

SkilleLECTRIC 2022 UK Final Training to Succeed Manual



What's this Document For?

This manual contains technical tips and advice to help SkilleLECTRIC UK finalists achieve their full potential and be competition ready.

It's designed to be used in conjunction with the competition training and development you should already be receiving from your training provider and/or employer for all stages of the competition.

IN THIS MANUAL YOU'LL FIND:

SECTION 1: General Tips – covering areas such as preparation, time management and the competition specification.

SECTION 2: Technical Guidance – with top tips on the specifics relating to the competition, such as positioning, installation quality, wiring and terminations and inspection and testing.

How will it help me?

Using the Training to Succeed manual can make a difference by helping you to:

- Focus on the basics at a higher level of accuracy.
- Plan before carrying out any work.
- Learn to step back occasionally to see if it looks right and as per the specification.

You are competing at a high standard designed to challenge you, but it is achievable with the right competition preparation. Remember to pace yourself and enjoy your competition journey!

SECTION 1: General Tips

1A. PREPARATION

Preparation is required in any competition and this includes; technical skill, body and mental training. To succeed at a higher level in any competition, be it Electrical, Formula 1, Football or the Olympics, all have one thing in common – consistent and regular training:

- Keep yourself fit as competition can be physically demanding.
- Prepare mentally to accept only the best quality work and become a self-critic, understanding your own strengths and weaknesses.
- Prepare physically to maintain your high level of skill and concentration throughout the competition.
- Prepare your tool kit and check you have the correct tools for each job. Check they are accurate and fit to carry out the task – check levels are correct, measures are clear and saw blades are sharp etc. Make sure you know how to use the tools correctly and safely.
- Prepare yourself for a noisy and distracting environment. At the finals you will have many people watching you throughout the competition.
- Make sure you keep hydrated and drink at least 2 litres of water per day, starting weeks before the competition to allow your body to get used to that amount of liquid.
- Eat regularly and wisely throughout the day.
- Have spare batteries for any permitted battery-operated tools.



During the competition try not to drink energy drinks or eat energy bars as they give a short burst of energy which then drops dramatically. Go for water and snack on bananas which give a slow, lasting energy release instead.

1B. PRACTICE

Practice is required to improve your performance and take your skill to the next level:

- Practice all elements of the competition, concentrating on not only your identified weaknesses but also your strengths to help improve your overall performance.
- Use every opportunity to use your skills and visualise success.
- When clearing up on site, providing you have permission to do so, keep off-cuts etc to practice with.
- Get into the competition mind-set and get used to accepting only the highest standard of work from yourself.
- Practice keeping focused on your work and planned outcome.
- Practice trusting your decisions and do not be tempted to alter your work after seeing another competitor's work, as it could be that theirs is wrong and yours is correct.
- Practice laying out your tools and keeping them close to hand. Repeatedly walking to and from your toolbox costs time that could be critical to your overall score.
- Practice creating a time line to complete every job: how long will each task take, after one hour how far should I have progressed etc?
- Prepare for a change in your plan, especially when you make an error. Resolve it if you can and then move on, leaving the problem behind and focusing on the task ahead.



- Whilst training, set up a video camera to record your work so that you can watch it back and see where you can save time and improve your performance further.
- Make sure that you use the rest room before starting the competition and again during the next break. Extra time may not be given, so avoid this if you can as it is time wasted.



Preparation + Practice = High Performance

1C. SPECIFICATION, DRAWING AND TIME MANAGEMENT

- Read the specification and drawing carefully until you have fully understood them and what is required to achieve high marks in the competition.
- Combine the two documents and create a timeline to complete the task within the specified time.
- Break the task into sections and allocate a time to each. Practice this during every task within your normal working day and monitor your accuracy to improve your time estimation.
- Monitor your progress throughout the day against your section times.
- Ask questions of your training provider, employer or NET if you are not sure of something.
- Make sure that you understand the marking criterion and where the most marks can be gained and what can be forfeited.
- Plan and do not waste valuable time e.g. why fit the accessories back, when you have to take them off to carry out your test?



