SCADA Upgrades

East WTP, East WWTP, and West WWTP

City of Margate, Florida

Qualification Proposal Due Date: March 14, 2024 11:00 AM ET

1st Negotiations Meeting: April 22, 2024 2:00 PM ET

2nd Negotiations Meeting: April 24, 2024 2:00 PM ET

3rd Negotiations Meeting: April 30, 2024 2:00 PM ET

REVERE
CONTROL SYSTEMS

T 205.824.0004   //   WWW.REVERECONTROL.COM

Table of Contents

1. Executive Summary

Thank you for the opportunity to present our proposal for the referenced project. We will work with the City of Margate to develop PLC Design Standards, SCADA Design Standards followed by detailed control strategies, PLC control logic and HMI applications to meet the functional operation as defined in the SCADA Upgrades Design Criteria Package. Your project deserves the selection and integration of reliable equipment and best possible cost-performance ratio available for this application. We will deliver such a system while meeting the functional requirements of the specifications.

We look forward to serving you and to delivering a system that will give you many years of valuable service.
Please contact the following with any questions regarding our proposal.

Nan Johnson

Nan Johnson, PMP
Vice President of Municipal Systems
Revere Control Systems, Inc.
Phone: 205.271.9806
njohnson@reverecontrol.com

Ben Matthews

Ben Matthews
Program Manager
Revere Control Systems, Inc.
Phone: 863.337.3001
bmatthews@reverecontrol.com

2. Reference Project Documentation

Drawings and Specifications by: **Carollo**

Section	Description
	RFQ 2024-005 Design Criteria Package for SCADA Upgrades Final/October 2023
	Appendix G specifications
	Appendix H

3. Management

3.1 Project Management
- Project Coordination and Scheduling
- Administrative Documents and Submittals
- Document Tracking
- Monthly Progress Meetings (To be held virtually via Microsoft Teams or Zoom)
- Detailed Design/Submittal Review Meetings
- Construction Coordination and Scheduling Meetings
- Closeout Meeting
- Post Construction Meeting

4. Mobilization

4.1 Initial Mobilization
- Pre-Construction Conference at a City of Margate Local Site
- Field Investigation for Existing SCADA Control System to obtain the following:
    - Physical Condition of the Control Panels
    - Physical Aspects of the Network Infrastructure System including Cable Routes
    - Obtain Current Copies of PLC Programs and HMI Applications
    - Observe the Operation of the Existing Plant Control System Functions
- Initial Cybersecurity Study
- Prepare & Submit a Report with Information Obtained from the Field Investigation
- Perform Value Engineering Activities with the City and Design Engineer
- Evaluate Cost Proposal for Adjustments Required to Achieve the Project Objectives
- Identify Permit Requirements and Initiate Specific Permit Activities
- Secure Required Insurance and Bonds

5. Design Activities and Engineering Documentation Packages

5.1 Project Meetings and Workshops

- One (1) WTP Control Strategy Design Workshop
- One (1) WTP Control Strategy Review Workshop
- One (1) WTP Control Strategy Construction Review Workshop
- One (1) WWTP Control Strategy Design Workshop
- One (1) WWTP Control Strategy Review Workshop
- One (1) WWTP Control Strategy Construction Review Workshop
- One (1) WTP and WWTP PLC Code Review Workshop
- One (1) WTP SCADA HMI Graphics Design Workshop
- One (1) WTP SCADA HMI Graphics Review Workshop
- One (1) WWTP SCADA HMI Graphics Design Workshop
- One (1) WWTP SCADA HMI Graphics Review Workshop
- One (1) WTP and WWTP SCADA System Reporting Workshop
- Three (3) Report Review Meetings
- One (1) Backup and Recovery Software Meeting
- Two (2) Alarm Priority Meetings
- Two (2) Network Monitoring and Threat Detection Meetings
- Two (2) Cybersecurity Workshops
- One (1) Server Room Modifications Workshop
- One (1) Network Design Workshop

Notes:
1. Various workshops may be combined due to the interconnection of the detailed topics. The ultimate goal is to cover all aspects of the SCADA Control System through the format of workshops and review meetings.
2. Workshops will take place virtually through Microsoft Teams or Zoom.

