



2022 SECONDARY COMPETITION
CONTEST INSTRUCTIONS

TRADE 18 ELECTICAL INSTALLATIONS





Contest Introduction

On behalf of the Provincial Technical Committee (PTC), we would like to thank you for competing in this year's virtual Alberta Provincial Skills Competition!

Competitor's will be assessed according to their skills and abilities performing various installation tasks in the field of residential, commercial, and industrial electrical wiring.

Given a supply of electrical equipment, competitors will build a complete electrical system according to supplied drawings and specifications incorporating a variety of wiring types and methods that may include non-metallic sheathed cable (NMSC), armored cable (AC90), EMT and PVC. Competitors will demonstrate their ability to do work in accordance with drawings and specifications, while showing general understanding of basic electrical circuits and knowledge of the current CEC (Canadian Electrical Code).

Competition Schedule

EVENT: Electrical Installations	LEVEL: Secondary
WORLDSKILLS TRADE #: 18	LOCATION: Per school
DURATION: 5.5 hours (One Day)	
COMPETITION SCHEDULE: Day One – April 14th:	
ORIENTATION	8:00 AM – 8:30 AM
COMPETITION	8:30 AM - 9:45 AM
BREAK	9:45 AM - 10:00 AM
COMPETITION	10:00 AM - 11:30 PM
LUNCH	11:30 PM - 12:00 PM
COMPETITION	12:00 PM - 1:30 PM
BREAK	1:30 PM – 1:45 PM
COMPETITION	1:45 PM – 3:00 PM
The times above are approximate and may change as required.	



Contest Instructions

General Rules

- Video cameras must be left on during the entire competition so that PTC staff can monitor your progress and assist with questions.
- The contest will run over one day for a total of five and a half (5.5) hours.
- The day one requirements of the competition will be judged at the end of day one.
- All documentation must be returned to the judging team after completion.
- All wiring must meet the minimum requirements of the 24th edition of the Canadian Electrical Code (2018 CEC).
- There will be no talking to anyone during the competition except for the judging volunteers.
- There is to be no discussion of the competition during breaks or the lunch hour.
- Any questions regarding the competition must be directed to the site judges. A discussion of the question will follow and if necessary, a written and or verbal answer to the question will be given to all competitors from the site judge.

Safety

- Steel toe safety footwear, safety glasses and hard hats must be always worn in the competition area.
- Gloves shall be worn when the task requires.
- The panel boards and controllers are to remain de-energized and will only be energized by the judges.
- Maintain a clean work area. All materials and waste are to remain neatly in your contest area or discarded in appropriate waste containers.
- All cuts and medical issues **MUST** be reported and attended to immediately.
- If required, the proper medical forms must be completed by the competitor before leaving the competition area.

Material

- Each competitor station contains the material that is required for the competition. A list of materials is included with the supplies. Check the materials before the start of the contest to verify that all components are accounted for and not damaged or missing.
- No additional materials will be available.
- No outside materials are permitted to assist in the project.
- Make sure that no materials leave your contest area. Use extra caution when bending and cutting so that your material does not extend into another competition area or passageway.



Contest Specifications

General

- You may test your circuitry with an ohmmeter if time permits.
- Identify all circuits on the panel directory as per the specifications below.
- At the end of the day turn all circuit breakers off and clean up your work area.
- Once you have completed your installation for the day, contact the timing judge to sign that you have finished, and they will record the time you left the competition site.
- Once you leave the competition site, you cannot return so please make sure you take all your personal belongings with you.

Stud Wall

- All boxes will be installed to allow for ½" drywall.
- All wiring will be done with NMSC.

Plywood Wall

- Panelboard shall be treated as the main distribution panel and mounted vertically with the main breaker section at the top.
- All equipment shall be installed plumb and level as well as accurately to the designated measurements.
- Solid #14 AWG conductors should be installed in raceways.

