

ADDENDUM NO. 1

TO THE PROJECT MANUAL AND DRAWINGS FOR

Oak Creek Water and Sewer Utility
Oak Creek, Wisconsin
Water Treatment Plant and Low Lift Pump Station Standby Power
Electrical Equipment Purchase Package

Clark Dietz Project No. O0130014

DATED: February 18, 2011

PREPARED BY: CLARK DIETZ, INC.

Note: This Addendum is hereby declared a part of the Contract Documents for the project designated above and in case of conflict, the following Addendum shall govern. Bidders shall state in their Bid Form that this Addendum has been received and is reflected in the Bid submitted.

TO THE PROJECT MANUAL

- Item 1. Replace Specification Section 26 13 14 with the attached revised section indicated as "Reissued in Addendum No. 1". All changes to the document are in bold font.
- Item 2. Specification Section 26 24 19, Para. 2.1.I: Replace paragraph in entirety with the following:
- I. Enclosure: NEMA ICS 6, Type 1 gasketed. MCC shall be provided with solid steel bottom.

TO THE DRAWINGS

- Item 3. Drawing E-20-701, MCC-2 Schedule: Make the following changes to the schedule:
- 1. Cubicle 1F for Power Failure Control – Add note as follows "Provide phase loss relay".
 - 2. Cubicle 4B for Screen SC-101 – Add note as follows "Provide 2 speed, 2 winding starter".
 - 3. Cubicle 4C Exhaust Fan EF-105 – Delete note "See Note 2".
 - 4. Notes: Add note 2 to read "Provide 2 sets of lugs for main lugs, one that can be used for permanent wiring and other to be used for temporary wiring from 75 kW natural gas generator during construction."

END OF ADDENDUM NO. 1

This addendum consists of 1 page and 1 attachment.

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O0130014
Electrical Equipment Purchase Package

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SECTION 26 13 14

MEDIUM-VOLTAGE TRANSFER SWITCHGEAR

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Medium-voltage transfer switchgear.

1.2 REFERENCES

- A. American National Standards Institute:
 - 1. ANSI C12.1 - Code for Electricity Metering.
 - 2. ANSI C37.06 - American National Standard for Switchgear - AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis - Preferred Ratings and Related Required Capabilities.
 - 3. ANSI C39.1 - Requirements, Electrical Analog Indicating Instruments.
- B. Institute of Electrical and Electronics Engineers:
 - 1. IEEE 48 - Standard Test Procedures and Requirements for Alternating-Current Cable Terminations 2.5 kV Through 765 kV.
 - 2. IEEE C37.04 - Standard Rating Structure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
 - 3. IEEE C37.11 - Standard Requirements for Electrical Control for High-Voltage Circuit Breakers Rated on A Symmetrical Current Basis.
 - 4. IEEE C37.20.2 - Standard for Metal-Clad and Station-Type Cubicle Switchgear.
 - 5. IEEE C57.13 - Standard Requirements for Instrument Transformers.
- C. International Electrical Testing Association:
 - 1. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.
- D. International Electrotechnical Commission
 - 1. IEC 61010 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use.
- E. Underwriters Laboratories
 - 1. UL 508 - Standard for Industrial Control Equipment.

1.3 SYSTEM DESCRIPTION

- A. Transfer Switch Design: The basis for design is the Zenith ZTS-MVD medium voltage transfer switchgear. Other listed manufacturer's transfer switch must be equivalent and meet the same equipment standards pertaining to specifications, performance, and fit in the designated space shown on the drawings with proper working space clearances as required.

- B. Upon review of the submitted bid packages the Owner has the right to reject any and all bids due to any of the following conditions not being met:
 - 1. All requested documentation is not submitted.
 - 2. Equipment does not meet the requirements indicated on the drawings and specifications.
 - 3. Equipment will not properly fit in the space shown on the drawings with working space clearance around the equipment as indicated on the drawings.