5.2 Engineering Documentation Packages

- Draft PLC Design Standards Reference Manual
- Draft SCADA Design Standards Reference Manual
- Network Block Diagrams
- Piping & Instrumentation Diagrams (P&ID)
- Electrical / Site Plans for Fiber Optic Cabling, UPS System Duct Bank and Installation Requirements
- Design Specifications for Equipment, Workmanship, Installation and Testing Requirements
- Control Panel Hardware and Drawings Submittals
- Functional Control Strategies Submittals
- PLC Control Logic Submittals
- HMI Graphics Software Submittals
- Computer and Network Hardware/Software Submittals
- Fiber Optic Cable Submittal

- Central Uninterruptable Power Supply (UPS) Submittal
- Spares Parts Submittal
- Factory and Field Test Plan Submittals
- Training Plan Submittal
- Loop Drawings Submittal
- As-Built Construction Drawings
- Operations & Maintenance Manuals (Preliminary & Final)
- Field Testing Documentation
- Final PLC Design Standards Reference Manual
- Final SCADA Design Standards Reference Manual

6. Programming & Configuration Services

6.1 Programming and Configuration Services
- PLC Programming for New/Upgraded PLC Systems
- Development of Trihedral VTScada HMI Applications
- Development of SCADA Control System Reports
- Network System Configuration
- Unwitnessed Factory Acceptance Testing
- Witnessed Factory Acceptance Testing
- Transition of Historical Data from Existing Wonderware HMI to Trihedral VTScada Historian

7. Uninterruptable Power Supplies

Uninterruptable Power Supplies	
Qty	**Description**
2	Central Uninterruptable Power Supply (UPS) - Estimated to Provide One (1) Central UPS per Facility Site – East WTP and West WWTP - Size and Configuration to be determined based on information obtained from the field investigation and detailed design for control panel upgrades and selection of equipment to be supported by the UPS - Load sized to have 25% additional spare capacity - Include power selector switch - Include bypass switch - Ethernet communications for status monitoring

8. Control Panel Upgrades

Qty	Type / Location / Service Description	Tag
West WWTP		
1	CP-2001 Headworks Control Panel (New Panel) consists of the following: - Schneider Electric M340 Remote I/O Modules - Air-to-Air Heat Exchanger - All new components including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System	CP-2001
1	CP-2008 Generator Building Control Panel modifications consists of the following: - Furnish and Install Schneider Electric M340 Remote I/O Modules to Replace Modicon Quantum PLC - Furnish and Install Ethernet Switch & FOPP - Remove Existing Modbus Plus Repeater - Power Control Panel from New Central UPS System	CP-2008
1	CP-2000 Control Room Main Control Panel modifications consists of the following: - Furnish and Install Schneider Electric M580 PLCs (hot standby) to Replace Modicon Quantum PLC & I/O - Furnish and Install Ethernet Switch & FOPP or Move to New Server Rack - Remove Existing Modbus Plus Repeater - Power Control Panel from New Central UPS System	CP-2000
1	CP-2005 Sanitaire and Blowers Control Panel (New Panel) consists of the following: - Schneider Electric M340 Remote I/O Modules - Air-to-Air Heat Exchanger - All new components including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System	CP-2005
1	CP-2006 Sludge Dewatering Control Panel modifications consists of the following: - Furnish and Install M340 PLC to Replace Modicon Quantum PLC & I/O - Furnish and Install Ethernet Switch & FOPP - Remove Existing Modbus Plus Repeater - Replace Existing I/O Surge Protection Devices - Replace existing Terminal Blocks - Power Control Panel from New Central UPS System	CP-2006

