

**PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY**

Meeting Date: March 13, 2018

**Consent [X]
Public Hearing []**

Regular []

Department: Water Utilities Department

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to approve: Consultant Services Authorization (CSA) No. 4 for the Water Treatment Plant 9 (WTP 9) Variable Frequency Drives and Grounding Improvements with Hillers Electrical Engineering, Inc., (R2017-0819) in the amount not to exceed \$139,256.56.

Summary: On June 20, 2017, the Board of County Commissioners (BCC) approved the Contract for Consulting/Professional Services Electrical Instrumentation and Telemetry Engineering Services (Contract) with Hillers Electrical Engineering, Inc. CSA No. 4 will provide for professional/engineering services related to the WTP 9 Variable Frequency Drives (VFD's) and Grounding Improvements (Project). CSA No. 4 provides for the design of eight (8) variable frequency drives on large pumps to improve energy efficiency. Grounding improvements and harmonic filters will be designed to improve safety and reduce motor maintenance. The Small Business Enterprise (SBE) participation goal established by the SBE Ordinance is 15% overall. The Contract with Hillers Electrical Engineering, Inc., provides for SBE participation of 100% overall. CSA No. 4 includes an overall SBE participation of 100%. The cumulative SBE participation including CSA No. 4 is 100% overall. Hillers Electrical Engineering, Inc., is headquartered in Palm Beach County. The Project is in the FY18 Capital Improvement Plan adopted by the BCC. (WUD Project No. 18-016) District 5 (MJ)

Background and Justification: WTP 9 serves the unincorporated Palm Beach County west of the City of Boca Raton. The Project will reduce energy consumption and improve operational efficiency by providing VFDs for three (3) membrane feed pumps, two (2) high service pumps and three (3) membrane concentrate pumps. VFD's produce harmonic distortion as they convert from 60 hertz alternating current (AC) to direct current (DC) and then back to a variable AC frequency which is used to control pump motor speeds. Harmonic filters will be installed for six (6) membrane feed pumps and eight (8) high service pumps to reduce harmonic distortion thereby protecting electrical equipment. Field investigations have determined that WTP 9 needs grounding improvements to reduce stray currents and improve safety which will be incorporated into the project. CSA No. 4 provides for professional engineering services to design, permit and bid the VFD and Grounding Improvements.

Attachments:

1. Four (4) Originals of CSA No. 4
2. Location Map
3. Proof of Insurance from Insurance Tracking Service (ITS)

Recommended By: Jim Stiles 2-7-18
Department Director Date

Approved By: [Signature] 2/22/18
Deputy County Administrator Date

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2018	2019	2020	2021	2022
Capital Expenditures	<u>\$139,257</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
External Revenues	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Program Income (County)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
In-Kind Match County	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
NET FISCAL IMPACT	<u>\$139,257</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
# ADDITIONAL FTE POSITIONS (Cumulative)	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>

Budget Account No.: Fund 4011 Dept 721 Unit W005 Object 6541

Is Item Included in Current Budget? Yes X No

Does this item include the use of federal funds? Yes No X

Reporting Category N/A

B. Recommended Sources of Funds/Summary of Fiscal Impact:

One (1) time expenditure from user fees, connection fees and balance brought forward.



C. Department Fiscal Review: _____

III. REVIEW COMMENTS

A. OFMB Fiscal and/or Contract Development and Control Comments:

[Signature] 2/14/18
OFMB

[Signature] 2/20/18
Contract Development and Control

B. Legal Sufficiency:

[Signature] 2/22/18
Assistant County Attorney

C. Other Department Review:

Department Director

CONSULTANT SERVICES AUTHORIZATION NO. 4

Project Title: Water Treatment Plant 9 Variable Frequency Drives and Grounding Improvements

Project No. WUD 18-016

Budget Line Item No. 4011-721-W005-6541

District No.: 5

THIS AUTHORIZATION No. 4 to the Contract for Consulting/Professional Services dated June 20, 2017 (R2017-0819), by and between Palm Beach County and the Consultant identified herein, is for the Consultant Services described in Item 3 of this Authorization. The Contract with Hillers Electrical Engineering, Inc. provides for 100.00% SBE participation overall. This Consultant Services Authorization includes 100.00% SBE participation. The cumulative SBE participation, including this authorization is 100.00% overall. Additional authorizations will be utilized to meet or exceed the stated overall participation goal.