1.4 SUBMITTALS

- A. Section 01 00 00 – General Requirements: Submittal procedures.
- B. Shop Drawings: Indicate electrical characteristics and connection requirements, outline dimensions, connection and support points, weight, specified ratings and materials. Include control schematics and point-to-point wiring diagrams. **Include detailed layout drawings showing all components installed in Utility Compartment for approval by WE Energies.**
- C. Product Data: Submit electrical characteristics and connection requirements, standard model design tests, and options. **Submit product data sheets for all components including protective relaying.**
- D. Test Reports: Indicate procedures and results for specified factory and field testing and inspection.
- E. Manufacturer's Field Reports: Indicate activities on site, final adjustments and overcurrent protective device coordination curves, adverse findings, and recommendations.

1.5 CLOSEOUT SUBMITTALS

- A. Section 01 00 00 – General Requirements: Operation and Maintenance Data.
- B. Operation and Maintenance Data: Submit operating instructions for manually and electrically opening and closing circuit breakers, and include maintenance instructions for circuit breaker removal, replacement, testing and adjustment, and lubrication.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.
- B. Testing Agency: Company member of International Electrical Testing Association and specializing in testing products specified in this section with minimum three years documented experience.

1.7 WARRANTY

- A. Furnish manufacturer's warranty as indicated in contract documents.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Section 01 00 00 – General Requirements: Product storage and handling requirements.
- B. Deliver in shipping splits, individually wrapped for protection and mounted on shipping skids.
- C. Lift only with lugs provided. Handle carefully to avoid damage to internal components, enclosure, and finish.
- D. Protect products from weather and moisture by covering with plastic or canvas and by maintaining heating within enclosure.

1.9 MAINTENANCE MATERIALS

- A. Section 01 00 00 – General Requirements: Spare parts and maintenance products.
- B. Furnish two of each special tool required to operate and maintain switchgear.
- C. Furnish one each electrically operated ground and test device.
- D. Furnish one relay test block with clips.
- E. Furnish one relay tool kit.

PART 2 PRODUCTS

2.1 MEDIUM-VOLTAGE TRANSFER SWITCHGEAR

- A. Manufacturers:
 - 1. Eaton Cutler-Hammer.
 - 2. GE Zenith.
- B. Product Description: IEEE 37.20.2, metal clad switchgear assembly including horizontal draw-out circuit breakers and auxiliary devices in free standing cubicles formed into integrated structure. Switchgear shall be service entrance rated **and UL Listed**.

All coils, relay timers, and accessories shall be readily front accessible, and isolated by grounded metal barriers from all high voltage primary devices.
- C. Nominal Voltage: 2.5 kV, three phase, three wire, 60 Hz.
- D. Voltage and Insulation Levels: Conform to IEEE C37.20.2.

- E. Main Bus Ampacity: 1200 amperes, continuous.
- F. Momentary Current Rating: To IEEE C37.20.2.

2.2 SERVICE CONDITIONS

- A. Meet requirements for usual service conditions described in IEEE C37.20.2.
- B. Altitude: 3,300 feet.
- C. Meet requirements for use as service entrance disconnecting means.
- D. Meet requirements for equipment installed accessible to general public.

2.3 FABRICATION

- A. Conform to requirements of IEEE C37.20.2.
- B. Construction: Indoor, front and rear accessible.
- C. Height: 95 inches, maximum, including auxiliary support members on top and bottom.
- D. Furnish sloped drip-proof roof. Sections shall be aligned at front and rear.
- E. Include continuous ground bus through switchgear assembly, securely connected to frame of each cubicle.

2.4 FACTORY FINISHES

- A. Finish Color: Manufacturer's standard gray finish.

