EXHIBIT "A"

SCOPE OF SERVICES

DISTRICT-WIDE DRAINAGE SERVICES

FINANCIAL PROJECT I.D. NO. 432644 1 32 06

INDEX

Exhibit "A"

District-Wide Drainage Services

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EXHIBIT A

District-Wide Drainage Services

Financial Project ID No. 432644 1 32 06

I. DESCRIPTION

Consultant services are required for miscellaneous Drainage Studies, Analyses and Design in support of the Work Program and the Drainage and Permitting Units of District One Florida Department of Transportation.

II. SERVICES

The CONSULTANT will provide the following drainage-oriented engineering tasks as requested by the DEPARTMENT. The CONSULTANT shall electronically sign, date and seal all final plans, specifications, reports or other documents submitted to the DEPARTMENT.

A. Drainage Maps

Prepare Drainage Maps in accordance with the latest edition of the Florida Department of Transportation (FDOT) Design Manual (FDM), FDOT Drainage Manual and Drainage Design Guide, and at the direction of the District Drainage Design Engineer.

B. Location Hydraulic Report

Prepare Location Hydraulic Report in accordance with the latest FDOT Drainage Manual, and Part 2, Chapter 24 of the Project Development and Environmental Manual. Where National Flood Insurance Program maps are not available or not of adequate detail to identify and evaluate floodplain encroachments, the CONSULTANT shall develop information to identify and evaluate the impact of the highway encroachments on floodplains.

C. Storm Water Analysis

The CONSULTANT is required to coordinate all services with the District Drainage Design Engineer. The DEPARTMENT will also be notified in adequate time to schedule a representative to attend all related coordination meetings.

1. The CONSULTANT shall be responsible for designing a drainage and storm water management system for each project. All design work shall be in compliance with the DEPARTMENT'S Drainage Manual and Drainage Design Guide; and the requirements of the regulatory agencies. This work

will include the engineering analyses necessary to design any or all of the following: cross drains, French drains, roadway ditches, outfall ditches, storm sewers, retention/detention facilities, interchange drainage and water management and other storm water management systems and elements of systems as required for a complete and thorough analysis. Full coordination with all permitting agencies, the District Drainage Section, Environmental Permitting, and Environmental Management sections will be required from the outset. Full documentation of all meetings and decisions are to be submitted to the DEPARTMENT Project Manager.

- 2. The exact number of drainage basins, outfalls, and water management facilities (retention/detention areas, inlets, weirs, etc.) will be the recommended by the CONSULTANT and approved by the DEPARTMENT's Project Manager.
- 3. The CONSULTANT will be responsible for the delineation of all wetlands and surface waters within the project limits as required by the permitting agencies and in coordination the DEPARTMENT's Environmental Permitting Section.
- 4. The CONSULTANT shall develop a Pond Siting Report including a preliminary storm water management facility design and probable costs of alternative storm water management systems. Prior to the Phase I plans submittal, alternative storm water management design concepts and a pond location analysis shall be submitted in a report (including a selection matrix) that considers the design criteria found in the Drainage Manual and Drainage Design Guide. The storm water management designs should consider alternative methods of treatment and conveyance of project waters, specifically looking at regional treatment alternatives which will provide greater benefit to the watershed. The preferred alternative should be based upon constructability, maintainability, environmental impacts, costs and economic risk analysis. The economic analysis shall consider costs related to right of way, construction, mitigation, and maintenance.

5. Existing Cross Drains:

The CONSULTANT shall notify the DEPARTMENT's Drainage Office of any existing cross drains within the project limits which are scheduled to remain and have been identified to potentially have issues. The DEPARTMENT will determine whether to perform desilting and pipe video inspection. The CONSULTANT shall review pipe video inspections provided by the DEPARTMENT and incorporate any required culvert remediations into the CONSULTANT'S construction plans subject to approval by the DEPARTMENT.

Flood data requirements will be determined in accordance with DEPARTMENT procedures.

