

AUTHORIZATION No. 89  
TO  
AGREEMENT BETWEEN  
CITY OF SMITHVILLE, MISSOURI  
AND  
HDR ENGINEERING, INC.  
FOR  
PROFESSIONAL ENGINEERING SERVICES  
  
RAW WATER PUMP STATION, VALVE  
VAULT, AND ZEBRA MUSSEL CONTROL

In accordance with Section 1.A. of the December 18, 2003 Agreement, ENGINEER is hereby authorized to assist the City of Smithville (City) with inspection of the interior of the raw water steel pipe that provides untreated water from Smithville Lake to the City of Smithville's Raw Water Pump Station.

**Background**

This Authorization is for the following engineering design work:

- Replace the existing Raw Water Pump Station.
- Replace the reducer and butterfly valve that controls the flow of water from Smithville Lake to the Raw Water Pump Station and construct a valve vault around the valve.
- Provide for mussel control at the raw water intake facility.

The City of Smithville obtains its drinking water from Smithville Lake, which is operated by the United States Corps of Engineers (COE).

**Raw Water Pump Station**

In recent years the raw water pump station has flooded, damaging electrical equipment in the pump station. The pump station is also reaching its rated capacity. The work is to replace the existing pump station and locate the new station at a higher elevation above the flood plain. The new pump station will have room for three pumps, two pumps now and one future pump. The station will have a separate electrical controls room and a room for chemical feed equipment.

**Replace Butterfly Valve and Reducer**

Water travels from the intake tower in the lake through a 69-inch steel pipe under the earthen dam of Smithville Lake. The COE maintains the 69-inch steel pipe and 24-inch tee that delivers the raw water to the City of Smithville. The COE has informed the City that the City is responsible for all pipe after the 24-inch tee. There is a pipe reducer and eighteen inch butterfly valve after the 24-inch tee that the COE is concerned is rusting and has reached its useful life and needs to be inspected on the exterior and possibly replaced. The COE requested the City remove rust and recoat the interior of the reducer while the COE is cleaning and recoating the 69-inch pipe. The COE has also requested the City construct a vault around the isolation valve, which is currently buried, so that the exterior of the valve can be inspected regularly and repaired or replaced as needed. The work is to construct a valve vault around the 24-inch tee, replace the

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reducer, and install a 24-inch isolation valve. The work will also allow for future capacity increases without replacing the reducer and valve in the future.

### Mussel Control

Zebra mussels have invaded Smithville Lake and are a maintenance problem for the COE and the City. The mussels attach to the walls of the raw water pipe and clog the pump intakes decreasing the pumping capacity. The COE has had success at other facilities killing or decreasing the amount of mussels with copper ion machines. Copper ion machines use an electrical current passing over copper rods to add low levels of copper to the water. The work is to install a copper ion machine and booster pump on the intake tower of the dam and run raw water through the machine and back into the 69-inch pipe.

### SCOPE

1. ENGINEER will perform internal project management and administration.
2. Engineer will perform data collection to obtain the necessary information to prepare drawings and specifications. The work will include the following:
  - a. Kick off meetings with the City and the Corps of Engineers
  - b. Topographic survey and location of boundary's for preparation of one easement
  - c. Three (3) meetings with the COE to review design.
  - d. Geotechnical investigation to obtain foundation requirements for the pump station and valve vault, review COE piezometer data, coordination of drilling and laboratory work, review of boring logs and tests, work with the COE on foundation requirements for the valve vault, and development of plans and specifications for the work.
  - e. Utility coordination for increasing the capacity of the raw water pump station.
3. ENGINEER will prepare design drawings and specifications for the bidding and construction of a New Raw Water Pump Station near the existing pump station site. The work will include
  - a. Preliminary design.
  - b. Preparation of a design memorandum to be submitted to the Missouri Department of Natural Resources (MDNR).
  - c. Preparation of twenty-one (21) drawings.
  - d. Preparation of technical specifications.
  - e. Attend two (2) design review meetings with the City and/ or the COE.
  - f. Preparation of four (4) permits as follows:
    - i. MDNR Construction Permit
    - ii. Land Disturbance Permit
    - iii. Corps of Engineers Permit
    - iv. Flood Proof Certification, (this assumes a No Rise Permit is not required, an extra will be required for a No Rise Permit)
  - g. Preparation of one easement for the new pump station location with the Corps of Engineers.
4. ENGINEER will prepare design drawings and specifications for the bidding and construction a Copper Ion Generation machine and booster pump (10-gpm) to be installed on the water intake tower of the Smithville Lake Dam and utilizing power from the US COE facilities. The work will include:
  - a. Preliminary design.

