PROFESSIONAL SERVICES
SUPPLEMENTAL AGREEMENT # 2
FOR
CITY OF PFLUGERVILLE WATER TREATMENT PLANT EXPANSION

STATE OF TEXAS §
§
COUNTY OF TRAVIS §

This Supplemental Agreement No. 2 to a contract for Professional Services is made by and between the City of Pflugerville, Texas ("City") and Ardurra Group, Inc. ("Consultant"). City and Consultant may be referred to herein singularly as "Party" or collectively as the "Parties."

WHEREAS, the City and Consultant executed an Agreement for Professional Services ("Agreement") on the 16th day of December 2020 for the City of Pflugerville Water Treatment Plant Expansion project ("Project") in the amount of one million nine hundred forty-seven thousand five hundred and twelve dollars ($1,947,512.00); and

WHEREAS, the City and Consultant executed a Supplemental Agreement #1 for Professional Services on the 16th day of July 2021 for the Project in the amount of five million two hundred three thousand five hundred and twenty-nine dollars ($5,203,529.00); and

WHEREAS, the City and Consultant desire to enter into a Supplemental Agreement #2 for Professional Services for the Project in the amount of three million two hundred seventy-seven thousand four hundred and fifty-eight dollars ($3,277,458.00), to add Construction Phase Engineering Services to the Agreement; and

WHEREAS, it has become necessary to amend the Agreement to modify the provisions for the Scope of Services and Compensation; and

WHEREAS, it is necessary for the City to amend its agreements from time to time to comply with changes in state law relating to contracts of municipalities.

NOW, THEREFORE, premises considered, the City and the Consultant agree that said Agreement is amended as follows:

I.

Article III. Scope of Services and Appendix A, shall be amended as set forth in the attached addendum to Appendix A.

Article IV. Compensation to Consultant and Appendix B (Fee Schedule), shall be amended by increasing by three million two hundred seventy-seven thousand four hundred and fifty-eight dollars ($3,277,458.00), the amount payable under the Agreement for a total of ten million four hundred twenty-eight thousand four hundred and ninety-nine dollars ($10,428,499.00), as shown by the attached Addendum to Appendix B (Fee Schedule).

2.

Except as amended hereby, and as previously amended as indicated above, the terms of the Agreement shall remain unchanged and in full force and effect.

EXECUTED and **AGREED** to as of the dates indicated below.

CITY OF PFLUGERVILLE		**CONSULTANT**	
			
(Signature)		*(Signature)*	
Printed Name:	Sereniah Breland	Printed Name:	Chris Canonico, PE
Title:	City Manager	Title:	Principal
Date:		Date:	5/19/2022

APPROVED AS TO FORM:

Charles E. Zech
City Attorney
DENTON NAVARRO ROCHA BERNAL & ZECH, P.C.

SCOPE OF SERVICES
FOR

CITY OF PFLUGERVILLE
WATER TREATMENT PLANT EXPANSION
CONSTRUCTION PHASE SERVICES

GENERAL

The City of Pflugerville (City) operates a nominal 17 million gallon per day (MGD) Water Treatment Plant (WTP). This project is to provide a comprehensive expansion of the WTP to 30 MGD, incorporating other active CIP projects currently underway, to meet current and future water demands. This project will also construct improvements required by the WTP facility to meet and maintain regulatory compliance, safety, technology improvements, process innovation and renew aging infrastructure.

Stakeholders for this contract include:

- Ardurra and its teaming partners as "Engineer"
- City of Pflugerville as "City"
- Garver as "Owner's Representative (OR)"

SCOPE OF WORK

The scope of work presented below describes the engineering services during the construction phase and commissioning and start-up phase of the WTP Expansion. The Engineer will provide construction service support for the project over a total of 42 months including:

- Forty (40) months construction period from Notice to Proceed (July 2022) to Final Completion (November 2025)
- Two (2) additional months for record drawings completion and any remaining close-out items (December 2025 through February 2026)

Unless noted otherwise, all deliverables will be electronic PDF.

Task 1.0 – PROJECT MANAGEMENT AND ADMINISTRATION

1.1. Project Management

Engineer shall oversee the delivery of the construction phase tasks for the Project. This task includes the Engineer's coordination with the City staff, selected General Contractor, and Owner's Representative to manage the delivery of the work outlined in this scope of work. The Engineer will perform the duties of project oversight and reporting to provide updates on the following items: project performance, schedule updates, budget tracking, monthly status reports, and project invoicing.

Engineer will track and update the budget, schedule, progress of work, and potential changes to the scope of work. Engineer will provide a project status report and submit with monthly invoice.

The project status report will include summary of work completed to date, work planned for upcoming month, and schedule update as needed.

It is assumed that City's OR will track program overall budget and schedule, and will submit all necessary outlay documents as required by the project funding agency.

1.2. Coordination with Other Consultants

Miscellaneous coordination with other consultants who are currently working on the Elevated Storage Tank project, Water Lines project, Generator project, E. Pflugerville Parkway Expansion, and Weiss Lane Lift Station Decommissioning to coordinate project activities throughout the project.

It is assumed that no more than eight (8) coordination meetings will be held virtually during the construction phase. Each meeting will be no more than one hour in length. Other miscellaneous coordination will be handled via email correspondence or as part of progress meetings.

Task 2.0 – ENGINEERING SERVICE DURING CONSTRUCTION

2.1. Monthly Progress Meetings and Site Visits

2.1.1. Pre-construction Meeting: The Engineer will attend a pre-construction meeting to provide information & answer questions. Meeting agenda and summary will be provided by City Owner's Representatives/Construction Manager (OR/CM) team.

2.1.2. Monthly Progress Meetings: Engineer will attend Monthly Progress Meetings to be held during the project with the City staff, Contractor, and OR/CM to discuss aspects of the project presently underway, project schedule, and upcoming issues. The scope of work assumes forty (40) progress meetings that will be facilitated by Owner's Representatives/CM. These meetings will generally be about two (2) r hours in duration. The appropriate Engineer team members shall attend these meetings to discuss pertinent issues, typically by two people. Meeting agenda and summary will be provided by City OR/CM team.

2.1.3. Virtual Meetings: In addition to the 40 in-person progress meetings, it is anticipated that fourteen (14) quarterly virtual meetings will be held over the course of construction to discuss construction progress, coordinate on RFI and shop drawings responses, and miscellaneous construction issues, and schedule of upcoming activities and meetings. It is assumed that Engineer will have two people at each call, plus subject matter experts as needed, and the call duration will be two hours for each.

2.1.4. Post-Progress Meeting Site Visits: The Engineer will make visits to the site to observe construction progress at intervals appropriate to the stage and on-going work being conducted. Visits will be conducted when deemed necessary by the City, and at a minimum of once per month in conjunction with the construction progress meetings to observe construction progress. The purpose of the visits will be to assess the construction progress, quality of the work, and generally determine if the work is proceeding in accordance with the Contract Documents.

The site visits will be scheduled to coincide with the monthly project meetings and to walk

the site and develop a standardized report on the general conformance of the work in place, construction observation and any issues identified by the project representatives that attended the meeting.

2.1.5. Discipline Site Visits: In addition, 45 site visits are included by various discipline leads. These site visits will be used to address any field issues that may rise during construction (this assumes two project representatives per visit), including:

Architectural - 5

Structural - 15

HVAC, Plumbing, and Fire Protection/Fire Alarm - 4

Electrical - 15

Instrumentation, Control, and SCADA - 6

2.2. Submittal Review and Substitutions

2.2.1. The Engineer will review and approve, or take other appropriate action, with respect to shop drawings, equipment operation manuals, samples, and other data which Construction Contractor is required to submit for conformance with the Contract Documents. The scope of work assumes up to 700 shop drawing and 350 resubmittal reviews. Submittal review responses will be provided through the City's construction document control system. Software licenses required for construction document control will be provided by Others.

2.2.2. Submittal Review Coordination Virtual Meetings. To facilitate quick turnaround on key submittal reviews by multidiscipline, up to 40 submittal review coordination virtual meetings will be held with the key project team members, Contractor and equipment suppliers to discuss review comments and clarifications. These meetings will be no more than 2 hours each.

2.2.3. Review laboratory, shop, and mill test of material for general conformance with Contract Document requirements.

2.2.4. The Engineer will evaluate and determine the acceptability of substitute materials and equipment proposed by the Construction Contractor and make recommendations to the City as to their acceptance or rejection. The scope of work assumes up to 10 such individual substitution evaluations.

2.3. Requests for Information and Work Change Directives

2.3.1. The Engineer will address Request for Information (RFI) submitted during construction to provide additional clarifications regarding the intent of the Contract Documents as appropriate to facilitate the completion of the work. Such clarifications and interpretations will be consistent with the intent of and reasonably inferable from the Contract Documents. The scope of work assumes the response of up to 200 RFIs during the construction period.

2.3.2. The Engineer will review and prepare Work Change Directives (WCD) which will subsequently be incorporated into a Change Order, to the City staff as appropriate for the

City to approve and issue the directives. The Engineer shall not issue or have the authority to approve such Work Change Directives until the City has approved and accepted the Contractor's cost and schedule change to implement such Work Change Directives (WCD). The scope of work assumes up to 20 WCDs shall be coordinated and executed during the construction period.

2.4. Substantial and Final Completion Inspections

2.4.1. Following notice from the Contractor that the construction work is substantially complete, the Engineer will have a representative from each discipline on site, in conjunction with the City and OR/CM, to conduct the necessary inspection(s) to determine if the work is substantially complete. After considering any objections by the City, the Engineer will deliver a list of items to be corrected or completed prior to achieving Final Completion. It is assumed the City Owner's Representative/CM will issue notice of Substantial Completion.

2.4.2. The Engineer will conduct a final inspection to determine if the completed work is acceptable, so the City OR/CM may recommend, in writing, final payment to the Construction Contractor and may give written notice to the City and Construction Contractor that the work is acceptable. The Engineer will indicate that the work is acceptable to the best of their knowledge, information and belief and based on the extent of services performed and furnished under this Agreement.

It is assumed the Engineer and Owner's Representative will both provide a certification that work has been completed in accordance with the Contract Documents. It is assumed that City OR will issue Final Completion documents for Engineer review and signature.

2.5. Record Drawings

The Contractor will provide the complete record of As-Built redlines in electronic format. The Engineer will develop record drawings based on the As-Built redlines provided by the Constructor and submit to the City via electronic submission.

Task 3.0 – REGULATORY AGENCY COORDINATION DURING CONSTRUCTION

3.1. Regulatory Agency Coordination with TCEQ

Engineer will coordinate with TCEQ to support the following activities during construction:

3.1.1. Approve for Use Coordination: Develop Step 2 Approval for Use sample plan, collect and process data, develop technical memorandum to summarize sample results and submit to TCEQ for review and approval. It is assumed that the City plant staff will collect field water samples and perform onsite field testing. Engineer will be responsible for coordinating required analyses by certified laboratories, coordinating with testing laboratory for delivery of sample bottles, chain-of-custody, and sample shipment. It is assumed that laboratory testing will be paid by others.

