 Line Cutting

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

27.27 Work Zone Safety

Provide work zone as required by DEPARTMENT standards.

27.28 Miscellaneous Surveys

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

27.29 Supplemental Surveys

Supplemental survey days and hours are to be approved in advance by DS or DLS. 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.

27.33 Quality Assurance/Quality Control (QA/QC)

Establish and implement a QA/QC plan. Also includes subconsultant review, response to

comments and any resolution meetings if required, preparation of submittals for review, etc.

27.34 Supervision

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

27.35 Coordination

Coordinate survey activities with other disciplines. 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- N/A

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

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

28.1 Flight Preparation

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

28.2 Control Point Coordination

Determine photo identifiable control points, and mark contact prints.

28.3 Mobilization

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

28.4 Flight Operations

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

28.5 Film Processing

Process, check, and annotate the aerial film.

28.6 Photo Products

Prepare contact prints, contact diapositives, and photo enlargements.

28.7 Scanning

Scan photographic images.

28.8 LiDAR

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

28.9 Aerial Triangulation

Measure and adjust control within aerial images.

28.10 Surfaces

Includes collection of break lines and spot elevations.

28.11 Ortho Generation

Includes creation of final images.

28.12 Rectified Digital Imagery (Georeferenced)

Create the rectified digital image.

28.13 Mosaicking

Create the mosaic.

28.14 Sheet Clipping

Create plot files for sheets from the database.

28.15 Topographics (3D)

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

28.16 Planimetrics (2D)

Prepare 2D planimetric map.

28.17 Drainage Basin

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

28.18 CADD Edit

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

28.19 Data Merging

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

28.20 Miscellaneous

Other tasks not specifically addressed in this document.

28.21 Field Review

Perform on site review of maps.

28.22 Technical Meetings

Attend meetings as required.

28.23 Quality Assurance/Quality Control

Establish and implement a QA/QC plan.

