

**Oklahoma Municipal Power Authority
Kaw Hydroelectric Plant
Ponca City, Oklahoma**

Low Voltage Switchgear

**Technical Specifications
415392.2000**

**Rev. 0
Issued for Bid
20 December 2023**

**Engineering Firm
Oklahoma Certificate of Authorization: CA3314**

**Black & Veatch Corporation
11401 Lamar Avenue
Overland Park, KS 66211, USA
913-458-2000**

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GENERAL TECHNICAL REQUIREMENTS

PART I - GENERAL

1-1 DEFINITIONS

- A. "Company" is OMPA, Oklahoma Municipal Power Authority, headquartered in Edmond, Oklahoma.
- B. "Engineer" is Black & Veatch, headquartered in Overland Park, Kansas.
- C. "Project" is the Kaw Rehabilitation.
- D. "Supplier" is the entity providing the Work or Materials under these specifications.
- E. "Contractor" is the entity providing installation services under the construction contract.

1-2 SUBMITTALS

- A. The Supplier shall submit shop drawings and data as described in the technical specifications in electronic form to the Engineer. The Engineer will provide an Internet-based data site or other means for transmittal and return of submittals.
- B. Engineer will coordinate and arrange for submittal reviews by Company and Engineer.
- C. Engineer's review of submittals covers only general conformity to the Drawings and Specifications, external connections, and dimensions that affect the layout; it does not indicate thorough review of all dimensions, quantities, and details of the material, equipment, device, or item covered. Engineer's review shall not relieve Supplier of sole responsibility for errors, omissions, or deviations in the drawings and data, nor of Supplier's sole responsibility for compliance with the contract documents.
- D. When the drawings and data are returned with review status: "RETURNED FOR CORRECTION", the corrections shall be made as instructed by Engineer. Unless noted otherwise on the return comments, Work shall not proceed.

- E. When the drawings and data are returned with review status: "EXCEPTIONS NOTED", a resubmittal is required to address the exceptions. Work may proceed as long as the Supplier incorporates the exceptions.
- F. When the drawings and data are returned with review status: "NO EXCEPTIONS NOTED", or "RECORD COPY", no additional submittals need be furnished unless specifically requested by Engineer. Work may proceed.

1-3 SHIPPING

- A. Before shipping, each item of equipment shall be tagged or marked as identified in the delivery schedule or on the shop drawings. Complete packing lists and bills of material shall be included with each shipment.
- B. All materials shall be suitably packaged to facilitate handling and protect against damage during transit and storage.
- C. Painted surfaces shall be protected against impact, abrasion, discoloration, and other damage. All painted surfaces which are damaged prior to acceptance of equipment shall be repainted to the satisfaction of Company.

1-4 DELIVERY

- A. All equipment and materials provided under these specifications shall be shipped and delivered at the expense of the Supplier and all costs relative thereto are included in the contract price.
- B. The equipment and materials shall be shipped to the Company's generating facility at the following address:

Kaw Hydroelectric Plant
9683 Fishermen's Bend Rd.
Ponca City, OK 74604

<https://goo.gl/maps/dezRL3QNcQnSa14U6>

- C. The Supplier shall contact Mr. Ivie (918) 824-5814 or Control Room (405) 359-2580 at least 48 hours before delivery or site access.

1-5 RESPONSIBILITY FOR MATERIALS AND EQUIPMENT

- A. The Company or Engineer will examine each shipment at delivery prior to acceptance and shall reject all visibly defective items. Company reserves the right, however, to accept items rejected by the Engineer.

B. Defective materials and equipment discovered after installation, where the defect is of a nature not detectable by visual examination and other appropriate field inspection methods, shall be replaced by Supplier, together with such additional materials and supplies as may be necessary for their replacement.

C. Summary Table of responsibilities.

Work	Responsible Party
Safety Training	Company
LOCKOUT/TAGOUT	Company
Hot Work Permits	Company
Confined Space Permits	Company
Safety Oversight at Project	Company
Safety Harness and all Safety Gear	Contractor
Scaffolding	Contractor
Crane	Contractor
Bridge Crane and Operator	Company
Fork Truck	Contractor
Manlift	Contractor
Material for Replacement	Contractor
Bonding Material	Contractor
Nuts, Bolts, Hardware	Supplier
Bathroom Facilities (Porta Johns)	Contractor
Washup Facility	Contractor
Dumpster and disposal of used material	Contractor
All Electrical Work needed for the project	Contractor
All Testing of new systems	Contractor & Supplier

D. Successful Bidder shall be required to attend OMPA Safety Training prior to work commencing on the project. All employees will be required to wear Flame Resistant Clothing (FR), Safety Boots, Hardhats, Gloves, and Safety Glasses. Outerwear such as coats and coveralls shall be FR as well.

