ADDENDUM NO. 4

TO: PLANS AND SPECIFICATIONS FOR STATE OF MISSOURI

REBID OF:
Install Lethal Fence and Guard House
Western Missouri Correctional Center
Cameron, Missouri
PROJECT NO. C1926-01

Bid Opening Date: 1:30 PM, Thursday, May 23, 2019

Bidders are hereby informed that the Construction Plans and/or Specifications are modified as follows:

SPECIFICATION CHANGES:

1. **SECTION 281000 – ELECTRONIC SECURITY SYSTEMS**

   a. REMOVE and REPLACE Paragraph 1.7-A.7 as follows:
      7. Contract documents make use of the terms Detention Electronic Systems Integrator (DESI) and Electronic Security Contractor (ESC) to describe typical project responsibilities. Coordination of Division 28 project tasks rest solely between the DESI, ESC, and the project's Prime Contractor.

   b. REMOVE and REPLACE Paragraph 1.7-A.8 as follows:
      8. In addition, ESC will coordinate integration with existing detention control system with the Owner preferred DESI:
         a. The approved DESI for this project is Ci3. Contact information for Ci3 is as follows:
            1) Jason Lindley
               JLindley@Ci3.com
               913.449.1652
               6200 Thornton Ave
               Suite 190
               Des Moines, IA 50321

   c. ADD Paragraph 1.7-A.9 as follows:
      9. Refer to individual sections for additional Contractor qualifications.

2. **SECTION 285220 – ELECTRIFIED FENCE CONTROLS AND DETECTION SYSTEM**

   a. REVISE Specification name to **GENERAL ELECTRIFIED FENCE SYSTEM REQUIREMENTS**. See attached for revised specification section.

   b. DELETE Paragraph 1.8-B. See attached for revised specification section.

3. **SECTION 285227 – ELECTRIFIED FENCE CONTROLS AND DETECTION SYSTEM**

   a. REVISE Specification name to **ELECTRIFIED FENCE MATERIALS**. See attached for revised specification section.

   b. REVISE Paragraph 2.11 BIRD DETERRENT PRONGS. See attached for revised specification section.

DRAWING CHANGES:

1. **Drawing T-510**

    a. ADD the following General Note: "LIST OF MATERIALS ARE PROVIDED AS A BASIS OF DESIGN. NO COMPLETE, ASSEMBLED UNITS ARE KNOWN TO EXIST. ACTUAL BILL OF MATERIALS SHALL BE SOURCED AND PROVIDED BY THE CONTRACTOR FOR THE FINAL, BUILT EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONING SYSTEM TO MEET THE DESIGN INTENT."

2. **Drawing T-515**

    a. ADD the following General Note: "LIST OF MATERIALS ARE PROVIDED AS A BASIS OF DESIGN. NO COMPLETE, ASSEMBLED UNITS ARE KNOWN TO EXIST. ACTUAL BILL OF MATERIALS SHALL BE SOURCED AND PROVIDED BY THE CONTRACTOR FOR THE FINAL, BUILT EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONING SYSTEM TO MEET THE DESIGN INTENT."

    b. ADD Description of "INTENTIONALLY BLANK" to the Equipment Table Reference Numbers that are empty.

3. **Drawing T-516**

    a. ADD the following General Note: "LIST OF MATERIALS ARE PROVIDED AS A BASIS OF DESIGN. NO COMPLETE, ASSEMBLED UNITS ARE KNOWN TO EXIST. ACTUAL BILL OF MATERIALS SHALL BE SOURCED AND PROVIDED BY THE CONTRACTOR FOR THE FINAL, BUILT EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONING SYSTEM TO MEET THE DESIGN INTENT."

    b. ADD Description of "INTENTIONALLY BLANK" to the Equipment Table Reference Numbers that are empty.

4. **Drawing T-517**

    a. ADD the following General Note: "LIST OF MATERIALS ARE PROVIDED AS A BASIS OF DESIGN. NO COMPLETE, ASSEMBLED UNITS ARE KNOWN TO EXIST. ACTUAL BILL OF MATERIALS SHALL BE SOURCED AND PROVIDED BY THE CONTRACTOR FOR THE FINAL, BUILT EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A COMPLETE AND FUNCTIONING SYSTEM TO MEET THE DESIGN INTENT."

    b. ADD Description of "INTENTIONALLY BLANK" to the Equipment Table Reference Numbers that are empty.