2.5 CIRCUIT BREAKERS

- A. Product Description: IEEE C37.04, electronic vacuum type power circuit breaker. Circuit breakers shall be interlocked for safe and reliable operation. Circuit breaker shall be Eaton VCP-W, Square D Masterclad, or other manufacturer's equivalent.
- B. Circuit Breaker Operator: Spring-charged stored energy with electric operator to IEEE C37.11.
- C. Rated Maximum Voltage: 5 kV.
- D. Rated Voltage Range Factor: 1.3.
- E. Rated Frequency: 60 Hz.
- F. Rated Continuous Current: 1,200 amperes.
- G. Rated Dielectric Strength: 36 kV rms, low frequency; 95 kV crest, impulse.

- H. Rated Permissible Tripping Delay: 2 seconds.
- I. Short-Circuit Rating: 36 kA rms, at rated maximum voltage.
- J. Operation Endurance Capability: ANSI C37.06.
- K. Rated Tripping Voltage: 125 volt, DC from capacitor-energized trip device in each circuit breaker cubicle.
- L. Rated Control Voltage, Closing: 120 volt, single phase from switchgear control power transformer.
- M. Protective Relays: Provide three phase solid state over-current relay, industrial grade. Furnish relaying instruments as indicated on Drawings for each circuit breaker from one of the following.
 - 1. Eaton #DT3000.
 - 2. Multilin # SR-750 (utility breaker).
 - 3. Multilin #MFR-13 (generator breaker).

2.6 INCOMING AIR TERMINAL COMPARTMENT

- A. Product Description: Fabricated structure with clamp-type terminal cable terminations bussed to primary circuit breaker.
- B. Maximum Design Voltage: 5 kV.
- C. Basic Impulse Level: 60 kV.
- D. Main Bus Ampacity: 1200 amperes, continuous.
- E. Short Circuit Rating: 250 MVA at rated nominal voltage.

2.7 MEDIUM-VOLTAGE SURGE ARRESTORS

- A. Product Description: Distribution class surge arrestors, rated 5 kV; mount in incoming line compartment.

2.8 CUSTOMER DIGITAL METERING

- A. Product Description: Microprocessor-based digital metering monitor suitable for 3- or 4-wire systems and with the following features:
 - 1. Switch selectable digital display of the following values with maximum accuracy tolerances as indicated:
 - a. Phase Currents, Each Phase: Plus or minus 0.3 percent.
 - b. Phase-to-Phase Voltages, 3 Phase: Plus or minus 0.3 percent.
 - c. Phase-to-Neutral Voltages, 3 Phase: Plus or minus 0.3 percent.
 - d. Megawatts: Plus or minus 0.6 percent.
 - e. Megavars: Plus or minus 0.6 percent.

- f. Power Factor: Plus or minus 0.1 percent.
 - g. Frequency: Plus or minus 0.1 percent.
 - h. Megawatt Demand: Plus or minus 2 percent; demand interval programmable from 5 to 60 minutes.
 - i. Accumulated Energy, Megawatt Hours: Plus or minus 2 percent. Accumulated values unaffected by power outages up to 72 hours.
 - j. Min.-Max. values: Current, voltage, watts, vars and va.
- B. Mounting: Display and control unit flush or semiflush mounted in instrument compartment door.
- C. Provide unit with Ethernet connection to provide all monitoring capabilities to the plant SCADA network. Provide software as required that is compatible with the plant SCADA operating system.