1-6 SUBSTITUTES AND "OR-EQUAL" ITEMS

A. Whenever a material or article is specified or described by using the name of a proprietary product or the name of a particular manufacturer or vendor, the specified item shall be understood as establishing the type, function, and quality desired. Requests for review of equivalency shall be transmitted to the Engineer for review and acceptance.

1-7 REFERENCE STANDARDS

- A. Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code, or laws or regulations in effect at the time of the effective date of the Purchase Order.

1.8 SEISMIC REQUIREMENTS

- A. Seismic Loads shall be determined in accordance with IBC 2018 Section 1613 in conjunction with ACSE 7 Chapter 11 to Chapter 15 as follows:
- a. Short period spectral acceleration (Ss) 0.136g
 - b. One second period spectral acceleration(S1) 0.064g
 - c. Risk Category III
 - d. Seismic Design Category A
 - e. Structural System Response Coefficient As per Table 12.2-1 of ASCE 7-16
 - f. Total Seismic Dead Loads TBD
 - g. Site Soil Classification C

1.9 WARRANTY

- A. Supplier warrants to the Company that the goods will be new when delivered. Supplier also warrants to Purchaser and Owner that the goods, for a three (3) year period of time after Project Substantial Completion (the project is substantially complete and has passed the startup demonstration period, including performance testing): (a) will be free from defects in design, material, and workmanship; (b) will comply with applicable law; (c) will comply with the requirements of this Purchase Order; and (d) will be good and sufficient to accomplish the results Purchaser identified and be fit for the purposes specified.
- B. Supplier shall correct any breach of this warranty occurring during the warranty period within ten calendar days after Company gives Supplier written notice of the breach. The cost of warranty work and removal or replacement of other work will be at Supplier's expense. In the case of emergency where, in the reasonable judgment of Company, delay could result in serious loss or damage to persons or property, Company may correct the defect or nonconformity at Supplier's expense.
- C. Supplier may not require Purchaser to issue an additional purchase order or similar document as a precondition to taking action related to correction of the

purported breach of warranty. If Supplier determines that work performed was not covered by the warranty, Supplier may submit a claim to the Company.

End of Section

Section 01 79 00

DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.01 DESCRIPTION. This section contains requirements for training the Company's personnel in the proper operation and maintenance of the equipment and systems installed under this contract.

1.02 GENERAL. Where as required by the specifications, the manufacturer's representative shall provide on-the-job training of the Company's personnel. The training sessions shall be conducted by qualified, experienced, factory-trained representatives of the various equipment manufacturers. Training shall include instruction in both operation and maintenance of the subject equipment.

1.03 SUBMITTALS. The following information shall be submitted to the Engineer in accordance with the provisions of the General Technical Requirements section. The material shall be submitted not less than 4 weeks prior to the provision of training.

1. Lesson plans, training manuals, handouts, visual aids, and other reference materials for each training session to be conducted by the manufacturer's representatives.
2. Subject of each training session, identity and qualifications of individuals to be conducting the training, and tentative date and time of each training session.

PART 2 – PRODUCTS

2.01 GENERAL. Where specified, the Supplier or Contractor shall conduct training sessions for the Company's personnel to instruct staff on the proper operation, care, and maintenance of the equipment and systems installed under this contract. Training shall take place at the site of the work and under the conditions specified in the following paragraphs. Approved operation and maintenance manuals shall be available at least 30 days prior to the scheduled date for the individual training session.

2.02 LOCATION. Training sessions shall take place at the site of the work at a location designated by the Company.

2.03 LESSON PLANS. Formal written lesson plans shall be prepared for each training session. Lesson plans shall contain an outline of the material to be

presented along with a description of the visual aids to be utilized during the sessions. Each plan shall contain time allocation for each subject.

One complete set of originals of the lesson plans, training manuals, handouts, visual aids and reference materials shall be the property of the Company and shall be suitably bound for proper organization and easy reproduction. The Contractor shall furnish ten copies of necessary training manuals, handouts, visual aids, and reference materials at least 1 week prior to each training session.

