



Scope of Work

City of Flagstaff

Lake Mary WTP Rehabilitation Design

July 31, 2019

Project Overview

This project includes rehabilitation of the Lake Mary Water Treatment Plant (LMWTP). LMWTP was originally constructed over 50 years ago, with many of the original structures and processes still in service. This facility is critical to meeting the City of Flagstaff's (City) water production needs. This project includes the design of improvements to the flocculation and sedimentation basins at LMWTP. Project delivery will be design-bid-build, with no pre-purchased equipment. The construction of the project requires coordination with water-system demands in order to maintain adequate supply through construction.

Some modifications have been made to the LMWTP since the original facility was installed; however, much of the equipment has been in service since 1965. In 1980, the concrete basins were capped with a layer of new concrete. In 2003, the original filters, located at the end of the sedimentation basins, were decommissioned and replaced with a new filtration facility. The filter equipment was removed and the structures abandoned in place.

The LMWTP is one of three major components of the City's drinking water supply. The plant uses conventional treatment, treating water from Upper Lake Mary and blending finished water with supplementary groundwater from the Lake Mary Wellfield. The plant capacity is rated to treat up to 8 million gallons per day (mgd), with a minimum flow of 2 mgd. The plant processes include coagulant and polymer addition, rapid mixing, flocculation and sedimentation, filtration, and ultra-violet (UV) light disinfection. Though rated at 8 mgd, the LMWTP is not operated for more than 5.5 mgd peak-day capacity. Lake Mary well water is blended with the treated surface water downstream of the UV disinfection and just upstream of the finished water reservoir. The Lake Mary wells provide an additional 3.4 mgd.

Rapid-mixing tanks are located downstream of the raw water chemical feed, but are no longer in service. Raw water flows to one of two rapid-mixing chambers and is distributed to the flocculation basin through a submerged diffuser pipe. The two-stage sedimentation process consists of two basins removing solids through gravitational settling. In the first stage, large flocculated particles settle and are collected by a rotating arm at the bottom of the basin and pumped to the sludge drying beds. Water overflows from the first basin into the second stage for additional settling, solids removal, and pumping to the drying beds. A tunnel located between the two process trains is used to house and access mechanical components of the flocculator mechanism, sludge draw-off piping, and process analyzers. Treated water is collected by a trough system at the top of the basin and conveyed to the filters.

The City does not currently use the rapid-mix systems and the plant is not equipped with static mixers. The raw water pump station is new and in good condition and was not included in this project.

Brown and Caldwell (BC) completed a condition assessment report for the LMWTP in January 2017. The scope of the condition assessment included, primarily, the rapid-mix tanks, flocculation and sedimentation basins.

The main improvements will include:

- Rapid mix improvements. Install a new static mixer on the raw water main between the current chemical dosing building and the flocculation basins
- Replacement of the flocculation/clarifier isolation valves with new motor-operated valves
- Replace flocculation basin inlet flow distribution piping
- Replacement of flocculator paddles, shaft and drive system
- Replacement of clarifier scraper mechanisms
- Replace sludge withdrawal telescoping valve systems with centrifugal pumping system; one for each collector mechanism
- Install new pH and turbidity analyzers on the settled water
- Replace square conduit interconnecting the two sides of the basin
- Replace all vertical concrete elements including equipment supports, columns and baffle walls
- Remove and replace basin concrete topping. Provide corrosion-resistant coating to all wetted surfaces

- Repair tunnel wall concrete, including removal of exposed aggregate and concrete paste to stable material with sufficient pH (>11), cleaning exposed rebar, and applying repair mortar to bring walls back to original thickness. Coat the concrete with a corrosion-resistant coating

Electrical and instrumentation improvements to bring the facility in compliance with current codes. This includes remove and replace conduit, replace outlets with GFCI outlets and/or breakers, and sealing conduit penetrations. Instrumentation will be connected to the existing programmable logic controller (PLC). This Scope of Work is based upon replacement of the existing clarifier mechanism, miscellaneous repair and refurbishment of structural elements, and upgrade or replacement of associated electrical components.

Phase 100 Project Management

Objectives:

The objectives of this task are to keep the project on schedule, stay within budget, and to deliver the Scope of Work necessary for a successful project.

