# SERVICES AUTHORIZATION #X
# ENGINEERING SERVICES AGREEMENT

*THIS SERVICES AUTHORIZATION* is made and entered into this _____ day of _____, 20___, by and between the **City of Orlando, Florida**, a municipal corporation existing under the laws of the State of Florida (CITY), and **Camp Dresser & McKee Inc**., doing business locally at 2301 Maitland Center Parkway, Suite 300 Maitland, Florida 32751 (ENGINEER).

*WHEREAS*, the CITY and the ENGINEER have previously entered into an agreement for the ENGINEER's professional services (Agreement) on March 9, 2000, concerning the Eastern Regional Reclaimed Water Distribution System Expansion Project (Project); and

*WHEREAS*, the Agreement was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk, as Documentary #32458A; and

*WHEREAS*, the CITY and the ENGINEER wish to amend the Agreement as set forth herein; and

*WHEREAS*, AMENDMENT I of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on August 11, 2000; and

*WHEREAS*, AMENDMENT II of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on August 14, 2001; and

*WHEREAS*, AMENDMENT III of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on March 18, 2002; and

*WHEREAS*, AMENDMENT IV of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on December 12, 2002; and

*WHEREAS*, AMENDMENT V of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on April 8, 2004; and

*WHEREAS*, AMENDMENT VI of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on July 1, 2005; and

WHEREAS, AMENDMENT VII of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on July 11, 2006.

*WHEREAS*, AMENDMENT VIII of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on April 29, 2009.

*WHEREAS*, AMENDMENT IX of the SERVICES AGREEMENT was approved and authorized by the City Council and signed by the Mayor Pro Tem and City Clerk on September 3, 2009.

*WHEREAS*, the CITY and the ENGINEER now wish to memorialize their understanding for the ENGINEER's additional professional services for the Project.

*NOW, THEREFORE*, in consideration of the mutual promises and covenants contained herein and given one to the other, the sufficiency of which is hereby acknowledged, the parties agree as follows:

I. SCOPE OF SERVICES

The scope of services has been agreed to by the parties, and is attached hereto and incorporated herein, by reference, as EXHIBIT I.

II. FEE

The not-to-exceed fee of $205,521 has been agreed to by the parties, and is attached hereto and incorporated herein, by reference, as EXHIBIT II.

III. TERM

The term of the Services Authorization shall be completed by the end of business (5:00 p.m.) on November 30,2010, as set forth on EXHIBIT III, attached hereto and incorporated by reference herein. It is also agreed that the CITY shall have an option for extension of this Services Authorization as necessary to complete the present scope of Services (Exhibit I) or to provide additional services.

IV. ENTIRE AGREEMENT

This Services Authorization supersedes all previous services authorizations, amendments, agreements, or representations, either verbal or written, heretofore in effect between the CITY and the ENGINEER that may have concerned the matters covered herein, except that this Services Authorization shall in no way supersede or amend the Agreement or other services authorizations or amendments except as specifically provided herein. No additions, alterations, or variations to the terms of this Services Authorization shall be valid, nor can the provisions of this Services Authorization be waived by either party, unless such additions, alterations, or waivers are expressly set forth in writing in a document duly executed by both parties.

*IN WITNESS WHEREOF*, the parties hereto have executed this Services Authorization on the day and year first written above.

**City of Orlando, Florida**

By:_____
Mayor Pro Tem

ATTEST:

_____
Alana C. Brenner, City Clerk

(SEAL)

APPROVE AS TO FORM AND LEGALITY
for the use and reliance of the
City of Orlando, Florida, only.
_____, 20_____.

_____
Chief Assistant City Attorney
Orlando, Florida

**Camp Dresser & McKee Inc.**

By:_____

_____
(Print Name)

Title:_____

STATE OF FLORIDA }

COUNTY OF _____}

*PERSONALLY APPEARED* before me, the undersigned authority,_____, [ ] well known to me or [ ] who has produced _____ as identification, and known by me to be the _____of the corporation named above, and acknowledged before me that he/she executed the foregoing instrument on behalf of said corporation as its true act and deed, and that he/she was duly authorized to do so.

*WITNESS* my hand and official seal this ____ day of _____, 20____.

