

INVITATION TO BID

September 3, 2020

Dear Vendor,

Enclosed you will find a bid package for the procurement of **14.4 kV Pad-Mounted Switchgear and 750 MCM wire** for the City of Seaford. All pertinent information is contained within.

The bid opening will be held at 2:00 p.m., on Wednesday October 7, 2020, inside the Council Chambers at City Hall, 414 High Street, Seaford, DE.

Should you need clarification on any item, please contact Director of Electric Bill Bennett at 302-629-9841.

Thank you for reviewing this information and participating in our bidding process.

Sincerely,
City of Seaford

Charles Anderson
City Manager

Enclosure

City of Seaford
BID NOTICE

14.4 KV PAD-MOUNTED SWITCHGEAR

Sealed bids for the procurement of **14.4 kV Pad-Mounted Switchgear and 750MCM wire** will be received by the City of Seaford, 414 High Street, PO Box 1100, Seaford, Delaware 19973, until 2:00 p.m., prevailing time on Wednesday October 7, 2020, at which time they will be opened and read aloud. The bids may be submitted to Mayor and Council for bid award at their regular Council meeting on Tuesday, October 13, 2020.

Bids must be submitted in a sealed envelope, addressed ATTN: Charles Anderson, City Manager, City of Seaford, P.O. Box 1100, Seaford, Delaware 19973. The outside of the envelope must be marked “**Attn: City Manager – BIDS – 14.4 kV Pad-Mounted Switchgear and 750 MCM Wire**” and the bidder’s name, shall be shown thereon. All proposals must be made on the bid forms provided in the specifications. All proposals must conform to the bid documents. Any exceptions will be evaluated for suitability and acceptance is at the sole discretion of the City of Seaford.

Complete specifications and bid documents will be available at the City of Seaford, 414 High Street, Seaford, Delaware 19973. Copies may be obtained by calling Tracy Torbert, City Clerk at (302) 629-9173. Questions pertaining to the bid specifications must be submitted in writing to Bill Bennett, Director of Electric, (seafordelectric@seafordde.com) 414 High Street, PO BOX 1100, Seaford, DE 19973. All questions must be received no later than 5:00 PM on September 29, 2020. If required, an addendum will be issued no later than 5:00 PM on October 1, 2020. Verbal responses by the Owner, employees of the owner or agents of the Owner shall not be binding.

No bids may be withdrawn for a period of thirty days after the scheduled time for the receipt of bids. The Mayor and Council reserves the right to reject any and all bids and to waive any or all informalities in any bid or bids.

City of Seaford
Charles Anderson
City Manager

TECHNICAL SPECIFICATIONS

14.4 kV Pad-Mounted Switchgear

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. This specification applies to an outdoor, three phase, medium voltage pad-mounted switchgear for installation on a 12.47 kV distribution system.

1.02 REFERENCES

- A. ANSI/IEEE C37 – All applicable portions
- B. ANSI/IEEE C57 - All applicable portions including C57.12.28 – Standard for Pad-Mounted Equipment – Enclosure Integrity.
- C. ANSI/IEEE C2 – National Electrical Safety Code: All applicable portions including Section 381G
- D. NEMA – National Electrical Manufacturer’s Association

1.03 SUBMITTALS

- A. Submit shop drawings indicating outline dimensions, enclosure construction, shipping splits, lifting and supporting points, and equipment electrical ratings.

1.04 OPERATION AND MAINTENANCE DATA

- A. Include two (2) copies of operations and maintenance manuals including recommended spare parts list.

1.05 QUALITY ASSURANCE

- A. Manufacturer: Company specializing in medium voltage substation vacuum station breakers with at least five years documented experience. The breaker shall be manufactured in a facility that is Quality Systems Registered by Underwriters Laboratories, Inc. to ISO 9001

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Bid price shall include shipping and delivery to Owner’s address below:

Seaford Utility Building
8000 Herring Run Road
Seaford, DE 19973

24 HOUR NOTICE IS REQUIRED PRIOR TO DELIVERY
CALL 302-629-9841

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. The pad mounted gear shall be Type PMH-11 and Type PMH-9 as manufactured by S&C, or approved equivalent as manufactured by ABB, Cooper or Federal Pacific.

