

CONSULTANT WORK ORDER

Date:	9/2/2025
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1. PROJECT INFORMATION:

Project Title:	Marshall Street WRF Sand Filter Rehabilitation
City Project Number:	25-0008-UT
City Plan Set Number:	NA
Consultant Project Number:	200-BPClearwater

2. SCOPE OF SERVICES:

The City of Clearwater (City) has requested assistance from Tetra Tech (Consultant) in rehabilitating the effluent filters at the City's Marshall Street Water Reclamation Facility (MS WRF). The MS WRF is located at 1605 Harbor Drive, Clearwater, FL 33755 and has a permitted (Facility ID FL0021857) treatment capacity of 10.0 million gallons per day (MGD).

The MS WRF effluent filtration system includes twelve (12) filter cells constructed of poured-in-place concrete. The system employs the Hydro Clear® pulsed-bed sand filter process.

Consultant's scope of services is based on the following considerations:

- Work completed under this scope of services will be based on the level of detail and scope of work of similar filter rehabilitation projects previously completed by the City. Reference projects are the Marshall Street WRF Sand Filter Rehab (City Project #20-0011-UT), East WRF Effluent Filter Rehabilitation (City Project #13-0014-UT), Northeast WRF Sand Filter Rehabilitation (City Project #23-0045-UT) and the Northeast WRF Effluent Sand Filter Repairs Project (City Project #18-0019-UT).
- As mentioned under Section 2.1 of this Scope, work completed under this scope of services will be based upon the inspection report prepared by Evoqua.
- Consultant's scope of services is based on a Design-Bid-Build (DBB) delivery method.

The Consultant visited the MS WRF facility on June 12, 2025, to meet with City staff, observe existing conditions, and discuss the City's desired improvements to the effluent filters. Based on these site visits and information provided by the City, the current system deficiencies include:

- The underdrains for all twelve (12) sand filters have some degree of failure leading to media loss.

- One (1) pneumatic actuator has failed necessitating replacement.
- Yokes on seven (7) pneumatic actuators are severely corroded necessitating replacement.
- Flange bolts on one (1) butterfly valve are extremely corroded, necessitating replacement.
- One (1) butterfly valve requires repacking to stop leakage at the shaft.
- Level sensors for all twelve (12) filter bays should be replaced due to age, condition, and functionality.
- The touch screen in the main filter control panel should be replaced with an updated unit having improved graphics and functionality to allow local initiation of backwash and manual control of other functions.
- The SCADA interface in the filter control room needs to be upgraded to facilitate total local control of the filtration system.

Consultant's proposed scope of services to address refurbishment of the effluent filters follows. The Filter Equipment Manufacturer (Evoqua, a Xylem brand) shall inspect and recommend the filter equipment and components that shall be replaced or rehabilitated during construction. The general scope for refurbishment of the effluent filters will include the following:

1. Removal of all filter media and subsequent on-site media washing/preparation (if cost effective) for reuse of media in combination with new material to restore proper media depth.
2. Cleaning of all filter cells to facilitate a thorough evaluation of the underdrain components and identification of needed rehabilitation efforts.
3. Rehabilitation of filter underdrains as recommended by the Filter Equipment Manufacturer (Evoqua). This includes various components such as grating, seal strips, screens, steel beams, angles and channels, as well as fasteners.
4. Replacement of one (1) pneumatic valve actuator, seven (7) actuator yokes, and one (set) of flange bolts.
5. Repack one (1) butterfly valve.
6. Replacement of twelve (12) filter level sensors.
7. Improvements to instrumentation facilities including:
 - Replacement of the touch screen for the main filter control panel with an updated unit having improved graphics and functionality to allow local initiation of backwash and manual control of other functions.
 - Upgrading the SCADA interface in the filter control room to facilitate total local control of the filtration system

Other improvements, replacements, or repairs to address other deficiencies are not included in this scope of work and will either be performed in-house by the City or under a different scope of services.

Task 1 – Meetings & Administration

1.1: Project Administration

Consultant will perform project coordination and management activities between Consultant and the City. Consultant will prepare progress reports and invoices to be submitted monthly. It is anticipated that eighteen (18) progress reports/invoices will be prepared/submitted. Each progress report will include schedule and budget updates for each project task.

1.2: Project Kickoff Meeting

Consultant will coordinate and attend a project kick off meeting to discuss the project goals, introduce key team members, establish lines of communication and roles. Consultant will prepare an agenda and minutes summarizing the meeting discussions, decisions made, tasks delegated, deadlines, and action items required by participants.

1.3: Progress Meetings

Consultant will coordinate and attend periodic project progress meetings to discuss progress and identify issues to be addressed. Consultant will prepare meeting agendas, milestone schedules, and minutes for each meeting. Each meeting will be attended by the Project Manager or designee as well as other team members as needed per the topics of discussion. It is anticipated that four (4) design progress meetings will be held virtually over Teams. Construction progress meetings and specialty site visits are provided under Section 8.

1.4: Design Review Meetings

Consultant will coordinate and attend design review meetings to discuss design progress and identify issues to be addressed. Consultant will prepare meeting agendas and minutes for each meeting. Each meeting will be attended by the Project Manager or designee as well as other team members as needed per the topics of discussion. It is anticipated that two (2) design review meetings will be held virtually over Teams.

1.5: Health and Safety Plan

Consultant will develop a project specific health and safety plan (HASP) for use by Consultant and its subconsultants. The HASP will be provided to the City upon request.

Task 2 – Final Design

Final Design will be based on providing plan, section and details for a complete filter rehabilitation as described above. Filter specific requirements for each filtration unit will be determined during an inspection from the Filter Manufacturer (Evoqua) when the filters are removed from service, drained and cleaned. The rehabilitation drawings will clearly depict the improvement described above (page 2, Items 1 through 7).

2.1: Evoqua Filter Rehab Inspection Report

Consultant will review the inspection report prepared by Evoqua that is based on an inspection that was conducted on November 21, 2024. Consultant will rely on the inspection report prepared Evoqua as the basis of design. The Evoqua report is provided under **Exhibit A**.

