

PERFORMING ELECTRICAL INSTALLATION

UNIT CODE: ENG/CU/EIT/CR/02/6/A

Relationship to Occupational Standards

This unit addresses the unit of competency and meets the requirements specified by the Occupational Standards: Perform Electrical Installation

Duration of Unit: 200 hours

Unit Description

This unit specifies the competencies required to perform electrical installation work for single phase and three phase systems. It focuses on the application of health, safety and environmental standards, preparation of working drawings, communicating with other service providers and maintaining housekeeping during the installation process.

Summary of Learning Outcomes

1. Apply health, safety and environmental standards
2. Prepare working drawings
3. Assemble tools, equipment, materials and drawing instruments
4. Perform electrical installation
5. Facilitate other service providers
6. Maintain housekeeping

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Apply health, safety and environmental standards	<ul style="list-style-type: none"><input type="checkbox"/> Relevant clauses in appropriate Acts e.g.<input type="checkbox"/> Occupational safety and health act (OSHA)<input type="checkbox"/> Work injury benefits act(WIBA)<input type="checkbox"/> Environment management and coordination Act (EMCA)<input type="checkbox"/> Relevant regulations:<ul style="list-style-type: none"><input type="checkbox"/> IEE regulations<input type="checkbox"/> KPLC by-laws<input type="checkbox"/> County by-laws<input type="checkbox"/> Causes of accidents and sources of danger e.g. burns, cuts, electric shock, falling from heights, falling objects, noise, dust, chemicals	<ul style="list-style-type: none">• Written tests• Oral questioning• Observation• Practical tests

Learning Outcome	Content	Suggested Assessment Methods
	<ul style="list-style-type: none"> <input type="checkbox"/> Meaning of term PPE <input type="checkbox"/> Purpose of PPE <input type="checkbox"/> Types of PPE <input type="checkbox"/> Safe and correct handling, use, maintenance and storage of different types of PPE <input type="checkbox"/> Classes of fires and fire fighting equipment <input type="checkbox"/> First aid procedures <input type="checkbox"/> Rescuing electric shock victim <input type="checkbox"/> Methods of resuscitation 	
2. Prepare working drawings	<ul style="list-style-type: none"> <input type="checkbox"/> Working drawings <input type="checkbox"/> Meaning of working drawings <input type="checkbox"/> Identification and care of drawing instruments and equipment <input type="checkbox"/> Identification of drawing paper sizes <input type="checkbox"/> Drawing various types of lines <input type="checkbox"/> Drawing title block <input type="checkbox"/> Drawing standard e.g. Electrical symbols <input type="checkbox"/> Conversion of scales <input type="checkbox"/> Interpretation of orthographic projections <input type="checkbox"/> Dimensioning of drawings <input type="checkbox"/> Drawing of electrical diagrams <input type="checkbox"/> Block, Circuits, Schematic, Wiring and Line <input type="checkbox"/> Reading and Interpretation of architectural drawings <input type="checkbox"/> Reading and Interpretation of electrical drawings <input type="checkbox"/> Use of Computer Aided Design (CAD) applications e.g. AutoCAD 	<ul style="list-style-type: none"> <input type="checkbox"/> Written tests <input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Practical tests

Learning Outcome	Content	Suggested Assessment Methods
3. Assemble tools, equipment and materials	<ul style="list-style-type: none"> <input type="checkbox"/> Types, application, care, maintenance and storage of: Tools e.g. <ul style="list-style-type: none"> ➤ Cable strippers ➤ Pliers ➤ Screw drivers ➤ Hammers ➤ Chisels ➤ Allen keys ➤ Electrician knives ➤ Crimping tools ➤ Bending springs ➤ Steel tapes ➤ Draw wires ➤ Hack saws ➤ Drills <input type="checkbox"/> Equipment e.g. Stock and die, Vice etc. <input type="checkbox"/> Materials e.g. <ul style="list-style-type: none"> ➤ Cables ➤ Fittings ➤ Accessories <input type="checkbox"/> Inventory management 	<ul style="list-style-type: none"> <input type="checkbox"/> Written tests <input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Practical tests
4. Perform electrical installation	<ul style="list-style-type: none"> <input type="checkbox"/> Single phase and three phase systems <input type="checkbox"/> Cables and cable joints <input type="checkbox"/> Wiring systems and accessories <input type="checkbox"/> Meaning of terms <input type="checkbox"/> Types and applications e.g. Conduits, Cable trays, Cable ducts, Trunkings <input type="checkbox"/> Preparation of wiring systems <input type="checkbox"/> Marking out, cutting, bending, threading, chiselling, trenching <input type="checkbox"/> Laying of cable routes <input type="checkbox"/> Installation of final circuits <input type="checkbox"/> Lighting circuits <input type="checkbox"/> One way, two way, intermediate <input type="checkbox"/> Looping in methods at ceiling rose, joint boxes, switches <input type="checkbox"/> Power circuits <input type="checkbox"/> Radial circuits, ring circuits <input type="checkbox"/> Water heating circuits 	<ul style="list-style-type: none"> <input type="checkbox"/> Written tests <input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning

Learning Outcome	Content	Suggested Assessment Methods
	<input type="checkbox"/> Electric cooker circuits <input type="checkbox"/> Call and alarm circuits <input type="checkbox"/> Bell circuits <input type="checkbox"/> Intruder alarm circuits <input type="checkbox"/> Fire alarm circuits <input type="checkbox"/> Electrical machines circuits e.g. Direct online (DOL), star-delta, forward and reverse <input type="checkbox"/> Relevant technical standards e.g. <ul style="list-style-type: none"> ➤ IEE regulations ➤ British standards ➤ Kenya bureau of standards (KEBS) 	
5. Facilitate other service providers	<input type="checkbox"/> Communication with other service providers e.g. Plumbers, Air conditioning technicians, Carpenters, Masons, Fitters, Welders etc.	<input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Written tests
6. Maintain housekeeping	<input type="checkbox"/> Housekeeping <input type="checkbox"/> Meaning of terms <input type="checkbox"/> Safety considerations <input type="checkbox"/> Sufficient lighting in work place <input type="checkbox"/> Proper tools storage facility <input type="checkbox"/> Clean workplace <input type="checkbox"/> Proper waste disposal	<input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Written tests

Suggested Methods of Instruction

- Demonstration by trainer
- Practice by the trainee
- Field trips
- On-job-training
- Discussions

Recommended Resources

Tools and equipment

- Cable Strippers
- Pliers

- Screw drivers
- Hammers
- Chisels
- Allen keys
- Electrician knives
- Crimping tools
- Bending springs
- Bending machine
- Steel tapes
- Draw wires
- Hack saws
- Drilling tools
- Stock and die
- Bench vice
- Machine vice
- PPE – hand gloves, dust coats, dust masks, helmets, ear muffs, industrial boots

Materials and supplies

- Stationery
- Cables
- Light fittings
- Accessories
- Conduits and fittings
- Cable trays
- Cable ducts
- Trunkings
- Computers
- Drawing instruments
- Screws

Reference materials

- IEE regulations
- Occupational safety and health act (OSHA)
- Work injury benefits act (WIBA)
- Manufacturers' catalogues
- British standards
- KEBS standards

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