GENERAL COMMENTS:

1. Contractors that wish to visit the site must contact Randy Eaton (816-632-1390) at least 24 hours in advance to schedule a time.
2. Please contact Kelly Copeland, Contract Specialist, at 573-522-2283 or kelly.copeland@oa.mo.gov for questions regarding bidding procedures and

MBE/WBE/SDVE submittal requirements.

3. The deadline for technical questions is May 16, 2019 at noon. Submit technical questions to Mark Maurer at mark.maurer@hendersonengineers.com and copy Bryan Chinn at bryan.chinn@oa.mo.gov.
4. All correspondence with respect to this project must include the State of Missouri project number as indicated above.
5. Changes to, or clarification of, the Bid Documents are only made as issued in the Addenda.
6. Current Planholders list is available at: http://planroom.adsmo.net/bidders.asp?job_id=6862
7. Prospective bidders contact American Document Solutions, 1400 Forum Blvd Suite 1C, Columbia MO 65201, 573-446-7768 to order official plans and specifications. Paper bid documents are available for a deposit of $100.00.

ATTACHMENTS:

1. Revised Section 285220 - GENERAL ELECTRIFIED FENCE SYSTEM REQUIREMENTS
2. Revised Section 285227 - ELECTRIFIED FENCE MATERIALS

May 10, 2019

END ADDENDUM NO. 4

SECTION 285220

GENERAL ELECTRIFIED FENCE SYSTEM REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes: General requirements of the controls that apply high voltage to the electrified fence and the detection system that monitors the electrified fence.

B. Related Sections:

1. Section 260010 - General Electrical Requirements
2. Section 285221 - Electrified Fence Controls and Relays
3. Section 285222 - Electrified Fence Control Cabinet
4. Section 285223 - Electrified Fence Interlock Panel
5. Section 285224 - Electrified Fence Programmable Logic Controller
6. Section 285225 - Electrified Fence Monitoring Equipment
7. Section 285226 - Electrified Fence Medium Voltage Wire
8. Section 285227 - Electrified Fence Materials
9. Section 285228 - Electrified Fence Cabinets and Panels
10. Section 285229 - Electrified Fence Field Testing

1.3 SUBMITTALS

A. Refer to requirements in Division 1 Section “Submittals”.

1.4 SYSTEM DESCRIPTION

A. General:

1. The control cabinets and interlock panels generate a high voltage for the electrified fence wires and monitor alarms and status. Refer to individual sections for detailed description.
2. The PLC along with the remote PLC I/O modules in individual cabinets provide a microprocessor-based data acquisition system which has the capability of multiplexing the data from cabinet to cabinet as scheduled on the PLC data table in the drawings.
3. Fault detection circuit alarms from the control cabinets must be manually reset at the individual cabinets. All other alarms and status are automatically reset at the individual cabinets. All alarms latch and require manual reset at each graphic display panel and at the perimeter detection control unit (ICU).

1.5 OWNER PERSONNEL TRAINING

A. Provide the Owner’s maintenance personnel formal instruction in the functions, operations and maintenance of the systems provided under this contract. Training shall consist of four hours of classroom and field instructions. Emphasis shall also be placed on safety features and features which may require readjustment, resetting or checking and recalibration by them from time to time.

B. Provide the training sessions at the prison facility and on the equipment furnished under this contract.

C. The education and instruction of Owner's personnel shall be by a qualified instructor familiar with the requirements for this project.

D. Session dates shall be directed by the Owner's Representative but will be during the 10-day Operational Tests (section 01430).

1.6 OWNER ACCESS TO MANUFACTURERS' FACILITIES

A. Owner's Representative may elect to visit manufacturers'/suppliers' facilities prior to or at any time during fabrication of equipment. Manufacturers/suppliers shall grant access to their facility for the Owner's Representative visits.

1.7 EXTRA MATERIALS

A. Submit extra materials under provisions of Division 1.

B. Provide equipment required to calibrate, test, service and maintain the controls and detection system.

1.8 QUALIFICATIONS

A. Manufacturers: Companies specializing in manufacturing the products (or similar products) in this section and related sections with minimum three years documented experience.

1.9 TESTING

A. Provide manufacturer's services at the jobsite for five days minimum, travel time excluded, to check the installation, including wire terminations.

B. A manufacturer's representative shall assist in the field testing per Section 285229 and perform the operational tests per Section 285229.

END OF SECTION 285220

SECTION 285227

ELECTRIFIED FENCE MATERIALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fence posts.
2. Wire high voltage fence.
3. Wire and insulators – rodent.
4. Insulators and clamps.
5. Tensioning devices.
6. Wire connectors.
7. Detection rings.

