TASK ORDER NO. 11230.I

Pursuant to the

MASTER AGREEMENT FOR PROFESSIONAL SERVICES
BETWEEN

CITY OF MERIDIAN (OWNER) AND JACOBS ENGINEERING GROUP INC. (ENGINEER)

This Task Order is made this ___ day of January 2024 and entered into by and between the City of Meridian, a municipal corporation organized under the laws of the State of Idaho, hereinafter referred to as "City", and accepted by JACOBS ENGINEERING GROUP INC., hereinafter referred to as "Engineer" pursuant to the mutual promises, covenant and conditions contained in the Master Agreement (category 7B) between the above-mentioned parties dated October 1, 2021. The Project Name for this Task Order is as follows:

AERATION BASINS RETROFIT AND UPGRADE –

PROCESS CONTROL SOFTWARE INTEGRATION

PROJECT UNDERSTANDING-SUMMARY

Services that will be provided by the System Programmer to complete the Process Control Software Integration as described in the Conformed Documents for the City of Meridian Wastewater Resource Recovery Facility Aeration Basins 1-4 Retrofit and 9-10 Upgrade

The process control system software integration services for the following equipment will be performed under this single task order:

- Process control system software configuration for automated monitoring and control of the new system functions, as specified in the Conformed Documents includes the following:
    - Programming for one (1) new Programmable Logic Controller (PLC), SABB1PLC0001.
    - Updated programming for four (4) existing PLCs, SABB2PLC0001, SPPS1PLC0001, SPBB1PLC0001, SRWS1PLC0001.
    - Modifications to the existing plant control system Wonderware System Platform, Historian, and TopView alarm notification software.
- Configuration of five (5) new Ethernet network switches listed below. All other network switches, including SCADA ring network switches and those provided by package system suppliers will be configured by others. Refer to enclosed Table 3, Device List, for a summary Ethernet Switches on this project.

- PLC configuration and testing for Ethernet communications to (16) Variable Frequency Drives (VFDs). VFD configuration is by others. Refer to enclosed Table 3, Device List, for a summary VFDs on this project.
- PLC configuration and testing for Ethernet communications to (40) Motor starters. Motor starter configuration is by others. Refer to enclosed Table 3, Device List, for a summary of motor starters on this project.
- PLC configuration and testing for Ethernet communications to (24) HACH ethernet transmitters. HACH device configuration is by others. Refer to enclosed Table 3, Device List, for a summary of HACH transmitters on this project.
- PLC configuration and testing for Ethernet communications to four (4) vendor package systems.
    - SABB1LCP1001 – Aeration Blower 1
    - SABB1LCP1002 – Aeration Blower 2
    - SABB1LCP1003 – Aeration Blower 3
    - SABB1LCP1004 – Classifying Selector Blower

Work Approach

System Programmer will complete the work in a phased approach.

- Software Planning:
    - To include meetings with the Owner, Engineer, and Contractor to coordinate project schedule, control sequences, PLC code development, HMI graphics development, testing procedures, and testing coordination.
- Software Development:
    - To include PLC and HMI development, unwitnessed software test, witnessed software factory acceptance test, panel builder factory acceptance test.
- Software Implementation:
    - To include implementation of PLC and HMI programming, onsite loop testing, process control strategy/functional testing, closed loop testing, and system acceptance test as described in Section 25 08 00. This phase will also include training and final tuning.

SCOPE OF WORK

Task 1 – Project Management

Manage, coordinate and lead System Programmer activities and perform administration of the project control system software execution and control system software quality reviews. System Programmer will provide the resources necessary for project initiation and management throughout the project. Activities include contract administration, project accounting, Health & Safety Plan preparation, project documentation, monitoring progress, change management, periodic invoicing, and closeout and archiving. The estimated level of effort associated with these functions is based on an 83-week

duration from Owner-issued notice-to-proceed to completion for the tasks described herein.

Change Management

Request for Change (RFC): Changes made by the Engineer, Owner, or Contractor to the City of Meridian Wastewater Resource Recovery Facility Aeration Basins 1-4 Retrofit and 9-10 Upgrade Project Conformed Contract Drawings and Specifications that impact this scope of work and or schedule will be submitted as an RFC by the Owner to the System Programmer prior to implementing the change. The System Programmer shall review the RFC and submit a response including cost and schedule impacts. The System Programmer may begin working on the change once terms are agreed upon and authorization is received from the Owner.

System Programmer Change Proposal (CP): If the System Programmer wants to propose an alternate solution to the Conformed Contract Drawings and Specifications or to suggest a change to the Contract, it will be done using a CP form. The System Programmer will provide information describing the change and the cost or credit being proposed and the schedule impacts. If a CP is accepted, or partially accepted by the Owner, the Owner will issue an RFC authorizing the change.