2.04 FORMAT AND CONTENT. Each training session shall include classroom and time at the location of the subject equipment or system. As a minimum, training sessions shall cover the following subjects for each item of equipment or system:

1. Familiarization

- a. Review catalog, parts lists, drawings, etc. which have been previously provided for the plan files and operation and maintenance manuals.
- b. Guided inspection of the subject equipment.
- c. Demonstration of the subject equipment and how to operate in accordance with the specified requirements.

2. Safety

- a. Review and demonstration of safety procedures and related documentation.
- b. Inspection and discussion of hazardous components of the subject equipment.

3. Operation

- a. Review of subject equipment operations literature and theory of operation.
- b. Overview of equipment operation and function.
- c. Explanation and demonstration of all modes of operation including start up, shut down, normal and emergency operation, and manual and automatic operation through the plant control system.
- d. Explanation of all hardwired interlocks.
- e. Explanation of all equipment related instruments including purpose and interpretation of information.
- f. Check out of Company's personnel on proper use of the equipment.

4. Preventive maintenance

- a. Review of preventative maintenance documentation and discussion of maintenance required at various intervals; e.g. daily, weekly, monthly, annually.
- b. Demonstration of performance of each preventive maintenance task.
- c. Identification of indicators of equipment problems.
- d. Discussion of corrosion protection and lubrication requirements.
- e. Requirements for periodic exercise of equipment and demonstration of equipment exercise where required.
- f. Identification of inspection points and demonstration of inspection covers removal and routine disassembly and assembly of equipment.

5. Corrective Maintenance and Equipment Repair

- a. Discussion of common repairs and identification of special problems.
- b. Explanation and demonstration of equipment inspection and troubleshooting.
- c. Demonstration of calibration procedures.
- d. Demonstration of repair procedures where practical.

6. Parts

- a. Discussion of the parts list and ordering of parts.
- b. Review of spare parts provided with the equipment and identification of other recommended spare parts.

7. Local Representatives

- a. Name, address, telephone number of local representative.
- b. Review of contact information for providers of routine and emergency repair and operational assistance.

8. Operation and Maintenance Manuals

- a. Review of O&M manual content and organization.
- b. Update O&M material as required.

2.05 VIDEO RECORDING. The Contractor shall record each training session and shall give the Company exclusive rights to each training session recording. The Contractor shall advise all manufacturers providing training sessions that the material will be recorded.

PART 3 – EXECUTION

Training shall be conducted in conjunction with the operational testing and commissioning periods. Classes shall be scheduled so that training is performed when equipment is available for operation. The Contractor shall arrange to have the training conducted on consecutive days, with no more than 6 hours of class scheduled for any one day. Concurrent classes will not be permitted.

End of Section

Section 26 23 00

LOW-VOLTAGE SWITCHGEAR

PART 1 - GENERAL

1-1. SCOPE. This section covers dead-front, low-voltage metal-enclosed switchgear equipment, with drawout power circuit breakers, which shall be furnished as specified herein and as indicated on the Drawings. Low-voltage switchgear shall meet the following requirements, and the design conditions and features as stipulated.

Low-voltage switchgear shall be designated and shall be located as follows:

Tag number(s)	LV-SWGR-001
Switchgear lineup designation(s)	480V Switchgear
Location of switchgear lineup(s)	Generator Floor – EL. 953'-0"

1-2. GENERAL. Equipment furnished and installed under this section shall be fabricated and assembled in full conformity with the Drawings, Specifications, engineering data, instructions, and recommendations of the equipment manufacturer, unless exceptions are noted by Engineer. Contractor will perform final installation and place in proper operating condition under a future contract.

1-2.01. General Technical Requirements. All work under this section shall be in accordance with the applicable provisions of the General Technical Requirements section.

1-2.02. Dimensional Restrictions. Layout dimensions will vary between manufacturers, and the layout area indicated on the Drawings is based on typical values. The supplier shall review the Contract Drawings, the manufacturer's layout drawings and installation requirements, and make any modifications required for proper installation subject to acceptance by Engineer.

Maximum equipment width shall be two 22 inch wide vertical sections 44 inches total.

1-2.03. Workmanship and Materials. Equipment supplier shall guarantee all equipment against faulty or inadequate design, improper assembly or erection, defective workmanship or materials, and leakage, breakage, or other failure. Materials shall be suitable for service conditions.

All equipment shall be designed, fabricated, and assembled in accordance with applicable governing standards. Individual parts shall be manufactured to standard sizes and thicknesses so that repair parts, furnished at any time, can be

installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall not have been in service at any time prior to delivery, except when required by tests.