B. Related Sections:

1. Section 323113.53 – High Security Chain Link Fencing.
2. Section 033000 – Cast-In-Place Concrete.
3. Section 101425 – Electrified Fence Signs
4. Section 285229 - Electrified Fence Field Testing.

1.3 REFERENCES

ANSI C29.5	Wet Process Porcelain Insulators, Low and Medium Voltage (Pin Type)
ASTM A36	Structural Steel.
ASTM F1083	Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structure.
ASTM A123	Zinc (Hot-Dip Galvanized on Iron and Steel Products.
ASTM A153	Zinc Coating (Hot-Dip) on Iron and steel Hardware.
ASTM A475	Zinc Coated Steel Wire Strand.
ASTM A500	Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
ASTM B3	Soft or Annealed Copper Wire.
AWS A2.0	Standard Welding Symbols.
AWS D1.1	Structural Welding Code.

1.4 SUBMITTALS

A. Refer to requirements in Division 1 Section “Submittals”.

1.5 QUALITY ASSURANCE

A. Like items of materials shall be the end products of one manufacturer.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Contractor: Posts and grade beam – five years minimum related experience in fence construction. Electrical work – five years minimum experience as licensed electrician.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store materials off ground. Protect against oxidation.

1.9 EXTRA MATERIALS

A. Submit extra materials under provisions of Division 1. Deliver to prison site and deliver to State’s Representative prior to completion of contract.

B. Intermediate posts: Furnish 5.

C. Strain posts: Furnish one of each type.

D. High voltage fence wire: Furnish 5,000 feet.

E. Pin insulators with bolt, pin, locknut, and wire clamp (spring type): Furnish 100.

F. Detection rings: Furnish 500.

G. Tensioning devices with 316 stainless steel tie wraps: Furnish 20.

H. Wire connectors: Furnish 100.

I. Wire connector compression tool and die: Furnish 1.

J. Rodent Wire: Furnish 1,000 feet.

K. Rodent wire insulators: Furnish 20.

L. Tool for measuring wire tension: Furnish 1.

M. Rodent bracket with grounding loop and mounting bolts: Furnish 10.

N. Bird deterrent springs: Furnish 500

PART 2 - PRODUCTS

2.1 STRAIN POSTS AND GATES

A. Provided by others.

2.2 INTERMEDIATE POSTS

A. Provided by others.

2.3 WIRE – HIGH VOLTAGE FENCE

A. Acceptable Manufacturers:

1. Multiple strand, either basket weave or spiral; minimum of 7 strands.

2. Strands shall be a combination of 316 stainless-steel strands and one soft temper solid copper strand. Individual stainless steel strands may be solid or stranded. Copper strand shall be located in center of wire as a core.

3. Copper strand per ASTM B3, 0.02 inch minimum diameter.

4. Stainless steel strands: Hard temper conforming to ASTM A-492.

5. Minimum tensile strength: 400 lbs.

6. Nominal weight: 8.2 lbs. Per 1,000 feet.

7. Overall diameter: 0.060 inch minimum; 0.065 maximum.

8. Modulus of elasticity: 28,000,000 psi (stainless steel strand); 17,000,000 psi (copper strand)

9. Strand ends shall stay together when cut with appropriate cutters.

2.4 INSULATORS

A. Acceptable Manufacturers:

1. A. B. Chance Company (816-795-8322).

2. McGraw Edison/Cooper Power Systems (415-368-5300).

3. Talley Industries/Porcelain Products (419-396-7621).

4. Or equivalent.

B. Pin Type:

1. Application voltage: 7.2 kv.

2. Glaze type: Radio-free.

3. RIV/1,000 khz: 50 microvolts, maximum.

4. Flashover rating (60 hz): 45 kv dry; 25 kv wet.

5. Flashover rating (impulse): 70 kv positive, 85 kv negative.

6. Cantilever: 2500 pounds.

7. Leakage distance: 5 inches.

8. Dry arc distance: 3-3/8 inches.

9. Per ANSI C29.5.

10. ANSI Class 55-2.

C. Pins:

1. Forged steel with 1-inch lead thread.

2. Provide with square nut and MF type locknut.

3. Hot dipped galvanized.

4. 3-5/8-inch height from base to top of pin.

5. 1-3/16-inch thread length below base.

6. 1/2-inch shank diameter.

D. Similar to Chance #7010 (except lead in lieu of wood cob and shorter thread length), or equivalent.

E. Wire Clamps – Spring Type:

1. Formed wire extension spring on top of insulator to hold wire within insulator cradle, yet allow wire to slide easily for contraction, expansion and tensioning. Formed wire springs shall be configured so that some portion of the spring is above the top of the insulator to prevent someone from stepping on the insulator.