_____
NOTARY PUBLIC
Print Name:_____
My Commission Expires:

# EXHIBIT I

# SCOPE OF SERVICES
# EASTERN REGIONAL RECLAIMED WATER DISTRIBUTION SYSTEM
# SERVICE AUTHORIZATION X

## INTRODUCTION

CDM is currently under contract with the City of Orlando to develop the final design of the Eastern Regional Reclaimed Water Distribution System (ERRWDS). Three tasks (Tasks 1 through 3), that were not covered in the original scope of work, have since been identified as necessary for the completion of the work.

The three tasks identified under this authorization are:

- Task 1, ERRWDS Supplemental Well Facilities – A supplemental supply well has already been permitted and constructed at the City of Orlando's Conserv I WRF. The 2-year permit is up for renewal. CDM will provide additional permitting renewal assistance, including services for the testing of the City's Easterly Wetlands.

- Task 2, Tradeport Airport Hangars Fire Pump Alternate Design – this task includes a redesign of the airport hangars from previously utilized design criteria. Refer to Task 2.0 for a detailed description of these additional design services.

- Task 3, ERRWDS Hydraulic Model Update – This task includes upgrading and updating the existing model to reflect current conditions, including recent projections of demand and development locations. This update will incorporate the distribution system piping to allow the City to better predict actual system occurrences. Wholesaling reclaimed water and peak demands will be important in this model development. Refer to Task 3.0 for a detailed description of the services required for this update.

## Task 1.0 – ERRWDS Supplemental Well Facilities

After submitting the original permit renewal and responding to the District's first Request for Additional Information (RAI), it has been indicated that a second RAI will be generated and will require further coordination and discussions with the SFWMD before the permit renewal/modification can be issued. This task includes the work required to develop and then analyze the data necessary to respond to the City's RAI in order to obtain a 20-year WUP.

### Task 1.1 – Additional SFWMD Coordination

CDM will attend up to five meetings, develop meeting minutes, and coordinate with SFWMD staff requests required to assist the City in obtaining a 20-year Water Use

Permit (WUP) for the supplemental well located at the Conserv I WRF and also a lower Floridan well currently sited at OUC's SE WTP. Some of the topics of these meetings will include the City's Easterly Wetlands flow requirements, reclaimed water to OUC's Stanton Energy Center, and inter-district transfer of water.

CDM will assist the City in preparing the agreement between the SFWMD and the SJRWMD for the inter-district flow of groundwater. CDM will also submit the required 90-day permit extension letters to SFWMD, for testing of the wetlands.

## Task 1.2 – Easterly Wetlands Testing

This task includes the protocol review and coordination with the SFWMD and the City in order to test the required levels of effluent necessary to be delivered from the Iron Bridge AWTP in order to keep the City's Easterly wetlands viable for effluent disposal without causing a significant environmental impact. CDM will review the City's protocol for testing the wetlands as well as provide review and limited oversight. This will include meeting with the City and SFWMD as well as site visits to the Easterly Wetlands. A review of the environmental impacts will not be included in this level of effort. This effort will generate data that will be utilized for responding to the District's requests for additional information regarding the necessary flows to the wetlands.

City staff will perform all actions required to isolate sections of the wetlands for viability testing over a 6 month period. CDM will review the testing protocol and provide coordination efforts between the City and the SFWMD. The City will observe and collect the viability data. CDM will analyze this data and prepare a report summarizing the findings, and will be included in the response to the District's RAI.

# Task 2.0 – Tradeport Airport Hangars Fire Pump Alternate Design

The original conceptual design for the transfer of the fire suppression deluge system at the two Continental Airplane Hangars, involved two separate pump stations with backup fuel supply, being fed from the potable water system. It is now preferred that the deluge system be supplied by from the potable water supplier, the Orlando Utilities Commission (OUC), using only one pump station that has the ability to feed either hangar. It is assumed that the pump station must only feed one fire at a time. The alternate design will be based upon one fire pump per hangar with one backup that can supply either system. Jockey pumps will be utilized to maintain pressure in the system when a fire-flow situation is not occurring.

