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Department of Utilities  
Wastewater Treatment Plant  
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**TO:** Chairperson Greg Dannecker and Members of the Utilities Committee

**CC:** Chris Shaw, Utilities Director

**DATE:** September 20, 2016

**RE:** *Award Motor Control Center Electrical Maintenance Contract to Midwest Electrical Testing in the amount of \$17,725 with a 10% contingency of \$1,773 for a project total not to exceed \$19,498.*

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**BACKGROUND:**

The Appleton Wastewater Treatment Plant (AWWTP) staff solicited for quotations to perform electrical testing and maintenance services. The maintenance activities are to occur on the 480V and lower voltage equipment at the wastewater treatment plant. Service proposals included the ability to provide inspection, testing, servicing, and making minor repairs to the Motor Control Center (MCC) equipment. Quotes needed to abide by the National Electrical Testing Association (NETA) and the National Fire Protection Agency (NFPA) 70B requirements.

The quotations addressed electrical work on 25% of the MCC equipment per year. The term of the contract would be 4 years with the stipulation that the Appleton Common Council would have to approve appropriations for subsequent years. If budgets were approved over the next three years the electrical work and contract term would be completed in 2019.

**CONTRACTOR SCOPE OF WORK:**

- Prepare a working Method of Procedure (MOP). The MOP will reviewed by the operations and maintenance staff
- OSHA, electrical safety, lockout tagout requirements (i.e., CFR 40, 1910.147) are to be exercised during this project
- Infrared scans are to be completed on individual buckets of all motor control centers as listed. Infrared scans are to be completed on all transformers and power panels that are listed. Infrared scanning will be done annually.
- The thermographic scanning shall occur when the equipment is energized and is operating at its normal capacity.
- A thermographic scanning report shall be prepared and furnished to the owner.

- ✓ The report shall include all photos of any hot spots found with the temperature readings, including what MCC, bucket location, date and time.
- ✓ The contractor shall promptly report all sources of heating problems to the owner for corrective action.
- ✓ The contractor will use the City's MCC inventory as the structure of their report.

### 1.0 Motor Control Centers

- Perform point to point ground resistance tests on each motor control center from the fall of potential test point.
- Clean dust and debris from the interior and exterior of the MCC by means of vacuum and clean with non-corrosive cleaners with lint free towels.
- Inspect, clean, lube, and adjust all hinges and locking hardware on all doors, access panels, and blanks.
- Close any and all openings not being used by means of knockout plugs or made closures.
- Inspect and tighten all ground connections on the MCC ground bus.
- Neatly arrange wiring in common areas of MCC. Use plastic zip ties to keep wires away from hinges and latches so they will not be pinched.

### 2.0 MCC Buckets

- Clean dust and debris from the interior MCC buckets by means of vacuum and clean with non-corrosive cleaners and lint free towels.
- Inspect, adjust, and lube all linkage incorporated in the disconnecting and locking out of the bucket and overload resets.
- Inspect and tighten all line voltage and control voltage terminations also the starter overloads.
- Check voltage at breaker and at any control transformer.
- Record breaker or fuse size and type.
- Record overload size or settings.
- Perform insulation resistance test on all noted units (reference Section 6).
- Neatly arrange any loose wires inside bucket so they will not become pinched in the door or any moving part.

### 3.0 Transformers and Power Panels

- Clean dust and debris from interior and exterior of transformers and power panels (reference Section 8).
- Test ground system of the panel and transformer.
- Inspect and tighten all terminations inside the panels and transformers.
- Close any and all openings not being used in the panel back box and face plate.
- Test insulation resistance of the feeders to the transformer and panel.
- Verify voltage at main lugs / breaker.

#### 4.0 Drives and Soft Starts

- Using a HEPA filter equipped vacuum, clean dust and debris from interior and exterior drive cabinet (reference Section9).
- Inspect and tighten all connections within cabinet.
- Inspect, clean, lube, and adjust all hinges and locking hardware on doors and access panels.
- Close any and all openings not being used in the cabinet.

6.0 Motors to Check Insulation Resistance – Please refer to Table 1 Motor Inventory for Insulation Resistance Testing for the contractor required insulation testing.

Table 1 Motor Inventory for Insulation Resistance Testing		
Building	MCC	Equipment
Building B	MCC 14	Channel Aeration Blower #3
	MCC 6	Process Air Blower #1 Process Air Blower #2
Building F1	MCC 7A	Blower #3
	MCC 7B	Blower #1 Blower #2
Building F2	MCC 19	Channel Air Blower #2
	MCC 17	Channel Air Blower #1 SWG 4000 High Pressure Blower #1 High Pressure Blower #2 High Pressure Blower #3 High Pressure Blower #4

#### 7.0 Switch Gear – 4160 V

- Clean dust and debris from the interior and exterior by means of vacuum and clean with non-corrosive cleaners and lint free towels.
- Inspect and clean all contact points of the switch gear.
- Check Resistance of contact points of the switch gear.
- Inspect, clean, adjust, and lube all linkage incorporated within the switch gear.
- Inspect and tighten all wire connections.

8.0 Power Panels and Transformers – Please refer to Table 2 Inventory of Power Panels and Transformers for a contractor required list of power panels requiring maintenance.

Table 2 – Inventory of Power Panels and Transformers	
Building	Panel
Building B	PP-202 PP-203 JP-204
Building K	PP-603 PP-605 JP-604
South Pump Station Building FG Control Panel 4004	JP-424 LP-419 JP-421
North Pump Station Building FG Control Panel 4003	LP-418 JP-423
Building V	PP-902 LP-901 JP-901

#### 9.0 Drive Cabinets

Table 3 - Drive Cabinets		
Building	MCC	Equipment
Building F1	MCC 7A	Waste Sludge Pump #1 Waste Sludge Pump #2
	MCC 7B	Blower #1 Blower #2 Waste Sludge Pump #3 Blower #2 Power Recovery Unit
Building F2	SWG 4000	High Pressure Blower #2

#### **RFQ PROCESS:**

A non-mandatory pre-quote meeting was held on September 1, at 9:30 a.m. at the wastewater plant. The meeting and tour was designed to give electrical contractors the opportunity ask questions and to view the facilities. Quotes were received at the Appleton Wastewater Treatment Plant on September 9, 2016. The table below identifies the companies and their quotes.

<b>COMPANY</b>	<b>Four Year Quote</b>	<b>2016 Quote</b>
Electrical Testing Solutions.	\$79,000	\$19,750
Midwest Electrical Testing	\$73,617	\$17,725
Steinmetz Corporation	DNP	NA

DNP – Did Not Propose

The quote received from Midwest Electrical Testing was the least cost quote. AWWTP staff have completed their review and recommends the project award to Midwest Electrical Testing.

Initial project estimates were projected at \$30,000/year. Available funds were identified in the 2016 operations and maintenance budget.

**RECOMMENDATION:**

It is recommended to approve the Motor Control Center Electrical Maintenance Contract to Midwest Electrical Testing in the amount of \$17,725 with a 10% contingency of \$1,773 for a project total not to exceed \$19,498. If you have any questions or require further information regarding this project please contact Chris Shaw at 832-2362.