skillELECTRIC

Electrical Installation
Skills Competition

Pre-Competition Activity **2019**

SkillELECTRIC is the electrical industry's premier, annual skills competition to search for the UK's best young electrician

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SkillELECTRIC Pre-Competition Activity 2019

The SkillELECTRIC competition is delivered by the registered charity NET (National Electrotechnical Training) who on behalf of the industry own, manage and develop the industry's assessment of occupational competence, the AM2.

SkillELECTRIC has been designed to reflect the role of an Electrical Technician and the standards that are expected within the electrical industry. Each year SkillELECTRIC searches for the UK's best young electrician and is the premier skills competition for the UK's electrical industry. The best electrical apprentices and newly qualified electricians from across the UK take part in regional heats to win a place in the competition's grand UK Final.

SkillELECTRIC is generously sponsored by the following industry partners; ECS (Electrotechnical Certification Scheme), Edmundson and Scolmore Group.

We hope that this document supports you to identify your most suitable candidate to register for the regional heats and to be as prepared as they can be for live competition activity.

If you have any further queries please contact Jennie Phung, SkillELECTRIC Project Manager, at jennie.phung@netservices.org.uk

Overview

This guidance document will help you to identify your most suitable individual(s) to register for the regional competition using the simple steps below:

Step	Suggested Task
1	From December to January use the **Talent Spotting Checklist** to identify those who have the potential and attributes to meet the competition standards as set out in the **Core Competencies** for each relevant stage of the competition.
2	It is also strongly encouraged that you use the **Pre-Competition Activity Task** and **Marking Guide** to run your own in-house competition and introduce the group to competition activity as part of their professional development. Register your identified competitor on the **WorldSkills UK** website from March 1 to April 5 2019
3	Prepare your competitor by using the **Training to Succeed Manual** alongside your own development techniques
4	Compete in one of the regional heats taking place across the UK where you will work on a test piece for a maximum of 4 hours
5	If you are successful you will be invited to compete at the UK Final 2019
6	Prepare your competitor by using the **Training to Succeed Manual** alongside your own development techniques
7	Compete at the live UK Final at Birmingham NEC November from 14 to 16 2019

Talent Spotting Checklist

This list identifies the ideal personal attributes we are looking for in a potential competitor. Please use this to identify your most appropriate candidate to enter the competition. It would be ideal if they have as many of these personal attributes as possible.

Competitor Name | Date

College and Campus

	Please tick
Has achieved S/ NVQ level 2 and is either working towards or has completed level 3	☐
Has a supportive employer	☐
Can work well under pressure	☐
Has a high level of ability and flexibility	☐
Good communication and interpersonal skills	☐
Self-motivated and can self-reflect	☐
Has a good level of practical skills and knowledge	☐
Uses theoretical knowledge to its full potential	☐
Consistent high performer in the work place and/ or at college	☐
Can adapt to different working environments	☐
Is accurate in measurements	☐
Possesses mental and physical stamina	☐
Able to assess task and plan before they act	☐
Good time management and can work to a tight time schedule	☐
Self confident, but not over confident	☐

Core Competencies

The table below clearly lists the core competencies and the expected standards at each stage of the competition journey for the SkillELECTRIC competition, starting from the regional heats through to world class international standards.

	Heats/Passive stages	National Final	WSI/ Team UK
Health and Safety			
Tidy work area	Yes	Yes	Yes
Correct PPE being used for task	Yes	Yes	Yes
Safe working practices being observed	Yes	Yes	Yes
Safe isolation of electrical supply	Yes	Yes	Yes
Theory knowledge	No	Yes	Yes
Positioning			
Mark horizontal and vertical datum lines	Yes	Yes	Yes
Correctly position electrical components in relation to the given drawings	Yes	Yes	Yes
Ensure all equipment is fitted level	Yes	Yes	Yes
Wiring and Terminations			
Correctly select the type and size of cable	Yes	Yes	Yes
Correctly fit and secure cable glands	Yes	Yes	Yes
Correctly and securely terminate conductors	Yes	Yes	Yes
Quality			
Install cable containment to industry standards	Yes	Yes	Yes
Correctly support cables with clips or cleats where required	Yes	Yes	Yes
Correctly install cables within containment	Yes	Yes	Yes
Inspection and Testing			
Correctly carry out the following tests:			
1. Continuity	Yes	Yes	Yes
2. Insulation resistance	Yes	Yes	Yes
3. Earth fault loop impedance	No	Yes	Yes
4. RCD operation	No	Yes	Yes
Function			
Installation operates as specified	Yes	Yes	Yes

Pre-Competition Activity Task

This task is designed to be used as an in-house competition from which you can identify your most suitable learners/ employees to register for the SkillELECTRIC competition.

