MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**MANUAL TRANSFER SWITCH**

UTL:BMB 1 of 4 APPR:NJM:DBP:07-21-21

**a. Description.** This work consists of the installation of a new electrical service, main disconnect switch, transfer switch, provisions for connection to the portable generator (at the noted pump stations) and all the necessary splicing, cable, conduit, conduit troughs, and modifications to the existing electrical system required to form a complete, ready-for-operation electrical system. The removal of the existing conduit, conduit riser, meter enclosure, cable junction boxes, disconnect switches and any associated hardware is included in this item. Furnish all miscellaneous items as herein specified and/or as noted on the plans.

**b. Materials.** Furnish all new materials that meet the current standards and practices of the *NEC, ANSI, ASTM, UL, NEMA*, the standard specifications, *MIOSHA*, and this special provision.

1. Wire and Cable. Ensure all wire and cable insulation are *NEC Type XHHW*, 600 volts (V), except as otherwise noted. Ensure all conductors are copper and stranded.

2. Electrical Grounding System. Ensure the grounding for the pump station meets subsection 918.02.B of the Standard Specifications for Construction. Ensure a minimum of three ground rods are installed at each pump station location.

3. Conduit and Fittings. Ensure all interior and exposed exterior conduits are PVC coated rigid steel. Ensure exterior buried conduits are PVC with the exception of sweeps, which are PVC coated rigid steel.

4. Manual Transfer Switch. Ensure the transfer switch is fusible 3 phase, 4 pole Heavy-duty, double throw and of the voltage and ampacity listed on the plans for each pumping station. Ensure the transfer switch is *UL* listed and labeled as suitable for use as service entrance rated equipment.

Ensure the external operating handle on the transfer switch is interlocked with the door so that the handle is in the “OFF” position before the door can be opened. Ensure the interlock allows bypassing by authorized personnel. Ensure the handle is arranged for padlocking in the “OFF” position so that when the operation handle is padlocked, the door is also locked.

Install the transfer switch in *a NEMA Type 4X* stainless steel enclosure equipped with a hasp to padlock in either the off or on position. Ensure the hasp is of a size to accommodate a Number 1 Master Lock shank.

5. Generator Connection. Provide generator lugs for use at each pump station(s).

6. Enclosures. Ensure all enclosures are *NEMA 4X* stainless steel, 316 grade.

7. Miscellaneous. Provide the service enclosure with a ground bus, cabinet breathers for ventilation, and thermostatically controlled heaters. Provide two heaters rated 500 watts each. Heaters will be powered at 120V. Within the service enclosure, provide sheet metal barriers over exposed service conductors.

8. Current Transformer (CT) Cabinet. Unless otherwise indicated on the plans as requiring a separate enclosure, ensure the CT cabinet is integral with the main disconnect/transfer switch enclosure, but has an individual access cover separated from the remaining equipment, for power company access only. Ensure the CT cabinet is 600V rated, three-phase, with ampere rating as shown on the plans.

9. Concrete, Steel Reinforcement and Adhesive Anchoring. Use Grade 3500 concrete in accordance with section 1004, steel reinforcement in accordance with section 905, and adhesive anchoring in accordance with subsection 712.03.J of the Standard Specifications for Construction.

**c. Construction.** Ensure all work meets the standards and practices of the *NEC, ANSI*, the standard specifications, *MIOSHA*, and this special provision. Ensure all electrical work is done by a licensed electrician and in accordance with the *NEC*.

The plans indicate the general service design. CT cabinet, main disconnect switch, meter enclosure, transfer switch, junction box, generator receptacle/lugs, generator disconnect switch, concrete support, and conduit runs indicated on the installation drawings are schematic only and may be altered to the actual location at each pump station. The Contractor must take his own field measurements and is responsible for the proper fit and location of conduits and other items included in the electrical work. All freestanding electrical equipment is to be installed on a four-inch thick concrete pad as detailed on the plans.

1. Operation. The Contractor is responsible for pump operation of the existing system during the installation of the new electrical service, transfer switch, and generator receptacle. Make provisions such that at least two pumps are in operation during the changeover should incoming water reach pumping levels.

Ensure when the work is complete, the pumping station(s) can transfer the power from the normal power source to the generator receptacle/lugs.

2. Equipment Lists. Submit shop drawings for approval, including the proposed wiring connections and an itemized bill of electrical equipment and materials showing the rating, make, style, type, and catalog cut of each item proposed for use.

Do not purchase or install electrical equipment until the bill of electrical equipment and material and the detailed wiring diagram have been reviewed and approved by the Engineer.

3. Power Supply. Power is already supplied at the pump stations. A list of the existing power sources is shown on the plans for each pumping station. The Contractor is responsible for verifying that these sources are correct prior to the installation of any equipment. Contact Consumers Energy, DTE, or the Detroit Public Lighting Department for the coordination of the electrical service change over.

4. Standby Service Connections. Schematic locations of the proposed generator lugs and transfer switch are shown on the plans.

5. Conduits and Wiring. Ensure all wire connections are made with pressure type (solderless) connections. Ensure all wire terminal connectors or lugs with a current rating of 30 amperes or larger are provided with Allen-head set screws.

Ensure wire terminals with a current rating of less than 30 amperes are solderless crimp-on type.

Ensure all interior conduits are run exposed, horizontal, or vertical. Ensure conduits have tight waterproof joints and are placed so that they are self-draining.

Ensure where conduits are mounted on concrete surfaces, clamp-backs together with malleable iron, one-screw type clamps are used.

Route conduits to avoid blocking openings for removal of equipment.

6. Grounding. Ensure the motor frames, control cabinet, conduits, and all the noncurrent carrying metal parts of all electrical equipment are securely grounded to the ground cable.

Ensure grounding cables are attached to equipment with solderless ground lugs and bolts and nuts or machine screws.

7. Submittals. When directed by the Engineer or required by the specifications, submit samples of materials and accessory equipment. Do not use these materials in the work until the Engineer has had ample time to determine the products suitability and compliance with the specifications. Submittals will be returned within 15 working days. Submit the following information for approval by the Engineer:

A. Submit a PDF file of the Catalog Cuts and/or Product Data Sheets. Ensure catalog cuts are provided for standard manufactured items such as conduit and conduit fittings, electric heaters, wire, etc. Each sheet must identify the exact equipment for which it is intended. Ensure all pertinent information such as physical dimensions, current rating, horsepower, kilowatt rating, phase, power factor, voltage, *NEMA* classifications, and material type is shown. Also approved listings such as *UL* label or other testing agencies are shown.

B. Submit a PDF file of the Manufacturer’s Product Literature. Clearly identify the field wiring connections with the terminal and wire numbers, equipment provided, the optional features to be used for this project and a written sequence of operation.

C. Submit a PDF file of a schedule that outlines the steps to be taken to maintain electrical service and showing the coordination effort which will be taken to coordinate the work between the various trades.

The approval of shop drawings does not relieve the Contractor from the responsibility to correct errors or omissions or to provide adequate field measurements as may be required. It is the Contractor’s responsibility to call attention to all deviations from the plans, specifications, and details. If deviations have not been clearly identified, they will not be considered as part of the shop drawing approval.

**d. Measurement and Payment.** The completed work, as described, will be measured and paid for at the contract unit price using the following pay item:

**Pay Item Pay Unit**

Manual Transfer Switch (Structure Identification) Each

**Manual Transfer Switch (Structure Identification)** includes installing a new electrical service, manual transfer switch, and generator plug as detailed on the plans and in this special provision. Removal and disposal of existing equipment as shown on the plans or as required for the installation of the new equipment is included in this pay item and will not be paid for separately.