

# SkillsUSA Maryland

## ELECTRICAL CONSTRUCTION WIRING 2023 State Competition



**CHESAPEAKE**

*Educate. Empower. Energize.*



**2023**

**MARYLAND STATE ELECTRICAL CONSTRUCTION WIRING**

**Skills USA Contest**

SCHEDULE (March 25, 2023)

8:00 am REPORT TO WORK STATION

8:05 am – 11:00 am RESIDENTIAL WIRING

LUNCH AT WORK STATION WHEN DELIVERED

11:00 am – 12:45 pm CONDUIT BENDING

12:45 pm – 1:15 pm JUDGING OF PROJECT ASSIGNMENT

1:15 pm – 1:30 pm SHOWING WORK

1:30 pm – 2:00 pm EACH CONTESTANT WILL DISMANTLE WORK AND PLACE AS DIRECTED

*PLEASE DO NOT LEAVE YOUR ASSIGNED WORK AREA AT ANY TIME.*

*SHOULD FOR ANY REASON YOU NEED TO LEAVE ASSIGNED WORK AREA YOU MUST BE GRANTED PERMISSION FROM ONE OF THE JUDGES.*

# **2023 MARYLAND STATE**

## **PURPOSE**

**To evaluate each contestant's preparation for employment and to recognize outstanding students for excellence and professionalism in the field of electrical construction wiring.**

## **CLOTHING REQUIREMENT and SAFETY EQUIPMENT**

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

## **ELIGIBILITY**

**Open to active SkillsUSA members enrolled in programs with electrical wiring or electrical trades as the occupational objective. All contestants must be registered prior to contest date; no student shall be placed as a substitute the day of the contest.**

## **EQUIPMENT and MATERIALS**

- 1) Supplied by the technical committee, (IEC CHESAPEAKE, INC.).**
  - a) All wiring panels, electrical supplies and materials, plans, and written exam to accomplish task designed by IEC CHESAPEAKE, INC.**
  - b) All necessary information and furnishing judges and technical committee, no other judge's will be allowed in contest area of students.**
  
- 2) Supplied by the Students**
  - a) Students must have a copy of the 2020 National Electrical Code (NEC) and all wiring shall conform to the 2020 N.E.C.**
  
  - b) All competitors must create a one-page, typed resume and submit a hard copy to the technical committee chair at orientation. Failure to do so will result in a 10 point penalty.**

**Skills USA Maryland**  
**2023 Maryland Leadership and Skills Conference (MLSC)**  
**Electrical Construction Wiring**  
**Tool List**

Please have each student equipped with the following tools, (only tools listed will be allowed to be used during the contest).

1. Tool Pouch with Belt
  2. Diagonal Pliers
  3. Side Cutters (Lineman)
  4. Electricians Claw Hammer
  5. Torpedo Level
  6. Needle Nose Pliers
  7. Measuring Tape or Six-Foot Ruler
  8. Wire Strippers
  9. Cable Rippers (Romex and BX)
  10. Knife
  11. Scratch Awl
  12. Folding Hex-Key Set
  13. Screwdrivers, assorted Flat Blade and Phillips Head
  14. Keyhole Saw
  15. Hack Saw
  16. Conduit Reamer
  17. Continuity Tester
  18. Fiberglass or Wooden Step Ladder (not to exceed 6 feet)
  19. ½" EMT Hand Bender (no other benders or offset benders allowed)
  20. Safety Glasses
  21. Cordless Batter Drill with extra Batteries (no power drill permitted)  
*Include Flat Head and Phillips Head Tips for Screws*
  22. Drill Bits – both wood (1/2" & 7/8") and Metal (1/8" & ¼")
  23. Marker or Pencil
  24. NEC Code Book – 2020 Edition (Optional, there will be no written test this year)
- Students/contestants are required to have Hardhats, goggles and hard work boots and be dressed appropriately. Gloves are optional.
  - Only students/contestants, judges and contest chairs allowed in the work area. **INSTRUCTORS, PARENTS, OR SCHOOL ADMINISTRATORS ARE NOT ALLOWED IN THE WORK AREA BEYOND THE YELLOW TAPE. VIOLATION OF THIS WILL RESULT IN DISQUALIFICATION OF STUDENT/CONTESTANT.**

Should you have any questions concerning tools or equipment, please contact IEC Chesapeake at 301-621-9545 ex. 107.

