

City of Hallandale Beach Public Works
Attn: Aqeel Abdool-Ghany, P.E.
Assistant City Engineer
City of Hallandale Beach
630 NW 2nd Street
Hallandale Beach, FL 33009
Ph: 954-457-1616

Arcadis U.S., Inc.
1000 NW 57th Ct.
Suite 770
Miami, FL 33126
Phone: 786 384 7012

www.arcadis.com

Subject:

WATER

Scope of Services – Telemetry System Engineering Services

City of Hallandale Beach Public Works

Dear Mr. Abdool-Ghany,

Date:

May 14, 2021

In accordance with Resolution No. 2020-054, RFP #FY 2018-2019-012 Continuing Professional Architectural and Engineering Services and Other Services, the following scope of services is provided by Arcadis U.S., Inc. (CONSULTANT) as requested by the City of Hallandale Beach (CITY) to provide Water Resources, Stormwater Design, and Wastewater Engineering.

Contact:

Dan Garcia, PE

Phone:

786.332.9494

Email:

daniel.i.garcia@arcadis.com

Florida License Numbers

Engineering

7917

Geology

GB564

Surveying

LB7062

1. Background & Project Objectives

The CITY owns and operates twenty-six (26) remote sites that comprise of water, wastewater, and storm water facilities. These are unmanned facilities monitored and controlled remotely from the CITY's water treatment plant, using radio telemetry system. The water system consists of three (3) wells with raw water pumps and one (1) elevated tank. The wastewater system consists of fifteen (15) lift stations in the collection system. The storm water management system consists of seven (7) remote sites that include pump stations and gate structures. The remote telemetry system consists of a Supervisory Control and Data Acquisition (SCADA) system located at the water treatment plant and Remote Telemetry Units (RTU) with radios at each remote site. The SCADA system has redundant servers (primary and backup) and runs Human Machine Interface (HMI) software manufactured by VTScada. The RTUs at the majority of the remote sites are by Data Flow System (DFS) that use TAC II radios. A few of the recently-upgraded remote sites use MicoLogix 1400 Programmable Logic Controllers (PLC) manufactured by Allen-Bradley. The RTUs and PLCs contain control logic to monitor and control equipment at the sites remotely from the water plant and locally at the remote sites if communication fails.

The existing control panels at the remote sites, except recently-upgraded sites, and the telemetry system hardware are old and do not provide all monitoring and control functions of a modern system. With aging infrastructure, tighter operating budgets, more stringent environmental regulations, and natural resources that are increasingly stressed, the additional monitoring and control functions offered by more modern systems are vital for treating, conveying, and then collecting water safely and reliably while staying within the limited operating and maintenance budgets. With this goal in mind, the CITY has identified the need to modernize, upgrade, and improve the reliability and functionality of its water, stormwater, and wastewater controls and telemetry systems. The CITY has requested that the CONSULTANT provide professional services to design and implement a modern control and telemetry system to replace the existing system at the remote sites.

The intent of this Scope of Services is to outline the professional engineering services required to perform design, inspection, PLC programming, HMI configuration, and startup services for the twenty (20) remote sites and the SCADA at the water treatment plant. The professional engineering services provided by the CONSULTANT for this project is provided in the sections below and include design, development of bid documents, bid assistance, and inspection during construction and startup.

It should be noted that the scope of work and fee provided below are prepared based on the assumption that the CONSULTANT will be performing the required PLC programming, as well as the OIT HMI and SCADA HMI configuration for this project during the construction phase, as part of a separate future project. These activities are not included within this scope of work or fee. If CONSULTANT does not perform PLC programming, as well as the OIT HMI and SCADA HMI configuration, additional tasks that are not covered in the scope of work and budget will need to be added.

2. Scope of Work

The CONSULTANT shall furnish professional engineering services for design and develop bid documents for replacing the existing control and telemetry systems at the twenty (20) remote sites, required modifications at the water treatment plant SCADA system, assistance during bid phase, and provide engineering support during construction. A list of remote sites can be referenced in Attachment 1. Requested professional engineering services will include electrical, instrumentation and control systems (I&C) and cellular communication system design, inspection, and startup services.