Qty	Type / Location / Service Description	Tag
	West WWTP	
1	CP-2007A and B Jet Air Control Panel (New Panel) consists of the following: - Nema 4X 316 Stainless Steel Enclosure with Top, Side and Front Sunshields and Cooling System - Schneider Electric M340 Remote I/O Modules - Furnish and Install Ethernet Switch & FOPP - Remove Existing Modbus Plus Repeater - Air-to-Air Heat Exchanger - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System	CP-2007A CP-2007B (Combined)
1	CP-2004 Chlorine Building Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to Replace Modicon Quantum PLC - Furnish and Install Ethernet Switch & FOPP - Remove Existing Modbus Plus Repeater - Furnish and Install 17" Local Operator Interface to Replace Existing Wonderware client PC - Furnish and Install IDEAS RFID Card Reader for Login to Client Application Panel PC - Furnish and install Air-to-Air Heat Exchanger - Repair hole in enclosure using appropriated sized hole seals or plates - Power Control Panel from New Central UPS System - Security components and HSP backup control panel FP-7-2 to remain in place as-is	CP-2004
1	CP-2003 Clarifiers Control Panel (New Panel) consists of the following: - Schneider Electric M340 Remote I/O Modules - Furnish and Install Ethernet Switch & FOPP - Remove Existing Modbus Plus Repeater - Air-to-Air Heat Exchanger - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System	CP-2003
1	CP-2002 Rotating Biological Contactors (RBC) Control Panel modifications consists of the following: - Disconnect from SCADA network - No modifications to take place, leave in place as-is	CP-2002

East WTP		
Qty	**Type / Location / Service Description**	**Tag**
1	CP-1000 Control Panel (New Panel) consists of the following: - Furnish and Install NEMA 12 Enclosure - Furnish and install M580 hot backup PLC and I/O rack to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Power Control Panel from New Central UPS System - Re-route, extend, field verify, and terminate existing I/O wires to new location; terminal junction box from existing to new location is not acceptable.	CP-1000
1	Switchgear PLC Control Panel modifications consists of the following: - Furnish and install Schneider Electric PLC and I/O rack to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Power for control panel to remain as-is - **During the Negotiations Meetings, it was mutually agreed upon by the City and Revere to remove the requirement for Russelectric to perform the Switchgear PLC Control Panel Upgrade from the RFQ.**	Switchgear PLC
1	CP-1003 High Service Pump Control Panel (New Panel) consists of the following: - Furnish and Install NEMA 12 Enclosure - Furnish and Install Schneider Electric M340 Remote I/O Modules - Furnish and Install Ethernet Switch & FOPP - Remove existing Modbus Plus Repeater - Furnish and install 17" Local Operator Interface to replace existing Wonderware client PC - Furnish and install IDEAS RFID card reader for login to client application panel PC - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System - Existing transformer and instrumentation to be removed and re-installed after modifications	CP-1003

East WTP		
Qty	**Type / Location / Service Description**	**Tag**
1	CP-1002 Transfer Pump Control Panel (New Panel) consists of the following: - Furnish and Install NEMA 4X 316SS Enclosure - Schneide Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and Install Ethernet Switch & FOPP - Remove Existing Modbus Plus Repeater - Air-to-Air Heat Exchanger - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System	CP-1002
1	CP-1004 Well Head No. 7 Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater	CP-1004
1	CP-1008 Coral Gate Pump Station Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Fiber optic connection cable under separate contract	CP-1008
1	CP-1009 Filters Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Furnish and install 17" local operator interface to replace existing Wonderware client PC - Furnish and install IDEAS RFID card reader for login to client application panel PC - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate - Power Control Panel from New Central UPS System - Maintain functionality of all hardwired controls (i.e. pushbuttons, HOA switch, etc)	CP-1009

East WTP		
Qty	**Type / Location / Service Description**	**Tag**
2	CP-1011 and CP-1012 Blowdown Water No. 1 and 2 Control Panel (New Panel) consists of the following: - NEMA 4X 316SS Enclosure - Schneider Electric M340 RIO Modules to Replace Modicon TSX PLC - Add controls for blowdown system to main SCADA HMI screens, remove existing LCP switches and touchscreen - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Air-to-Air Heat Exchanger - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Power Control Panel from New Central UPS System - Maintain functionality of all hardwired controls (i.e. pushbuttons, HOA switch, etc)	CP-1011 CP-1012
2	CP-1006 and CP-1007 Lime Silo no. 1 and 2 Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/Omodules to replace Modicon Quantum PLC - Add controls for blowdown system to main SCADA HMI screens, remove existing LCP switches and touchscreen - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Furnish and install air-to-air heat exchanger - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Power Control Panel from New Central UPS System - Maintain functionality of all hardwired controls (i.e. pushbuttons, HOA switch, etc)	CP-1006 CP-1007
1	CP-1005 Sodium Hypo Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace AB MicroLogix PLC - Furnish and install Ethernet switch & FOPP - Furnish and install 17" local operator interface to replace existing Magelis touchscreen - Furnish and install IDEAS RFID card reader for login to client application panel PC - Verify size constraints of new equipment and provide separate enclosure if necessary - Remove existing Modbus Plus repeater - Furnish and install air-to-air heat exchanger - Replace all components inside the control panel including relays, terminal blocks equivalent to current I/O capacity - Power Control Panel from New Central UPS System - Maintain functionality of all hardwired controls (i.e. pushbuttons, HOA switch, etc)	CP-1005

