

**REPUBLIC OF**



**KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**ELECTRICAL OPERATOR (POWER OPTION)**

**KNQF LEVEL 5**

**ISCED CODE: 07130554 B**



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## PREPARE AND INTERPRET TECHNICAL DRAWINGS

UNIT CODE: ENG/OS/PO/CC/04/5/B

### UNIT DESCRIPTION

This unit covers the competencies required to prepare and interpret technical drawings. It involves competencies to select; use and maintain drawing equipment and materials, producing plain geometry drawings, solid geometry drawings, pictorial and orthographic drawing, and producing electrical drawings.

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
These describe the key outcomes which make up workplace function.	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. Use and maintain drawing equipment and materials	1.1 <b><i>Drawing equipment</i></b> are identified and gathered according to task requirements 1.2 <b><i>Drawing materials</i></b> are identified and gathered according to task requirements 1.3 Drawing equipment are used and maintained as per manufacturer's instructions 1.4 Drawing materials are used as per workplace procedures 1.5 Waste materials are disposed in accordance with workplace procedures and <b><i>environmental legislations</i></b> 1.6 <b><i>Personal Protective Equipment</i></b> is used according to occupational safety and health regulations
2. Produce plane geometry drawings	2.1 Different types of lines used in drawing and their meanings are identified according to standard drawing conventions 2.2 Different types of <b><i>geometric forms</i></b> are constructed according to standard conventions 2.3 Different types of angles are constructed according to principles of trigonometry 2.4 Different types of angles are measured using appropriate measuring tools 2.5 Angles are bisected according to standard conventions 2.6 Freehand sketching of different types of geometric forms, tools, equipment, diagrams is conducted

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These describe the key outcomes which make up workplace function.	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>
3. Produce solid geometry drawings	3.1 Drawings of patterns are interpreted according to standard conventions 3.2 Patterns are developed in accordance with standard conventions
4. Produce orthographic and pictorial drawings	4.1 Symbols and abbreviations are identified and their meaning interpreted according to standard drawing conventions 4.2 First and third angle orthographic drawings are interpreted and produced in accordance with the standard conventions 4.3 Orthographic elevations are dimensioned in accordance with standard conventions 4.4 Isometric drawings are interpreted and produced in accordance with standard conventions 4.5 Assembly drawing is produced and interpreted in line with the operating standards
5. Produce electrical drawings	2.1 Electrical symbols and abbreviations are identified and their meaning interpreted according to BS 3939 2.2 <b><i>Electrical drawings</i></b> are produced in accordance with BS 3939

## **RANGE**

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

<b>Variable</b>	<b>Range</b>
1. Drawing equipment may include but is not limited to:	<ul style="list-style-type: none"> <li>• Drawing boards, T and set squares, drawing sets</li> </ul>
2. Drawing materials may include but is not limited to:	<ul style="list-style-type: none"> <li>• Drawing papers, pencils, erasers, masking tapes, paper clips</li> </ul>
3. Environmental legislations may include but is not limited to:	<ul style="list-style-type: none"> <li>• EMCA 1999</li> </ul>

4. Personal Protective Equipment may include but is not limited to:	<ul style="list-style-type: none"> <li>• Dust coats, closed leather shoes</li> </ul>
5. Geometric forms may include but is not limited to:	<ul style="list-style-type: none"> <li>• Circles, triangles, rectangles, parallelogram, polygons, pyramids, conic sections, prisms, loci</li> </ul>
6. Standard conventions may include but is not limited to:	<ul style="list-style-type: none"> <li>• Anatomy of engineering drawing (title block, coordinate grid system, revision block, notes and legends)</li> <li>• Drawing scale (paper size and drawing symbols)</li> <li>• International drawing standards</li> </ul>
7. Electrical drawings may include but is not limited to:	<ul style="list-style-type: none"> <li>• Block, schematic, circuit, line and wiring diagrams</li> </ul>

## REQUIRED SKILLS AND KNOWLEDGE

This section describes the skills and knowledge required for this unit of competency.

### Required skills

The individual needs to demonstrate the following skills:

- Critical thinking
- Drawing
- Interpretation
- Drawing equipment handling
- Analysis and synthesis
- Communication
- Inter personal

### Required knowledge

The individual needs to demonstrate knowledge of:

- Drawing equipment and materials
- Freehand sketching
- Lettering
- Geometrical constructions
- Types of drawings
- Types of lines
- Isometric drawing conventions, features, characteristics, components
- Orthographic drawing conventions, features, characteristics, components
- Sketches and drawings of simple patterns

## EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Applied and adhered to safety procedures 1.2 Cared and maintained drawing equipment 1.3 Interpreted circuit, assembly and lay out diagrams 1.4 Applied appropriate technical standards, used proper tools and equipment for a given task 1.5 Produced sketches and drawings 1.6 Produced electrical drawings
2. Resource Implications	Resources the same as that of workplace are advised to be applied. 2.1 Drawing room 2.2 Drawing equipment and materials 2.3 Computers
3. Methods of Assessment	Competency may be assessed through: 3.1 Practical tests 3.2 Observation
4. Context of Assessment	Competency may be assessed individually in the actual workplace or a simulated work place setting
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.