



world**skills**
New Zealand

2010 NATIONAL COMPETITION

Electrical Trades

**Pre-Competition Information
for Competitors**

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INTRODUCTION

Congratulations on qualifying for a WorldSkills New Zealand national competition. The pathway to success includes a careful study of these instructions. **Please read these instructions fully and retain them for the competition days.**

A WorldSkills New Zealand competition will give you a ranking against your peers according to the skills you demonstrate on the day. You are judged according to your ability to achieve set goals and are awarded marks according to how well you achieve those goals. Unlike standard competency assessments if you perform better than the industry standard demands [the minimum mark], then you will be rewarded for that effort.

The project is divided into five modules :

- Module A:** Domestic Wiring Installation Project
- Module B:** Commercial Wiring Installation Project
- Module C:** Installation Testing and Fault Finding Project
- Module D:** An equipment set-up project
- Module E:** Commissioning of Modules A and B

1. Name and Description of Trade.

The name of the trade is **Electrical Wiring**.

Electrical Wiring covers the installation, maintenance and repair of electrical equipment in offices, schools, hospitals, agriculture and industry. The electrical installations are carried out with materials, switches, control devices and consumer appliances.

2. Scope of the Competition Project.

The modules are designed to test a range of skills that would be required by an electrician involved in electrical installation type work. This competition may be used to assess the competencies under the National Training Packages.

A theoretical knowledge is required of the current additions of the following standards AS/NZ 3000, AS/NZ 3008 and AS/NZS 3017 and will need to be applied to all practical work.

3. Work Area.

The project work will be carried out on three timber frames measuring approximately 1.2 m wide x 2.4 m high. The work surfaces will consist of the following:

Flat timber surface (custom wood, chip board or similar material)

A floor area of approximately 2.4 m x 2.5 m for working will be available in front of the timber framed area

4. Practical Work.

In the category of Electrical Wiring competitors will be assessed in each of the following areas.

Electrical Installation Practices. – Module A and B

Content; the project will be designed from a selection of the following topics:

- reading and interpreting circuit diagrams and equipment layout diagrams.
- assembly and mounting of electrical accessories on a flat surface.
- assembly and mounting of electrical equipment in a switchboard.
- measure and set out conduits and cables from circuit and layout drawings.
- working to a tolerance of ± 3 mm.
- cutting, bending and installation of PVC conduit.
- installation of flexible conduits.
- cutting and installation of PVC duct.
- installation of wiring into conduits, ducts and switchboards.
- the installation of electrical equipment in control panel
- the wiring of equipment in a control panel
- the wiring of field devices to a control panel
- installation of cables.
- installation of appliances.
- interpretation of AS 3000, AS 3008 & AS3017

Fault finding – Module C

Content:

- Test and fault find on a simulated installation using an insulation tester and ohmmeter or similar device.
- the competitor must find the faults in the allowed time, if the competitor is able to find the faults in less time than allowed, the remaining time will be added to the main project.

Equipment Set-up – Module D

- You will be required to perform a programming exercise.

Commission Installation - Module E

Content:

- ◆ You will be required to Commission the installations of 4.1 (modules A and B) prior to assessment by the judges.
- ◆ A test report must be submitted before you will be provided with power to carry out function tests.
- ◆ Power will be given once only for the function tests.

Materials

Materials used for the test project will be limited to commercially available types. This may also include devices that have been recently released on the market.

Safety:

You are required to adopt normal safe working practices and to use appropriate safety equipment during the competition.

Safety glasses must be worn at all times.

Competition Schedule

Project Time

- ◆ The time for the total project will be a maximum of 22 hours.
- ◆ Fault finding will be limited to a maximum of 1 hour.
- ◆ Equipment set-up will be a maximum of 1 hour.
- ◆ Power will be available only after the commissioning report has been submitted for Module A and again for Module B.

As a competitor you should keep track of time yourself. The timetable for the day of competition is shown below.

Day of Arrival (Wednesday 22 September)

2.30pm – 4.30pm	Familiarisation
5.00pm – 6.30pm	Opening Ceremony

Day 1 (Thursday 23 September)

9.00am	Commence work on competition project
10:30am	Morning Break
10:45am	Continue work on competition project
1:00	Lunch break
2:00pm	Continue work on competition project
4:00pm	Afternoon Break
4:15pm	Continue work on competition project
6:00pm	Stop work on competition project
6:00pm	Competition Debrief

Day 2 (Friday 24 September)

8:00am	Commence work on competition project
10:00am	Morning Break
10:15am	Continue work on competition project
12:00	Lunch break
1:00pm	Continue work on competition project
3:00pm	Afternoon Break
3:15pm	Continue work on competition project
5:00pm	Stop work on competition project
5:00pm	Competition Debrief

Day 3 (Saturday 25 September)

8:30am	Commence work on competition project
10:00am	Morning Break
10:15am	Continue work on competition project
12:00pm	Lunch break
1:00pm	Continue work on competition project
3.00pm	Stop work on competition project
3.30pm	Competition Debrief and Clean up

Day 4 (Sunday 26 September)

11:am	Awards Ceremony
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Marking Scale Summary

All competitors who compete in this skill category will be judged according to the same criteria. A summary of the different project sections and the number of marks allocated to each section is shown below.