3.1.2. Membrane DIT Coordination: Coordinate full-scale membrane direct integrity testing with membrane suppliers, collect and process data, develop technical memorandum to summarize results, and submit to TCEQ for review and approval. DIT will be performed

separately for each train.

3.1.3. Plate Settler Demonstration: Develop full-scale plate settler demonstration testing protocol and sample plan, collect and process data, prepare technical memorandum to present results and submit to TCEQ for review and approval. It is assumed that the City plant staff will monitor daily operation and treatment performance during the test, collect field water samples and perform onsite field testing. Engineer will be responsible for preparing daily operation logs and event logs for the City plant staff to document field issues and observations. Lab testing will be paid by others.

3.1.4. Miscellaneous coordination with TCEQ.

Task 4.0 – COMMISSIONING AND START-UP ENGINEER SUPPORT AND WITNESS FACTORY TESTING

It is understood that City OR team will develop commissioning and start up (C&SU) testing procedures for the Contractor and Contractor will implement the testing procedures. Contractor will be responsible for coordination and construction completion during the C&SU period. Contractor is still required to submit the testing procedures through the normal review process through the Engineer. It is assumed that C&SU staffing plan/matrix, communication protocol, water quality monitory and sample plan, testing QAQC, C&SU checklist, acceptance requirements, testing phase and schedule, daily reports, testing operation supplies quantity estimating and etc, will be developed and outlined in detail by the City OR team to include in the C&SU testing plan.

4.1. Testing Plan Review, Coordination Meetings, and Site Visits

Engineer will supply commissioning and startup support for the following items:

4.1.1. C&SU Testing Plan Review and Meetings: The Engineer will review C&SU plan prepared by the City OR team and provide comments. Attend four (4) plan review meetings with the Contractor, City, and City OR/CM to discuss comments and finalize the testing plan. The Engineer will refine C&SU temporary bypass piping plans as needed. Two (2) meetings will include process mechanical team, and two meetings will include process mechanical team, electrical team, and I&C/control team. Each meeting will be about four hours in duration.

4.1.2. Pre-C&SU Coordination and Meetings: Engineer will attend Pre-C&SU coordination meetings with the Contractor, City, and City OR/CM to plan C&SU activities and provide inputs to preliminary process set points, including up to six (6) in-person meetings and six (6) virtual meetings. Each in-person meeting will have up to three persons attending from the process mechanical team. Each virtual meeting will have up to six persons attending, from the process mechanical team, electrical team, and I&C/control team. The in-person meetings will generally be about four hours in duration and the virtual meetings will be about two hours each in duration.

4.1.3. C&SU Coordination Site Visits: Engineer will make up to six (6) site visits for C&SU coordination.

4.1.4. Coordination Meetings during C&SU: The Engineer will attend up to 12 virtual meetings during C&SU period to coordinate with the Contractor, City, and City OR team to discuss field

issues and solutions. These meetings will be about two hours each in length.

It is assumed that the City will provide chemical supplies during the C&SU testing. It is assumed that the City OR team will monitor daily operation and treatment performance during the C&SU, coordinate with the City plant staff to collect samples and to perform analytical testing in accordance with the C&SU testing plan, and document daily operation logs, event logs, field issues and observations etc. Analytical testing will be paid by others.

4.2. Witness Factory Testing and Functional Demonstration Testing

Engineer will evaluate and provide recommendations regarding factory and/or field test procedures of key equipment by process control system supplier (PCSS), membrane filter system supplier (MFSS), and Application Services Provider.

4.2.1. Witness Factory Testing (WFT). Engineer will attend the WFT along with the PCSS, MFSS, and City SCADA Inspector. The testing will be conducted in the PCSS or MFSS facility as applicable. The test will verify functionality, performance, and stability of the hardware and software.

4.2.2. Operational Readiness Testing (ORT). Engineer will attend the ORT along with the PCSS, MFSS, and City SCADA Inspector. The testing will be conducted at the project site. The entire system shall be checked for proper installation, calibrated, and adjusted on a loop-by-loop and component-by-component basis to ensure that it is in conformance with related submittals and specifications.

4.2.3. Functional Demonstration Testing (FDT). Engineer will attend the FDT with the PCSS, Application Services Provider, applicable Equipment Suppliers and City SCADA Inspector. The testing will be conducted at the project site to demonstrate that it is operating and in compliance with the specifications. Each specified function shall be demonstrated on a paragraph-by-paragraph, loop-by-loop, and site- by-site basis.

4.2.4. Site Acceptance Test (SAT). The 30-day SAT will be a test by the PCSS and application service provider and City SCADA inspector. The testing will be conducted at the project site to demonstrate the entire system will operate continuously for a period of 30 consecutive days with full plant operation, without a single non-field repairable malfunction. Engineer will provide support and oversight of the PCSS and AES for one week of the SAT.

It is assumed that the City SCADA Inspector will perform the vendor control panel testing. Review and inspection of the existing SCADA PLC control panels, HMI screens, and field instruments is not included.

Task 5.0 – FINAL POWER SYSTEM STUDIES

Power system studies are necessary to assist in meeting the latest NFPA, NEC, and OSHA requirements for an existing or new electrical distribution system. Power system studies include, but are not limited to, the following components:

- Short Circuit Analysis
- Arc Flash Hazard Analysis and Hazard Mitigation Options

A preliminary power study for purposes of determining the available short circuit duties and potential arc flash hazard was performed during the final design phase. The final power system study will be conducted during the construction phase to include final protective device coordination and arc flash labeling, based on the actual equipment selected.

Task 6.0 – CONSTRUCTION MATERIAL TESTING SERVICES

Engineer will provide quality assurance testing for the WTP expansion project. The general scope of material testing services are as follows:

- Soil Lab/Field Testing
- Concrete Field/ Lab Testing
- Reinforcing Steel Observations
- Inspection of Masonry and Grout Testing
- Steel Pipe Weld Testing and Inspection

Soil Lab/Field Testing

- Obtain and perform laboratory moisture/density relations and soil classification tests (liquid limit, plastic limit, gradation and percent finer than No. 200 sieve analysis) for each soil type.
- Observe proof rolling of subgrades.
- Perform in-place moisture/density tests (Tex-115-E).
- Perform earthwork observation of excavation and fill placement

Cast-In-Place Concrete /Shallow Foundation /Drilled Pier Concrete /Reinforcing Steel Observations/Observation of Erection and Inspection of Precast Members

Perform inspection and testing during concrete/observations of reinforcing steel placements.

- Drilled pier observation to verify drilling conditions encountered, placement locations, side sloughing and plumbness, confirm element diameters, lengths, the type of bearing material, embedment into bearing strata, the cleaning of the bottom of the shaft, the size, number, configuration, and grade of steel reinforcement, record approximate concrete volumes.
- Shallow foundation observation to verify proper condition of bearing material, to verify excavations are extended to proper depth and have reached proper material, and to verify proper grade beam width and steel reinforcing.
- Preplacement observations of reinforcing steel (immediately prior to concrete placement, performed during same trip as concrete placement, except for grade beams and slabs on grade which will be separate call-out trips) including number and size of bars, clearance and spacing, securing, tying and chairing.
- Ambient and concrete temperature determinations.
- Entrained air content determination.

- Slump determination.
- Cast six-inch by twelve-inch or four-inch by eight-inch concrete test cylinders with the following cylinder compressive strength test schedule for each set – one for 7 days, one for 14 days, two for 28 days, and one early strength or hold cylinder.
- Review the mix design submittals to ensure the material used satisfies required specifications.
- Inspect any reinforcing steel as part of a precast member, and also perform observation of the erection of these members per the client's request

Inspection of Masonry and Grout Testing

- Inspect any reinforcing steel as part of masonry construction.
- Sample and prepare grout specimen cylinders with the following cylinder compressive strength test schedule for each set – two for 7 days, two for 28 days, and one hold cylinder.

Steel Pipe Weld Testing, Inspection and Bolting Inspection

- Perform visual or non-destructive testing of structural steel welds as part of piping placed as part of this project.
- Inspect anchors cast in concrete as requested by the client.

This task will be performed on an on-call basis where personnel will not be present full time during performance of the work. The proposed level of effort fee estimate is based on our best estimate for anticipated construction schedule and frequency of service requests from the City. Should additional material testing be required beyond what's proposed, Engineer will submit an authorization request to the City for additional funds.

Scheduling of material testing services personnel for this project will require at least 24-hour advance notice prior to providing on-call personnel to ensure proper scheduling of work. Services will be invoiced on a unit basis in accordance with the attached Construction Phase Material Testing Services Fee Schedules. Overtime rates of 1.5 times the regular hourly rates will be charged for time worked over 8 hours or before 6:00 AM or after 6:00 PM on Monday through Friday, and all hours worked on Saturdays, Sundays, or holidays.

TASK 7.0 – ADDITIONAL SERVICE TASKS

These items are not part of the basic engineering services and will be added to the scope of services upon written authorization from the City. The services provided under this task will be used at the City's discretion on an as-needed basis.

7.1. Membrane Design Revision

Should any changes be needed as a result of the pilot testing (currently is underway), the Engineer will make necessary design modifications and produce revised conformed drawings for the Contractor to use. 80 hours are included in the budget.

7.2. Additional Engineering Service During Construction

This task represents additional engineering services during construction to be used if the number of site visits, submittals/resubmittals and/or RFIs exceed those planned for in Task 2 and Task 4, and any additional engineering service that may be required.

7.3. Defective Work Correction

In the event Contractor's work will not produce a completed project that conforms generally to the Contractor Documents or that it will prejudice the integrity of the design concept of the competed Project as a functioning whole as indicated in the Contract Documents, Engineer will review and recommend corrective actions to address non-conformance or construction deficiency work. 80 hours are included in the budget.

7.4. Geotechnical Engineering Supports during Construction Phase (on an as-needed cost basis)

If required, Engineer will obtain as-needed assistance from geotechnical subconsultant to coordinate issues during the WTP expansion construction. This task will be performed on a time and material basis and will only be performed upon written authorization from the city.

7.5. Additional Meetings During Construction

This task represents additional meetings that may be required during construction in addition to those planned for in Task 2 and Task4. A total of fourteen (14) virtual meetings are included in the budget with two hours for each.

7.6. Engineer Support During One-Year Warranty

7.6.1. Engineer will consult with City on a monthly basis, for a period not to exceed 12 months, to review outstanding issues, problems with plant and related matters, and advise on possible solutions and actions to be undertaken by the City. A total of 126 hours is included in the budget for use by disciplines.

