



**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**ELECTRICAL INSTALLATION ARTISAN**

**KNQF LEVEL 4**

**ISCED OCCUPATIONAL STANDARD CODE:07130454B**



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## PREPARE AND INTERPRET TECHNICAL DRAWINGS

UNIT CODE: ENG/OS/EI/CC/04/4/B

### UNIT DESCRIPTION

This unit covers the competencies required to prepare and interpret technical drawings. It involves selecting and using and maintaining drawing tools, equipment and materials, producing plane geometry drawings, producing solid geometry drawings, producing electrical drawings

### ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT These describe the key outcomes which make up workplace function.	PERFORMANCE CRITERIA 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. Select, use and maintain drawing tools equipment and materials	1. 1 <b><i>Drawing tools and 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 geometry 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
3. Produce solid geometry drawings	3.1 Drawings of patterns are interpreted according to standard conventions

<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>
	3.2 Patterns are developed in accordance with standard conventions 3.3 Patterns are assembled as per standard conventions 3.4 Pattern assembly is interpreted as per standard conventions
4. Produce orthographic drawings	4.1 Pictorial and orthographic drawings are produced according to job requirements. 4.2 Sectioning of orthographic drawing is performed according to BS 3939 4.3 Symbols and abbreviations are inserted according to job requirements. 4.4 Drawing and interpretation of orthographic elevations is performed according to job requirements. 4.5 Dimensioning of orthographic elevations is carried out according to BS 3939 4.6 Orthographic drawing is assembled according to BS 3939
5. Produce electrical drawings	1.1 Electrical symbols and abbreviations are identified and their meaning interpreted according to BS 3939 1.2 Electrical diagrams and drawings are developed as per established standards 1.3 <b><i>Electrical drawings</i></b> are produced in accordance with BS 3939 1.4 Electrical drawings and diagrams are interpreted as per established standards 1.5 Performed CAD drawing per standard operating procedure

## 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 tools and equipment may include but not limited to;	<ul style="list-style-type: none"> <li>• Drawing boards</li> <li>• square</li> <li>• Set squares</li> <li>• Drawing sets</li> <li>• Pencils</li> </ul>
2. Drawing materials may include but not limited to	<ul style="list-style-type: none"> <li>• Drawing papers</li> <li>• Pencils</li> <li>• Erasers,</li> <li>• Masking tapes</li> </ul>
3. Environmental legislation	<ul style="list-style-type: none"> <li>• EMCA 1999</li> </ul>
4. Personal Protective Equipment may include but not limited to	<ul style="list-style-type: none"> <li>• Dust coats</li> </ul>
5. Geometric forms may include but not limited to	<ul style="list-style-type: none"> <li>• Triangles</li> <li>• Square</li> <li>• Rectangles</li> <li>• Parallelogram</li> <li>• Polygons</li> <li>• Circles</li> <li>• Pyramids</li> <li>• Conic sections,</li> <li>• Prisms</li> <li>• Ellipse</li> <li>• Parabola</li> <li>• Hyperbola</li> </ul>
6. Standard conventions	<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. Drawings may include but not limited to:	<ul style="list-style-type: none"> <li>• Block</li> <li>• Schematic,</li> <li>• Circuit,</li> <li>• Line 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
- Using and maintenance of drawing tools and instruments
- Interpretation
- Analysis and synthesis
- Freehand sketching
- Communication
- Inter personal

### **Required knowledge**

The individual needs to demonstrate knowledge of:

- Drawing equipment and materials
- 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
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

3. Methods of Assessment	Competency may be assessed through: 3.1 Practical tests 3.2 Observation 3.3 Written tests 3.4 Oral questioning
4. Context of Assessment	Competency may be assessed individually: 4.1 On-the-job, 4.2 Off-the-job or a combination of these. 4.3 During industrial attachment
5. Guidance information for assessment	Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.