- **6.** The CONSULTANT will consider Optional Culvert Materials for all culvert applications in accordance with the DEPARTMENT'S Drainage Manual and Drainage Design Guide.
- 7. The CONSULTANT shall prepare a report that documents the drainage design strategies, in a signed, dated and sealed hydraulic design study. The design study should show that the design requirements of the DEPARTMENT and all applicable permitting agencies have been met. For those projects requiring an environmental permit, the signed and sealed hydraulic design study shall be submitted to all applicable permitting agencies. This report is addressed below in Section "I" (Project Storm Water Management Design).
- 8. The CONSULTANT shall furnish to the DEPARTMENT all supporting data (reports, drainage tabulations, risk analysis, related correspondence, pictures and documents) compiled during the performance of services to the DEPARTMENT.

D. Contract Plans

Prepare contract plans, profiles, cross sections, details and notes for roadway drainage improvement projects including but not limited to: Drainage Maps, Drainage Structures, Summary of Drainage Structures, Lateral Ditches and Outfalls, Outfall Cross Sections, Optional Culvert Materials Tabulations, Bridge Hydraulics Recommendations, Retention/Detention Plans, Special Drainage Details, Erosion Control Details, Maintenance of Traffic, Utility Relocations, Stormwater Pollution Prevention Plans and Culvert Details. Prepare plans in accordance with the FDM and Design Standards. Submit plans for at least two review phases, and address all DEPARTMENT comments which may relate to technical, format, constructability, and maintainability aspects of the submittal.

E. Surface Water Management

Surface Water Management shall include storm water treatment and attenuation required to comply with the rules of the appropriate Water Management District, FDOT Drainage Manual and Drainage Design Guide. The objective is to obtain an approved storm water treatment/attenuation design.

If applicable, surface water management shall also address the potential for regional stormwater management alternatives. Additional stormwater management strategies shall be identified within the adjoining project watersheds that can serve as permittable alternatives as compared to traditional stormwater ponds. The design approach should consider, at a minimum, two (2) adjoining roadway basins in an attempt to minimize the number of stormwater ponds while accomplishing the environmental permitting needs for this roadway project.

These services shall include, but are not limited to, the following:

- 1. Design stormwater management facilities to meet requirements for stormwater quality treatment and attenuation. Develop proposed pond layout (contributing drainage basin, shape, contours, slopes, volumes, tieins, etc.), perform routing, pollutant loading calculations, recovery calculations, design the outlet control structure and buoyancy calculations for pond liners when necessary.
- 2. Preparation of a Pond Siting Report locating and assessing suitable land areas for storm water management. Early coordination during this effort with the District Right of Way, Environmental Management, Geotechnical and Environmental Permitting Sections will be necessary. The land areas selected will be based on hydrologic, hydraulic, environmental, and economic analysis.
- 3. Coordinate with local government offices (when applicable) regarding local regulations, restrictions, and possible joint use opportunities for the DEPARTMENT. Obtain information concerning present or future land development that could impact the design.
- 4. Submit preliminary plans or reports as early as possible and prior to each scheduled Phase Review date to the District Drainage and Environmental Permitting sections for review, comment and revision as necessary.
- **5.** Review preliminary design concepts with permitting agencies and finalize plans.
- **6.** Incorporate storm water management design into the project plans.
- 7. Determine the Seasonal High-Water Table (SHWT) elevation(s) and recommend the appropriate Normal Water Level (NWL) for proposed treatment/attenuation areas.

F. Bridge Hydraulic Report (BHR) and Recommendation Sheet (BHRS)

- 1. The CONSULTANT shall provide a BHR and BHRS for bridge structures, including a scour analysis in accordance with the FDOT Drainage Manual and Drainage Design Guide. Signed, dated, and sealed copies of the BHR and BHRS shall be submitted to the DEPARTMENT. The BHR and BHRS are to be prepared in accordance with the latest requirements of FHWA and the DEPARTMENT.
- A hydraulic model in accordance with the DEPARTMENT'S Drainage Manual shall be utilized to analyze the bridge and waterway. The freshwater/tidal events need to be modeled and the scour analysis shall be performed in accordance with HEC-18 and 20 and the latest procedures

listed in the Drainage Manual. The recommended bridge length shall be determined based upon all applicable factors including the minimum hydraulic structure, environmental impacts including wildlife connectivity, safety, maintenance, and constructability. The intent is to obtain a recommended bridge length that meets FHWA and FDOT design criteria, permit requirements and has conceptual approval from the FDOT District Drainage Engineer.