The competitors are expected to:

- Comply with all Health and Safety legislation and requirements for the competition
- Install the competition piece to industry standards in a safe and orderly manner
- Eye protection must be worn for all drilling and cutting
- Complete the exercise with the materials provided
- Work to the dimensions included on the diagram with a tolerance of +/- 4mm
- Determine all necessary wiring for the correct installation and operation of equipment as described in the specification
- Carry out dead electrical safety tests and record your readings on the test results sheet to prove the installation is safe to energise prior to requesting live testing.

Materials

Please supply all the tools and equipment for which to complete this task including; hand tools, test equipment, bending springs, cutting blocks, handsaws, draw tapes, spare blades etc. Competitors can use their own tools if they prefer. The supply to energise will have its protection when the assessment is complete. You are welcome to use RCBO in line with the domestic expectations of the current edition of BS7671 if you wish.

*Please note the use of MCB was considered in order to keep costs down for this stage of competition and that there is no requirement for "live" testing.

Below is the suggested materials list you will require per competitor:

Material	Quantity
Metal clad 4-way DB	1
6A MCB *or RCBO	1
16A MCB *or RCBO	2
MCB Blank	1
2 gang 2-way switch	1
2-way switch	1
Switch pattress PVC with 20mm knockout	2
13A fused connection unit	1
Pattress for above with 20mm knock out	1
Metal clad socket outlet with backbox	1
20mm PVC conduit tee box	2
20mm PVC conduit angle box	1
20mm PVC conduit end box	1
Batten lamp holder	2
20mm PVC conduit	3 metres
20mm conduit saddles	6
2.5mm T&E PVC/ PVC	3 metres
2.5 clips	10
2.5mm 3core SWA	3.5 metres
20mm SWA glands	2
SWA cleats	8
PVC conduit box lids	2

We suggest that you set a time limit by which to complete this task which consists of a PVC conduit, PVC/ PVA and a SWA installation with the following 3 circuits:

Circuit 1: 20A radial circuit feeding a switched fused connection unit (CU1) wired in PVC/ PVC insulated cable.

Circuit 2: 20A general power circuit feeding one single metal clad switch socket outlet (S01) wired in 2- core SWA cable.

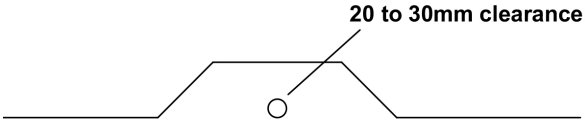
Circuit 3: 6A lighting circuit wired in a single PVC insulated cable enclosed in PVC conduit. The circuit consists of 2 lighting points. LT1 is controlled by two-way switching, SW1 and the left-handed side of SW2. LT2 is controlled by a one-way switch, right-hand side of the two-gang switch (SW2).

Key for diagrams

DB1 Metal clad consumer unit
LT1 BC baton lamp holder
LT2 BC baton lamp holder
SW1 1 gang 2-way light switch
SW2 2 gang 2-way light switch
SO1 13A single metal clad switched socket outlet
CU1 13A switched fused connection unit

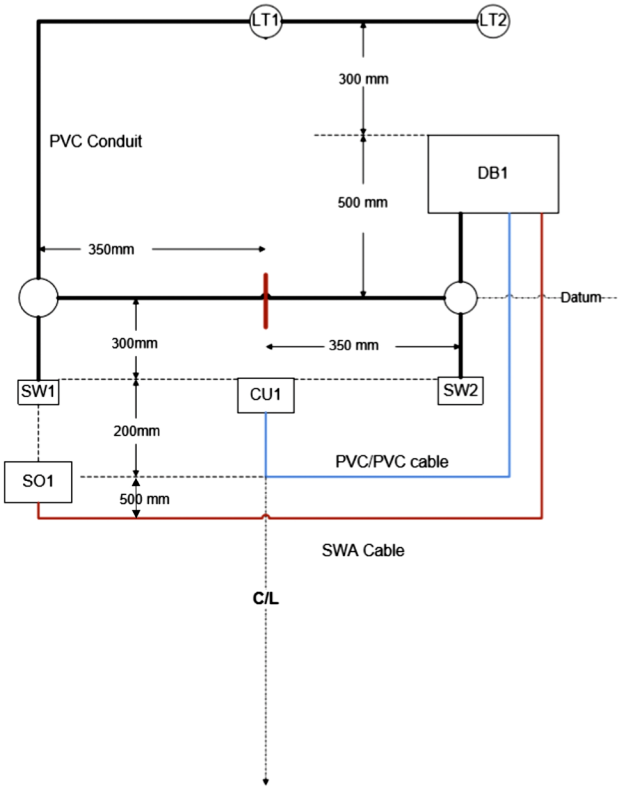
Note 1

The PVC conduit must bridge an obstruction (20mm PVC conduit) using a double set with a minimum clearance of 20mm and a maximum clearance of 30mm.



Note 2

3 core flex and 13A plug top to be supplied by organisation for connection to a RCD protected supply using trailing socket.