Task 110 Project Control and Reporting

Specific activities under this task include:

- **Project Management Planning:** Establish the project goals, objectives and critical success factors; project team members, their roles and responsibilities; scope of services with work breakdown structure; project schedule (schedule updates will be provided in monthly progress reports if changes have been made and agreed upon by City; project budgets; communications plan; quality assurance/quality control (QA/QC) plan; project documentation plan and file structure; change management process; and Health and Safety Plan for field work, where applicable.
- **Project Control and Reporting:** Monthly invoices will be prepared and submitted to City in an approved format. Monthly project status reports will be prepared and submitted to City along with the monthly invoices. These reports will include summary of services completed since the previous report, current project schedule and budget status, project issues, and potential change logs.
- **Project Closeout:** During project closeout, BC will resolve final invoices to City, consolidate and archive project files, and meet with City to review the project performance and achievement of project objectives.

Task 120 Project Meetings

This task includes all meetings pertaining to the project that will be held on location at the City. To limit travel-related expenses, in-person attendance is generally limited to the Project Manager and Project Engineer. Other personnel will be included by teleconference. Activities include developing and distributing meeting agendas, meeting participation, and preparation and distribution of meeting notes. The following meetings are planned:

- **Project Kick-off Meeting.** The project kick-off meeting will include a review of the project objectives, success factors, Scope of Work, schedule, team roles and responsibilities, and communications. An electrical questionnaire will be provided in-advance for City notation of preferences of electrical, instrumentation, and control equipment manufacturer and method preferences. Meeting duration is expected to be 2 hours.
- **Monthly Project Progress Meetings.** A total of six monthly progress meetings are planned. Meetings will include an update on project progress and discussion of design topics requiring City input and decisions. Each meeting is expected to be 2 hours.
- **Design Review Meetings.** Will be held after the 30%, 60%, and 90% design submittals. Each meeting is expected to be 2 hours.

Phase 300 Lake Mary WTP Rehabilitation Design

Objectives:

The objectives for this Phase are to design improvements, prepare construction documents for bid advertisement and obtain necessary regulatory approvals from the Arizona Department of Environmental Quality (ADEQ) for construction.

Task 310 LMWTP Basis of Design Memorandum

- A basis of design memorandum (BODM) will be prepared in parallel with the 30% design. The BODM will define project requirements including a description of existing facilities affected by this project, process flows and performance requirements, process equipment design data, structural design criteria, electrical power supply requirements, control system requirements, access requirements, and a permitting matrix.

- One site visit for the purpose of gathering information on existing facility is included in this task. This includes one representative each from process-mechanical, structural and electrical/controls disciplines.

Task 320 LMWTP Preliminary (30%) Design

Subtask 025 Civil Engineering and Design

- Development of preliminary grading and yard piping drawings

Subtask 030 Structural Engineering and Design

- Identify building materials and structural requirements

Subtask 035 Process Mechanical Engineering and Design

- Select major equipment and prepare design data sheets
- Prepare preliminary layout drawings

Subtask 040 Building Mechanical Engineering and Design (Not Used)

Subtask 045 Electrical Engineering and Design

- Preliminary design including:
 - Investigate and determine size of service required
 - Determine size and requirements of existing equipment
 - Review size/location of buildings and equipment to develop a site plan and understand the physical size constraints within the existing building
 - Develop preliminary single-line diagram to include new equipment

Subtask 50 I&C Engineering and Design

- Evaluate existing equipment to determine useful life and/or develop a list of instrumentation required to be installed new to either replace existing or to be added as new to the process for control
- Develop preliminary Process and Instrumentation Diagrams (P&ID)s as created by Mechanical based on existing information provided by the City.

Subtask 055 Design Coordination

- Coordinate design efforts, including coordination of drawings and specifications

Subtask 080 Cost Estimating and Scheduling

A Class 3 construction cost estimate will be prepared based on the preliminary design documents. A Class 3 estimate is based on a minimum level of design (10% to 40% complete) and has an expected accuracy from 10 to 20% under and 10 to 30% over, largely depending on the level of project definition available.

Subtask 085 Quality Control Reviews

BC will perform internal quality QA/QC activities to obtain expert guidance on project methodology and criteria, review project deliverables, and perform checks of engineering calculations and cost estimates. QA/QC staff will consist of senior-level engineers who are not otherwise involved in the day-to-day project activities. The QC review team roles include: civil, structural, process-mechanical, electrical, instrumentation and controls disciplines; interdisciplinary coordination, and CAD standards. The Project Manager assures that review comments are addressed and properly incorporated into the deliverables prior to submittal to the City.