2. 302 or 316 stainless steel, condition B.

3. Springs shall be 6.5 inches long including hooks, 0.3 inch minimum diameter, 0.032 inch wire strand, cross center 340 degree hooks.

F. Wire Clamps – Cap Type:

1. 301.5 stainless steel, 0.016 thick.

2. Form cap to clip onto top of insulator and prevent easy removal (5 lbs. Minimum pressure to unclip). Round edges to prevent edge of metal from contacting electrified fence wire and to center wire within cap. Provide metal contact from clip to electrified fence wire when wire is in bottom of insulator cradle.

3. Cap shall not come off insulator when wire is pulled up on both sides of cap with 10 lbs of tension.

4. Manufacturer's Representative: A & A Industry (telephone; 714-530-1656), Patent No. DES369954.

2.5 TENSIONING DEVICES

A. Spool and ratchet design that permits increasing or decreasing tension of wire without crimping, cutting or damaging wire.

B. Devices shall be 316 stainless steel, hot dipped galvanized steel, or 30% glass filled polyester resin. Extra flexible, 316 stainless steel, multiple strand, 0.07 inch minimum overall diameter, 18 inch minimum length wire attached to spool for connection of high voltage fence wire.

C. Rated for the minimum tensile strength of the high voltage fence wire.

D. Non-metallic tensioners shall have a bonding jumper of high voltage wire around tensioner and secured to the tensioner with a stainless steel cable tie. Wrap cable tie around take-up handle to prevent turning handle without cutting cable tie.

E. Drawings are based on non-metallic tensioners by Perimeter Products. Submit connection details if metallic tensioners are proposed.

2.6 WIRE CONNECTORS

A. Provide the following type of connection for connecting the high voltage fence wire to high voltage fence wire or connecting the high voltage fence wire to insulated medium voltage wire. The high voltage fence wire that is under tension shall not be spliced unless approved by State's Representative. Connections to the tensioned wire shall be tap connections.

1. C tap compression connector made of high conductivity wrought copper. Utilize a precision hardened steel die to compress the connector around the wires, converting into a solid mass. Provide a circumferential hex- or diamond-shaped compression rather than a simple indent. If wires or cable are too small for use of standard die size, folding the non-tensioned wire/cable once so the tap includes three wires/cables is acceptable to permit use of a standard die size. Thomas & Betts, #54705, or equivalent.

2.7 WIRE AND INSULATORS – RODENT

A. Wire:

1. Smooth galvanized steel, single strand wire, 17 gauge.
2. Breaking load – 165 lbs., minimum.
3. Tensile strength – 80,000 psi, minimum.

B. Insulators:

1. Provide spool porcelain insulators secured with bolt and nut. Provide Chance C909-1031 or equivalent.

C. Splices:

1. Barrel type connector: Thomas & Betts 2B-16 or equivalent.

2.8 FINISHES

A. Galvanize pipe per ASTM A53.

B. Galvanize steel hardware per ASTM A153.

C. Galvanize steel strand wire per ASTM A475.

2.9 DETECTION RINGS

A. Rings shall be fabricated from #302 stainless spring steel with a wire diameter between 0.05 and 0.06 inches. Radius of ring shall be uniform within ± 1/4 inch. Factory solder joints, factory crimps of butt splices shall be sufficient to not break or come loose during installation or when twisted/pulled with 20 lb. force in any direction.

B. Detection rings shall be manufactured by:

1. Champion Spring 909-465-1096
2. Aard Industries, Inc. 909-676-6681
3. Hamphill Spring Company 213-269-9276
4. Orlando Spring Company 310-946-4891
5. Or equivalent.

2.10 BIRD DETERRENT SPRINGS

A. Springs shall be fabricated from No. 302 stainless spring steel with a nominal wire diameter of 0.05 inch. Wire shall be shaped into a random triangular configuration as detailed on the plans. The ends shall loop around the electrified fence wire to enable it to rotate freely.

B. Springs shall be manufactured by:

1. Foremost Spring Company 310-923-0791
2. Champion Spring 909-465-1096
3. Aard Industries, Inc. 909-676-6681
4. Hamphill Spring Company 213-269-9276
5. Golden Bay Fence 510-276-5552
6. Bird Barrier 310-527-8000

2.11 BIRD DETERRENT PRONGS

A. Three-prong with 4-5” spike width.

B. Rod and Base Material: Stainless steel.

C. Basis of Design: Bird Barrier America Inc. (www.birdbarrier.com) Dura-Spike Wide, Bird*B*Gone (birdbgone.com) Stainless Steel Spikes, Nixalite Premium Bird Spikes, or other approved equivalent.

