



THE
REPUBLIC OF KENYA
NATIONAL OCCUPATIONAL STANDARDS
FOR
ARCHITECTURAL DRAFTSMAN
LEVEL 5



TVET CDACC
P.O BOX 15745-00100
NAIROBI

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FOREWORD

The provision of quality education and training is fundamental to the Government's overall strategy for social economic development. Quality education and training will contribute to achievement of Kenya's development blueprint, Vision 2030 and sustainable development goals.

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution of Kenya 2010 and this resulted in the formulation of the Policy Framework for Reforming Education and Training. A key feature of this policy is the radical change in the design and delivery of the TVET training. This policy document requires that training in TVET be competency based, Curriculum development be industry led, certification be based on demonstration of competence and mode of delivery allows for multiple entry and exit in TVET programmes.

These reforms demand that Industry takes a leading role in Curriculum development to ensure the Curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for the purpose of developing a competency-based Curriculum for Architectural Draftsmanship. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards development of competent human resource for the Construction sector's growth and sustainable development.

**PRINCIPAL SECRETARY, VOCATIONAL AND TECHNICAL TRAINING
MINISTRY OF EDUCATION**

PREFACE

Kenya Vision 2030 aims to transform the country into a newly industrializing, “middle-income country providing a high-quality life to all its citizens by the year 2030”. Kenya intends to create a globally competitive and adaptive human resource base to meet the requirements of a rapidly industrializing economy through life-long education and training. TVET has a responsibility of facilitating the process of inculcating knowledge, skills and attitudes necessary for catapulting the nation to a globally competitive country, hence the paradigm shift to embrace Competency Based Education and Training (CBET).

The Technical and Vocational Education and Training Act No. 29 of 2013 on Reforming Education and Training in Kenya, emphasized the need to reform Curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Construction Sector Skills Advisory Committee (SSAC) have developed these Occupational Standards for an architectural draftsman. These standards will be the basis for development of competency-based Curriculum for Architectural Draftsmanship level 5.

The Occupational Standards are designed and organized with clear performance criteria for each element of a unit of competency. These standards also outline the required knowledge and skills as well as evidence guide.

I am grateful to the Council Members, Council Secretariat, Construction SSAC, expert workers and all those who participated in the development of these Occupational Standards.

CHAIRPERSON, TVET CDACC

ACKNOWLEDGMENT

These Occupational Standards were developed through combined efforts of various stakeholders from private and public organizations. I am thankful to the management of the organizations for allowing their staff to participate in this course. I wish to acknowledge the invaluable contribution of industry players who provided inputs towards the development of these Standards.

I thank TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) for providing guidance on the development of these Standards. My gratitude goes to Construction Sector Skills Advisory Committee (SSAC) members for their contribution to the development of these Standards. I thank all the individuals and organizations who participated in the validation of these Standards.

I acknowledge all other institutions which in one way or another contributed to the development of these Standards.

CHAIRMAN

CONSTRUCTION SECTOR SKILLS ADVISORY COMMITTEE

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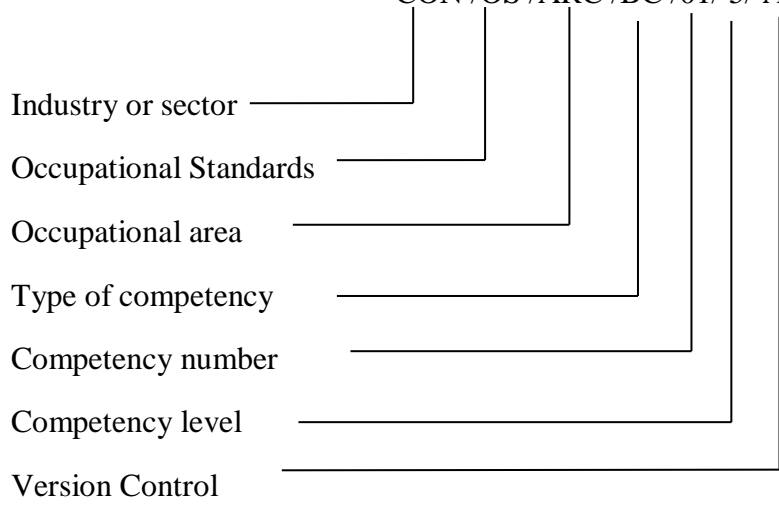
ABBREVIATIONS AND ACRONYMS

ARC	: Architecture
BC	: Basic competency
CC	: Common competency
CDACC	: Curriculum Development Assessment and Certification Council
CON	: Construction
CR	: Core competency
HVAC	: Heating Ventilation Air Conditioning
ICT	: Information Communication Technology
MoE	: Ministry of Education
NCA	: National Construction Authority
NEMA	: National Environmental Management Authority
OS	: Occupational Standards
OSH	: Occupation Safety and Health
OSHA	: Occupation Safety and Health Act
OSHS	: Occupational Safety and Health Standards
PPE	: Personal Protective Equipment
SSAC	: Sector Skills Advisory Committee
TVET	: Technical and Vocational Education and Training

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KEY TO UNIT CODE

CON / OS / ARC / BC / 01 / 5 / A



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OVERVIEW

This course consists of competencies required by an architectural draftsman to detail architectural projects, produce architectural perspectives, produce architectural models and install building finishes and fittings.

It consists of the following units of competencies:

BASIC UNITS OF COMPETENCY

UNIT OF COMPETENCY CODE	UNIT OF COMPETENCY TITLE
CON/OS/ARC/BC/01/5/A	Demonstrate communication skills
CON/OS/ARC/BC/02/5/A	Demonstrate numeracy skills
CON/OS/ARC/BC/03/5/A	Demonstrate digital literacy
CON/OS/ARC/BC/04/5/A	Demonstrate entrepreneurial skills
CON/OS/ARC/BC/05/5/A	Demonstrate employability skills
CON/OS/ARC/BC/06/5/A	Demonstrate environmental literacy
CON/OS/ARC/BC/07/5/A	Demonstrate occupational safety and health practices

COMMON UNITS OF COMPETENCY

UNIT OF COMPETENCY CODE	UNIT OF COMPETENCY TITLE
CON/OS/ARC/CC/01/5/A	Apply mathematical skills
CON/OS/ARC/CC/02/5/A	Prepare and interpret technical drawings
CON/OS/ARC/CC/03/5/A	Apply workshop technology practices
CON/OS/ARC/CC/04/5/A	Apply principles of building technology

CORE UNITS OF COMPETENCIES

UNIT OF COMPETENCY CODE	UNIT OF COMPETENCY TITLE
CON/OS/ ARC /CR /01/5/A	Detail architectural projects
CON/OS/ ARC /CR/02/5/A	Produce architectural perspectives
CON/OS/ ARC /CR/03/5/A	Produce architectural models
CON/OS/ ARC /CR/04/5/A	Install building finishes and fittings

BASIC UNITS OF COMPETENCY

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DEMONSTRATE COMMUNICATION SKILLS

UNIT CODE: CON/OS/ARC/BC/01/5/A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, contributing to the development of communication strategies, conducting workplace interviews, facilitating group discussions and representing the organisation

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 italicized terms are elaborated in the Range</i>
1. Meet communication needs of clients and colleagues	1.1 Specific communication needs of clients and colleagues are identified and met based on workplace requirements 1.2 Different communication approaches are identified and applied according to clients' needs 1.3 Conflict is identified and addressed as per the standards of the organization
2. Contribute to the development of communication strategies	2.1 Strategies for internal and external dissemination of information are developed, promoted, implemented and reviewed as per organizations' strategic plan 2.2 Channels of communication are established and reviewed based on the workplace needs 2.3 Communication training needs are identified and provided according to SOPs 2.4 Work related network and relationship are maintained based on workplace requirements 2.5 Negotiation and conflict resolution strategies are maintained as per the workplace procedures
3. Conduct workplace interviews	3.1 <i>Communication strategies</i> are identified and employed in <i>interview situations</i> based on workplace requirements 3.2 Records of interviews are made and maintained in accordance with organizational procedures

	3.3 Effective questioning, listening and nonverbal communication techniques are used based on needs
4. Facilitate group discussions	<p>4.1 Mechanisms to enhance <i>effective group interaction</i> are identified and implemented according to workplace requirements</p> <p>4.2 Strategies to encourage group participation are identified and used as per organizations' procedures</p> <p>4.3 Meetings objectives and agenda are set and followed based on workplace requirements</p> <p>4.4 Relevant information is provided and feedback obtained according to set protocols</p> <p>4.5 Evaluation of group communication strategies is undertaken in accordance with workplace guidelines</p> <p>4.6 Specific communication needs of individuals are identified and addressed as per individual needs</p>
5. Represent the organization	<p>5.1 Relevant presentation are researched and presented based on internal or external communication forums requirements Presentation is delivered in a clear and sequential manner as per the predetermined time</p> <p>5.2 Presentation is made as per appropriate media</p> <p>5.3 Difference views are respected based on workplace procedures</p> <p>5.4 Written communication is done as per organizational standards</p> <p>5.5 Inquiries are responded according to organizational standard</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
1. Communication strategies may include but not limited to:	<ul style="list-style-type: none"> • Language switch • Comprehension check • Repetition • Asking confirmation • Paraphrase • Clarification request • Translation