Request for Information (RFI): The System Programmer may request interpretation or clarification of the Conformed Contract Drawings and Specifications or the I/O list during the construction of the project. Either the Owner, Engineer, Contractor, or System Programmer may request additional information from one of the other parties. The request section of the form will be filled out by the party initiating the request. It will be sent to the Engineer. The Engineer will distribute it to the appropriate party for a written response. The written response will be returned to the Engineer who will distribute copies. If the response to an RFI causes a change to this Contract, the Owner shall be notified. If the Engineer and Owner concur, Owner will issue an RFC to the System Programmer.

Health and Safety Plan

Develop a Health and Safety Plan for Jacobs work throughout the project.

Deliverables

- Completed RFC responses.
- Completed CP forms.
- Completed RFI forms.
- Monthly invoices and progress reports.
- Monthly schedule updates.

Task 2 – Construction Support Services

Coordinate construction schedules and equipment submittals with the Contractor and Owner in order to provide successful integration of the control system software.

- Participate in Pre-Construction meeting at the project site with Owner and Contractor (2 people at 4 hours each)
- Review Contractor's preliminary construction schedule
- Review 25 associated Contractor submittal packages from the following sections and provide review responses. Up to four re-submittals assumed (up to a total of 70 hours).
    - 01 32 00, Construction Progress Documentation
    - 01 75 00, Testing, Training, and Commissioning
    - 01 79 00, Demonstration and Training
    - 25 08 00, Commissioning of Integrated Automation
    - 25 99 00, Integrated Automation Control Sequences for Process Systems
    - 25 99 15, Control Sequences
    - 26 08 00, Commissioning of Electrical Systems
    - 26 24 19, Low Voltage Motor Control
    - 26 29 23, Low Voltage Adjustable Frequency Drives
    - 40 06 20.13, Power Actuated Valve and Gate Schedule for Process Services
    - 40 90 00, Instrumentation and Control for Process Systems.
    - 40 91 00, Primary Process Measurement Devices, (includes all 40 91 subsections)
    - 40 94 43, Programmable Logic Controllers
    - 40 94 53, Package Process Control Systems
    - 40 95 00, Process Control Hardware
    - 40 95 13, Process Control Panels and Hardware
    - 40 95 23, Schedules for Instrumentation of Process Systems
    - 40 95 33, Process Control Networks
    - 40 95 43, Process Control Hardware Interfaces
    - 40 95 53, Process Control Switches
- Review associated requests for information (RFIs) and provide responses. Up to 20 RFI responses assumed (up to a total of 32 hours).
- Incidental coordination with Contractor (maximum 83 hours, average 1 hour per week in accordance with Milestone Schedule below.)

Deliverables

- Submittal review comments.
- RFI responses.

Task 3 – Software Planning
Coordinate planning activities with the Engineer, Owner and Contractor in order to define roles and responsibilities. Workshops are included to allow System Programmer, Owner and Engineer to review the control sequences, and to further define the details of the control sequences prior to beginning software development.

System Programmer Kickoff Meeting

- Schedule and lead one 2-hour workshop at the project site.
- Review procedures for exchanging information with Owner, Engineer, Contractor, System Integrator, and Package System Vendors including:
    - Contractor Submittals
    - System Programmer Submittals
    - Contractor RFIs
    - I/O Interface Summaries (spreadsheet maintained and submitted by Contractor per 25 08 00 2.02D)
        - Rack/Slot/Point assignments
    - Test Plans (maintained and submitted by Contractor per 25 08 00 2.02B)
    - Control Sequences (maintained and submitted by System Programmer for Engineer Approval)
    - Training Plans (maintained and submitted by Contractor per 01 75 00 1.04C)
    - Review Construction Schedule and determine update frequency.
    - Reference Sections
        - 01 75 00, Testing, Training, and Commissioning
        - 25 08 00, Commissioning of Integrated Automation
        - 25 99 00, Integrated Automation Control Sequences
        - 25 99 15, Control Sequences
        - 40 90 00, Instrumentation and Control for Process Systems
        - 40 95 33, Fiber Optic Process Control Networks

Database setup

- Populate Commissioning database with PLC I/O tags, loop descriptions, and AOI assignments.

Control Sequences

- Lead one 5-hour Preliminary Control Sequence Workshop at the project site with Owner staff and Engineer to review the control sequences as described in Sections 25 99 00 and 25 99 15 and to further define the details of the control sequences necessary for programming.