**STATE OF MARYLAND**

**2023**

**SKILLS USA**

**ELECTRICAL CONSTRUCTION WIRING**

2023 STATE OF MARYLAND

SkillsUSA

CONTEST

ELECTRICAL:

INSTRUCTIONS TO EACH CONTESTANT

REVIEW AND STUDY THE ENCLOSED INFORMATION BEFORE STARTING:

- A. DRAWINGS AND SPECIFICATIONS
- B. ALL STUDS AND WALLS HAVE BEEN LABELED AND ALL YOUR WORK SHALL BE PLACED IN ACCORDANCE TO LAYOUT DRAWINGS INFORMATION PROVIDED.
- C. YOU ARE TO REMAIN AT YOUR WORK STATION AT ALL TIMES DURING THE CONTEST. **THERE IS TO BE NO CONVERSATION AFTER ORIENTATION AND CONTEST HAS BEGUN. YOU WILL NOT BE PERMITTED TO GET ANY HELP FROM ANY INSTRUCTORS OR PERSONS WATCHING FROM THE VIEWING AREA. IF IT IS DETERMINED THAT HELP IS PROVIDED, THE STUDENT WILL BE DISQUALIFIED.**
- D. AFTER JUDGING HAS BEEN CONCLUDED, EACH CONTESTANT WILL REMAIN AND DISMANTLE HIS OR HER WORK FROM THEIR WORK AREA AND PLACE AS INSTRUCTED. YOU WILL HAVE AN OPPORTUNITY TO SPEAK WITH ALL THE JUDGES DURING THIS TIME.

THIS CONTEST IS BEING JUDGED AS A TWO PART CONTEST

- PART A:     Electrical Construction Wiring     (New Work)
- PART B:     Conduit Work                             (Bending Conduit)

**ALL MATERIALS WILL BE LOCATED AT WORK STATION FOR WHICH YOU ARE ASSIGNED. (should you be missing any materials shown on list, please inform chairperson, prior to start of work).**

**Part A: Electrical Construction Wiring (New Work)**

**ROUGH IN**

- 1) LAYOUT WORK AS PER PLAN PROVIDED**
- 2) INSTALL PANEL BOX**
- 3) INSTALL BOXES AND RELATED EQUIPMENT**
- 4) INSTALLATION OF WIRING AND EQUIPMENT**
- 5) MAKE ALL NECESSARY SPLICING (ETC.)**
- 6) REQUEST ROUGH IN INSPECTION FROM JUDGES**

**FINAL**

- 1) INSTALLATION OF DEVICES, BREAKERS, ETC.**
- 2) REQUEST FINAL INSPECTION**

**UPON COMPLETION PLACE YOUR RESIDENTIAL WIRING COMPLETE SIGN, AND WAIT TO PROCEED TO PART B. (conduit bending)**

**Part B: Conduit Installation**

- 1) LAYOUT AND INSTALL ALL BOXES, CONDUIT, ETC. TO PLYWOOD WALL PER DRAWING PROVIDED**

**UPON COMPLETION OF PART B (conduit bending) YOU MAY USE ANY TIME LEFT TO WORKON PART A (residential wiring) IF NOT COMPLETED.**

UPON COMPLETION, PLEASE REMAIN AT YOUR WORKSTATION AND INFORM JUDGES BY PLACING SIGNS PROVIDED THAT YOU HAVE COMPLETED FOR INSPECTION.

**(DO NOT REMOVE ANY OF YOUR WORK)**

**A JUDGE WILL INFORM YOU AS TO WHEN TO REMOVE YOUR WORK.**

WE WISH YOU MUCH SUCCESS IN YOUR FUTURE AS A SKILLED QUALIFIED ELECTRICIAN AND STRONGLY ENCOURAGE EACH OF YOU TO CONTINUE IN AN APPRENTICESHIP PROGRAM THEREBY OBTAINING YOUR GOALS IN LIFE.

IF THE (IEC CHESAPEAKE ) CAN ASSIST YOU, PLEASE DO NOT HESITATE TO CONTACT US AT 301-621-9545



**READ CAREFULLY BEFORE STARTING**

**2023 STATE OF MARYLAND**

**CONTEST**

**ELECTRICAL CONSTRUCTION WIRING**

**ELECTRICAL INSTALLATIONS**

**INSTRUCTIONS AND PLANS**

***SHOULD YOU LEAVE AREA WITHOUT PERMISSION YOU WILL BE  
DISQUALIFIED FROM THE CONTEST***

## **SCOPE OF CONTEST**

### **1) SAFETY RULES AND PRACTICES**

- a) Safety equipment and use of tools and equipment in a safe manner.
- b) Correct use of hand tools in a safe manner.
- c) Selection of work clothing.
- d) Maintaining a safe and clean workspace.