The CITY will provide the CONSULTANT with any available documentation required to adequately perform the scope of work. The CITY will provide the CONSULTANT with access to remote sites and the water treatment plant for assessing field conditions and collecting pertinent information for developing detailed design documents.

Project Management efforts will include project staffing, budget, and schedule management. The services will cover general project management throughout the project duration to include oversight and coordination of the CONSULTANT's efforts in executing the project internally and with the CITY. The Project Management activities are included within the tasks presented below and their associated proposed fee.

2.1 Design

2.1.1 Kick-off Meeting

The CONSULTANT shall lead a project kick-off meeting with the CITY to provide all parties with an overview of the project scope and objectives as well as enable the project activities to be well coordinated from the very beginning of the project. The objectives of the kick-off meeting are to:

- Develop understanding of project objectives.
- Establish project roles.
- Review preliminary project schedule, including establishing key project meetings.
- Identify critical sites.
- Establish a cutover sequence and order for remote site construction.
- Identify key project stakeholder, both internal and external to the CITY Public Works Department
- Define communication protocols between the CITY and the CONSULTANT and any other external stakeholders.

Deliverables

- Meeting agenda and materials.

2.1.2 Site Survey

The CONSULTANT shall visit the remote sites to investigate current conditions and to collect information required for detailed design. The CONSULTANT shall request and review existing documents available to the CONSULTANT prior to conducting site visits and validate the accuracy of the documents before they are used for developing new system design. The information collected will be used for developing detailed design, establishing construction and cutover sequence, order, and shutdowns and/or bypass pumping requirements.

Deliverables

- Site survey report documenting condition assessment and other findings of site survey (two hard copies and one electronic "PDF" file).

2.1.2 Design Documents (70%)

The CONSULTANT shall develop detailed specifications and design drawings, which will include a site plan showing location of existing control panels, RTU panels, field instruments and existing electrical conduits at the remote sites identified under this scope. The table in Attachment 1 shows specific design elements to be included in each remote site design. These design documents will include:

- Electrical schematics showing control logic in new pump control panels.
- PLC hardware layout and Input and Output wiring drawings.
- Specifications describing requirements of panels coated with white-colored paint and sun shields.
- Control panel and RTU panel layout drawings.

- Drawings showing removing existing control panels from the dry pits and demolishing them where necessary.
- Drawings showing design details to raise the control and RTU panels above 100-year flood level in accordance with FEMA guidelines.
- Demolition details.

Deliverables

- 70% design documents (two hard copies and one electronic "PDF" file).
- 70% technical specifications (two hard copies and one electronic "PDF" file).

2.1.3 Design Review (70%)

The CONSULTANT shall submit 70% level design documents to the CITY for review and approval. The CONSULTANT shall conduct a 70% design review meeting with the CITY and present design details and receive review comments from the CITY. Part of the design review meeting will be used to discuss and finalize staging, sequence, specific cutover requirements, construction duration, and construction schedule. The CONSULTANT shall incorporate 70% review comments received from the CITY into the 100% design.

Deliverables

- Meeting agenda and materials.

2.1.4 Design Documents (100%)

The CONSULTANT shall develop 100% design documents that include detailed specification and design drawings. The CONSULTANT shall submit 100% design documents to the CITY for review and approval. In addition to the drawings identified in Task 2.1.2, the 100% design documents will include the following:

- Panel and field instruments installation details drawings.
- Cellular modem installation details.
- Bill of materials.
- Drawings showing design details of field instrument installation.
- Input and Output list.
- Data sheet for field instruments.
- Factory acceptance testing of control panels jointly with the CITY, CONSULTANT, and Contractor.
- Startup, testing, and commissioning requirements.
- System operational demonstration requirements and duration for acceptance of the system by the CITY.

Deliverables

- 100% design documents (two hard copies and one electronic "PDF" file).
- 100% technical specifications (two hard copies and one electronic "PDF" file).