East WTP		
Qty	**Type / Location / Service Description**	**Tag**
1	CP-1001 Electrical Room Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - Verify need for isolators and remove or replace them - Power Control Panel from New Central UPS System - Pull back all field wiring, cut off ends of wires, re-strip, re-label as required and re-terminate	CP-1001
1	CP-2009 RAS-WAS Building Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - No changes to power or I/O wiring	CP-2009

East WWTP		
Qty	**Type / Location / Service Description**	**Tag**
1	CP-2009 RAS-WAS Building Control Panel modifications consists of the following: - Furnish and install Schneider Electric M340 Remote I/O Modules to replace Modicon Quantum PLC - Furnish and install Ethernet switch & FOPP - Remove existing Modbus Plus repeater - No changes to power or I/O wiring	CP-2009

9. Computer / Displays / Network Communications & Software

Computer and HMI Software	
Qty	**Description**
1	VTSCADA WTP SCADA Software (located at East WTP): - VTSCADA 50K Dual Server Premium Bundle - Development/Runtime with Alarm Notification and Unlimited Thin Client - System Upgrades and Maintenance Fixes for Two (2) Years from Substantial Completion
1	VTSCADA WWTP SCADA Software (located at West WWTP): - VTSCADA 50K Dual Server Premium bundle - Development/Runtime with Alarm Notification and Unlimited Thin Client - System Upgrades and Maintenance Fixes for Two (2) Years from Substantial Completion
1	VTSCADA Central SCADA Software (located at West WWTP): - VTSCADA 100K Development/Runtime with Ten (10) Thin Clients - System Upgrades and Maintenance Fixes for Two (2) Years from Substantial Completion
2	Veeam Backup Essentials Backup and Recovery Software with Universal License Packs
1	SyTech XLReporter Reporting Software

Computers, Displays, Network Hardware – East WTP	
Qty	**Description**
1	East WTP SCADA Server No. 1 - VTScada WTP Server Virtual Machine - Domain Controller Server Virtual Machine (Local Primary)
1	East WTP SCADA Server No. 2 - VTScada WTP Server Virtual Machine - Domain Controller Server Virtual Machine (Local Secondary) - WTP Change Management/Backup Client Server Virtual Machine
1	East WTP Backup and Recovery Server (Environmental Services)
2	Operator workstations with VTSCADA VIC client and dual 27" LED monitors
1	Full-Size Server Rack with Side Panels and Front/Back Doors

Computers, Displays, Network Hardware – West WWTP	
Qty	**Description**
1	West WWTP SCADA Server No. 1 - VTScada WWTP Server Virtual Machine - Domain Controller Server Virtual Machine (Local Primary)
1	West WWTP SCADA Server No. 2 - VTScada WWTP Server Virtual Machine - Domain Controller Server Virtual Machine (Local Secondary) - WWTP Change Management/Backup Client Server Virtual Machine
1	Central SCADA Server No. 1 (Environmental Services) - VTScada Main (WTP/WWTP) Application Server Virtual Machine - XLReporter Server Virtual Machine - Change Management Server Virtual Machine
1	Central Management Server No. 1 (Environmental Services) - Active Directory Server Virtual Machine (Primary) - Windows Security Update Server (WSUS) Virtual Machine with Anti-Virus Manager/Agent - Network Monitoring Server and Firewall Management Server Virtual Machine - Syslog Server Virtual Machine - VCenter Server Virtual Machine
1	Central Network Time Protocol (NTP) Server (Environmental Services)
1	West WTP Backup and Recovery Server (Environmental Services)
2	Operator workstations with VTSCADA VIC client and dual 27" LED monitors
1	Full-Size Server Rack with Side Panels and Front/Back Doors