	<ul style="list-style-type: none"> • Restructuring • Approximation • Generalization
2. Effective group interaction may include but not limited to:	<ul style="list-style-type: none"> • Identifying and evaluating what is occurring within an interaction in a non-judgmental way • Using active listening • Making decision about appropriate words, behavior • Putting together response which is culturally appropriate • Expressing an individual perspective • Expressing own philosophy, ideology and background and exploring impact with relevance to communication • Openness and flexibility in communication
3. Interview situations may include but not limited to:	<ul style="list-style-type: none"> • Establishing rapport • Eliciting facts and information • Facilitating resolution of issues • Developing action plans • Diffusing potentially difficult situations

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:

- Active listening
- Giving/receiving feedback
- Interpretation of information
- Role boundaries setting
- Negotiation
- Communication

Required Knowledge

The individual needs to demonstrate knowledge of:

- Communication process

- Dynamics of groups and different styles of group leadership
- Communication skills relevant to client groups
- Flexibility in communication

EVIDENCE GUIDE

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

1. Critical aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> 1.1 Met communication needs of clients and colleagues 1.2 Contributed to the development of communication strategies 1.3 Conducted interviews 1.4 Facilitated group discussions 1.5 Represented the organization
2. Resource Implications	The following resources should be provided: <ul style="list-style-type: none"> 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
4. Context of Assessment	Competency may be assessed: <ul style="list-style-type: none"> 4.1 On the job 4.2 Off the job 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.

DEMONSTRATE NUMERACY SKILLS

UNIT CODE: CON/OS/ARC/BC/02/5/A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate numeracy skills. It involves calculating with whole numbers and familiar fractions, decimals, and percentages for work, estimating, measuring, and calculating with routine metric measurements for work, using routine maps and plans for work, interpreting, drawing and constructing 2D and 3D shapes for work, interpreting routine tables, graphs and charts for work, collecting data and constructing routine tables and graphs for work and using basic functions of calculator.

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 italicized terms are elaborated in the Range.</i>
1. Calculate with whole numbers and familiar fractions, decimals and percentages for work	1.1 Mathematical information that may be partly embedded in routine workplace tasks and texts is selected and interpreted as per SOPs 1.2 Whole numbers and routine or familiar fractions, decimals and percentages including familiar rates are interpreted and comprehended as per SOPs 1.3 Calculations which may involve a number of steps are performed as per SOPs 1.4 Calculations done with whole numbers and routine or familiar fractions, decimals and percentages as per SOPs 1.5 Conversion between equivalent forms of fractions, decimals and percentages is done as per SOPs 1.6 Order of operations is applied to solve multi-step calculations as per SOPs 1.7 Problem solving strategies are appropriately applied as per SOPs 1.8 Estimations are made to check reasonableness of problem solving process, outcome and its appropriateness to the context and task as per SOPs

	<p>1.9 Formal and informal mathematical language and symbolism are used to communicate the result of the task as per SOPs.</p>
<p>2. Estimate, measure, and calculate with routine metric measurements for work</p>	<p>2.1 Measurement information in workplace tasks and texts are selected and interpreted in accordance with workplace requirements</p> <p>2.2 Appropriate routine measuring equipment are identified and selected in accordance with workplace requirements</p> <p>2.3 Measurements are estimated and made using correct units as per measurement manuals.</p> <p>2.4 Estimations and calculations done as per routine measurements</p> <p>2.5 Conversions performed routinely as per metric units</p> <p>2.6 Problem solving processes are used to undertake the tasks as per workplace procedures.</p> <p>2.7 Estimations are made to check reasonableness of problem solving process, outcome and its appropriateness to the context and task as per workplace procedures</p> <p>2.8 Information is recorded using mathematical language and symbols appropriate to discuss the task as per workplace procedures.</p>
<p>3. Use routine maps and plans for work</p>	<p>3.1 Features are identified in routine maps and plans as per SOPs</p> <p>3.2 Symbols and keys in routine maps and plans are clearly explained as per SOPs</p> <p>3.3 Orientation of map to North is identified and interpreted as per SOPs</p> <p>3.4 Understanding of direction and location is clearly demonstrated as per SOPs</p> <p>3.5 Simple scale is applied to estimate length of objects, or distance to location or object as per SOPs</p> <p>3.6 Directions are given and received using both formal and informal language as per SOPs</p>
<p>4. Interpret, draw and construct 2D and 3D shapes for work</p>	<p>4.1 Two dimensional shapes and routine three dimensional shapes identified in everyday objects and in different orientations in accordance with job specifications</p> <p>4.2 The use and application of shapes elaborately explained as per SOPs</p>

	<p>4.3 Formal and informal mathematical language and symbols used to describe and compare the features of two dimensional shapes and routine three dimensional shapes as per workplace procedures.</p> <p>4.4 Common angles identified in accordance with SOPs</p> <p>4.5 Common angles in everyday objects are appropriately estimated as per SOPs</p> <p>4.6 Formal and informal mathematical language are used to describe and compare common angles as per workplace procedures.</p> <p>4.7 Common geometric instruments used to draw two dimensional shapes as per SOPs</p> <p>4.8 Routine three dimensional objects constructed from given nets as per SOPs.</p>
<p>5. Interpret routine tables, graphs and charts for work</p>	<p>5.1 Routine tables, graphs and charts identified in predominately familiar texts and contexts as per tables and graph manuals</p> <p>5.2 Common types of graphs and their different uses identified as per SOPs</p> <p>5.3 Features of tables, graphs and charts identified as per workplace procedures</p> <p>5.4 Information in routine tables, graphs and charts located and interpreted as per workplace procedures</p> <p>5.5 Calculations are perform to interpret information as per SOPs</p> <p>5.6 How statistics can inform and persuade interpretations is explained as per SOPs</p> <p>5.7 Misleading statistical information is identified as per workplace procedures.</p> <p>5.8 Information relevant to the workplace is discussed as per workplace procedures.</p>
<p>6. Collect data and construct routine tables and graphs for work</p>	<p>6.1 Features of common tables and graphs identified as per SOPs</p> <p>6.2 Uses of <i>different tables and graphs</i> identified as per job specifications</p> <p>6.3 Data and variables to be collected are determined as per workplace procedures.</p> <p>6.4 The audience is determined as per the workplace procedures</p> <p>6.5 Method of data collection is select as per job requirement</p> <p>6.6 Data is collected as per SOPs</p> <p>6.7 Information is collated in a table as per SOPs</p>

	<p>6.8 Suitable scale and axes determined as per job specifications</p> <p>6.9 Graph to present information is drafted and drawn as per SOPs</p> <p>6.10 Data checked to ensure that it meets the expected results and context as per workplace procedures</p> <p>6.11 Information is reported or discussed using formal and informal mathematical language as per workplace procedures</p>
7. Use basic functions of calculator	<p>7.1 Keys are identified and used for <i>basic functions on a calculator</i> as per SOPs</p> <p>7.2 Calculation is done using whole numbers, money and routine decimals and percentages as per SOPs</p> <p>7.3 Calculation done with routine fractions and percentages as per SOPs</p> <p>7.4 Order of operations is applied to solve multi-step calculations as per SOPs</p> <p>7.5 Results are interpreted, displayed and recorded as per workplace procedures</p> <p>7.6 Estimations are made to check reasonableness of problem solving process, outcome and its appropriateness to the context and task as per workplace procedures</p> <p>7.7 Formal and informal mathematical language and appropriate symbolism and conventions used to communicate the result of the task as per workplace procedures.</p>

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.