### **2) USE OF TOOLS AND EQUIPMENT**

- a) Use of and dexterity when using hand tools.

### **3) BASIC THEORY**

- a) Use and application of wiring diagram, schematic/drawing and prints, planning work and layout of electrical installations.
- b) Application of math calculations for circuits and measurements.

### **4) TRADE INFORMATION**

- a) Correlating specification, prints, and job tasks.
- b) Planning work and layout of electrical installations.

### **5) BASIC EQUIPMENT AND PROCEDURES**

- a) Techniques of residential wiring.

### **6) ELECTRICAL CIRCUITS**

- a) Use of all types of cables NM, THHM AND CONDUIT.

7) **SWITCH BOXES and OUTLET BOXES**

- a) Install as noted on drawings

8) **MAINTAIN EXISTING WIRING**

9) **ROUGH IN, CONNECTION OF DEVICES**

*(please do not attach devices until rough-in inspection is completed)*

- a) Three-way switches
- b) Four-way switch
- c) Duplex and GFCI, grounded receptacles
- d) 120/240 volt distribution panel
- e) Keyless fixtures

10) **CONDUIT BENDING**

- a) Make the following conduit bends per drawing
- b) All bends will be made from measurements
- c) Determine correct conduit measurements

**THE USE OF AC POWER OPERATED TOOLS WILL NOT BE PERMITTED**

**( BATTERY DRILLS ONLY )**

***ALL MATERIALS ARE LOCATED AT YOUR  
WORK STATION***

***PLEASE CHECK ALL MATERIALS TO LIST PROVIDED BEFORE  
STARTING CONTEST, INFORM COMMITTEE SHOULD YOU BE  
SHORT ANY ITEMS ON MATERIAL LIST***

***UPON COMPLETION OF YOUR INSTALLATION REMAIN AT  
YOUR WORK STATION***

***PLACE YOUR SIGN INDICATING THAT YOU ARE  
COMPLETE***

# Skills 2023

## Electrical Construction Wiring Contest

### Task #1 Residential /Romex

#### Specifications:

- All boxes to be mounted to their centerline AFF unless otherwise noted. Refer to drawings.
- Support all wiring per NEC.
- Mount all devices vertically. Receptacles to be mounted with the ground down.
- All device terminals to be taped prior to installation in boxes.
- All devices to be grounded per NEC.

#### Project Details:

- Both lights and bottom half of receptacle "C" to be controlled by 3way and 4way switches.
- Top half of receptacle "C" to be constantly hot.
- GFC receptacle to be constantly hot.

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### Task #2 Commercial / Conduit

#### Specifications:

- All boxes to be mounted to their centerline AFF unless otherwise noted. Refer to drawings.
- Support all conduit per NEC.
- Conduit to be routed as noted on drawing.
- Ground all non-current carrying surfaces per NEC. (boxes/enclosures)
- All device terminals to be taped prior to installation in boxes.
- All devices to be grounded per NEC.

#### Project Details:

- Mount panel and all boxes according to the dimensions shown on the drawings.
- Receptacle "A" to be fed from the black circuit.
- Receptacle "B" to be fed from the red circuit.
- Leave a loop of the blue circuit in all other boxes for future expansion.
- Black and red circuits to be terminated on 20 circuit breakers.
- Blue circuit to be safely capped off in panel with it's ground wire properly terminated in panel.

Skills 2023

Electrical Construction Wiring Material List

3 – ½" EMT one hole straps

30' – Black, Red, Blue, White, and Green THHN, #12 solid

5 – 1900 box w/ ½" & ¾" KO

3 – 1900 blank plates

5 – Ground screws

15 – Romex Staples

3 – Plastic single gang nail in boxes

2 – 20 amp receptacles

2 – 8b plastic nail in box

25' – 14/2 Romex

25' – 14/3 Romex

1 – Panel single phase 120/240V

2 – 3 way switches

2 – Keyless fixtures

2 – Incandescent lamps

1 – 4 way switch

1 – 15A duplex receptacle

21 – Wire nuts

24 – #10 x ¾" sheet metal screws

4 – ¼ washers

12 – 1/2" EMT connectors

9 – ½" Minerallac straps

30' - ½" EMT conduit

**1 – single gang switch plate**

**1 – single gang duplex receptacle plate**

**1 – GFCI receptacle**

**1 - GFCI receptacle plate**

**1 – roll of black tape**

**2 – 20A breaker**

**2 – Raised metal receptacle covers**

**1 – blue nail on 2 gang box**

**1 – 2 gang switch plate**

**ROUGH - IN  
INSPECTION  
REQUEST**