2.02 RATINGS

- A. The pad-mounted gear shall meet the following ratings and electrical characteristics:

KV, Nominal	14.4
KV, Maximum	17.0
KV, BIL	95
Main Bus Continuous, Amperes	600
Three-Pole Interrupter Switches	
Continuous, Amperes	600
Load Dropping, Amperes	600
Fuses with Integral Load Interrupter	
Maximum, Amperes	200E
Load Dropping, Amperes	200
Short-Circuit Ratings, Amperes, RMS Symmetrical At rated Nominal Voltage	14,000

The momentary and two-time duty-cycle fault-closing ratings of switches, momentary rating of bus, interrupting ratings of fuses, and one-time duty-cycle fault-closing capabilities of fuses with integral load interrupters shall equal or exceed the short-circuit ratings of the pad-mounted gear.

- B. The pad-mounted gear shall be rated to withstand a wind load of 110 mph sustained
- C. The pad-mounted gear shall be rated for an ambient temperature range of -30 degrees to +40 degrees Celsius.
- D. Certification of Ratings
1. The manufacturer of the pad-mounted gear shall be completely and solely responsible for the performance of the basic switch and fuse components as well as the complete integrated assembly as rated.
 2. The manufacturer shall furnish, upon request, certification of ratings of the basic switch and fuse components and/or the integrated pad-mounted gear assembly consisting of the switch and fuse components in combination with the enclosure.

2.03 WARRANTY

- A. The pad-mounted switchgear shall be warrantied against defects in materials and workmanship for a minimum period of one (1) year from the date of delivery. Bidder shall clearly state the manufacturer's standard warranty terms including any options for extended warranties.

PART 3 CONSTRUCTION

3.01 ENCLOSURE

- A. The pad-mounted gear enclosure shall be of unitized monocoque (not structural- frame-and-bolted-sheet) construction to maximize strength, minimize weight, and inhibit corrosion.
- B. The basic material shall be 11-gauge hot-rolled, pickled and oiled steel sheet.
- C. All structural joints and butt joints shall be welded, and the external seams shall be ground flush and smooth. The gas-metal-arc welding process shall be employed to eliminate alkaline residues and to minimize distortion and spatter.

- D. To guard against unauthorized or inadvertent entry, enclosure construction shall not utilize any externally accessible hardware.
- E. The base shall consist of continuous 90-degree flanges, turned inward and welded at the corners, for bolting to the concrete pad.
- F. The door openings shall have 90-degree flanges, facing outward, that shall provide strength and rigidity as well as deep overlapping between doors and door openings to guard against water entry.
- G. Enclosure top side edges shall overlap with roof side edges to create a mechanical maze which shall allow ventilation to help keep the enclosure interior dry while discouraging tampering or insertion of foreign objects.
- H. A heavy coat of insulating "no-drip" compound shall be applied to the inside surface of the roof to minimize condensation of moisture thereon.
- I. Insulating interphase and end barriers of NEMA GPO3-grade fiberglass- reinforced polyester shall be provided for each interrupter switch and each set of fuses where required to achieve BIL ratings. Additional insulating barriers of the same material shall separate the front compartments from the rear compartments and isolate the tie bus (where furnished).
- J. Full-length steel barriers shall separate side-by-side compartments.
- K. Interrupter switches shall be provided with dual-purpose front barriers. These barriers, in their normal hanging positions, shall guard against inadvertent contact with live parts. It shall also be possible to lift the barriers out and insert them into the open gap when the switch is open. These barriers shall meet the requirements of Section 381G of the National Electrical Safety Code (ANSI Standard C2).
- L. Interrupter switches shall be provided with window panels to allow viewing of the switch position without removing the dual-purpose front barriers. Window panels shall be removable to facilitate phasing and shall be secured to the enclosure with stainless-steel hardware.
- M. Each fuse shall be provided with a dual-purpose front barrier. These barriers, in their normal hanging positions, shall guard against inadvertent contact with live parts. It shall also be possible to lift these barriers out and insert them into the open gaps when the fuses are in the disconnect position. These barriers shall meet the requirements of Section 381G of the National Electrical Safety Code (ANSI Standard C2).
- N. The enclosure shall be provided with an instruction manual holder.
- O. Lifting tabs shall be removable. Sockets for the lifting-tab bolts shall be blind- tapped. A resilient material shall be placed between the lifting tabs and the enclosure to help prevent corrosion by protecting the finish against scratching by the tabs. To further preclude corrosion, this material shall be closed-cell to prevent moisture from being absorbed and held between the tabs and the enclosure in the event that lifting tabs are not removed.
- P. Inner barrier panels that meet the Rural Electrification Association's requirements for "dead-front" and the requirements of Section 381G of the National Electrical Safety Code (ANSI Standard C2) shall be provided—one for each door opening providing access to high voltage. These panels shall be secured in place with recessed pentahead bolts. When so secured, they shall guard against inadvertent contact with live parts.
- Q. A stainless steel-compartmented base spacer shall be provided to increase the elevation of live parts in the pad-mounted gear above the mounting pad by 24 inches.