2.9 MICROPROCESSOR BASED CONTROL PANEL

- A. Microprocessor Based Control Panel: The control panel shall perform the operational and display functions of the transfer switch. The control panel shall be cover mounted with LCD display screen with touch pad function and display menus. The display functions of the control panel shall include transfer switch position and source availability. Controller shall include at a minimum the following.
1. Three-phase voltage sensing on normal utility source.
 2. Three-phase voltage and frequency sensing on generator source.
 3. Delayed throwover.
 4. Delayed engine – starting.
 5. Delayed engine – shutdown (cool-off)
 6. Delayed return, automatic.
 7. Manual return from generator source to normal source.
 8. Manual – automatic mode selector switch.
 9. Test switch – simulates loss of normal power.
 10. Breaker control switches for manual operations.
 11. Indicating lights as follows: Breakers open (green) or closed (red); Breakers tripped by overcurrent (amber); Source power available (white); Operating in manual mode (blue).
 12. Overcurrent trip lockout – electrical and mechanical to prevent reclosing and transfer when a breaker has tripped because of an overcurrent condition.
 13. Breakers interlocked to prevent paralleling the sources – by closing circuits electrically interlocked.
 14. Control power transformers.
 15. Control power transfer relay.
 16. Plant exerciser time switch – programmable and adjustable for operation of throwover or engine only.
 17. Auxiliary contacts for the following functions:
 - a. Allow motor loads to be disconnected prior to transfer in either direction.
 - b. Normal source available.
 - c. Emergency source available.
 - d. Closed in emergency.

- e. Closed in normal.
 - f. Engine start.
 - g. Pre-transfer control circuit disconnect.
18. Indicating lights for the following:
- a. Emergency position.
 - b. Normal position.
 - c. Normal available.
 - d. Emergency available.
- B. Communications Module: Communications module capable of 2-way communicating via Ethernet connection to provide all control, monitoring, and programming capabilities from the control panel to the plant SCADA network. Provide software as required that is compatible with the plant SCADA operating system.
- C. Interlocking Provisions: Interlocking provisions shall prevent interconnection of utility and generator power sources during any operation of the automatic switching equipment.

2.10 SEQUENCE OF OPERATION

- A. The transfer switchgear shall incorporate adjustable three phase under and over-voltage and three phase under and over-frequency sensing on the normal utility source.
- B. When the voltage of any phase of the normal utility source is reduced to 80% or exceeds 110% nominal voltage, or frequency is displaced 2 Hz from nominal, for a period of 0 – 10 seconds (programmable) a pilot contact shall close to initiate starting of the engine generator.
- C. When the emergency source has reached a voltage value within +/- 10% of nominal and achieved frequency within +/- 5% of the rated value, the load shall be transferred to the emergency source after a programmable time delay.
- The programmable time delay shall be set at 15 seconds after transfer of 24.9 KV feed to second WE Energies transmission feed at outdoor 24.9 KV Switchgear. Contractor shall coordinate the time delay setting in the field with existing equipment.
- D. When the normal utility source has been restored to not less than 90% of rated voltage on all phases, the load shall be retransferred to the normal utility source after a time delay of 0 to 30 minutes (programmable). The generator shall run unloaded for 0 - 15 minutes (programmable) and then automatically shut down. The generator shall be ready for automatic operation upon the next failure of the normal source.
- E. If the engine generator should fail while carrying the load, retransfer to the normal utility source shall be made instantaneously upon restoration of proper voltage (90%) on the normal utility source.

2.11 METERING TRANSFORMERS

- A. Current Transformers: IEEE C57.13; 5 ampere secondary, bushing type, with single secondary winding and secondary shorting device, primary/secondary ratio, burden and accuracy consistent with connected metering and relay devices, 60 Hz.
- B. Potential Transformers: IEEE C57.13; 120 volt single tapped secondary, disconnecting type with integral fuse mountings, primary/secondary ratio, burden and accuracy consistent with connected metering and relay devices, 60 Hz.

2.12 ACCESSORIES

- A. Provide (1) breaker truck with rollers capable of removing breaker from top or bottom compartment.

