



2020 Electrical: Residential-Commercial Competition

FACT SHEET

Project Manager
Timothy Ely, Beacon Electric Company

For questions related specifically to the electrical competition, contact 2020 Electrical Project Manager Timothy Ely, (513) 309-1586 or tim.ely@beacon-electric.com. For all event questions, contact Lisa Nardone, National Craft Championships director, (202) 595-1789 or nardone@abc.org.

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 25, 2020 from 2 p.m. to 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 hardhats (provided by ABC), safety glasses, gloves (ABC will provide but competitors may bring their own), and approved work boots during this portion of the competition.**

Written Exam

Important news for 2020—The written exam must be completed before competitors arrive onsite. Exceptions will be made for extreme circumstances with prior approval of the NCC director via email. If an exception is granted, the make-up exam will take place Wednesday, March 25, 8:30 a.m.-11 a.m. and be proctored onsite by NCCER. Only those competitors with prior approval from the NCC director will be allowed to exam the test onsite. All competitors must sit for the written exam or face disqualification from the NCC. The written exam continues to make up 25 percent of one's overall competition score.

Competitors will complete the written exam at a local NCCER Accredited Assessment Center prior to arriving onsite. It is the responsibility of the sponsor organization to schedule test sessions directly with NCCER by emailing a request to: NCCTest@nccer.org SUBJECT: Schedule NCC Test.

NCCER will contact the sponsoring organization to provide access to the written test in NCCER's Online Testing System. Information on accessing the Testing System will be provided including requirements for the testing proctor.

All exams/tests are based on the standardized craft training process. In addition to the knowledge and skills required for each competition, all competitors should have completed the NCCER Contren® Learning Series Core Curriculum modules. A non-programmable calculator will be provided for the written exam, but no reference materials are permitted.

Practical Performance Test Description

Each competitor, over a two-day period, will perform three tasks utilizing knowledge and skills applicable to conduit bending (work boots or shoes must be worn during all tasks), utilizing all facets of industrial/commercial construction and utilizing knowledge and skills applicable to industrial applications.

Electrical Task: Residential-Commercial Construction

Working on a plywood wall, 6 feet, 6 inches by 4 feet, the competitor may be required to install an electrical meter, disconnect switch and electrical panels with circuit breakers. The project is to be connected to power with a flexible cord and plug connector to a 120-volt, three-wire power source utilized by judges. The competitor will install electrical metallic tubing and metal boxes. **All hand tools will be provided.**

Safety Orientation

A safety program containing a general safety overview and safe work practices will be conducted during the scheduled competitor orientation. Attendance is mandatory for all competitors.

Personal Protective Equipment (PPE)

All personal protective equipment (PPE) must be appropriate for task and meet current ANSI standards, which have been incorporated into the Occupational Safety and Health Administration (OSHA). PPE regulations are as follows: Eye and Face Protection ANSI Z87.1; Head Protection ANSI Z89.1; Foot Protection ANSI Z41.1. There are no ANSI standards for gloves; however, selection must be based on the performance characteristics of the glove in relation to the tasks to be performed. During the practical performance test, ABC National will provide and require the proper use of the following personal protective equipment for all competitors:

- Ear protection
- Hard hat
- General work gloves
- Each competitor may bring his own PPE, gloves and safety glasses.
 - Exceptions to the provided PPE, with prior approval from the respective project manager, are: Prescriptive safety glasses with side shields;
 - Prescriptive goggles; and
 - Task-specific gloves per industry standards, designed to protect against sharp edges or high heat.

Competitors must provide and use the following:

- Standard work shoes or boots (tennis shoes and sandals are not permitted);
- Blue jean pants or work pants; and
- Shirts with sleeves, minimum 4 inches in length (baggy or excessively loose -fitting clothing is not permitted)

Jewelry

Exposed jewelry is not permitted. Examples include (but are not limited to):

- Earrings (stud or dangling);
- Wrist watches;
- Rings;
- Studs exposed through the nose, jaw, lip, eyebrow or any part of the body that is visible; and
- Gauges.

Safety Judging

Judges will be present during the practical performance test to score competitors in such safety areas as the use of personal protective equipment, hand and power tool safety, clean work area, etc. Depending on the severity and/or frequency of a violation or violations, the judges, in consultation with the project manager, have the authority to disqualify competitors.

Note: Competitors continue to be judged during disassembly/clean-up activities and are subject to disqualification or deduction of points for safety violations.

First Aid

All injuries should be reported to the project manager immediately. The project manager will determine the appropriate action, including assistance by onsite EMT personnel.

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 Contren® Learning Series 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
Wire strippers
VOM Meter
Channel locks
Awl or center punch
Claw hammer
Utility knife
Romex stripper
9-inch lineman pliers

Diagonal-cutting pliers
Keyhole saw
EMT conduit reamer
EMT Benders
Rigid bender
Pencils- Sharpe marker
Basic, non-programmable calculator
25' 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, crush, pinch and puncture.
- Hazards particular to the conduit threader include cuts, crush, pinch, 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.