2.2: Site Visit

Consultant's Project Manager and process design engineer will conduct one (1) site visit during design to discuss the project and observe existing conditions.

Consultant's Project Manager and instrumentation engineer will conduct one (1) site visit to verify existing equipment and software and refine the scope of instrumentation improvements.

2.3: Data Collection

Consultant will review existing documents, including:

- Documents related to the previously completed Marshall Street and NE WRF filter rehabilitation projects.

2.4: Technical Specifications

Consultant will prepare the supplemental technical specifications required for the project. See list of anticipated Supplemental Technical Specifications (Section IVa). Consultant will update and revise the Supplemental Technical Specifications prepared for the Northeast WRF Sand Filters Rehabilitation (City Project #23-0045-UT).

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<u>Section</u>	<u>Title</u>
<u>DIVISION 1 – GENERAL REQUIREMENTS</u>	
01005	Project Requirements
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01041	Project Coordination
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01100	Special Project Procedures
01200	Project Meetings
01310	Construction Progress Schedules
01340	Shop Drawings, Working Drawings, and Samples
01370	Schedule of Values
01505	Mobilization and Demobilization
01600	Material and Equipment
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DIVISION 3 – CONCRETE

03930 Existing Concrete Structures Repair

DIVISION 11 – EQUIPMENT

11366 Sand Filters

DIVISION 13 – SPECIAL CONSTRUCTION

13300 Instrumentation

DIVISION 15 – MECHANICAL

15000 Mechanical - General Requirements
15050 Pipe, Valves, Fittings, & Appurtenances

The City will provide the additional project contract documents as deemed applicable. These may include an Advertisement of Bids and Notice to Contractors (Section I), Instructions to Bidders (Section II), General Conditions (Section III), Technical Specifications (Section IV), and Contract Documents (Section V).

Consultant's design submittals are defined as follows:

- 75% supplemental technical specifications submittal. A review meeting will be held following the submission.
- 100% supplemental technical specifications submittal will consist of further development of the 75% supplemental technical specifications and revisions to address 75% review comments from the City. A review meeting will be held following the submission.

The supplemental technical specifications will be formatted in accordance with City Standards and prepared using Microsoft Word and PDF for each review submittal.

2.5: Final Design Drawings

Consultant will prepare Construction Plans/Drawings required for the project. Consultant will provide level of detail similar to the Bid Documents prepared for the NE WRF Sand Filters Rehabilitation (City Project #23-0045-UT).

The following drawings are anticipated:

1. Cover Sheet with Sheet Index and Location Map
2. General Notes and Legend

3. Overall Facility Site Plan
4. Structural General Notes
5. Structural Concrete Repair Details (2 sheets)
6. Filter Rehabilitation Upper Plan
7. Filter Rehabilitation Lower Plan
8. Filter Rehabilitation Sections
9. Filter Rehabilitation Details (3 sheets)
10. Detail Sheets (2 sheets)
11. Instrumentation Improvements (3 sheets)

Consultant will prepare the final design drawings required for the project. Consultant's design submittals are defined as follows:

- 75% design drawings submittal will consist of development of the design drawings.
- 100% design drawings submittal will consist of further development of the 75% design drawings and revisions to address 75% review comments from the City.

The design drawings will be formatted in accordance with City Standards and prepared using AutoCAD and provided in PDF format for each review. Full scale drawings will be 24x36". A review meeting will be held following each submission.

Task 3 – Permitting

3.1: City of Clearwater – Building Permits

No building permits are anticipated based on the anticipated rehabilitation scope of work.

3.2: FDEP Permit

It is anticipated that the MS WRF sand filter rehabilitation will not require a FDEP Wastewater Permit Modification due to the like for like replacement and no change to the WRF capacity. Coordination with FDEP will be provided by Consultant outlining the rehabilitation work to confirm that no permit modification will be required.

Task 4 –Bidding and Award

Upon authorization to proceed with bidding and award phase of the project, Consultant will complete the following tasks for the project:

4.1: Bid Set

Consultant will provide a Bid Set of the Drawings and Project Manual in electronic format for advertisement and issuance of documents to potential bidders by the City. Electronic formats for the drawings and specifications will be provided in PDF format. The City will distribute documents for bidding.

4.2: Respond to Questions

Consultant will respond to questions received by the City for clarifications and will provide technical revisions that become apparent during the bidding process. The City will prepare and issue addenda.

4.3: Pre-Bid Meeting

Consultant will attend the Pre-Bid Meeting. It is assumed the Pre-Bid Meeting will be held virtually and attendance will be over Teams.

4.4: Review and Award

Upon receipt of bids (to be provided after bid opening by the City), Consultant will review the bids, prepare a bid tabulation and recommendation of award.

4.5: Furnish Conformed Set

Consultant will conform the Final Drawings and Project Manual at the end of the bidding phase to reflect any changes to the project design resulting from addenda. Consultant will furnish the City with one (1) Conformed Drawings set and one (1) Project Manual for use during construction. Electronic format of the Conformed Drawings and Project Manual will be PDF. One (1) reproducible set will be provided to the selected Contractor and the City.

Task 5 – SCADA Design Services

Overall supervisory control and data acquisition (SCADA) design services are not included in this scope of work, however, minor SCADA modifications as described above have been included.

Task 6 – Construction Administration Services

Upon award of the project, the Consultant will assist the City with Construction Management and shall complete the following tasks defined below. Construction phase is based on an estimated construction period of 365 calendar days (45 days for submittals and 320 days for construction) to Final Completion. During construction, the Consultant will assist the City with the following:

6.1: Preconstruction Meeting

Prepare and administer one (1) preconstruction meeting and prepare written summary of the meeting for distribution to attendees.

6.2: Progress Meetings

Attend, over Teams, up to twelve (12) progress meetings for the contracted construction period. Progress meetings will be held monthly as needed to coordinate work in progress. Consultant shall be responsible for preparing and distributing written summary of each meeting.

6.3: Requests for Information (RFIs)

Provide interpretation or clarification of the design documents when requested including responding to RFIs and claims. Up to ten (10) RFIs are anticipated.