3.02 DOORS

- A. Doors shall be constructed of 11-gauge hot-rolled, pickled and oiled steel sheet.
- B. Door-edge flanges shall overlap with door-opening flanges and shall be formed to create a mechanical maze that shall guard against water entry and discourage tampering or insertion of foreign objects, but shall allow ventilation to help keep the enclosure interior dry.
- C. Doors shall have a minimum of two extruded-aluminum hinges with stainless- steel hinge pins, and interlocking extruded-aluminum hinge supports for the full length of the door to provide strength, security, and corrosion

resistance. Mounting hardware shall be stainless steel and shall not be externally accessible to guard against tampering.

- D. In consideration of controlled access and tamper resistance, each door (or set of double doors) shall be equipped with an automatic three-point latching mechanism.
 - 1. All latch points shall latch at the same time to preclude partial latching.
 - 2. A pentahead socket wrench or tool shall be required to actuate the mechanism to unlatch and latch the door.
 - 3. The latching mechanism shall have provisions for padlocking that incorporate a means to protect the padlock shackle from tampering and that shall be coordinated with the latches such that:
 - (a) It shall not be possible to unlatch the mechanism until the padlock is removed, and
 - (b) It shall not be possible to insert the padlock until the mechanism is completely latched closed.
- E. Doors providing access to solid-material power fuses shall have provisions to store spare fuse units or refill units.
- F. Each door shall be provided with a zinc-nickel-plated steel door holder located above the door opening. The holder shall be hidden from view when the door is closed, and it shall not be possible for the holder to swing inside the enclosure.

3.03 FACTORY FINISHING

- A. All steel structure components shall be cleaned, rinsed and phosphatized prior to painting.
- B. Finish shall be in accordance with ANSI C57.12.28 including: Salt spray, Cross Hatch Adhesion, Humidity, Impact, Oil Resistance, Ultra-violet Accelerated Weathering, Abrasion Resistance.
- C. Color: Munsell Green No. 7GY3.29/1.5