- *Time is the most important tool you have so use it wisely.*
- *Read the drawing carefully, noting any special requirements.*
- *Keep your tools close to hand, so as not to waste time.*

1D. MARKING CRITERIA

SkilleLECTRIC is assessed against a set of assessment criteria, for example:

Assessment criteria	Maximum marks available
Measuring and marking out	20
Cable connections	25
Function	5
Angles of bends sets and clearances	12
Fault Finding	10
Inspection and testing	10
Cable clipping	8
Health and safety	10
Total	100

Ensure that you understand the marks weighted against each task so that you can plan how to best approach the order of tasks.

The actual standards for your particular task will be shared with you in a 'Task Information' document before the competition. Make sure you read this as minor errors can lead to marks not being gained.

You can achieve marginal gains through competition preparation and planning.



SECTION 2: Technical Guidance

In this section we outline what's required for each criterion and share some top tips, so that you can take note and do your best on the day.

2.1 POSITIONING OF EQUIPMENT



WHAT'S REQUIRED:

- Correct measurements within allowed tolerance.
- Correct position of accessories and equipment.
- Correct levels of accessories horizontal and vertical.



TIPS FOR SUCCESS:

- Ensure your measure is accurate and do not use the '0' end of a tape measure (use '10' as your start or preferably use a steel rule).
- Read the specification and drawing thoroughly.
- Check your tools, measurements and fixings are accurate.
- When you cut, make sure that you leave the line visible on the part you are using, rather than cutting on the line (the thickness of the blade may be enough to put you outside the tolerance allowed).



IN THE PAST...

competitors have lost marks in this category mainly due to not reading the specification correctly and placing accessories in the incorrect position with poor alignment.



- *Read the measurements on the drawing to know where to place datum lines.*
- *Don't use a tape measure, as the end that's loose may well exceed the tolerance you're working to. Use a steel rule.*
- *Measure twice, cut once.*

2.2 INSTALLATION QUALITY



WHAT'S REQUIRED:

- Gaps of less than 1mm on trunking joints and lids.
- Internal radii of cables and encasement within limitations.
- Work produced as specified.
- Conduit sets produced with correct clearance/ angles and no distortion.
- Correct levels of encasement horizontal and vertical.



TIPS FOR SUCCESS:

- Practice cutting mitre joints on odd scraps to perfect your joints and angles.
- Check the On Site Guide (OSG) (BS 7671) to calculate radius of bends and fixing spacing. Draw the radii out, so you get to know what it should look like.
- You should be using recognised standards (BS 7671:2018, Electricity at Work Regulations and Health and Safety at Work Act) in your everyday work, so you just need to ensure that your work is compliant.
- Practice using a template for conduit and trunking bends and sets, in order to perfect your accuracy, with small off-cuts.
- Check your levels continuously, along with the angle of your bends, to ensure that once installed both horizontal and vertical are correct.

