



**SCNC**  
**SKILLS CANADA**  
**NATIONAL**  
**COMPETITION**



**OCMT**  
**OLYMPIADES**  
**CANADIENNES**  
**DES MÉTIERS**  
**ET DES**  
**TECHNOLOGIES**



**SkillsCompétences**  
**Canada**  
Halifax2019

CONTEST DESCRIPTION / DESCRIPTION DE CONCOURS

# **ELECTRICAL INSTALLATIONS INSTALLATIONS ELECTRIQUES**

POST- SECONDARY / NIVEAU POSTSECONDAIRE



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## **1 THE ESSENTIAL SKILLS FOR CAREERS IN THE SKILLED TRADES AND TECHNOLOGY**

SCC is currently working with Employment and Social Development Canada (ESDC) in order to bring awareness to the importance of Essential Skills that are absolutely crucial for success in the workforce. Part of this ongoing initiative requires the integration and identification of Essential Skills in contest descriptions, projects, and project documents. The next phase and very important aspect of our Essential Skills (ES) initiative is to provide an ES report card to each competitor at the Skills Canada National Competition. The purpose of the ES report card is to inform the competitor about their current level of essential skills based on their competition scores. With this knowledge, the competitor will be made aware which essential skill may require improvement. Full implementation is expected in the next Skills Canada National Competition.

The following 9 skills have been identified and validated as key essential skills for the workplace in the legend below:<sup>1</sup>Numeracy, <sup>2</sup>Oral Communication, <sup>3</sup>Working with Others, <sup>4</sup>Continuous Learning, <sup>5</sup>Reading Text, <sup>6</sup>Writing, <sup>7</sup>Thinking, <sup>8</sup>Document Use, <sup>9</sup>Digital

These essential skills have been identified within your Contest Description. The top three Essential Skills for your area of competition have been identified on your Project and all other supporting project documents.

## **2 CONTEST INTRODUCTION**

### **2.1 Description of the associated work role(s) or occupation(s).**

<http://skillscompetencescanada.com/en/skills/construction/electrical-installations/>

### **2.2 Purpose of the Challenge.**

Assess the contestant's skills and abilities performing various installation tasks in the field of residential, commercial and industrial electrical wiring.

### **2.3 Duration of contest.**

12 hours

## 2.4 Skills and Knowledge to be tested.

- Throughout the final contest, contestants can expect to be evaluated in one, two, three or all of the following areas:
  - Installing residential, commercial wiring and control systems;
  - Installing branch circuit components;
  - Installing heating equipment and controls;
  - Installing motor control systems;
  - Installing communications systems, wiring devices and various types of detectors;
  - Install and program an intelligent relay using the relay faceplate or laptop;
  - Trouble shooting using test instruments;

## 3 CONTEST DESCRIPTION

### 3.1 List of documents produced and timeline for when competitors have access to the documents.

DOCUMENT	DATE OF DISTRIBUTION VIA WEBSITE
Competition Layout	January, 2019

### 3.2 Tasks that may be performed during the contest

- Contestants must demonstrate mastery of the following technical skills:
  - Measuring and marking dimensions on a work surface using scale plans and drawings based on the metric or imperial measuring system;<sup>1, 8</sup>
  - Measuring and accurately marking the location of outlets and drilling holes on control panels;<sup>1</sup>
  - Installing electrical equipment, cables, conduit, tubing and raceways;
  - Measuring and bending tubing and conduit;<sup>1</sup>
  - Measuring, sawing, drilling, deburring metals and plastics;<sup>1</sup>
  - Assembling components using screws, staples and bolts;
  - Linking lines and equipment to control panels and their components;<sup>7</sup>
  - Wiring and connecting electrical components;
  - Wiring and programming of an intelligent relay;
  - Identifying and marking conductors according to plans and drawings;<sup>8</sup>
  - During the competition, competitors will be required to complete a trouble shooting exercise using provided test equipment. The competitor will be assigned a time to complete this task;<sup>7</sup>
- Contestants must demonstrate mastery of the following theoretical skills:
  - Reading, interpreting and executing plans, drawings, diagrams and schematics in compliance with standards;<sup>8</sup>
  - Reading, interpreting and executing manufacturer's technical specifications for the electrical components to be installed;<sup>8</sup>
  - Knowledge of electrical materials and construction work methods;

- Knowledge of basic electrical circuits;
- Knowledge of basic electrical devices and equipment;
- Knowledge of occupational health and safety regulations;<sup>7</sup>
- Knowledge and application of electrical code requirements in Canada and installation to comply with the current edition of the Canadian electrical code book (CEC current enforced edition)<sup>5</sup>

*Essential Skills – <sup>1</sup>Numeracy, <sup>5</sup>Reading Text, <sup>7</sup>Thinking (Critical, Problem Solving, Significant Use of Memory), <sup>8</sup>Document Use*