Variable	Range
1. Use basic functions of calculator may include but not limited to:	<ul style="list-style-type: none"> • Addition • Multiplication • Calculate ratios • Conversion of ratios into percentages

2. Different tables and graphs may include but not limited to:	<ul style="list-style-type: none"> • Bar Graphs • Flow Charts • Pie Charts • Pictograph • Line Graphs • Time Series Graphs • Stem and Leaf Plot • Histogram • Dot Plot • Scatter plot

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:

- Measuring
- Logical thinking
- Computing
- Drawing of graphs
- Applying mathematical formulas
- Analytical

Required knowledge

The individual needs to demonstrate knowledge of:

- Types of common shapes
- Differentiation between two dimensional shapes / objects
- Formulae for calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Fundamental operations (addition, subtraction, division, multiplication)
- Rounding techniques
- Types of fractions
- Different types of tables and graphs

- Meaning of graphs, such as increasing, decreasing, and constant value
- Preparation of basic data, tables & graphs

EVIDENCE GUIDE

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

<p>1. Critical aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Calculated correctly with whole numbers and routine or familiar fractions, decimals and percentages 1.2 Estimated, measured and calculated with routine metric measurements 1.3 Applied simple scale to estimate length of objects or distance to location or object 1.4 Used formal and informal mathematical language to describe and compare common angles 1.5 Used common geometric instruments to draw two dimensional shapes 1.6 Collected data and constructed routine tables and graphs 1.7 Used basic functions of calculator correctly
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview 3.6 Third party report
<p>4. Context of Assessment</p>	<p>Competency may be assessed in:</p> <ul style="list-style-type: none"> 4.1 On the job 4.2 Off the job 4.3 Industrial attachment
<p>5. Guidance information for</p>	<p>Holistic assessment with other units relevant to the</p>

assessment	industry sector, workplace and job role is recommended.
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DEMONSTRATE DIGITAL LITERACY

UNIT CODE: CON/OS/ARC/BC/03/5/A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate digital literacy. It involves identifying appropriate computer software and hardware, applying security measures to data, hardware, software in automated environment, applying computer software in solving tasks, applying internet and email in communication at workplace, applying desktop publishing in official assignment and preparing presentation packages.

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 italicized terms are elaborated in the Range</i>
1. Identify appropriate computer software and hardware	1.1 Concepts of ICT are determined in accordance with computer equipment 1.2 Classifications of computers are determined in accordance with manufacturers specification 1.3 <i>Appropriate computer software</i> is identified according to manufacturer's specification 1.4 <i>Appropriate computer hardware</i> is identified according to manufacturer's specification 1.5 Functions and commands of operating system are determined in accordance with manufacturer's specification
2. Apply security measures to data, hardware, software in automated environment	2.1 <i>Data security and privacy are classified</i> in accordance with the prevailing technology 2.2 <i>Security threats</i> are identified, <i>and control measures</i> are applied in accordance with laws governing protection of ICT 2.3 Computer threats and crimes are detected in accordance with Information security management guidelines 2.4 Protection against computer crimes is undertaken in accordance with laws governing protection of ICT

<p>3. Apply computer software in solving tasks</p>	<p>3.1 Word processing concepts are applied in resolving workplace tasks, report writing and documentation as per job requirements</p> <p>3.2 Word processing utilities are applied in accordance with workplace procedures</p> <p>3.3 Worksheet layout is prepared in accordance with work procedures</p> <p>3.4 Worksheet is build and data manipulated in the worksheet in accordance with workplace procedures</p> <p>3.5 Continuous data manipulated on worksheet is undertaken in accordance with work requirements</p> <p>3.6 Database design and manipulation is undertaken in accordance with office procedures</p> <p>3.7 Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures</p>
<p>4. Apply internet and email in communication at workplace</p>	<p>4.1 Electronic mail addresses are opened and applied in workplace communication in accordance with office policy</p> <p>4.2 Office internet functions are defined and executed in accordance with office procedures</p> <p>4.3 Network configuration is determined in accordance with office operations procedures</p> <p>4.4 Official World Wide Web is installed and managed according to workplace procedures</p>
<p>5. Apply desktop publishing in official assignments</p>	<p>5.1 Desktop publishing functions and tools are identified in accordance with manufactures specifications</p> <p>5.2 Desktop publishing tools are developed in accordance with work requirements</p> <p>5.3 Desktop publishing tools are applied in accordance with workplace requirements</p> <p>5.4 Typeset work is enhanced in accordance with workplace standards</p>
<p>6. Prepare presentation packages</p>	<p>6.1 Types of presentation packages are identified in accordance with office requirements</p> <p>6.2 Slides are created and formulated in accordance with workplace procedures</p> <p>6.3 Slides are edited and run in accordance with work procedures</p> <p>6.4 Slides and handouts are printed according to work requirements</p>

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.

Variable	Range
1. Appropriate computer hardware may include but not limited to:	<ul style="list-style-type: none"> • Computer case • Monitor • keyboard • mouse
2. Data security and privacy may include but not limited to:	<ul style="list-style-type: none"> • Confidentiality of data • Cloud computing • Integrity -but-curious data surfing
3. Security and control measures may include but not limited to:	<ul style="list-style-type: none"> • Counter measures against cyber terrorism • Risk reduction • Cyber threat issues • Risk management • Pass wording
4. Security threats may include but not limited to:	<ul style="list-style-type: none"> • Cyber terrorism • Hacking

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:

- Analytical skills
- Interpretation
- Typing
- Communication
- Basic ICT skills

Required Knowledge

The individual needs to demonstrate knowledge of:

- Software concept
- Functions of computer software and hardware
- Data security and privacy
- Computer security threats and control measures
- Technology underlying cyber-attacks and networks
- Cyber terrorism
- Computer crimes
- Detection and protection of computer crimes
- Laws governing protection of ICT
- Microsoft suite

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified and controlled security threats 1.2 Detected and protected computer crimes 1.3 Applied word processing in office tasks 1.4 Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures 1.5 Opened electronic mail for office communication as per workplace procedure 1.6 Installed internet and World Wide Web for office tasks in accordance with office procedures 1.7 Integrated emerging issues in computer ICT applications 1.8 Applied laws governing protection of ICT
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Tablets 2.2 Laptops 2.3 Desktop computers 2.4 Calculators 2.5 Internet 2.6 Smart phones 2.7 Operation Manuals
<p>3. Methods of Assessment</p>	<p>Competency may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Written Test 3.2 Observation 3.3 Practical assignment

	3.4 Interview/Oral Questioning
4. Context of Assessment	Competency may be assessed in: 4.1 Off the job 4.2 On the job setting 4.3 Industrial attachment
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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DEMONSTRATE ENTREPRENEURIAL SKILLS

UNIT CODE : CON/OS/ARC/BC/04/5/A

UNIT DESCRIPTION

This unit covers the competencies required to demonstrate understanding of entrepreneurship. It involves demonstrating understanding of an entrepreneur, entrepreneurship, and self-employment, identifying entrepreneurship opportunities, creating entrepreneurial awareness, applying entrepreneurial motivation, developing business innovative strategies and developing business plan.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT	PERFORMANCE CRITERIA
1. Demonstrate understanding of an Entrepreneur	<p>1.1 Entrepreneurs and Businesspersons are distinguished as per principles of entrepreneurship</p> <p>1.2 <i>Types of entrepreneurs</i> are identified as per principles of entrepreneurship</p> <p>1.3 Ways of becoming an Entrepreneur are identified as per principles of Entrepreneurship</p> <p>1.4 <i>Characteristics of Entrepreneurs</i> are identified as per principles of Entrepreneurship</p> <p>1.5 Factors affecting Entrepreneurship development are explored as per principles of Entrepreneurship</p>
2. Demonstrate understanding of Entrepreneurship and self-employment	<p>2.1 Entrepreneurship and self-employment are distinguished as per principles of entrepreneurship</p> <p>2.2 Importance of self-employment is analysed based on business procedures and strategies</p> <p>2.3 <i>Requirements for entry into self-employment</i> are identified according to business procedures and strategies</p> <p>2.4 Role of an Entrepreneur in business is determined according to business procedures and strategies</p> <p>2.5 Contributions of Entrepreneurs to National development are identified as per business procedures and strategies</p> <p>2.6 Entrepreneurship culture in Kenya is</p>

	<p>explored as per business procedures and strategies</p> <p>2.7 Born or made Entrepreneurs are distinguished as per entrepreneurial traits</p>
3. Identify Entrepreneurship opportunities	<p>3.1 Sources of business ideas are identified as per business procedures and strategies</p> <p>3.2 Business ideas and opportunities are generated as per business procedures and strategies</p> <p>3.3 Business life cycle is analysed as per business procedures and strategies</p> <p>3.4 Legal aspects of business are identified as per procedures and strategies</p> <p>3.5 Product demand is assessed as per market strategies</p> <p>3.6 Types of business environment are identified and evaluated as per business procedures</p> <p>3.7 Factors to consider when evaluating business environment are explored based on business procedure and strategies</p> <p>3.8 Technology in business is incorporated as per best practice</p>
4. Create entrepreneurial awareness	<p>4.1 Forms of businesses are explored as per business procedures and strategies</p> <p>4.2 Sources of business finance are identified as per business procedures and strategies</p> <p>4.3 Factors in selecting source of business finance are identified as per business procedures and strategies</p> <p>4.4 Governing policies on Small Scale Enterprises (SSEs) are determined as per business procedures and strategies</p> <p>4.5 Problems of starting and operating SSEs are explored as per business procedures and strategies</p>
5. Apply entrepreneurial motivation	<p>5.1 Internal and external motivation factors are determined in accordance with motivational theories</p> <p>5.2 Self-assessment is carried out as per entrepreneurial orientation</p> <p>5.3 Effective communications are carried out in accordance with communication principles</p>

	5.4 Entrepreneurial motivation is applied as per motivational theories
6. Develop innovative business strategies	<p>6.1 Business innovation strategies are determined in accordance with the organization strategies</p> <p>6.2 Creativity in business development is demonstrated in accordance with business strategies</p> <p>6.3 <i>Innovative business strategies</i> are developed as per business principles</p> <p>6.4 Linkages with other entrepreneurs are created as per best practice</p> <p>6.5 ICT is incorporated in business growth and development as per best practice</p>
7. Develop Business Plan	<p>7.1 Identified Business is described as per business procedures and strategies</p> <p>7.2 Marketing plan is developed as per business plan format</p> <p>7.3 Organizational/Management plan is prepared in accordance with business plan format</p> <p>7.4 Production/operation plan in accordance with business plan format</p> <p>7.5 Financial plan is prepared in accordance with the business plan format</p> <p>7.6 Executive summary is prepared in accordance with business plan format</p> <p>7.7 Business plan is presented as per best practice</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.