Task 330 LMWTP Intermediate (60% Design)

Subtask 025 Civil Engineering and Design

- Update grading and yard piping drawings

Subtask 030 Structural Engineering and Design

- Prepare preliminary structural calculations
- Prepare foundation and roof plans
- Prepare major wall sections

Subtask 035 Process Mechanical Engineering and Design

- Update layouts and sections
- Prepare details
- Prepare major equipment specifications

Subtask 040 Building Mechanical Engineering and Design (Not Used)**Subtask 045 Electrical Engineering and Design**

- Develop details for installation of equipment
- Update the single-line diagram and power-load summary
- Develop control single-line diagrams
- Develop electrical plan drawings
- Develop schematic diagrams for motor control centers (MCCs)
- Develop specifications for major electrical equipment

Subtask 050 I&C Engineering and Design

- Develop preliminary control strategies.

Subtask 055 Design Coordination

- Coordinate design efforts, including coordination of drawings and specifications

Subtask 080 Cost-Estimating and Scheduling

- The preliminary design cost estimate will be updated to a Class 2 construction cost estimate based on the intermediate design documents. A Class 2 estimate is based on a minimum level of design (30% to 75% complete) and has an expected accuracy from 5 to 15% under and 5 to 20% over, largely depending on the level of project definition available.
- A preliminary construction schedule will be prepared and submitted with the intermediate construction cost estimate.

Subtask 085 Quality Control Reviews

See Task 220, Subtask 085.

Task 340 LMWTP Final Design

The final design includes completion and coordination of the design details. The 90% drawing and specification package will be submitted to ADEQ for technical review, followed by submittal of final documents to the City once technical review comments are resolved.

Subtask 025 Civil Engineering and Design

- Complete final details
- Prepare earthwork and yard piping specifications

Subtask 030 Structural Engineering and Design

- Prepare general notes and typical details
- Complete structural calculations
- Complete structural details
- Prepare concrete, masonry, structural metal work, roofing and related specifications

Subtask 035 Process Mechanical Engineering and Design

- Complete details
- Complete major equipment specifications
- Complete piping, valve and other process related materials specifications

Subtask 040 Building Mechanical Engineering and Design (Not Used)**Subtask 045 Electrical Engineering and Design**

- Update existing documentation generated during the 60% design to bring the design to a final deliverable based on review comments provided.

Subtask 050 I&C Engineering and Design

- Update existing documentation generated during the 60% design to bring the design to a final deliverable based on review comments provided.

Subtask 055 Design Coordination

- Coordinate design efforts including coordination of drawings and specifications
- Finalize general drawings and project requirement specifications
- Incorporate agency review comments
- Prepare final drawings for bid advertisement, including registered professional engineer seals and signatures

Subtask 075 Permitting and Agency Coordination

The BODM and final design documents will be submitted to ADEQ for technical review and Approval to Construct. BC will prepare application forms and deliver the required number of copies to ADEQ, document and respond to review comments, and obtain the approval signatures for drawings.

Subtask 080 Cost-Estimating and Scheduling

- The intermediate design cost estimate will be updated to a Class 1 construction cost estimate based on the final design documents. A Class 1 estimate is based on a minimum level of design (65% to 100% complete) and has an expected accuracy from 3 to 10 % under and 3 to 15% over, largely depending on the level of project definition available.
- The preliminary construction schedule will be updated and submitted with the final construction cost estimate.

Subtask 085 Quality Control Reviews

See Task 320, Subtask 085.

Deliverables:

All deliverables will be made in electronic form. Draft submittals will be made in PDF format. Final submittals will be in PDF and native file format (Microsoft Word, AutoCAD). The LMWTP design effort includes the following submittals.

- LMWTP Basis of Design Memorandum, draft and final
- LMWTP Preliminary (30%) drawings and specifications.
- LMWTP Intermediate (60%) drawings and specifications.
- LMWTP Final (90%) drawings and specifications.
- LMWTP Approved for Construction/Bid Ready drawings and specifications, including a bid form (template provided by City) and Special Provisions (if required)
- LMWTP Class 3 Engineer's Estimate of Construction Cost at Preliminary Design
- LMWTP Class 2 Engineer's Estimate of Construction Cost at Intermediate Design
- LMWTP Class 1 Engineer's Estimate of Construction Cost at Final Design

Summary of Assumptions

The following assumptions apply to the Scope, budget and schedule for this project.

- Design includes preliminary evaluation only for the addition of pH control for enhanced coagulation. Should the Owner decide to include a new pH control system, a contract amendment will be required.
- Design efforts include 2 days per discipline lead for field investigations.
- The City will provide access to the facilities for field investigations.
- The City will provide all drawings, operation and maintenance (O&M) information and data required by Engineer to complete the work.
- The City will coordinate development and plan reviews and arrange for payment of review fees.
- An allowance of \$3,000 is included for ADEQ technical review.
- The schedule is based on a 30 day review by ADEQ.
- The City will facilitate coordination with the US Forest Service.
- The City will review draft deliverables within 2 weeks of submittal. Design Review Meetings will be scheduled as soon as practical following the 2-week review period.

