# East Central College

HANSEN HALL – LEVEL 300/400 RENOVATIONS PACKAGE

# 14434.03

CONSTRUCTION

# SECTION 260519 - BUILDING WIRE AND CABLE

# PART 1 - GENERAL

- 1.1 WORK INCLUDES
  - A. Base and Alternate Bids:
    - 1. Contractor Provide:
      - a. Building wire and cable as shown on drawings or specified including feeders, branch circuit power, lighting systems and other systems specified.
      - b. Wiring connectors and connections.

#### 1.2 RELATED SECTIONS

- A. Section 260533 Conduit.
- B. Section 260534 Boxes.
- C. Section 260526 Grounding and Bonding.
- D. Section 260553 Identification.
- 1.3 REFERENCES
  - A. ANSI/NFPA 70 National Electrical Code, 2008 edition.

#### 1.4 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this Section with minimum 3 years experience.

#### 1.5 SUBMITTALS

- A. Submit shop drawings and product data per Division 1.
- B. Indicate material specifications, dimensions, capacities and color coding.
- C. Provide product data for all wire and cable.
- D. Submit manufacturer's installation instructions.
- 1.6 REGULATORY REQUIREMENTS

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- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by UL as suitable for purpose specified and shown.
- 1.7 REFERENCES
  - A. If conflict between referenced standards and contract documents, notify Architect/Engineer immediately. Do not proceed with the work until the Architect/Engineer issues instructions.
  - B. National Electrical Manufacturers Association (NEMA):
    - 1. WC 3 Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
    - 2. WC 5 Thermoplastic-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
    - 3. WC 7 Cross-Linked-Thermosetting-Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.
  - C. National Fire Protection Association (NFPA): NFPA 70- National Electrical Code.
  - D. Manufacturers Catalogs: Specified manufacturers catalogs are incorporated by reference to same force and effect as if repeated herein full.
- 1.8 PROJECT CONDITIONS
  - A. Verify that field measurements are as shown on Drawings.
  - B. Conductors shall be copper.
  - C. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.
- 1.9 COORDINATION
  - A. Determine required separation between cable and other work.
  - B. Determine cable routing to avoid interference with other work.

## PART 2 - PRODUCTS

- 2.1 BUILDING WIRE AND CABLE
  - A. Thermoplastic insulated building wire: NEMA WC 5, UL-83 ICEA S-61-402 or S-66-524.
  - B. Feeders and branch circuits 250 MCM and larger: Copper, stranded conductor, 600 volt insulation THHN/THWN.

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- C. Feeders and branch circuits larger than 8 AWG and smaller than 250 MCM: Copper, stranded conductor, 600 volt insulation THHN/THWN.
- D. Feeders and branch circuits 8 AWG and smaller: Copper conductor, 600 volt insulation THHN/THWN, solid or stranded conductor.
- E. Control Circuits: Copper, stranded conductor, 600 volt insulation THW, THHN/THWN.
- F. Underground feeders and circuits: Copper, stranded conductor, 600 volt insulation, type XHHW.
- G. Color code conductors as specified in Section 260553 Electrical Identification.

## 2.2 JOINTS AND SPLICES

- A. Make terminations, taps and splices with an indent type pressure connector with insulating cover for 8 AWG and smaller.
- B. Instead of indent type connectors insulated spring compression connectors may be used for 10 AWG and smaller.
- C. Use mechanical compression or bolted type connector for 6 AWG or larger. Cover connector with insulating type or heat shrinkable insulation equivalent to 150% conductor insulation.

## 2.3 WIRE PULLING LUBRICANT

- A. Pulling lubricant shall be UL listed, water-based, polymer solution. Lubricants containing waxes or soaps are not acceptable.
- B. The lubricant shall be compatible with the cable insulation and shall not cause any premature deterioration of the insulating material. When use on high voltage cable, the lubricant shall not affect the volume resistivity of any semi-conducting jacket or insulation shield present.
- C. Dried residue from lubricant shall not become tacky or gum-up. Cables shall remain pullable after lubricant has dried.
- D. The lubricant shall be approved by the cable manufacturer for use with their cables.
- E. Acceptable Manufacturers/Products:
  - 1. American Colloid/Poly-X.
  - 2. American Polywater/Polywater J.
  - 3. ARNCO/Hydra-Lube.
  - 4. Buchanan/Quick Slip.
  - 5. Condux/Super-Lube.
  - 6. Ideal/Aqua-Gel.

## PART 3 - EXECUTION

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# 3.1 EXAMINATION

- A. Verify that interior of building has been protected from weather.
- B. Verify that mechanical work likely to damage wire has been completed.
- 3.2 PREPARATION
  - A. Completely and thoroughly swab raceway before installing wire.

#### 3.3 WIRING METHODS

- A. Concealed Dry Interior Locations: Use only building wire.
- B. Exposed Dry Interior Locations: Use only building wire, in raceway.
- C. Above Accessible Ceilings: Use only building wire, in raceway.
- D. Wet or Damp Interior Locations: Use only building wire, in raceway.
- E. Exterior Locations: Use only building wire, in raceway.
- F. Underground Installations: Use only building wire, in raceway.
- G. Use wiring methods indicated on Drawings.

#### 3.4 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Use conductor not smaller than 12 AWG for power and lighting circuits.
- C. Use conductor not smaller than 14 AWG for control circuits.
- D. Use 10 AWG conductors for 20 ampere, 120 volt branch circuits longer than 80 feet.
- E. Use 10 AWG conductors for 20 ampere, 277 volt branch circuits longer than 140 feet.
- F. Pull all conductors into raceway at same time.
- G. Use suitable wire pulling lubricant for building wire 4 AWG and larger.
- H. Protect exposed cable from damage.
- I. Use suitable cable fittings and connectors.
- J. Neatly train and lace wiring inside boxes, equipment, panelboards and switchboards.

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- K. Clean conductor surfaces before installing lugs and connectors.
- L. Make splices, taps and terminations to carry full ampacity of conductors with no perceivable temperature rise.
- M. Place an equal number of conductors for each phase of a circuit in same raceway or cable.
- N. Splice only in accessible junction, outlet boxes, cable tray or surface metal raceway.
- O. Make conductor lengths for parallel circuits equal.
- P. Provide dedicated neutral conductor for each computer lab circuit.

#### 3.5 IDENTIFICATION

- A. Identify wire and cable under provisions of Section 260553.
- B. Identify each conductor with its circuit number or other designation indicated on Drawings.

#### 3.6 FIELD QUALITY CONTROL

- A. Inspect wire and cable for physical damage and proper connection.
- B. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.
- C. Verify continuity of each branch circuit conductor.

END OF SECTION 260519