## Task 2.1 – Final Design Services

*Task 2.1.1 – Survey and Geotechnical Services*

CDM will obtain a survey of Tradeport Drive North from the south airplane hangar to the north airplane hangar along the right-of-way (appox. 1-mile). This survey will include spot elevations every 100-feet, utility locating, and horizontal and vertical

verifications of utilities in areas where the new pipeline will be installed (i.e. soft-digs). The survey will extend to approximately 20 feet east and west of the existing curb due to the security of private property on the east side and the creek/retention ditch on the west side.

CDM will obtain a geotechnical report for the proposed pump station locations and the pipeline installation locations. SPT borings will be performed at a maximum spacing of 500 feet along the proposed path of the pipeline to be installed and one at each of the possible pump pad sites.

*Task 2.1.2 – Fire Pipeline Design*

CDM will perform preliminary and final design of the pipeline from the selected pump station location to the nearest fire hangar and also the pipeline from the pump station, along Tradeport Drive North, to the second fire hangar connection (approx. 1-mile). CDM will prepare 60%, 90%, and 100% designs for the City to review and comment. After the 100% review comments are incorporated, the final Bid Documents will be prepared.

*Task 2.1.3 – Pump Station Alternate Design*

CDM will adjust its original design from two pump stations to one pump station for both hangars. CDM will coordinate fire flow availability with the potable water supplier, OUC, and discuss designs and regulations with the City's Fire Protection Engineer. CDM will perform final design of the pump station. CDM will prepare 60%, 90%, and 100% designs for the City to review and comment. After the 100% review comments are incorporated, the final Bid Documents will be prepared.

*Task 2.1.4 – Coordination Meetings with GOAA*

CDM will attend up to three coordination meetings between the City and the Greater Orlando Aviation Authority (GOAA) in addition to the design review meetings discussed above.

# Task 3.0 – ERRWDS Hydraulic Model Update

CDM will develop a hydraulic model for the ERRWDS using MWHSoft's InfoWater v8.0. This is a GIS based software and will incorporate demands as provided by the "*Orlando Utilities Commission: Orlando Reuse System Evaluation*", dated October 2008.

## Task 3.1 – Data Collection and Analysis

*Task 3.1.1 – Data Collection*

CDM will request existing information related to the reclaimed water transmission and distribution system. The information to be requested will include, but not limited to: Geographical Information Systems (GIS) data on the reclaimed water transmission and distribution system, flow and pressure data from the Iron Bridge and Conserv I, Water Reclamation Facilities (WRFs), reclaimed water meter billing data from the

Orlando Utilities Commission (OUC), and any reports or master plans that are to be utilized for reclaimed water demands.

*Task 3.1.2 – Data Clean-up and Analysis*
This task will involve checking the GIS data for missing information, notifying the City of the incomplete data, and then working with the City to correct any incomplete or missing data. It is assumed that any necessary field checking of pipe sizes, locations, etc. will be made by City of Orlando Staff, through requests made by CDM.

## Task 3.2 – Model Development

*Task 3.2.1 – Network Components*

CDM will use the data from Task 3.1 to setup the network components in the model. This will include the Iron Bridge WRF effluent pumps, transmission/distribution system pipes (down to 4" nominal diameter), nodes, the proposed In-Line Booster Pumping Station, and the proposed Lake Nona GST and Pumping Station Facility. Pump curves will be included in the model for the designated pumps. CDM will utilize the latest USGS DEM file for the City of Orlando to extract node elevations into the model (ground surface elevations will be utilized for the nodes).

*Task 3.2.2 – Demand Allocation*

CDM will utilize the meter billing data to allocate average day reclaimed water demands to each of the nodes. This will involve creating the nodal zones of influence (NZIs) and assigning parcel-level reclaimed water demand to each node. Any un-allocated reclaimed water demand will be globally applied throughout the system, unless otherwise directed by the City. These allocations will be coupled with the diurnal flow patterns to yield max-day and peak hour demands.