1. CONSULTANT: Hillers Electrical Engineering, Inc. (HEE)

2. ADDRESS: 23257 State Rd 7, Suite 100, Boca Raton, FL 33428

3. Description of Services to be provided by the Consultant:

HEE will study/analyze the harmonics caused by the increased use of Variable Frequency Drives (VFDs) and design harmonic mitigation devices using harmonic filters applied to existing (but not installed) VFDs. The grounding in all electrical rooms needs to be upgraded to properly ground the harmonics.

See ATTACHMENT A.

4. Services completed by the Consultant to date (Summary and Status of Authorizations):

See ATTACHMENT E.

5. Consultant shall begin work upon receipt of Notice to Proceed correspondence.

6. The compensation to be paid to the Consultant for providing the requested services shall be:

A. Computation of time charges plus expenses, not to exceed: \$ 139,256.56

B. Fixed price of: \$ 0

7. This Authorization may be terminated by the County without cause or prior notice. In the event of termination not the fault of the Consultant, the Consultant shall be compensated for all services performed through the date of termination, together with reimbursable expenses (if applicable) then due.

Project Title: Water Treatment Plant 9 Variable Frequency Drives and Grounding Improvements

- 8. SBE participation is included in Attachment D under this Authorization. The attached Schedule 1 defines the SBE applied to this Authorization and Schedule 2 establishes the SBE contribution from each subconsultant (Letter of Intent to perform as an SBE).
- 9. EXCEPT AS HEREBY AMENDED, CHANGED OR MODIFIED, all other terms, conditions and obligations of the Contract dated June 20, 2017 remain in full force and effect

IN WITNESS WHEREOF, this Authorization is accepted, subject to the terms, conditions and obligations of the aforementioned Contract.

PALM BEACH COUNTY, A POLITICAL SUBDIVISION OF THE STATE OF FLORIDA

Sharon R. Bock, Clerk & Comptroller,
Palm Beach County

Palm Beach County,
Board of County Commissioners

ATTEST:

Signed: _____

Signed: _____
Melissa McKinlay, Mayor *JCS*

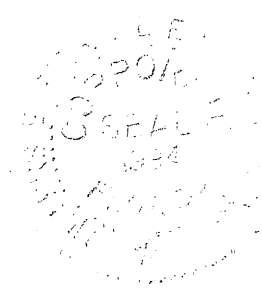
Typed Name: _____
Deputy Clerk

_____ Date

Approved as to Form and Legal Sufficiency

Signed: _____

Typed Name: _____
County Attorney



CONSULTANT:

Hillers Electrical Engineering, Inc

[Handwritten Signature]

(Signature)

Paul Hillers, President

(Name and Title)

1/8/18

Date

LIST OF ATTACHMENTS

Project No. WUD 18-016

Consultant Services Authorization No. 4

Project Title: Water Treatment Plant 9 Variable Frequency Drives and Grounding Improvements

ATTACHMENT - A	Scope of Work
ATTACHMENT - B	Budget Summary
ATTACHMENT - C	Project Schedule
ATTACHMENT - D	SBE Schedule 1, 2, 3a and 4
ATTACHMENT - E	Authorization Status Report - Summary and Status of Authorizations
ATTACHMENT - F	Authorization Status Report – Summary of SBE Tracking
ATTACHMENT - G	Location Map

ATTACHMENT - A

CONSULTANT SERVICE AUTHORIZATION NO. 4

PALM BEACH COUNTY WATER UTILITIES DEPARTMENT ENGINEERING/PROFESSIONAL SERVICES

SCOPE OF WORK FOR

Water Treatment Plant 9 Variable Frequency Drives and Grounding Improvements

INTRODUCTION

Palm Beach County (COUNTY) entered into an agreement entitled Contract for Engineering/ Professional Services - Palm Beach County Utilities Department Project No. WUD 17-006 (CONTRACT) with Hillers Electrical Engineering, Inc. (CONSULTANT) to provide engineering services for various general activities (Reference Document R2017-0819). This Consultant Service Authorization will be performed under that CONTRACT.