7.6.2. Engineer will participate with the City in the end-of-warranty walkthrough of the project. Schedule approximately 30 days prior to expiration of the One-Year Warranty period. Engineer will prepare a walkthrough summary to the City summarizing any deficiencies found and the recommended actions to be taken with a schedule of completion. The warranty inspection will be four (4) hours and attended by all disciplines (process mechanical, architectural, structural, HPF, electrical and instrumentation controls).

7.7. Pump Factory Witness Test

The Engineer will attend pump factory witness testing for the pumps associated with the Lake Raw Water Pump Station and High Service Pump Station No. 2. Travel and lodging expenses and the cost for retesting, if required, shall be borne by the Contractor.

7.8. Allowance for Building Mechanical and HVAC Inspection

The Engineer will perform HVAC inspection during commissioning. 100 hours are included in the proposal to cover various buildings in the project.

8.0 – OTHER SERVICE TASKS, CLARIFICATIONS AND EXCLUSIONS

Other service tasks will be negotiated with the City as needed, including additional studies and investigation as required to support recommended solution and/or as required to address system which may become affected as a result of the proposed work but not originally envisioned or as added by the City. These other services may include the following and will be authorized by the City in writing for an additional fee as agreed upon by the City and the Engineer:

1. Any additional meetings during construction and commissioning and start-up, outside of those listed herein
2. Treatability studies
3. Physical laboratory scale modeling
4. Hydraulic transient analysis
5. Computational fluid dynamics (CFD) modeling
6. Any off-site survey work outside the plant fence line
7. Subsurface utility engineering
8. Any additional geotechnical borings and laboratory testing
9. Phase 1 and Phase 2 environmental site assessment (ESA)
10. USACE Permitting
11. Archeological investigation Services
12. Plant security system design
13. Site landscaping
14. Texas Department of Insurance windstorm inspection as city is located outside of tier 1 counties
15. Development of value engineering design options and associated cost savings
16. Construction management and inspection
17. Review and approval of Contract's applications for payment is in Owner Representative's Scope
18. Plant SCADA system programming and application engineering services
19. Vendor control panel testing by City SCADA Inspector
20. HVAC Inspection outside of those listed herein.
21. Analytical laboratory testing during C&SU
22. Testing chemicals during C&SU
23. System Operation and Maintenance manual
24. Hard copies of record drawings and specifications

25. Engineer support services during one-year warranty outside of those listed herein
26. Software licenses needed for review of construction documents
27. Engineer's support to provide documents and respond questions from federal funding agencies, and to prepare, coordinate, and submit necessary documentation to assist with project reimbursement and project closeout documents.
28. The contractor will provide on-site concrete cylinder cure boxes for construction material testing. Contractor to provide OSHA rated lift for observations of above-grade structural steel and bolted / welded connections.

TABLE A-1
Summary of Services and Fees

TASK NO.	TASK DESCRIPTION	AMOUNT
1.0	General Project Management and Coordination (LS)	$201,311.00
2.0	Engineering Service During Construction (LS)	$1,478,431.00
3.0	Regulatory Agency Coordination during Construction (LS)	$107,020.00
4.0	Commissioning and Start-up Engineer Support and Witness Factory Testing (LS)	$343,760.00
5.0	Final Power System Studies (LS)	$28,410.00
6.0	Construction Material Testing Service (HNE)	$592,155.00
7.0	Additional Service Tasks (LS)	$306,895.00
	Project Expenses including reproduction, deliveries, travel lodging, meal, and mileage expenses, and any other direct costs as authorized by the City	$219,476.00
TOTAL		**$3,277,458.00**

LS – Lump Sum
HNE – Hourly Not to Exceed

TABLE A-2
HOURLY LABOR RATES

LABOR CATEGORY	Hourly Rate
Project Principal/ Sr. Project Manager	$275
Sr. Tech Specialist (QA/QC)	$275
Senior Project Engineer (Process Mech)	$225
Project Engineer (Process Mech)	$165
EIT	$140
Senior Project Manager (Structural/Architectural)	$240
Project Engineer (Structural/Architectural)	$205
Senior Environmental Scientist	$215
Environmental Scientist	$140
Senior Construction Inspector	$185
Construction Inspector	$145
CAD Designer	$165
CAD Technician	$120
Word Processor	$120
Contract Admin	$90

Note: The above labor rates are based on the current salary grade structure. These rates are effective through calendar year 2022. An annual inflation of 3.5% will be included to determine future rates in subsequent years over the course of construction.

APPENDIX B
City of Pflugerville WTP Expansion
Construction Phase Engineering Services
Level of Efforts Fee Estimate

			Ardurra Estimated Man-hours																		Subconsultants								
		Position	Project Principal	QA/QC /Technical Specialist	Sr. PM	Sr. Proj. Eng. (Process Mech)	Proj Eng. (Process Mech)	EIT (Process Mech)	Sr. Proj. Mgr (Structural /Arch)	Proj Eng. (Structural /Arch)	EIT (Structural/Arch)	Sr. Construction Inspector	CAD Designer	CAD Technician	Word Processor/Project Admin	Contract Admin	Ardurra - Total Hours	Ardurra Subtotal Labor Cost	ODCs	Ardurra Subtotal	K Friese (Site Civil, Process Mechanical Support)	Mbroh (I&C, SCADA)	Gupta (Electrical)	AACE (MEP/HPF)	HVJ (Geotech)	Subconsultant Total	Ardurra Sub Mark-up (5%)	Total Cost (Ardurra + Subs)
		Rate	$ 275.00	$ 275.00	$ 275.00	$ 225.00	$ 165.00	$ 140.00	$ 240.00	$ 205.00	$ 140.00	$ 185.00	$ 165.00	$ 120.00	$ 120.00	$ 90.00	(Hrs)	($)	($)	($)	($)	($)	($)	($)	($)	($)	($)	($)
Task	Subtask	Task Description																											
Task 1.0 - GENERAL PROJECT MANAGEMENT AND COORDINATION																													
	1.1	Project Management (Regular project reporting, invoicing, and scheduling) and Coordination	48		80	80	160	80	15	0	0				24	24	511	$ 99,440.00		$ 99,440.00	$9,300.00	$7,800.00	$39,200.00	$5,310.00		$61,610.00	$ 3,080.50	$ 164,130.50
	1.2	Coordination with Other Consultants	4		40	40	80		0	0	0				24		188	$ 37,180.00		$ 37,180.00						$0.00	$ -	$ 37,180.00
Task 1.0 - GENERAL PROJECT MANAGEMENT AND COORDINATION			**52**	**0**	**120**	**120**	**240**	**80**	**15**	**0**	**0**	**0**	**0**	**0**	**48**	**24**	**699**	**$ 136,620.00**		**$ 136,620.00**	**$9,300.00**	**$7,800.00**	**$39,200.00**	**$5,310.00**	**$0.00**	**$61,610.00**	**$ 3,080.50**	**$ 201,311.00**
Task 2.0 - ENGINEERING SERVICE DURING CONSTRUCTION																													
	2.1	**Monthly Progress Meetings and Site Visits**																											
	2.1.1	Pre-construction Meeting			8		16		0	0	0				6		30	$ 5,560.00		$ 5,560.00	$900.00		$1,687.56			$2,587.56	$ 129.38	$ 8,276.94
	2.1.2	Monthly Progress Meetings (40)			80	80	160		0	32	0						352	$ 72,960.00		$ 72,960.00	$3,405.00	$23,100.00	$33,632.44			$60,137.44	$ 3,006.87	$ 136,104.31
	2.1.3	Quarterly Virtual Meetings (14)			28	28	42	42	38	23	0						201	$ 40,645.00		$ 40,645.00						$0.00	$ -	$ 40,645.00
	2.1.4	Post-Progress Meeting Site Visits (40)			40	40	40		0	0	0						120	$ 26,600.00		$ 26,600.00	$3,405.00					$3,405.00	$ 170.25	$ 30,175.25
	2.1.5	Discipline Site Visits (50)							62	58	42						162	$ 32,650.00		$ 32,650.00		$37,260.00		$4,972.00		$42,232.00	$ 2,111.60	$ 76,993.60
	2.2	**Submittal Review**							0	0	0							$ -		$ -								
	2.2.1	Submittal Review (700 original plus 350 resubmittals)		24	120	200	640	840	36	96	84				96	96	2232	$ 368,040.00		$ 368,040.00	$17,600.00	$143,730.00	$122,360.00	$34,145.00		$317,835.00	$ 15,891.75	$ 701,766.75
	2.2.2	Submittal Review Coordination Meetings		6	24	56			9	17	0						112	$ 26,495.00		$ 26,495.00		$16,150.00				$16,150.00	$ 807.50	$ 43,452.50
	2.2.3	Review Material Testing Data		4					4	3	7					24	42	$ 5,815.00		$ 5,815.00						$0.00	$ -	$ 5,815.00
	2.2.4	Substitution Requests (10)		8	10	40		60	0	0	0						118	$ 22,350.00		$ 22,350.00						$0.00	$ -	$ 22,350.00
	2.3	**Requests for Information/Word Change Directives**																		$ -								
	2.3.1	RFI (200)		16	24	80	60	40	32	33	35		25	25			370	$ 70,970.00		$ 70,970.00	$10,980.00	$23,100.00	$22,400.00	$12,912.00		$69,392.00	$ 3,469.60	$ 143,831.60
	2.3.2	Work Change Directive (20)		8	24	60	60		0	8	0		15	15			190	$ 38,115.00		$ 38,115.00	$5,810.00	$13,340.00	$10,080.00			$27,230.00	$ 1,361.50	$ 66,706.50
	2.4	**Substantial and Final Completion Inspections**							0	0	0							$ -		$ -								
	2.4.1	Substantial Completion Inspections and Punchlist			16	40		16	7	10	0						89	$ 19,370.00		$ 19,370.00	$6,740.00	$24,840.00	$2,840.00	$2,298.00		$36,718.00	$ 1,835.90	$ 57,923.90
	2.4.2	Final Completion Inspections			12	40		16	7	8	0						83	$ 17,860.00		$ 17,860.00	$1,280.00	$12,420.00	$1,720.00	$2,298.00		$17,718.00	$ 885.90	$ 36,463.90
	2.5	**Record Drawing Development**			12	40		100	8	19	34		60	120			393	$ 61,175.00		$ 61,175.00	$5,130.00	$23,320.00	$14,000.00	$2,074.00		$44,524.00	$ 2,226.20	$ 107,925.20
Task 2.0 - ENGINEERING SERVICE DURING CONSTRUCTION			**0**	**66**	**398**	**704**	**1018**	**1114**	**203**	**307**	**202**	**0**	**100**	**160**	**102**	**120**	**4494**	**$ 808,605.00**	**$ -**	**$ 808,605.00**	**$55,250.00**	**$315,260.00**	**$208,720.00**	**$58,699.00**	**$0.00**	**$637,929.00**	**$ 31,896.45**	**$ 1,478,431.00**
Task 3.0 - REGULATORY AGENCY COORDINATION DURING CONSTRUCTION																													
	3.1	**Regulatory Coordination During Construction**															0	$ -		$ -								
	3.1.1	Approval for Use Coordination		8	16	24	40	60							8		156	$ 27,960.00		$ 27,960.00						$0.00	$ -	$ 27,960.00
	3.1.2	Full Scale Membrane DIT Coordination		16	24	40	60								10		150	$ 31,100.00		$ 31,100.00						$0.00	$ -	$ 31,100.00
	3.1.3	Full-Scale Plate Settler Demonstration		8	16	24	40	60							10		158	$ 28,200.00		$ 28,200.00						$0.00	$ -	$ 28,200.00
	3.1.4	Misc. Coordination with TCEQ			16	32		48							12		108	$ 19,760.00		$ 19,760.00						$0.00	$ -	$ 19,760.00
Task 3.0 - REGULATORY AGENCY COORDINATION DURING CONSTRUCTION			**0**	**32**	**72**	**120**	**140**	**168**	**0**	**0**	**0**	**0**	**0**	**0**	**40**	**0**	**572**	**$ 107,020.00**	**$ -**	**$ 107,020.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$ -**	**$ 107,020.00**
Task 4.0 - COMMISSIONING AND START-UP ENGINEER SUPPORT AND WITNESS FACTORY TESTING																													
	4.1	**Testing Plan Review/Coordination Meetings/Site Visits**																$ -		$ -								
	4.1.1	C&SU Testing Plan Review and Meetings	4	16	32	32	64						40		12	12	212	$ 41,180.00		$ 41,180.00						$0.00	$ -	$ 41,180.00
	4.1.2	Pre-C &SU Coordination and Meetings	4	16	60	80	80								16	16	272	$ 56,560.00		$ 56,560.00	$12,620.00					$12,620.00	$ 631.00	$ 69,811.00
	4.1.3	C&SU Coordination Site Visits			24	48	96										168	$ 33,240.00		$ 33,240.00						$0.00	$ -	$ 33,240.00
	4.1.4	C&SU Coordination Meetings during C&SU	4	8	24	48	48								24	24	180	$ 33,660.00		$ 33,660.00						$0.00	$ -	$ 33,660.00
	4.2	**Witness Factory Testing and Functional Demonstration Testing**																$ -		$ -								
	4.2.1	Witness factory test															0	$ -		$ -		$33,480.00				$33,480.00	$ 1,674.00	$ 35,154.00
	4.2.2	Operational Readiness Testing															0	$ -		$ -		$33,480.00				$33,480.00	$ 1,674.00	$ 35,154.00
	4.2.3	Functional Demonstration Testing															0	$ -		$ -		$82,510.00				$82,510.00	$ 4,125.50	$ 86,635.50
	4.2.4	Site Acceptance Test															0	$ -		$ -		$8,500.00				$8,500.00	$ 425.00	$ 8,925.00
Task 4.0 - COMMISSIONING AND START-UP ENGINEER SUPPORT AND WITNESS FACTO			**12**	**40**	**140**	**208**	**288**	**0**	**0**	**0**	**0**	**0**	**40**	**0**	**52**	**52**	**832**	**$ 164,640.00**	**$ -**	**$ 164,640.00**	**$12,620.00**	**$157,970.00**	**$0.00**	**$0.00**	**$0.00**	**$170,590.00**	**$ 8,529.50**	**$ 343,760.00**
Task 5.0 - FINAL POWER SYSTEM STUDIES																													
		Final Power Study and Labeling				4		24									28	$ 4,260.00		$ 4,260.00			$23,000.00			$23,000.00	$ 1,150.00	$ 28,410.00
Task 5.0 - FINAL POWER SYSTEM STUDIES			**0**	**0**	**0**	**4**	**0**	**24**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**28**	**$ 4,260.00**	**$ -**	**$ 4,260.00**	**$0.00**	**$0.00**	**$23,000.00**	**$0.00**	**$0.00**	**$23,000.00**	**$ 1,150.00**	**$ 28,410.00**
Task 6.0 - CONSTRUCTION MATERIAL TESTING SERVICES																													
	9.1	Construction Material Testing															0	$ -		$ -					$563,957.13	$563,957.13	$ 28,197.86	$ 592,155.00
Task 6.0 - CONSTRUCTION MATERIAL TESTING SERVICES			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**$ -**	**$ -**	**$ -**	**$0.00**	**$0.00**	**$0.00**	**$0.00**	**$563,957.13**	**$563,957.13**	**$ 28,197.86**	**$ 592,155.00**