2.13 NAMEPLATES

- A. Provide master nameplate mounted at center of each line-up, indicating switchgear identification.
 - 1. Master Nameplate Size: 1-1/2 x 6 inch, with 5/8 inch high letters.
- B. Provide laminated plastic, or metal nameplate in accessible location on each switchgear assembly, designating voltage, phase, Hz., main bus current rating, short circuit bus rating, manufacturer's name, general order number and item number.
- C. Provide laminated nameplates not less than 1 x 2.5 inch with 1/4 inch high white background with black letters mounted on each compartment door designating function of equipment in compartment, or space.
- D. Nameplate Legend: As indicated on single line diagram on Drawings. Including circuit breaker frame size and trip rating.
- E. Provide nameplate below each metering, control, and switching device, designating device function.
- F. Provide nameplate for each control circuit fuse block, engraved with recommended fuse rating.
- G. Provide plastic or metal nameplate in accessible location on each panel designating voltage, phase, Hz., main bus current rating, and short circuit bus rating.

2.14 CONTROL POWER TRANSFORMERS

- A. Provide power for control and other power requirements by (2) sets of line-side voltage transformers.
- B. Rating: Control power transformers to have adequate capacity to supply power to connected equipment including space heaters.

- C. Type: Single phase, epoxy cast dry type.
- D. Basic Impulse Level (BIL): 60 kV.
- E. Primary Windings: Line to line voltage of medium voltage equipment bus.
- F. Fuses: Equipped with self protecting current limiting fuses on primary.
- G. Fuse Mounting: Mount and protect fuses to permit their replacement without de-energizing main bus, and without hazard to personnel.
- H. Secondary Windings: 120/240 Volts
- I. Secondary Circuit Protection: Provide secondary circuit protection as indicated.

2.15 UTILITY COMPARTMENT

- A. Provide metering section with utility metering instrument transformers as required and approved by WE Energies. Coordinate with local WE Energies offices to have metering instrument transformers sent to the factory for installation in utility compartment.
- B. The metering section shall be specifically designed for metering equipment only, and no devices other than those required for support and connection of metering instrument transformers will be permitted. **Provide bussing, cables, insulators, support structures, etc. as required to meet WE Energies standards and to properly mount and connect the utility metering equipment.**
- C. **The metering section shall be the same depth and height as switchgear enclosure and bolted to that enclosure. Provide enclosure width as required to properly lay out and install metering instruments per latest edition of WE Energies Customer Substation Manual Article 220, Typical Arrangement Drawing Article 220.40.10, and all other applicable articles of the Manual.**
- D. **Refer to WE Energies website <http://www.we-energies.com> for additional metering requirements or contact Sarah Mullen, Senior Service Manager Customer Field Operations with WE Energies, at 414-423-5047 with metering questions.**

2.16 SOURCE QUALITY CONTROL

- A. Test in accordance with IEEE C37.20.2.
- B. Make completed switchgear available for inspection at manufacturer's factory prior to packaging for shipment. Notify Engineer at least seven days before inspection is allowed.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Installation of equipment shall be by Others.

3.2 FIELD QUALITY CONTROL

- A. Section 01 00 00 – General Requirements: Field inspecting, testing, adjusting, and balancing.
- B. Inspect and test in accordance with NETA ATS, except Section 4.
- C. Perform inspections and tests listed in NETA ATS, Section 7.6.2.

3.3 ADJUSTING

- A. Section 01 00 00 – General Requirements: Testing, adjusting, and balancing.
- B. Adjust operating mechanisms for free mechanical movement.
- C. Adjust protective relays in accordance with recommendations in Engineer's coordination study.

3.4 DEMONSTRATION AND TRAINING

- A. Section 01 00 00 - General Requirements: Demonstration and Instructions.
- B. Equipment supplier shall provide a factory authorized manufacturer's representative for the following field services. All work shall be coordinated with generator supplier, installing contractor, and the Owner.
 - 1. 16 hours for startup and programming of the equipment.
 - 2. 8 hours to demonstrate operation of circuit breakers and transfer switch.
 - 3. 8 hours to assist Owner in programming of plant SCADA system for transfer switch remote control and monitoring capabilities.
 - 4. 8 hours of instruction for six persons.
- C. Simulate power outage by interrupting normal source, and demonstrate system operates to provide standby power.

END OF SECTION