1-2.04. Governing Standards. The switchgear furnished under this section shall be designed, constructed, and tested in accordance with the following standards:

ANSI C37.13, C37.16, C37.17, C37.20.1, C37.50, C37.51, C37.90, C39.1
UL 1066, 1558

The equipment shall also conform to all the applicable standards of ANSI, IEEE, NEMA, UL, and NFPA 70.

1-2.05. Nameplates. A master nameplate shall be attached to the switchgear giving switchgear designation, voltage and ampere rating, short circuit rating, manufacturer's name, general order number and item number.

Each circuit breaker and instrument on the front of the low-voltage switchgear shall have a suitable nameplate. Each incoming line section shall be furnished with a nameplate to indicate the power source or substation from which it is fed. The nameplates for the distribution circuit breakers shall indicate the equipment fed through the breaker. Nameplates shall be black and white laminated phenolic material of suitable size, and shall be engraved with 3/4 inch [19 mm] high letters for section and circuit breaker identity and 1/8 inch [3 mm] letters for other information. The engraving shall extend through the black exterior lamination to the white center.

Each control device and each control wire terminal block connection inside the units shall be identified with a permanent nameplate or painted legend to match the identification on the manufacturer's wiring diagram.

1-2.06. System Characteristics. The switchboard will be connected to a power system with characteristics as specified below.

Voltage rating	480V
Frequency	60 Hz
Type	Three phase and neutral
Grounding	Solid

1-3. SUBMITTALS. Complete assembly, foundation, and installation drawings, together with complete engineering data covering the materials used, parts, devices, and accessories forming a part of the low-voltage switchgear, shall be submitted in accordance with the General Technical Requirements section. The drawings and data shall include, but shall not be limited to, the following:

- a. Elevation, plan, conduit entrance locations, and weight.
- b. Circuit breaker time-current characteristic curves.
- c. Nameplate legends and equipment schedule.
- d. Single-line and control wiring interconnection diagrams.
- e. Metering section details.
- f. Shop test report.
- g. Installation report.
- h. Surge protective device submittals shall include drawings (including unit dimensions, weights, component and connection locations, mounting provisions, and wiring diagrams), equipment manuals that detail the installation, operation and maintenance instructions for the specified unit(s), and manufacturer's descriptive bulletins and product sheets.
- i. Submit confirmation of compliance with the requirements of the Meteorological and Seismic Design Criteria section.

1-4. OPERATION AND MAINTENANCE DATA AND MANUALS. Operation and maintenance manuals shall be submitted in accordance with the Submittal Procedures section. The operation and maintenance manuals shall be in addition to any instructions or parts lists packed with or attached to the equipment when delivered.

1-5. SPARE PARTS.

Spare parts shall be suitably packaged, as specified herein, with labels indicating the contents of each package. Spare parts shall be delivered to Owner as directed.

<u>Spare Parts</u>	<u>Quantity</u>
Fuses	100% replacement set
Insulated Case Circuit Breaker	One 800A breaker
Breaker Trip Unit	One 600A trip unit

1-6. PROTECTIVE DEVICE STUDY. Not used.

1-7. DELIVERY, STORAGE, AND HANDLING. Shipping shall be in accordance with the General Technical Requirements section.

Switchgear shall be equipped to be handled by a crane. Where cranes are not available, switchgear shall be suitable for skidding in place on rollers using jacks to raise and lower the groups.

PART 2 - PRODUCTS

2-1. ACCEPTABLE MANUFACTURERS. The low-voltage switchgear shall be manufactured by Eaton, General Electric, Powell, Schneider-Electric, or Siemens equal.

2-2. CONSTRUCTION. All equipment furnished under this section shall be designed and constructed in accordance with the following requirements and as indicated on the Drawings.

2-2.01. Sills and Anchors. Sills and anchor materials shall be shipped ahead of the scheduled equipment delivery to permit installation before concrete is placed. Equipment drawings shall show sill and anchor bolt locations.

All equipment requiring anchor bolts shall be provided with the anchor materials, complete with bolts, nuts, and washers as needed.

2-2.02. Enclosure. The type of switchgear enclosure shall be NEMA Type 1. The enclosure shall contain circuit breakers and all necessary accessory components. The integrated switchgear assembly shall withstand the effects of closing, carrying, and interrupting currents up to the assigned short circuit rating. End sections shall include provisions for main, ground and neutral bus extensions and installation of future vertical sections.