- 3. Bridge Hydraulic design computations and analyses shall be documented in a permanent record file. The permanent record file shall address all design standards provided herein. Documentation shall be provided in detail commensurate with the complexity of the project. Documentation shall be sufficient enough so that an independent engineer with expertise in bridge hydraulics, but not involved with the design, can fully interpret, follow and understand the logic, methods, computations, analysis and considerations used to develop the final design.
- **4.** Prepare Bridge Hydraulic Recommendation Sheet in accordance with the FDM, FDOT Drainage Manual, and Drainage Design Guide.

G. FEMA "No-Rise" Certification

The CONSULTANT shall provide a "No-Rise" Certification, when activities involve an adopted regulatory floodway, in accordance with the DEPARTMENT'S Drainage Manual, Drainage Design Guide and FEMA.

H. Coastal Engineering Services

The CONSULTANT shall provide coastal engineering services as requested by the DEPARTMENT.

I. Project Storm Water Management Design

Perform complete storm water investigations and analyses necessary to prepare a design, which will adequately drain the project in accordance with the DEPARTMENT'S design criteria. Services include the establishment of outfall locations and the design thereof in conformance to standard DEPARTMENT procedures. The design shall be in accordance with the FDOT Drainage Manual and Drainage Design Guide.

The CONSULTANT shall provide a Hydraulic Design Study to document and furnish the DEPARTMENT all supporting data compiled during the performance of services described in this section. The CONSULTANT is required to coordinate all services with the District Drainage Design Engineer. The DEPARTMENT will also be notified in adequate time to schedule a representative to attend all related coordination meetings.

J. Storm Water Studies and Complaint Review

Perform field investigations and analyses necessary to prepare responses to address identified storm water problem areas. Provide recommendations for drainage improvements when requested.

K. Storm Water Management Design Review

Review and comment on the adequacy, feasibility, constructability, and maintainability of storm water designs developed by others. The review will consider:

- 1. Compliance with the FDOT Drainage Manual and Drainage Design Guide, and the FDM;
- **2.** Economics.
- **3.** Accuracy,
- **4.** Maintainability and
- **5.** Constructability.

L. Drainage Connection Permit Design Review

The CONSULTANT shall act as an extension of the DEPARTMENT'S staff in order perform reviews of Drainage Connections to the DEPARTMENT'S Right of Way per Rule Chapter 14-86 of Florida Administrative Code.

In coordination with the DEPARTMENT, the CONSULTANT will review Drainage Connection Permit applications for compliance with Rule Chapter 14-86. The CONSULTANT will coordinate with applicants and/or their engineers in addition to the Operations Centers staff to provide any and all information necessary in assist in the drainage connection permit process. The CONSULTANT will accept telephone calls and correspondence related to drainage permit and exception requests.

1.0 Exceptions

The CONSULTANT may occasionally be required to assist in the review of Drainage Connection Permit applications for Exceptions to the permit requirements in order to ensure the project complies with the exception criteria listed within Rule Chapter 14-86.003. This review shall be conducted within a timely manner using sufficient engineering data and engineering judgment to examine the amount of data, level of detail, and the methods used to satisfy the criteria and intent of the Drainage Connection Rule for an Exception. Exceptions will only be granted for applications which strictly comply with the criteria contained in Chapter 14-