*Task 3.2.3 – Development of Diurnal Patterns*

The flow and pressure data will be correlated to develop diurnal patterns for two separate demand types: Golf course irrigation and domestic irrigation. These diurnal patterns will be in one-hour increments for a full day. Flow recorders will be rented by CDM and placed on the meters for the two golf courses in the Conserv I service area. The flow recorders will gather flow data in 15-minute increments for 1-week at each of the two golf courses (Eagle Creek Golf Course and Lake Nona Golf Course). The City of Orlando Reclaimed Water Division staff will be utilized to help locate the meters and gain access for installation and removal of the devices. CDM will download the flow data from the data recorders and develop the diurnal patterns for the golf course demands. The domestic irrigation factors will be based upon flow data from the WRFs, subtracting the flow utilized by the golf courses.

## Task 3.3 – Model Calibration

CDM will calibrate the hydraulic model by correlating the model to field tests. Each pipe will initially be given a Hazen-Williams C-factor of 130 in the model. This value will be modified based upon the flow tests to a maximum of 140 and a minimum of

70. The goal is to have the model pressures and flows resemble the field test pressures and flows within ±5 psi.

The flow testing performed in the field will initially involve installing pressure loggers at four blow-offs throughout the southeast service area. A flow test will involve flowing water through a blow-off with a pitot gauge to record the pressure and derive the flow at the blow-off. The time of the flow test will be recorded. The pressures at each of the loggers and the flow and pressure from the Conserv I WRF will be utilized to calibrate the model. This type of flow-test will be performed at eight locations throughout the Conserv I reclaimed water service area. The pressure recorders will be rented by CDM. These will remain in place for one week gathering data in 15 minute increments.

If the blow-off locations are not conducive to flowing or gathering a representative sample for calibrating, then flowing larger reclaimed meters will be necessary. The customers will have to have their accounts credited the amount flowed (by the City) with the customer, meter number, and flow utilized for the test to be provided by CDM.

## Task 3.4 – Hydraulic Model Development Report

CDM will summarize the data, analyses, and model development reflecting work completed under Tasks 3.1-3.3, in a report. Five copies of the draft report, including all appendices, will be submitted to the City for review and comment. The City will prepare a single, consolidated matrix of comments to be addressed by CDM. CDM will supply responses to each comment submitted by the City along with five copies of the final edition of the report incorporating these comments.

**Exhibit II, Page 1 of 2**
**Eastern Regional Reclaimed Water Distribution System Amendment X**
**Summary By Task**

| Task | Description | Cost | |
|---|---|---|---|
| 1.0 | ERRWDS Supplemental Well Facilities | $ | 24,520 |
| 2.0 | Tradeport Hangars Fire Pump Design | $ | 81,730 |
| 3.0 | ERRWDS Hydraulic Model Update | $ | 99,271 |
| | **Total Amendment Amount** | **$** | **205,521** |