    - Notes from the workshop will be used by System Programmer to update the Control Sequence document.
    - Revised Control Sequences to be approved by Engineer and Owner. Once revised, the System Programmer will assess the quantity and level of changes resulting from the Preliminary Control Sequence Workshops and submit Change Proposal forms if needed prior to developing preliminary code and prior to scheduling Final Control Sequence Workshop.
    - System Programmer will follow the intent of the written control sequences through the use of the City's current software programming standards, while not requiring Requests for Change to transpose into the current standard.
- Lead one 2-hour Final Control Sequence Workshop at the project site with Owner staff and Engineer to review and finalize the control sequences. Workshop to include discussions related to custom control faceplates that will be developed on the project to provide operations the ability to configure setpoints for control functions.
    - Notes from the workshop will be used by the System Programmer to update the Control Sequences document. Revised Control Sequences to be approved by Engineer and Owner. Once revised, the System Programmer will assess the quantity and level of changes resulting from the Final Control Sequence Workshop and submit Change Proposal forms if needed prior to proceeding with task 4.
- All Control Sequence document edits to be completed by the System Programmer and approved by the Engineer and Owner.

IO List Evaluation and Assignments

- SABB2 – Existing Blower Building 2 PLC Panel
    - System Programmer to evaluate the IO requirements defined in the contract documents and assign Rack/Slot/Point in the existing SABB2 PLC panel.
    - Determine that there is enough spare capacity in the existing SABB2 PLC panel and notify project team if additional IO cards need to be added.
    - System Programmer to evaluate the Ethernet IO requirements defined in the contract documents and determine if there is enough capacity in the existing network switches to accommodate the network additions. If additional switches are required, System Programmer will notify the Owner.
    - Coordinate Rack/Slot/Point assignments with Contractor, Owner and Engineer.
- SPBB1 – Existing Post Aeration Blower Building PLC Panel

    - System Programmer to evaluate the Ethernet IO requirements defined in the contract documents and determine if there is enough capacity in the existing network switches to accommodate the network additions. If additional switches are required, System Programmer will notify the Owner.
- SRWS1 – Existing Ras/Was Station 1 PLC Panel
    - System Programmer to evaluate the Ethernet IO requirements defined in the contract documents and determine if there is enough capacity in the existing network switches to accommodate the network additions. If additional switches are required, System Programmer will notify the Owner.
- SPPS1 – Existing Primary Sludge Pump Station PLC Panel
    - System Programmer to evaluate the Ethernet IO requirements defined in the contract documents and determine if there is enough capacity in the existing network switches to accommodate the network additions. If additional switches are required, System Programmer will notify the Owner.
- SABB1 – New Blower Building 1 PLC Panel
    - Coordinate Rack/Slot/Point assignments with Contractor, Owner and Engineer.

Vendor Package Coordination Workshop

Jacobs will lead one 1-hour coordination workshop with the Blower Vendor to coordinate PLC to PLC communication strategies, data map, and control functionality.

Deliverables

- Meeting minutes from System Programmer Kickoff meeting.
- Preliminary control sequences workshop notes.
- Final control sequences workshop notes.
- Revised control sequences document.
- IO list with Rack Slot Point assignments.
- Vendor package coordination workshop notes

Task 4 – Software Development

The purpose of this task is to complete the programming of the plant control system software, and to demonstrate the software functions to the Owner and Engineer, refer to enclosed Table 2, Subsystem Details, for a description of the systems included in this scope of work.

System Programmer will provide the following services for each of the 5 PLCs listed in Table 2:

PLC and HMI programming

- Based on the results of the final Control Sequences workshop.
- Up to 10 process graphics.
- Up to 5 custom control pop-up graphics.
- Modify Navigation graphic, Site plan graphic, and control network graphic.
- Modify up to 5 existing process graphics that are affected by the existing equipment modifications on the Project.
- Vendor package system programming for Blower Vendor package systems
    - Programming effort based off Lonestar Blower Vendor package systems programmed in the Meridian Liquids project.
    - PLC and HMI programming for the Vendor package to align with the vendor package coordination workshop.

Draft HMI Graphics Review

Provide HMI screenshots of up to 5 major process graphics and 2 custom control popups digitally for review of concepts by City staff before labor is invested in development of all graphics required for the project.

System Programmer to lead a 2-hour workshop with within one week of providing the screenshots for review to demonstrate the concepts and collect Owner feedback. Owner staff will provide marked-up copies of the graphics identifying the desired changes within 1 week from completion of the graphics review workshop.

Unwitnessed Software Demonstration

Unwitnessed software demonstration test to confirm that the PLC and HMI programs are ready for the witnessed software demonstration test and that they meet the functional requirements of the project. This test does not include vendor package PLCs, VFDs, or smart overload devices.