- Drawings will be prepared in 2D AutoCAD format using BC drafting standards.
- No drainage reports will be prepared.
- The design does not include telemetry for remote communication with the facilities. Existing telemetry systems will be utilized.
- Project Meeting budgets include travel time and expenses
- No design will be provided to replace/improve existing aging electrical and controls equipment/conduit/wiring not related to the equipment defined in this Scope.
- As determined during the separate LMWTP Conditional Assessment, electrical power distribution and MCC equipment has been replaced by others. Equipment is assumed to have been replaced and has sufficient capacity for modifications to power for new and replacement process equipment. Addition or replacement of switchboards, transformers, panelboards, and MCCs is not included. Electrical testing of existing power distribution and MCC equipment is not included.
- LMWTP conduit and wire for replacement equipment will be replaced. Any cable trays utilized for replacement circuits that are not grounded will be grounded.
- Electrical and instrumentation improvements to bring the existing LMWTP equipment into compliance with current codes is not included.
- Existing LMWTP equipment and lighting electrical conduit and wire will be specified to be replaced in-kind except per current codes.
- The existing LMWTP Supervisory Control and Data Acquisition (SCADA) system is capable of accepting additional input/output modules for new process equipment signals.
- LMWTP design does not include addition or modification to the following: Lighting; video surveillance; security system; fire alarm or control systems; site or equipment access control systems; telephone system; cathodic protection; or lightning protection (air terminal) system.
- Arc flash hazard and short circuit studies, overcurrent protection device settings, and arc flash hazard labeling will be specified to be provided by the Contractor.
- Instrumentation and control-loop diagrams will be specified to be provided by the SCADA supplier.
- Electrical and control interconnect diagrams showing connections between equipment are not included.
- Electrical schematic diagrams will be generic but include control logic to function as required. Equipment manufacturers will be required to submit detailed diagrams with terminal numbers, wire numbers, nameplate schedules, etc.
- Electrical and control circuit wiring, cables, and conduit to be shown on single-line and control single-line diagrams. Cable and conduit schedules are not required or included.
- SCADA PLC drawings will be examples for layout, equipment, and each type of input and output module. Contractor's control system integrator will be required to provide detailed SCADA or PLC drawings with terminal numbers, wire numbers, nameplate schedules, etc. Any recent City drawings available from O&M manuals may be included as reference drawings to depict detail and equipment preferences.
- PLC and SCADA system control and graphics programming is not included (such services may be provided under separate contract upon City request).
- No software, software licenses, hardware, or hardware keys are provided with this Scope of Work.
- Services during Bid Phase (pre-bid meeting, addenda, conformed to bid drawings and specs) are not included, but may be added at the City's option.
- Engineering services during construction will be under separate contract.

Summary of Deliverables

- Monthly invoices and progress reports
- Meeting agendas, handouts and meeting notes
- LMWTP BODM, draft and final
- LMWTP Preliminary (30%) drawings and specifications
- LMWTP Intermediate (60%) drawings and specifications
- LMWTP Final (90%) drawings and specifications
- LMWTP Approved for Construction/Bid Ready drawings and specifications, including a bid form (template provided by City) and Special Provisions (if required)

- LMWTP Class 3 Engineer's Estimate of Construction Cost at Preliminary Design
- LMWTP Class 2 Engineer's Estimate of Construction Cost at Intermediate Design
- LMWTP Class 1 Engineer's Estimate of Construction Cost at Final Design

Compensation

Compensation will be on a time-and-materials, not-to-exceed basis. The level of effort is presented in Exhibit B. This level of effort is based on the scope defined herein and the preliminary drawing list presented in Exhibit C.

Reimbursable Expenses

Reimbursable expenses have been identified for this assignment as follows:

- Travel expenses for travel from outside Coconino County
- Document reproduction, scanning and digitizing
- Reimbursements will not contain markups

Schedule

The project schedule is given in Exhibit D and includes the design for both sites conducted concurrently. The final bid-ready documents are scheduled to be delivered 9 months from Notice to Proceed.