6.4: Shop Drawings

Review up to twenty (20) shop drawings and other submittals up to two (2) times per submittal for general conformance with the Contract Documents. Any additional review fees to be paid to the Consultant by the Contractor through the City.

6.5: Contractor Applications for Payment

Review applications for payment, quantities and the accompanying data and schedule, determine the amounts owed to the Contractor and advise the City of the recommended payments. Up to twelve (12) pay apps are anticipated for the project.

The Contractor shall create and maintain submittal log including shop drawings, substitution requests, requests for information, and change order requests. Consultant shall work with the Contractor to maintain the log.

6.6: Substantial Completion Site Visits

Attend six (6) substantial completion site visits (one per set of two filters) to determine if the project has been completed in accordance with the Contract Documents. Tetra Tech will coordinate with Evoqua to develop a punch list of items to be corrected by the Contractor. Each substantial completion visit is assumed to be prior to media placement within the rehabilitated filter bed.

6.7: Final Completion Site Visit

Conduct one (1) final completion inspection to determine if the punch list items have been completed.

6.8: Project Closeout

Tetra Tech will perform the following Project Closeout services:

- Prepare record drawings, incorporating changes made to original design during construction based on record information furnished by the Contractor and provide one (1) flash drive with an electronic version of the record documents to the City in PDF-format and ACAD format.
- Prepare a project catalog that includes all of the construction documentation, including files of correspondence, meeting minutes, Contract Documents, change orders, field orders, RFI's, work change directives, addenda, additional drawings issued subsequent to the Contract, progress reports, shop drawing and progress submittals, regulatory correspondence and other project related documents. At the conclusion of the project, Tetra Tech will combine the information into a project catalog and submit to the City for review and comment. The project

catalog will be submitted electronically. One round of City review and comment is budgeted. Upon receipt and inclusion of City comments, Tetra Tech will provide a final project catalog in electronic format.

Task 7 – Resident Project Representative (RPR) Services

7.1: RPR Services

To better ensure that the Project is constructed in accordance with the Contract Documents, the Tetra Tech will provide the construction observation services throughout the duration of construction. The anticipated construction duration is 45 weeks. Therefore, total on-site construction observation hours are estimated to be 8 hours per week for a 45-week period and an additional 22 days on site based on work being completed each week for a total of 67 days or 536 hours.

The role, limitations and responsibilities of the Tetra Tech are set forth below:

- Provide onsite observation to verify compliance with the Contract Documents and inform the City of progress and any observed deficiencies.
- Prepare field reports for the portion of the day on site, documenting construction activities and submit them to the City for review on a weekly basis.
- Review the Contractor’s red-line as-builts on site on a monthly basis.
- Observation inspections as Tetra Tech deems necessary.

Task 8 – Other Direct Costs

Other Direct Costs (travel outside of Tampa area, photocopies, postage,) are included in the grand total project fee.

Task 9 – Owner’s Contingency (10%)

A 10% Owner’s contingency is included in the grand total project fee and will only be billed with prior written authorization from the City Project Manager.

3. PROJECT GOALS:

Consultant will prepare the following deliverables:

- 75% and 100% Design Documents
- Conformed Drawings and Project Manual
- Weekly Construction Field Reports
- Record Drawings and Project Catalog

4. FEES:

This price includes all labor and expenses anticipated to be incurred by Consultant for the completion of these tasks in accordance with Professional Services Method “A” – Hourly Rate for a fee not to exceed three-hundred six thousand five-hundred and nine dollars (\$306,509). A detailed breakdown of the fee is provided in **Attachment A**.

5. SCHEDULE:

Consultant anticipates that the project schedule will be as follows from notice to proceed (NTP):

Task	Calendar Days Per Task	Task Completion
Task 1 - Meetings & Administration	530	530 Calendar Days from Notice to Proceed
Task 2 - Final Design	120	120 Calendar Days from Notice to Proceed
Task 4 - Bidding and Award	45	165 Calendar Days from Notice to Proceed
Task 6 – Construction Administration Services	365	530 Calendar Days from Notice to Proceed
Task 7 – Resident Project Representative (RPR)	315	530 Calendar Days from Notice to Proceed

Note: Tasks 3 and 5 are not included or do not have a project schedule component associated with it.

6. STAFF ASSIGNMENT:

City’s Staff assignments include:

Project Manager:	Rama Pandkar, P.E
Engineering Manager:	Kaylynn Price
Public Utilities Director:	Richard Gardner, P.E
Public Utilities Assistant Director:	Michael Flanigan
Infrastructure Maintenance Manager	Daniel Trueblood
Infrastructure Maintenance Asst Manager	Wayne LaFleur

Public Utilities (WET) Assistant Manager	Travis Teuber
MS St WRF Chief Plant Operator	Ryan Alexander
Utilities Maintenance Supervisor II	Herman Winthrop
Utilities Maintenance Supervisor II (Electrical)	Zeron Rance

The City Consultant's staff assignments include:

Client Manager:	Andrew Woodcock
Regional Manager:	James Uzdavinis
Project Manager:	Jennifer Ribotti

7. CORRESPONDENCE/REPORTING PROCEDURES:

Consultant's project correspondence shall be directed to the Project Manager. With copies to the Client Manager

All City project correspondence shall be directed to the City Project Manager, with copies to the Engineering Manager, Public Utilities Assistant Director, and Public Utilities Director.

A health and safety plan will be prepared by Consultant and submitted to the City Project Manager upon request prior to mobilizing to the site.

Consultant shall provide a minimum of forty-eight (48) hours' notice prior to conducting fieldwork/site visits. Consultant shall provide a minimum of seven (7) days notification for site visits requiring the assistance of City Operations and Maintenance personnel. Notification will be provided by Consultant for employees of Consultant.

Consultant acknowledges that all City directives shall be provided by the City Project Manager.