1.1 Connection Permits Reviews

The CONSULTANT will review all information provided for site specific drainage connections to the DEPARTMENT'S Right-of-Way and determine compliance with the Drainage Connection Rule, Chapter 14-86.003(1) F.A.C. Prudent engineering judgment is expected in determining the amount of data, level of detail and design methods used to satisfy the criteria and intent of the Drainage Connection Rule. The type of information expected as part of the permit application submittals shall include but are not limited to the following items: topographical and boundary survey maps of the "pre" and "post" conditions, site plans showing locations and types of connections, stormwater management facilities and underground storage systems, details of the control structures, conveyance calculations, and stormwater routing calculations. This review is to be completed in the DEPARTMENT'S allotted timeframe and written notification of the results of this review shall be provided to the DEPARTMENT'S Permits Coordinator.

The CONSULTANT will ensure that all proposed development within the DEPARTMENT'S right-of-way, which does not meet current design standards, will obtain an approved Design Variation from the District Design Engineer.

The CONSULTANT will identify any potential impacts caused by the proposed improvements to existing permitted facilities within the DEPARTMENT'S right-of-way. The CONSULTANT will obtain a copy of the DEPARTMENT'S approved Water Management District's (WMD) permit to ensure the proposed work complies with the conditions included as part of the original permit.

The CONSULTANT will inform the applicant/engineer of the DEPARTMENT'S right to request right-of-way donations, when applicable, in an attempt to preserve the existing drainage facilities along the State's roadway system. The CONSULTANT will notify owners/applicants of the DEPARTMENT'S criteria and the amount of compensatory right-of-way required to mitigate for the impacts to the existing drainage features.

1.2 Review of Improvements to the DEPARTMENT'S Facilities by Third Parties

The CONSULTANT will review upon request any proposed roadway work within the DEPARTMENT'S right-of-way to determine the potential impacts, if any, to the existing drainage facilities. These reviews will include, but are not limited to, turn lane additions, roadway widening,

landscaping, sidewalk/pathway installations, etc. The results of these reviews will be provided to the DEPARTMENT in writing to ensure the following items are addressed:

- Compliance with the DEPARTMENT'S drainage criteria as contained in the FDM (FDM), Drainage Manual, Drainage Design Guide, Standard Indexes, etc.
- Compliance with District One Drainage Practices and Policies.
- Compliance with storm water management permits required by the WMD.
- The CONSULTANT shall also inform the DEPARTMENT'S Design Project Manager(s) of work within the right-of-way that potentially conflicts with roadway projects currently included in the 5-Year Work Program.

When improvements are made to the DEPARTMENT'S facilities that require either a permit or permit modification from the WMD, the permit applications shall be reviewed to ensure the following:

- All environmental permits for the proposed roadway and drainage improvements to the DEPARTMENT'S system have been issued.
- The WMD permit plans agree with the construction plans submitted to the Department.
- Stormwater management facilities within the DEPARTMENT'S rightof-way are used for the DEPARTMENT'S stormwater runoff only.

M. Survey Services

- 1. General Survey Services, including Subsurface Utility Engineering, and deliverable data required to support a Drainage Design, Drainage Map, Bridge Hydraulics Report, Location Hydraulic Report, Wetland Delineations, and other work elements as outlined in the FDOT Drainage Manual.
- 2. Survey services and deliverable data will be in accordance with the DEPARTMENT'S current procedures, including special instructions and directions issued in writing by the DEPARTMENT'S Survey Administrator. Survey services will also comply with all pertinent Florida Statutes and applicable rules in the Florida Administrative Code. All field survey data gathered by use of electronic field notebook will be furnished in a CAiCE readable format, readily available for input and use in CADD Design files.
- 3. The above survey work must be accomplished in accordance with the DEPARTMENT'S Location Survey Manual (Topic Numbers 550-030-100, 550-030-001, and 550-030-030). This work must comply with the Minimum Technical Standards for Professional Surveyors and Mappers (Rules 61G17-6, Florida Administrative Code, pursuant to Section 472.027, F.S.), and any special instructions from the DEPARTMENT. Survey work will comply with Chapter 177, F.S., and the Department of Environmental Protection rules governing Mean High Water and Jurisdictional Line surveys.

