MANATEE COUNTY
FLORIDA

March 11, 2014

TO: All Interested Bidders

SUBJECT: Invitation for Bids #14-0131CD
Rehabilitation of Headworks and Internal Recycle Pumps at the Southeast Water Reclamation Facility

ADDENDUM #1

Bidders are hereby notified that this Addendum shall be acknowledged on page Bid Form-1 of the Bid Form and made a part of the above named bidding and contract documents. Bids submitted without acknowledgment of the Addendum will be considered incomplete.

The following items are issued to add to, modify, and clarify the bid and contract documents. These items shall have the same force and effect as the original bidding and contract documents, and cost involved shall be included in the bid prices. Bids to be submitted on the specified bid date, shall conform to the additions and revisions listed herein.

1. **CHANGE** Article 1.02 on page 16150-1 in Section 16150 Motors of the technical Specifications to read as follows:

   1.02 SUBMITTALS
   A. The requirements of Section 01340 and Section 16050 shall be met.

   B. The Contractor shall submit to the Owner and Engineer five (5) sets of the certified motor manufacturer(s) dimension drawings showing nameplate data and outline dimensions within three (3) weeks of receiving the order.

   C. The Contractor shall submit to the Owner and Engineer five (5) sets of the standard motor manufacturer(s) test results (per 3.02 A) for the motors after they are constructed prior to the motors being shipped.

2. **ADD** Section 16921- 480 Volt Motor Control Center , to the Technical Specifications, that is attached to this Addendum #1.

END OF ADDENDUM #1

Bids will be received at Manatee County Purchasing, 1112 Manatee Avenue West, Bradenton, Florida 34205 until **Friday, March 14, 2014 at 3:00 PM.**

Sincerely,

Melissa M. Wendel, CPPO for
Purchasing Official

Financial Management Department –Purchasing Division
1112 Manatee Avenue West, Suite 803, Bradenton, FL 34205
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SECTION 16921 480 VOLT MOTOR CONTROL CENTER

PART 1 GENERAL

1.01 SCOPE OF WORK

A. Furnish, install, test, and place in service motor control center(s) as hereinafter specified and/or shown on the Contract Drawings.

B. This work will necessarily require interfacing with new power, control, and instrumentation wiring.

C. The existing MCCs and their associated systems must be maintained in a fully operational condition while the new MCCs and its associated power, lighting, control, and instrumentation systems are being installed and tested.

D. After the new MCCs and their associated systems have been installed, tested, and certified ready for operation, the cut-over from the existing MCCs and systems to the new MCCs and systems shall be done in one continuous uninterrupted period not to exceed twenty-four (24) hours. However, this intended cut-over scenario may be altered at the actual cut-over if Water Treatment Plant operating conditions/requirements mandate that a different cut-over scenario be implemented.

E. The existing MCCs and systems may be removed only after the new MCC and systems are fully operational and have been accepted by the Water Treatment Plant.

F. The Contractor shall remove from the premises and properly dispose of all items or pieces of equipment not specifically designated for retention by the Water Treatment Plant.

1.02 REGULATORY REQUIREMENTS

A. MCC-1A and MCC-2A shall conform to the latest revisions of the following:

Underwriters Laboratory (UL) 845.
NEMA ICS-3, Part 1.
National Electrical Code, 1996.

B. The MCCs shall be manufactured in an ISO 9001 certified facility.

C. The MCCs, all individual MCC sections, and all individual components shall be UL labeled where applicable.

1.03 MANUFACTURER'S QUALIFICATIONS

A. The MCCs shall be the product of a manufacturer who shall also be the manufacturer of the circuit breakers, motor starters, control and timing relays, and control components (push buttons, etc.).

B. To match existing equipment and to preclude the unnecessary and expensive duplication of spare parts, the MCC shall be the Model 6, Class 8998 as manufactured by the Square 'D' Company, no substitutions!

1.04 MANUFACTURER'S REPRESENTATIVE

A. The manufacturer of the MCCs shall provide the services of an authorized factor representative(s) who is well versed in the operation and maintenance of the MCCs.

B. The authorized factory representative shall be available as follows:

1. To assist the Contractor during construction on an as needed basis.
2. To perform the final system check-out, conduct the final acceptance test, and place the MCCs into initial service [one (1) day, minimum].
3. To instruct the County's personnel in the proper operation and maintenance of the MCCs [one (1) day, minimum].

1.05 PACKING, HANDLING, AND SHIPPING

A. The MCCs shall be divided into convenient shipping blocks not to exceed three (3) vertical sections per shipping block.