8. INVOICING/FUNDING PROCEDURES:

City Invoicing Code: 3217321-530100-96213

For work performed, invoices shall be submitted monthly to:

**CITY OF CLEARWATER, PUBLIC UTILITIES DEPARTMENT
ATTENTION: PU Engineering
1650 NO ARCTURAS AVE BLDG-C
CLEARWATER, FLORIDA 33765-1945
Email: PUEngineering@MyClearwater.com**

Contingency services will be billed as incurred only after written authorization provided by the City to proceed with those services.

9. INVOICING PROCEDURES:

At a minimum, in addition to the invoice amount(s) the following information shall be provided on all invoices submitted on the Work Order:

1. Purchase Order, Project and Invoice Numbers and Contract Amount.
2. The time period (begin and end date) covered by the invoice.
3. A short narrative summary of activities completed in the time period.
4. Contract billing method – Lump Sum or Hourly Rate.
5. If Lump Sum, the percent completion, amount due, previous amount earned and total earned to date for all tasks (direct costs, if any, shall be included in lump sum amount).
6. If Hourly Rate, hours, hourly rates, names of individuals being billed, amount due, previous amount earned, the percent completion, total earned to date for each task and other direct costs (receipts will be required for any single item with a cost of \$50 or greater or cumulative monthly expenses greater than \$100).
7. If the Work Order is funded by multiple funding codes, an itemization of tasks and invoice amounts by funding code.

10. CONSIDERATIONS:

Consultant acknowledges the following:

1. The Consultant named above is required to comply with Section 119.0701, Florida Statutes, where applicable.
2. All City directives shall be provided by the City Project Manager.
3. "Alternate equals" shall not be approved until City Project Manager agrees.
4. All submittals must be accompanied by evidence each has been internally checked for QA/QC before providing to City.
5. Consultants/Contractors are not permitted to use City-owned equipment (i.e., sampling equipment, etc.).
6. Documents posted on City website must ADA accessible.

11. ADDITIONAL CONSIDERATIONS:

All work orders should include considerations for the following:

1. Sea Level Rise and Flood Resilience, as applicable.
2. Submittal of a Critical Path Method (CPM) Schedule(s).
3. Submittal of a Project Catalog with the following items, as appropriate:
 - a. Data requests, assumptions, critical correspondence, meeting agenda, sign-in sheets, meeting minutes, document comment-response log(s), technical memorandum/reports, addenda, progress reports, regulatory correspondence, and other project-related documents.
 - b. If construction project, also include design plans, conformed plans, change orders, field orders, RFIs, work change directives, addenda, progress reports, shop

drawing and progress submittals, as-builts, record drawings, and other project-related documents such as O&M manuals and warranty information.

- c. At the conclusion of the project, ENGINEER will combine this information into a Project Catalog and submit to the City for review and comment.
- 4. Arc Flash labeling requirements:
 - a. All electrical designs and construction shall adhere to NFPA 70 E "Standard for Electrical Safety in the Workplace".
 - b. Updated calculations of Fault and Arc Flash, and provisions for new or updated Arc Flash equipment labeling shall be included in the contract documents.

12. SPECIAL CONSIDERATIONS:

None

13. SIGNATURES:

PREPARED BY:



Andrew Woodcock, P.E.
Client Manager
Tetra Tech

September 3, 2025

Date

APPROVED BY:

Richard Gardner, P.E.
Public Utilities Director
City of Clearwater

Date

ATTACHMENT "A"**CONSULTANT WORK ORDER – PROJECT FEES TABLE**

MS WRF Sand Filter Rehabilitation

Tetra Tech Inc.

25-0008-UT

City of Clearwater

CONSULTANT WORK ORDER

PROJECT FEES TABLE

Task	Description	Subconsultant Services	Labor	Total
1.0	Meetings and Administration			
1.1	Project Administration		\$6,840	\$6,840
1.2	Project Kickoff Meeting and Site Visit		\$7,480	\$7,480
1.3	Progress Meetings (4 Virtual)		\$4,240	\$4,240
1.4	Design Review Meetings (2 Virtual)		\$4,720	\$4,720
1.5	Health and Safety Plan		\$850	\$850
Task 1.0 Total:				\$24,130
2.0	Final Design			
2.1	Review Evoqua Filter Inspection Report		\$ 2,005	\$2,005
2.2	Site Visits (2)		\$3,380	\$3,380
2.3	Data Collection		\$2,740	\$2,740
2.4	Supplemental Technical Specifications		\$ 9,100	\$9,100
2.5	Final Design Drawings	\$3,446	\$51,685	\$55,131
Task 2.0 Total:				\$72,356
3.0	Permitting			
3.1	FDEP Permit Coordination		\$1,360	\$1,360
Task 3.0 Total:				\$1,360
4.0	Bidding and Award			
4.1	Bid Set	\$423	\$4,860	\$5,283
4.2	Respond to Questions		\$5,480	\$5,480
4.3	Pre-Bid Meeting		\$645	\$645
4.4	Review and Award		\$1,230	\$1,230
4.5	Furnish Conformed Documents		\$4,170	\$4,170
Task 4.0 Total:				\$16,808
5.0	SCADA Design Services⁽¹⁾			
6.0	Construction Administration Services			
6.1	Preconstruction Meeting		\$5,940	\$5,940
6.2	Progress Meetings		\$16,980	\$16,980
6.3	Respond to RFIs		\$6,110	\$6,110
6.4	Shop Drawing Review		\$19,180	\$19,180
6.5	Review Pay Apps		\$3,150	\$3,150
6.6	Substantial Completion Site Visits		\$5,620	\$5,620
6.7	Final Completion Site Visit		\$5,040	\$5,040

ATTACHMENT "A"**CONSULTANT WORK ORDER – PROJECT FEES TABLE**

MS WRF Sand Filter Rehabilitation

Tetra Tech Inc.