APPENDIX B
City of Pflugerville WTP Expansion
Construction Phase Engineering Services
Level of Efforts Fee Estimate

			Ardurra Estimated Man-hours																		Subconsultants							
		Position	Project Principal	QA/QC /Technical Specialist	Sr. PM	Sr. Proj. Eng. (Process Mech)	Proj Eng. (Process Mech)	EIT (Process Mech)	Sr. Proj. Mgr (Structural /Arch)	Proj Eng. (Structural /Arch)	EIT (Structural/Arch)	Sr. Construction Inspector	CAD Designer	CAD Technician	Word Processor/Project Admin	Contract Admin	**Ardurra - Total Hours**	**Ardurra Subtotal Labor Cost**	**ODCs**	**Ardurra Subtotal**	K Friese (Site Civil, Process Mechanical Support)	Mbroh (I&C, SCADA)	Gupta (Electrical)	AACE (MEP/HPF)	HVJ (Geotech)	**Subconsultant Total**	Ardurra Sub Mark-up (5%)	**Total Cost (Ardurra + Subs)**
		Rate	$ 275.00	$ 275.00	$ 275.00	$ 225.00	$ 165.00	$ 140.00	$ 240.00	$ 205.00	$ 140.00	$ 185.00	$ 165.00	$ 120.00	$ 120.00	$ 90.00	(Hrs)	($)	($)	($)	($)	($)	($)	($)	($)		($)	($)
Task	**Subtask**	**Task Description**																										
Task 7.0 - ADDITIONAL SERVICE TASKS																												
	7.1	Membrane Design Revision				60							20				80	$ 16,800.00		$ 16,800.00						$0.00	$ -	$ 16,800.00
	7.2	Additional Engineering Service during Construction	16		80	150	160	240					80		80		806	$ 142,950.00		$ 142,950.00						$0.00	$ -	$ 142,950.00
	7.3	Defective Work Correction			20	60											80	$ 19,000.00		$ 19,000.00						$0.00	$ -	$ 19,000.00
	7.4	Geotechnical Engineering Supports during Construction Phase (as needed)															0	$ -		$ -					$25,000.00	$25,000.00	$ 1,250.00	$ 26,250.00
	7.5	Additional Virtual Meetings during Construction (14)			28	28	42	42									140	$ 26,810.00		$ 26,810.00						$0.00	$ -	$ 26,810.00
	7.6	**Engineer Support During One-Year Warranty**																									$ -	
	7.6.1	Additional Virtual Meetings during Construction (14)			12	90			24								126	$ 29,310.00		$ 29,310.00						$0.00	$ -	$ 29,310.00
	7.6.2	End-of Warranty Walkthrough/Summary			6	22		18	8		4				8		66	$ 12,560.00		$ 12,560.00						$0.00	$ -	$ 12,560.00
	7.7	Pump factory witness testing															0	$ -		$ -	$9,300.00					$9,300.00	$ 465.00	$ 9,765.00
	7.8	Allowance for Building Mechanical and HVAC Inspection															0	$ -		$ -				$22,333.00		$22,333.00	$ 1,116.65	$ 23,450.00
Task 7.0 - ADDITIONAL SERVICE TASKS			**16**	**0**	**146**	**410**	**202**	**300**	**32**	**0**	**4**	**0**	**100**	**0**	**88**	**0**	**1298**	**$ 247,430.00**	**$ -**	**$ 247,430.00**	**$9,300.00**	**$0.00**	**$0.00**	**$22,333.00**	**$25,000.00**	$56,633.00	**$ 2,831.65**	**$ 306,895.00**
Project Expenses including reproduction, deliveries, travel lodging, meal, mileage expenses, misc. pilot supplies, and any other direct costs as authorized by the City																												
		Project Expenses including reproduction, deliveries, travel lodging, meal, and mileage expenses, and any other direct costs as authorized by the City																	$ 162,880.00	$ 162,880.00	$1,000.00	$42,600.00	$9,295.80	$1,000.00		$53,895.80	$ 2,700.00	$ 219,476.00
TOTAL			**80**	**138**	**876**	**1566**	**1888**	**1686**	**250**	**307**	**206**	**0**	**240**	**160**	**330**	**196**	**7923**	**$ 1,468,575.00**	**$ 162,880.00**	**$ 1,631,455.00**	**$ 87,470.00**	**$ 523,630.00**	**$ 280,215.80**	**$ 87,342.00**	**$ 588,957.13**	**$ 1,567,614.93**	**$ 78,385.96**	**$ 3,277,458.00**

Scope of Services
Construction and Startup Phase
Water Treatment Plant Expansion Project
City of Pflugerville

Background

Ardurra Group, Inc. (Ardurra) and K Friese & Associates, Inc. (KFA) are completing the design and bid phase services for the City of Pflugerville (Client) Water Treatment Plant Expansion to 30.0 MGD (Project). KFA will provide construction phase services for the Project components designed by KFA. The items included in KFA's scope include the process mechanical components for the expansion of the Lake Pump Station to 33.7 million gallons per day (MGD), 6.0 MGD High Service Pump Station serving the 794' pressure zone, and discharge header modifications at the existing High Service Pump Station and civil components of the stormwater drainage, stormwater detention, and site pavement.

Construction and Startup Services

Scope of Services

The Scope of Services generally includes the following:

- KFA will provide project management supervision and oversight of project team, monitoring budgets and schedules, communications, and other tasks directly associated with the Project
- Attend pre-construction meeting to provide information and answer questions
- Review and comment on equipment and product submittals
- Review and comment on Request for Information and provide interpretive guidance for the resolution
- Review and comment on Construction Request for Proposals, Change Directives and Change Orders
- Attend eight onsite progress meetings or site visits to review questions and the status of the work completed
- Attend four onsite meetings to discuss and provide guidance on startup procedures
- Attend one substantial completion inspection and produce punch list
- Attend one final completion inspection to confirm the completion of punch list items
- Provide Record Drawings from Contractor's As-Builts in electronic .pdf format

The Scope of Services and Fee are based on the following assumptions.

1. The City or Ardurra will provide qualified construction management and onsite field representation services. KFA will not be responsible for providing or supplementing these services.
2. The City or Ardurra will lead startup services. KFA will provide limited services focused on review plans prepared by the City, Ardurra or the Contractor.
3. KFA assumed 30 submittals and 10 request for information for the preparation of the level of effort.