1. Variable	Range
2. Types of entrepreneurs may include but not limited to:	<ul style="list-style-type: none"> • Innovators • Imitators • Craft • Opportunistic • Speculators
3. Characteristics of Entrepreneurs	<ul style="list-style-type: none"> • Creative

may include but not limited to:	<ul style="list-style-type: none"> • Innovative • Planner • Risk taker • Networker • Confident • Flexible • Persistent • Patient • Independent • Future oriented • Goal oriented
4. Requirements for entry into self-employment may include but not limited to	<ul style="list-style-type: none"> • Technical skills • Management skills • Entrepreneurial skills • Resources • Infrastructure
5. Internal and external motivation may include but not limited to:	<ul style="list-style-type: none"> • Interest • Passion • Freedom • Prestige • Rewards • Punishment • Enabling environment • Government policies
6. Business environment may include but not limited to:	<ul style="list-style-type: none"> • External • Internal • Intermediate
7. Forms of businesses may include but not limited to:	<ul style="list-style-type: none"> • Sole proprietorship • Partnership • Limited companies • Cooperatives
8. Governing policies may include but not limited to:	<ul style="list-style-type: none"> • Increasing scope for finance • Promoting cooperation between entrepreneurs and private sector • Reducing regulatory burden on entrepreneurs • Developing IT tools for entrepreneurs
9. Innovative business strategies may include but not limited to:	<ul style="list-style-type: none"> • New products • New methods of production

	<ul style="list-style-type: none"> • New markets • New sources of supplies • Change in industrialization
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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:

- Analytical
- Management
- Problem-solving
- Root-cause analysis
- Communication

Required Knowledge

The individual needs to demonstrate knowledge of:

- Decision making
- Business communication
- Change management
- Competition
- Risk
- Net working
- Time management
- Leadership
- Factors affecting entrepreneurship development
- Principles of Entrepreneurship
- Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
- Conflict resolution
- Health, safety and environment (HSE) principles and requirements
- Customer care strategies
- Basic financial management
- Business strategic planning

- Impact of change on individuals, groups and industries
- Government and regulatory processes
- Local and international market trends
- Product promotion strategies
- Market and feasibility studies
- Government and regulatory processes
- Local and international business environment
- Relevant developments in other industries
- Regional/ County business expansion strategies

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Distinguished entrepreneurs and business persons correctly</p> <p>1.2 Identified ways of becoming an entrepreneur appropriately</p> <p>1.3 Explored factors affecting entrepreneurship development appropriately</p> <p>1.4 Analysed importance of self-employment accurately</p> <p>1.5 Identified requirements for entry into self-employment correctly</p> <p>1.6 Identified sources of business ideas correctly</p> <p>1.7 Generated Business ideas and opportunities correctly</p> <p>1.8 Analysed business life cycle accurately</p> <p>1.9 Identified legal aspects of business correctly</p> <p>1.10 Assessed product demand accurately</p> <p>1.11 Determined Internal and external motivation factors appropriately</p> <p>1.12 Carried out communications effectively</p> <p>1.13 Identified sources of business finance correctly</p> <p>1.14 Determined Governing policy on small scale enterprise appropriately</p> <p>1.15 Explored problems of starting and operating SSEs effectively</p>
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	<p>1.16 Developed Marketing, Organizational/Management, Production/Operation and Financial plans correctly</p> <p>1.17 Prepared executive summary correctly</p> <p>1.18 Determined business innovative strategies appropriately</p> <p>1.19 Presented business plan effectively</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Access to relevant workplace where assessment can take place</p> <p>2.2 Appropriately simulated environment where assessment can take place</p>
3. Methods of Assessment	<p>Competency may be assessed through:</p> <p>3.1 Written tests</p> <p>3.2 Oral questions</p> <p>3.3 Third party report</p> <p>3.4 Interviews</p> <p>3.5 Portfolio</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4.1 On-the-job</p> <p>4.2 Off-the-job</p> <p>4.3 During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE EMPLOYABILITY SKILLS

UNIT CODE: CON/OS/ARC/BC/05/5/A

Unit Description

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating interpersonal communication, critical safe work habits, leading small teams, planning and organizing work, maintaining professional growth and development, demonstrating workplace learning, problem solving skills and managing workplace ethics.

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 italicized terms are elaborated in the Range</i>
1. Conduct self-management	1.1 Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 1.2 Emotional intelligence is demonstrated as per workplace requirements. 1.3 Individual performance is evaluated and monitored according to the agreed targets. 1.4 Assertiveness is developed and maintained based on the requirements of the job. 1.5 Accountability and responsibility for own actions are demonstrated based on workplace instructions. 1.6 Self-esteem and a positive self-image are developed and maintained based on values. 1.7 Time management, attendance and punctuality are observed as per the organization policy. 1.8 Goals are managed as per the organization's objective 1.9 Self-strengths and weaknesses are identified based on personal objectives
2. Demonstrate interpersonal communication	2.1 Writing skills are demonstrated as per communication policy 2.2 Negotiation and persuasion skills are demonstrated as per communication policy

	<p>2.3 Internal and external stakeholders’ needs are identified and interpreted as per the communication policy</p> <p>2.4 Communication networks are established based on workplace policy</p> <p>2.5 Information is shared as per communication policy</p>
<p>3. Demonstrate critical safe work habits</p>	<p>3.1 Stress is managed in accordance with workplace policy.</p> <p>3.2 Punctuality and time consciousness is demonstrated in line with workplace policy.</p> <p>3.3 Personal objectives are integrated with organization goals based on organization’s strategic plan.</p> <p>3.4 Resources are utilized in accordance with workplace policy.</p> <p>3.5 Work priorities are set in accordance to workplace goals and objectives.</p> <p>3.6 Leisure time is recognized and utilized in line with personal objectives.</p> <p>3.7 Drugs and substances of abuse are identified and avoided based on workplace policy.</p> <p>3.8 HIV and AIDS prevention awareness is demonstrated in line with workplace policy.</p> <p>3.9 Safety consciousness is demonstrated in the workplace based on organization safety policy.</p> <p>3.10 Emerging issues are identified and dealt with in accordance with organization policy.</p>
<p>4. Lead small teams</p>	<p>4.1 Performance targets for the team are set based on organization’s objectives</p> <p>4.2 Duties are assigned in accordance with the organization policy.</p> <p>4.3 Forms of communication in a team are established according to organization’s policy.</p> <p>4.4 Team performance is evaluated based on set targets as per workplace policy.</p> <p>4.5 Conflicts are resolved between team members in line with organization policy.</p> <p>4.6 Gender related issues are identified and mainstreamed in accordance workplace policy.</p> <p>4.7 Human rights and fundamental freedoms are identified and respected as Constitution of Kenya 2010.</p> <p>4.8 Healthy relationships are developed and maintained in line with workplace.</p>