Adequate bracing shall be provided for seismic forces. The bracing shall be designed to meet the requirements of the Meteorological and Seismic Design Criteria section.

2-2.03. Vertical Sections. The switchgear shall consist of the required number of vertical sections, bolted together to form a rigid assembly. The sides shall be covered with removable bolt-on covers. All edges of front covers or hinged front panels shall be formed. The integrated switchgear assembly shall withstand the effects of closing, carrying, and interrupting currents up to the assigned short circuit rating.

The assembly shall be provided with adequate lifting means and shall be capable of being rolled into position or moved with a forklift.

Each vertical unit shall have one or more individual breaker or instrument compartments, a bus compartment, and a rear-cabling compartment. All compartments shall be separated from each other by steel barriers. Current transformers for instrumentation shall be located within the appropriate breaker cells.

The primary disconnecting devices for each power circuit breaker shall consist of an assembly of multiple silver-to-silver full floating high-pressure point contacts with uniform pressure on each finger. Load studs shall be equipped with

insulated copper load extension buses terminating in solderless type terminals in the rear cable compartment of each structure. Compression type terminals shall be provided for terminating the number and size of copper conductors indicated on the Drawings. Bus extensions shall be silver-plated where cables are attached. When the circuit breaker is withdrawn, a safety shutter shall automatically cover the line and load stabs.

2-2.04. Busing. The main bus shall be tin-plated copper and shall be of sufficient size to limit the temperature rise to 149°F [65°C], based on ANSI tests. End sections shall be predrilled for units to be added in the future. All bus connections shall use conical spring washers. The bus rating shall be as follows:

Bus current rating.	800A
Bus and circuit breaker fault current rating (symmetrical).	50,000A

2-2.04.01. Neutral Bus. A tin-plated copper neutral bus shall be provided through all vertical sections and shall be rated full capacity.

2-2.04.02. Neutral Pad. Not used.

2-2.05. Ground Bus. The ground bus shall extend the entire length of the low-voltage switchgear and shall be firmly secured to each vertical section. A ground lug shall be provided at each end of the ground bus for connection to building grounding system with 4/0 AWG bare copper cables. Other ground lugs for feeder circuits shall also be supplied as indicated on the Drawings.

2-2.06. Switchgear Compartments. Compartments shall be provided as shown on the one-line diagram and as specified herein for main, tie, feeder, and generator breakers and, incoming line metering, or other uses.

Number of incoming line sections	2
Incoming cable entrance	Top

2-2.06.01. Incoming Line Metering Compartment. The incoming line section(s) shall be provided with a microprocessor-based, digital power meter for incoming line metering. Current transformers and potential transformers shall be provided for input of current and voltage signals to the metering package. Phase currents, phase voltages, watts, vars, power factor, frequency, watt-hours, watt demand, and total harmonic distortion waveforms shall be available for display. Metering units shall also include a display with touch screen monitor on the front of the equipment. The following alarm features shall be provided: undervoltage, power factor leading or lagging, kVAR limit, voltage sequence reversal, under

frequency, and overcurrent. The metering package shall be capable of Ethernet/IP communication for remote monitoring. The digital power meters shall be SEL-735 series meters without exception.

2-2.06.02. Main Breaker Compartment. Each main breaker compartment shall include an electrically operated drawout power circuit breaker, with a frame rating as indicated on the Drawings. Control power shall 125VDC from the station battery.

The incoming line circuit breakers shall be furnished with an electrical interlock to prevent incoming circuit breakers, generator breaker, and the tie breaker from being closed in a manner that would parallel two electrical sources.

The cable exit shall be from top.

2-2.06.06. Tie Breaker Compartment. The tie breaker compartment shall include an electrically operated drawout power circuit breaker, with a frame rating as indicated on the Drawings. Control power shall 125VDC from the station battery.

2-2.06.07. Feeder Breaker Compartment. Not Used.

2-2.06.08. Generator Breaker Compartment. Each generator breaker compartment shall include a electrically operated drawout power circuit breaker, with a frame rating as indicated on the Drawings. Control power shall 125VDC from the station battery.

The cable exit shall be from top.

2-2.06.07. Sub Feed Lug Compartment. Each sub feed lug compartment shall include lugs to sub feed to motor control centers as indicated on the Drawings.

The cable exit shall be from top.