BACKGROUND

Variable frequency drives (VFD's) are used to increase pumping efficiency and eliminate throttling of valves to maintain pumps within desired operating parameters. The VFD's produce more heat than soft start devices. VFD's also produce harmonic distortion in the electrical systems as they convert from 60 hertz alternating current (AC) to direct current (DC) and then back to a variable AC frequency which is used to control pump motor speeds.

The existing constant speed membrane feed pumps and high service pumps are being converted from constant speed to VFD's. In this project the remaining constant speed pumps which are the membrane feed pumps 2, 4 and 5, high service pumps 7 and 8, as well as, concentrate booster pumps 1, 2 and 3 are all being equipped with VFD's. The VFD's are Owner furnished and are to be installed in this project. Due to the increase in harmonics, harmonic mitigation will be required as well as a new ground grid in all applicable electrical rooms.

Insulated Gate Bi-Polar Transistors (IGBT) switch the DC voltage in VFD's to a variable frequency AC voltage. This switching can create ground currents. Due to the advancements in Insulated Gate Bi-Polar Transistors fast switching technology over the last two decades, we will design new cables from the VFD's to each motor. This will assist in minimizing the ground currents which can cause motor bearing damage.

It will be assumed that the HVAC in the main electrical room is sufficient, but that the HVAC in the maintenance electrical room needs to be upgraded. The upgrade to the HVAC systems will be done by Palm Beach County Facilities Capital Improvements Division (CID) and this CSA includes two (2) coordination meetings with CID.

The Chlorine Building is currently connected to the 9 South Regional Pump Station. This project will connect the Chlorine Building to the Main WTP 9 Switchgear. This will minimize disruption to the chlorine pumps, scale inhibitor system and sand strainer which are connected to the Chlorine Building.

SCOPE OF SERVICES

CONSULTANT shall perform the engineering Scope of Services as described herein.

The design of the harmonic mitigation, grounding improvements and new VFD motor cables to all high service pumps, membrane feed pumps and concentrate booster pumps, and connection of the Chlorine Building to the Main WTP 9 Switchgear will be performed as follows:

Task 1 – Conceptual Design Study:

- 1.1. Model the amount of harmonics created by the VFD's and how to mitigate the bulk of the harmonics. Provide harmonics mitigation method in the study.
- 1.2. Determine how to substantially improve the grounding by adding an above-grade grounding grid in all electrical rooms with VFD's present. This would include the main electrical room and the maintenance electrical room.
- 1.3. Study the feasibility of replacing motor cables with VFD rated cables for all high service pumps, membrane feed pumps and concentrate booster pumps.
- 1.4. Investigate the methods to connect the Chlorine Building to the WTP 9 Main Switchgear and the cable routing. The power for the new I/O rack for the permeate flush and cleaning system will also be considered in the study.
- 1.5. Provide study in electronic format (Adobe PDF) and attend review meeting with the Owner and response to the Owner's comments.
- 1.6. Coordinate with CID the HVAC heat loads from the electrical equipment. Attend one meeting with CID.