**Exhibit II**
**Eastern Regional Reclaimed Water Distribution System Amendment X**
**Fee Estimate**

| Task | Description | Officer $ 60 /hr Hrs | Officer Raw Labor | Project Manager $ 38 /hr Hrs | Project Manager Raw Labor | Senior Engineer $ 34 /hr Hrs | Senior Engineer Raw Labor | Project Engineer $ 27 /hr Hrs | Project Engineer Raw Labor | Junior Engineer $ 23 /hr Hrs | Junior Engineer Raw Labor | Designer $ 50 /hr Hrs | Designer Raw Labor | Drafting/ACAD $ 21 /hr Hrs | Drafting/ACAD Raw Labor | Clerical $ 16 /hr Hrs | Clerical Raw Labor | Total Hours | Raw Labor | Labor Cost | ODCs | Buchheit WBE | Antillian MBE | Total Subs | Subs * 10% | Total Cost |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **1.0** | **ERRWDS Supplemental Well Facilities** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1.1 | Additional SFWMD Coordination | 36 | $ 2,160 | 12 | $ 456 | 84 | $ 2,856 | 0 | $ - | 0 | $ - | 24 | $ 1,200 | 0 | $ - | 4 | $ 64 | 160 | $ 6,736 | $ 20,208 | $ 1,010 | | | $ - | $ - | $ 21,218 |
| 1.2 | Easterly Wetlands Testing | 4 | $ 240 | 2 | $ 76 | 12 | $ 408 | 12 | $ 324 | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - | 30 | $ 1,048 | $ 3,144 | $ 157 | | | $ - | $ - | $ 3,301 |
| **2.0** | **Tradeport Hangars Fire Pump Design** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.1 | Final Design Services | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2.1.1 | Survey and Geotechnical Services | 0 | $ - | 2 | $ 76 | 2 | $ 68 | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - | 2 | $ 32 | 6 | $ 176 | $ 528 | $ 26 | $ 39,840 | $ 8,040 | $ 47,880 | $ 4,788 | $ 53,222 |
| 2.1.2 | Pipeline Design | 4 | $ 240 | 8 | $ 304 | 32 | $ 1,088 | 20 | $ 540 | 0 | $ - | 40 | $ 2,000 | 80 | $ 1,680 | 4 | $ 64 | 188 | $ 5,916 | $ 17,748 | $ 887 | | | $ - | $ - | $ 18,635 |
| 2.1.3 | Pump Station Alternate Design | 4 | $ 240 | 8 | $ 304 | 40 | $ 1,360 | 10 | $ 270 | 0 | $ - | 4 | $ 200 | 0 | $ - | 4 | $ 64 | 70 | $ 2,438 | $ 7,314 | $ 366 | | | $ - | $ - | $ 7,680 |
| 2.1.4 | Coordination Meetings with GOAA | 0 | $ - | 4 | $ 152 | 16 | $ 544 | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - | 0 | $ - | 20 | $ 696 | $ 2,088 | $ 104 | | | $ - | $ - | $ 2,192 |
| **3.0** | **ERRWDS Hydraulic Model Update** | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.1 | Data Collection and Analysis | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.1.1 | Data Collection | 0 | $ - | 4 | $ 152 | 40 | $ 1,360 | 0 | $ - | 0 | $ - | 8 | $ 400 | | $ - | 4 | $ 64 | 56 | $ 1,976 | $ 5,928 | $ 296 | | | $ - | $ - | $ 6,224 |
| 3.1.2 | Data Clean-up and Analysis | 0 | $ - | 4 | $ 152 | 48 | $ 1,632 | 20 | $ 540 | 0 | $ - | 24 | $ 1,200 | | $ - | 0 | $ - | 96 | $ 3,524 | $ 10,572 | $ 529 | | | $ - | $ - | $ 11,101 |
| 3.2 | Model Development | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.2.1 | Network Components | 0 | $ - | 8 | $ 304 | 100 | $ 3,400 | 12 | $ 324 | 0 | $ - | 4 | $ 200 | | $ - | 4 | $ 64 | 128 | $ 4,292 | $ 12,876 | $ 644 | | | $ - | $ - | $ 13,520 |
| 3.2.2 | Demand Allocation | 4 | $ 240 | 8 | $ 304 | 72 | $ 2,448 | 24 | $ 648 | 0 | $ - | 2 | $ 100 | | $ - | 0 | $ - | 110 | $ 3,740 | $ 11,220 | $ 561 | | | $ - | $ - | $ 11,781 |
| 3.2.3 | Development of Diurnal Patterns | 0 | $ - | 8 | $ 304 | 80 | $ 2,720 | 20 | $ 540 | 0 | $ - | 2 | $ 100 | | $ - | 0 | $ - | 110 | $ 3,664 | $ 10,992 | $ 550 | | | $ - | $ - | $ 11,542 |
| 3.3 | Model Calibration | 4 | $ 240 | 12 | $ 456 | 120 | $ 4,080 | 24 | $ 648 | 0 | $ - | 8 | $ 400 | | $ - | 4 | $ 64 | 172 | $ 5,888 | $ 17,664 | $ 883 | | | $ - | $ - | $ 18,547 |
| 3.4 | Hydraulic Model Development Report | 8 | $ 480 | 32 | $ 1,216 | 60 | $ 2,040 | 32 | $ 864 | 0 | $ - | 8 | $ 400 | | $ - | 16 | $ 256 | 156 | $ 5,256 | $ 15,768 | $ 788 | | | $ - | $ - | $ 16,556 |
| | **Equipment Rental for Calibration/Testing** | | | | | | | | | | | | | | | | | | | | $ 10,000 | | | | | $ 10,000 |
| | **Subtotal** | **64** | **$ 3,840** | **112** | **$ 4,256** | **706** | **$ 24,004** | **174** | **$ 4,698** | **0** | **$ -** | **124** | **$ 6,200** | **80** | **$ 1,680** | **42** | **$ 1,932** | **1302** | **$ 45,350** | **$ 136,050** | **$ 16,803** | **$ 39,840** | **$ 8,040** | **$ 47,880** | **$ 4,788** | **$ 205,521** |
| | **Total Amount** | | | | | | | | | | | | | | | | | | | | | | | | | **$ 205,521** |
| | | | | | | | | | | | | | | | | | | | | | | 19.38% | 3.91% | | | |