B. Each shipping block shall be fitted with a removable lifting angle which will provide a convenient means for attachment to a crane or other suitable lifting equipment. In addition, each shipping block shall be fitted with back and front removable channel sills.

C. Each shipping block shall be so packed as to prevent damage to the MCCs by normal handling methods or by weather elements while in transit.

D. The manufacturer of the MCCs shall deliver it to the appointed receiving site utilizing his customary mode(s) of transportation.

1.06 STORAGE

A. The MCCs shall be stored on-site in a clean, dry, well-ventilated, indoor location which is free from temperature and humidity extremes. Ideally, the temperature range should be 32-degrees F to 104-degrees F and the humidity range should be 15% to 75%, non-condensing.

1.07 SUBMITTALS

A. Prior to beginning manufacturing of the MCCs, the following shall be submitted to the County for review and approval:

1. Outline drawings showing major dimensions for the MCCs.
2. Front elevation showing compartment and component arrangements for the MCCs.
3. Complete master wiring diagrams and elementary or control schematics for the MCCs showing the interconnections with existing external devices. Due to the complexity of the interconnections with the existing devices, it is imperative that the diagrams/schematics be carefully prepared. Standard preprinted sheets or drawings marked to indicate applicability to this project will <u>not</u> be acceptable under this Contract.

4. Complete single line diagrams for the MCCs showing:
   a. Incoming line section components.

b. Frame and trip rating for all circuit breakers.
c. Size and type for all motor starters.
d. Pertinent data for all special devices such as lighting transformer and panelboard.
e. Conduit and conductor sizes for motors and other external loads.

B. Changes or alternations in the MCCs necessitated by the failure to comply with the provisions of Item 1.07.A above will be entirely at the expense of the Contractor and/or manufacturer with no cost accruing to the County.

1.08 WARRANTY

A. The MCCs shall be warranted to be free from defects in materials and workmanship for a period of one (1) year from date of final acceptance.

PART 2 PRODUCTS

2.01 RATING

A. The MCCs shall be designed for use on a 480 Volt, 3-phase, 3-wire, 60 Hertz power system.

B. The MCC shall have a power bus system braced for a minimum short circuit capacity of 42,000 Amperes RMS, symmetrical.

2.02 CONFIGURATION

A. The MCC shall consist of individual vertical sections bolted together to form a rigid, free-standing structure.

2.03 MATERIAL

A. The vertical sections shall be fabricated from heavy gauge structural steel, No. 14 gauge minimum thickness, which shall be in full compliance with UL 485.

2.04 CONSTRUCTION

A. STRUCTURES

1. The MCC structures shall be composed of individual vertical sections of the standard metal-enclosed, free-standing, dead-front type which shall be bolted together to form the MCC assembly.
2. The overall height of the MCC structures shall not exceed 90-inches, exclusive of the removable lifting angle and base channels.
3. The vertical sections shall be 20-inches deep by 20-inches wide, except that the width may be increased as required to allow installation of larger sized devices.
4. The vertical sections shall have 72-inches of vertical space for the installation of control devices. The sections shall also have a 12-inch wireway at the top and a 6-inch wireway at the bottom. The wireways in adjacent sections shall line up to provide wireways the full length of the MCCs to accommodate power, control, and instrumentation interconnecting wiring between the various vertical sections.

