

## PLAN ELECTRICAL INSTALLATION WORK

UNIT CODE: ENG/OS/EIT/CR/01/6/A

### UNIT DESCRIPTION

This unit covers the competencies required to plan electrical installation works. It is for Electrical Technicians involved in the different types of electrical installation and systems, ranging from simple to complex installations.

### ELEMENTS AND PERFORMANCE CRITERIA

<b>ELEMENT</b>  These describe the key outcomes which make up workplace function.	<b>PERFORMANCE CRITERIA</b>  These are assessable statements which specify the required level of performance for each of the elements.  <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Conduct site survey	1.1 The site is surveyed for suitability for the type of installation to be done as per the contract 1.2 Conditions of the site are evaluated according to the established procedures 1.3 The best location and route for the installation is identified as per design 1.4 Actual measurements are taken 1.5 Survey report is generated and shared with relevant parties according to the established procedures
2. Perform system sizing	2.1 Load estimation is conducted according to the set standard 2.2 Type and size of protective devices is determined according to IEE regulations 2.3 Cable sizes are calculated for the estimated loads according to IEE regulations 2.4 System sizes are recorded and shared as per established procedures
3. Prepare list of tools, equipment & materials	3.1 The necessary tools and equipment needed for the work are determined and list prepared as per established procedure 3.2 Tools and equipment are checked for correct specifications and functionality and list prepared as per established procedure 3.3 Materials needed for the work are determined and list prepared as per established procedure
4. Arrange logistics	4.1 Necessary logistics for the particular work and site is determined 4.2 Determined logistics are reported and arranged

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	<p>with the responsible party according to work schedule</p>
<p>5. Prepare installation work plan</p>	<p>5.1 Official request is made for installation drawings</p> <p>5.2 Installation drawing is acquired and deposited in a safe place as per established procedure</p> <p>5.3 The scope of installation work is identified</p> <p>5.4 All work is undertaken safely and to workplace procedures,</p> <p>5.5 National/County regulations and legislative requirements</p> <p>5.6 Working drawing is prepared in accordance with the design drawing</p> <p>5.7 Work schedule is prepared based on the scope and the working drawing</p>
<p>6. Establish installation team</p>	<p>6.1 Team members are identified according to the task</p> <p>6.2 Communication protocol is designed and distributed among the team members</p> <p>6.3 Responsibilities are established and distributed among the team members</p> <p>6.4 Team familiarization is done according to the established procedure</p>
<p>7. Acquire working permit</p>	<p>7.1 Type of permit to work is identified where applicable</p> <p>7.2 Permit to work issuing body is identified</p> <p>7.3 Permit to work form is filled and submitted to the responsible body</p>
<p>8. Prepare work site</p>	<p>8.1 Special work, hazard and safety requirements are identified</p> <p>8.2 Identified hazards and Safety issues are mitigated according to OSHA</p> <p>8.3 (Occupational Safety and Health Act</p> <p>8.4 Work plan is confirmed in accordance with legislative and regulatory requirements and standard operating procedures.</p> <p>8.5 Work site is prepared for accessibility of utilities</p>
<p>9. Prepare tenders and service contracts</p>	<p>9.1 Laws of contracts and tendering are adhered to types and forms of contracts are identified</p> <p>9.2 Type of tenders are identified</p>

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	<p>9.3 Tender estimating is performed in line with the tendering laws</p> <p>9.4 Statutory documents in contract and tendering are identified</p>

## RANGE

This section provides work environment and conditions to which the performance criteria apply. It allows for different work environment and situations that will affect performance.

Variable	Range
Installation may include but is not limited to:	<ul style="list-style-type: none"> <li>• Domestic installation</li> <li>• Commercial installation</li> <li>• Industrial Installation</li> <li>• Agriculture/ horticulture</li> <li>• Power Generator</li> <li>• Security</li> <li>• Water heating installations</li> <li>• Power transmission and distribution</li> <li>• IBMS (integrated building Management system)</li> </ul>
Established Procedures may include but is not limited to:	<ul style="list-style-type: none"> <li>• Company rules</li> <li>• Procedures mentioned in contract</li> </ul>
Design may include but is not limited to:	<ul style="list-style-type: none"> <li>• Electrical design for lighting and power</li> <li>• Electrical design for switchgear</li> <li>• Electrical design for alarm systems</li> </ul>
Standard may include but is not limited to:	<ul style="list-style-type: none"> <li>• IEE standard</li> <li>• British Standard</li> <li>• KEBS standard</li> <li>• 17th Edition</li> </ul>
Logistics includes but not limited to	<ul style="list-style-type: none"> <li>• Personnel, Finance and input materials</li> <li>• Transport and storage</li> <li>• Communications</li> </ul>