28.24 Supervision

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

28.25 Coordination

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

29 MAPPING

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

Master CADD File

29.1 Alignment

29.2 Section and 1/4 Section Lines

29.3 Subdivisions / Property Lines

29.4 Existing Right of Way

29.5 Topography

29.6 Parent Tract Properties and Existing Easements

29.7 Proposed Right of Way Requirements

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

29.8 Limits of Construction

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

29.9 Jurisdictional/Agency Lines

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

Sheet Files

29.10 Control Survey Cover Sheet

29.11 Control Survey Key Sheet

29.12 Control Survey Detail Sheet

29.13 Right of Way Map Cover Sheet

29.14 Right of Way Map Key Sheet

29.15 Right of Way Map Detail Sheet

29.16 Maintenance Map Cover Sheet

29.17 Maintenance Map Key Sheet

29.18 Maintenance Map Detail Sheet

29.19 Reference Point Sheet

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

29.20 Project Network Control Sheet

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

29.21 Table of Ownerships Sheet

Miscellaneous Surveys and Sketches

29.22 Parcel Sketches

29.23 TIITF Sketches

29.24 Other Specific Purpose Survey(s)

29.25 Boundary Survey(s) Map

29.26 Right of Way Monumentation Map

29.27 Title Search Map

29.28 Title Search Report

29.29 Legal Descriptions

29.30 Final Map/Plans Comparison

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

29.31 Field Reviews

29.32 Technical Meetings

29.33 Quality Assurance/Quality Control

29.34 Supervision

29.35 Coordination

29.36 Supplemental Mapping

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

30 TERRESTRIAL MOBILE LiDAR

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

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- N/A

PHASE I - 30% DESIGN DEVELOPMENT

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

Documents

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

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

- Floor plan drawn at an architectural scale that will allow the entire facility to be shown on one sheet, without breaklines, and which indicates project phasing as applicable to the Scope.
- Floor plans drawn at 3/32 inch or larger scale showing typical occupied spaces or special rooms with dimensions, sanitary facilities, stairs, elevators, identification of accessible areas for the disabled and other program requirements.
- Floor plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, indicating door and window layouts and other relevant features.
- For alterations or additions to an existing facility: Indicate the connections and tie-ins to the existing facilities, including all existing spaces, exits, plumbing fixtures and locations and any proposed changes thereto. Distinguish between new and existing areas for renovation, remodeling, or an addition and show demolition plans of areas to be removed.
- Furniture and Equipment plans drawn at 1/8 inch or larger scale showing typical spaces or special rooms with dimensions, equipment and furnishing layouts and other relevant features.
- Reflected ceiling plans drawn at 3/32 inch or larger scale showing typical spaces or special rooms with dimensions, major lighting equipment and ceiling panel layouts.

- Roof and miscellaneous plans to be drawn at 3/32 inch or larger scale showing dimensioned features penetrations, equipment and other relevant features.
- Plumbing fixture locations and fixture unit calculations, isometrics, one line diagram and riser details, schedule of common fixtures and other relevant features.
- All exterior building elevations to illustrate and indicate the scale, finish, size and fenestration of the facility.
- Sufficient building and wall sections to show dimensions, proposed construction material, and relationship of finished floor to finished grades.
- Preliminary Structural Drawings to include plans and sections indicating systems, connections and foundations.
- Mechanical Drawings to include ceiling plans with a single line duct layout, location of grease trap(s), LP gas tank location, natural gas piping to existing utilities. Provide narrative description to include a description of proposed HVAC system equipment including the chiller, pumps, AHUs, cooling tower, electric duct heaters and other relevant features.
- Electrical Drawings include plans with lighting layouts for outdoors and major interior spaces and electrical outlets for all major spaces. Show location of electrical rooms, transformers, emergency generator. Also show locations of mechanical equipment such as chillers, compressors and air handler units and their respective electrical connections and other relevant features.
- Equipment and Furnishing Schedules to indicate major equipment that will be provided by the Contractor and those that will be provided by the DEPARTMENT or others.

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

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

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

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

Outline Specifications

- Organized to conform to the formats for outline specifications as established by the Construction Specifications Institute's current edition of Master Format on the date of

execution of the Contract.

- Complete for Divisions 2 through 16 for finishes, material, and systems including structural, HVAC, electrical, plumbing and specialty items, including fire sprinklers, alarm systems, electronic controls and computer networking components.

Other Requirements

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

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

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

PHASE II - 60% DOCUMENTS:

After written Authorization to Proceed from DEPARTMENT and based on the approved Phase I documents, and any adjustments in the scope or quality of the project or in the Fixed Limit of Construction Cost authorized by DEPARTMENT, the Design Professional shall prepare for approval by DEPARTMENT, Phase II (60% Construction) Documents setting forth in detail the requirements for the construction of the Project. The Design Professional is responsible for the full compliance of the design with all applicable codes. Phase II

documents comprised of, but not limited to, the following:

Documents

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

Drawings

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

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

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

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

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

Floor plans to include the following:

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

- Identify room and door numbers with all doors having individual numbers.

Demolition Plans

Indicate required demolition activities.

- Provide separate demolition plan(s) and other drawings (elevations, sections, etc.) if the scope of work includes demolition which is too excessive to indicate in drawings depicting new construction.
- Indicate notes on the extent of the demolition: address dimensions at locations where partial walls are being removed or altered, existing room names and numbers, existing partitions, equipment, plumbing, HVAC or electrical elements,
- Include notes dealing with protection of existing areas as a result of demolition.
- Delineate any modifications to existing buildings involving structural elements within the structural documents rather than on the architectural.

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

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

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

Roof Plans

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

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

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

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

Details of the following:

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

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

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

Mechanical Drawings

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

Electrical

Provide drawings for the following systems:

- Lighting including, circuiting and luminaire identification and switching. Also provide illuminance computer print out for all indoor typical indoor spaces and parking lots.
- Convenience outlets and circuiting, special outlets and circuiting, and power systems and equipment. Provide riser diagrams for all electrical systems including master clock, intercom, fire alarm, ITV, computer networking/telephone. Also, provide for emergency and normal power distribution. Provide light fixture schedule.
- Panel schedule may be in preliminary form but circuitry must be included.
- Applicable installation details.
- General legend and list of abbreviations.
- Voltage drop computations for all main feeders.

