

ELECTRICAL INSTALLATION WORK PLANNING

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

Relationship to Occupational Standards

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

Duration of Unit: 140 hours

Unit Description

This unit specifies the competencies required for planning an electrical installation, ranging from surveying the site to determining the system size to preparation of materials, tools, and drawings, and establishing the team required to prepare the work site.

Summary of Learning Outcomes

1. Conduct site survey
2. Perform system sizing
3. Prepare list of tools, equipment and materials
4. Arrange logistics
5. Obtain installation drawings
6. Prepare installation work plan
7. Establish installation team
8. Raise necessary permit and licences
9. Prepare work site

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
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Learning Outcome	Content	Suggested Assessment Methods
1. Conduct site survey	<ul style="list-style-type: none"> <input type="checkbox"/> Type of installations <ul style="list-style-type: none"> ➤ Domestic installations ➤ Industrial installations ➤ Commercial installations <input type="checkbox"/> Type of building e.g. <ul style="list-style-type: none"> ➤ Permanent building ➤ Semi-permanent buildings <input type="checkbox"/> Utilities available <ul style="list-style-type: none"> ➤ Water ➤ Electricity <input type="checkbox"/> Communication e.g. Phones <input type="checkbox"/> Installation conditions e.g. <ul style="list-style-type: none"> ➤ Temperature ➤ Humidity ➤ Moisture <input type="checkbox"/> Taking measurements on site <input type="checkbox"/> Length e.g. conduits size <ul style="list-style-type: none"> ➤ Total area ➤ Temperature 	<ul style="list-style-type: none"> • Written tests • Oral questioning • Observation • Practical tests
2. Perform system sizing	<ul style="list-style-type: none"> <input type="checkbox"/> Introduction to standards e.g. <ul style="list-style-type: none"> ➤ IEE regulations. ➤ Kenya bureau of standards (KEBS) ➤ British standards ➤ KPLC by-laws ➤ ERC regulations ➤ County by-laws ➤ National Construction Authority (NCA) <input type="checkbox"/> Reference to relevant IEE regulation tables <input type="checkbox"/> Determining cables: <ul style="list-style-type: none"> ➤ Types ➤ Ratings ➤ sizes ➤ Insulation type ➤ Protective devices ➤ Types ➤ Ratings 	<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. Prepare list of tools, equipment and materials	<input type="checkbox"/> Identification of tools and materials e.g. <ul style="list-style-type: none"> ➤ Cutting tools ➤ Measuring tools ➤ Measuring equipment ➤ Cables and conductors ➤ Crimping tools ➤ Conduits ➤ Trunking ➤ Consumables 	<input type="checkbox"/> Written tests <input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Practical tests
4. Plan for logistics	<input type="checkbox"/> Transport for: <ul style="list-style-type: none"> ➤ Materials and their safety ➤ Personnel <input type="checkbox"/> Storage of materials on site <input type="checkbox"/> Site security <input type="checkbox"/> Human resource <input type="checkbox"/> Skills required <input type="checkbox"/> Communication <input type="checkbox"/> Purpose <input type="checkbox"/> Modes	<input type="checkbox"/> Written tests <input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning
5. Prepare installation work plan	<input type="checkbox"/> Identification of scope of installation work <input type="checkbox"/> Preparation of work schedules <ul style="list-style-type: none"> ➤ Bar charts ➤ Gantt charts ➤ Critical path networks 	<input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Written tests
6. Establish installation team	<input type="checkbox"/> Team building <input type="checkbox"/> Team members <input type="checkbox"/> familiarization <input type="checkbox"/> Collaboration <input type="checkbox"/> Task distribution <input type="checkbox"/> Communication protocol	<input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Written tests
7. Raise the necessary permit and licences	<input type="checkbox"/> Meaning of terms <input type="checkbox"/> Permit to work <input type="checkbox"/> Types e.g. gate pass, name tag <input type="checkbox"/> Sources <input type="checkbox"/> Application procedure <input type="checkbox"/> Classes of ERC licences <input type="checkbox"/> C2, C1, B, A2, A1	<input type="checkbox"/> Observation <input type="checkbox"/> Oral questioning <input type="checkbox"/> Written tests

Learning Outcome	Content	Suggested Assessment Methods
8. Prepare work site	<input type="checkbox"/> Identification of hazards and safety requirements for the site <input type="checkbox"/> Reference to relevant regulations e.g. <input type="checkbox"/> Occupational Safety and Health Act (OSHA) <input type="checkbox"/> County by-laws <input type="checkbox"/> Utilities <ul style="list-style-type: none"> ➤ Access roads ➤ Water ➤ Electricity <input type="checkbox"/>	<input type="checkbox"/>
9. Prepare tenders and service contracts	<input type="checkbox"/> Sources of law Law of tort Laws of contract and tendering <input type="checkbox"/> Types and forms of contract <input type="checkbox"/> Types of tenders <input type="checkbox"/> Tender estimation and Sources of law <input type="checkbox"/> Law of tort <input type="checkbox"/> Laws of contract and <input type="checkbox"/> tendering <input type="checkbox"/> Types and forms of contract <input type="checkbox"/> Types of tenders <input type="checkbox"/> Tender estimation and costing <input type="checkbox"/> Statutory documents in contracts and tendering	<input type="checkbox"/>

Suggested Methods of Instruction

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

Recommended Resources

Tools

- Measuring tools

- Cutting tools

Equipment

- PPEs (Personal Protective Equipment)
- Measuring equipment
- Communication equipment

Materials and supplies

- Stationery
- Assorted Cables
- Assorted protective devices

Reference materials

- Standards
- County by-laws
- Occupational Safety and Health Act (OSHA)
 - National Environmental Management Authority (NEMA) regulations
 - National Construction Authority (NCA) regulations
 - IEE tables