2.1.5 Design Review (100%) & Bid Documents

The CONSULTANT shall conduct a 100% design review meeting with the CITY and go over design details and receive review comments from the CITY. Part of the design review meeting will be used to discuss and finalize bid advertisement date, pre-bid meeting (if necessary) date, bid opening date, construction duration, and construction schedule. The CONSULTANT shall incorporate 100% review comments received from the CITY into the 100% design. After all review comments are incorporated, the bid-ready documents will be submitted to the CITY for final review and advertisement by the CITY's purchasing department.

Deliverables

- Meeting agenda and materials.
- Bid design documents and technical specifications (two hard copies and one electronic "PDF" file).

2.2 Bidding Support

The CONSULTANT shall assist the CITY during bidding as follows:

- Supporting the CITY in the development of the bid advertisement.
- Participating in one (1) pre-bid meeting.
- Supporting response to Request for Information from prospective bidders to be included in one (1) addendum.
- Evaluating bids and recommending the bidder who meets all requirements and criteria.

Deliverables

- Bid advertisement, pre-bid meeting record, addendum, and bid evaluation and recommendation (to be submitted electronically).

2.3 Services During Construction

Upon Contract Award, the CONSULTANT shall coordinate with the CITY and perform the following services:

1. Schedule and conduct a pre-construction meeting with the Contractor. The CONSULTANT shall prepare the meeting record, distribute it to all meeting attendees, and file it for record keeping.
2. Attend up to nine (9) project progress meetings. The CONSULTANT shall prepare the meeting record, distribute it to all meeting attendees, and file it for record keeping.
3. Review and approve Contractor's applications for payment and send the invoice to the CITY's project manager with a recommendation letter for payment to the Contractor. Up to nine (9) applications are assumed for review.
4. Review shop drawing submittals and approve them for fabrication and/or construction. CONSULTANT will review and approve record drawings.
5. Provide up to ten (10) construction site visits to verify Contractor work meets the specified requirements, work is progressing in accordance with the construction schedule and assist the CITY in resolving construction-related issues. The ten site visits include one (1) walkthrough with CITY and Contractor to determine

substantial completion of the project and one (1) walkthrough with CITY and Contractor for final acceptance of the project.

6. Attend on-site factory acceptance test of selected control panels.
7. Assist the CITY on startup and commissioning of the system at each remote site and at the water treatment plant.
8. Provide required information for the CITY to acquire cellular service from a service provider.

Deliverables

- Pre-construction and progress meeting record during construction (to be submitted electronically).
- Recommendation letter for substantial and final acceptance of the control and telemetry systems (to be submitted electronically).

2.4 Assumptions

The following are the assumptions made in the creation of this scope of work and the budget for this project. Should the work of the project exceed these assumptions, the CONSULTANT may request additional fees. Any change to the above scope of work, fee or schedule will not be done without the prior written authorization of the CITY.

- Cellular service at each remote site and at the water treatment plant will be acquired by the CITY and fully functional prior to the scheduled cutover from existing system to new system at each remote site.
- The CITY wants, and can sole source, MicroLogix PLC hardware for each remote site. The detailed design drawings showing layout, wiring, and bill of material will be based on MicroLogix PLC hardware manufactured by Allen-Bradley.
- Bypass pumping, if required, will be provided by the CITY.
- The scope of work and budget are prepared based on the assumption that the CONSULTANT will be performing the required PLC programming, as well as the OIT HMI and SCADA HMI configuration for this project during the construction phase, as part of a separate future project, and those activities are not included within this scope of work or fee. Project specifications will be developed based on this assumption. If CONSULTANT does not perform PLC programming, as well as the OIT HMI and SCADA HMI configuration, additional tasks that are not covered in this scope of work and budget will need to be added.
- CONSULTANT has assumed a construction duration of eight (8) months for the services to be provided during construction.

3. Budget

The table below includes a breakdown of the proposed lump-sum compensation for the project, distributed by task. The budget is based on a design duration of five (5) months and construction duration of eight (8) months. If the construction duration exceeds eight (8) months, CONSULTANT shall coordinate with the CITY for additional compensation related to the additional services during construction time and project management time.

Aqeel Abdool-Ghany, P.E.
City of Hallandale Beach Public Works
May 14, 2021

CONSULTANT proposes to invoice for the services monthly based upon percentage complete by task as established in the Scope of Work section.