- Short circuit analysis
- Provide 1/2" scale floor plan and wall elevations for all electrical rooms.
- Indicate surge protector for main switchboard and electrical panels.

Specifications

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

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

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

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

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

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

PHASE III - 100% CONSTRUCTION DOCUMENTS SUBMITTAL

After written Authorization to Proceed from DEPARTMENT and based on the approved Phase II documents and any adjustments in the scope or quality of the project or in the Fixed Limit of Construction Cost authorized by DEPARTMENT, the Design Professional shall

prepare for approval by DEPARTMENT, Phase III (100% Construction) Documents setting forth in detail the requirements for the construction of the Project. The Design Professional is responsible for the full compliance of the design with all applicable codes. Phase III documents are to be comprised of, but not limited to, the following:

General Requirements

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

Drawings

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

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

Staff from each of the Design Professional's major technical disciplines, and subconsultants shall attend coordination, review and presentation meetings with the Owner to explain the

design concept and technical resolution of their respective building or site systems.

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

PHASE IV FINAL CONSTRUCTION DOCUMENTS SUBMITTAL:

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

General Requirements

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

Drawings

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

- Site plans including, but not limited to, area location map, legal description of property, demolition, excavation, utilities, finish grading, landscaping, mechanical, electrical, civil/structural, and architectural site plans:
- Drawings include at a minimum, the following:
- Key sheets including a table of contents and statement of compliance by the design professional. Each discipline shall have a list of abbreviations, schedule of material indications, and schedule of notations and symbols at the beginning of their section of the plans.
- Architectural drawings including floor plans, door, window and finish schedules, roof plans, elevations, sections, and details.
- Structural drawings including foundation plans; floor plans; roof plans; structural plans;

sections; details; and, beam and column schedules.
- Mechanical drawings including floor plans; sections; details; riser diagrams; kitchen exhaust hoods; and, equipment, fan, and fixture schedules.
- Electrical drawings including floor plans; sections; details; riser diagrams, and fixture and panel schedules.
- The drawings should indicate that the approved mechanical/electrical systems, from the previous phases FEEC/LCCA analysis, have been incorporated into the documents.