<p>5. Plan and organize work</p>	<p>5.1 Task requirements are identified as per the workplace objectives</p> <p>5.2 Task is interpreted in accordance with safety (OHS), environmental requirements and quality requirements</p> <p>5.3 Work activity is organized with other involved personnel as per the SOPs</p> <p>5.4 Resources are mobilized, allocated and utilized to meet project goals and deliverables.</p> <p>5.5 Work activities are monitored and evaluated in line with organization procedures.</p> <p>5.6 Job planning is documented in accordance with workplace requirements.</p> <p>5.7 Time is managed achieve workplace set goals and objectives.</p>
<p>6. Maintain professional growth and development</p>	<p>6.1 Personal training needs are identified and assessed in line with the requirements of the job.</p> <p>6.2 Training and career opportunities are identified and utilized based on job requirements.</p> <p>6.3 Resources for training are mobilized and allocated based organizations and individual skills needs.</p> <p>6.4 Licenses and certifications relevant to job and career are obtained and renewed as per policy.</p> <p>6.5 Work priorities and personal commitments are balanced and managed based on requirements of the job and personal objectives.</p> <p>6.6 Recognitions are sought as proof of career advancement in line with professional requirements.</p>
<p>7. Demonstrate workplace learning</p>	<p>7.1 Learning opportunities are sought and managed based on job requirement and organization policy.</p> <p>7.2 Improvement in performance is demonstrated based on courses attended.</p> <p>7.3 Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job</p> <p>7.4 Time and effort is invested in learning new skills based on job requirements</p> <p>7.5 Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.</p> <p>7.6 New systems are developed and maintained in accordance with the requirements of the job.</p> <p>7.7 Awareness of personal role in workplace innovation is demonstrated based on requirements of the job.</p>

8. Demonstrate problem solving skills	8.1 Creative, innovative and practical solutions are developed based on the problem 8.2 Independence and initiative in identifying and solving problems is demonstrated based on requirements of the job. 8.3 Team problems are solved as per the workplace guidelines 8.4 Problem solving strategies are applied as per the workplace guidelines 8.5 Problems are analyzed and assumptions tested as per the context of data and circumstances
9. Demonstrate workplace ethics	9.1 Policies and guidelines are observed as per the workplace requirements 9.2 Self-worth and professionalism is exercised in line with personal goals and organizational policies 9.3 Code of conduct is observed as per the workplace requirements 9.4 Integrity is demonstrated as per legal requirement

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.

Range	Variable
1. Drug and substance abuse may include but not limited to:	Commonly abused <ul style="list-style-type: none"> • Alcohol • Tobacco • Miraa • Over-the-counter drugs • Cocaine • Bhang • Glue
2. Feedback may include but not limited to:	<ul style="list-style-type: none"> • Verbal • Written • Informal • Formal

<p>3. Relationships may include but not limited to:</p>	<ul style="list-style-type: none"> • Man/Woman • Trainer/trainee • Employee/employer • Client/service provider • Husband/wife • Boy/girl • Parent/child • Sibling relationships
<p>4. Forms of communication may include but not limited to:</p>	<ul style="list-style-type: none"> • Written • Visual • Verbal • Non verbal • Formal and informal
<p>5. Team may include but not limited to:</p>	<ul style="list-style-type: none"> • Small work group • Staff in a section/department • Inter-agency group
<p>6. Personal growth may include but not limited to:</p>	<ul style="list-style-type: none"> • Growth in the job • Career mobility • Gains and exposure the job gives • Net workings • Benefits that accrue to the individual as a result of noteworthy performance
<p>7. Personal objectives may include but not limited to:</p>	<ul style="list-style-type: none"> • Long term • Short term • Broad • Specific
<p>8. Trainings and career opportunities may include but not limited to</p>	<ul style="list-style-type: none"> • Participation in training programs • Technical • Supervisory • Managerial • Continuing Education • Serving as Resource Persons in conferences and workshops
<p>9. Resource may include but not limited to:</p>	<ul style="list-style-type: none"> • Human • Financial • Hardware • Software
<p>10. Innovation may include but not limited to:</p>	<ul style="list-style-type: none"> • New ideas • Original ideas • Different ideas • Methods/procedures

	<ul style="list-style-type: none"> • Processes • New tools
11. Emerging issues may include but not limited to:	<ul style="list-style-type: none"> • Terrorism • Social media • National cohesion • Open offices
12. Range of media for learning may include but not limited to:	<ul style="list-style-type: none"> • Mentoring • peer support and networking • IT and courses

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:

- Communication
- Critical thinking
- Observation
- Organizing
- Negotiation
- Monitoring
- Evaluation
- Record keeping
- Problem solving
- Decision Making
- Resource utilization
- Resource mobilization

Required Knowledge

The individual needs to demonstrate knowledge of:

- Work values and ethics
- Company policies
- Company operations, procedures and standards
- Occupational Health and safety procedures
- Fundamental rights at work
- Personal hygiene practices
- Workplace communication

- Concept of time
- Time management
- Decision making
- Types of resources
- Work planning
- Resources and allocating resources
- Organizing work
- Monitoring and evaluation
- Record keeping
- Workplace problems and how to deal with them
- Gender mainstreaming
- HIV and AIDS
- Drug and substance abuse
- Leadership
- Safe work habits
- Professional growth and development
- Technology in the workplace
- Emerging issues
- Social media
- Terrorism
- National cohesion

EVIDENCE GUIDE

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

1. Critical aspects of Competency	Assessment requires evidence that the candidate: <ul style="list-style-type: none"> 1.1 Conducted self-management 1.2 Demonstrated interpersonal communication 1.3 Demonstrated critical safe work habits 1.4 Led small teams 1.5 Planned and organized work 1.6 Maintained professional growth and development 1.7 Demonstrated workplace learning 1.8 Demonstrated problem solving skills 1.9 Demonstrated workplace ethics
2. Resource Implications	The following resources should be provided: <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
3. Methods of	Competency in this unit may be assessed through:

Assessment	<ul style="list-style-type: none"> 3.1 Oral questioning 3.2 Portfolio of evidence 3.3 Third Party Reports 3.4 Written tests
4. Context of Assessment	<p>Competency may be assessed:</p> <ul style="list-style-type: none"> 4.1 On-the-job 4.2 Off-the –job 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.

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DEMONSTRATE ENVIRONMENTAL LITERACY

UNIT CODE: CON/OS/ARC/BC/06/5/A

UNIT DESCRIPTION

This unit describes the competencies required to demonstrate understanding of environmental literacy. It involves controlling environmental hazard, controlling control environmental pollution, complying with workplace sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs and monitoring activities on environmental protection/programs.

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 italicized terms are elaborated in the Range</i>
1. Control environmental hazard	1.1 <i>Storage methods</i> for environmentally <i>hazardous</i> materials are strictly followed according to environmental regulations and OSHS. 1.2 <i>Disposal methods</i> of hazardous wastes are followed always according to environmental regulations and OSHS. 1.3 <i>PPE</i> is used according to OSHS.
2. Control environmental Pollution control	2.1 Environmental pollution <i>control measures</i> are compiled following standard protocol. 2.2 Procedures for solid waste management are observed according to Environmental Management and Coordination Act 1999 2.3 Methods for minimizing <i>noise pollution</i> is complied with based on <i>Noise and Excessive Vibration Pollution and Control Regulations, 2009</i>
3. Demonstrate sustainable resource use	3.1 Methods for minimizing wastage are complied with. 3.2 Waste management procedures are employed

	<p>following principles of 3Rs (Reduce, Reuse, Recycle)</p> <p>3.3 Methods for economizing and reducing resource consumption are practiced as per the Environmental Management and Coordination Act 1999</p>
4. Evaluate current practices in relation to resource usage	<p>4.1 Information on resource efficiency systems and procedures are collected and provided to the work group where appropriate.</p> <p>4.2 Current resource usage is measured and recorded by members of the work group.</p> <p>4.3 Current purchasing strategies are analyzed and recorded according to industry procedures.</p> <p>4.4 Current work processes to access information and data is analyzed following enterprise protocol.</p>
5. Identify Environmental legislations/conventions for environmental concerns	<p>5.1 Environmental <i>legislations/conventions</i> and local ordinances are identified according to the different <i>environmental aspects/impact</i></p> <p>5.2 <i>Industrial standard/environmental practices</i> are described according to the different environmental concerns</p>
6. Implement specific environmental programs	<p>6.1 Programs/Activities are identified according to organizations policies and guidelines.</p> <p>6.2 Individual roles/responsibilities are determined and performed based on the activities identified.</p> <p>6.3 Problems/constraints encountered are resolved in accordance with organizations' policies and guidelines</p> <p>6.4 Stakeholders are consulted based on company guidelines</p>
7. Monitor activities on Environmental protection/Programs	<p>7.1 Activities are periodically monitored and evaluated according to the objectives of the environmental Program</p> <p>7.2 Feedback from stakeholders are gathered and considered in proposing enhancements to the program based on consultations</p> <p>7.3 Data gathered are analyzed based on evaluation requirements</p> <p>7.4 Recommendations are submitted based on the findings</p> <p>7.5 Management support systems are set/established to sustain and enhance the program</p>

	7.6 Environmental incidents are monitored and reported to concerned/proper authorities
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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.