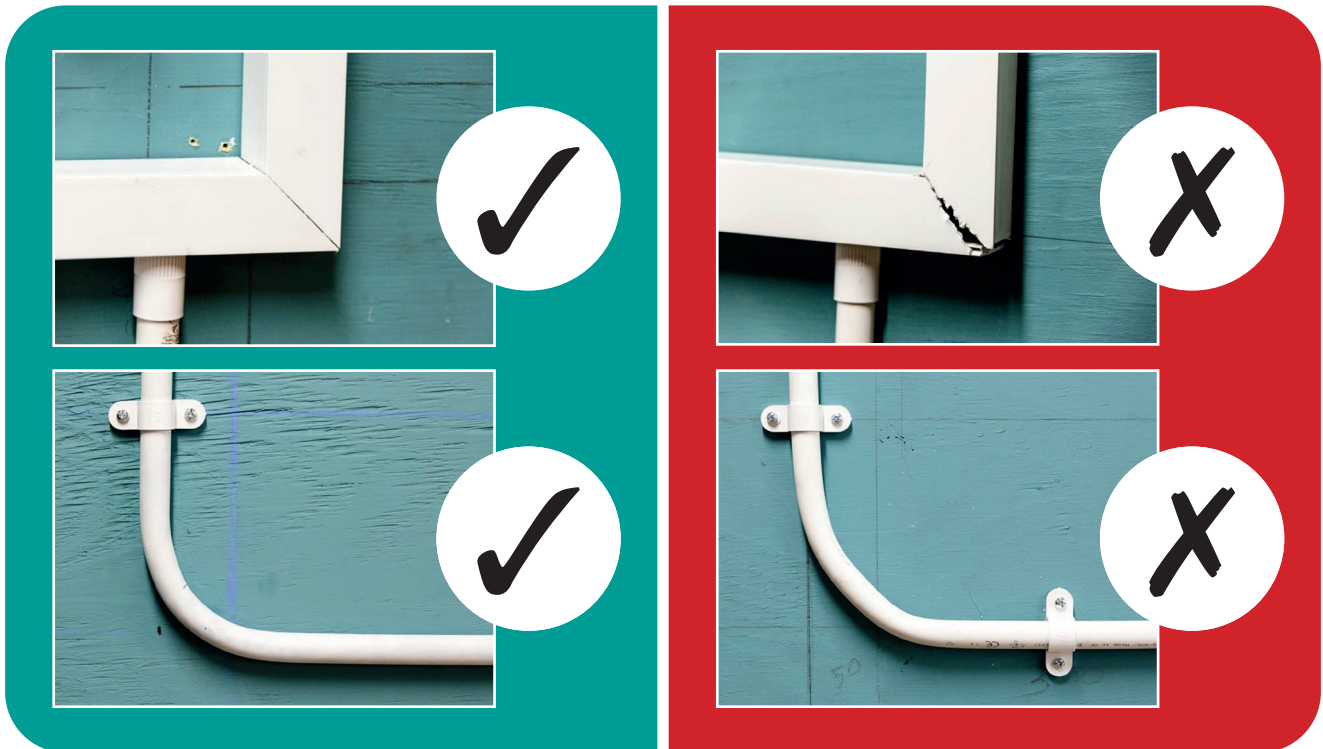


IN THE PAST...

competitors have lost marks in this category mainly due to poor quality sets and bends in conduit and poor joints in trunking.



- Take the greatest of pride in your workmanship before you attend the competition and do not accept second best.



2.3 WIRING AND TERMINATIONS



WHAT'S REQUIRED:

- Correct selection and use of cables.
- Conductors securely terminated withstanding pull test, and no bare conductor showing at any termination when viewed at 90 degrees.
- No reduction in cross-sectional area of conductor (scoring by knife etc) and insulation undamaged.
- All terminations fitted correctly.



TIPS FOR SUCCESS:

- Ensure you use the correct cables as required – referring to the drawing and specification.
- Ensure that all connections are tight and terminated correctly, as above. This includes after you have tested.
- Be careful when stripping cable to ensure you do not cut into the conductor, and be sure that you take precautions not to damage the insulation within the installation.
- Ensure that you fit terminations (glands) correctly and tight using all materials provided.



- *Pull, test and inspect every connection.*



2.4 INSPECTING, TESTING AND FAULT FINDING

In this section you will need to carry out basic safety tests of the project, prior to energising by a judge or authorised person who will witness the tests.

Test instruments will be available, but if you are using your own, which you are advised to do, then make sure they are calibrated prior to the competition.

1. TESTING



WHAT'S REQUIRED:

- Each circuit inspected and tested with results recorded.

TESTS INCLUDE:

- Continuity of protective conductors.
- Continuity of ring final circuit conductors (if applicable).
- Insulation resistance.
- Polarity (by continuity method).



TIPS FOR SUCCESS:

- Always zero your tester before commencing, ensuring the judge is aware.
- Remember, a THREE-STEP test is required to verify continuity of ring final circuit conductors (line, neutral and protective conductors) and correct polarity at associated socket-outlets.
- Ensure you test ALL circuits including the supply inlet.