PART 4 COMPONENTS

4.01 INTERRUPTER SWITCHES

- A. Interrupter switches shall have a two-time duty-cycle fault-closing rating equal to or exceeding the short-circuit rating of the pad-mounted gear. These ratings define the ability to close the interrupter switch twice against a three-phase fault with asymmetrical current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current. Tests substantiating these ratings shall be performed at maximum voltage with current applied for at least 10 cycles. Certified test abstracts establishing such ratings shall be furnished upon request.
- B. Interrupter switches shall be operated by means of an externally accessible 3/4" hex switch-operating hub. The switch-operating hub shall be located within a recessed stainless-steel pocket mounted on the side of the pad-mounted gear enclosure and shall accommodate a 3/4" deep-socket wrench or a 3/4" shallow-socket wrench with extension. The switch-operating-hub pocket shall include a pad-lockable stainless-steel access cover that shall incorporate a hood to protect the padlock shackle from tampering. Stops shall be provided on the switch-operating hub to prevent over travel and thereby guard against damage to the interrupter switch quick-make quick-break mechanism. Labels to indicate switch position shall be provided in the switch-operating-hub pocket.
- C. Each interrupter switch shall be provided with a folding switch-operating handle. The switch-operating handle shall be secured to the inside of the switch-operating-hub pocket by a brass chain. The folded handle shall be stored behind the closed switch-operating-hub access cover.
- D. Interrupter switches shall utilize a quick-make quick-break mechanism installed by the switch manufacturer. The quick-make quick-break mechanism shall be integrally mounted on the switch frame, and shall swiftly and positively open and close the interrupter switch independent of the switch-operating-hub speed.
- E. Each interrupter switch shall be completely assembled and adjusted by the switch manufacturer on a single rigid mounting frame. The frame shall be of welded steel construction such that the frame intercepts the leakage path which parallels the open gap of the interrupter switch to positively isolate the load circuit when the interrupter switch is in the open position.
- F. Interrupter switch contacts shall be backed up by stainless-steel springs to provide constant high contact pressure.
- G. Interrupter switches shall be provided with a single blade per phase for circuit closing including fault closing,

continuous current carrying, and circuit interrupting. Spring-loaded auxiliary blades shall not be permitted. Interrupter switch blade supports shall be permanently molded in place in a unified insulated shaft constructed of the same cycloaliphatic epoxy resin as the insulators.

- H. Circuit interruption shall be accomplished by use of an interrupter which is positively and inherently sequenced with the blade position. It shall not be possible for the blade and interrupter to get out of sequence. Circuit interruption shall take place completely within the interrupter, with no external arc or flame. Any exhaust shall be vented in a controlled manner through a deionizing vent.
- I. Interrupter switches shall have a readily visible open gap when in the open position to allow positive verification of switch position.
- J. Ground studs shall be provided at all switch terminals. Ground studs shall also be provided on the ground pad in each interrupter switch compartment and on the terminals and ground pad in any bus compartment. The momentary rating of the ground studs shall equal or exceed the short-circuit ratings of the pad-mounted gear.
- L. Base-mounted distribution-class surge arresters, metal-oxide type, rated 9 kV shall be provided at all source switch terminals.
- M. Switch terminal pads shall accommodate attachment of rod-type compression terminals on cables entering the switchgear.

4.02 FUSES

A. Solid-Material Power Fuses

1. Fuses shall be disconnect style, solid-material power fuses, and shall utilize refill-unit-and-holder or fuse-unit-and-end-fitting construction. The refill unit or fuse unit shall be readily replaceable and low in cost.
2. Fusible elements shall be non-aging and non-damageable so that it is unnecessary to replace un-blown companion fuses on suspicion of damage following a fuse operation.
3. Fusible elements for refill units or fuse units rated 10 amperes or larger shall be helically coiled to avoid mechanical damage due to stresses from current surges.
4. Fusible elements, that carry continuous current, shall be supported in air to help prevent damage from current surges.
5. Each refill unit or fuse unit shall have a single fusible element to eliminate the possibility of unequal current sharing in parallel current paths.
6. Solid-material power fuses shall have melting time-current characteristics that are permanently accurate to within a maximum total tolerance of 10% in terms of current. Time-current characteristics shall be available which permit coordination with protective relays, automatic circuit reclosers, and other fuses.
7. Solid-material power fuses shall be capable of detecting and interrupting all faults whether large, medium, or small (down to minimum melting current), under all realistic conditions of circuitry, with line-to-line or line-to-ground voltage across the fuse, and shall be capable of handling the full range of transient recovery voltage severity associated with these faults.
8. All arcing accompanying operation of solid-material power fuses shall be contained within the fuse, and all arc products and gases evolved shall be effectively contained within the exhaust control device during fuse operation.
9. Solid-material power fuses shall be equipped with a blown-fuse indicator that shall provide visible evidence of fuse operation while installed in the fuse mounting.