Variable	Range
1. PPE may include but not limited to:	<ul style="list-style-type: none"> • Mask • Gloves • Goggles • Safety hat • Overall • Hearing protector • Safety boots
2. Environmental pollution control measures may include but not limited to:	<ul style="list-style-type: none"> • Methods for minimizing or stopping spread and ingestion of airborne particles • Methods for minimizing or stopping spread and ingestion of gases and fumes • Methods for minimizing or stopping spread and ingestion of liquid wastes
3. Waste management procedures may include but not limited to:	<ul style="list-style-type: none"> • Sorting • Storing of items • Recycling of items • Disposal of items
4. Resources may include but not limited to:	<ul style="list-style-type: none"> • Electric • Water • Fuel • Telecommunications • Supplies • Materials
5. Workplace environmental hazards may include but not limited to:	<ul style="list-style-type: none"> • Biological hazards • Chemical and dust hazards • Physical hazards

<p>6. Organizational systems and procedures may include but not limited to:</p>	<ul style="list-style-type: none"> • Supply chain, procurement and purchasing • Quality assurance • Making recommendations and seeking approvals
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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:

- Observation
- Measuring
- Writing
- Communication
- Analytical
- Monitoring
- Evaluation

Required Knowledge

The individual needs to demonstrate knowledge of:

- Storage methods of environmentally hazardous materials
- Disposal methods of hazardous wastes
- Usage of PPE Environmental regulations
- OSHS
- Types of pollution
- Environmental pollution control measures
- Different solid wastes
- Solid waste management
- Different noise pollution
- Methods of minimizing noise pollution
- Solid Waste Act
- Methods of minimizing wastage
- Waste management procedures
- Economizing of resource consumption
- 3Rs principle
- Types of resources
- Techniques in measuring current usage of resources

- Calculating current usage of resources
- Types of workplace environmental hazards
- Environmental regulations
- Environmental regulations applying to the enterprise.
- Measurement and recording of current resource usage
- Analysis current work processes to access information and data Analysis of data and information
- Identification of areas for improvement
- Resource consuming processes
- Determination of quantity and nature of resource consumed
- Analysis of resource flow of different parts of the resource flow process
- Use/conversion of resources
- Causes of low efficiency of use
- Increasing the efficiency of resource use
- Inspection of resource use plans
- Regulations/licensing requirements
- Determine benefit/cost for alternative resource sources
- Benefit/costs for different alternatives
- Components of proposals
- Criteria on ranking proposals
- Regulatory requirements
- Proposals for improving resource efficiency
- Implementation of resource efficiency plans
- Procedures in monitor implementation
- Adjustments of implementation plan
- Inspection of new resource usage

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Controlled environmental hazard 1.2 Controlled environmental pollution 1.3 Demonstrated sustainable resource use 1.4 Evaluated current practices in relation to resource usage 1.5 Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns.
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	<p>1.6 Described industrial standard environmental practices according to the different environmental issues/concerns.</p> <p>1.7 Resolved problems/ constraints encountered based on management standard procedures</p> <p>1.8 Implemented and monitored environmental practices on a periodic basis as per company guidelines</p> <p>1.9 Recommended solutions for the improvement of the Program</p> <p>1.10 Monitored and reported to proper authorities any environmental incidents</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Workplace with storage facilities</p> <p>2.2 Tools, materials and equipment relevant to the tasks (ex. Cleaning tools, cleaning materials, trash bags, etc.)</p> <p>2.3 PPE</p> <p>2.4 Manuals and references</p> <p>2.5 Legislation, policies, procedures, protocols and local ordinances relating to environmental protection</p> <p>2.6 Case studies/scenarios relating to environmental Protection</p>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <p>3.1 Observation</p> <p>3.2 Oral questioning</p> <p>3.3 Written test</p> <p>3.4 Interview/Third Party Reports</p> <p>3.5 Portfolio of evidence</p>
4. Context of Assessment	<p>Competency may be assessed:</p> <p>4.1 On-the-job</p> <p>4.2 Off-the –job</p> <p>4.3 During Industrial attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: CON/OS/ARC/BC/07/5/A

UNIT DESCRIPTION

This unit specifies the competencies required to identify workplace hazards and risk, identify and implement appropriate control measures and implement OSH programs, procedures and policies/ guidelines

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 italicized terms are elaborated in the Range</i>
1. Identify workplace hazards and risk	1.1 <i>Hazards</i> in the workplace are identified <i>based their indicators</i> 1.2 Risks and hazards are evaluated based on legal requirements. 1.3 <i>OSH concerns</i> raised by workers are addressed as per legal requirements.
2. Control OSH hazards	2.1 Hazard prevention <i>and control measures</i> are implemented as per legal requirement. 2.2 Risk assessment is conducted and a risk matrix developed based on likely impact. 2.3 <i>Contingency measures</i> , including <i>emergency procedures</i> during workplace <i>incidents and emergencies</i> are recognized and established in accordance with organization procedures.
3. Implement OSH programs	3.1 Company OSH program are identified, evaluated and reviewed based on legal requirements. 3.2 Company OSH programs are implemented as per legal requirements. 3.3 Workers are capacity built on OSH standards and procedures as per legal requirements 3.4 <i>OSH-related records</i> are maintained as per legal requirements.

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.

Variable	Range
1. Hazards may include but are not limited to:	<ul style="list-style-type: none"> • Physical hazards • Biological hazards • Chemical hazards • Ergonomics • Psychological factors • Physiological factors • Safety hazards • Unsafe workers' act
2. Indicators may include but are not limited to:	<ul style="list-style-type: none"> • Increased of incidents of accidents, injuries • Increased occurrence of sickness or health complaints/ symptoms • Common complaints of workers related to OSH • High absenteeism for work-related reasons
3. Evaluation and/or work environment measurements may include but are not limited to:	<ul style="list-style-type: none"> • Health Audit • Safety Audit • Work Safety and Health Evaluation • Work Environment Measurements of Physical and Chemical Hazards
4. OSH issues and/or concerns may include but are not limited to:	<ul style="list-style-type: none"> • Workers' experience/observance on presence of work hazards • Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) • Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines

<p>5. Prevention and control measures may include but are not limited to:</p>	<ul style="list-style-type: none"> • Eliminate the hazard • Isolate the hazard • Substitute the hazard with a safer alternative • Use administrative controls to reduce the risk • Use engineering controls to reduce the risk • Use personal protective equipment • Safety, Health and Work Environment Evaluation • Periodic and/or special medical examinations of workers
<p>6. Safety gears /PPE (Personal Protective Equipment's) may include but are not limited to:</p>	<ul style="list-style-type: none"> • Arm/Hand guard, gloves • Eye protection (goggles, shield) • Hearing protection (ear muffs, ear plugs) • Hair Net/cap/bonnet • Hard hat • Face protection (mask, shield) • Apron/Gown/coverall/jump suit • Anti-static suits • High-visibility reflective vest
<p>7. Appropriate risk controls</p>	<ul style="list-style-type: none"> • Eliminate the hazard altogether • Isolate the hazard from anyone who could be harmed • Substitute the hazard with a safer alternative • Use administrative controls to reduce the risk • Use engineering controls to reduce the risk • Use personal protective equipment
<p>8. Contingency measures may include but are not limited to:</p>	<ul style="list-style-type: none"> • Evacuation • Isolation • Decontamination • Emergency personnel
<p>9. Emergency procedures may include but are not limited to:</p>	<ul style="list-style-type: none"> • Fire drill • Earthquake drill • Basic life support/CPR • First aid • Spillage control • Decontamination of chemical and toxic • Disaster preparedness/management • Set of fire-extinguisher

<p>10. Incidents and emergencies may include but are not limited to:</p>	<ul style="list-style-type: none"> • Chemical spills • Equipment/vehicle accidents • Explosion • Fire • Gas leak • Injury to personnel • Structural collapse • Toxic and/or flammable vapors emission.
<p>11. OSH-related Records may include but are not limited to:</p>	<ul style="list-style-type: none"> • Medical/Health records • Incident/accident reports • Sickness notifications/sick leave application • OSH-related trainings obtained

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:

- Communication
- Interpersonal
- Presentation
- Risk assessment
- Evaluation
- Critical thinking
- Problem solving
- Negotiation

Required Knowledge

The individual needs to demonstrate knowledge of:

- General OSH Principles
- Occupational hazards/risks recognition
- OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
- National OSH regulations; company OSH policies and protocols
- Systematic gathering of OSH issues and concerns
- General OSH principles

- National OSH regulations
- Company OSH and recording protocols, procedures and policies/guidelines
- Training and/or counseling methodologies and strategies

EVIDENCE GUIDE

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

<p>1. Critical Aspects of Competency</p>	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified hazards in the workplace based their indicators 1.2 Evaluated workplace hazards based on legal requirements. 1.3 Addressed OSH concerns raised by workers as per legal requirements. 1.4 Implemented hazard prevention and control measures as per legal requirement. 1.5 Conducted risk assessment as per legal requirement. 1.6 Developed risk matrix based on likely impact. 1.7 Recognized and established contingency measures in accordance with organization procedures. 1.8 Identified, evaluated and reviewed company OSH program based on legal requirements. 1.9 Implemented company OSH programs as per legal requirements. 1.10 Capacity built workers on OSH standards and procedures as per legal requirements 1.11 Maintained OSH-related records as per legal requirements.
<p>2. Resource Implications</p>	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace where assessment can take place 2.2 Appropriately simulated environment where assessment can take place
<p>3. Methods of Assessment</p>	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 3.1 Observation 3.2 Oral questioning 3.3 Written test 3.4 Portfolio of Evidence 3.5 Interview

	3.6 Third party report
4. Context of Assessment	Competency may be assessed: 4.1 On-the-job 4.2 Off-the –job 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.

