



CITY OF WASHINGTON, ILLINOIS

Public Works Agenda Communication

- Meeting Date:** May 2nd, 2022
- Prepared By:** Brian Rittenhouse – Public Works Director
- Agenda Item:** Water & Wastewater SCADA Master Plan Consideration.
- Explanation:** Staff reached out to Concentric Integration to develop a Supervisory Control and Data Acquisition (SCADA) Master Plan that will assess the existing system, analyze where improvements and upgrades should be made, and then methodically plan the best and most cost-effective way to move forward. SCADA is currently used to control both the Water and Wastewater Treatment Processes as well as to control each of the lift stations in our Collection System.
- Our current SCADA has been assembled and maintained by two separate firms, and it is the intent to bring all SCADA together as part of this as well.
- Fiscal Impact:** \$30,000.00 was budgeted in accounts #500-000-530-1500 and #501-000-530-1500 for FY 22-23.
- Staffs**
- Recommendation:** A Master Plan, similarly to the Capital Improvement Plan, will give staff professional guidance on maintenance and scheduled replacement of equipment. Concentric Integration specializes in the integration of water/wastewater systems, and they are the largest water/wastewater systems integrator in the state of Illinois. They have assisted with enhancements and troubleshooting the Wastewater Treatment SCADA for several years. It is Staff's recommendation to contract Concentric Integration to develop a SCADA Master Plan, in a not to exceed amount of \$30,000.00.
- Action Requested:** Motion to move the Water and Wastewater SCADA Master Plan to tonight's City Council Consent Agenda for approval.



Project Proposal

March 10, 2022

Mr. Brian Rittenhouse
Utilities Superintendent
City of Washington, Illinois
107 Legion Road
Washington, IL 61571

Subject: SCADA Master Plan

Concentric Project Number: 220302.30

Dear Mr. Rittenhouse:

The City of Washington operates several control systems that are essential parts of the City's operation to provide water treatment, wastewater collection, and wastewater treatment. These control systems have a complex infrastructure that includes Programmable Logic Controllers (PLCs), motor controllers, field instrumentation, alarm dialers, networking, fiber communications, radios, and computerized Human Machine Interfaces (HMIs). In the water/wastewater industry, this complex infrastructure is typically referred to as the Supervisory Control and Data Acquisition (SCADA) system.

Existing Infrastructure

The City currently operates three independent SCADA systems:

1. Wastewater Treatment
 - a. One Wastewater Treatment Plant (STP #2)
 - b. Wonderware InTouch HMI with Allen-Bradley CompactLogix PLCs
 - c. Hardware Alarm Dialer
2. Wastewater Collection
 - a. Six Lift Stations with Allen-Bradley MicroLogix PLCs
 - b. MTCO Fiber Internet Service Provider (ISP) for Telemetry
 - c. Rockwell Software FactoryTalk View SE HMI
 - d. Hardware Alarm Dialer
 - e. All Allen-Bradley MicroLogix PLCs
 - f. HMI & Master PLC located at Public Works Building on Legion Rd.
3. Water Treatment
 - a. Two Water Treatment Plants, each with Local Wells
 - b. One Remote Well Site (Wells 11 & 12) near PW Building on Legion Rd
 - c. All Allen-Bradley PLCs – MicroLogix, CompactLogix, & SLC Series
 - d. Rockwell Software FactoryTalk View SE HMI
 - e. Hardware Alarm Dialer
 - f. HMI located at Water Treatment Plant #1 Only





What is a SCADA Master Plan?

When considering the many moving parts and complex components of the SCADA systems, the City may be having a difficult time determining the best path forward in addressing long-range issues and concerns. At this time, the City seeks an intentional and proactive approach to accurately assess the existing system, analyze where improvements and upgrades should be made, and then methodically plan the best and most cost-effective way to move forward. The approach that the City seeks is typically best provided through the development of a SCADA Master Plan.

Typically, a SCADA Master Plan answers the following questions about a SCADA system:

-) What is the status of the existing system?
-) Has any equipment exceeded its life expectancy or reached (or near) obsolescence?
-) Is there new equipment or software that offers more reliability, cost savings, or additional functionality?
-) What are the current problems in the existing system?
-) Are there any long-term concerns that need to be addressed?
-) What are the best solutions to these problems and concerns?
-) Are there any possible improvements to the system that offer substantial benefits?
-) Are there any system maintenance issues?
-) Are there any existing IT resources outside of the SCADA system that can be utilized (or developed) to provide greater functionality and reduce overall costs of implementation and maintenance?
-) How much will it cost to fix the problems, address the concerns, implement the improvements, and increase the efficiency of the system?
-) Considering all the priorities and reflecting on the budget, what is the best phasing of these improvements in a long-range (5-year) plan?

Typically, a SCADA Master Plan answers the preceding questions in regard to the following aspects of a SCADA system:

-) Control System Hardware & Software
 - Industrial Control Panels
 - Motor Starters & Variable Frequency Drives (VFDs)
 - Electrical Power Monitors
 - Process Analyzers & Instrumentation
 - Programmable Logic Controllers (PLCs)
 - Operator Interface Terminals (OITs)
 - HMI Software for Process Visualization, Alarming, Trending
 - HMI Graphic Development for High Performance & Optimized Situational Awareness
 - Instrumentation & Controls Documentation (P&IDs, Loop Diagrams, Sequence of Operations)
-) Client Information Management
 - Automatic Historical Data Collections
 - Manual Data Collections (clipboards)





- Reporting Systems
- Informational Dashboards
-) Operational Technology (OT) Infrastructure
 - Servers & Workstations
 - Ethernet Networking
 - Remote Access from Corporate Network
 - Software Updates
 - Backups, System Survivability, & Disaster Recovery
 - Antivirus Software & Cybersecurity
 - Software Licensing & Updates
 - IT/OT Convergence
-) Remote Sites Telemetry
 - Cellular Communications
 - Radio Communications
 - Fiber Communications
 - Remote Terminal Units (RTUs)

Unique Challenges to Address:

In the process of developing this scope of services, an estimate, and our fee for this SCADA Master Plan, we have identified the following challenges, issues, or problems that are unique to your system and must be addressed in the SCADA Master Plan.