Witnessed Software Demonstration

Lead 2 4-hour witnessed software demonstrations. Witnessed software demonstrations are a repeat of the unwitnessed software demonstration test but witnessed by Owner and Engineer to verify functionality of PLC and HMI programs meet the project requirements.

Control Sequence Document

Maintain redline electronic copies of Control Sequences throughout the development and implementation phases of the project. Edits to Control Sequences will be submitted to Owner and Engineer for approval. (Note: System Programmer to maintain master copy of Control Sequences).

After the witnessed software demonstration, Control Sequences will be updated with screenshots from Jacobs Lab development environment. This document will be used in preliminary operator classroom training prior to the operational test phase.

System Test Plan Development

Develop system test plans for new systems for local interlocks and remote-control functionality based on Control Sequences developed in the project. System Test Plans to be reviewed by City staff and Engineer for approval prior to Software Implementation. System Test Plans will be developed within the System Programmer Commissioning Database and will be exported into PDF format.

Blower Factory Acceptance Test

System Programmer to attend the Blower Factory Acceptance Test to verify proper construction of Blower PLC Panels and verify PLC to PLC to Wonderware communications.

Aeration Blower Building 1 PLC Factory Acceptance Test

System Programmer to attend the Aeration Blower Building PLC Factory Acceptance Test to verify proper construction of the Aeration Blower Building 1 PLC.

Deliverables

- Up to 10 preliminary process graphics
- Up to 5 preliminary custom control pop-up graphics
- Witnessed Software Demonstration notes
- Updated control sequence document
- System Test Plans (in PDF format)
- Blower Factory Acceptance Test notes, including punch list items for blower vendor
- Aeration Blower Building 1 PLC Factory Acceptance Test Notes, including punch list items for the panel fabricator.

Task 5 – Software Implementation

Install the Plant control system software additions, provide required field testing, provide Owner training, and to complete the system startup and tuning.

TopView Alarm List

Develop alarm list for the project to provide to the Owner for selecting and importing alarms into the TopView alarm notification software. Owner staff will coordinate with operations and import into TopView.

Configuration and Commissioning

- System Programmer will provide the following services for each of the subsystems listed in Table 2:
    - HMI software installation and configuration.
    - PLC software installation and configuration
- Ethernet communication configuration for (5) IO network switches.

- Ethernet communication configuration for (16) variable frequency drives (VFDs). All other VFD configuration is by others.
- Ethernet communication configuration for (40) motor starters. All other motor starter configuration is by others.
- SCADA network switch communication failure testing: network node failure testing to verify that network alarming is confirmed when a loss of communication occurs.

Testing Preparation

Prior to beginning each test phase, System Programmer will review Contractor test result submittals of each required prerequisite test to confirm systems are ready for System Programmer testing. System Programmer testing to commence no less than 2 weeks following review and approval of the Contractor's prerequisite test result submittals.

Upon completing each test phase, System Programmer will submit test results for Owner and Engineer approval and signature.

Component Test Phase

- Loop Testing as described in Section 25 08 00 3.03.G in collaboration with Contractor. Test each instrument loop as an integrated system from field instruments and controlled devices to Wonderware. I/O counts based on Section 40 95 23.10.
    - Local I/O: 182 DI, 0 DO, 62 AI, 48 AO.
    - Network I/O: 439 DI, 57 DO, 125 AI, 14 AO.
    - 1 person, 160 hours total

System Test Phase

- Process Control Strategy/Functional Testing as described in Section 25 08 00 3.04.B including debugging PLC control logic, exercising control narratives, verifying alarming functions and verifying interlocks.
    - 1 person 120 hours total
- Control System Closed Loop Testing as described in Section 25 08 00 3.04.C including PID loop tuning.
    - 1 person, 48 hours total

Operational Test Phase

Perform System Acceptance Test (SAT) as described in Section 25 08 00 3.05A.

- Each component of the system operates correctly with all other components of the system.
- Verify analog control loops operate in a stable manner.
- Verify hardwired and software equipment interlocks perform correctly.

- Verify process control sequences perform correctly.
- Verify PLC application programs performs monitoring and control functions correctly.
- Verify operator interface graphics represent the monitoring and control functions correctly.
- 1 person 80 hours total
- Operational Test Phase is considered complete when the software performs the functions as described in the process control narratives modified in Task 3.

Final Tuning

- Final tuning adjustments of all PID loops, timing sequences, and alarm setpoints.
- 1 person 40 hours total

Training

- Classroom training onsite following System Test Phase, prior to Operational Test Phase. 2 people for two 2-hour sessions (up to 8 hours total).
- Live control room training using Plant HMI and functional PLCs, after Operational Test Phase. 2 people for two 2-hour sessions (up to 8 hours total).