Exhibit B
Flagstaff, City of (AZ) -- Lake Mary WTP Floc Sed Basin Rehab
Level of Effort

	Project Management and Administration						Senior Technical Advisors and Quality Control Team					Engineering Design Team						CAD and Editing				Cost Estimating and Scheduling			Total Labor Effort	Total Expense Effort	Total Effort	
	Abin, Ronald L	McCandless, Robert R	Muller, Theresa C	Houston, Susan C	Bongiovanni, Lewis Nicole M	Williams, Jeremy	Stamisc, Dusan	Guirguis, Michael M	Chandler, Kenneth W	Troyer, Raymond D	Vanyo, Catherine S	Falken, Eric J	Murphy, Peter N	Foote, Franklin R	Moraca, Patrick M	Nys, Dillon	Pedroza, Sergio C	Resop, Christopher J	Jacobsen, Jennifer L	Rogers, Connie J	Goodburn, Daniel L	Agster, William P	Shroyer, David W					
100 Project Management	\$260.00	\$260.00	\$175.00	\$91.00	\$91.00	\$260.00	\$199.00	\$199.00	\$199.00	\$175.00	\$145.00	\$199.00	\$121.00	\$121.00	\$145.00	\$111.00	\$145.00	\$145.00	\$111.00	\$91.00	\$199.00	\$199.00	\$175.00	0	\$ 51,484	\$ 3,550	\$ 55,034	
110 Project Plan, Control & Reporting	2	62	10	40	20	0	0	0	0	0	148	14	14	14	0	0	0	0	0	0	0	0	0	0	0	\$ 15,530	\$ -	\$ 15,530
120 Project Progress Meeting	0	32	0	0	0	0	0	0	0	0	148	14	14	14	0	0	0	0	0	0	0	0	0	0	0	\$ 35,954	\$ 3,000	\$ 38,954
310 LMWTP Basis of Design	0	4	0	0	0	2	0	0	0	0	16	8	8	8	0	32	0	0	8	8	0	0	0	0	\$ 12,576	\$ -	\$ 12,576	
**** Default Task	0	4	0	0	0	2	0	0	0	0	16	8	8	8	0	32	0	0	8	8	0	0	0	0	0	\$ 12,576	\$ -	\$ 12,576
320 LMWTP Preliminary Design	0	6	0	0	0	8	6	5	34	21	98	64	44	66	16	80	118	56	0	0	40	3	5	\$ 102,388	\$ 5,750	\$ 108,138		
025 Civil Engineering & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	\$ 2,320	\$ 5,000	\$ 7,320
030 Structul Eng/ Design	0	0	0	0	0	0	0	0	0	11	0	64	0	0	0	52	0	0	0	0	0	0	0	0	0	\$ 22,201	\$ -	\$ 22,201
035 Process-Mechanical Eng. & Design	0	0	0	0	0	0	0	0	0	0	80	0	0	0	0	80	66	0	0	0	0	0	0	0	0	\$ 30,050	\$ -	\$ 30,050
040 Building Mechancial Eng. & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ -	\$ -	\$ -
045 Electrical Engineering & Design	0	0	0	0	0	0	0	0	12	0	0	0	0	66	0	0	0	36	0	0	0	0	0	0	0	\$ 15,594	\$ -	\$ 15,594
050 I & C Engineering & Design	0	0	0	0	0	0	0	0	6	0	0	0	44	0	0	0	0	20	0	0	0	0	0	0	0	\$ 9,418	\$ -	\$ 9,418
055 Design Coordination	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ 1,450	\$ 750	\$ 2,200
080 Cost Estimating & Scheduling	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	40	3	5	\$ 9,952	\$ -	\$ 9,952		
085 Quality Control	0	4	0	0	0	8	6	5	16	10	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ 11,403	\$ -	\$ 11,403