Programming Laptop & Software	
Qty	**Description**
1	Modicon EcoStruxure Control Expert (Unity Pro)
1	Laptop for PLC Programming

Communications	
Qty	**Description**
9,000 FT (Combined for East WTP and West WWTP)	18 Strand (minimum) Single-mode fiber optic cabling ring to separate the following networks: - WTP control network - WWTP Control network - SCADA DMZ network - Security network - Building Systems network - City IT network
9,000 Ft (Combined for East WTP and West WWTP)	Three (3) 1.25" HDPE corrugated innerducts
A/R	Fiber Connectors - LC Single-Mode for All New Fiber Optic Cable - SC or ST Single-Model when Matching Connectors for Existing Equipment

10. On-Site Services

10.1 On-Site Services (Revere Staff Members)

- Installation, Termination and Testing of Fiber Optic Cable
- Establish Network Communications via the New Fiber Optic Cable Infrastructure
- Installation of Central Uninterruptable Power Supplies
- Installation and Commissioning of Control Panel Upgrades
- I/O Checkout for Equipment Connected to the PLC Control Panels through to the HMI Application
- Testing and Verification of Functional Control Strategies through the PLC Control Logic and HMI Applications

10.2 Training (Revere Staff Members)

- Onsite Training Provided by Revere Personnel
  - East WTP Training – Eleven (11) Courses with Session Durations of Various Lengths for a Total of Twenty-Two (22) Hours
  - West WWTP Training – Eleven (11) Courses with Session Durations of Various Lengths for a Total of Twenty-Eight (28) Hours
  - Training Sessions will be recorded.
- Manufacturer Training
  - Trihedral VTScada Training for Two (2) Owner Representatives including Travel Expenses
  - XLReporter Training for Two (2) Owner Representatives including Travel Expenses
  - Note: Manufacturer Training may be provided via Virtual Training Sessions.

11. Spare Parts

Spare Parts	
Qty	**Description**
1	Schneider Electric M580 PLC CPU Processor (Spec Section 17720)
1	Schneider Electric M340 PLC CPU Processor (Spec Section 17720)
3	Schneider Electric Discrete Input Modules (Spec Section 17720)
3	Schneider Electric Discrete Output Modules (Spec Section 17720)
3	Schneider Electric Analog Input Modules (Spec Section 17720)
3	Schneider Electric Analog Output Modules (Spec Section 17720)
2	Schneider Electric PLC Power Supplies for Each Type Provided (Spec Section 17720)
1	Schneider Electric Network / Communication Module for Each Type Provided (Spec Section 17720)
1	Schneider Electric Remote Adapter Module for Each Type Provided (Spec Section 17720)
1	Schneider Electric Chassis for Each Type Provided (Spec Section 17720)
1	Ethernet Switch Backplane (Spec Section 17733)
1	Ethernet Module of Each Type Provided (Spec Section 17733)

12. Clarifications

The above proposal is based on the following clarifications:

- Builders Risk Insurance is not required or included.

- Priced proposal is budgetary until Revere completes the field investigation, workshops with Owner representatives and the detailed design documents outlined in Section 5.2 above.

- Existing field instrumentation, motor control centers, variable frequency drives and control devices are fully operational and will not require replacement or troubleshooting by Revere.

- A Maintenance Agreement is not included due to requirements not outlined in the Specifications. A Maintenance Agreement can be prepared and provided as a deliverable during Project Closeout.

Supply Chain Disruption

Note that given the uncertain and dynamic nature of the global supply chain, some suppliers have issued "protective" or "rolling" force majeure notices and have indicated an inability to meet previously quoted lead times. Revere shall not be responsible for delays associated with supply chain deficiencies of specified components related to this project. Revere will immediately notify the client of any such delays and will, when applicable, offer options that could best meet the delivery schedule.

13. Warranty

Warranty shall run for a period of twelve (12) months from substantial completion.

Thank you for your consideration of Revere Control Systems. We look forward to working with you on this project.

Sincerely,

Nan Johnson

Nan Johnson, PMP
Vice President of Municipal Systems
Revere Control Systems, Inc.
Phone: 205.271.9806
njohnson@reverecontrol.com

Ben Matthews

Ben Matthews
Program Manager
Revere Control Systems, Inc.
Phone: 863.337.3001
bmatthews@reverecontrol.com