Construction and Startup Scope of Services Schedule

The level of effort is based on a 24-month schedule for construction.

Construction and Startup Scope of Services Fee

Scope of Services
Construction and Startup Phase
Water Treatment Plant Expansion Project
City of Pflugerville

KFA will conduct the Scope of Services for a lump sum fee of $78,170. Table 1 provides a breakdown of the fee.

Table 1: Construction and Startup Scope of Services Fee Summary

Service	Labor Hours	Fee
Project Administration & Management	48	$9,300
Preconstruction Conference	4	$900
Submittal Review	108	$17,600
Requests for Information	60	$10,980
Requests for Proposal/Change Orders	32	$5,810
Site Visits/Progress Meetings	39	$6,810
Startup Assistance	68	$12,620
Substantial Completion Walk Through	34	$6,740
Final Completion Walk Through	8	$1,280
Record Drawings	38	$5,130
Expenses	0	$1,000
Total	470	$78,170

Supplemental Services

Witness Testing

KFA will attend onsite witness testing for the pumps associated with the Lake Raw Pump Station and High Service Pump Station #2.

The Scope of Services and Fee are based on the following assumptions.

1. Travel and lodging expenses will be paid by the Contractor
2. The cost for any retesting, if required will be paid by the Contractor

Supplemental Services Fee

KFA will conduct the Scope of Supplemental Services for witness testing in accordance with the Scope Assumptions for a time and material not to exceed fee of $9,300.

KFA FEE SCHEDULE
CONSTRUCTION PHASE
ARDURRA
PFLUGERVILLE WTP EXPANSION PROJECT

	Task	Senior Project Manager	Technical Lead	Senior Engineer	Project Engineer LRWPS	Project Engineer HSPS	Graduate Engineer Drainage	Designer 2D CAD	General Office Clerk Hours	Total Labor	KFA Total Labor Cost	Expenses	Total Cost
		$ 280.00	$ 280.00	$ 225.00	$ 160.00	$ 160.00	$ 130.00	$ 120.00	$ 90.00				
Construction Phase Services		*12*	*40*	*92*	*84*	*96*	*51*	*24*	*40*	***439***	***$77,170***	***$1,000***	***$78,170***
1.0	Project Administration & Management	12		20					16	48	$9,300		$9,300
2.0	Preconstruction Conference			4						4	$900		$900
3.0	Submittal Review		12	16	16	24	16		24	108	$17,600		$17,600
4.0	Requests for Information		8	12	12	16	12			60	$10,980		$10,980
5.0	Requests for Proposal/Change Orders		4	6	8	8	6			32	$5,810		$5,810
6.0	Site Visits/Progress Meetings			12	10	10	7			39	$6,810		$6,810
7.0	Startup Services		8	12	24	24				68	$12,620		$12,620
8.0	Substantial Completion Walk Through		8	8	6	6	6			34	$6,740		$6,740
9.0	Final Completion Walk Through				4	4				8	$1,280		$1,280
10.0	Record Drawings			2	4	4	4	24		38	$5,130		$5,130
11.0	Expenses									0	$0	$1,000	$1,000
	Base Services Totals	**12**	**40**	**92**	**84**	**96**	**51**	**24**	**40**	**470**	**$77,170**	**$1,000**	**$78,170**
Supplemental Services													
A.	Witness Testing									52	$0		$0
1	Lake Raw Water Pumps		2		24					26	$4,400	$250	$4,650
2	High Service Pumps		2			24				26	$4,400	$250	$4,650
	Supplemental Services Totals	**0**	**2**	**0**	**12**	**12**	**0**	**0**	**0**	**52**	**$8,800**	**$500**	**$9,300**
	Total Base + Supplemental Services	**12**	**42**	**92**	**96**	**108**	**51**	**24**	**40**	**522**	**$85,970**	**$1,500**	**$87,470**

MBROH

13601 Preston Road., Suite 900W | Dallas, TX 75240 | tel 972.364.9090 | fax 972.364.9091 | www.mbroh.com

March 14, 2022

Yue Sun, P.E.
Project Manager
Ardurra
2032 Buffalo Terrace
Houston, TX. 77019

RE: City of Pflugerville WTP Expansion Construction Services

Dear Ms. Sun:

Thank you for the opportunity to provide our Scope of Work and Level of Effort (LOE) for the City of Pflugerville WTP Expansion Project.

The task below describes the SCADA Engineering Services to be provided by Mbroh Engineering, Inc. for the Construction Services engineering effort including:

- Project Management
- Meetings
- Submittal Review
- Operations and Maintenance Manual (O&M) Review
- Witness Factory Testing
- Operational Readiness Testing
- Functional Demonstration Testing
- Site Acceptance Testing
- Respond to Requests for Information (RFI)
- Develop Record Drawings
- Perform periodic oversight inspections
- Perform Substantial and Final Completion Inspections

Please find the attached Scope of Work and LOE Spreadsheet for the proposed Professional Services fee of **$523,630.00**.

If you should have questions, please feel contact me at (972) 364-9090.

Sincerely,

Anthony Mbroh, P.E.
President

SCOPE OF WORK

Mbroh Engineering, Inc. (MEI) will provide I&C design engineering services during construction for the for City of Pflugerville Water Treatment Plant (WTP) Expansion Project to include the following:

- Project Management
- Meetings
- Submittal Review
- Operations and Maintenance Manual (O&M) Review
- Witness Factory Testing
- Operational Readiness Testing
- Functional Demonstration Testing
- Site Acceptance Testing
- Respond to Requests for Information (RFI)
- Develop Record Drawings
- Perform periodic oversight inspections
- Perform Substantial and Final Completion Inspections

The proposal for construction services assumes the following items are excluded from the scope of work:

- Monthly construction meetings
- Review / inspection of existing SCADA PLC control panels, HMI Screens, and field instruments.
- The following testing is assumed to be by the City SCADA inspector:
    - Vendor Control Panel Testing

Engineering Services During Construction

A. Project Management

1. Monthly Management

   MEI will manage and control professional service provide efficient completion of the project. Under this task we will provide the following documents:

   - Monthly Project Invoices

2. Meetings

   MEI will attend the following coordination meetings as required for specification and drawing clarification, startup sequencing, inspection coordination, and workshops. The proposal assumes two MEI attendees per two hour meeting

   - Coordination Meetings Ardurra (10)
   - Coordination Meetings MFSS (8)
   - Coordination Meetings PCSS / AES (8)

B. Submittals

1. Shop Drawings
   - Review Contractor's submittals in accordance with the Contract Documents. Submittals include shop drawings, diagrams, illustrations, catalog data, schedules, samples, results of tests and inspections, manufacturer's operation and maintenance manuals, and other data which the Contractor is required to submit. These shall be reviewed for general conformance with the design concept of the project and general compliance with the information given in the Contract Documents.
   - Maintain a log of submittals
2. Equipment O&M Manuals
   - Review preliminary and final O&M manuals submitted for each piece of new equipment provided under MEI's SOW for this project. Verify that preventive maintenance and recommended spare parts are included in the manuals. Require that Contractor submit the O&M manuals in an MS Word or Adobe Acrobat compatible format.
3. Request for Information (RFI)
   - Provide responses to RFIs for clarification of plans and specifications. Maintain log of all RFIs received.

C. Testing

1. Evaluate and provide recommendations regarding factory and/or field test procedures of key equipment by PCSS, MFSS, and Application Services Provider.
2. This proposal assumes all testing is to be performed on separate site visits. The actual construction schedule may allow for multiple tests to be performed on the same trip, which could reduce the travel expenses accordingly.
3. Witness Factory Testing (WFT)
    - MEI will attend the WFT along with the PCSS, MFSS, and City SCADA Inspector (if applicable). The testing will be conducted in the PCSS or MFSS facility as applicable. The test will verify functionality, performance, and stability of the hardware and software.
4. Operational Readiness Testing (ORT)
    - MEI will attend the ORT along with the PCSS, MFSS, and City SCADA inspector (if applicable).
    - The testing will be conducted at the project site. The entire system shall be checked for proper installation, calibrated, and adjusted on a loop-by-loop and component-by-component basis to ensure that it is in conformance with related submittals and specifications.
5. Functional Demonstration Testing (FDT)
    - The FDT will be a joint test by MEI, the PCSS, Application Services Provider, applicable Equipment Suppliers and City SCADA Inspector (if applicable).
    - The testing will be conducted at the project site to demonstrate that it is operating and in compliance with the specifications. Each specified function shall be demonstrated on a paragraph-by-paragraph, loop-by-loop, and site-by-site basis.
6. 30-Day – Site Acceptance Test (SAT)
    - The SAT will be a test by the PCSS, and Application Services Provider, and City SCADA Inspector (if applicable).
    - The testing will be conducted at the project site to demonstrate the entire system will operate continuously for a period of 30 consecutive days with full plant operation, without a single non-field repairable malfunction.
    - MEI will provide support and oversight of the PCSS and AES for one week of the SAT.

D. Project Closeout

7. Substantial and Final Completion Inspections
    - MEI will assist Ardurra in final construction inspection walk-through and punchlist development at Substantial and Final completion. Ardurra will have conducted preliminary walk-throughs and prepared preliminary punchlist.
    - Due to the number of process areas needing inspection, it is assumed that inspections will be staggered as specific areas are ready for Substantial completion.
    - The proposal assumes the I&C Project Manager and Senior I&C Engineer will perform a total of four inspections / site visits of two days each, for a total of eight days.

8. Record Documents
    - MEI will revise previously conformed contract plans and specifications to reflect information provided from contractors and inspectors on changes made during the construction phase of the project. MEI will provide a CD containing AutoCad drawings and a PDF of the revised drawings. Provide a CD with PDF of the specifications separated by division.

FEE

The lump sum fee for the scope of work defined above is $523,630. Cost breakdown is shown on Attachment A.