2-3. CIRCUIT BREAKERS. Each breaker shall be furnished with a solid-state tripping system consisting of three current sensors, a solid-state trip device, and shunt trip. The solid-state element shall have long delay current pickup, short delay pickup, and instantaneous pickup, ground fault pickup and fault trip indicators. All elements of the solid-state trip device shall be of the sealed potentiometer type providing adjustable current pickup in percentage of current sensor primary rating and time delay adjustments. The current sensor primary ampere rating shall be as indicated on the Drawings. Fault current rating for each breaker shall be the same as the specified bus fault current rating.

Breaker trip systems shall include an integral display providing visual indication of metered values for currents, voltages, active power, reactive power, power factor, watt-hours, frequency, and demand.

The breaker shall have built-in test points for testing long delay, short delay, instantaneous, and ground fault functions of the breaker by means of a 120 volt ac operated test kit.

2-4. AUTOMATIC TRANSFER CONTROLLER. A microprocessor based automatic transfer controller with touch screen HMI shall be provided and programmed as indicated on the drawings. Controller shall automatically initiate an open transition transfer to a remaining live source if current power source loses voltage. Transfer sequence shall prioritize to the transformer supplied mains 52AT1 & 52AT2, followed by initiating start of the standby generator and transferring to the generator source. Controller shall prevent any two source breakers from being closed in parallel. End user shall be able to reconfigure the controller preferred source(s) and sequence. The controller shall have the ability to add or modify user level and programmer level passwords. Controller shall be provided with Ethernet communication for network connection to the plant control system. Automatic transfer controller shall coordinate the network interface and data points with the Owner and plant control system supplier.

2-4.01 Performance. The automatic transfer control system shall be designed to function in accordance with the following requirements:

- a. The voltage of each phase of the three sources shall be monitored and the pickup voltage shall be adjustable from 85 percent to 100 percent of nominal, and the dropout voltage shall be adjustable from 75 percent to 98 percent of the pickup value. The transfer will be initiated upon reduction of a source to 85 percent of the normal voltage. The affected breaker will be tripped and tie breaker closed to initiate the transfer. Retransfer to normal operating mode shall occur after a time delay when the station transformer source(s) are restored.
- b. A time delay to override momentary normal source outages to delay all transfer signals shall be provided. The time delay shall be field adjustable from 0.5 to 6 seconds and shall be factory set at 1 second.
- c. An inphase monitor shall be provided to control transfer so motor load inrush currents do not exceed normal starting currents. The monitor shall compare the phase relationship and frequency difference between the two main sources and shall permit transfer only at acceptable values of voltage, phase relationship, and frequency differential.

2-5. CONTROL POWER. Control power shall be 125VDC provided from the station batteries. A manual disconnect shall be provided ahead of the primary fuses.

2-6. CONTROL SWITCHES AND PILOT LIGHTS. Control switches and pilot lights shall be 30.5 mm heavy-duty, oiltight construction. Pilot lights shall be full voltage type with LED lamps.

2-7. SHOP PAINTING. All iron and steel surfaces, except machined surfaces and stainless steel, shall be shop painted with the manufacturer's standard coating. Finish color shall be ANSI 61. Field painting, other than touchup painting, will not be required. A sufficient quantity of additional coating material and thinner shall be furnished for field touch up of damaged coatings.

2-8. ACCESSORIES. A traveling type circuit breaker lifter, rail-mounted on top of switchgear, shall be provided.

2-9. MAINTENANCE GROUNDING PROVISIONS. Provisions for connecting three ground jumpers at the cable terminations, to the ground bus shall be included in the design. AB Chance "ball stud" connectors shall be utilized of each phase in the rear of each terminal cubicle, and an equal number shall be provided in each compartment for connection to the switchgear ground bus. Ball-stud shall be furnished with removable covers and be sufficiently spaced to meet uninsulated clearance for the voltage class.

2-10. SHOP TESTS. After the equipment has been completely assembled, it shall be shop tested for general operating conditions, circuit continuity, and high potential and other standard tests for the particular class of equipment as defined by industry standards. Four certified copies of the test results shall be submitted to Engineer before the equipment is shipped.

PART 3 - EXECUTION

3-1. INSTALLATION. Installation will be in accordance with the Electrical Equipment Installation section.

3-2. FIELD QUALITY CONTROL.

3-2.01. Installation Check. An experienced, competent, and authorized representative of the manufacturer shall visit the site of the Work and inspect, check, adjust if necessary, and approve the equipment installation. The representative shall be present when the equipment is placed in operation in accordance with Commissioning section.