5. Each 20-inch wide or wider vertical section shall come equipped with all the requisite hardware and bus bars arranged as needed to install modular plug-in units. Each modular plug-in unit shall have its own separate compartment with a door and a disconnecting device. Plug-in units of a similar size and type shall be interchangeable. All unused space in the vertical section shall be covered by hinged blank doors and shall be equipped to accept the installation of future plug-in units. Each section shall include both top and bottom plates which shall be removable for ease in cutting conduit openings.
6. The compartments shall not only totally isolate the enclosed equipment, but shall also be isolated from each other. The compartments shall be equipped with interlocks to prevent the compartment door from being opened with the disconnecting device in the "Closed" position. An interlock bypass shall be provided for the use of qualified personnel. The disconnecting device shall be able to be locked in the "Off" position, three (3) padlocks minimum. The disconnecting device operating mechanism shall not be attached to the compartment door. Compartment openings to the vertical bus shall be covered by manual shutters.
7. Vertical sections which accept modular plug-in units shall be provided with a 4-inch wide full depth vertical wireway which connects with both the top and the bottom horizontal wireways. The vertical wireways shall be isolated from unit interiors by a full height barrier. The vertical wireways shall have a separate full length hinged door which does not require opening control unit doors for access to the wiring. Vertical sections which house a single, full section control unit shall not be required to have vertical wireways. However, these control units must open directly into the MCC horizontal wireways.
8. The assembled MCC structures shall be a one-deep configuration designed for against-the-wall mounting. All wiring, bus bar joints, and other mechanical parts which require adjustment, servicing, or maintenance must be accessible from either the front or the top of the structures. Rear access will not be acceptable under this Specification.
9. The assembled MCC structures shall meet the requirements for NEMA Type 12 construction. Wiring shall conform to NEMA Class 2, Type C requirements.
10. The MCCs shall be painted with a UL recognized acrylic electrodeposition based enamel, ANSI 49 gray. The painting process shall consist of cleaning, rinsings, phosphating, non-chrome sealer rinsings, prepaint rinsings, painting, post-painting rinsings, a baking cure, and a cooling down period. All painted parts must be able to withstand at least 300-hours of salt spraying with less than an 1/8-inch loss of paint from a scribed line per ASTM b117.
11. The MCCs shall be furnished as a completely factory assembled unit except where shipping and/or handling requirements make it necessary to subdivide the MCC into smaller more convenient units (see Items 1.05.A, B & C above).

B. BUS BARS

1. All bus bars and bus bar connectors shall be silver-plated or tin-plated copper. Aluminum bus bars and aluminum connectors will not be acceptable under this Specification.
2. The main horizontal bus bars shall run the full length of the MCC. Provisions shall be made to allow splicing additional sections onto either end of the MCCs.
3. Bus bar ratings shall be based on a 65 degree C maximum temperature rise over a 40 degree C ambient temperature. The main horizontal bus of MCC-1A and MCC-2A shall be rated 600 Amperes. As is required by Item 2.01.B above, the power bus systems shall be braced for a minimum short circuit capacity of 42,000

Amperes RMS, symmetrical.

4. Each vertical section that includes plug-on units shall be equipped with a vertical bus with a minimum rating of 300 A continuous. The vertical bus shall be connected directly to the main horizontal bus without the use of risers or intervening connectors. The vertical buses shall be insulated and isolated with a glass polymer or an equivalent continuous insulation. Taped buses will not be acceptable under this Specification.
5. The MCCs shall be furnished with a 1/4-inch by 2-inch ground bus which runs the full length of the MCC. An appropriately sized mechanical lug shall be provided in the MCCs for connecting a ground cable. The ground bus shall be furnished with six (6) drilled holes per vertical section to accept County-supplied ground lugs for any loads which require a ground conductor.
6. Each vertical section shall have a vertical ground bus which connects to the main horizontal ground bus. Vertical section construction shall be such that upon insertion of plug-on units, the vertical ground bus shall engage before the power stabs make contact and upon removal of the plug-on units, the power stabs shall disengage before the vertical ground bus is disconnected.

C. WIRING

1. Both intercompartment and intracompartment wiring shall utilize all copper conductors.
2. All terminations and connections shall be via compartment mounted, plug-in terminal blocks which allow compartments to be removed without having to disconnect wires from fixed terminal blocks.
3. Ground conductors shall be green, power conductors shall be black, control conductors shall be red, and conductors energized from sources other than the starter control power transformer shall be yellow.
4. Except for short jumpers, all conductors shall be numbered at both ends and at all intermediate junction points. This numbering scheme shall be reflected in the wiring diagrams.

D. SIGNAGE

1. The MCCs shall be furnished with a signs marked "DANGER-480 VOLTS". Sign shall be laminated plastic, red letters on a white background. Letters shall be 1-inch high, minimum.
2. All compartments which have voltage sourced from outside the cabinet which are not disconnected by the compartment=s motor circuit protector shall be furnished with a sign marked "CAUTION - THIS UNIT CONTAINS A VOLTAGE FROM A SOURCE OUTSIDE OF THIS UNIT". Signs shall be black letters on a high visibility yellow background. Signs shall be 3-inches by 5-inches, minimum size.

2.05 COMPONENTS

A. COMBINATION MOTOR STARTERS

1. All starters shall be the 3-pole, magnetic, combination type suitable for 480 Volt, 60 Hz operation. Starter types (full voltage, non-reversing or reduced voltage) shall be as shown on the Drawings. Reduced voltage starters shall be solid state devices.
2. Starter NEMA sizes shall be determined from the motor horsepowers shown on the

Drawings, but in no case shall any starter size be smaller than NEMA 1.