In the event of a tie, the winner will be decided by the competitor with the highest mark in section A - Circuit Function, in the event of the competitors being still tied the winner will be decided by the competitor with the highest mark for Section B - Mounting Dimensions.

MARKING SUMMARY	
Section - Installation Exercise	Max. Marks
Circuit function	25
Equipment Dimensions and Mounting	10
Installation of Wiring Systems and Cable	30
Wiring and Connections	10
Safety	10
Installation Testing and Fault Location	5
Equipment Set-up	5
Commissioning	5
Total	100

Points that Judges will be looking for:

Job planning

The main reason for competitors not completing the project or rushing to finish, is lack of job planning or planning ahead.

It is not uncommon for a competitor to spend time going back and doing something left out or forgotten earlier, which usually involves dismantling and re-assembly of previously completed sections.

Time is wasted when you have completed one section, and you are deciding what to do next. By having a plan and listing the order that you want to construct the project, you have an immediate reference for the next starting point. Have an idea in your mind, or write down the time you will require to complete sections of the project. This is an easy check to see if you are on schedule or working too slow.

**REMEMBER
TIME IS IMPORTANT !**

Job Planning:

Approach your work in a professional manner, keep tools and equipment organised. Apparatus which is not relevant to the section you are working on should be placed away to keep the work area and benches clear. Occasionally clean away any rubbish from the floor or workbenches.

Accuracy:

The layout drawings are marked with dimensions and a tolerance of ± 3 mm will apply. Learn to work within these limits. It's just as easy to place equipment within the specified tolerance as it is outside the tolerance.

DESCRIPTION OF MARKING SYSTEMS

The following marking systems will be used by the Judges in their assessment of your project.

Objective Marking

Judges will carry out **objective marking** in areas of the project where tolerances can be applied or where it can clearly be seen that a task has or has not been completed.

The marks to be awarded are scaled as shown:

Within tolerance or complete, maximum marks

Greater than tolerance or not attempted, no marks

Subjective Marking

Judges will carry out **subjective marking** in areas of the project where a visual assessment needs to be made.

Description of Judges marking scale where subjective marking is to be used.

Judges Marking Scale	0-10
Perfect	10
Very Good	9
Good	8
Acceptable	7
Sufficient	6
Medium	5
Weak	4
Poor	3
Bad	2
Very Bad	1
Not acceptable/Not attempted	0

EQUIPMENT TO BE SUPPLIED BY THE COMPETITOR

Competitors are responsible for their own tools. It should be noted that all power tools and machinery must comply with OSH regulations and have adequate safety guards and be in what is deemed to be safe operating condition. At the discretion of the officials any suspect piece of equipment may be prevented from being used. Competitors should supply the information listed below.

- combination pliers
 - side cutting pliers
 - long nose pliers
 - crimping pliers
 - hammer- engineers
 - battery drill and bits
 - shifting spanners
 - PVC conduit cutters
 - spirit level
 - extension lead
 - spade bit (speed bore) 20 and 25 mm
 - insulation tape
 - highlighter, pens pencils, rubber,
 - multimeter
 - multi-grips
 - hacksaw and blades
 - knife
 - hammer- claw
 - tape measure
 - screwdrivers- various
 - heat gun or gas bottle
 - files- various
 - wire strippers
 - hole saw (or similar) 16, 20 and 25 mm
 - Gyprock, plaster saw
 - safety glasses
 - note pad etc.
- you may bring additional tools if you wish.

The organisers will supply the following equipment:

- wiring board
- workbench
- 500 volt insulation tester
- step ladder
- engineers vice

IMPORTANT NOTE !

YOU WILL NOT BE PERMITTED TO USE ANY ELECTRIC POWER TOOLS THAT HAVE NOT BEEN TAGGED

2008 National [Skill Category] Competition
 Pre-Competition Information for Competitors

1. JOB HAZARD ASSESSMENT AND RISK ANALYSIS			
1.1 Competitor:		<i>Category:</i>	
		(a) Commercial Wiring	
		Date:	
Work Activity	(b) Potential Hazards	(i) Hazard Controls	(ii) Responsibility
	(c)	(i)	(ii)