ENGINEERING SERVICES
RATE SHEET

LABOR RATES

CLASSIFICATION	RATE
Senior Project Manager (PM)	**$200**
Senior I&C Engineer	**$185**
Project Engineer	**$150**
Senior CAD/Drafter	**$120**
Administrative Assistant	**$75**

Pflugerville WTP Construction - Attachment A

Level of Effort Spreadsheet

		Project Manager	Senior I&C Engineer	Project Engineer	Sr CAD Designer	Admin			
	Basic Services Section						Labor Totals	Other Direct Costs	Total Fee
		200	185	150	120	75	$	$	$
1.0	**Construction Phase Services WTP Expansion**								
	Project Management						$0		
	Monthly invoicing (24 invoices out of 40 month construction)	12				72	$7,800		
	Coordination Meetings Ardurra (10 meetings)	20	20				$7,700		
	Coordination Meetings MFSS (8 meetings)	16	16				$6,160		
	Coordination Meetings PCSS / AES (8 meetings), meeting notes	24	24			10	$9,990		
	Coordination with SCADA Inspectors	40	40				$15,400		
							$0		
	Submittals (equipment submittals includes O&M manual review)						$0		
	11010 Copper Ion Generation System	2	8			1	$1,955		
	11214 Vertical Turbine Pumps	2	8			1	$1,955		
	11221 Inline Static Mixers	2	8			1	$1,955		
	11222 Vertical Shaft Flocculators	2	10			1	$2,325		
	11223 Vertical Shaft Hyperbolic Flocculators	2	10			1	$2,325		
	11225 Raw Sludge Thickeners	2	10			1	$2,325		
	11241 Chemical Metering Systems	4	12			1	$3,095		
	11280 Slide Gates and Weir Gates	0	0			1	$75		
	11312 Submersible Centrifugal Pumps for Process Service	2	8			1	$1,955		
	11315 Progressive Cavity Pumps	2	8			1	$1,955		
	11317 Sump Pumps	2	6			1	$1,585		
	11344 Fiberglass Tanks	0	0			1	$75		
	11350 Chain and Flight Sludge Collectors	4	10			1	$2,725		
	11352 Stainless Steel Inclined Plate Settlers	2	4			1	$1,215		
	11501 Safety Devices/Equipment	2	4			1	$1,215		
	13220 Vendor Package System Controls	4	16			1	$3,835		
	13300 Instrumentation and Controls – General Provisions	2	8			1	$1,955		
	13300 Instrumentation and Controls – PCSS Testing documentation	8	20			1	$5,375		
	13300 Instrumentation and Controls – PCSS O&M Manual	4	16			1	$3,835		
	13301 Instrumentation and Controls – General Provisions MFSS	4	16			1	$3,835		
	13301 Instrumentation and Controls – MFSS Testing documentation	4	16			1	$3,835		
	13301 Instrumentation and Controls – MFSS O&M Manual	4	16			1	$3,835		
	13310 Level Measurement: Switches	2	4			1	$1,215		
	13311 Level Instrumentation Equipment	2	4			1	$1,215		

Pflugerville WTP Construction - Attachment A

Level of Effort Spreadsheet

		Project Manager	Senior I&C Engineer	Project Engineer	Sr CAD Designer	Admin			
	Basic Services Section						Labor Totals	Other Direct Costs	Total Fee
		200	185	150	120	75	$	$	$
	13312 Flow Measurement: Switches	2	4			1	$1,215		
	13313 Flow Measurement: Transmitters	2	8			1	$1,955		
	13314 Pressure/Vacuum Measurement: Diaphragm and Annular Seals	2	8			1	$1,955		
	13315 Pressure/Vacuum Measurement: Instrument Valves	2	4			1	$1,215		
	13316 Pressure/Vacuum Measurement: Switches	2	6			1	$1,585		
	13317 Pressure/Vacuum Measurement: Gauges	2	8			1	$1,955		
	13318 Pressure/Vacuum Measurement: Direct	2	8			1	$1,955		
	13320A Streaming Current Analyzers	2	8			1	$1,955		
	13320B Analyzers: Oxygen Reduction Potential (ORP)	2	8			1	$1,955		
	13320C Analyzers: pH Analyzer Monitor	2	6			1	$1,585		
	13320D Analyzers: Chlorine Residual	2	8			1	$1,955		
	13322 Turbidity Analyzers	2	4			1	$1,215		
	13330 Control Systems: Programmable Logic Controllers	4	12			1	$3,095		
	13331 Control Strategies and PLC IO	12	48			3	$11,505		
	13332 Network Materials and Equipment	2	16			1	$3,435		
	13333 Uninterruptible Power Supplies 10 KVA and Below	2	8			1	$1,955		
	13334 Process Control Panels and Hardware	2	12			1	$2,695		
	15200 Electric Valve Actuators	2	8			1	$1,955		
	15500 HVAC - General Provisions (temperature sensors)	1	2			1	$645		
	16480 Low Voltage Motor Control Centers	4	16			1	$3,835		
	16485 Low Voltage Variable Frequency Drives (VFDs)	2	12			1	$2,695		
	16487 Electrical Contractor Provided Control Panels (ECPs)	2	8			1	$1,955		
	MFSS Membrane System Supplier Submittals	24	40			1	$12,275		
	Misc Submittal	8	24			1	$6,115		
							$0		

Pflugerville WTP Construction - Attachment A
Level of Effort Spreadsheet

		Project Manager	Senior I&C Engineer	Project Engineer	Sr CAD Designer	Admin			
	Basic Services Section						Labor Totals	Other Direct Costs	Total Fee
		200	185	150	120	75	$	$	$
	Testing - Witness Factory Test (WFT)						$0		
	Lake Pump Station PLC SCADA Panel WFT	4	20			2	$4,650	$800	
	Pretreatment PLC SCADA Panel WFT	4	20			2	$4,650	$800	
	High Service Pump Station PLC SCADA Panel WFT	4	20			2	$4,650	$800	
	Chemical Facility PLC SCADA Panel WFT	4	20			2	$4,650	$800	
	Sludge Handling PLC SCADA Panel WFT	4	20			2	$4,650	$800	
	Membrane Master PLC, (7) RIO Panels WFT	6	48			2	$10,230	$1,840	
							$0	$0	
	Testing Operational Readiness Test (ORT)						$0	$0	
	Lake Pump Station PLC SCADA Panel ORT	4	20			2	$4,650	$800	
	Pretreatment PLC SCADA Panel ORT	4	20			2	$4,650	$800	
	High Service Pump Station PLC SCADA Panel ORT	4	20			2	$4,650	$800	
	Chemical Facility PLC SCADA Panel ORT	4	20			2	$4,650	$800	
	Sludge Handling PLC SCADA Panel ORT	4	20			2	$4,650	$800	
	Membrane Master PLC, (7) RIO Panels ORT	6	48			2	$10,230	$1,840	
							$0	$0	
	Testing - Functional Demonstration Test (FDT)						$0	$0	
	Lake Pump Station PLC SCADA Panel FDT	4	24			2	$5,390	$800	
	Pretreatment PLC SCADA Panel FDT	4	24			2	$5,390	$800	
	High Service Pump Station PLC SCADA Panel FDT	4	24			2	$5,390	$800	
	Chemical Facility PLC SCADA Panel FDT	4	24			2	$5,390	$800	
	Sludge Handling PLC SCADA Panel FDT	4	24			2	$5,390	$800	
	Membrane Master PLC FDT + Train 1	8	32			2	$7,670	$1,060	
	Membrane RIO Panel FDT - Train 2	4	24			2	$5,390	$800	
	Membrane RIO Panel FDT - Train 3	4	24			2	$5,390	$800	
	Membrane RIO Panel FDT - Train 4	4	24			2	$5,390	$800	
	Membrane RIO Panel FDT - Train 5	4	24			2	$5,390	$800	
	Membrane RIO Panel FDT - CIP + Neutralization	4	24			2	$5,390	$800	
	Membrane RIO Panel FDT - Blower, Backwash	4	24			2	$5,390	$800	
	SCADA HMI FDT	40	40			2	$15,550	$2,360	
							$0	$0	
	Testing - 30 Day Site Acceptance Testing (SAT) Support						$0	$0	
	Final Testing entire system	4	40			4	$8,500	$1,580	

Pflugerville WTP Construction - Attachment A

Level of Effort Spreadsheet

		Project Manager	Senior I&C Engineer	Project Engineer	Sr CAD Designer	Admin			
	Basic Services Section						Labor Totals	Other Direct Costs	Total Fee
		200	185	150	120	75	$	$	$
							$0		
							$0		
	Respond to RFIs	40	80			4	$23,100		
	Review and make recommendations on contract change proposals	16	32		16	4	$11,340		
	Develop final record drawings for the work	12	32		120	8	$23,320		
	Periodic oversight site inspections (6 inspections, 1 day ea + travel)	96	96			4	$37,260	$9,000	
	Substantial and final completion inspections (4 inspections, 2 day ea + travel)	96	96			4	$37,260	$8,120	
							$0		
	Quality Control Review	40	40				$15,400		
	Subtotal - Basic Services Section	**713**	**1656**	**0**	**136**	**210**	**$481,030**	**$42,600**	**$0**
	Project Total						**$523,630**		

City of Pflugerville Surface Water Treatment Plant Expansion Project
Construction Phases
Electrical Engineering Project Scope

1. **Overview and Understanding:**
This project will provide the 30 MGD Expansion Project construction phase services (Project) for the City of Pflugerville (Owner) Surface Water Treatment Plant (Plant). Gupta & Associates, Inc. (GAI) will perform both the electrical distribution and controls (ED&C) services as a subconsultant to Ardurra.

1.1. Project Description – Basic Services

1.1.1. Power System Studies

1. A preliminary power study for purposes of determining the available short circuit duties and potential arc flash hazard was performed during the final design phase. The final power system study will be conducted during the construction phase to include final protective device coordination based upon the Contractor's shop drawing submittals.
2. Arc flash warning labels will be printed and installed on appropriate electrical equipment based upon the final power study results.
3. Submit the final SKM Power*Tools computer-based power study model to Ardurra.

1.1.2. Contractor Submittals (RFIs)

1. Review and resolve Contractor's Requests for Information (RFIs) – Assumed quantity: 30.
2. Review and respond to Contractor's Shop Drawings submittals/resubmittals – Assumed quantity: 60.
3. Review and respond to Contractor's Operations and Maintenance Manuals (O&Ms) submittals/resubmittals – Assumed quantity: 20.
4. Review and make recommendations for Contract Change/Field Orders – Assumed quantity: 10.

1.1.3 Intentionally deleted

1.1.4. Meetings

1. Participate in one Pre-Construction Meeting.
2. Conduct two Oncor Coordination Meetings. Provide meeting minutes and action items to Ardurra.
3. Attend up to 14 Monthly Construction Progress Meetings.

1.1.5. Site Inspections

1. In conjunction with each Monthly Construction Progress Meeting attended, perform an informal site walk to observe construction progress. Submit results of the site visit to Ardurra.
2. Upon substantial completion, inspect the construction work, in the company of the Owner's and/or Ardurra's representative. Prepare a punch-list of those items to be completed or corrected before final completion of the project. Submit results of the inspection to Ardurra.
3. Upon correction of the substantial completion punch list, inspect the construction work, in the company of the Owner's and/or Ardurra's representative. Prepare a punch-list of those items which are not completed or corrected from the substantial completion punch-list. Submit results of the inspection to Ardurra.

1.1.6. Record Drawings

1. Upon completion of the project, incorporate Contractor field mark-ups into the plans to create Record Drawings. Provide electronic copies of the drawings and specifications.