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COMMON UNITS OF COMPETENCY

APPLY MATHEMATICAL SKILLS

UNIT CODE: CON/OS/ARC/CC/01/5/A

UNIT DESCRIPTION:

This unit describes the competencies required by a technician in order to apply a wide range of mathematical skills in their work; apply ratios, rates and proportions to solve problems; estimate, carry out measurement; collect, organize and interpret statistical data; use common formulae and algebraic expressions to solve problems.

ELEMENTS AND PERFORMANCE CRITERIA

ELEMENT This describes the key outcomes which make up workplace functions	PERFORMANCE CRITERIA These are assessable statements which specify the required level of performance for each element. <i>Bold and italicised terms are elaborated in the range</i>
1. Apply algebra	1.1 Calculations involving Indices are performed as per the concept 1.2 Calculations involving Logarithms are performed as per the concept 1.3 Scientific calculator is used in solving mathematical problems in line with manufacturer's manual 1.4 Simultaneous equations are performed as per the rules 1.5 Quadratic equations are calculated as per the concept
2. Apply Trigonometry and hyperbolic functions	2.1 calculations are performed using trigonometric rules 2.2 calculations are performed using <i>hyperbolic functions</i>
3. Apply Coordinate Geometry	3.1 Polar equations are calculated using coordinate geometry 3.2 Graphs of given polar equations are drawn using the Cartesian plane 3.3 Normal and tangents are determined using coordinate geometry
4. Carry out Mensuration	4.1 Perimeter and areas of figures are obtained 4.2 Volume and of Surface area of solids are obtained 4.3 Area of irregular figures are obtained 4.4 Areas and volumes are obtained using Pappus theorem
5. Apply Statistics	5.1 Identification, Collection and Organization of data is performed 5.2 Interpretation, analysis and presentation of data in appropriate format is performed 5.3 Mean, median, mode and Standard deviation are obtained from given data

	<p>5.4 Calculations are performed based on Laws of probability</p> <p>5.5 Calculation involving probability distributions, mathematical expectation sampling distributions are performed</p> <p>5.6 Sampling distribution methods are applied in data analysis</p> <p>5.7 Calculations involving use of standard normal table, sampling distribution, T-distribution and Estimation are done</p>
6. Apply Matrix	<p>6.1 Determinant and inverse of 3x3 matrix are obtained</p> <p>6.2 Solutions of simultaneous equations are obtained</p> <p>6.3 Calculation involving Eigen values and Eigen vectors are performed</p>

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.

Variable	Range
1. Operations may include but not limited to:	<ul style="list-style-type: none"> • Addition • Subtraction
2. Hyperbolic functions may include but not limited to:	<ul style="list-style-type: none"> • Sinh x • Cosh x • Cosec x • Coth x • Tanh x • Sech x

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:

- Applying fundamental operations (addition, subtraction, division, multiplication)
- Using and applying mathematical formulas
- Logical thinking
- Problem solving
- Applying statistics
- Drawing graphs
- Using different measuring tools

Required knowledge

The individual needs to demonstrate knowledge of:

- Fundamental operations (addition, subtraction, division, multiplication)
- calculating area and volume
- Types and purpose of measuring instruments
- Units of measurement and abbreviations
- Rounding techniques
- Types of fractions
- Types of tables and graphs
- Presentation of data in tables and graphs
- Vector operations
- Matrix operations

EVIDENCE GUIDE

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

1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1 Applied algebra 1.2 Applied Trigonometry 1.3 Applied Co-ordinate Geometry 1.4 Carried out Mensuration 1.5 Applied Statistics 1.6 Applied Matrix
2. Resource Implications	The following resources should be provided: 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Measuring equipment 2.3 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency in this unit may be assessed through: 1.1 Direct Observation 1.2 Demonstration with Oral Questioning 1.3 Written tests
4. Context of Assessment	Competency may be assessed 4.1 On job 4.2 Off job 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.

PREPARE AND INTERPRET TECHNICAL DRAWINGS

UNIT CODE: CON/OS/ARC/CC/02/5/A

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. It also involves producing plain geometry drawings, solid geometry drawings, pictorial and orthographic drawings and application of Computer Aided Design (CAD) packages.

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 element. <i>(Bold and italicised terms are elaborated in the Range)</i>
1. Use and maintain drawing equipment and materials	1.1 <i>Drawing equipment</i> are identified and gathered according to task requirements 1.2 <i>Drawing materials</i> 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 <i>environmental legislations</i> 1.6 <i>Personal Protective Equipment</i> 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 <i>geometric forms</i> 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 2.6 Angles are bisected according to standard conventions 2.7 Freehand sketching of different types of geometric forms, tools, equipment, diagrams is

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 element. <i>(Bold and italicised terms are elaborated in the Range)</i>
	conducted
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
5. Apply CAD packages	5.1 CAD packages are selected according to task requirements 5.2 CAD packages are applied in production of drawings

RANGE

Variable	Range
1. Drawing equipment may include but not limited to:	<ul style="list-style-type: none"> • Drawing boards • T and set squares • drawing sets • computers with CAD packages
2. Drawing materials may include but not limited to:	<ul style="list-style-type: none"> • Drawing papers • Pencils • Erasers • masking tapes • paper clips
3. Environmental legislations may include	<ul style="list-style-type: none"> • EMCA 1999

but not limited to:	
4. Personal Protective Equipment may include but not limited to:	<ul style="list-style-type: none"> • Dust coats • closed leather shoes
5. Geometric forms may include but not limited to:	<ul style="list-style-type: none"> • Circles • Triangles • Rectangles • Parallelogram • Polygons • Pyramids • conic sections • Prisms • loci
6. Standard conventions may include but not limited to:	<ul style="list-style-type: none"> • Anatomy of engineering drawing (title block, coordinate grid system • revision block, notes and legends) • Drawing scale (paper size and drawing symbols) • International drawing standards

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: <ul style="list-style-type: none"> 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 Applied CAD packages in production of drawings
2. Resource Implications	Resources the same as that of workplace are advised to be applied. <ul style="list-style-type: none"> 2.1 Drawing room 2.2 Drawing equipment and materials 2.3 Computers 2.4 CAD packages
3. Methods of Assessment	Competency may be assessed through: <ul style="list-style-type: none"> 3.1 Practical tests 3.2 Written Tests 3.3 Oral questioning
4. Context of Assessment	Competency may be assessed <ul style="list-style-type: none"> 4.1 On job 4.2 Off job 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.

APPLY WORKSHOP TECHNOLOGY PRACTICES

UNIT CODE: CON/OS/ARC/CC/03/5/A

UNIT DESCRIPTION

This unit describes the competence in applying workshop technology practices. It entails performing masonry, plumbing and carpentry tasks.

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 element. <i>(Bold and italicized terms are elaborated in the Range)</i>
1 Perform masonry tasks	1.1 Safety requirements in the workshop environment are identified 1.2 <i>Masonry hand tools</i> are used appropriately to perform tasks in masonry workshop 1.3 <i>Masonry machine tools</i> are used appropriately to perform tasks in masonry workshop 1.4 Masonry tools used in construction works are maintained as per manufacturer's specifications
2 Perform plumbing tasks	2.1 Safety requirements in the workshop environment are identified 2.2 <i>Plumbing hand tools</i> are used appropriately to perform tasks in plumbing workshop 2.3 <i>Plumbing machine tools</i> are used appropriately to perform tasks in plumbing workshop 2.4 Plumbing tools used in construction works are maintained as per manufacturer's specifications
3 Perform carpentry tasks	3.1 Safety requirements in the workshop environment are identified 3.2 <i>Carpentry hand tools</i> are used appropriately to perform tasks in carpentry workshop 3.3 <i>Carpentry machine tools</i> are used appropriately to perform tasks in carpentry workshop 3.4 Carpentry tools used in construction works are maintained as per manufacturer's specifications