4. A quality checklist will be furnished by the DEPARTMENT and completed by the CONSULTANT for submittal along with the field books, maps and other data. Marks-up of the CONSULTANT's quality control review will be provided along with all map submittals.

N. Permitting Services

- 1. <u>Wetland Delineations</u> The CONSULTANT will conduct field surveys to determine the presence and location of jurisdictional boundaries of surface waters or wetlands. Wetland delineations will be performed per the requirements of the water management districts and the appropriate Section 404 permitting agency either Florida Department of Environmental Protection (FDEP) or US Army Corps of Engineers.
- 2. <u>Wildlife Surveys</u> The CONSULTANT will conduct field surveys to determine the presence and location of threatened or endangered species or other listed species. The surveys will be performed in accordance with the requirements of all the permitting agencies.
- 3. <u>Mitigation Design</u> The CONSULTANT shall collect all data and information necessary to prepare a mitigation plan that will be acceptable to all permitting and commenting agencies. Prior to development of the mitigation plan, the CONSULTANT shall meet with representatives of the District's Permit Department to determine the District's preferences for mitigation. The Uniform Mitigation Assessment Method (UMAM) shall be utilized to determine mitigation requirements unless otherwise specified by the DEPARTMENT.
- 4. Permitting The CONSULTANT shall prepare permit applications as requested by the DEPARTMENT. Permit applications may be for Water Management Districts, US Army Corps of Engineers, US Coast Guard, Florida Department of Environmental Protection, or other agencies. The CONSULTANT will be responsible for collecting all pertinent data in support of the permit application. The CONSULTANT will be responsible for all coordination activities with the permitting agencies, including pre-application meetings, field reviews, responding to agency comments, and seeking clarification on agency comments. The CONSULTANT will advise the District Permits Department of all meetings, field reviews, and monthly status of each permit application. The CONSULTANT will provide the District Permits Department with copies of all submittal packages. The CONSULTANT will not be considered as having completed the permitting task until each agency involved issues a statement of final agency action.
- 5. The CONSULTANT is to be familiar with the use of GIS programming for tracking and data base file management.

O. Field Review

Upon request by the DEPARTMENT, the CONSULTANT shall perform field reviews of hurricane damaged or flooded roadway areas to document conditions such as high-water marks, delineate limits of inundation, capture photographic and video evidence and assess damage.

The CONSULTANT should be aware that Water Management District permit reviewers routinely request survey information up to 100-ft outside of the Right-of-Way line. The CONSULTANT shall be prepared to provide this information through means other than additional field survey work (i.e. either aerial contour maps or LiDAR topography, where available).

P. Geotechnical Services

The CONSULTANT shall be responsible for a complete geotechnical investigation to support a Drainage Design, Drainage Map, Bridge Hydraulics Report, Location Hydraulic Report, Pond Siting Report, Wetland Delineations, and other work elements as outlined in the FDOT Drainage Manual. 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, 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.

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.

III. RESPONSIBILITIES OF THE DEPARTMENT

The DEPARTMENT will furnish, without charge, the following services and data to the CONSULTANT for the performance of services:

1. Provide all criteria and full information as to the DEPARTMENT'S requirements for consultants and contract services including objectives, constraints, budgetary limitations, and time constraints.

- 2. Furnish drawings, specifications, schedules, reports and other information prepared by the DEPARTMENT or for the DEPARTMENT by others that are available to the DEPARTMENT and that the DEPARTMENT considers pertinent to the CONSULTANT'S responsibilities, as described herein.
- **3.** Permit the Consultant to utilize the DEPARTMENT'S Data Processing and Computer Services for programs requested by the CONSULTANT and approved by the DEPARTMENT.
- **4.** Provide available existing plans.