Deliverables

- TopView Alarm List
- Software test documentation forms for signature by an Owner representative authorized to witness and approve successful test completion.
    - Component test results
    - System test results
    - Operational test results
- Updated Wonderware HMI application
- Final PLC programs
- Final Updated Control Narrative with screenshots

Task 6 – Blower Building 2 Blower VFD

Provide PLC and HMI programming to control the new VFD being installed in Blower Building 2. This VFD is added to act as a “soft start” for Blower 2. Based on the contract drawing I-300-1002 Rev B, Dated August 2023, a new VFD is installed that will be dedicated to Blower 2. The drawing indicates this new VFD will be wired directly to the Blower 2 PLC and therefore programming updates associated with this effort would be in the vendor Blower 2 PLC.

Software Function Definition Workshop

System Programmer to lead a 1-hour workshop to define the software functions required because of the installation of the new VFD. Included in this workshop will be

discussions about the overall blower start / stop function as well as potential for using this VFD to start each of the medium voltage blowers.

Software Planning

Following the Software Function Definition Workshop, System Programmer to develop control sequence for the new VFD.

- 1 person 4 hours total

Following the Software Function Definition Workshop, System Programmer to coordinate with blower vendor to ensure they agree with proposed changes.

- 1 person 4 hours total

Software Development

System Programmer to update existing Blower 2 PLC, HMI and Wonderware programs to accommodate the swap from the existing starter to the new VFD. The development for this software will be done in the Jacobs lab, tested, and reviewed with Owner SCADA staff.

Development to include the upgrade from hardwired start/stop controls to ethernet start/stop and speed command controls.

- 1 person 40 hours total

Software Implementation

System Programmer to install updated PLC and HMI software, provide required field testing and to complete the VFD startup.

Component Test Phase

- PLC configuration and testing for Ethernet communications to the Blower Building 2 Large Blower VFD, SABB2VFD1000. VFD configuration is by others.
- Loop Testing as defined in Section 25 08 00 3.03.G in collaboration with Contractor. Test the VFD loop as an integrated system from the VFD to the Blower HMI and to Wonderware.
- 1 person 24 hours total

System Test Phase

- Process Control Strategy / Functional Testing as defined in the Software Function Definition Workshop, including debugging PLC control logic, verifying alarming functions and verifying interlocks.
- 1 person 12 hours total

Operational Test Phase

Perform System Acceptance Test (SAT) as described in Section 25 08 00 3.05A.

- Verify VFD operates correctly with all other components of the Blower system.
- Verify hardwired and software interlocks perform correctly.
- Verify process control sequences perform correctly.

- Verify PLC, HMI and Wonderware application programs performs the monitoring and control functions correctly.
- 1 person 16 hours
- Operational Test Phase is considered complete when the software performs the functions as described in the process control narratives modified in the control narratives modified in the Software Function Definition Workshop portion of this task (Task 6).

ASSUMPTIONS

While preparing our scope of services and fee schedule, we have made the following assumptions:

- Due to the System Programmer's experience and understanding of Owner's plant control system and programming standards, Section 40 98 00, Process Control Software is replaced in entirety by this scope of work.
- Any software licenses required for this project are supplied by others and are not included in this scope of work.
- System Programmer to have remote access to PLC programming software and System Platform programming software during Task 5 to allow for remote assistance for small troubleshooting tasks.
- Control functionality is based on the conformed specifications.
    - Any functionality changes proposed during workshops will be reviewed and approved by the Engineer and Owner for functionality, schedule and budget impacts before proceeding with detailed PLC and HMI programming.
    - Any functionality changes proposed during Software Development, FAT, or Implementation will be reviewed and approved by the Engineer and Owner for functionality, schedule and budget impacts before implementing the change.
    - Any functionality changes that require modification to field equipment or the construction of field equipment shall be processed with the Contractor through the Contract Modification Procedures by the Engineer or Owner as required prior to implementing the functionality change, unless directed otherwise by the Engineer and Owner.
- PLC and HMI programming for this project will be done remotely from the site, primarily in the Jacobs Boise office.
- PLC I/O to be programmed and tested is based on Section 40 95 23.10 with the addition of IO for 6 ethernet drives. Engineer, Contractor, or Owner changes to the I/O list shall be issued as an RFC. System Programmer shall have no less

than 30 working days prior to loop testing to implement each change or as agreed to in the RFC response.

