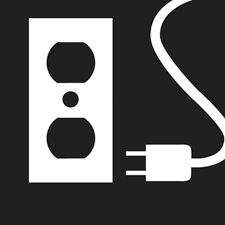
**NORTH CAROLINA STATE STANDARDS 2022**

**ELECTRICAL CONSTRUCTION WIRING**

**PURPOSE**

The Electrical Construction Wiring event will

allow each contestant the opportunity to perform in a practical work environment. Each contestant will have the opportunity to the use their acquired electrical wiring skills to construct an electrical wiring design, using electrical blue prints, written specifications and verbal instructions based on the National Electrical Construction Wiring standards in accordance with the National Electrical Code.

First, download and review the General

Regulations at: [updates.skillsusa.org](http://updates.skillsusa.org/).

**CLOTHING REQUIREMENT \***

Official SkillsUSA khaki work shirt and pants, black or brown leather work shoes, safety gloves and safety glasses with side shields or goggles. (Prescription glasses can be used only if they are equipped with side shields. If not, they must be covered with goggles.)

**\*SkillsUSA logo not required for State Competition.**

These regulations refer to clothing items that are pictured and described at: [www.skillsusastore.org.](http://www.skillsusastore.org/)

Note: Contestants must wear their official contest clothing to the contest orientation meeting.

**ELIGIBILITY**

Open to active SkillsUSA members enrolled in

programs with electrical wiring or electrical trades as the occupational objective.

**EQUIPMENT AND MATERIALS**

1. Supplied by the technical committee:

a. All wiring panels, electrical supplies

and materials as required by the project assigned

2.  **Supplied by the contestant:**

a. Latest edition of the National Electrical Code as of the January prior to the SkillsUSA Championships. Note: The NEC handbook is not approved for use in the hands-on portion of the contest nor written test.

b. All competitors must create a one-page résumé and submit a hard copy to the technical committee chair at orientation. Failure to do so will result in a 10-point penalty.

c. Hand Tools, see Tool List.

d. Non-Programable Calculator.

e. Resume

**SCOPE OF THE CONTEST**

The contest will assess the ability to perform

jobs or skills selected from the following list of competencies as determined by the SkillsUSA Championships technical committee.

**Knowledge Performance**

The contest will include a written knowledge

exam assessing general knowledge of electrical construction wiring. Written portions may also exist during the skills portion of the contest. Knowledge of terms and principles used in residential wiring will be required for the skill demonstration portion of the contest.

**Skill Performance**

The skills portion of the contest will include a

series of workstations that have information and instruction sheets for wiring a residence or completing a commercial installation.

All work must conform to the specifications of the latest edition of the National Electrical Code as of the January prior to the SkillsUSA Championships.