D. Apply with Bird Barrier Bond adhesive or approved equivalent, following manufacturer's instructions.

2.12 GALVANIZING REPAIR

A. Accomplish repair of galvanized surfaces by use of DRYGALV as manufactured by the American Solder and Flux Company, ZRC Product Company, or equivalent. Apply in accordance with manufacturer's instructions.

2.13 GATE POSITION SWITCH

A. See Division 11190.

2.14 GATE LOCK LIMIT SWITCH

A. See Division 11190.

2.15 WIREWAY AT STRAIN POSTS

A. Description: General purpose type wireway.

B. Knockouts: None; specially drilled holes to suit cable size and spacing.

C. Size: 4 x 4 inch; length as indicated on drawings.

D. Cover: Screw cover with gasketing. Provide 316 stainless-steel screws.

E. Finish: ANSI 61 gray polyester powder coating inside and out over phosphatized surfaces.

F. NEMA 3R or NEMA 12 when mounted vertically.

PART 3 - EXECUTION

3.1 ERECTION TOLERANCES

A. Maximum variation from plumb prior to wire tensioning: 1/4 inch.

B. Maximum variation from straight line between strain posts: ± 1 inch.

C. Maximum offset from true position for strain posts: ± 1 inch.

D. Top of fence measured from grade beam: ± 0.25" – 0".

3.2 INSTALLATION

A. Erect fencing in straight lines between angle points.

B. Postholes:

1. Depth and diameter of postholes are noted on the drawings.
2. Work concrete into postholes to leave no voids.
3. Provide crown watershed finish on the top surface of concrete.

3.3 WIRE – HIGH VOLTAGE FENCE

A. Install wire in continuous lengths, without splices. Notify State's Representative if splice is deemed necessary before proceeding.

B. Do not drag or lay wire on ground or drag on insulator brackets.

C. Tension wire using a wire tensioner considering wire temperature. Tension and retension wire before installing detection rings and without ice on wire. Utilize the following table to obtain this tension:

Wire Temperature	Wire Tension (lbs) For Bottom 9 Wires	Wire Tension (lbs) For Remaining Wires
30 F	102	44
40 F	96	41
50 F	90	37
60 F	84	34
70 F	78	30
80 F	72	26
90 F	66	23
100 F	60	19
110 F	54	16

D. Allow installed wire to stretch five days, then re-tension wires per paragraphs 3.3C and 3.3G prior to installing detection rings.

E. Tolerance for wire tension shall meet the following:

1. ± 3 lbs. measured with an approved wire tension measuring gauge.

F. Install pin insulator wire clamp (spring type) for each pin insulator as detailed on the drawings. Install cap type wire clamps for intermediate posts at dips where electrified fence wire tends to pull off the top of the insulator. Provide a total of 100 cap type wire clamps for this use.

G. State's Representative will witness wire installation, including tensioning for the entire first zone that the Contractor installs wire. State's Representative retains the opinion to witness the tensioning and re-tensioning of all of the zones.

3.4 WIRE CONNECTORS

A. Install per manufacturer's written instructions.

3.5 WIRE AND INSULATORS – RODENT

A. Wire:

1. Install per manufacturer's recommendations. Splice with barrel type connectors.

2. Install with no visible sag between insulators, approximately 10-20 lb. tension.

B. Insulators:

1. Provide mounting bracket attached to top of grade beam as detailed on plans.

2. Wrap wire once around porcelain insulators to secure wire to insulators. Wire shall enter and leave insulator on the grade beam side of the insulator.

3.6 FIELD REPAIR OF GALVANIZED SURFACES

A. Field repair damaged galvanized surfaces in accordance with SSPC surface preparation SP1 and SP2 or SP3, and one coat of brush-applied galvanizing repair compound to 3-mil dry film thickness.

B. Application from spray cans is not acceptable.

C. All repaired surfaces must be inspected by the State's Representative.

3.7 DETECTION RINGS

A. Mount the plane of the ring perpendicular to the fence wire within 5° tolerance.

B. Install the rings spaced as shown on the drawings ± 2 inches horizontally.

C. Attach rings to high voltage fence wire with wire connectors. Attach so that the ring will not slide along high voltage wire.

D. Install detection rings after re-tensioning. Refer to installation of wire-high voltage fence in the section.

3.8 PIN TYPE INSULATORS

A. Secure insulators on pins, hand tight.

B. Install with lead threads completely inserted within insulators.

END OF SECTION 285227