Labor Multiplier 3.00
ODC Multiplier 5.00%

MBE 3.91%
WBE 19.38%

**Buchheit Associates, Inc. Surveyors & Mappers Fee Estimate**
**October 20, 2009**
**EASTERN REGIONAL RECLAIMED WATER DISTRIBUTION SYSTEM**
**FIRE PUMPS/TRADEPORT**
**CITY OF ORLANDO**

| TASK | Proj. Mgr. | | Proj. Surv. | | Field Crew | | Technician | | Expenses | Subtotal |
|---|---|---|---|---|---|---|---|---|---|---|
| | hours | rate | hours | rate | hours | rate | hours | rate | | Amount |
| Route Survey (Topography) | 16 | $ 85.00 | 60 | $ 75.00 | 96 | $ 100.00 | 36 | $ 55.00 | | $ 17,440.00 |
| Options forUtilities, if required. | | | | | | | | | | $ - |
| Utility Designations (Subconsultant) | | | | | 20 | $ 100.00 | 20 | $ 55.00 | $ 6,000.00 | $ 8,000.00 |
| Utility Location Vvh's 30 Max. (Subconsultant) | | | | | 24 | $ 100.00 | 20 | $ 55.00 | $ 12,000.00 | $ 14,400.00 |
| **Additional Survey Work** | | | | | | | | | | **$ 39,840.00** |

Scope of Services Summary:
Miscellaneous Surveying services for Route Survey for Tradeport Dr. Northbound from # 9809 to #8855 (Hangars previously surveyed).
Revise drawings to add new data.

Coordination with utility location subconsultant, if required.
Estimate includes allowance for utility locates. This is subject to change based on level of effort to be performed.

Prepared by:

*transmitted by email* 10/20/2009

Kimberly A. Buchheit, P.S.M. Date
Buchheit Associates, Inc. Surveyors & Mappers
427 CenterPointe Circle, Suite 1811
Altamonte Springs, FL 32701
Phone: 407-331-0505, ext. 102
Fax: 407-331-3266

Approved By:

Greg Taylor, P.E. Date
Camp Dresser & McKee, Inc.
2301 Maitland Center Parkway, Suite 300
Maitland, FL 32751
Phone (407) 660-2552, Fax (407) 875-1161

ANTILLIAN
ENGINEERING ASSOCIATES, INC.

August 25, 2009

CDM, Inc.
2301 Maitland Center Parkway, Suite 300
Maitland, Florida 32751

Attention: Gregory Taylor, P.E.

Reference: Proposal for Geotechnical Engineering Services
Tradeport Drive Fire Service Line and Booster Pump Station
Orlando, Florida

Dear Mr. Taylor:

Antillian Engineering Associates, Inc. is pleased to submit this proposal to provide geotechnical engineering services for the above-referenced project. The proposal was prepared in response to your e-mail request dated August 24, 2009.

**SCOPE OF SERVICES**

The City of Orlando is planning to install fire pumps and a fire service line for some of the airport hangars along Tradeport Drive. Two pump station sites have been selected; one at 8825 Tradeport Drive and the other at 9829 Tradeport Drive. Both sites are on the eastern side of this divided roadway. Each station will consist of three or four pumps and a diesel fuel storage tank, all supported on a cast-in-place concrete pad measuring about 20 feet by 30 feet in plan. The distance between pump stations was estimated by CDM to be about one mile. Our measurements indicated a distance of about 5,500 feet. We anticipate that the fire lines will be installed at modest depth by conventional cut-and-cover construction. It is our understanding that trenchless street crossing methods such as directional drilling, jack-and-bore or microtunneling are not anticipated.