Marking Guide for Pre-Competition Activity

Competitor Name | Date

College and Campus

Aspect ID	Description	Maximum mark allocated	Mark awarded
A1	CU1 circuit completed in the correct cable as per the specification	**1**	
A2	SO1 circuit completed in the correct cable as per the specification	**1**	
A3	LT1 and LT2 circuit completed in the correct cable as per the specification	**1**	
A4	Conductors securely terminated at DB1 with no exposed copper when viewed at 90 degrees. Pull test on all terminations. No damage to insulation or reduction in conductor CSA (1 mark per circuit to include supply)	**3**	
A5	SWA gland terminated correctly (1 mark per gland)	**2**	
A6	Conductors securely terminated at CU1 with no exposed copper when viewed at 90 degrees. No damage to insulation or reduction in conductor CSA. Pull test on all terminations	**2**	
A7	Conductors securely terminated at SW1 with no exposed copper when viewed at 90 degrees. No damage to insulation or reduction in conductor CSA. Pull test on all terminations	**2**	
A8	Conductors securely terminated at SW2 with no exposed copper when viewed at 90 degrees. No damage to insulation or reduction in conductor CSA. Pull test on all terminations	**2**	
A9	Conductors securely terminated at SO1 with no exposed copper when viewed at 90 degrees. No damage to insulation or reduction in conductor CSA. Pull test on all terminations	**2**	
A10	Conductors securely terminated at LT1 with no exposed copper when viewed at 90 degrees. No damage to insulation or reduction in conductor CSA. Pull test on all terminations	**2**	
A11	Conductors securely terminated at LT2 with no exposed copper when viewed at 90 degrees. No damage to insulation or reduction in conductor CSA. Pull test on all terminations	**2**	
A12	CPCs and Neutral conductors connected in correct sequence at DB1 for all circuits (1 mark per circuit and 1 mark for Earthing conductor)	**3**	
	Total marks for A	**23**	

Aspect ID	Description	Maximum mark allocated	Mark awarded
B1	PVC conduit bridge set and offset acceptable as per specification and drawing	**3**	
B2	PVC conduit bend acceptable and inner radius at least 2.5 times outside diameter of the conduit	**3**	
B3	PVC/ PVC cable securely clipped horizontally and vertically. Bending radii satisfactory	**3**	
B4	SWA cable securely clipped horizontally and vertically. Bending radii satisfactory	**3**	
B5	Additional material used **(-1 mark for each item issued)**	**0**	
	Total marks for B	**12**	

Aspect ID	Description	Maximum mark allocated	Mark awarded
C1	DB1 level, centred horizontally and vertically within 2mm of measurements taken from datum lines (500mm)	**1**	
C2	LT1 centred, horizontally and vertically within 2mm of measurements taken from datum lines (350mm and 1000mm)	**1**	
C3	LT2 centred horizontally and vertically within 2mm of measurements taken from datum lines (1000mm)	**1**	
C4	SW1 level, centred horizontally and vertically within 2mm of measurements taken from datum lines (350mm and 300mm)	**1**	
C5	SW2 level, centred horizontally and vertically within 2mm of measurements taken from datum lines (350mm and 300mm)	**1**	
C6	Centre of set within 2mm of measurements taken from datum (500mm)	**1**	
C7	SO1 level, centred horizontally and vertically within 2mm of measurements taken from datum lines (350mm and 800mm)	**1**	
C8	CU1 level, centred horizontally and vertically within 2mm of measurements taken from datum lines (300mm)	**1**	
C9	PVC/ PVC cable horizontal and vertically within 2mm of measurements taken from datum line (500mm)	**1**	
C10	SWA cable horizontal and vertically below datum lines within 2mm of measurements (1000mm)	**1**	
	Total marks for C	**10**	

Aspect ID	Description	Maximum mark allocated	Mark awarded
D1	Personal protective equipment used at all times	1	
D2	Work area kept free from hazards at all times	1	
D3	Safe working practices employed when using hand tools	1	
D4	No faults or dangers found when work tested	1	
D5	Due consideration to others safety demonstrated	1	
	Total marks for D	5	

Aspect ID	Description	Maximum mark allocated	Mark awarded
E1	Correctly carries out continuity testing on each circuit	3	
E2	Correctly carries out insulation resistance testing on each circuit	3	
E3	Correctly carries out polarity testing on each circuit	3	
E4	Correctly completes schedule of test results for each circuit	3	
	Total marks for E	12	

Aspect ID	Description	Maximum mark allocated	Mark awarded
F1	CU1 functions correctly	1	
F2	SO1 functions correctly	1	
F3	LT1 functions correctly	1	
F4	LT2 functions correctly	1	
	Total marks for F	4	

Total marks awarded for Pre-Competition Activity	

Pre-Competition Activity assessed by:

Name _____ Date _____