B. Fuse-mounting jaw contacts shall incorporate an integral load interrupter that shall permit live switching of fuses with a hookstick.

1. The integral load interrupter housing shall be of the same cycloaliphatic epoxy resin as the insulators.
2. The integral load interrupter shall be in the current path continuously. Auxiliary blades or linkages shall not be used.
3. Live switching shall be accomplished by a firm, steady opening pull on the fuse pull ring with a hookstick. No separate load-interrupting tool shall be required.
4. The integral load interrupter shall require a hard pull to unlatch the fuse to reduce the possibility of an incomplete opening operation.
5. Internal moving contacts of the integral load interrupter shall be self- resetting after each opening operation to

permit any subsequent closing operation to be performed immediately.

6. Circuit interruption shall take place completely within the integral load interrupter with no external arc or flame.
 7. The integral load interrupter and the fuse shall be provided with separate fault-closing contacts and current-carrying contacts. The fuse hinge shall be self-guiding and, together with the fault-closing contacts, shall guide the fuse into the current-carrying contacts during closing operations. Circuit-closing inrush currents and fault currents shall be picked up by the fault-closing contacts, not by the current-carrying contacts or interrupting contacts.
 8. Integral load interrupters for fuses shall have a one-time duty-cycle fault-closing capability equal to the interrupting rating of the fuse, and a two-time duty-cycle fault-closing capability of 13,000 amperes rms asymmetrical at 14.4 kv or 25 kv. The duty-cycle fault-closing capability defines the level of available fault current into which the fuse can be closed the specified number of times (once or twice), without a quick-make mechanism and when operated vigorously through its full travel without hesitation at any point, with the integral load interrupter remaining operable and able to carry and interrupt currents up to the emergency peak-load capabilities of the fuse.
- D. Fuse terminal pads shall accommodate attachment of rod-type compression terminals on cables entering the switchgear.
- E. Ground studs shall be provided at all fuse terminals. One ground stud shall also be provided on the ground pad in each fuse compartment. The momentary rating of the ground studs shall equal or exceed the short-circuit ratings of the pad-mounted gear.
- F. A fuse storage compartment shall be provided in two source interrupter-switch compartments. Each fuse storage compartment shall provide space for storing three spare fuse holders or fuse units with end fittings for solid-material power fuses, or one spare electronic power fuse holder.

PART 5 – LABELING

5.01 HAZARD-ALERTING SIGNS

- A. All external doors shall be provided with "Warning—Keep Out—Hazardous Voltage Inside—Can Shock, Burn, or Cause Death" signs.
- B. The inside of each door shall be provided with a "Danger—Hazardous Voltage— Failure to Follow These Instructions Will Likely Cause Shock, Burns, or Death" sign. The text shall further indicate that operating personnel must know and obey the employer's work rules, know the hazards involved, and use proper protective equipment and tools to work on this equipment.
- C. Interrupter switch compartments shall be provided with "Danger" signs indicating that "Switches May Be Energized by Backfeed."
- D. Fuse compartments shall be provided with "Danger" signs indicating that "Fuses May Be Energized by Backfeed."
- E. Barriers used to prevent access to energized live parts shall be provided with "Danger—Keep Away—Hazardous Voltage—Will Shock, Burn, or Cause Death" signs.

5.02 NAMEPLATES, RATINGS LABELS, AND CONNECTION DIAGRAMS

- A. The outside of each door (or set of double doors) shall be provided with a nameplate indicating the manufacturer's name, catalog number, model number, date of manufacture, and serial number.
- B. The inside of each door (or set of double doors) shall be provided with a ratings label indicating the following: voltage ratings; main bus continuous rating; short-circuit ratings (amperes rms symmetrical and Mva three-phase symmetrical at rated nominal voltage); the type of fuse and its ratings including duty-cycle fault-closing capability; and interrupter switch ratings including duty-cycle fault-closing and short-time (momentary, amperes rms asymmetrical and one-second, amperes rms symmetrical).
- C. A three-line connection diagram showing interrupter switches, fuses with integral load interrupter, and bus along with the manufacturer's model number shall be provided on the inside of each door (or set of double doors), and on the inside of each switch-operating-hub access cover.