330 LMWTP Intermediate Design	0	6	0	0	0	8	0	5	34	21	82	64	44	66	16	80	156	20	0	18	20	4	6	\$ 97,196	\$ -	\$ 97,196		
025 Civil Engineering & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	3	0	0	0	0	0	0	\$ 2,593	\$ -	\$ 2,593
030 Structul Eng/ Design, Geotech Allow	0	0	0	0	0	0	0	0	0	11	0	64	0	0	0	52	0	0	7	0	0	0	0	0	0	\$ 22,838	\$ -	\$ 22,838
035 Process-Mechanical Eng. & Design	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	80	68	0	0	8	0	0	0	0	0	\$ 28,748	\$ -	\$ 28,748
040 Building Mechancial Eng. & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ -	\$ -	\$ -
045 Electrical Engineering & Design	0	0	0	0	0	0	0	0	12	0	0	0	0	66	0	0	36	0	0	0	0	0	0	0	0	\$ 15,594	\$ -	\$ 15,594
050 I & C Engineering & Design	0	0	0	0	0	0	0	0	6	0	0	0	44	0	0	0	0	20	0	0	0	0	0	0	0	\$ 9,418	\$ -	\$ 9,418
055 Design Coordination	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ 1,450	\$ -	\$ 1,450
080 Cost Estimating & Scheduling	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	4	6	\$ 6,346	\$ -	\$ 6,346		
085 Quality Control	0	4	0	0	0	8	0	5	16	10	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ 10,209	\$ -	\$ 10,209
340 LMWTP Final Design	0	8	0	0	0	8	8	5	26	21	90	64	44	66	16	88	120	56	0	32	18	2	12	\$ 101,292	\$ -	\$ 101,292		
025 Civil Engineering & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0	0	0	3	0	0	0	0	0	0	\$ 2,593	\$ -	\$ 2,593
030 Structul Eng/ Design, Geotech Allow	0	0	0	0	0	0	0	0	0	11	0	64	0	0	0	52	0	0	7	0	0	0	0	0	0	\$ 22,838	\$ -	\$ 22,838
035 Process-Mechanical Eng. & Design	0	0	0	0	0	0	0	0	0	0	64	0	0	0	0	80	68	0	0	6	0	0	0	0	0	\$ 28,566	\$ -	\$ 28,566
040 Building Mechancial Eng. & Design	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ -	\$ -	\$ -
045 Electrical Engineering & Design	0	0	0	0	0	0	0	0	10	0	0	0	0	66	0	0	36	0	10	0	0	0	0	0	0	\$ 16,106	\$ -	\$ 16,106
050 I & C Engineering & Design	0	0	0	0	0	0	0	0	4	0	0	0	44	0	0	0	0	20	0	6	0	0	0	0	0	\$ 9,566	\$ -	\$ 9,566
055 Design Coordination	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ 1,450	\$ -	\$ 1,450
075 Permitting/Agency Coordination	0	2	0	0	0	0	0	0	0	0	8	0	0	0	0	8	0	0	0	0	0	0	0	0	0	\$ 2,568	\$ -	\$ 2,568
080 Cost Estimating & Scheduling	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18	2	12	\$ 6,600	\$ -	\$ 6,600		
085 Quality Control	0	4	0	0	0	8	8	5	12	10	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$ 11,005	\$ -	\$ 11,005
GRAND TOTAL	2	86	10	40	20	26	14	15	94	63	434	214	154	220	48	280	394	132	8	58	78	9	23	\$ 364,936	\$ 9,300	\$ 374,236		