**Standards and Competencies**

**ECW 1.0 — Define and apply safety rules and practices in residential wiring according to NEC standards**

1.1 Apply shop rules and regulations to work stations

1.2 List the techniques and practices used to prevent fires

1.3 Use electrical and hand tools correctly

1.4 Discuss the appropriate methods for lifting and climbing ladders

1.5 Explain appropriate clothing for electrical wiring construction

1.6 Outline the safety requirements for installing temporary electrical services

**ECW 2.0 — Apply knowledge of basic wiring theory according to NEC standards**

2.1 Use wiring diagrams, schematic diagrams and prints successfully in a scenario

2.2 Apply math calculations to circuits and measurements

2.3 Discuss theory concepts for troubleshooting

**ECW 3.0 — Discuss important trade information and standards according to the NEC**

3.1 Explain the purpose and use of the

National Electric Code

3.2 Sketch and diagram effectively

3.3 Plan the layout of an electrical installation

3.4 Use trade catalogs and publications to solve electrical construction wiring problems

3.5 Correlate specifications, prints and job sites

**ECW 4.0 — Use basic equipment and procedures defined by industry standards**

4.1 Discuss techniques of residential and commercial wiring

4.2 Demonstrate wire-pulling techniques

**ECW 5.0 — Apply knowledge of service loads and electrical safety to electrical construction wiring situations**

5.1 Compute service loads

5.2 Calculate individual service loads

5.3 Determine the number of outlets permitted in a circuit

5.4 Compute the size of service entrance conductors

5.5 Use any wire types listed in NEC 310.16

**ECW 6.0 — Install a service entrance to meet NEC**

**standards**

6.1 Install a main service panel and sub- panel

6.2 Install circuit breakers in a panel

6.3 Install a service entrance cable to service drop

6.4 Install temporary electrical service

6.5 Install equipment disconnect

6.6 Install meter bases

**ECW 7.0 — Install switch boxes and outlet boxes to meet**

**NEC standards**

7.1 Install box hangers

7.2 Install recess boxes for outlets

7.3 Install hangable boxes

7.4 Install octagon boxes

7.5 Install surface mount boxes

7.6 Install recessed fixture housing in a ceiling

7.7 Install outlet boxes in dry wall, lath plaster or paneled walls

7.8 Install telephone boxes in dry wall, lath plaster or paneled walls

**ECW 8.0 — Maintain already existing wiring to meet NEC**

**standards**

8.1 Diagnose and repair incandescent lights

8.2 Replace existing receptacles and switches

8.3 Troubleshoot a branch circuit

8.4 Test wiring for correct voltages

**ECW 9.0 — Rough in, connect and install electrical devices to meet NEC standards**

9.1 Rough in, connect and install a single pole switch

9.2 Rough in, connect and install a three-way switch

9.3 Rough in, connect and install a four-way switch

9.4 Rough in, connect and install a duplex grounded receptacle

9.5 Rough in, connect and install a 120–240 volt distribution panel

9.6 Rough in, connect and install a door chime system

9.7 Rough in, connect and install a ground fault interrupting device

9.8 Rough in, connect and install an emergency warning system

9.9 Rough in, connect and install a photoelectric cell control

9.10 Rough in, connect and install a surface raceway

9.11 Rough in, connect and install an exterior lighting fixture

9.12 Rough in, connect and install lighting dimmers

9.13 Rough in, connect and install TV outlets

9.14 Rough in, connect and install telephone outlets

9.15 Rough in, connect and install emergency lighting systems

9.16 Rough in, connect and install appliance circuits

9.17 Rough in, connect and install occupancy sensor

9.18 Rough in, connect and install motion sensor

**ECW 10.0 — Install PVC and EMT conduit to meet NEC**

**standards**

10.1 Make 90-degree bends from measurements

10.2 Make offset bends from measurements

10.3 Make back-to-back bends from measurements

10.4 Make saddle bends from measurements

10.5 Determine correct conduit measurements

**ECW 11.0 — Install telecommunications infrastructure to meet current TIA/EIA 570 standards**

11.1 Install a coaxial cable with “F” type connectors and terminating hardware

11.2 Install unshielded twisted-pair cable, connectors and terminating hardware

11.3 Install 110-type terminating hardware

**ECW 12.0 — Apply knowledge of NEC Chapter 5 Special**

**Occupancies**

**ECW 13.0 — Apply knowledge of the International Energy**

**Conservation Code**

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| 2022 NC SkillsUSA Contestant Tool List | | |
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| **QUANITY** | **TOOL DESCRIPTION** | **Y/N** |
|  |  |  |
| 1 | 8'' Diagonal cutters (angle head) |  |
| 1 | 9'' Linesman Pliers |  |
| 1 | 16 oz. Claw Hammer |  |
| 1 | 8'' Needle Nose Pliers |  |
| 1 | 10'' Pump Pliers |  |
| 1 | Torpedo Level |  |
| 1 | 603-3 Phillips screwdriver #1 |  |
| 1 | 603-4B Phillips Screwdriver #2 |  |
| 1 | 605-4 1/4'' Screwdriver 4'' |  |
| 1 | 605-6 1/4'' Screwdriver 6'' |  |
| 1 | Hard Hat |  |
| 1 | 25' tape Measure |  |
| 1 | 11045 Wire Stripper/Cutter |  |
| 1 | 1550-11Electricians knife |  |
| 1 | 85191 Reaming Screwdriver |  |
| 1 | 650 Scratch Awl |  |
| 1 | MC Cable Splitter |  |
| 1 | 32476 Screw/Nut Driver |  |
| 1 | 70570 Hex Key Set |  |
| 1 | Tool Pouch |  |
| 1 | Tool Belt |  |
| 1 | Cordless Drill |  |
| 1 | Auger drill Bit |  |
| 1 | 1/2'' EMT Bender |  |
| 1 | Hack Saw |  |
| 1 | Hammer Holder |  |
| 1 | 1/8" Cabinet Rd. shank screw driver # 608-3 |  |
| 1 | Safety Glasses |  |
| 2 | #2 Pencils |  |
| 1 | 2017 NEC Code Book |  |
| 1 | Black, Red or Blue Sharpie Marker |  |
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