Task No	Task Description	Subtotal
2.1	Design	\$148,820.00
2.2	Bidding Support	\$19,440.00
2.3	Services During Construction	\$31,440.00
Grand Total		\$199,700.00

We thank you for the providing us the opportunity to assist the CITY on this project and we look forward to working with you. Please contact me if you have any questions or require further information.

Sincerely,

Arcadis U.S., Inc.

Daniel Garcia, P.E.
Project Manager

Email: daniel.i.garcia@arcadis.com
Telephone: 786-332-9494

CC: Leah Richter, Arcadis

Attachments: Design Elements for Sites

This proposal and its contents shall not be duplicated, used or disclosed — in whole or in part — for any purpose other than to evaluate the proposal. This proposal is not intended to be binding or form the terms of a contract. The scope and price of this proposal will be superseded by the contract. If this proposal is accepted and a contract is awarded to Arcadis as a result of — or in connection with — the submission of this proposal, Arcadis and/or the client shall have the right to make appropriate revisions of its terms, including scope and price, for purposes of the contract. Further, client shall have the right to duplicate, use or disclose the data contained in this proposal only to the extent provided in the resulting contract.

Attachment 1
Design Elements for Sites

Station No.	Station Name	PLC Panel Only	New PCP with PLC	New LT	New PT	New CT	New MD	New UPS	New MTS	Need T Box	New Pad	Remove from Well	Only Cell Modem
3	Beach Lift Station	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
4	Three Island Lift Station	N	Y	Y	Y	Y	N	Y	N	N	Y	Y	N
7	NE 4th Court Lift Station	N	Y	Y	Y	Y	Y	Y	N	Y	Y	N	N
8	SE Fifth Avenue	N	N	N	N	N	N	N	N	N	N	N	Y
9	Foster Road	N	Y	Y	Y	Y	Y	Y	N	Y	N	N	N
10	Sunset East	N	Y	Y	N	Y	N	Y	N	Y	N	N	N
11	Holiday Drive	N	Y	Y	N	Y	N	Y	N	Y	N	N	N
12	SW Fourth Avenue	N	Y	Y	Y	Y	N	Y	N	N	N	Y	N
13	SW eighth Avenue	N	Y	Y	Y	Y	N	Y	N	N	N	Y	N
15	Sunset West	N	Y	Y	Y	Y	N	Y	y	Y	N	N	N
17	I-95 Pump Station	Y	N	Y	N	N	N	Y	N	N	N	N	N
101	Elevated Tank	Y	N	N	Y	N	N	Y	N	N	N	N	N
103	Well No. 8	Y	N	N	N	N	N	Y	N	N	N	N	N
104	Well No.7	Y	N	N	N	N	N	Y	N	N	N	N	N
105	Well No. 9	N	N	N	N	N	N	Y	N	N	N	N	Y
181	14th Ave N Pump Station	N	N	N	N	N	N	N	N	N	N	N	Y
182	14th Ave S Pump Station	N	N	N	N	N	N	N	N	N	N	N	y
183	Scavo Park	N	N	N	N	N	N	N	N	N	N	N	Y
184	210 SW Pump Station	N	N	N	N	N	N	N	N	N	N	N	Y
186	Control Gate Structure	y	N	N	N	N	N	Y	N	N	N	N	N
201	Water Treatment Plant	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Legend for Design Elements for Sites Table

Y	Yes
N	No
N/A	Not Applicable
PLC Panel Only	A cabinet with PLC, Cell Modem, Power Supply and UPS
PCP with PLC	A panel with electric motor starter, PLC, Cell modem, and related components
LT	Radar Level Transmitter
PT	Pressure Transmitter
CT	Current Transformer for Amp monitoring
MD	Moisture Detector Relay
UPS	Uninterruptible Power Supply
MTS	Manual Transfer Switch for generator backup connection
T Box	NEMA-7 Terminal Box for motor lead termination
Pad	Concrete Pad to raise control panel above 100-year flood level
Remove from Well	Remove and demolish existing control panel from dry well and install new control panel on the grade level