Variable	Range
	<ul style="list-style-type: none"> <li>• Security</li> </ul>
Specifications may include but is not limited to:	<ul style="list-style-type: none"> <li>• Make / model</li> <li>• Size</li> <li>• Class</li> <li>• Tolerance/ range</li> </ul>
Regulations and legislative requirements may include but is not limited to	<ul style="list-style-type: none"> <li>• KPLC procedures</li> <li>• County bylaws</li> <li>• Energy Act, 2006</li> <li>• National Construction Authority Act</li> <li>• 8.5 OSHA</li> </ul>
Work schedule may include but is not limited to:	<ul style="list-style-type: none"> <li>• Gant chart</li> <li>• Block</li> </ul>
Permit to work may include but is not limited to:	<ul style="list-style-type: none"> <li>• KPLC permit</li> <li>• Gate Pass</li> <li>• Daily work permit</li> <li>• Work Tag</li> </ul>
Utilities may include but is not limited to:	<ul style="list-style-type: none"> <li>• Water, electrical power, toilets and communication</li> </ul>

## REQUIRED KNOWLEDGE AND UNDERSTANDING

The individual needs to demonstrate knowledge and understanding of:

<ul style="list-style-type: none"> <li>• The manufacturer's warranty requirements relating to electrical installation systems and related components.</li> <li>• The legal requirements relating to electrical installation</li> <li>• Kenyan legislation and workplace procedures relevant to: Health and safety;</li> <li>• Environment (including waste disposal);</li> <li>• Appropriate personal protective equipment (PPE).</li> <li>• Workplace procedures for:</li> <li>• Work place communication;</li> <li>• Time management</li> </ul>	<ul style="list-style-type: none"> <li>• Communications (verbal and written)</li> <li>• Proficient in ICT</li> <li>• Time management</li> <li>• Problem solving</li> <li>• Negotiation</li> <li>• Decision making</li> <li>• First aid</li> <li>• Report writing</li> <li>• Planning</li> <li>• Contractual agreements</li> <li>• Necessary insurance and policies including security bonds, performance bonds, contractors</li> <li>• Preparing work plans in accordance with legislative and regulatory requirements and standard operating procedures and health and safety requirements</li> </ul>
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<ul style="list-style-type: none"> <li>• Materials management</li> <li>• The importance of documentation and keeping records</li> <li>• The relationship between time and costs</li> <li>• The use of technical information including:</li> <li>• Importance of contractual agreements</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• all risks</li> <li>• Insurance of contractors work</li> <li>• Keeping records of income</li> <li>• Financial statements</li> <li>• Interpreting circuits, drawings, specifications and instructions</li> <li>• The importance of using the correct sources of technical information.</li> </ul>
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## FOUNDATION SKILLS

The individual needs to demonstrate the following foundation skills:	
<ul style="list-style-type: none"> <li>• Communications (verbal and written)</li> <li>• Time management</li> <li>• Proficient in ICT</li> </ul>	<ul style="list-style-type: none"> <li>• Negotiation</li> <li>• Problem solving</li> <li>• Decision making</li> <li>• First aid</li> <li>• Report writing</li> <li>• Planning</li> </ul>

## EVIDENCE GUIDE

This provides advice on assessment and must be read in conjunction with the performance criteria, required skills and understanding and range.

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ol style="list-style-type: none"> <li>1.1 Applied work health and safety procedures</li> <li>1.2 Interpreted drawings correctly</li> <li>1.3 Applied appropriate standard</li> <li>1.4 Determined types and sizes of materials and equipment and protective devices</li> <li>1.5 Demonstrated knowledge of logistics to the given task</li> </ol>
2. Resource Implications	Resources the same as that of workplace are advised to be applied including. Measuring tape, pegs, calculator, stationery
3. Methods of Assessment	<p>Competency may be assessed through:</p> <ol style="list-style-type: none"> <li>3.1 Observation</li> <li>3.2 Oral questioning</li> <li>3.3 Written test</li> <li>3.4 Portfolio of Evidence</li> <li>3.5 Interview</li> <li>3.6 Third party report</li> </ol>

4. Context of Assessment	Competency may be assessed individually 4.1 In the actual workplace 4.2 Simulated environment of the work place
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.

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