1.2. Fee:
GAI will perform these services on a fixed fee basis, based upon the following:

Description	Total
Task 1.0 – GENERAL PROJECT MANAGEMENT AND QUALITY CONTROL	$39,200
Task 2.0 – CONSTRUCTION PHASE SERVICES	$208.720
Task 6.0 – FINAL POWER STUDY	$23,000
Expenses	$9,296

2. Clarifications:

The following items apply to this proposal:

1. GAI assumes no responsibility for directing the safety performance or ways and means of construction work of the contractor directly.
2. GAI has not included any hardware in this proposal.
3. This proposal is valid for 30 days.
4. This proposal is based upon the existing design phase contract being amended.

Exhibit B

Level of Effort

AACE - Responsible for HVAC, Plumbing, and Fire Protection

Pflugerville WTP Expansion - Construction Phase Services

			AACE Estimated Man-hours									
		Position	Principal	QA/QC/ Technical Specialist	Sr. PM	Mid. Eng. 4/5	EIT Eng. 1	Admin 2	Sr. Admin 5/Acct	AACE - Total Hours	AACE Subtotal Labor Cost	AACE Subtotal
		Rate	$ 218.00	$ 148.00	$ 164.00	$ 125.00	$ 90.00	$ 60.00	$ 77.00	(Hrs)	($)	($)
Task	**Subtask**	**Task Description**										
PART 1 - BASIC SERVICES												
A1.01. GENERAL PROJECT MANAGEMENT AND COORDINATION												
	1	Project Schedule, Filing, Invoicing, Progress Report & Contract Administration (36 months)	18						18	36	$ 5,310.00	$ 5,310.00
CONSTRUCTION PHASE												
		General										
	1	Attend pre-construction meeting (Not included for AACE)								0	$ -	$ -
	2	**Submittal, RFI, CO Review**										
		Submittals, assume 25% resubmittals	8		107		93	7		215	$ 28,082.00	$ 28,082.00
		RFI Review and Response	4		50		40	4		98	$ 12,912.00	$ 12,912.00
		Change Order review and response, estimated 4	3		16		16	4	1	40	$ 5,035.00	$ 5,035.00
	3	**Meetings/Site Visits**										
		Attend (2) Construction Meetings/Site Visits	2		24		4	4		34	$ 4,972.00	$ 4,972.00
	4	**Substantial Completion and Final Acceptance**										
		Substantial completion walkthrough and punch list	1		12		3	1		17	$ 2,516.00	$ 2,516.00
		Final completion inspection and final acceptance	1		12		3	1		17	$ 2,516.00	$ 2,516.00
	5	**Review contractor as-built redlines and Prepare Record Drawings**	1	4	4		8	8		25	$ 2,666.00	$ 2,666.00
		Project Task Expenses (5% on Subtotal Hrs Cost)									$ 1,000.00	$ 1,000.00
CONSTRUCTION PHASE			**20**	**4**	**225**	**0**	**167**	**29**	**1**	**446**	**$ 59,699.00**	**$ 59,699.00**
TOTAL BASIC SERVICES			**38**	**4**	**225**	**0**	**167**	**29**	**19**	**482**	**$ 65,009.00**	**$ 65,009.00**

HVJ ASSOCIATES

4201 Freidrich Lane, Suite 110
Austin, Texas 78744
512.447.9081 Ph
512.443.3442 Fax
www.hvj.com

April 4, 2022

Ms. Yue Sun, PE, BCEE
Project Director/Group Leader
Ardurra
7400 Rialto Blvd, Bldg 1, Ste 240,
Austin, Texas 78735

Re: City of Pflugerville Water Treatment Plant Expansion
Construction Phase Materials Engineering and Testing Proposal
Pflugerville, Texas
HVJ Project No. AC2010412

Dear Ms. Yue:

Pursuant to your request, HVJ South Central Texas – M&J, Inc. (HVJ) is pleased to submit this proposal to provide Owner quality assurance testing for the proposed water treatment plant and raw water infrastructure project in Pflugerville, Texas. This proposal reflects brief scope and fee for construction phase materials engineering and testing services following a brief review of project documents.

Project Description
It is understood the proposed water treatment plant and raw infrastructure consists of and not limited to the following structures: lake pump station/raw water intake tower, pretreatment/pretreatment electrical building, membrane building/membrane electrical building, chlorine contact basin/clearwell, high service pump station, chemical facilities, solids handling structures, main electrical building, and an elevated storage tank.

Scope of Services
The general scope of material testing services anticipated for this project are as follows.

- Soil Lab/Field Testing
- Concrete Field/ Lab Testing
- Reinforcing Steel Observations
- Inspection of Masonry and Grout Testing
- Steel Pipe Weld Testing and Inspection

Soil Lab/Field Testing

- Obtain and perform laboratory moisture/density relations and soil classification tests (liquid limit, plastic limit, gradation and percent finer than No. 200 sieve analysis) for each soil type.
- Observe proof rolling of subgrades.
- Perform in-place moisture/density tests (Tex-115-E).
- Perform earthwork observation of excavation and fill placement.

Cast-In-Place Concrete /Shallow Foundation /Drilled Pier Concrete /Reinforcing Steel Observations /Observation of Erection and Inspection of Precast Members

Perform testing during concrete/observations of reinforcing steel placements.

- Drilled pier observation to verify drilling conditions encountered, placement locations, side sloughing and plumbness, confirm element diameters, lengths, the type of bearing material, embedment into bearing strata, the cleaning of the bottom of the shaft, the size, number, configuration, and grade of steel reinforcement, record approximate concrete volumes.
- Shallow foundation observation to verify proper condition of bearing material, to verify excavations are extended to proper depth and have reached proper material, and to verify proper grade beam width and steel reinforcing.
- Preplacement observations of reinforcing steel (immediately prior to concrete placement, performed during same trip as concrete placement, except for grade beams and slabs on grade which will be separate call-out trips) including number and size of bars, clearance and spacing, securing, tying and chairing.
- Ambient and concrete temperature determinations.
- Entrained air content determination.
- Slump determination.
- Cast six-inch by twelve-inch or four-inch by eight-inch concrete test cylinders with the following cylinder compressive strength test schedule for each set – one for 7 days, one for 14 days, two for 28 days, and one early strength or hold cylinder.
- We will also review the mix design submittals to ensure the material used satisfies required specifications.
- We will also inspect any reinforcing steel as part of a precast member, and also perform observation of the erection of these members per the client's request.

Inspection of Masonry and Grout Testing

- Inspect any reinforcing steel as part of masonry construction.
- Sample and prepare grout specimen cylinders with the following cylinder compressive strength test schedule for each set – two for 7 days, two for 28 days, and one hold cylinder.

Steel Pipe Weld Testing, Inspection and Bolting Inspection

- Perform visual or non-destructive testing of structural steel welds as part of piping placed as part of this project.
- Inspect anchors cast in concrete as requested by the client.

It is understood that materials testing and observations services was estimated on a call-out basis, where personnel will not be present full time during performance of the work.

Cost Estimate

We recommend allocating a budget of **$563,957.13** for construction materials testing for the proposed treatment plant expansion project**.** Summary of materials testing budget fee is shown below.

		Cost Estimate for Materials Testing related to Water Treatment Plant Structures				
		Field Services				
1644	Hour	Rebar Observation, Concrete Testing and Observation, Precast member erection Observation	$	84.00	$	138,096.00
261	Hour	Grout Testing	$	84.00	$	21,924.00
660	Hour	Sample Pickup	$	84.00	$	55,440.00
1791	Hour	Density Test on Backfill Compaction	$	84.00	$	150,444.00
224	Trip	Nuclear Density Gauge Fee	$	55.00	$	12,313.13
854	Trip	Vehicle Charge	$	80.00	$	68,320.00
				Subtotal	$	446,537.13
		Laboratory Services				
25	Each	Sieve Analysis Tex-110E	$	72.00	$	1,800.00
25	Each	Atterberg Limits	$	75.00	$	1,875.00
25	Each	Moisture/Density Relationship Tex-113/114E	$	275.00	$	6,875.00
26	Each	Sample Preparation	$	85.00	$	2,210.00
2	Each	Sulfate Content Tex-145E	$	85.00	$	170.00
1	Each	Lime PI Series	$	250.00	$	250.00
2	Each	Linear Bar Shrinkage Tex-107E	$	25.00	$	50.00
1	Each	Triaxial Tex-117E	$	1,700.00	$	1,700.00
1210	Each	Concrete Cylinders Compressive Strength (Each set - one 7 day, one 14 day, two 28 day, one hold cyl	$	24.00	$	29,040.00
5	Each	Obtaining and Testing Drilled Cores of Concrete	$	150.00	$	750.00
210	Each	CMU Grout Cylinders (Each set - two 7 day, two 28 day, one hold cylinder)	$	24.00	$	5,040.00
160	Hrs	AWS/CWI and bolting Inspection	$	115.00	$	18,400.00
				Subtotal	$	68,160.00
				Estimated Total for Testing	**$**	**514,697.13**
		PROJECT MANAGEMENT & ADMINISTRATION				
90	Hour	Project Manager, PE	$	179.00	$	16,110.00
130	Hour	Staff Engineer, EIT	$	125.00	$	16,250.00
260	Hour	Admin/Clerical	$	65.00	$	16,900.00
				Subtotal	$	49,260.00
				PROJECT MANAGEMENT & ADMINISTRATION	**$**	**49,260.00**
				Estimated Total for Testing, Project Management, and Administration	**$**	**563,957.13**

This estimate was prepared based on a ***36 month*** construction schedule. The cost estimate is based on our best estimate for both the construction schedule and frequency of service requests from the client. As the schedule and frequency of requests are beyond our control, we cannot guarantee that the estimate provided would be adequate to provide the services needed throughout the entire duration of construction of this project. Advance authorization will be needed if additional funds are required to complete testing per project

specification. HVJ will monitor the budget as the work proceeds and will keep you or your designated representative informed.

Scheduling of our personnel for this project will be at the request of you or your designated representatives. We require at least 24-hours notice prior to providing on-call personnel to ensure proper scheduling of work. Services will be invoiced on a unit basis in accordance with the attached Construction Phase Services Fee Schedules. Overtime rates of 1.5 times the regular hourly rates will be charged for time worked over 8 hours or before 6:00 AM or after 6:00 PM on Monday through Friday, and all hours worked on Saturdays, Sundays, or holidays.

Limitations
Our work will be performed in a manner consistent with that level of care and skill ordinarily exercised by other members of HVJ's profession practicing in the same locality, under similar conditions and at the date the services are provided. Our conclusions, opinions and recommendations will be based on a limited number of observations and data. It is possible that conditions could vary between or beyond the data evaluated. HVJ makes no guarantee or warranty, express or implied, regarding the services, communication (oral or written), report, opinion, or instrument of service provided.