Task 2 – Design and Permitting Services:

- 2.1 Produce a 60% design level electrical, instrumentation & control set of plans and specifications with cost estimate
- 2.1A Attend a 60% design level review meeting at the County and respond in writing to County's written review comments
- 2.2 Produce a 90% design level electrical, instrumentation & control set of plans and specifications with cost estimate
- 2.2A Attend a 90% design level review meeting at the County and respond in writing to County's written review comments
- 2.3 Incorporate County comments and produce three (3) 100% set of signed and sealed drawings for the Palm Beach County Building Permit as well as for bidding purposes
- 2.4 Assist County with Permitting
- 2.5 Coordinate with CID new HVAC equipment power requirements and implement into the electrical design. Attend one meeting with CID.

Assumption: County will create the front end documents for bidding. Consultant will use Owners standard technical specifications and use track changes for the modifications. Consultant shall provide additional specifications sections as necessary which are not included in the Owner's standard technical specifications.

Task 3 – Bidding Services:

- 3.1 Attend pre-bid meeting, answer written questions and provide addendum as necessary

This project will be designed in accordance with the Palm Beach County Water Utilities Department Manual of Minimum Engineering Standards and Design Manual.

Rev. 5-27-15

COMPENSATION: Not-to-exceed: \$ 139,256.56

SBE PARTICIPATION

1. SCHEDULE 3(A) – Professional Services Activity Report

This form shall be submitted by the prime contractor with each payment application when SBE and/or M/WBE sub-consultants are utilized in the performance of the contract. This form shall contain the names of all SBE and M/WBE sub-consultants, specify the sub-consultants dollar amount for each sub-consultants and show amount drawn and payments to date issued to sub-consultants.

2. SCHEDULE 4 – SBE-M/WBE Payment Certification

A schedule 4 for each SBE and/or M/WBE sub-consultant shall be completed and signed by the proposed SBE and/or M/WBE after receipt of payment from the prime. When applicable, the prime shall submit this form with each application submitted to the county for payment to document payment issued to a sub-consultant in the performance of the contract.

SBE participation is included in the **ATTACHMENT F** under this authorization. The attached Schedule 1 defines the SBE applied to this CSA/Contract and Schedule 2 establishes the SBE contribution from each subcontractor (Letter of Intend to perform as an SBE).

ATTACHMENT B

Water Treatment Plant 9 Variable Frequency Drives and Grounding Improvements							
	Raw Rate	\$74.00	\$54.00	\$50.00	\$50.00	\$40.00	
	Multiplier	2.84	2.84	2.84	2.84	2.84	
		Proj. Mgr.	Prof. Eng.	Programmer	Lead Engineer	Cons. Coord.	Total
PHASE OF WORK		Hours	Hours	Hours	Hours	Hours	TOTAL TASK COST
Task 1 - Conceptual Design Study							
Task 1.1-1.5: Study and Analysis-Electrical		12	115		55		182 \$27,968.32
Task 1.6: HVAC Coordination		1	12				\$2,050.48
Task 2 - Design and Permitting Services							
Task 2.1: 60% Design - Electrical		21	119		55		195 \$30,473.20
Task 2.1: 60% Design - I&C		2	16		16		34 \$5,146.08
Task 2.1A: 60% Design Review - Electrical and I&C		2	17				19 \$3,027.44
Task 2.2: 90% Design - Electrical		20	122		56		198 \$30,865.12
Task 2.2: 90% Design - I&C		4	24		16		44 \$6,793.28
Task 2.2A: 90% Design Review - Electrical and I&C		2	17				19 \$3,027.44
Task 2.3: 100% Bid Ready Documents - Electrical		7	55		27		89 \$13,739.92
Task 2.3A: 100% Bid Ready Documents - I&C		2	12		12		26 \$3,964.64
Task 2.4: Permitting Assistance - Electrical and I&C		2	21				23 \$3,640.88
Task 2.5: HVAC/Electrical Design Implementation		2	16				18 \$2,874.08
Task 3: Bidding Services							
Task 3.1: Bidding Assistance - Electrical and I&C		2	26		9		37 \$5,685.68
	Total Hours	79	572		246		897
	Total Labor Cost	\$16,602.64	\$87,721.92		\$34,932.00		\$139,256.56

ATTACHMENT - C

PROJECT SCHEDULE

SCHEDULE

The completion dates for this work will be as follows (starting from CONSULTANT'S receipt of Notice-to-Proceed).