We propose to conduct a geotechnical engineering investigation to support the design of this system. We understand that this work will be authorized as an addendum to our existing agreement for services related to the design of the Eastern Regional Reclaimed Water Distribution System Phase II. The overall scope of services would be separated into tasks as follows:

**Task 1 - Field Investigation** - Before commencing the drilling program, we would meet in the field with representatives of the appropriate utility companies, the Greater Orlando Aviation Authority and the City of Orlando Department of Environmental Services to confirm and mark the locations of any existing underground service facilities. Although the project area is along an urban roadway, we think an all-terrain vehicle (ATV) drill rig would be more appropriate because of the limited access, sloping terrain and vegetation in some parts of the alignment.

A single boring would be drilled to a depth of 15 feet at each of the two pump station locations selected by CDM. Based on a maximum spacing of 500 feet, we estimated that 14 borings would be drilled along the proposed fire line alignment. Each boring would be completed at a depth of ten feet below the existing ground surface. The Standard Penetration Test (SPT) with split-spoon sampling would be performed in accordance with ASTM D 1586. Tests would be conducted continuously from ground surface to a depth of ten feet and then at five-foot intervals to the indicated completion depths. Soils penetrated during the drilling operation would be logged in the field. Representative samples would be sealed in clean, airtight containers for transportation to our Orlando office. The groundwater level encountered at each boring location would be measured and recorded on the field logs. At the completion of the drilling program, the borings would be backfilled to the ground surface with soil. It is also our understanding that soil corrosion potential testing is not required.

**Task 2 - Laboratory Testing** - The recovered soil samples would be examined in our office by a geotechnical engineer to confirm the descriptions on the field logs and classify the soils visually. Laboratory testing would consist of 20 single-sieve soil gradation analyses, 2 Atterberg limits tests and 2 moisture content tests.

**Task 3 - Engineering Services** - We would perform the following services:

- review available information to develop a general understanding of the alignment and the proposed construction
- compile field and laboratory data with the available information to characterize the subsurface conditions
- evaluate the suitability of the encountered soils for the proposed construction
- recommend a bearing pressure value for shallow foundation design
- recommend a modulus of subgrade reaction for slab-on-grade design
- prepare a geotechnical engineering report

The report would contain a summary of available information, appropriate surface and subsurface characterizations, a summary of the laboratory test data and our recommendations for shallow foundation design, site preparation and other concerns as appropriate. The report would be sealed by a Professional Engineer registered in Florida.

## COMPENSATION FOR SERVICES

We propose to provide the described services for a not-to-exceed fee of $8,040.00. An itemized breakdown of the costs is attached as Appendix A. The fee represents our best estimate of the scope of services needed to satisfy the requirements of this project. Additional engineering services that may be requested or needed would be provided at the unit rates shown in the itemized estimate. We would not exceed the estimated fee without notifying you and receiving your authorization to do so.

## SCHEDULE

We can begin work on this project within a day of receiving your notification to proceed. The field and laboratory investigations should take about three weeks. The report should be submitted within three weeks after completing the laboratory testing.

## LIMITATIONS

The work on this project will be performed in accordance with accepted procedures for the practice of geotechnical engineering. The general conditions under which services will be provided for this project are attached as Appendix B. I will accept signed copies of the Work Authorization Form (attached as Appendix C) as your acceptance of the terms of service and your authorization to proceed. We will execute both copies and return one copy to you. Please call if you have any questions or if you require additional information.

Respectfully submitted,
**ANTILLIAN ENGINEERING ASSOCIATES, INC.**

Peter G. Suah, P.E.
Principal Engineer/President

Attachments: Appendix A - Budget Estimate
Appendix B - Terms and Conditions
Appendix C - Work Authorization Form