IV. COMPUTER REQUIREMENTS AND SERVICES

- A. The Consultant shall be authorized to use the DEPARTMENT'S computer programs. Computations based on computer programs other than the DEPARTMENT'S must conform to the DEPARTMENT'S general format. (See latest FDM.)
- **B.** All CADD files submitted to the DEPARTMENT by the CONSULTANT electronically or on disk shall be in MicroStation format. It is the responsibility of the CONSULTANT to utilize current DEPARTMENT releases of all CADD applications and follow the current DEPARTMENT CADD procedures. The CONSULTANT's role and responsibilities are defined in the DEPARTMENT's CADD Manual.
- C. The project file CADD deliverables shall conform to the DEPARTMENT'S CADD Manual.

V. SPECIFICATIONS FOR WORK

A. Plans and Specifications

The CONSULTANT shall ensure that all construction plans, as applicable, are prepared in accordance with the latest standards adopted by AASHTO, DEPARTMENT Standard Specifications, DEPARTMENT current memorandums, latest FDM, DEPARTMENT Flexible Pavement Design Manual, latest DEPARTMENT Drainage Manual, and shall be accurate, legible, complete in design, and drawn to the appropriate scale and furnished in reproducible form on material acceptable to the DEPARTMENT.

B. Compliance of Studies and Reports

All studies shall be done in compliance with current applicable federal, state and local regulations and procedures.

C. Document Format

The CONSULTANT shall submit to the DEPARTMENT all reports and design calculations prepared during the development of the plans. The design calculations submitted shall adequately address the complete design of all storm water components. These calculations and supporting documentation shall be neatly and logically presented on 8½ x 11-inch paper (where possible), be electronically signed, dated and sealed by a registered professional engineer, and also be submitted electronically in pdf format. A cover sheet indexing the calculations and supporting documentation shall be included and the engineer shall sign, date and digitally seal that sheet. All computer programs and parameters used in the design calculations and supporting documentation shall include sufficient backup information to facilitate the review task.

The CONSULTANT shall ensure that all contractual services documents and support forms have been prepared in a DEPARTMENT compatible format (hardware and software).

D. Quality Assurance/Quality Control

The CONSULTANT shall submit a copy of their QA/QC comments and responses with each task submittal.

E. Progress Reporting

The CONSULTANT shall provide to the DEPARTMENT, concurrently with each invoice, written progress and schedule status reports which describe the task assignment number, task description, progress-to-date on each task, and planned work, to the DEPARTMENT concurrently with each invoice. The Project Manager will make judgement on whether work of sufficient quality and quantity has been accomplished by comparing the reported percent complete against actual work accomplished.

F. Submittals

The CONSULTANT shall furnish prints, and documents as required by the DEPARTMENT to adequately control, coordinate, and approve the plans. All submittals are to be submitted electronically (pdf format) to the DEPARTMENT Project Manager. All Final Reports and documents shall be digitally signed, dated and sealed.

G. Governing Regulations

The services performed by the CONSULTANT shall, for each task, be in compliance with all applicable DEPARTMENT Manuals and Guidelines. The DEPARTMENT'S Manuals and Guidelines incorporate by requirement or reference all applicable State and Federal regulations. The following

DEPARTMENT Manuals and Guidelines, current edition, including updates, may be required for the various tasks in the performance of this work.

- 1. FDOT Drainage Manual and Drainage Design Guide.
- 2. Project Development and Environmental Manual.
- 3. FDM.
- 4. FDOT Roadway Traffic and Design Standards.
- 5. Manual of Uniform Minimum Standards for Design, Construction, and Maintenance for Streets and Highways.
- 6. FDOT Computer Aided Design and Drafting (CADD) Roadway Standards Manual.
- 7. FDOT Right-of-Way Mapping Handbook.
- 8. FDOT Right-of-Way Mapping CADD Handbook.
- 9. FDOT Location Survey Manual.
- 10. FDOT Electronic Field Book system (EFB) User Guide.
- 11. FDOT Outline Specifications Aerial Surveys/Photogrammetry.
- 12. FDOT Soils and Foundations Manual.
- 13. FDOT Roadway CADD Handbook.
- 14. FDOT Structures Design Guidelines.
- 15. Soils and Foundations Handbook