<i>Engineering Services</i>	<i>Completion Date From Notice to Proceed</i>	<i>Deliverables</i>
Conceptual Design Study	75 Calendar Days	4 copies of study
60% Design Drawings	165 Calendar Days	4 sets 11x17 plans and specs with cost estimate
90% Design Drawings	255 Calendar Days	4 sets 11x17 plans and specs with cost estimate
100% Bid Drawings	315 Calendar Days	2 sets of signed and sealed full-size plans and 1 set of signed and sealed 11" x 17" plans, CAD and PDF design files

*The project schedule assumes the County will submit comments within 15 calendar days.

ATTACHMENT D

SCHEDULE 1

LIST OF PROPOSED SBE-M/WBE CONSULTANT/SUBCONSULTANTS

WTP 9 Variable Frequency Drives and

PROJECT NAME: Grounding Improvements **PROJECT NO.:** WUD 18-016
NAME OF PRIME CONSULTANT: Hillers Electrical Engineering **ADDRESS:** 23257 State Road 7, Ste. 100 Boca Raton, FL 33428
CONTACT PERSON: Paul Hillers **PHONE NO.:** 561-451-9165 **FAX NO.:** 561-451-4886
DESCRIPTION OF SERVICES: Electrical Engineering Services

**PLEASE LIST THE DOLLAR AMOUNT AND PERCENTAGE OF WORK TO BE COMPLETED BY THE PRIME ON THIS PROJECT.
PLEASE ALSO LIST THE DOLLAR AMOUNT AND PERCENTAGE OF WORK TO BE COMPLETED BY ALL SUB-CONSULTANTS ON THIS
PROJECT. IDENTIFY ALL APPLICABLE CATEGORIES OF CONSULTANT/SUBCONSULTANTS**

Name, Address and Phone Number	(Check one or both Categories)		Consultant/Sub-consultant Dollar Amount and Percentage of Services				
	<u>M/WBE</u>	<u>SBE</u>					
	Minority Business	Small Business	Black	Hispanic	Women	Caucasian	Other (Please Specify)
1. Hillers Electrical Engineering, Inc. 23257 State Road 7, Suite 100 Boca Raton, FL 33428	<input type="checkbox"/>	<input checked="" type="checkbox"/>	_____	_____	_____	\$139,256.56	_____
2.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	_____
3.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	_____
4.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	_____
5.	<input type="checkbox"/>	<input type="checkbox"/>	_____	_____	_____	_____	_____
(Please use additional sheets if necessary)							
Total SBE-M/WBE Participation		Total	_____	_____	_____	\$139,256.56	_____
_____ 100 %							

NOTE: 1. The percentages listed on this form must be supported by the sub-consultant included on Schedule 2 in order to be counted toward goal attainment.
2. Firms may be certified by Palm Beach County as an SBE and/or M/WBE

**OSBA SCHEDULE 2
LETTER OF INTENT TO PERFORM AS AN SBE-M/WBE CONSULTANT/SUBCONSULTANT**

This document must be completed by ALL SBE-M/WBE's and submitted with this CSA. Specify in detail, the particular consulting services to be performed and the dollar amount and/or percentage for each services. SBE credit will only be given for services which the SBE-M/WBE's is certified to perform. Failure to properly complete Schedule 2 will result in your SBE participation not being counted.

WTP 9 Variable Frequency Drives

PROJECT NUMBER: WUD 18-016 PROJECT NAME: and Grounding Improvements

TO: Hillers Electrical Engineering, Inc.
(Name of Prime Consultant)

The undersigned is certified by Palm Beach County as a - (check one or more, as applicable):

Small Business Enterprise Minority Business Enterprise _____
Black _____ Hispanic _____ Women _____ Caucasian Other (Please Specify) _____

Date of Palm Beach County Certification: October 17, 2015

The undersigned is prepared to perform the following described consulting services in connection with the above project and will enter into a formal agreement for work with you, conditioned upon execution of a contract with Palm Beach County.