1. Three Independent SCADA Systems
2. Two Different Software Platforms (Wonderware & Rockwell Software)
3. Wide Range of Allen-Bradley PLCs (CompactLogix, MicroLogix, SLC)
4. Combination of Hardware & Software Alarm Dialers
5. Insufficient Proactive & Preventative Maintenance

Concentric Integration

Concentric Integration is a team of technology consultants and integrators helping progressive government leaders to implement a roadmap to efficiency, greater operational intelligence, and quality systems integration. Concentric Integration specializes in the integration on Water/Wastewater system, and they are the largest water/wastewater systems integrator in the state of Illinois. While supporting many similar clients with similar SCADA systems, Concentric Integration has completed many SCADA Master Plans. With offices and staff in Peoria, Concentric Integration has a unique relationship with the City. As a part of Baxter & Woodman, Concentric Integration also has the civil engineering resources to provide services outside of a typical systems integrators skillset. Through these two unique relationships, we can confidently propose the following scope of services for a SCADA Master Plan:





Scope of Services

Labor

Project Management

1. Plan, schedule, and coordinate the activities that must be performed to complete the project.

Client Visit to Gather Information

1. One Engineer All Day Onsite
2. Utilize Existing Knowledge and Previous Conversations
3. Meet with Each of 3 City Staff Groups (Water, Wastewater, Collections)
4. One Engineer All Day Follow-Up for Details, Programs, Pictures
5. One Engineer All Day Offsite to File & Organize Information with Notes

Collaborative Design

1. Internal Team Review with Senior Systems Integrators (Doug, Josh, & Rich)
2. Collaborative Design Effort for Comprehensive Solution/Plan
3. Meet with Concentric Technical Directors

Develop SCADA Master Plan

1. Spreadsheet with Budgetary Modernization Costs in Phases
2. Visio Network Diagram
 - a. Summarize Existing SCADA System
 - b. Details of Ultimate SCADA System
3. Phased Modernization Plan in Memo Format
 - a. Document rationale & justification (why)
 - b. Document areas for further planning

Present SCADA Master Plan

1. Internal Presentation to Team with Revisions
2. Client Presentation





3. Revise & Finalize SCADA Master Plan

Subcontractors

Concentric will not be utilizing any subcontractors for additional services or equipment.

Equipment / Expenses

Concentric will not be providing any equipment.

Fee

Our fee for the above scope \$24,880

This proposal is valid for 90 days from the date issued.

Concentric Assumptions / Customer Responsibilities

1. It is assumed that the existing radio telemetry system between Water Treatment Plant #1, Water Treatment Plant #2, and the Remote Wells 11 & 12 has been correctly designed and the existing equipment is functional. If this is not the case, we will need to add additional scope and fee to accommodate a third-party radio / antenna subcontractor to perform a radio path study with a site survey and a final report.
2. Customer will assign an initial project manager at the project kickoff meeting.
3. Customer will provide site access for investigation Customer's normal business hours. Work outside of Customer's normal business hours can be agreed upon as needed, provided Concentric can secure the site(s) upon departure.
4. Customer will provide existing documentation of the current SCADA system.
5. Customer will provide staff to tour existing sites.
6. To limit scope & fee, this SCADA Master Plan will not research or identify any operational processes or improvements. This service can be provided later, if requested.

Project Schedule

Concentric is available to begin work upon notice to proceed.

Warranty

The warranty listed in the Standard Terms and Conditions (Paragraph 12.2):





- DOES apply
- DOES NOT apply

Standard Terms and Conditions References

Effective Date: The Effective Date of this Proposal and the associated Standard Terms and Conditions shall be the date this Proposal is accepted as shown by Customer's dated signature below.

Third Party Materials (See Standard Terms and Conditions Paragraphs 3.2 & 8.3):

- DOES apply
- DOES NOT apply

Notices: Notices required to be provided to Customer in accordance with Paragraph 16.3 of the Standard Terms and Conditions shall be delivered to the individual and address given above, unless Customer provides updated notification information to Concentric in writing

Standard Terms and Conditions

Concentric Integration, LLC's Standard Terms and Conditions, Version 10 (V10), located at <http://goconcentric.com/standard-terms/> are hereby incorporated into this Project Proposal as though fully attached hereto. By signing below, each of the undersigned represents and warrants that Concentric Integration, LLC's Standard Terms & Conditions are legal, valid and binding obligations upon the parties for which they are the authorized representative.





Acceptance

If this proposal is acceptable, please sign one copy and return to us. Feel free to contact me if you have any questions.

Sincerely,

CONCENTRIC INTEGRATION, LLC

A handwritten signature in black ink that reads "Michael D. Klein".

Michael D. Klein, PE
President
RJF/DRS

CUSTOMER:
CITY OF WASHINGTON, ILLINOIS

ACCEPTED BY: _____

TITLE: _____

DATE: _____

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