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

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

Architectural Plans

31.1 Architectural Program Review/Verification

31.2 Key Sheet and Index of Sheets

31.3 General Notes, Abbreviations, Symbols, and Legend

31.4 Life Safety Plan(s)

31.5 Site Plan(s)

31.6 Floor Plan(s) (small scale)

31.7 Floor Plan(s) (large scale)

31.8 Exterior Elevation(s)

31.9 Roof Plan(s)

31.10 Roof Details

31.11 Interior Elevation(s)

31.12 Rest Room Plan(s) (Enlarged)

31.13 Rest Room Elevation(s)

31.14 Building Section(s)

31.15 Stair Section, Enlarged Stair Plan and Details

31.16 Reflective Ceiling Plan(s)

31.17 Room Finish Schedule or Finish Plan

31.18 Door and Window Finish Schedule

31.19 Door Jamb Detail(s) and Window Details

31.20 Exterior Wall Section(s)

31.21 Interior Wall Section(s)

31.22 Overhead Door Detail(s)

31.23 Curtain Wall Detail(s)

31.24 Fascia, Soffit and Parapet Details

31.25 Signage Detail(s)

31.26 Miscellaneous Detail(s)

31.27 Repetitive Sheets

31.28 Design Narrative Reports

31.29 Permitting

31.30 Other Pertinent Project Documentation

31.31 Cost Estimate

31.32 Technical Special Provisions Package

31.33 Field Reviews

31.34 Technical Meetings

31.34.1 FDOT

31.34.2 Local Governments (cities)

31.34.3 Local Governments (counties)

31.34.4 Other Meetings

31.34.5 Progress Meetings

31.34.6 Phase Review Meetings

31.35 Quality Assurance/Quality Control

31.36 Meeting with Independent Peer Review

31.37 Supervision

Structural Plans

31.38 General Notes, Abbreviations, Symbols, and Legend

31.39 Foundation Plan(s) (Small Scale)

31.40 Foundation Plan(s) (Large Scale)

31.41 Slab Plan(s) (Small Scale)

31.42 Slab Plan(s) (Large Scale)

31.43 Slab Placement Plan(s)

31.44 Slab Placement Detail(s)

31.45 Foundation Section(s)

31.46 Foundation Detail(s)

31.47 Slab Section(s)

31.48 Slab Detail(s)

31.49 Roof Framing Plan(s) (Small Scale)

31.50 Roof Framing Plan(s) (Large Scale)

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

31.52 Roof Section(s)

31.53 Roof Detail(s)

31.54 Bearing Wall Section(s)

31.55 Bearing Wall Detail(s)

31.56 Column Section(s)

31.57 Column Detail(s)

31.58 Miscellaneous Sections

31.59 Repetitive Sheets

31.60 Other Pertinent Project Documentation

31.61 Cost Estimate

31.62 Technical Special Provisions Package

31.63 Field Reviews

31.64 Technical Meetings

31.64.1 FDOT

31.64.2 Local Governments (cities)

31.64.3 Local Governments (counties)

31.64.4 Other Meetings

31.64.5 Progress Meetings

31.64.6 Phase Review Meetings

31.65 Quality Assurance/Quality Control

31.66 Independent Peer Review

31.67 Supervision

Mechanical Plans

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

31.69 Plan(s) (Small Scale)

31.70 Plan(s) (Large Scale)

31.71 Detail(s)

31.72 Section(s)

31.73 Piping Schematic(s)

31.74 Control Plan(s)

31.75 Schedule(s)

31.76 HVAC Calculations

31.77 Life Cycle Cost Analysis

31.78 Repetitive Sheets

31.79 Other Pertinent Project Documentation

31.80 Cost Estimate

31.81 Technical Special Provisions Package

31.82 Field Reviews

31.83 Technical Meetings

31.83.1 FDOT

31.83.2 Local Governments (cities)

31.83.3 Local Governments (counties)

31.83.4 Other Meetings

31.83.5 Progress Meetings

31.83.6 Phase Review Meetings

31.84 Quality Assurance/Quality Control

31.85 Independent Peer Review

31.86 Supervision

Plumbing Plans

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

31.88 Plan(s) (Small Scale)

31.89 Plan(s) (Large Scale)

31.90 Isometric(s) (Large Scale)

31.91 Riser Diagram(s)

31.92 Detail(s)

31.93 Repetitive Sheets

31.94 Other Pertinent Project Documentation

31.95 Cost Estimate

31.96 Technical Special Provisions Package

31.97 Field Reviews

31.98 Technical Meetings

31.98.1 FDOT

31.98.2 Local Governments (cities)

31.98.3 Local Governments (counties)

31.98.4 Other Meetings

31.98.5 Progress Meetings

31.98.6 Phase Review Meetings

31.99 Quality Assurance/Quality Control

31.100 Independent Peer Review

31.101 Supervision

Fire Protection Plans

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

31.103 Fire Protection Plan

31.104 Riser Diagram, Details, and Partial Plans

31.105 Hydraulic Calculation

31.106 Repetitive Sheets

31.107 Other Pertinent Project Documentation

31.108 Cost Estimate

31.109 Technical Special Provisions Package

31.110 Field Reviews

31.111 Technical Meetings

31.111.1 FDOT

31.111.2 Local Governments (cities)

31.111.3 Local Governments (counties)

31.111.4 Other Meetings

31.111.5 Progress Meetings

31.111.6 Phase Review Meetings

31.112 Quality Assurance/Quality Control

31.113 Independent Peer Review

31.114 Supervision

Electrical Plans

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

31.116 Electrical Site Plan

31.117 Lighting Plan(s)

31.118 Lighting Fixtures Schedule(s)

31.119 Lighting Fixtures Detail(s)

31.120 Lightning Protection Plan(s)

31.121 Lightning Protection Details

31.122 Power Plan(s)

31.123 Power Distribution Riser Diagram(s)

31.124 Panel Board Schedule(s)

31.125 Data Plan(s)

31.126 Data Detail(s)

31.127 Communication Plan(s)