25-0008-UT

City of Clearwater

Task	Description	Subconsultant Services	Labor	Total
6.8	Project Close-out		\$10,800	\$10,800
	Structural Subconsultant	\$4,636		\$4,636
Task 6.0 Total:				\$77,456
7.0	Resident Project Representative (RPR)			
7.1	RPR Services		\$83,080	\$83,080
Task 7.0 Total:				\$83,080
SUBTOTAL, LABOR, AND SUB-CONTRACTORS:				\$275,190
8.0	Other Direct Costs (travel, photocopies, postage, etc.) (Not applicable to lump sum Work Orders)			\$3,800
9.0	Owner’s Contingency (10%)			\$27,519
Sub Total:				\$31,319
GRAND TOTAL:				\$306,509

⁽¹⁾Fees for Task 5 are not included in the Project Fees Table. These Tasks are not anticipated as part of this scope of work.

Minor SCADA associated work has been integrated into Task 2.0.

Attachment A - Price Proposal														
Clearwater Marshall Street WRF Filter Rehabilitation		Bill Rate >	215.00	120.00	275.00	155.00	260.00	140.00	155.00					
Design, Permitting and CEI for Filtration System Refurbishment at the MS WRF.		Proj Area >												
Submitted to: City of Clearwater (Attn: Rama Pandkar)														
Contract Type: T&M										Pricing by Resource				
	Total Labor Hrs	Project Manager 2	Sr Project Administrator	Principal Engineer (Process)	Project Engineer 1 (Process)	Sr Engineer 3 (I&C)	Senior CAD Designer1	Sr Construction Project Rep 2	Labor	Subs	Travel	Mat'l's & Equip	ODCs	Task Pricing Totals
Project Phases / Tasks	1,542	173	75	68	362	138	182	544	266,685	36,024	-	-	3,800	306,509
1. Meetings and Administration	122	41	24	16	25	16	-	-	24,130	-	-	-	-	24,130
1.1 Project Administration	38	24	14						6,840					6,840
1.2 Project Kickoff Meeting and Site Visit	34	8	2	8	8	8			7,480					7,480
1.3 Progress Meetings (4 virtual)	20	4		4	8	4			4,240					4,240
1.4 Design Review Meetings (2 virtual)	24	4	4	4	8	4			4,720					4,720
1.5 Health and Safety Plan	6	1	4		1				850					850
2. Final Design	382	40	4	28	118	58	134	-	68,910	3,446	-	-	-	72,356
2.1 Review Evoqua Filter Inspection Report	11	1		2	8				2,005					2,005
2.2 Site Visit (2)	16	8			4	4			3,380					3,380
2.3 Data Collection	14	2		2	8	2			2,740					2,740
2.4 Technical Specifications	48	8	4	4	24	8			9,100					9,100
2.5 Final Design Drawings	293	21	-	20	74	44	134	-	51,685	3,446	-	-	-	55,131
75% Drawings	193	14	-	12	49	32	86	-	34,265	3,446	-	-	-	37,711
General Drawing Sheets (3)	20	2		4	6		8		3,580					3,580
Mechanical/Process Sheets (8)	106	8		8	40		50		17,120					17,120
Structural Sheets (3) by Sub	7	2			1		4		1,145	3,446				4,591
I/C Sheets (3)	60	2			2	32	24		12,420					12,420
100% Drawings	100	7	-	8	25	12	48	-	17,420	-	-	-	-	17,420
General Drawing Sheets (3)	9	1			4		4		1,395					1,395
Mechanical/Process Sheets (8)	60	2		6	20		32		9,660					9,660
Structural Sheets (2) by Sub	7	2			1		4		1,145					1,145
I/C Sheets (4)	24	2		2		12	8		5,220					5,220
3. Permitting	8	2	-	-	6	-	-	-	1,360	-	-	-	-	1,360
3.1 FDEP Permit Coordination	8	2			6				1,360					1,360
4. Bidding and Award	96	8	11	6	37	10	24	-	16,385	423	-	-	-	16,808
4.1 Bid Set	28	2	4	2	8	4	8		4,860	423				5,283
4.2 Respond to Questions	32	2	4	2	12	4	8		5,480					5,480
4.3 Pre-Bid Meeting	3	1		1	1				645					645
4.4 Review and Award	7	1	1	1	4				1,230					1,230
4.5 Furnish Conformed Documents	26	2	2		12	2	8		4,170					4,170
6. Construction Administration	398	82	36	18	176	54	24	8	72,820	4,636	-	-	-	77,456
6.1 Preconstruction Meeting (on site)	30	6		6	8	2		8	5,940					5,940
6.2 Progress Meetings (12, on site)	84	24			36	24			16,980					16,980
6.3 Respond to RFIs (up to 10)	32	10	10	4	4	4			6,110					6,110
6.4 Shop Drawing Review (up to 20)	112	20	20	4	60	8			19,180					19,180
6.5 Review Pay Apps (up to 12)	18	6			12				3,150					3,150
6.6 Substantial Completion Site Visits (up to 6)	32	4			24	4			5,620					5,620
6.7 Final Completion Site Visit	24	8			8	8			5,040					5,040
6.8 Project Close-Out	66	4	6	4	24	4	24	-	10,800	-	-	-	-	10,800
Record Drawings	40	2		2	8	4	24		6,620					6,620
Project Catalog	26	2	6	2	16				4,180					4,180
Structural Subconsultant	-									4,636				4,636
7. Resident Project Representative (RPR)	536	-	-	-	-	-	-	536	83,080	-	-	-	-	83,080
7.1 RPR Services (67 days)	536							536	83,080					83,080
8. Other Direct Costs	-	-	-	-	-	-	-	-	-	-	-	-	3,800	3,800
Other Direct Costs	-												3,800	3,800
9. Contingency	-	-	-	-	-	-	-	-	-	27,519	-	-	-	27,519
Contingency (10%)	-									27,519				27,519
Totals	1,542	173	75	68	362	138	182	544	266,685	36,024	-	-	3,800	306,509

ATTACHMENT "B"

CONSULTANT WORK ORDER – CITY DELIVERABLES MS WRF Sand Filter Rehabilitation

Tetra Tech Inc.