Measurements

- The blueprints contain the approximate box layout and contains lettered dimensions for the competition. The corresponding letter dimension is listed below in the specifications.
- All vertical stud measurements shall be from the floor or table to the point on the equipment as shown on the drawing.
- All vertical plywood measurements shall be from the floor or table to the point on the equipment as shown on the drawings.
- All horizontal locations for stud mounted equipment shall be installed according to the layout as shown on the drawings.
- All horizontal plywood measurements shall be from the specified edge of the plywood to the point on the equipment as shown on the drawings.



Measurements

Vertical Measurements

- A 110 cm LT1, LT2, SMK1
- B 75 cm SW1, SW2, SW3
- C 30 cm REC1, REC2, REC3
- D 80 cm PNL1

Horizontal Measurements

- E 85 cm PNL1
- F 45 cm LT2
- G 15 cm SMK1, SW3, REC3

Raceways & Cables

- REC3 shall be connected to the panelboard using EMT.
- SW3 and SMK1 shall be connected using rigid PVC conduit.
- SW3 shall be connected to the panelboard using armored BX cable.
- LT2 and SMK1 shall be connected using armored BX cable.
- All stud mounted equipment shall be wired using the appropriate size and number of conductors of NMSC cabling based on the control requirements and CEC minimum standards.

Control Requirements

Panelboard CCT#1 will energize the following:

- REC1 and REC2 connected to an Arc Fault Circuit Breaker
- REC1 and REC2 shall always remain energized.

Panelboard CCT#2 will energize the following:

- SW3, SMK1 and LT2
- SMK1 shall always remain energized.
- LT2 shall be controlled on or off from SW3.

Panelboard CCT #3 will energize the following:

- SW1, SW2 and LT1
- LT1 must be controlled on or off from either location SW1 or SW2.

Panelboard CCT #4 will energize the following:

- REC3
- REC3 shall always remain energized.
- REC3 will be an outdoor GFCI receptacle with approved cover.



Judging

- Once you have completed your installation for the day, contact the timing judge to sign that you have finished, and they'll record the time you left the competition site.
- Once you leave the competition site, you cannot return so please make sure you take all your personal belongings with you.
- Once all the competitors have signed out the judging shall start.
- The mounting of the junction boxes and non-electrical equipment will be judged including the installation of any surface mounted raceways and cables on the plywood wall.
- Judges will energize and test all components of the competition.
- The installation of all wiring and functionality of electrical components shall be judged.
- Testing will be performed to make sure each electrical component performs the required task as per the specifications listed above.
- No marks will be granted for wiring and equipment that is not installed.

General Marking Evaluation

The competition will be judged but not limited to the following general criteria:

Equipment and Component Installation

- Check that all junction boxes, control panels and panelboards are installed properly and in the correct location.
- Check the installation of raceways and surface mounted cabling required to interconnect boxes on the plywood wall.

Measurement

- Measurements will be made to the mm with only a small allowable tolerance.
- To maintain consistency each competitor's personal tape measure and level will be used by the judges for the measurements. Please leave your measuring tape and level at your workstation.

Tubing and Conduit Installation

- No kinking of tubing and conduit is allowed.
- Offsets must be installed only where required.
- All tubing and conduit must be installed plumb and level.
- Set screws must be secured properly to maintain bonding requirements.
- Bonding conductors must be installed in raceways as required by the CEC.



Operation

- Ensure that all circuitry works safely and properly.
- Check the Panelboard and wiring devices for neatness, correct operation, and control.

Cable installation

- The appropriate size and type of conductor must be at each location as specified.
- Proper strapping and stapling required as per CEC minimum requirements.
- Conductor and cable insulation must not be damaged.
- Proper pigtail lengths are required for device terminations.

Connection of Conductor to Components and Equipment

- All connections and terminations must be mechanically and electrically sound.
- No excess conductor to be exposed at terminations and splices.
- Insulation of conductors must not be installed under device screws.

Compliance with Health and Safety Rules

- Any competitor acting in a way that may cause harm to themselves or others may be removed as a competitor.
- Maintain a clean work area and correctly use equipment for its intended use.
- All cuts and medical issues MUST be reported and attended to immediately.
- If required, the proper medical forms must be completed by the competitor before leaving the competition area.

From all of us on the PTC staff we want to wish you a safe and enjoyable competition experience! Good luck!