3. Starters shall be provided with a three-pole externally manual reset, overload relay.
4. Unless otherwise indicated on the Drawings, all starters shall be provided with a control transformer. The transformer shall be sized to handle both the contactor load and all connected control circuit loads.
5. The control transformer shall have two (2) primary protective fuses and one (1) secondary fuse. The secondary fuse shall be installed in the ungrounded conductor only!
6. The control transformer rating shall be clearly visible from the front when the starter unit door is opened.
7. In units where a control transformer is not provided, but where externally powered control circuits are present, the unit disconnect shall include an electrical interlock for disconnection of the externally powered circuits.
8. Auxiliary control interlocks, field convertible to normally open or normally closed operation, shall be provided where required to assure proper circuit operation.
9. Unless otherwise indicated on the Drawings, all starter cubicles shall be provided with the following door mounted devices:
    a. 120 Volt, push-to-test pilot lights:
        1) Red "ON" light.
        2) Green "OFF" light.
    b. Three-position selector switch:
        1) Hand-Off-Auto.
    c. Indicating ammeter:
        1) Analog type.
    d. Elapsed time meter:
        1) Digital type.
        2) Non-resettable.
        3) 0-99,999.9 hours.
10. Where applicable, the door mounted devices shall be the heavy-duty, oiltight type.

B. CIRCUIT BREAKERS

1. Circuit breakers shall be the molded case, thermal-magnetic type with an interrupting capacity not less than the design short circuit rating of their respective motor control centers.
2. Incoming line circuit breakers and branch feeder circuit breakers shall have frame and trip ratings as indicated on the Drawings. Circuit breakers used as part of a combination starter shall be the manufacturer's standard for the respective starters furnished.
3. Circuit breaker operating handles shall protrude through, but shall not be attached to, the cubicle door.
4. The circuit breaker handle operating mechanisms shall allow complete ON/OFF control of the circuit breakers with a clear indication of the breaker's status.
5. The handle operators shall also have a separate and distinct TRIPPED position to clearly indicate a circuit breaker trip condition. It shall be possible to reset the tripped circuit breakers without opening the cubicle doors.
6. Provisions shall be made for locking the operating handles in the OFF position, three (3) padlocks minimum.

C. INCOMING LINE SECTION

1. The MCC shall be furnished with an incoming line section composed of the following:
   a. Top mounted main circuit breaker.
   b. Surge protection.
2. The main circuit breaker shall comply with all the applicable provisions of Item 2.05.B above.
3. Surge protection:
   a. Lighting arrestor:
      (a) Three-phase, MOV type.
   b. Surge capacitor:
      (a) Three-phase type.

D. IDENTIFICATION OF DEVICES

1. All devices in the MCCs, whether internally mounted or through-the-door mounted, shall be identified individually.
2. The individual device identification shall be the same designation or number as that used on the respective wiring diagrams.
3. The identification of the internally mounted devices shall be by either stenciling thereon or by small nameplates attached thereto.
4. The identification of the through-the-door mounted devices shall be by either stenciling or by small nameplates adjacent to the devices on the inside surface of the door.

E. NAMEPLATES

1. Engraved nameplates shall be provided for the MCCs and each unit compartment.
2. The nameplates shall be phenolic or a similar durable plastic material.
3. The nameplates shall have a black or dark gray background with white lettering.
4. Both the size of the nameplate and the size of the lettering on the nameplate shall be appropriate for the specific application.

2.06 SPARE PARTS

A. The manufacturer of the MCC shall furnish a list of recommended spare parts for the County's review and approval.

B. The spare parts shall include, but not necessarily be limited to, the following:

1. One (1) box of power fuses of each size used.
2. One (1) box of pilot lamps.
3. Six (6) red lens caps for pilot lamps.
4. Six (6) green lens caps for pilot lamps.
5. Six (6) amber lens caps for pilot lamps.
6. One (1) of each special tool or device, if any, required to maintain the MCC and included equipment.

C. The manufacturer of the MCCs shall furnish all items on the spare parts list as approved by the County.

2.07 FACTORY QUALITY CONTROL

A. After fabrication, but before shipment, the MCCs shall be subjected to a thorough factory quality control inspection.

B. The quality control inspection shall include, but not necessarily be limited to, the following:

1. Physical inspection of the structures.
2. Physical inspection of both the interior and exterior finished coatings.
3. Physical inspection of the individual components.
4. Physical inspection of the bus installations.
5. Physical inspection of the individual wiring conductors, including terminations.