25-0008-UT

City of Clearwater

CONSULTANT WORK ORDER CITY DELIVERABLES

1. FORMAT:

The design plans shall be compiled utilizing the following methods:

1. City of Clearwater CAD standards.
2. Datum: Horizontal and Vertical datum shall be referenced to North American Vertical Datum of 1988 (vertical) and North American Datum of 1983/90 (horizontal). The unit of measurement shall be the United States Foot. Any deviation from this datum will not be accepted unless reviewed by City of Clearwater Engineering/Geographic Technology Division.

2. DELIVERABLES:

The design plans shall be produced on bond material, 24" x 36" at a scale of 1" = 20' unless approved otherwise. Upon completion the consultant shall deliver all drawing files in digital format with all project data in Autodesk Civil 3D file format.

NOTE: If approved deviation from Clearwater CAD standards is used the Consultant shall include all necessary information to aid in manipulating the drawings including either PCP, CTB file or pen schedule for plotting. The drawing file shall include only authorized fonts, shapes, line types or other attributes contained in the standard release of Autodesk, Inc. software. All block references and references contained within the drawing file shall be included. Please address any questions regarding format to Mr. Kyle Vaughan, at (727) 444-8232 or email address Kyle.Vaughan@myClearwater.com.

All electronic files (including CAD and Specification files) must be delivered upon completion of project or with 100% plan submittal to City of Clearwater.

EXHIBIT "A"

SUBCONSULTANT PROPOSALS
MS WRF Sand Filter Rehabilitation
23-0008-UT

Tetra Tech Inc.

City of Clearwater



1320 Wilfred Drive
Orlando, FL 32803
Phone: 407.219.4454

June 20, 2025

Wekiva Project #25-317

Jennifer Ribotti, PE
Tetra Tech, Inc.
201 East Pine Street, Suite 1000
Orlando, FL 32801

Re: Proposal for Structural Engineering Services
Marshall Street WRF Sand Filter Rehabilitation
City of Clearwater, Florida

Ms. Ribotti,

Wekiva Engineering, LLC (Wekiva) is pleased to submit this proposal to provide structural engineering services to Tetra Tech (TT) for the above-referenced project. It is our understanding that this project will entail the following improvements to the existing filter treatment process, which could require structural engineering design support:

- Rehabilitation of Filter media along with the replacement of the existing underdrain system.
- Rehabilitation of the existing concrete structure at surfaces that are in poor condition.

SCOPE OF SERVICES

Wekiva will perform the following tasks:

Task 1: Perform Site Visit & Prepare Drawings and Specifications (75%, 100%): Wekiva staff will visit the site to view the current condition of the structure. Wekiva will then prepare drawings and specifications. It is anticipated that approximately two (2) drawings will be prepared and standard division 3 specifications. We will prepare signed and sealed drawings for permitting purposes.

Task 2: Services During Bidding: Wekiva staff will assist TT with services during bidding by answering Contractor's questions and issuing addenda.

Task 3: Services During Construction: Wekiva staff will assist TT staff during the construction phase of the project with the following:

- Review shop drawing submittals (Assumed to be 2 submittals)
- Review and respond to RFI's (Assumed to be 1 RFI)
- Perform (3) total site visits
- Prepare record drawings based on Contractor provided markups of the drawings

COST AND SCHEDULE

Wekiva proposes to undertake the work described above on a time and expense fee basis at a total not-to-exceed price of **\$8,505.64**. The following is a breakdown of fee per task:

• Task 1	\$3,446.30
• Task 2	\$423.28
• Task 3	\$4,636.06
• Total	\$8,505.64



1320 Wilfred Drive
Orlando, FL 32803
Phone: 407.219.4454

TERMS AND CONDITIONS

Wekiva will begin work immediately upon your notice to proceed. We will issue monthly invoices for the work accomplished during the calendar month. We appreciate the opportunity to submit this proposal to TT and we look forward to a successful collaboration on this project. If you have any questions or need further information, please call.

Sincerely,

David Morris, P.E.
Member

City of Clearwater Marshall Street WRF Sand Filter Rehabilitation

Task	Task	Est.No	Man-hours By Category					Totals	
No	Description	Dwgs	Principal	Project Engineer	Engineer	Drafting	Clerical	Hrs	Cost
1	Site Visit and Prepare Drawings and Specs	2	9	2	4	14	2	31	\$ 3,446.30
2	Services During Bidding	-	2	0	0	0	1	3	\$ 423.28
3	Services During Construction	-	23	1	0	1	3	28	\$ 4,636.06
Total Cost									\$ 8,505.64



City of Clearwater Marshall St. AWWTF Hydro Clear® Filter Inspection Report

DATE: November 21, 2024

SITE ADDRESS

Marshall ST. AWWTF
1605 Harbor Dr.
Clearwater, FL 34615

PROJECT #: 88416

FILTER MODEL: 12 KK 12 x 30

CONTROLLER: A/B

START-UP DATE: June 21, 1990

On November 21, 2024, an inspection was made of the Hydro Clear Model 12 KK 12 x 30 Rapid Sand Filtration system located at the Marshall St. AWWTF in the City of Clearwater, FL. This filter was put into service in June of 1990 and has 12 poured in place concrete filter cells. Filter routines of Air Mix, Pulse Mix, Backwash and Chemical Clean are controlled by an Allen Bradley PLC with a ProFace HMI operator interface.

We were asked to review:

1. The filter logic to investigate operator reported instances that filters would fill up and would not backwash automatically or manually until they physically reset the operating system often resulting in by-pass or near overflow conditions.
2. The condition of the filters to determine the reason for recent ongoing effluent violations.

Arriving onsite, David Wolfe and I met Chief Plant Operator Ryan Alexander and some of the operators. We discussed some of the issues they have with the fitters as well as other questions they had about the operation of the filters.

We visually inspected each of the 12 filter cells and noted that the media in each cell looked similar with uneven mounds of sand in some areas and voids next to the mounds of sand exposing the fiberglass grating and, in some areas so little sand that even the wire mesh support screens were visible. We also noted that several structural holddown I-beams in cells #3, #5 and #7 were not in place.

While David started going through the PLC logic, I began the inspection of the filters. Since cell #7 was offline and drained, we decided to concentrate our inspection to cell #7 agreeing that what we found in that filter would most likely be typical of the remaining 11 filters.