31.128 Communication Detail(s)

31.129 Security Alarm System Plan(s)

31.130 Miscellaneous Detail(s)

31.131 Repetitive Sheets

31.132 Energy Analysis

31.133 Other Pertinent Project Documentation

31.134 Cost Estimate

31.135 Technical Special Provisions Package

31.136 Field Reviews

31.137 Technical Meetings

31.137.1 FDOT

31.137.2 Local Governments (cities)

31.137.3 Local Governments (counties)

31.137.4 Other Meetings

31.137.5 Progress Meetings

31.137.6 Phase Review Meetings

31.138 Quality Assurance/Quality Control

31.139 Independent Peer Review

31.140 Supervision

31.141 LEED Certification

31.142 Coordination

31.143 Building Information Modeling (BIM)

32 NOISE BARRIERS IMPACT DESIGN ASSESSMENT IN THE DESIGN PHASE

The CONSULTANT shall fulfill the commitments resulting from the traffic noise analysis and noise barrier evaluation performed during the Project Development and Environment (PD&E) Phase, as directed and clarified by the DEPARTMENT.

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

32.1 Noise 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 32 of the FDOT's Plans Preparation Manual (PPM)) 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

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

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

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

33.1 ITS Analysis

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

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

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

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

Fog/Smoke Detection sensor;

Classifying Precipitation;

Precipitation Occurrence Sensor;

Air Temperature/Relative Humidity Sensor;

Wind Speed and Direction Sensor;

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

Communication hardware.

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

33.2 Communications

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

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

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

33.3 Grounding and Lightning Protection

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

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

33.4 Power Subsystem

The CONSULTANT shall be responsible for an electrical design in accordance with all NEC requirements. No solar power should be utilized as a power solution for the Project unless otherwise approved by the DEPARTMENT. To enhance power reliability, the CONSULTANT shall design a power distribution and backup system consisting of, at a minimum, underground power conduits and conductors, transformers, generators, automatic transfer switches, UPS, and all associated equipment. The power backup system shall supply electrical power in event of commercial power supply failure for all system components. Power equipment shall be installed in areas to avoid wet locations. All connections and

equipment shall be protected from moisture and water intrusion. The CONSULTANT shall ensure that vandal resistant mechanisms for all electrical infrastructure shall be included as part of the Design.

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

33.5 Voltage Drop Calculations

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

33.6 Design Documentation

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

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

33.7 Existing ITS

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

33.8 Queue Analysis

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

33.9 Reference and Master ITS Design File

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

33.10 Reference and Master Communications Design File

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

33.11 Pole Elevation Analysis

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

33.12 Sign Panel Design Analysis

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

33.13 Quantities

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

33.15 Technical Special Provisions

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

33.16 Other ITS Analyses

As specified by each Task Work Order

33.17 Field Reviews

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

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

33.18 Technical Meetings

The CONSULTANT shall attend meetings as necessary support the project.

33.19 Quality Assurance / Quality Control

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

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

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

33.20 Supervision

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

33.21 Coordination

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

34 INTELLIGENT TRANSPORTATION SYSTEMS PLANS

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

34.1 Key Sheet

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

MUTCD

Standard Specs

Standard Index

34.2 Summary of Pay Items Including Designer Interface (TRNS*port) Input

The CONSULTANT shall include input into Designer Interface (TRNS*port) and create the CADD generated sheet.