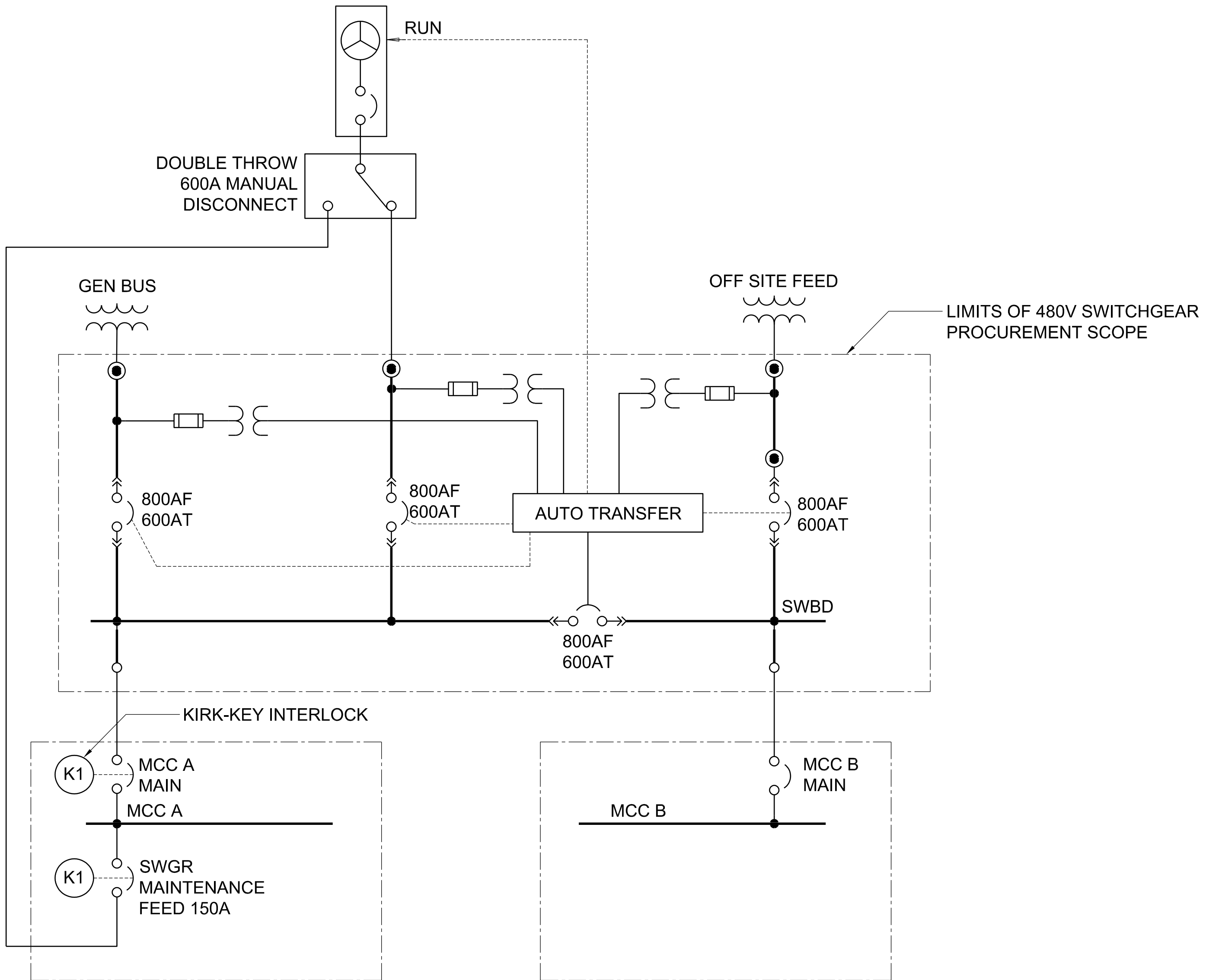
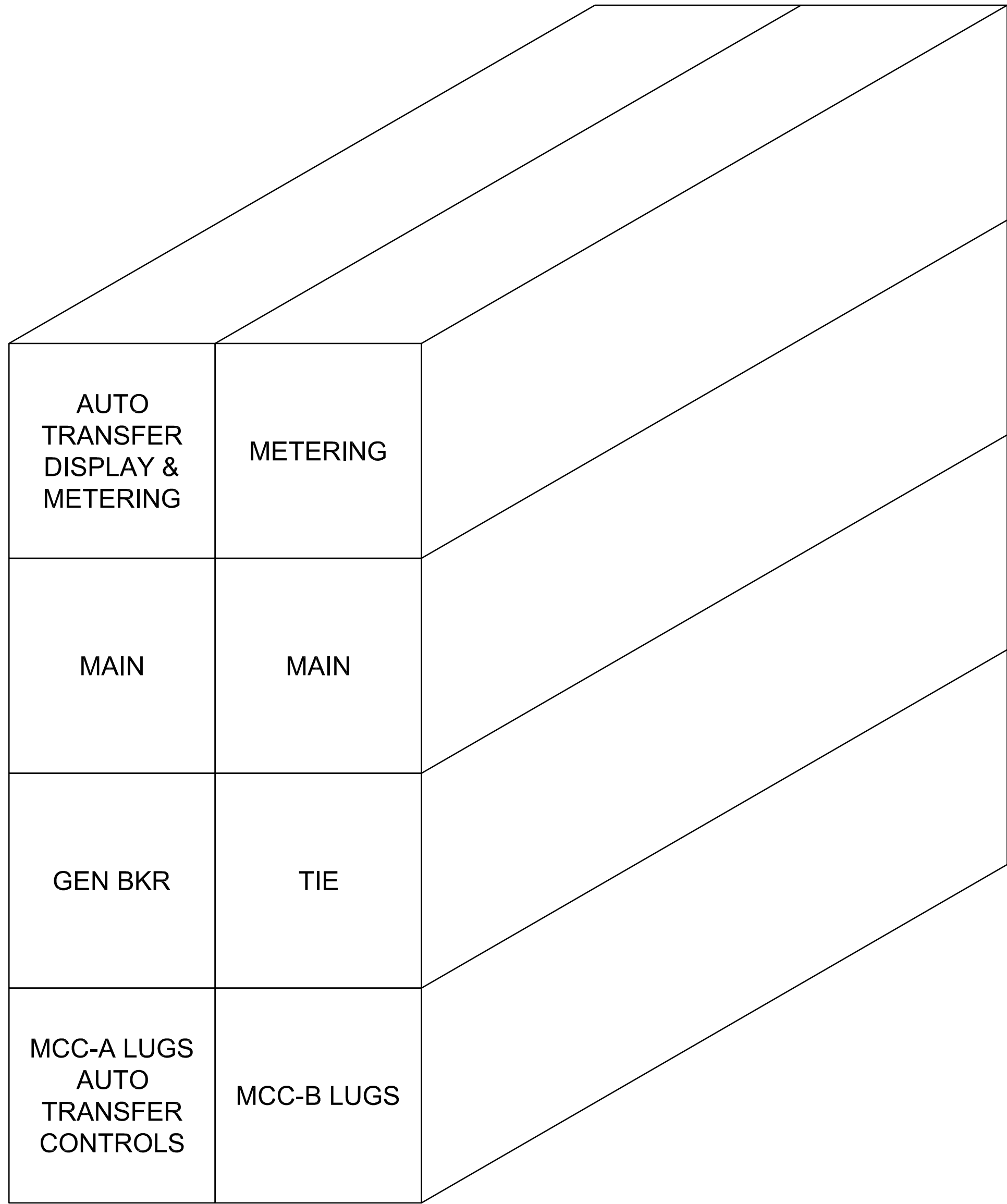
The manufacturer's representative shall furnish a written report certifying that the equipment has been properly installed and lubricated; is in accurate alignment; is free from any undue stress imposed by connecting piping or anchor bolts; and has been operated under full load conditions and that it operated satisfactorily.

Supplier shall include a minimum of 2 days on site and 1 trip to the site.

3-2.02. Installation Supervision. Installation supervision by the manufacturer is not required.

3-3. TRAINING. The manufacturer's representative shall provide training of Owner's personnel as described in the Demonstration and Training specification. All costs for training services shall be included in the Contract Price.

End of Section



**ISSUED FOR SWITCHGEAR BID
2023-12-20**

	NO.	BY	CHK/APP
DATE			

BLACK & VEATCH
Black & Veatch Corporation

OKLAHOMA MUNICIPAL POWER AUTHORITY
KAW HYDROELECTRIC PROJECT
PLANT REHABILITATION

ELECTRICAL
480V SWITCHGEAR

DESIGNED: -
 DETAILED: -
 CHECKED: -
 APPROVED: -
 DATE: -

SCALE: NONE

PROJECT NO.

E-901
SHEET
OF

SUR64018, 11/11/2023 11:22:50 AM
 SUR64018, 10/10/2023 2:17:11 PM
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