FILTER COMPONENT EVALUATION

- **Controls** – On site to investigate problems with PLC locking up when multiple cells are calling for backwash. After discussing with plant personnel, the symptoms were that the PLC was not enabling the next backwash usually when there were high flows such as produced during large rain events. On rare occasions, we have seen in some of the older Allen-Bradley PLC systems that the FIFO (First In First Out) stack in the PLC that determines the sequential Backwash order when multiple cells call for Backwash and will lockout the call for a subsequent backwash. Typically, this occurs during storm



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conditions with high flows and the power drops out. While on site, I did not see any indication of this happening, but the flow to the plant was negligible and only one cell was calling for a backwash at a time. I did make a modification to the PLC program that will reset the FIFO stack once power returns after a power cycle. I also modified the program that if the system does appear to be locked out and not backwashing cells requiring a backwash, the operator can manually reset the backwash system by turning the Backwash Control Hand-Off-Auto switch to the Off position for about ten seconds and then returning the switch to the Auto position.

- **Recommendations –**

- **Operator Interface**

Evoqua recommends replacing the current Operator Interface and supplying a PanelView Plus 15 touchscreen. Programming would be similar to the HMI that was installed at the Northeast Plant in 2019.

This would include graphics of each cell, composite status screens that would indicate filter cell status, (Backwash, Pulse Mix, Air Mix, & Chemical Clean), Next filter to backwash, Timer Presets and time remaining in each step, Motor status (Running, Off, Fail), Valve Status (Open, Close), Backwash Counts for each cell and Backwash Counter Reset Pushbuttons.

- **PLC**

Evoqua recommends re-programming the PLC to work like the PLC at the Northeast Plant. The existing PLC need not be replaced, but can be modified to provide programming for the current operation of the filters which will be similar to the PLC program at the North East plant. Evoqua will need to co-ordinate with the Plant to ensure that the Plant SCADA system still receives the data from the filter system as required.

- **CELL #7** – The design depth of sand beds in Hydro Clear filters is 10”. In filter cell #7, we found mounds of sand/solids piled 12” – 14” high with areas nearly void of sand next to them. We removed the sand in random areas throughout the filter cell exposing the fiberglass grating and found the solids throughout the sand and into the squares in the fiberglass grating. We exposed the grating so we could inspect the sand just above the wire mesh support screens in the 2” x 2” grating squares and found sand, solids and some trash (plastics, cloth etc.) compacted in every square that we inspected (see photos). The compacted sand / solids in the fiberglass grating squares on the top of the wire mesh support screen effectively blind off that area of the screen restricting flow in that area. Once solids accumulate that deep in the sand bed, it is nearly impossible to remove them during backwashing and solids continue to accumulate and restrict flow through the filters. Consequently, during backwashing, pressure increases on the bottom side of the wire mesh screens because of the compacted solids in the grating squares and eventually, this will fatigue the wire mesh support screens and potentially cause the perimeter seals to fail or the screens to rip allowing sand / solids and unfiltered water to enter the clearwell ultimately showing up the plant effluent.
- **Media** – The design depth of the media in Hydro Clear Filters is 10” and the sand bed surface should be relatively flat with NO visible craters, voids or mounds of sand. The sand in Cell #7 was typical of what was seen in the other cells. (see attached photo). Generally, there are two reasons that the filters have problems handling higher than average flows:



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1. Grease / solids in the applied water attaches to the sand grains binding them together and restricting flow through the filters. This will cause an increase in the number of backwashes per cell per day and cause the filters to not handle increased flows. This condition is usually corrected by using the Chemical Clean system provided with the Hydro Clear filter.
 2. Heavy solids/debris in the applied water that becomes trapped in the sand bed and ultimately into the squares in the fiberglass grating right on top of the wire mesh support screens. This material does not wash out, compacts into the grating squares and restricts flow through the filters. Those solids eventually break down and pass through the screens into the clearwell increasing TSS and Turbidity in the effluent.
- **Recommendation** – Remove all of the sand from each of the 12 cells. Pressure wash the cells clean (I-beams, long and short angles, cell perimeter and wire mesh screen) . It may be necessary to use a shop vac to better clean the grating squares to remove the trapped debris between the grating and wire mesh screen that couldn't be removed with the vac truck. Once the cells are clean, cells should be inspected by Evoqua to determine if any of the wire mesh screens, I-beams, long angles, short angles or clip angles need to be repaired or replaced and provide a list of necessary repairs to the city. After the repairs are made, Evoqua will need to make a final inspection of the cells before 10" of new .45mm sand is placed in each cell.
 - **Structural Holddown I-beams and Wire Mesh Support Screens** – We found several of the structural holddown I-beams not being held in place either due to corrosion and failure around the tab end of the I-beam that bolts the I-beam in place or because the embedded holddown stud pulled out from under the frame tab in the grout area. This allowed the perimeter seal to be lost during subsequent pulse mixes and backwashes eventually tearing or ripping the wire mesh support screens. Once that occurred, solids and sand short circuited directly into the clearwell showing up in effluent samples as TSS or fecal or turbidity. (see photos)
 - **Recommendation** – With the sand removed, the cells need to be inspected by Evoqua to provide the contractor with a list of items that need to be corrected prior to installing the new sand. This could include I-beams, long and short perimeter angles, short side holddown bolt clip angles, embedded I-beam holddown bolts, wire mesh support screens and gaskets.
NOTE: The existing loose steel (I-beams and long and short angles) are painted steel. Paint being chipped off during assembly or repair could be some of the reason for the corrosion. It would be worth considering using stainless steel for any of those items that need to be replaced.
 - **Valves and Backwash Rate** – The Hydro Clear filters backwash at a rate of 12 gpm/ft² of surface area. Rates lower than that do not remove most of the solids from the sand beds during backwashing. The gradual accumulation of solids from eventually causes the filters to backwash more frequently and ultimately yielding less solids removal. Proper seating of the filtrate and backwash valves is critical to providing the 12 gpm/ft² backwash rate. If one (or more) of those valves is not closing fully during pulse mix or backwash it will affect the backwash rate.