PART 6 - ACCESSORIES

- 6.01 End fittings and fuse units shall be furnished.

Specifications

750 MCM Underground Wire

Wire to be Okonite 162-23-4096 or equivalent. Total length to be 10,500 feet with individual reel lengths as follows:

(14) reels of 750 feet each.

END OF SECTION

BID FORM
CITY OF SEAFORD
PROCUREMENT OF 14.4 kV PAD-MOUNTED SWITCHGEAR

To: City Manager
City Hall
414 High St.
Seaford, DE 19973

Gentlemen,

Proposal of _____ (hereinafter called "Bidder"), organized and existing under the laws of the State of _____ doing business as _____ (insert "a corporation" "partnership", or "an individual" as applicable) to the City of Seaford, Delaware (hereinafter called "Owner.")

In compliance with your Advertisement for Bids, BIDDER hereby proposes to supply all materials and labor necessary for the Procurement of **14.4 kV Pad-Mounted Switchgear and 750 MCM wire** in strict accordance with the CONTRACT DOCUMENTS, and at the prices and lead times stated below unless the period for contract execution is extended in writing by the City Manager.

By submission of this BID, each BIDDER certified, and in the case of a joint BID each party thereto certified as to his own organization, that this BID has been arrived at independently, without consultation, communications, or agreement as to any matter relating to this BID, with any other BIDDER or with any competitor.

Furnish & deliver all materials for the prices stated below:

Quantity of five (7) 14.4 kV Pad-Mounted Switchgears, and 750 MCM Wire in the quantities and configurations listed below, delivered to 8000 Herring Run Road, Seaford, DE 19973.

ITEM 1: Qty. of two (2) PMH-11 configuration with 24" base and three (3) SMU-20 Fuse Units each with 3-25E standard speed fuses delivered to 8000 Herring Run Road, Seaford, DE 19973

Manufacturer _____ Model No. _____ Unit Cost: \$ _____

ITEM 2: Qty. of four (4) PMH-9 configuration with 24" base and six (6) SMU-20 Fuse Units each with 6-25E & 6-15E standard speed fuses delivered to 8000 Herring Run Road, Seaford, DE 19973

Manufacturer _____ Model No. _____ Unit Cost: \$ _____

ITEM 3 : Qty. of one (1) PMH-12 configuration with 24" base and nine (9) SMU-20 Fuse Units each with 3-10E, 3-15E & 3-30E standard speed fuses delivered to 8000 Herring Run Road, Seaford, DE 19973.

Item 4: 10,500 feet of 750 MCM Okonite wire 162-23-4096 (on (14) individual reels of 750 LF each) or equivalent delivered to 8000 Herring Run Road, Seaford, DE 19973

Manufacturer _____ Cost per foot: \$ _____

TOTAL COST ITEMS 1,2 and 3: \$ _____

Estimated Delivery Time for Equipment: _____

BID FORM (cont.)

CITY OF SEAFORD

PROCUREMENT OF 14.4 kV PAD-MOUNTED SWITCHGEAR and 750 MCM Wire

Detail drawings, specification sheets and warranty conditions shall be submitted with all bid proposals. All deviations from this bid specification MUST be submitted, in writing, with this bid proposal. Failure to bid all specifications may disqualify your bid.

Bidder's Name (Please print or type)

Address

Signature of Officer of Company

Name of Officer (Please print or type)

Date

Cell Phone #

Email Address

DECLARATION OF DEVIATIONS AND EXCEPTIONS

CITY OF SEAFORD

14.4 kV Pad-Mounted Switchgear

(Add additional pages if necessary)

Section No.

Deviation or Exception