Additional Sheets May Be Used As Necessary

(Specify in detail the particular consulting services thereof to be performed)

Electrical Engineering Services

Total SBE-M/WBE Participation 100 %

If undersigned intends to sub-subcontract any portion of this job to a certified SBE-M/WBE or a non-SBE sub-consultant, please list the name of that sub-consultant and the amount below.

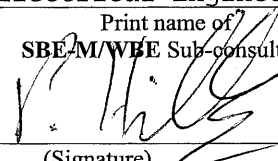
Price or Percentage _____
(Name of Sub-consultant)

The Prime Consultant affirms that it will monitor the SBE-M/WBE listed to ensure the SBE-M/WBE perform the services with their own work force. The undersigned SBE-M/WBE Prime or SBE-M/WBE sub-consultant affirms that it has the resources necessary to perform the work listed without subcontracting to a non-certified SBE or any other certified SBE sub-consultants except as noted above.

The undersigned sub-consultant understands that the provision of this form to the Prime Consultant does not prevent sub-consultant from providing quotations to other.

Hillers Electrical Engineering Inc.

Print name of
SBE-M/WBE Sub-consultant

By 
(Signature)

Paul Hillers, President
Print name/title of person executing on behalf
of SBE-M/WBE

Date: 1/8/2018

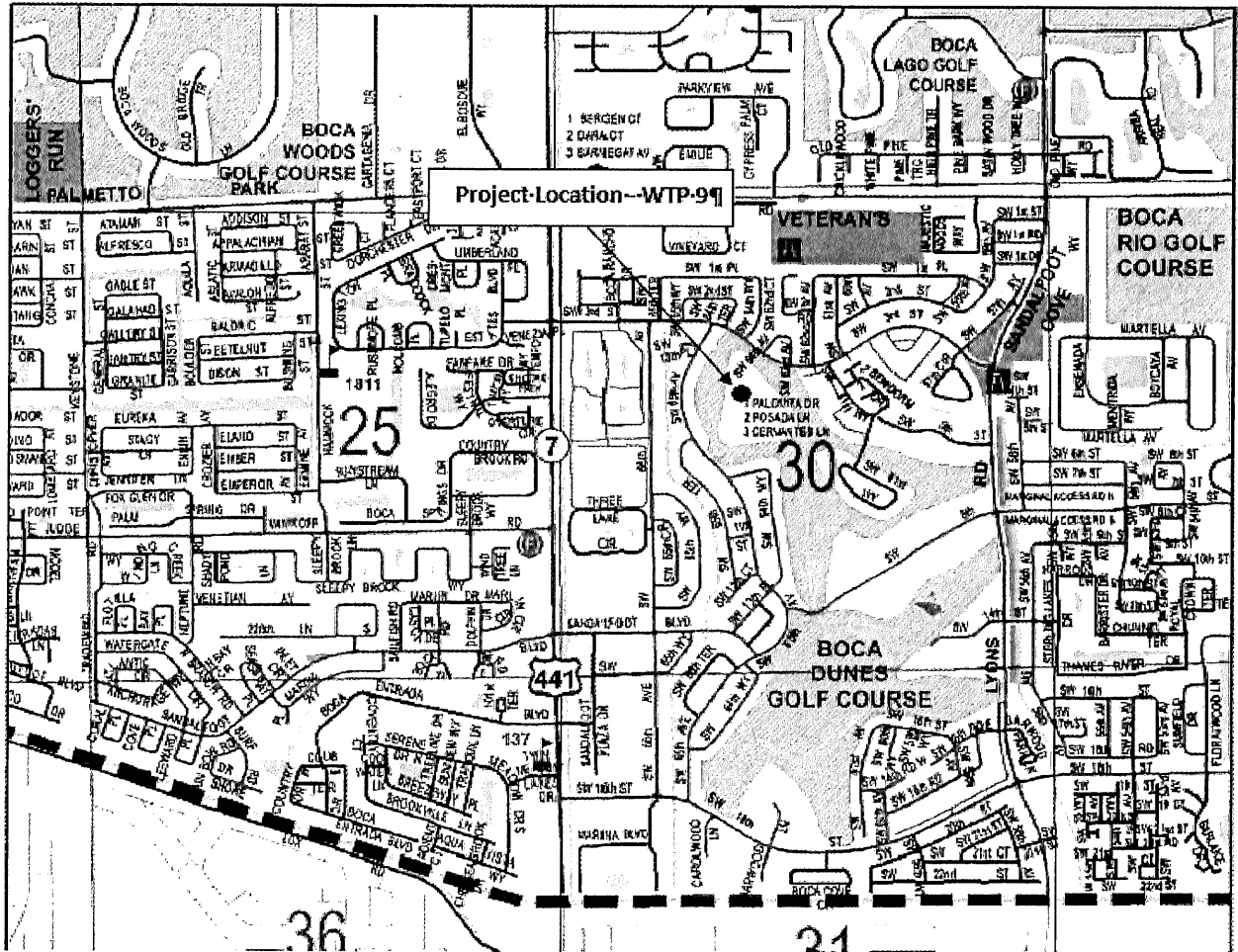
ATTACHMENT - F

AUTHORIZATION STATUS REPORT

SUMMARY OF SBE / MINORITY BUSINESS TRACKING

	Total	SBE
Current Proposal		
Value of Authorization No. 4	\$139,256.56	
Value of SBE Letters of Intent	\$139,256.56	\$139,256.56
Actual Percentage	100%	100%
Signed/Approved Authorizations		
Total Value of Authorizations	\$62,940.08	
Total Value of SBE Signed Subcontracts	\$62,940.08	\$62,940.08
Actual Percentage	100.00%	100.00%
Signed/Approved Authorizations Plus Current Proposal		
Total Value of Authorizations	\$202,196.64	
Total Value of Subcontracts & Letters of Intent	\$202,196.64	\$202,196.64
Actual Percentage	100.00%	100.00%
GOAL	100%	100%