We were not able to inspect the physical open / close position of those valves because of their location in the effluent and backwash piping. We did however check the backwash



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rate with each of the backwash pumps. The backwash rate with BW Pump #1 was 9.6 gpm/ft² and with BW Pump #2 the rate was 9.8 gpm/ft². That suggests that at least one of the 12 backwash inlet valves isn't closed fully all of the time and possibly one or more of the filtrate valves are not closing fully on a cell that is in backwash.

Another option would be that the backwash pumps are not delivering the correct volume of backwash water because of their age or the backwash pump discharge valves are not set properly.

- **Recommendation** – Check the backwash pump discharge valve position to see if they can be opened any more to provide additional backwash rate. If so, open them and recheck the backwash rate. If the backwash wash pump discharge valves are full open, it will be necessary to find out which valves are causing the low backwash rate. That may require systematic removal of each backwash inlet valve and possibly the filtrate valves and replace / repair as necessary.

Even though we could not get into any of the other cells, aside from the obvious sand concerns, some issues were found:

Cell #1 – during a backwash, a piece of 3" perimeter gasket was noticed floating in the admixture on the east side of the filter cell. It did not wash out and the cell never drained down after the backwash so we couldn't confirm that the perimeter seal in that area had been lost or that the cell is losing sand / solids in that area.

Cell #3 – At least 2 of the holddown I-beams were not secured in place and we could see the wire mesh support screen and perimeter gasket pulled out from under the long angle in that area.

Cell #5 – At least 1 holddown I-beam was found not being held in place with one of the embedded holddown studs not secured under the tab and the wire mesh screen and perimeter gasket pulled out from under the long angle.

Cell #8 – After a backwash, a strip of perimeter gasket and the edge of the wire mesh screen could be seen on the short side of the cell.

SUMMARY: It appears that the logic is correct, and the filters will operate as designed in the level mode. Replacing the existing HMI will give the operators additional control and provide added information on the screens to help operators have better control of the filter operation during periods of changing flow situations and during troubleshooting suspected issues.

Remove the sand from each of the cells. Pressure wash the filter cells including the wire mesh support screens to remove all remaining sand and vacuum all remaining sand / solids / trash using a shop vac.

Evoqua should then make an inspection and provide a list of any and all repairs that need to be made:

1. I-beams
2. Long & short angles
3. Short side holddown clip
4. Embedded I-beam holddown studs
5. Wire mesh support screens w/ 3" perimeter gasket and 1" sealing strip gasket

It is worth considering using stainless steel for any I-beams, angles or holddown clips that need to be replaced rather than using painted steel.

After repairs are made, Evoqua should inspect the filter cells again to ensure repairs were made properly and nothing was overlooked before installing 10" of new .45mm sand to the cells.

Based on what we saw in only 1 cell, we would want to discuss with the city how many of each item they would like to have on hand prior to starting the work with the option to restock as the initial quantity of parts are used to keep the project moving forward without interruption.

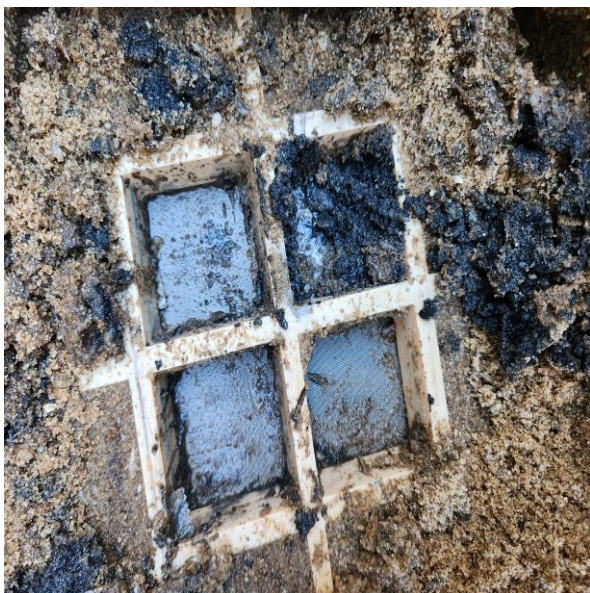
By following the recommendations above, the overall operation will improve as well as the filter's ability to handle and recover from increased flows during rain events or plant upset conditions. Following the outlined recommendations will improve the effectiveness of the backwash and pulse mix routines. This in turn will reduce the number of backwashes per cell per day which translates into less recycle back to the head of the plant, less sand loss and reduce effluent discharge violations.



Cell #7 sand bed craters and voids



Cell #7 I-beam off holddown stud with tab missing



Cell #7 compacted sand removed from squares



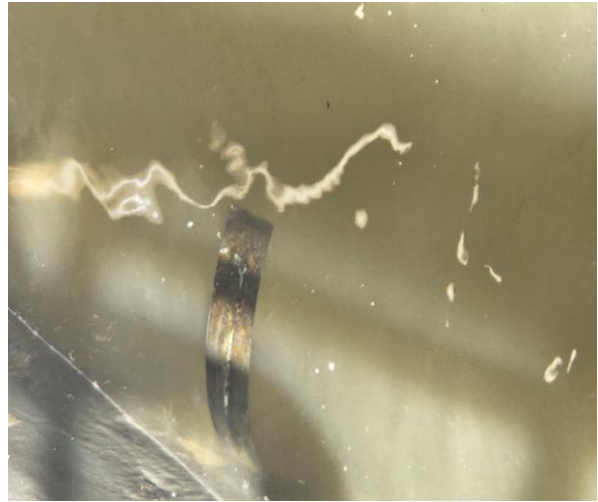
Cell #7 sand and fiberglass grating squares



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Screen and gasket failure



Cell #1 3" perimeter gasket (seal failure)



Holddown Clip with corner missing



I-beam holddown tabs ok

Respectfully Submitted
Earl Gehringer / David Wolfe
Evoqua Hydro Clear Filter
Product Specialist / Engineer II