

## 2023 Electrical: Residential-Commercial Competition FACT SHEET

### Project Manager

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### Specific Competition Eligibility

The electrical competition has no competition-specific eligibility requirements. Please refer to overall eligibility requirements listed in the guidebook.

### Special Competition Announcement

The conduit-bending portion of the electrical practical performance test will be conducted on Wednesday, March 15, 2023, from 2-4 p.m. during the competitor practical performance test site orientation. **All tools to complete this portion of the exam will be provided.**

**Competitors will be required to wear hard hats, safety glasses and gloves provided by ABC. Competitors must bring their own boots, which must be worn during this portion of the competition.**

### Online Exam

The online exam must be completed before competitors arrive on site, at a local NCCER Accredited Training Sponsor or Assessment Center. Accommodations will be made for extreme circumstances with prior approval of the NCC director. All competitors must sit for the online exam or face disqualification from the NCC. The online exam continues to make up 25% of one's overall competition score. It is the responsibility of the sponsor organization to schedule test sessions directly with NCCER. Test registration and guidelines will be available in January 2023.

### Practical Performance Test Description

Each competitor, over a two-day period, will perform multiple tasks utilizing knowledge and skills applicable to residential/commercial construction.

### Electrical Task: Residential-Commercial Construction

The competitor will be required to install electrical equipment with possible examples such as an electrical meter, a disconnect switch, panelboards with circuit breakers, branch circuitry, grounding, various raceways and cables and various devices and luminaires. Working surfaces shall be two wood-framed walls, each measuring 6-1/2-feet tall by 4-feet wide, with drywall and plywood finishes. The construction shall be completed within six hours. With the completion of the construction, the project is to be connected to a power source utilized by judges for functionality testing. **All hand tools will be provided.**

## Knowledge and Skills Required

The knowledge and skills for this competition are based on the **2017 National Electrical Code** and all levels of the NCCER electrical curriculum 2017 revisions. It is strongly recommended that competitors have a working knowledge equivalent to a third-year apprentice.

- Electrical Safety
- Hand Bending
- Fasteners and Anchors
- Electrical Theory One
- Electrical Theory Two
- Electrical Test Equipment
- Introduction to National Electrical Code®
- Raceways, Boxes and Fittings
- Conductors
- Introduction to Electrical Blueprints
- Wiring: Commercial and Industrial
- Alternating Current
- Motors: Theory and Application
- Grounding
- Conduit Bending
- Load Calculations—Feeders and Services
- Practical Applications of Lighting
- Boxes and Fittings
- Conductor Installations
- Cable Tray
- Conductor Terminations and Splices
- Installation of Electric Services
- Circuit Breakers and Fuses
- Contactors and Relays
- Electric Lighting
- Calculations—Branch Feeders and Circuits
- Conductor Selection and Calculations
- Overcurrent Protection
- Raceway, Box and Fitting Fill Requirements
- Wiring Devices
- Distribution Equipment
- Standby and Emergency Systems
- Basic Electronic Theory
- Fire Alarm Systems

## Tools

Each competitor will be provided with the needed tools. Listed below are examples of the tools provided by NCC. No other tools will be allowed.

- Medium and large screwdrivers, straight
- Medium Phillips screwdriver
- Wire strippers
- VOM meter
- Channel locks
- Awl or center punch
- Claw hammer
- Utility knife
- Romex stripper
- 9-inch lineman pliers
- Keyhole saw
- EMT conduit reamer
- EMT benders
- Rigid bender
- Pencils, Sharpie marker
- Basic, non-programmable calculator
- 25-foot tape measure
- Hacksaw
- Torpedo level
- Tool pouch and belt
- Hard hat, gloves and safety glasses

### **Please be aware of the hazards associated with the above tools:**

- All hand tools should be used for their intended purpose.
- Hazards include cuts, scrapes, crushes, pinches and punctures.
- Hazards particular to the conduit threader include cuts, crushes, pinches, scrapes and snagging of loose clothing.

- Gloves must be worn when cutting, sawing or threading conduit.
- No loose clothing should be worn when using the power threader.

**Sample Score Sheet**

The following sample score sheet is provided to give competitors an example of the criteria that may be included in the practical performance test. **However, this score sheet is only a sample and not intended to act as a study guide in preparation or to imply specific criteria that will be judged during the actual practical performance test.**

**ABC National Craft Championships  
Electrical Sample Score Sheet**

| Judging Criteria   | Competitor Identification Numbers |  |  |  |  |  |
|--|-----------------------------------|--|--|--|--|--|
|  | Maximum Points                    |  |  |  |  |  |
| Use of materials   |                                   |  |  |  |  |  |
| Grounding  |                                   |  |  |  |  |  |
| Placement  |                                   |  |  |  |  |  |
| Follow prints/plans  |                                   |  |  |  |  |  |
| NEC  |                                   |  |  |  |  |  |
| Accuracy   |                                   |  |  |  |  |  |
| Terminations of conductors and cables                          |                                   |  |  |  |  |  |
| Proper circuiting and device makeup                            |                                   |  |  |  |  |  |
| Trim out of devices and Panel                                  |                                   |  |  |  |  |  |
| Devices  |                                   |  |  |  |  |  |
| Installation of devices  |                                   |  |  |  |  |  |
| Operation  |                                   |  |  |  |  |  |
| Sequence of work   |                                   |  |  |  |  |  |
| Care and use of tools  |                                   |  |  |  |  |  |
| Proper use of fasteners  |                                   |  |  |  |  |  |
| General – ability to follow directions, quality of workmanship |                                   |  |  |  |  |  |
| Project disassembly  |                                   |  |  |  |  |  |
| <b>SUBTOTAL:</b>   | <b>160</b>                        |  |  |  |  |  |
| Safety – housekeeping  |                                   |  |  |  |  |  |
| Use of hard hat  |                                   |  |  |  |  |  |
| Use of safety glasses  |                                   |  |  |  |  |  |
| Use of power tools   |                                   |  |  |  |  |  |
| Proper footwear  |                                   |  |  |  |  |  |
| <b>SUBTOTAL:</b>   | <b>40</b>                         |  |  |  |  |  |
| <b>GRAND TOTAL:</b>  | <b>200</b>                        |  |  |  |  |  |
| Tie Breaker #1   |                                   |  |  |  |  |  |
| Tie Breaker #2   |                                   |  |  |  |  |  |