**APPENDIX A**
**FEE ESTIMATE**
**TRADEPORT DRIVE FIRE SYSTEM**
**ERRWDS PHASE II DESIGN**
**ORLANDO, FLORIDA**

08/25/2009

| WORK ITEM | UNITS | QTY | UNIT COST | TOTAL COST |
|---|---|---|---|---|
| **Task 1 - Field Investigation** | | | | |
| Crew & Equipment Mobilization, Truck Rig | each | 0 | $ 300.00 | $ 0.00 |
| Crew & Equipment Mobilization, ATV or Tripod Rig | each | 1 | $ 500.00 | $ 500.00 |
| SPT Borings, Pump Station, 2 to 15 feet each | LF | 30 | $ 9.00 | $ 270.00 |
| SPT Borings, Fire Service Lines, 14 to 10 feet each | LF | 140 | $ 9.00 | $ 1,260.00 |
| Tripod Rig | days | 0 | $ 1,500.00 | $ 0.00 |
| Drill Rig and Crew, movement between boreholes | hours | 4 | $ 130.00 | $ 520.00 |
| Project Manager, initial coordination/meetings | hours | 2 | $ 110.00 | $ 220.00 |
| Project Engineer, site recon./utility loc./field coordination | hours | 16 | $ 65.00 | $ 1,040.00 |
| Sr Engineering Technician, drilling supervision | hours | 10 | $ 45.00 | $ 450.00 |
| **Task 2 - Laboratory Testing** | | | | |
| Project Engineer, visual classification/stratification | hours | 2 | $ 65.00 | $ 130.00 |
| Single-sieve gradation analysis | each | 20 | $ 25.00 | $ 500.00 |
| Atterberg Limits | each | 2 | $ 75.00 | $ 150.00 |
| Moisture Content | each | 2 | $ 10.00 | $ 20.00 |
| Permeability tests with porosity evaluation | each | 0 | $ 120.00 | $ 0.00 |
| **Task 3 - Engineering Services** | | | | |
| Project Manager | each | 8 | $ 110.00 | $ 880.00 |
| Sr. Project Engineer | each | 0 | $ 85.00 | $ 0.00 |
| Project Engineer | each | 24 | $ 65.00 | $ 1,560.00 |
| CADD Operator | each | 12 | $ 45.00 | $ 540.00 |
| Clerical | each | 0 | $ 35.00 | $ 0.00 |
| **PROJECT TOTAL** | | | | **$ 8,040.00** |

# Exhibit III
# Eastern Regional Reclaimed Water Distribution System Service Authorization X
# Project Schedule

| Task | Description | 2009 | | | | 2010 | | | | | | | | | | | | 2011 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sep-09 | Oct-09 | Nov-09 | Dec-09 | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 | Nov-10 | Dec-10 | Jan-11 | Feb-11 | Mar-11 | Apr-11 |
| **1.0** | **ERRWDS Supplemental Well Facilities** | | | | | | | | | | | | | | | | | | | | |
| 1.1 | Additional SFWMD Coordination | | | | | | | | | | | | | | | | | | | | |
| 1.2 | Easterly Wetlands Testing | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| **2.0** | **Tradeport Hangars Fire Pump Design** | | | | | | | | | | | | | | | | | | | | |
| 2.1 | Final Design Services | | | | | | | | | | | | | | | | | | | | |
| 2.1.1 | Survey and Geotechnical Services | | | | | | | | | | | | | | | | | | | | |
| 2.1.2 | Pipeline Design | | | | | | | | | | | | | | | | | | | | |
| 2.1.3 | Pump Station Alternate Design | | | | | | | | | | | | | | | | | | | | |
| 2.1.4 | Coordination Meetings with GOAA | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| **3.0** | **ERRWDS Hydraulic Model Update** | | | | | | | | | | | | | | | | | | | | |
| 3.1 | Data Collection and Analysis | | | | | | | | | | | | | | | | | | | | |
| 3.1.1 | Data Collection | | | | | | | | | | | | | | | | | | | | |
| 3.1.2 | Data Clean-up and Analysis | | | | | | | | | | | | | | | | | | | | |
| 3.2 | Model Development | | | | | | | | | | | | | | | | | | | | |
| 3.2.1 | Network Components | | | | | | | | | | | | | | | | | | | | |
| 3.2.2 | Demand Allocation | | | | | | | | | | | | | | | | | | | | |
| 3.2.3 | Development of Diurnal Patterns | | | | | | | | | | | | | | | | | | | | |
| 3.3 | Model Calibration | | | | | | | | | | | | | | | | | | | | |
| 3.4 | Hydraulic Model Development Report | | | | | | | | | | | | | | | | | | | | |