- b. Preparation of a design memorandum to be submitted to the Missouri Department of Natural Resources (MDNR) along with the Raw Water Pump Station Design Memorandum.
  - c. Preparation of eight (8) drawings, this assumes the drawings will be included in the raw water pump station design drawings so that the cover sheet, general details and other general drawings do not have to be recreated.
  - d. Preparation of technical specifications.
  - e. One (1) design review meeting with the City and the COE.
  - f. Preparation of one (1) permit;
    - i. MDNR Construction Permit/ Pesticide Permit
5. ENGINEER will prepare design drawings and specifications for the bidding and construction to replace the existing Raw Water Valve and Reducer with a 24-inch butterfly valve and a New Valve Vault that connects to the US COE's existing 69-inch raw water supply pipe at the dam. The work will include:
- g. Preliminary design
  - h. Preparation of information to add to the Raw Water Pump Station design memorandum to be submitted to the Missouri Department of Natural Resources (MDNR) with the Raw Water Pump Station design memorandum.
  - i. Preparation of five (5) drawings, this assumes the drawings will be included in the raw water pump station design drawings so that the cover sheet, general details and other general drawings do not have to be recreated.
  - j. Preparation of technical specifications
  - k. Two (2) design review meetings with the City and the US COE.
  - l. Preparation of one (1) permit
    - i. MDNR Construction Permit
6. ENGINEER will assist with Bidding the project as follows;
- a. Prepare Advertisement and submit plans and specifications to Drexel Technologies for distribution to potential bidders.
  - b. Answer questions from potential bidders and suppliers.
  - c. Evaluate bidders and make recommendation to the City
  - d. Prepare two (2) addendums if needed
  - e. Prepare contract documents for signatures and review insurance accord and bonds
  - f. Prepare Notice of Award and Notice to Proceed to the selected bidder.
7. Engineer will assist the OWNER with Construction Administration of the project as follows:
- a. Attend preconstruction and monthly ten (10) progress meetings
  - b. Review pay applications submitted by the Contractor
  - c. Perform special progress inspections of the work. Engineer is not providing a full time resident project representative.
  - d. Review shop drawings to be sure they conform to the contract documents
  - e. Review and evaluate change orders and Field Orders.
  - f. Perform substantial completion inspection
  - g. Perform final completion inspection
  - h. Prepare record drawings
  - i. Review Operation and Maintenance manuals submitted by the Contractor.

**FEE**

The CITY shall compensate ENGINEER for the Design, Bidding, and Construction Administration assistance of the Raw Water Pump Station, Copper Ion Machine, and Valve Vault in the amount of \$472,655.00.

**SCHEDULE**

Tasks 2 through 5 shall be completed within 270 calendar days from notice-to-proceed. Task 6 shall be completed within 60 days of MDNR and USACE approvals. Task 7 shall be completed within 270 days of City award of construction contract.

This AUTHORIZATION shall be binding on the parties hereto only after it has been duly executed and approved by the CITY and ENGINEER.

IN WITNESS WHEREOF, the parties hereto have executed, or caused to be executed by their duly authorized officials, this AGREEMENT in duplicate on the respective dates indicated below.

CITY: SMITHVILLE, MISSOURI

By: \_\_\_\_\_

\_\_\_\_\_  
Type or Print Name

Title \_\_\_\_\_

Date \_\_\_\_\_

ENGINEER: HDR Engineering, Inc. (formally  
E.T. ARCHER CORPORATION)

By:  \_\_\_\_\_  
Joseph Drimmel (Dec 23, 2019)

\_\_\_\_\_  
Joseph Drimmel, P.E.