This proposal was prepared specifically for the client and its designated representatives and may not be provided to others without HVJ's express permission.

Assumptions
The following assumptions were made in developing the scope and fee estimate for this project:

- Depending on the frequency of call-outs, this scope may increase or decrease. The client will be notified and there is a potential need for budget increase.
- Overtime rates will apply for all hours worked between 8pm and 6am Monday through Friday, all day Saturday and Sunday, and national observed holidays. Invoices will reflect 1-hour minimum time blocks for technicians.
- This proposal includes some overage for retesting in the event of failures or non-conformances.
- The contractor/client will provide on-site concrete cylinder cure boxes.
- HVJ will not be providing full-time testing and observations services. HVJ will provide intermittent on-call testing services for the work on this project. We can provide full-time testing and observations services and a revised proposal upon request.
- Contractor to provide OSHA rated lift for observations of above-grade structural steel and bolted / welded connections.

HVJ Associates® is pleased to submit this proposal for the proposed improvements. Should you have any questions regarding the contents of this proposal, please contact us at 512-447-9081.

Sincerely,

HVJ South Central Texas – M&J, Inc.
TBPE F-18091

Rezwan Jahangir, Ph.D., P.E.
CoMET Department Manager

Syed Jafar, P.E.
Executive Vice President

Agreed to this _____ day of _____, 20_____

By: _____

Title: _____

Firm: _____

Phone Number: _____

Date to Start Work: _____

Enclosures:

Attachment A: Standard Fee Schedule (4 pages)

HVJ SOUTH CENTRAL TEXAS Attachment A

CONSTRUCTION MATERIALS ENGINEERING AND TESTING SERVICES

STANDARD FEE SCHEDULE

CITY OF PFLUGERVILLE WATER TREATMENT PLANT EXPANSION MASTER FEE SCHEDULE

CODE	DESCRIPTION		HOURLY RATES
1	Project Manager (PE)	$	179.00
2	Sr. Project Engineer(PE)	$	179.00
3	Project Engineer (PE)	$	150.00
4	Staff Engineer (EIT)	$	125.00
5	Certified Engineering Technician	$	84.00
6	Welding Inspector (CWI)	$	115.00
7	NDT Inspector (ASNT Level II)	$	125.00
8	NDT Inspector (ASNT Level III)	$	145.00
9	NACE Inspector Level I Coatings Inspector	$	115.00
10	Administrative	$	65.00
11	Vehicle Charge (per trip)	$	80.00
12	Nuclear Gauge (per trip)	$	55.00
13	Traffic Control		Cost + 10%

MATERIAL TESTING

CODE	DESCRIPTION		UNIT PRICE
100	**Concrete Aggregates:**		
101	Screen or Sieve Analysis (ASTM C-136 or Tex-110)	$	72.00
102	Specific Gravity (ASTM C-127 or C128)	$	51.00
103	Unit Weight (ASTM C-29)	$	45.00
104	Absorption (ASTM C-127 or C-128)	$	44.00
105	Finer than 200 Mesh (ASTM C-117)	$	49.00
106	Organic Impurities (ASTM C-40)	$	45.00
107	Scratch Hardness (ASTM C-851)	$	45.00
108	Abrasion Tests (ASTM C-131 or C-535)	$	215.00
109	Clay Lumps (ASTM C-142)	$	55.00
110	Light Weight Pieces (ASTM C-123)	$	61.00
111	Sand Equivalent (ASTM D-2419)	$	65.00
112	Sodium/Magnesium Sulfate Soundness (5 Cycles)	$	390.00
113	Sodium/Magnesium Sulfate Soundness Additional Cycles	$	175.00
114	Petrographic Examination of Concrete Aggregates (ASTM C-295)		By Quotation
200	**Concrete Mix Design Inspection and Testing**		
201	Mix Design Review (using previously determined aggregate properties and other design factors) Excluding Test Costs	$	179.00
202	Trial Batch Tests (ASTM C-192) (Using aggregate admixtures and cement proposed for use in the project) each batch or each curve point	$	450.00
203	Cylinders (ASTM C-39) test or hold, each	$	24.00

204	Beam Test (ASTM C-78, C-293) or Hold, Each	$	55.00

CODE	DESCRIPTION		UNIT PRICE
205	Concrete Coring (4" Dia Up to 6" Thickness) ASTM C-42 includes Personnel, Vehicle and Patching Holes	$	90.00
206	Measuring Thickness of Concrete Cores (ASTM C-174)	$	22.00
207	Additional Thickness (6"to 12")/ (Inch)	$	8.00
208	Additional Thickness (Over 12")/ (Inch)	$	10.00
209	Concrete Coring, Minimum Charge (Min. 3 Cores)/ (LS)	$	290.00
210	Preparation of Cores, Capping & Test (ASTM C42, C-39)	$	67.00
211	Cement Compressive Strength, one age (ASTM C-109)/(Set)	$	120.00
212	Cement Compressive Strength, two age (ASTM C-109)/ (Set)	$	127.00
213	Mortar/Grout Compressive Strength Cubes (ASTM C-109)	$	27.00
214	Mortar/Grout Compressive Strength 3" x 6" (ASTM C-495)	$	24.00
215	Mortar/Grout Compressive Strength Grout Prisms (ASTM C-1019)	$	55.00
216	Structural Coring		By Quotation
217	Windsor Probes (ASTM C-803)	$	79.00
218	Bar Linear Shrinkage/ (Set)	$	282.00
219	Unit Weight of Lightweight Cylinders/ (Set)	$	70.00
220	Split Tensile Strength including preparation (ASTM C-496)	$	94.00
221	Petrographic Examination of Hardened Concrete (ASTM C-856)		By Quotation
222	Concrete Shrinkage Test (ASTM C-157, C-490)/ (Test)	$	138.00

800 ASPHALT CONCRETE MIX DESIGN & INSPECTION

801	Mix Design Review (using previously determined aggregates properties and other design factors) Excluding Test Costs	$	
802	Trial Batch Test (up to 5 curve points)	$	1,403.00
803	Additional Curve Points for item 802, Per Point	$	202.00
804	Extraction & Gradation Test (ASTM D-2172, ASTM C-136 or TEX - 210F)	$	174.00
805	Specific Gravity (ASTM D-2041 TEX 201F)	$	75.00
806	Stability: Hveem (3 Per Set) (ASTM D-1559)	$	125.00
807	Bulk Density of Lab Molded or Field Specimen (Core), (TEX - 207F)/(Set)	$	75.00
808	Molding Specimens (3 Per Set) for 806 & 807 (ASTM D-1560, TEX-208F)/(Set)	$	125.00
809	Penetration (ASTM D-5)	$	74.00
810	Ductility (ASTM D-113)	$	99.00
811	Viscosity (ASTM D-2170)	$	82.00
812	Asphalt Coring (4" Dia Up to 6" Thickness) includes Personnel, Vehicles and Patching Holes	$	80.00
813	Asphalt Coring Minimum Charge/ (LS)	$	290.00
814	Additional Thickness over 6"/ (Inch)	$	7.00

CODE	DESCRIPTION		UNIT PRICE
815	Abson Recovery (TEX-211F)	$	281.00
816	Measuring Thickness of Asphalt Cores	$	8.00
817	Maximum Theoretical Specific Gravity (TEX 227F)	$	115.00
818	Hot Mix In-Place Asphalt Design	$	1,870.00
819	Apparent Specific Gravity (TEX 227F)	$	58.00
820	Moisture Susceptibility Test (TEX 531C)	$	409.00
821	PMA Extraction/Gradation (ASTM D-2172)	$	234.00
822	PMA Extraction/Gradation by Ignition (ASTM D-2928)	$	145.00
1000	**Soils Tests:**		
1001	Liquid and Plastic Limits: (Atterberg Limits) (ASTM D-4318. Tex 104E, 105E, 106E)	$	75.00
1002	Moisture Content Only (ASTM D-2216)	$	15.00
1003	Mechanical Sieve Analysis, Through #200 Sieve (ASTM D-422)	$	72.00
1004	Percent Passing #200 Sieve (ASTM D-1120)	$	65.00
1005	Specific Gravity (ASTM D-854 & D-204)	$	51.00
1006	OMD Standard Compaction (ASTM D-698 , Tex-114E)	$	275.00
1007	OMD Modified Compaction (ASTM D-1557, Tex-113E)	$	275.00
1008	OMD Lime or Cement Stabilized Soil (ASTM D-698, D-558, D-1557, Tex121E)	$	275.00
1009	California Bearing Ratio (ASTM D-1883)	$	185.00
1010	Percent Solids in Lime Slurry /(Test)	$	37.00
1011	Four Point Lime Content Recommendation Series (PI)/(Set)	$	250.00
1012	Cement Content of Freshly Mixed CSS Mixture (ASTM D-806)	$	269.00
1014	Comp. Strength of CSS Sample, Including Molding (ASTM D-1632 & D-1633)	$	61.00
1015	Maximum & Minimum Density (Sands) (ASTM D-4254)/ (Test)	$	275.00
1016	Density and Moisture of Soil Sample	$	19.00
1017	Unconfined Compression (ASTM D-2166)	$	39.00
1018	Unconsolidated Undrained (ASTM D-2850)	$	54.00
1019	Consolidation (One cycle) (ASTM D-2435)	$	310.00
1020	Consolidation - Additional Increments	$	44.00
1021	Ph of Soil (ASTM D-4972)	$	45.00
1022	Optimum Lime Content Ph Method	$	225.00
1023	Sieve Analysis - Base Materials (ASTM C-136)	$	85.00
1024	Compressive Strength of Cement Stablilized Base Materials, (TEX-120E, ASTM D-2166)	$	275.00
1025	Soil Shrinkage Factor (ASTM D-427)	$	54.00
1026	One Dimensional Swell Cohesive Soils	$	251.00
1027	Triaxial Testing		By Quotation
1028	Sample Preparation	$	85.00

1028	Permeability Test, Constant Head Method (ASTM D-2434)	$	225.00
1029	Pinhole Test	$	246.00
1030	Crumb Test (ASTM D-4647)	$	33.00
1031	Double Hydrometer (ASTM D-4221)	$	152.00
1032	Free Swell (FHA)	$	75.00
1033	Soil Suction - Filter Paper Method	$	49.00

1300 REIMBURSABLE EXPENSES:

1301	Reimbursable Expenses Including Outside Testing, Equipment and Supplies	Cost + 10%

GENERAL NOTES

* Services on an hourly basis will be invoiced based on unit rates presented above. Overtime rates of 1.5 times the regular hourly rates will be charged for time worked over 8 hours or before 6:00 AM or after 6:00 PM on Monday through Friday, and all hours worked on Saturdays, Sundays, or holidays.

* A minimum charge of four (4) hours applies to time worked less than four hours in any service call. HVJ, when possible will combine inspection and testing activities to minimize trip charges and labor expenses.