## **4 EQUIPMENT, MATERIAL, CLOTHING**

### **4.1 Equipment and material provided by Skills/Compétences Canada**

- Work bench
- Ladder
- Access to a 120-volt 15A (5-15R) receptacle;
- Manual pipe bender EMT ½
- 3/4" x 6" total length self feeding ship auger
- Cordless drill - Impact combo pack
- Driver Bit – #2 x 6 inch Robertson
- Driver Bit – #1 x 6 inch Robertson
- Mitre box and saw;
- Smart relay pack;

**COMPETITORS WILL BE REQUIRED TO USE THE MATERIAL AND EQUIPMENT PROVIDED BY SCC. ALL OTHER MATERIAL AND EQUIPMENT WILL BE REMOVED FROM THE SKILL AREA.**

### **4.2 Equipment and material provided by the competitor**

- Supplies for drawing and writing, i.e., pencil, eraser, etc.
- Metric tape measure (or metric/sae combination)
- Set of screwdrivers (Robertson, flat, termination and Philips)
- Electrician's pliers (lineman pliers)
- Electrical digital multi-meter
- Tri square
- Cutting pliers (side cutters)
- Knife (no utility knives, box cutters etc. Nothing with a replaceable blade)  
Must be a lockable or fixed blade type.
- Hammer
- Needle-nose pliers
- Adjustable wrench (crescent wrench)
- Fish tape

- Unibit metal bit, capable of 7/8" hole and/or 1 set manual hole punches for 1/2" knock-outs
- Tapping screwdriver (6/32 - 8/32 – 10/32)
- Metal hack saw
- EMT reaming tool
- Wire stripper
- Torpedo level
- Drywall saw
- Multi-purpose pliers
- Adjustable pliers (water pump pliers)
- Set of metal drill bits
- Canadian Electrical Code Book (Current Enforced Edition)
- Laptop – (optional for programming smart relay)
- **Heat gun or heating blanket for bending PVC conduit**
- NO OTHER EQUIPMENT AND MATERIAL ACCEPTED

#### 4.3 Required clothing provided by the competitor

- Neat and clean – torn clothing is not allowed
- No facial, hand or loose hanging jewellery

## 5 SAFETY REQUIREMENTS

### 5.1 Safety workshop

Upon arrival at the Skill area, Competitors will participate in a Safety workshop and they will be expected to work and maintain a safe working area during the competition. Any Competitor breaking any health, safety and environmental rules, may be required to undertake a second safety workshop, this will not affect the Competitor's competition time.

### 5.2 List of required CSA approved personal protective equipment (PPE) provided by competitors

- Hearing protection
- Safety shoes
- Safety gloves
- Hard Hat
- Safety Glasses
- **Note:** Contestants who do not have the required protective gear will not be allowed to participate in the contest

## 6 ASSESSMENT

### 6.1 Point breakdown

POINT BREAKDOWN	/100
Operation	30
Equipment and component installation	10
Intelligent relay operation	7.5
Measurement	10
Cable installation	10
Tubing and conduit installation	10
Connection of conductor to components and equipment	10
Compliance with health and safety rules	5
Fault finding	7.5

## 7 CONTEST SPECIFIC RULES

Contest specific rules cannot contradict or take priority over the Competition Rules. They do provide specific details and clarity in areas that may vary from contest to contest. Any additional contest rules will be reviewed during competitor orientation.

TOPIC/TASK	CONTEST SPECIFIC RULE
Tools / Infrastructure	<p>Competitors <b><u>may not</u></b> bring tools other than those listed above.</p> <p>No other outside material or manuals are allowed</p> <p>No cell phone or smart phone use during competition at any time.</p>

## 8 ADDITIONAL INFORMATION

### 8.1 Interpreter

If a competitor requires the help of an interpreter once onsite during the competition, the Skills/Compétences Canada Provincial/Territorial offices must advise Skills/Compétences Canada National Secretariat a minimum of 1 month prior to the competition or this service might not be guaranteed.

### 8.2 Ties

- Tiebreaker #1: The competitor with the highest score in the Operation criteria will be declared the winner.
- Tiebreaker #2: The competitor with the highest score in the Health and Safety criteria will be declared the winner.

- Tiebreaker #3: The competitor with the highest score in the Equipment and Component Installation will be declared the winner.

### 8.3 Test Project change at the Competition

Where the Test Project has been circulated to Competitors in advance, NTC shall change a maximum of 30% of the work content. Please refer to the Competition Rules.

### 8.4 Competition rules

Refer to the competition rules of the Skills Canada National Competition which can be found on our website.

## 9 NATIONAL TECHNICAL COMMITTEE MEMBERS

Member Organization	Name
Alberta	Chuck Zylla
Manitoba	Derrick Doyle
Ontario	Adam Hicks
Québec	Serge Guay
Nova Scotia	Edward (Ted) Peters
New Brunswick - Chair	Rick Mason
Nunavut	Kimberly Smith
British Columbia	Norm Chamberlain
Newfoundland and Labrador – Co-Chair	Randy Rice
Yukon	Aaron France
Saskatchewan	Jay Vollet
Prince Edward Island	Ray Murphy

Contact the Skills/Compétences Canada national secretariat for any questions or concerns: Nathalie Maisonneuve (nathaliem@skillscanada.com).