Type or Print Name

Title Senior Vice President

Date Dec 23, 2019

Smithville MO Raw Water Pump Station  
Scope and Fee

	Saffels, Ryan D	Bresette, Aaron J	Newport, Kenton L	Janke, Jewel	Rickert, John S	Hopson, Anthony J	Craft, Robert Anthony	Anderson, Scott	Buechler, Kathleen M	Boyd, Thomas K III	Wiseman, David L	Keyhill, Patrick K	Reuss, Billie J	Yakle, Johnny R	Meyer, Timothy C	Shields, Tyler	Jasper, James F	Hardee, Ronald B	Berne, Susan L	Harkins, Jeremy	Campbell, Joni L	HDR Expenses	Subconsultants	Total
Rate Schedule Code	Senior Project Manager III	Senior Project Manager I	Project Manager III	Engineer I	Engineer IV	Engineer II	Engineer I	Technical Specialist	Technical Specialist	Engineer II	Technical Specialist	Cadd/GIS Technician III	Cadd/GIS Technician II	Senior Land Surveyor	Survey Technician II	Survey Technician II	Survey Technician III	Engineer III	Admin Assistant	Project Accountant I	Project Assistant			
Project Role	Sr. PM	Sr. PM	PM	EIT	Architect	Structural	Structural	Geotech	Sr. Electrical	Electrical	Sr. Structural	CADD	CADD	Survey Mgr	Survey Crew	Survey Crew	Survey Tech	Sr. Civil	Admin	Project Accountant	Project Assistant			
Billing Rate	\$275.00	\$225.00	\$195.00	\$110.00	\$195.00	\$135.00	\$110.00	\$250.00	\$250.00	\$135.00	\$250.00	\$130.00	\$110.00	\$160.00	\$80.00	\$80.00	\$120.00	\$160.00	\$80.00	\$95.00	\$95.00			
TASKS																								
A. Task 1 - Project Management																								
1 Project Setup and Administration	2	40	24																	18	24			\$18,220
2 QA/QC	10		4					4	4		4													\$6,530
3 Safety Plan		1	1	4	1	1	1	1	1	1	1			1	1	1	1				2			\$2,815
Subtotal Hours	12	41	29	4	1	1	1	5	5	1	5	0	0	1	1	1	1	0	0	18	26			
Subtotal Dollars	3300	9225	5655	440	195	135	110	1250	1250	135	1250	0	0	160	80	80	120	0	0	1710	2470	0	0	\$27,565
Total Task 1																								\$27,565
B. Task 2 - Data Collection																								
1 Site Visit/ Kickoff Meeting		2	4	4	4	4			4	4	4											\$30		\$5,560
2 Topographic Survey and Base Map			2									8		8	40	40	24					\$250		\$12,240
3 Title Report/Control Survey/Locate Boundary												4		4								\$250		\$1,410
4 Corps Meetings (3)			8	8	4	8		8		8												\$50		\$7,430
5 Geotechnical Investigation/Evaluation			2			4		32			2	2											\$20,000	\$29,690
6 Utility Coordination				2						4				2										\$1,080
Subtotal Hours	0	2	16	14	8	16	0	40	4	16	6	14	0	14	40	40	24	0	0	0	0			
Subtotal Dollars	0	450	3120	1540	1560	2160	0	10000	1000	2160	1500	1820	0	2240	3200	3200	2880	0	0	0	0	580	20000	\$57,410
Total Task 2																								\$57,410
C. Task 3 - Raw Water Pump Station																								
1 Preliminary Design		4	8	24		8			4	8	4													\$9,260
2 Prepare Design Memorandum	2		8	24		8			4	8	4													\$8,910
3 Prepare Drawings (21)	2		40	80	120	40	120		12	120	16	200	160											\$125,950
4 Prepare Specifications	4		24	40	40	8	40		8	40	8								40					\$36,060
5 Design Meetings (2)			8	8	8	8				8														\$6,160
6 Environmental Permits																								\$0
a. MDNR Construction Permit			1	2								2												\$675
b. Land Disturbance Permit			1	4								2						1						\$1,055
c. Corps of Engineers Permit			1	4								2						1						\$1,055
d. Flood Proof Certification (Assumes No Rise Permit Not Required)			1									2						4						\$1,095
7 Easement with Corps of Engineers (1 Assumed)														6		8								\$1,920
Subtotal Hours	8	4	92	186	168	72	160	0	28	184	32	208	160	6	0	0	8	6	40	0	0			
Subtotal Dollars	2200	900	17940	20460	32760	9720	17600	0	7000	24840	8000	27040	17600	960	0	0	960	960	3200	0	0	0	0	\$192,140
Total Task 3																								\$192,140
D. Task 4 - Zebra Mussel Control w/ Copper Ion Generator																								
1 Preliminary Design		2	12	16		2				8			4											\$6,340
2 Prepare Design Memorandum	1		8	16						4									4					\$4,455
3 Prepare Drawings (8)	1		8	16			8		2	16		64	24											\$18,095
4 Prepare Specifications	1		8	16		4	8		2	20									8					\$8,855
5 Design Meetings (1)			8	4		4	2			4														\$3,300
6 Permit - MDNR Pesticide			4	4								2							2					\$1,640
Subtotal Hours	3	2	48	72	0	10	18	0	4	52	0	66	28	0	0	0	0	0	14	0	0			
Subtotal Dollars	825	450	9360	7920	0	1350	1980	0	1000	7020	0	8580	3080	0	0	0	0	0	1120	0	0	0	0	\$42,685
Total Task 4																								\$42,685