Lake Mary WTP Floc/Sed Basin Rehabilitation

Drawing List

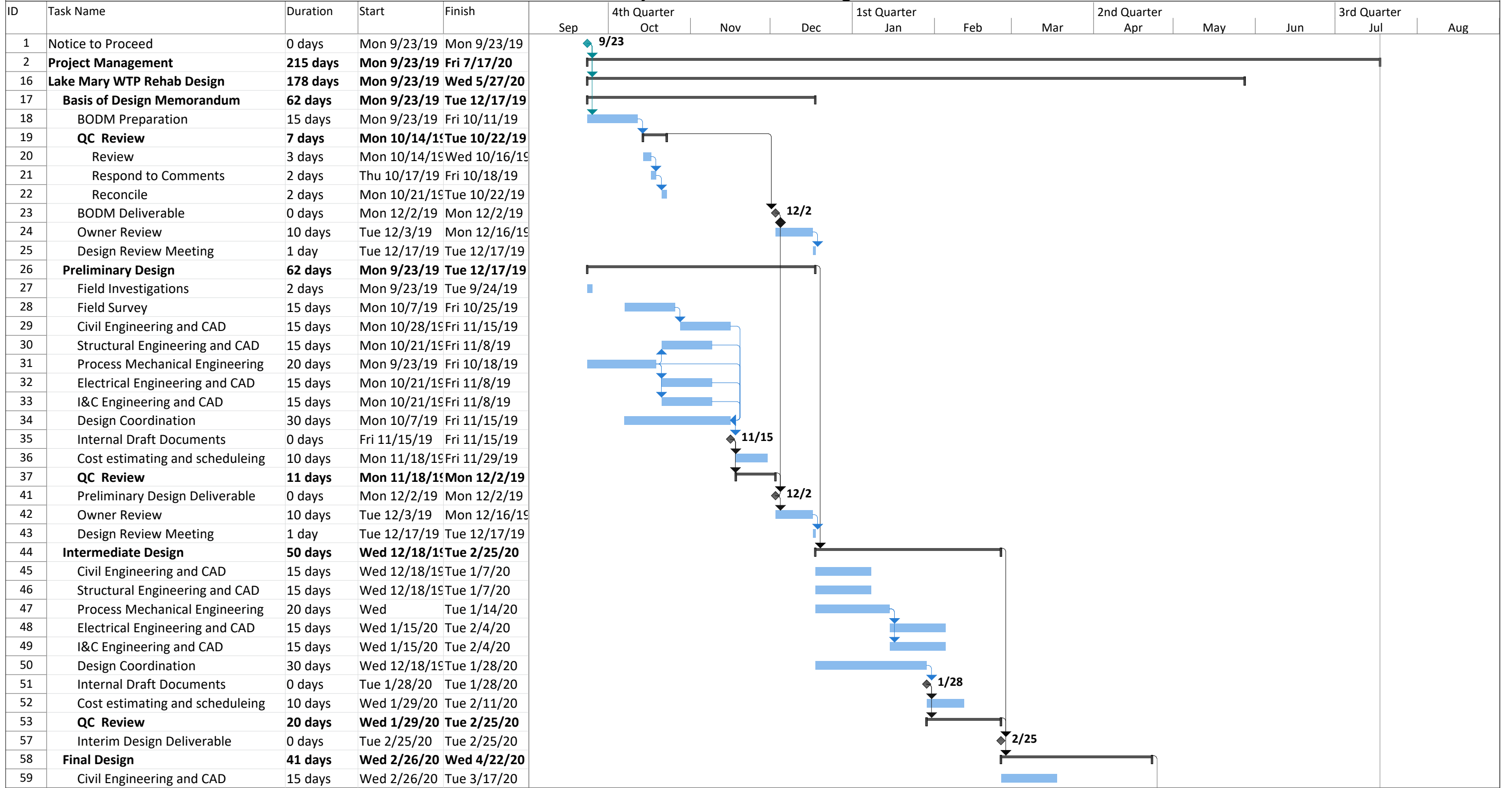
Sheet Number	Drawing Number	Drawing Title
1	-	
2	G-001	COVER
3	G-002	DRAWING INDEX - 1
4	G-003	LOCATION AND VICINITY MAP AND TYPICAL DRAWING CONVENTION
5	G-004	SYMBOLS AND ABBREVIATIONS
6	G-005	PIPING SYMBOLOGY
7	G-006	SITE PLAN
8	G-007	PROCESS FLOW DIAGRAM
9	G-008	HYDRAULIC PROFILE
10	C-001	PAVING AND GRADING STANDARD DETAILS
11	C-002	YARD PIPING STANDARD DETAILS - 1
12	C-003	YARD PIPING STANDARD DETAILS - 2
13	C-003	PAVING AND GRADING
14	C-004	YARD PIPING
15	C-005	PIPE PROFILES
16	S-001	GENERAL NOTES
17	S-002	SPECIAL INSPECTION TABLES
18	S-003	STANDARD DETAILS - 1
19	S-004	STANDARD DETAILS - 2
20	S-005	STANDARD DETAILS - 3
21	S-006	STANDARD DETAILS - 4
22	S-007	STANDARD DETAILS - 5
23	S-008	STANDARD DETAILS - 6
24	S-009	RAPID MIXING VAULT TOP AND BOTTOM PLAN
25	S-010	RAPID MIXING VAULT SECTIONS AND DETAILS
26	S-011	FLOCCULATION AND SEDIMENTATION BASIN OVERALL PLAN
27	S-012	STRUCTURAL REHABILITATION DETAILS
28	S-013	STRUCTURAL REHABILITATION DETAILS
29	S-014	STRUCTURAL REHABILITATION DETAILS
30	S-015	STRUCTURAL REHABILITATION DETAILS
31	S-016	STRUCTURAL REHABILITATION DETAILS
32	M-001	STANDARD SYMBOLS AND NOTES
33	M-002	PIPE GUIDES, HANGERS, SUPPORTS AND SEISMIC RESTRAINT SYSTEMS
34	M-003	PIPE GUIDES AND HANGERS - 1
35	M-004	STRUCTURAL ATTACHMENTS AND PIPE SUPPORT ASSEMBLIES - 1
36	M-005	EQUIPMENT ANCHORS AND PADS
37	M-006	PIPE PENETRATION DETAILS AND NOTES
38	M-007	MISCELLANEOUS DETAILS
39	M-008	STATIC MIXER VAULT - PLAN, SECTION AND DETAILS
40	M-009	FLOCCULATION/CLARIFIER ISOLATION VALVES - PLAN AND SECTIONS
41	M-010	FLOCCULATION BASIN 1 - PLAN AND SECTION
42	M-011	FLOCCULATION BASIN 2 - PLAN AND SECTION
43	M-012	FLOCCULATION BASINS - DETAILS
44	M-013	SEDIMENTATION BASIN 1 - PLAN AND SECTION
45	M-014	SEDIMENTATION BASIN 2 - PLAN AND SECTION
46	M-015	SEDIMENTATION BASIN 2 - DETAILS

