

ADDENDUM NO. 3

**PR005329 ECEE 2B80 Room Renovation
University of Colorado at Boulder
November 5, 2010
Page 1 of 1**

This Addendum forms a part of the original Contract Documents, Drawings, and Specifications for the above-referenced project. All parts of the original Drawings and Specifications shall remain in force except as noted below.

BIDDING CONTRACTORS SHALL ACKNOWLEDGE RECEIPT OF THIS ADDENDUM ON THE BID FORM.

1. Refer to attached letter from Beaudin Ganze Consulting Engineers, Inc. dated November 3, 2010:

Add the attached Specification Section 16461, Low-Voltage Transformers (4 pages).

2. Refer to Specification Section 10270, Paragraph 2.01.A. Append to the sentence the following:

"or equal products by the following manufacturers: C-Tec, Inc., Hitachi Metals America, or USG Interiors, Inc., Access Floor Division."

3. Refer to Specification Section 15651, Paragraph 1.04.A. Change paragraph to read:

"Provide 5 year warranty on all parts. Warranty to commence upon completion of commissioning, with UCB approval accepting equipment."

4. Refer to Specification Section 15651, Paragraph 2.01.F.2. Change sentence to read:

"Equivalent model by Liebert."

5. Refer to Specification Section 16289, Paragraph 2.01.A.1.

Please note that there are no other pre-approved substitutions for this equipment.

6. The Bid Schedule shall remain as follows:

Publication Date: 10/21/10
Plans/specifications available: 10/28/10 at pre-bid meeting
Mandatory pre-bid conference: 10/28/10 10:00 AM @ jobsite
Last day for questions/substitutions: 11/03/10 4:00 PM
Last day for addenda issue: 11/05/10 4:00 PM
Bid date: 11/09/10 2:00 PM

END OF ADDENDUM NUMBER THREE

November 3, 2010

Ms. Nancy Thomas
Engineered Solutions, Inc.
575 Union Blvd, Suite #200
Lakewood, Colorado 80228

**RE: University of Colorado at Boulder – ECEE2B80 Computer Room Remodel
Project #8260.01**

Nancy:

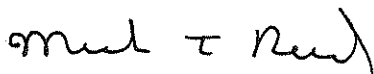
Please issue the following information as addendum #3 for the above referenced project.

A. Electrical Specifications:

1. Add specification section 16461. Refer to attached specification section.

Please call with questions or comments.

Sincerely,



Michael T. Reed
Project Manager

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes the following types of dry-type transformers rated 600 V and less, with capacities up to 1000 kVA:
 - 1. Distribution transformers (K-rated).

1.02 SUBMITTALS

- A. Product Data: Include rated nameplate data, capacities, weights, dimensions, minimum clearances, installed devices and features, and performance for each type and size of transformer indicated.
- B. Qualification Data: For testing agency.
- C. Source quality-control test reports.
- D. Output Settings Reports: Record tap adjustments specified in Part 3.
- E. Operation and Maintenance Data: For transformers to include in emergency, operation, and maintenance manuals.

1.03 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with IEEE C 57.12.91, IEEE Standard Test Code for Dry Type Distribution and Power Transformers.
- C. Energy-Efficient Transformers Rated 15 kVA and Larger: Certified as meeting NEMA TP 1, Class 1 efficiency levels when tested according to NEMA TP 2.
- D. Source Limitations: Obtain each transformer type through one source from a single manufacturer.

1.04 COORDINATION

- A. Coordinate size and location of concrete bases with actual transformer provided. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Westinghouse / Cutler Hammer
 - 2. Hevi-Duty
 - 3. General Electric Company.
 - 4. ITE
 - 5. Sorgel / Square D

2.02 GENERAL TRANSFORMER REQUIREMENTS

- A. Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.
- B. Cores: Grain-oriented, non-aging silicon steel.
- C. Coils: Continuous windings without splices except for taps.
 - 1. Internal Coil Connections: Brazed or welded.
 - 2. Coil Material: Continuous Aluminum.

2.03 DISTRIBUTION TRANSFORMERS

- A. Comply with NEMA ST 20 (Dry Type Transformers for General Applications), and list and label as complying with UL 1561.
- B. Cores: One leg per phase.
- C. Enclosure: Ventilated, NEMA 250, Type 2.
 - 1. Core and coil shall be encapsulated within resin compound, sealing out moisture and air.
- D. Indoor Transformer Enclosure Finish: Comply with NEMA 250.
 - 1. Finish Color: Gray.
- E. Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 80 deg C rise above 40 deg C ambient temperature
- F. Energy efficiency for transformers rated 15kVA and larger:
 - 1. Complying with NEMA TP 1, Class 1 efficiency levels.
 - 2. Tested according to NEMA TP2.
- G. Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and four 2.5 percent taps below normal full capacity.

- H. K-Factor Rating: Transformers indicated to be K-factor rated shall comply with UL 1561 requirements for nonsinusoidal load current-handling capability to the degree defined by designated K-factor.
 - 1. Unit shall not overheat when carrying full-load current with harmonic distortion corresponding to designated K-factor. The maximum hot spot temperature shall not exceed 220 deg C under full rated harmonic load.
 - 2. Indicate value of K-factor on transformer nameplate.
 - 3. Terminal provisions shall be suitable for two (2) neutral conductors.
 - 4. Provide electrostatic shielding.
- I. Sound levels:
 - 1. Maximum sound level of 50 dB.
- J. Vibration Isolation
 - 1. Transformer winding assemblies shall be isolated from housing by vibration isolation mounts.

2.04 SOURCE QUALITY CONTROL

- A. Test and inspect transformers according to IEEE C57.12.91.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine conditions for compliance with enclosure- and ambient-temperature requirements for each transformer.
- B. Verify that field measurements are as needed to maintain working clearances required by NFPA 70 and manufacturer's written instructions.
- C. Examine walls, floors, roofs, and concrete bases for suitable mounting conditions where transformers will be installed.
- D. Verify that ground connections are in place and requirements in Division 16 Section "Grounding and Bonding" have been met. Maximum ground resistance shall be 5 ohms at location of transformer.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.
- F. Install floor-mounting transformers level on concrete bases. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit and 3½ inches high.
- G. Provide vibration isolation supports:
 - 1. Floor or wall bracketed supported transformers shall be mounted using unit DNP (Double Neoprene Pad) vibration isolation supports.

3.02 CONNECTIONS

- A. Ground equipment according to Division 16 Section "Grounding and Bonding."
- B. Connect wiring according to Division 16 Section "Conductors and Cables."
- C. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- D. A single point ground connection sized in accordance with NEC 2005 Table 250-66 shall be made from the transformer ground lug to the nearest grounding electrode. Use grounding bushings at both ends of the metallic conduit containing grounding conductor.
- E. Neutrals shall be solidly grounded.
- F. Use a minimum 2 feet and a maximum of 3' length of flexible conduit for final primary and secondary connections. Final connections to transformers in areas subject to moisture, water or oil exposure shall be made with flexible liquid tight conduit.

3.03 ADJUSTING

- A. Output Settings Report: Prepare a written report recording output voltages and tap settings.

3.04 CLEANING

- A. Vacuum dirt and debris; do not use compressed air to assist in cleaning.

END OF SECTION 16461