34.3 Tabulation of Quantities

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

34.4 General Notes / Pay Item Notes

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

34.5 Project Layout

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

34.6 Typical and Special Details

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

34.7 Plan Sheet

The CONSULTANT shall prepare the ITS plan sheets utilizing the Design file to include all necessary information related to the project design elements and all associated reference

files. The plan sheets shall include general and pay item notes and pay items. The plans shall depict the location of pull boxes, splice boxes, conduit runs and device locations with setbacks from the travel way. Devices shall be located by station and offset.

34.8 ITS Communications Plans

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

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

Temporary communication connectivity as necessary for assigned Task.

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

The CONSULTANT is responsible for the design of the communication infrastructure and its integration with the DEPARTMENT's communication system. Additionally, the CONSULTANT shall determine the most cost effective, best performing, communication connectivity option. The communication system must allow command and control as well as data and video transmission between the field devices and the stated TMCs location.

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.

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 Grounding and Lightning Protection Plans

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

34.11 Cross Sections

The CONSULTANT shall prepare cross sections for ITS devices.

34.12 Guide Sign Work Sheet(s)

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

34.13 Special Service Point Details

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

34.14 Strain Pole Schedule

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

34.15 Overhead / Cantilever Sign Structure

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

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

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

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

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

34.17 Traffic Control Plans

The CONSULTANT shall prepare Traffic Control Plans (TCP) to minimize impact to traffic

during the construction of ITS field devices and associated communications infrastructure that will be deployed along the project corridor.

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

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

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
- 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

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

35.5 Coordinate and Develop MOT Plans for Field Investigation

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

35.6 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. Assist the Engineer of Record with detailing these limits on the cross-sections. If requested, prepare a plan view of the limits of unsuitable material.

35.17 Electronic Files for Cross-Sections

Create electronic files of boring data for cross-sections.

35.18 Embankment Settlement and Stability

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

35.19 Monitor Existing Structures

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

Optional services (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 PPM Volume I Chapter 34 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 Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT will respond in writing to any changes and/or comments from the DEPARTMENT and submit any responses and revised reports.

35.24 Final Report

The Final Roadway Report shall include the following:

- Copies of U.S.G.S. and S.C.S. maps with project limits shown.
- A report of tests sheet that summarizes the laboratory test results, the soil stratification (i.e. soils grouped into layers of similar materials) and construction recommendations relative to Standard Indices 500 and 505.
- The results of all tasks discussed in all previous sections regarding data interpretation and analysis.
- An appendix that contains stratified soil boring profiles, laboratory test data sheets, sample embankment settlement and stability calculations, design LBR calculation/graphs, and other pertinent calculations.
- The CONSULTANT 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 Design Standards Index 600 series.

35.30 Drilling Access Permits

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

35.31 Property Clearances

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

35.32 Collection of Corrosion Samples

Collect corrosion samples for determination of environmental classifications.

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

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

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

35.46 Final Report - Bridge and Associated Walls

The final structures report shall include the following:

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

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

The final reports shall include the following:

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

Final reports 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

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

1 36 3D MODELING

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

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

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

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

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

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

36.1 Phase I 3D Design Model

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

36.2 Phase II 3D Design Model

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

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

36.3 Phase III 3D Design Model

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

36.4 Final 3D Model Design

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

36.5 Cross Section Design Files

The CONSULTANT shall establish and develop cross section design files in accordance with the FDOT 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, project specific templates/assemblies needed to develop the features required to deliver the 3D model.

36.7 Quality Assurance/Quality Control

36.8 Supervision

36.9 Coordination

37 PROJECT REQUIREMENTS

37.1 LIAISON OFFICE

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

37.2 Key Personnel

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

37.3 Progress Reporting

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

37.4 Correspondence

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

37.5 Professional Endorsement

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

37.6 Computer Automation

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

37.7 Coordination with Other Consultants

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

37.8 Optional Services

At the 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.