Smithville MO Raw Water Pump Station  
Scope and Fee

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Billing Rate	\$275.00	\$225.00	\$195.00	\$110.00	\$195.00	\$135.00	\$110.00	\$250.00	\$250.00	\$135.00	\$250.00	\$130.00	\$110.00	\$160.00	\$80.00	\$80.00	\$120.00	\$160.00	\$80.00	\$95.00	\$95.00			
TASKS																								
E. Task 5 - Raw Water Valve and Vault																								
1 Preliminary Design		2	12	16		4	8	2																\$6,470
2 Prepare Design Memo		1	4	16	2	4		2			1								2					\$4,605
3 Prepare Drawings (5)	1	1	4	16	4	24	32	2			1	40												\$16,530
4 Prepare Specifications	1		4	16	2	8	24	2			2								8					\$8,565
5 Design Meetings (2)			8	8		8		2																\$4,020
6 MDNR Construction Permit			1	2								2												\$675
Subtotal Hours	2	4	33	74	8	48	64	10	0	0	4	42	0	0	0	0	0	0	10	0	0			
Subtotal Dollars	550	900	6435	8140	1560	6480	7040	2500	0	0	1000	5460	0	0	0	0	0	0	800	0	0	0	0	\$40,865
Total Task 5																								\$40,865
F. Task 6 - Bidding Phase																								
1 Advertisement			1	2																				\$415
2 Answer Questions			4	4	4	4				4									4					\$3,400
3 Evaluate Bidders Make Recommendation		1	2	2																				\$835
4 Prepare Addendums (2)		2	8	8	8	8			2	8	2	4	4											\$8,570
5 Prepare Contract Documents and Review Insurance			4	4															4					\$1,540
6 Notice of Award and Notice To Proceed			2	2															2					\$770
Subtotal Hours	0	3	21	22	12	12	0	0	2	12	2	4	4	0	0	0	0	0	10	0	0			
Subtotal Dollars	0	675	4095	2420	2340	1620	0	0	500	1620	500	520	440	0	0	0	0	0	800	0	0	0	0	\$15,530
Total Task 6																								\$15,530
G. Task 7 - Construction Phase																								
1 Pre Construction Meeting/ Monthly Progress Meetings		24	24	24																		\$600		\$13,320
2 Payment Applications - Project Oversight			8	16																				\$3,320
3 Special Progress Inspections			32	40	24	8	24	2		24												\$600		\$23,380
4 Shop Drawing Review			8	32	24	8	16			24														\$15,840
5 Change Requests - Field Orders			8	16	8	4	8		4	8	4													\$9,380
6 Substantial Completion Inspection			8	8	8	4	8		4	8	4											\$180		\$8,680
7 Final Completion Inspection			4	4	4	4				4												\$180		\$3,260
8 Record Drawings			8	8	8	4	8			8		40	20											\$13,900
9 O&M Manual Review			8	8	4					16														\$5,380
Subtotal Hours	0	24	108	156	80	32	64	2	8	92	8	40	20	0	0	0	0	0	0	0	0			
Subtotal Dollars	0	5400	21060	17160	15600	4320	7040	500	2000	12420	2000	5200	2200	0	0	0	0	0	0	0	0	1560	0	\$96,460
Total Task 7																								\$96,460
Total Hours	25	80	347	528	277	191	307	57	51	357	57	374	212	21	41	41	33	6	74	18	26			3,123
Total Billing Amount	\$6,875	\$18,000	\$67,665	\$58,080	\$54,015	\$25,785	\$33,770	\$14,250	\$12,750	\$48,195	\$14,250	\$48,620	\$23,320	\$3,360	\$3,280	\$3,280	\$3,960	\$960	\$5,920	\$1,710	\$2,470	\$2,140	\$20,000	\$472,655

Estimated Project Fee \$472,655