- System Programmer to use the Owner standard Allen Bradley ControlLogix version 30 and Wonderware ArchestrA system platform version 2017 SP3, Update 1.
- PLC programming effort is based on using the Owner's existing add-on instructions (AOIs) similar to those used on the Lift Station SCADA Upgrade project.
    - Analog_Input_Scaling_V1 – v0.0
    - CoM_Interlock_v1 – v1.0
    - CoM_Sequencer_Start_Immediate – v0.3
    - Discrete_Alarm – v4.0
    - E300_V2 – v0.0
    - LeadLag – v1.0
    - LeadStandby – v1.0
    - Motor_Fixed_Speed_v2 – v2.0
    - Motor_VariableSpeed_v2 – v2.0
    - PIDE_Control_v1 – v0.0
    - PIDe_Override_V1_0 – v1.1
    - Sequencer_Start_Immediate_V1 – v0.0
    - Totalizer1 – v8.1
- HMI programming effort is based on using the Owner's existing System Platform object templates similar to those used on the Lift Station SCADA Upgrade project.
- Historian configuration is not required as all historicized objects will use owner standard templates that have the historian configuration already configured.
- PLC and HMI tagging format will be based on tags listed in Section 40 95 23.10.
- Programming for monitoring of vendor package systems will be similar to the methods and functions used for the existing blowers on the Meridian Liquids Project.
- Owner will use tags in Section 40 95 23.10 for entering and assigning tags within the Plant Maintenance Management System (Hansen). Owner modification of tags to be completed prior to the software development phase of the project.
- TopView modifications will add up to 600 new alarms based on new PLC programs, importing of alarms into the live TopView system will be handled by Owner.

- Onsite software testing will not begin until preliminary equipment testing has been successfully completed by the Contractor and authorization to proceed is issued to System Programmer. Preliminary testing means that all wiring is complete and tested, field instrumentation is calibrated and operational, phase rotation has been confirmed on all 3-phase powered rotating machinery, all required manufacturer's startup service is complete (including receipt of Manufacturer's Certificate of Proper Installation, where required by specification), and local manual control of all equipment has been confirmed.
- Network switches for the main SCADA ring are configured by IT.
- Factory Acceptance Test for the Blower PLC panels will not happen locally and therefore travel expenses are included. It is assumed that the Blower PLC FAT will happen in the contiguous US and only one FAT is required to cover the 3 aeration blowers and the classifying selector blower.
- Factory Acceptance Test for the new SABB1 PLC will happen locally in the Treasure Valley and therefore travel expenses for this FAT are not included.
- Test results signed by Owner and Engineer are confirmation that testing has been completed successfully. Repeat of tests following sign off or additional testing beyond what is described in this scope are not included and will be resolved using contract modification procedures described in Task 1.
- Test delays or interruptions due to Contractor, Engineer, Owners or vendors work are not included and will be resolved using contract modification procedures described in Task 1.
- Failed tests resulting from Engineer errors, Contractor errors, equipment problems or issues outside the control of the System Programmer will be submitted by the System Programmer to the Owner for resolution by the associated parties. Impacts to programming will be resolved using contract modification procedures described in Task 1.
- System Programmer is not accountable for errors and omissions in the construction contract documents. Impacts to programming will be resolved using contract modification procedures described in Task 1.
- Contractor staff will be available for coordination and assistance with field equipment during software testing.
- System Programmer will use software test documentation forms for signature by an authorized Owner representative (similar to those used for previous work executed at the WWRF by System Programmer).
- Milestone schedule is based on Owner provided start date of January 1st, 2024 and 19-month project duration.
- Temporary controls described in Section 01 50 00, or 01 57 28 are by others and are not included in this scope of work.

- Installation, testing and configuration of HVAC systems, networked telephone systems, distributed antenna system, and fire and alarm systems are by others and not included in this scope of work.
- Contractor RFIs associated with System Programmer tasks will be reviewed by System Programmer prior to Engineer issuing a response to the Contractor.
- Configuration of VFD's, smart overloads, and HACH transmitters by others.