Lake Mary WTP Floc/Sed Basin Rehabilitation

Drawing List

Sheet Number	Drawing Number	Drawing Title
47	M-016	SLUDGE PUMPS - PLAN AND SECTION
48	M-017	SLUDGE PUMPS - DETAILS
49	E-001	SYMBOLS AND ABBREVIATIONS / NOTES
50	E-002	STANDARD DETAILS - 1
51	E-003	STANDARD DETAILS - 2
52	E-004	STANDARD DETAILS - 3
53	E-005	STANDARD DETAILS - 4
54	E-010	RAW WATER MCC ONE LINE DIAGRAM
55	E-011	FLOC / SED BASIN MCC ONE LINE DIAGRAM
56	E-012	MCC LOAD SUMMARIES / PANEL SCHEDULES -1
57	E-013	MCC LOAD SUMMARIES / PANEL SCHEDULES -2
58	E-101	RAW WATER AREA - PARTIAL SITE PLAN
59	E-102	FLOCCULATION BASIN 1 - PARTIAL SITE PLAN POWER / LIGHTING
60	E-103	FLOCCULATION BASIN 2 - PARTIAL SITE PLAN POWER / LIGHTING
61	E-104	SEDIMENTATION BASIN 1 - PARTIAL SITE PLAN POWER / LIGHTING
62	E-105	SEDIMENTATION BASIN 2 - PARTIAL SITE PLAN POWER / LIGHTING
63	E-106	CHEMICAL INJECTION AND RAPID MIX - PARTIAL SITE PLAN POWER / LIGHTING
64	E-107	CONTROL SINGLE LINE DIAGRAM - 1
65	E-108	CONTROL SINGLE LINE DIAGRAM - 2
66	E-109	SCHEMATIC DIAGRAMS - 1
67	E-110	SCHEMATIC DIAGRAMS - 2
68	I-001	SYMBOLS AND ABBREVIATIONS / NOTES
69	I-002	FLOCCULATION BASIN P&ID
70	I-003	SEDIMENTATION BASIN P&ID
71	I-004	CHEMICAL INJECTION AND RAPID MIX P&ID
72	I-005	RTU PANEL LAYOUT / BOM

Lake Mary WTP Rehabilitation Design Schedule



Project: Schedule_LMWTP Only	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only		Manual Progress	
	Summary		Inactive Task		Duration-only		Finish-only			

Lake Mary WTP Rehabilitation Design Schedule

ID	Task Name	Duration	Start	Finish	Sep	4th Quarter			1st Quarter			2nd Quarter			3rd Quarter	
						Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
60	Structural Engineering and CAD	15 days	Wed 2/26/20	Tue 3/17/20												
61	Process Mechanical Engineering	15 days	Wed 2/26/20	Tue 3/17/20												
62	Electrical Engineering and CAD	15 days	Wed 3/18/20	Tue 4/7/20												
63	I&C Engineering and CAD	15 days	Wed 3/18/20	Tue 4/7/20												
64	Design Coordination	30 days	Wed 2/26/20	Tue 4/7/20												
65	Internal Draft Documents	0 days	Tue 4/7/20	Tue 4/7/20												
66	Cost estimating and scheduleing	10 days	Wed 4/8/20	Tue 4/21/20												
67	QC Review	11 days	Wed 4/8/20	Wed 4/22/20												
71	Final Design Deliverable	0 days	Wed 4/22/20	Wed 4/22/20												
72	ADEQ Technical Review	25 days	Wed 4/22/20	Wed 5/27/20												
73	Initial Submittal	0 days	Wed 4/22/20	Wed 4/22/20												
74	ADEQ Review	20 days	Thu 4/23/20	Wed 5/20/20												
75	Comment review and response	5 days	Thu 5/21/20	Wed 5/27/20												
76	Notice of Approval To Construct	0 days	Wed 5/27/20	Wed 5/27/20												
77	Deliver Bid Ready Documents	0 days	Wed 5/27/20	Wed 5/27/20												

Project: Schedule_LMWTP Only	Task		Project Summary		Inactive Milestone		Manual Summary Rollup		Deadline	
	Split		External Tasks		Inactive Summary		Manual Summary		Progress	
	Milestone		External Milestone		Manual Task		Start-only		Manual Progress	
	Summary		Inactive Task		Duration-only		Finish-only			