2.08 FACTORY ELECTRICAL TESTING

A. Prior to shipment, the MCCs shall be subjected to a thorough factory electrical testing which shall include, but not necessarily be limited to, the following:

1. AC dielectric test of the power circuit.
2. Power circuit phasing.
3. Control circuit continuity and operation.
4. Polarity and operation of instrument transformers.
5. Polarity and operation of meters and meter switches.
6. Sensitivity and operation of the ground fault system.
7. Operation of the individual devices.

2.09 SIGNS AND LABELS

A. After the MCCs have successfully completed both the factory quality control inspection and the factory electrical testing, it shall be affixed with the appropriate signs and labels.

B. The signs and labels shall include, but not necessarily be limited to, the following:

1. Warning/informational type signs and labels.
2. Operational/instructional type signs and labels.
3. U.L. label (s).
4. Inspector's stamp(s).

PART 3 EXECUTION

3.01 INSTALLATION

A. EXISTING FACILITIES OPERATION

1. Unless otherwise directed by Water Treatment Plant personnel, the existing facilities (MCC's, bus duct, motors, lighting, etc.) must be kept fully operational during the installation of the new MCCs and associated wiring and equipment (see Item 1.02.C above).
2. Temporary shut-down of any of the existing facilities shall only be with the prior approval of and at the convenience of the Water Treatment Plant personnel.

B. MCC-1A and MCC-2A

1. The MCCs shall be installed on an existing concrete pad in the location shown on the Drawings.
2. The bottom mounting members of the MCCs shall be bolted to channel sills imbedded in the new concrete pad.
3. The imbedded sills shall run the full length of the two longest sides of the MCCs. The sills shall be installed level in all directions.
4. The mounting bolts and associated hardware shall be stainless steel.
5. The MCCs shall be maintained in a vertically upright position at all times during installation.
6. The MCCs shall be lifted only suing the top mounted, factory installed, lifting angles or as otherwise approved, in writing, by the manufacturer of the MCCs.
7. The MCCs shall be protected against both physical and environmental damage at all times. Any damage to the paint shall be carefully repaired using a touch-up paint furnished by the manufacturer of the MCCs.
8. All wiring, whether incoming or outgoing, shall be connected to the MCCs via through-the-top conduits with the exception of the main power supplies which shall utilize through-the-top bus duct connections.
9. Field installed interior wiring shall be neatly grouped by circuit and shall be bound by plastic tie-wraps. Care shall be taken to support the wire groupings in such a manner as to avoid any stressing of the termination points.

3.02 FIELD TESTS AND CHECKS

A. After assembly of the MCCs, but prior to the termination of any field wiring, the following tests shall be made:

1. Megger terminals and buses with the main circuit breaker closed and all other circuit breakers open.
2. Megger terminals and buses with the main circuit breaker and all other circuit breakers closed.
3. The results of the tests in Items 3.02.A.1 and 3.02.A.2 above shall be forwarded to the County for review and approval. The minimum acceptable result for each test is 100 megohms.
4. The tests in Items 3.02.A.1 and 3.02.A.2 above shall be performed using a 1000 VDC megger <u>after</u> all devices sensitive to the megger voltage have been disconnected.

B. Before the MCCs are energized, check for the following:

1. All current transformer secondary circuits have been completed and the shunts have been removed.
2. Correctly sized overloads have been installed for all motors.
3. All mechanical interlocks operate properly.

C. After the MCC's have been energized, check for the following:

1. All individual components within the MCCs function properly both mechanically and electrically.
2. There are no visible hot spots on the buses or at major termination points.

D. After the requirements of Items 3.02.A, B, and C above have been successfully

completed, the MCCs shall be subjected to the following:

1. A fully operational 24-hour acceptance test.
2. The acceptance test shall be conducted by an authorized factory representative(s) of the manufacturer of the MCCs.
3. The acceptance test shall be witnessed by Water Treatment Plant personnel as designated by the County.
4. Anytime during the acceptance test after eight (8) consecutive hours of trouble-free operation, the County may, at his option, forego the remainder of the test and accept the MCCs at that point. However, this County=s option shall in no way relieve the manufacturer=s authorized representative(s) from the obligation to be fully prepared to conduct a complete 24-hour acceptance test.
5. All problems and shortcomings in the MCCs and the associated equipment and devices which are discovered during the acceptance test shall be remedied/corrected by the Contractor entirely at his own expense with no cost to the County.

END OF SECTION