TABLE 2: Subsystem Details

	Hardwired I/O				Network I/O			
PLC	**DI**	**DO**	**AI**	**AO**	**DIE**	**DOE**	**AIE**	**AOE**
SABB1PLC0001	132	0	46	34	306	38	107	12
SABB2PLC0001	50	0	16	14	98	14	18	2
SPBB1PLC0004	0	0	0	0	7	1	0	0
SPPS1PLC0001	0	0	0	0	28	4	0	0
SRWS1PLC0001	0	0	0	0	18	6	12	6

TABLE 3: Device List

Device	Description	Type
SABB1NWS0001	Aeration Blower Building 1 IO switch	Network Switch
SAER1NWS0001	Aeration 1 AIT IO switch	Network Switch
SAER3NWS0001	Aeration 3 AIT IO switch	Network Switch
SABB1NWS1001	Aeration Blower Building MCC IO switch	Network Switch
SAER9NWS0001	Aeration 9 AIT IO switch	Network Switch
SABB1VFD0001	Secondary Clarifier 4 Mechanism	VFD
SABB1VFD0002	Secondary Clarifier 4 Scum Pump	VFD
SABB1VFD0003	Secondary Clarifier 5 Mechanism	VFD
SABB1VFD0004	Secondary Clarifier 5 Scum Pump	VFD
SABB1VFD0005	RAS Basin Pump 1	VFD
SABB1VFD0006	RAS Basin Pump 2	VFD
SABB1VFD0007	RAS Basin Pump 3	VFD
SABB1VFD0008	RAS Basin Mixer 1	VFD
SABB1VFD0009	RAS Basin Mixer 2	VFD
SABB1VFD0010	WAS Pump 1	VFD
SABB1VFD0011	Aeration Basin 1 Internal Mixed Liquor Recycle Pump	VFD
SABB1VFD0012	Aeration Basin 2 Internal Mixed Liquor Recycle Pump	VFD
SABB1VFD0013	Aeration Basin 3 Internal Mixed Liquor Recycle Pump	VFD
SABB1VFD0014	Aeration Basin 4 Internal Mixed Liquor Recycle Pump	VFD
SABB2VFD0009	Aeration Basin 9 Internal Mixed Liquor Recycle Pump	VFD
SABB2VFD0010	Aeration Basin 10 Internal Mixed Liquor Recycle Pump	VFD

Device	Description	Type
SSCL4PMP0003	Secondary Clarifier 4 Weir Washer Pump	Motor Starter
SSCL5PMP0003	Secondary Clarifier 5 Weir Washer Pump	Motor Starter
SAER1PMP2001	Aeration Basin Drain Pump	Motor Starter
SAER1MIX1001	Aeration Basin 1 Zone 1 Mixer	Motor Starter
SAER1MIX1002	Aeration Basin 1 Zone 2 Mixer	Motor Starter
SAER1MIX1003	Aeration Basin 1 Zone 3 Mixer	Motor Starter
SAER1MIX1004	Aeration Basin 1 Zone 4 Mixer	Motor Starter
SAER1MIX1005	Aeration Basin 1 Zone 6 Mixer	Motor Starter
SAER1MIX1006	Aeration Basin 1 Zone 7 Mixer	Motor Starter
SAER2MIX1001	Aeration Basin 2 Zone 1 Mixer	Motor Starter
SAER2MIX1002	Aeration Basin 2 Zone 2 Mixer	Motor Starter
SAER2MIX1003	Aeration Basin 2 Zone 3 Mixer	Motor Starter
SAER2MIX1004	Aeration Basin 2 Zone 4 Mixer	Motor Starter
SAER2MIX1005	Aeration Basin 2 Zone 6 Mixer	Motor Starter
SAER2MIX1006	Aeration Basin 2 Zone 7 Mixer	Motor Starter
SAER3MIX1001	Aeration Basin 3 Zone 1 Mixer	Motor Starter
SAER3MIX1002	Aeration Basin 3 Zone 2 Mixer	Motor Starter
SAER3MIX1003	Aeration Basin 3 Zone 3 Mixer	Motor Starter
SAER3MIX1004	Aeration Basin 3 Zone 4 Mixer	Motor Starter
SAER3MIX1005	Aeration Basin 3 Zone 6 Mixer	Motor Starter
SAER3MIX1006	Aeration Basin 3 Zone 7 Mixer	Motor Starter
SAER4MIX1001	Aeration Basin 4 Zone 1 Mixer	Motor Starter
SAER4MIX1002	Aeration Basin 4 Zone 2 Mixer	Motor Starter
SAER4MIX1003	Aeration Basin 4 Zone 3 Mixer	Motor Starter
SAER4MIX1004	Aeration Basin 4 Zone 4 Mixer	Motor Starter
SAER4MIX1005	Aeration Basin 4 Zone 6 Mixer	Motor Starter
SAER4MIX1006	Aeration Basin 4 Zone 7 Mixer	Motor Starter
SAER9MIX1001	Aeration Basin 9 Zone 1 Mixer	Motor Starter
SAER9MIX1002	Aeration Basin 9 Zone 2 Mixer	Motor Starter
SAER9MIX1003	Aeration Basin 9 Zone 3 Mixer	Motor Starter
SAER9MIX1004	Aeration Basin 9 Zone 4 Mixer	Motor Starter
SAER9MIX1005	Aeration Basin 9 Zone 6 Mixer	Motor Starter
SAER9MIX1006	Aeration Basin 9 Zone 7 Mixer	Motor Starter
SAER10MIX1001	Aeration Basin 9 Zone 1 Mixer	Motor Starter
SAER10MIX1002	Aeration Basin 9 Zone 2 Mixer	Motor Starter
SAER10MIX1003	Aeration Basin 9 Zone 3 Mixer	Motor Starter
SAER10MIX1004	Aeration Basin 9 Zone 4 Mixer	Motor Starter