Only the basic tests, and not a full 18th edition test, are required for this section. Do not waste your time carrying out a full test it gains nothing.



- *Work through the circuits systematically.*
- *Keep it in your mind what the test instrument is doing.*
- *Be aware of any sensitive equipment and disconnect it.*
- *Make a point of learning exactly what the test equipment is doing for each test.*
- *Write it down so you can see what is happening.*
- *Visualise it in your mind.*
- *Zero test your instrument in front of the judge every time you use it.*
- *Operate all switches when testing.*

2.5 FUNCTION



WHAT'S REQUIRED:

- The installation is to function, when energised by a judge or authorised person, in compliance with the specification.
- There will be nothing in the project that you have not done before within your training, so just relax and think it through.



TIPS FOR SUCCESS:

- Read and absorb the specification and drawing to ensure compliance.
- Draw up your time line and monitor it continuously to ensure completion.
- Check, Check and Check again to make sure it is correct.
- Remain focused and do not get distracted.



- *Use your own test time to ensure correct function.*
- *Remember to operate all switches to ensure all strappers are tested.*



2.6 HEALTH AND SAFETY



WHAT'S REQUIRED:

- Correct Personal Protective Equipment (PPE) used.
- Safe working methods practised.
- Work area kept clean and free of hazards.
- Correct tools used safely for the job in hand.
- Complying with the Health and Safety at Work Act.



TIPS FOR SUCCESS:

- You will be required to wear safety boots/shoes and work trousers whilst you are in the competition area.
- You will be required to wear safety goggles/glasses **at all times** (non-tinted).
- The best solution is to get used to wearing them all the time you are in competition (this does not mean on the top of your head, forgotten), as there are marks deducted if you do not.
- All of the remainder of Health and Safety is what you should be practicing every day in the working environment.



At all times we will ask competitors:

- To work safely always and take appropriate precautions when working with any tools that have a potential safety hazard.
- To wear appropriate Personal Protective Equipment (PPE).
- Not to carry out any live working.
- Not to use power tools except a battery-operated drill (preferably not impact).
- To comply with additional competition rules for safety.



- *Focus on your work but remain aware of your surroundings.*
- *Electricians' clasp knives only. 'Stanley' type knives are not allowed.*

Conclusion

In a competition, one point can make the difference between achieving a medal position or not. By getting into the correct mind set and putting productive, positive thinking into practice you can improve your performance.

Be clear and set goals to achieve within the allocated time.

Preparation and practice are the two factors that will make all the difference to your overall performance and score.

**IN SUMMARY**

- Prepare your mind and body.
- Prepare your working practices.
- Prepare your tool kit.
- Prepare your approach.
- Practice your timing.
- Practice your weaknesses and enhance your strengths.
- Understand the marking schemes fully and where you can gain more marks, or afford to lose minor marks.
- Never get complacent.
- Be proud of your work.

About SkilleLECTRIC

SkilleLECTRIC is organised by registered charity NET (National Electrotechnical Training).

SkilleLECTRIC has been designed to reflect the role of an Electrical Technician and the standards that are expected within the electrotechnical industry. Each year, the best electrical apprentices and newly qualified electricians from across the UK take part in SkilleLECTRIC regional heats to win a place in the competition's grand UK Final.

SkilleLECTRIC is the only route to the next WorldSkills International competition taking place in Lyon, France 2024. Those who are age eligible and meet the standard will be considered for a place in Squad UK following the 2022 UK Final.

CONTACT

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www.skillelectric.org.uk



REFERENCES

References made in this document can be found at the following sources:

HM Stationery Office – www.legislation.gov.uk

Health and Safety at Work Act

Electricity at Work Regulations

Institution of Engineering and Technology – www.theiet.org

Wiring Regulations BS 7671

Inspection and Testing GN3 BS 7671

On Site Guide BS 7671