ATTACHMENT G
LOCATION MAP

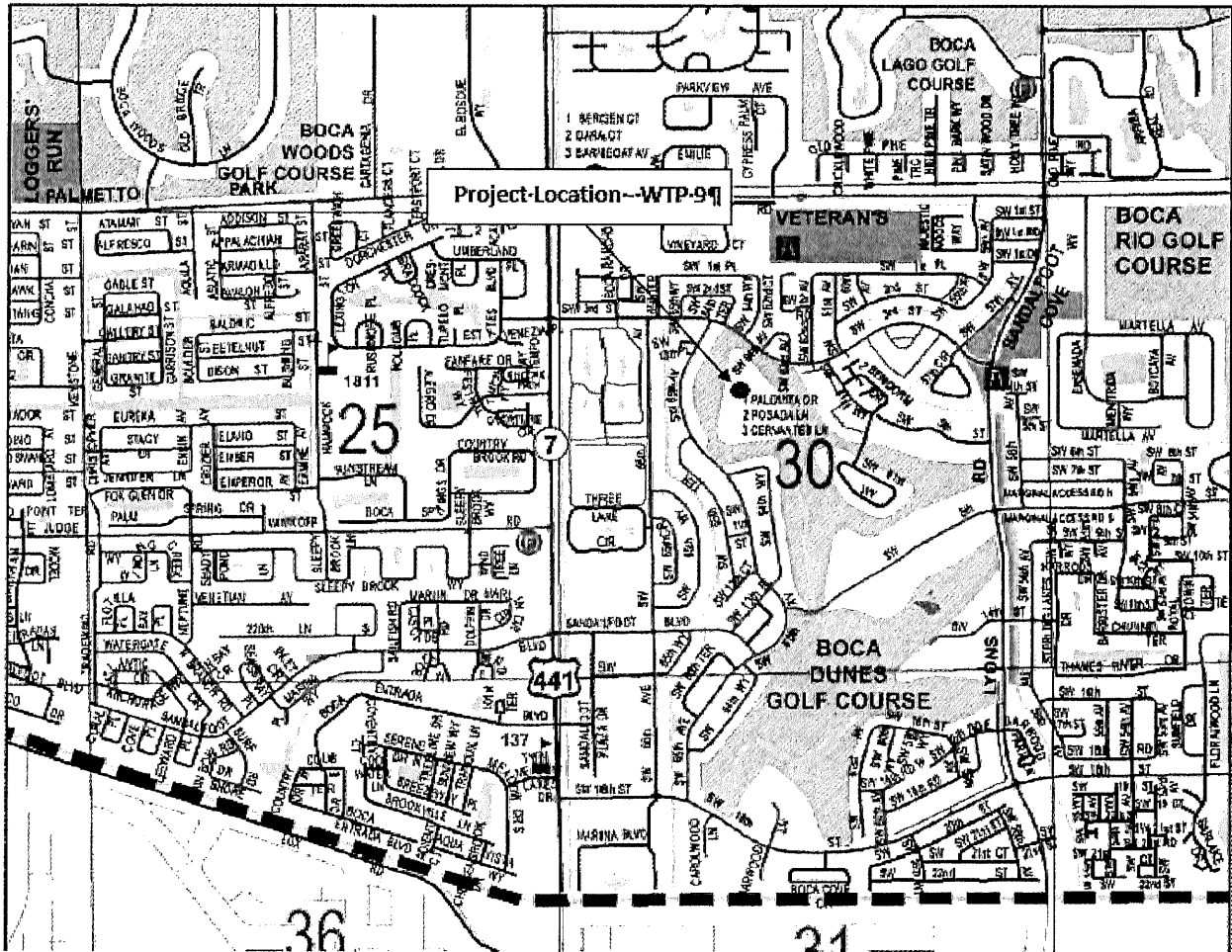


WATER TREATMENT PLANT NO. 9

PROJECT No. WUD 18-016

ATTACHMENT 2

LOCATION MAP



WATER TREATMENT PLANT NO. 9

PROJECT No. WUD 18-016

ATTACHMENT 3

Summary of Certificates

This report displays detailed Certificate of Insurance information for a selected Insured. Any items shown in red are deficient.

Wednesday, January 10, 2018

Insured: Hillers Electrical Engineering, Inc. Insured ID: 17-006-PBC_2

Status: Compliant

ITS Account Number: PLC2684

Project(s): Palm Beach County - Water Utilities

Insurance Policy	Required	Provided	Override
<u>General Liability</u>			
Expiration: 5/12/2018			
General Aggregate:	\$500,000	\$2,000,000	
Products - Completed Operations Aggregate:	\$0	\$0	
Personal And Advertising Injury:	\$0	\$0	
Each Occurrence:	\$500,000	\$1,000,000	
Fire Damage:	\$0	\$0	
Medical Expense:	\$0	\$0	
<u>Automobile Liability</u>	All Owned Autos	not provided	X
Expiration: 5/9/2018	Hired Autos	Hired Autos	
	Non-Owned Autos	Non-Owned Autos	
Combined Single Limit:	\$500,000	\$1,000,000	
<u>Workers Compensation/Employers Liability</u>	WC Stat. Limits	WC Stat. Limits	
Expiration: 5/12/2018			
<u>Professional Liability</u>			
Expiration: 5/12/2018			
Each Occurrence:	\$3,000,000	\$3,000,000	
Aggregate Limit:	\$3,000,000	\$3,000,000	

Notifications

There were no deficiency letters issued.

Do you have an updated Certificate? Click the button below to submit a Certificate.