Device	Description	Type
SAER10MIX1005	Aeration Basin 9 Zone 6 Mixer	Motor Starter
SAER10MIX1006	Aeration Basin 9 Zone 7 Mixer	Motor Starter
S1FIN0PMP0003	Elutriation Water Pump	Motor Starter
SAER1AIT0001	Aeration Basin 1 DO Transmitter 1	HACH Transmitter
SAER1AIT0002	Aeration Basin 1 DO Transmitter 2	HACH Transmitter
SAER1AIT0003	Aeration Basin 1 DO Transmitter 3	HACH Transmitter
SAER1AIT0004	Aeration Basin 1 DO Transmitter 4	HACH Transmitter
SAER2AIT0001	Aeration Basin 2 DO Transmitter 1	HACH Transmitter
SAER2AIT0002	Aeration Basin 2 DO Transmitter 2	HACH Transmitter
SAER2AIT0003	Aeration Basin 2 DO Transmitter 3	HACH Transmitter
SAER2AIT0004	Aeration Basin 2 DO Transmitter 4	HACH Transmitter
SAER3AIT0001	Aeration Basin 3 DO Transmitter 1	HACH Transmitter
SAER3AIT0002	Aeration Basin 3 DO Transmitter 2	HACH Transmitter
SAER3AIT0003	Aeration Basin 3 DO Transmitter 3	HACH Transmitter
SAER3AIT0004	Aeration Basin 3 DO Transmitter 4	HACH Transmitter
SAER4AIT0001	Aeration Basin 4 DO Transmitter 1	HACH Transmitter
SAER4AIT0002	Aeration Basin 4 DO Transmitter 2	HACH Transmitter
SAER4AIT0003	Aeration Basin 4 DO Transmitter 3	HACH Transmitter
SAER4AIT0004	Aeration Basin 4 DO Transmitter 4	HACH Transmitter
SAER9AIT0001	Aeration Basin 9 DO Transmitter 1	HACH Transmitter
SAER9AIT0002	Aeration Basin 9 DO Transmitter 2	HACH Transmitter
SAER9AIT0003	Aeration Basin 9 DO Transmitter 3	HACH Transmitter
SAER9AIT0004	Aeration Basin 9 DO Transmitter 4	HACH Transmitter
SAER10AIT0001	Aeration Basin 10 DO Transmitter 1	HACH Transmitter
SAER10AIT0002	Aeration Basin 10 DO Transmitter 2	HACH Transmitter
SAER10AIT0003	Aeration Basin 10 DO Transmitter 3	HACH Transmitter
SAER10AIT0004	Aeration Basin 10 DO Transmitter 4	HACH Transmitter

TIME OF COMPLETION and COMPENSATION SCHEDULE

COMPENSATION AND COMPLETION SCHEDULE			
Task	**Description**	**Estimated Completion Date**	**Compensation**
1	Project Management	▪ 9/30/2025	$30,998.00
2	Construction Support Services	▪ 9/30/2025	$41,409.00
3	Software Planning (Phase 1)	▪ 4/1/2024	$22,194.00
4	Software Development (Phase 2)	▪ 1/15/2025	$228,465.00
5	Software Implementation (Phase 3)	▪ 9/30/2025	$84,870.00
6	Blower Building 2 VFD	▪ 7/31/2025	$22,851.00
		TASK ORDER TOTAL:	**$430,787.00**

The Not-To-Exceed amount to complete all services listed above for this Task Order No. 11230.i is (four hundred thirty thousand seven hundred eighty-seven dollars) $430,787.00. No compensation will be paid over the Not-to-Exceed amount without prior written approval by the City in the form of a Change Order. No travel or expenses will be reimbursed through this agreement. All costs must be incorporated in the individual tasks within the Compensation and Completion Schedule above.

CITY OF MERIDIAN	**JACOBS ENGINEERING GROUP INC.**
BY:_____	BY:_____
KEITH WATTS, Procurement Manager	**JEFF HODSON**
Dated:_____	Dated: 12/27/2023

City Project Manager:
Troy Thrall