RANGE

Variable	Range

1. Masonry hand tools may include but not limited to:	<ul style="list-style-type: none"> • Masons trowel • Wood float • Cold chisels • Masons square • Spade • Shovel • Plumb bob
2. Masonry machine tools may include but not limited to:	<ul style="list-style-type: none"> • Concrete mixer • Block cutter • Vibrator • Pneumatic hammer • compactors
3. Plumbing hand tools may include but not limited to:	<ul style="list-style-type: none"> • Bench shears • Anvil • Pipe wrench • Pliers
4. Plumbing machine tools may include but not limited to:	<ul style="list-style-type: none"> • Bending machine • Welding • Sheet metal holding machine • Portable power drill • Hand grinder
5. Carpentry hand tools may include but not limited to:	<ul style="list-style-type: none"> • Saws • Planes • Hammer • Carpenter square • Marking gauges • Hand drill • Screw drivers
6. Carpentry machine tools may include but not limited to:	<ul style="list-style-type: none"> • circular saw • Thicknesser • Portable sander • Close cut saw • Portable drill machine

REQUIRED KNOWLEDGE

- Tools and equipment
- Safety regulations
- Mathematics
- Plumbing
- Masonry
- Mortar mixing
- Carpentry and joinery

SKILLS

- Analytical
- Critical thinking
- Problem solving
- Firefighting
- Quality control
- Circuit interpretation

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified safety requirements in the workshop environment 1.2 Performed masonry tasks 1.3 Performed plumbing tasks 1.4 Performed carpentry tasks 1.5 Appropriately used workshop tools
2. Resource Implications	The following resources should be provided: 2.1 Working tools and equipment 2.2 Training Workshops 2.3 Plumbing materials 2.4 Masonry materials 2.5 Carpentry materials
3. Methods of Assessment	Competency may be assessed through: 3.1 Written text 3.2 Interview 3.3 Observation
4. Context of Assessment	Competency may be assessed 4.1 On the job 4.2 Off the job 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.

APPLY PRINCIPLES OF BUILDING TECHNOLOGY

UNIT CODE: CON/OS/ARC/CC/04/5/A

UNIT DESCRIPTION

This unit describes the competence required to conduct site investigations, identify building elements, draw substructure, draw superstructure, prepare reinforced concrete, apply building finishes and fittings, draw architectural landscape and apply alternative building technologies.

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 element. <i>(Bold and italicized terms are elaborated in the Range)</i>
1. Conduct site investigations	1.1 Site boundaries are established based on the architect's instructions 1.2 Site characteristics are assessed and documented 1.3 Location of proposed building is identified based on the architect's drawings and plans 1.4 Construction site is prepared based on the architect's drawings and plans
2. Identify building elements	2.1 Precast concrete production is identified 2.2 Timber components are identified 2.3 Metal components are identified 2.4 Stabilized soil components are identified
3. Draw substructure details	3.1 Foundation details are drawn as per the design 3.2 Foundation slab, walls, columns or beams are drawn as per the design
4. Draw superstructure details	4.1 Concrete slab details are drawn as per the design 4.2 Walls, columns and beams are drawn as per the design 4.3 Roof is drawn as per the design
5. Prepare reinforced concrete	5.1 Formwork is prepared as per building specifications 5.2 Steel fixing is performed as per design 5.3 Concreting is done as per design
6. Apply building finishes and fittings	6.1 Building surfaces are prepared to receive finishes 6.2 Building finishes and fittings are installed/ applied based on the type of fitting/finish 6.3 Finishes are inspected as per workplace procedures
7. Draw architectural landscape	7.1 Ground is prepared 7.2 Pathways and driveways are set out as per the design 7.3 Plants and vegetation are established

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 element. <i>(Bold and italicized terms are elaborated in the Range)</i>
	7.4 Pathways and driveways are laid as per the design
8. Apply alternative building technologies	8.1 <i>Alternative building technologies</i> are identified 8.2 Alternative building technologies are drawn as per the design

RANGE

Variable	Range
1. Foundation may include but is not limited to:	<ul style="list-style-type: none"> ● Strip foundation ● Pad foundation ● Pile foundation ● Raft foundation
2. Roof may include but is not limited to:	<ul style="list-style-type: none"> ● Flat roof ● Pitched roof
3. Reinforced concrete may include but is not limited to:	<ul style="list-style-type: none"> ● RC slabs ● RC beams ● RC columns
4. Precast concrete may include but is not limited to:	<ul style="list-style-type: none"> ● Paving slabs ● Road kerbs and channels ● Precast concrete slabs
5. Formwork may include but is not limited to:	<ul style="list-style-type: none"> ● Timber ● Aluminium ● Steel
6. Timber components may include but is not limited to:	<ul style="list-style-type: none"> ● Chip boards ● Ply wood ● MDF boards ● Marine boards
7. Metal components may include but is not limited to:	<ul style="list-style-type: none"> ● Steel bars ● Aluminium frames
8. Stabilized soil components may include but is not limited to:	<ul style="list-style-type: none"> ● Clay roofing tiles ● Clay bricks ● Clay vents
9. Building finishes and fittings may include but is not limited to:	<ul style="list-style-type: none"> ● Paint ● Tiles ● Ceiling ● Gypsum

	<ul style="list-style-type: none"> • Wardrobes • Kitchen cabinets
10. Alternative building technologies may include but is not limited to:	<ul style="list-style-type: none"> • EPS (expanded polystyrene systems) • Interlocking blocks • Prefabricated wall panels • Metal panels • Timber panels • Plastics • Glass panels • Traditional construction materials.

REQUIRED KNOWLEDGE

- Safety precautions
- Masonry
- Carpentry and joinery
- Surveying
- Finishes and fittings
- Metal works
- Construction materials, tools and equipment
- Occupational health and safety

SKILLS

- Measuring
- Planning and organizing
- Analytical skills
- Management skills
- Finishing
- Mathematical skills
- Observation skills

EVIDENCE GUIDE

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

1. Critical Aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Identified building elements 1.2 Drew substructure details 1.3 Drew superstructure details 1.4 Applied building finishes and fittings 1.5 Drew architectural landscape 1.6 Drew alternative building technologies
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take

	place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency may be assessed through: 3.1 Observation 3.2 Oral questioning 3.3 Projects
4. Context of Assessment	Competency may be assessed 4.1 On the job 4.2 Off the job 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.

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CORE UNITS OF COMPETENCIES

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DETAIL ARCHITECTURAL PROJECTS

UNIT CODE:CON/OS/ARC/CR/01/5/A

UNIT DESCRIPTION

This unit describes the competencies required to conduct literature review, carry out case study, produce schematic drawings, prepare presentation drawings, prepare working drawings, prepare details drawings, revise working drawings and apply CADD in architectural work

ELEMENTS 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 italicized terms are elaborated in the Range.</i>
1. Conduct literature review	1.1 Research on design parameters is done as per spatial requirements 1.2 Research on material use is conducted as per spatial requirement 1.3 Research on historical backgrounds of similar projects is conducted
2. Carry out case study	4.1 An identical existing project is identified 4.2 The identified project is visited 4.3 Observations are recorded as per workplace procedures 4.4 Analysis of the observations is done 4.5 Conclusions and recommendations are made as per the existing project. 4.6 Sound findings are adopted in the proposed project
3. Produce schematic drawings	3.1 Bubble diagram is prepared as per the spatial requirement 3.2 A scaled sketch is formulated based on the bubble diagram and client's proposed budget. 3.3 A sketch model is prepared as per the sketch 3.4 Drawing is presented for approval or adjustments
4. Prepare presentation drawings	4.1 Sketches are adopted or adjusted based on the client's approval 4.2 Fittings and Furniture layout and human elements incorporated in the drawing as per spatial requirement 4.3 Major dimensions are indicated as per the spatial design 4.4 Artistic impressions are incorporated in the drawing 4.5 Drawing is presented for approval or adjustments

<p>5. Prepare working drawings</p>	<p>5.1 Presentation drawings are adopted or adjusted based on approval</p> <p>5.2 Artistic impressions removed from the working drawings</p> <p>5.3 Drawing is fully dimensioned and labelled</p> <p>5.4 Door and window schedules are prepared as per working drawing</p> <p>5.5 Finishing materials and codes are indicated on the working drawing</p> <p>5.6 Detailed site plan is prepared observing local government regulations</p> <p>5.7 Drawing is plotted on a tracing paper</p> <p>5.8 Drawing is produced on blueprint</p> <p>5.9 Working drawing is submitted to the local government authorities for approval</p>
<p>6. Prepare drawing details</p>	<p>6.1 Required details are identified based on the working drawings</p> <p>6.2 Scaled details are produced</p> <p>6.3 Details drawings are presented to the architect.</p>
<p>7. Revise working drawings</p>	<p>7.1 Design changes are received from architect in the design team</p> <p>7.2 Additions and alterations are incorporated in the working drawings</p> <p>7.3 Revised working drawings presented to the architect for approval</p>
<p>8. Draw architectural landscapes</p>	<p>8.1 Landscape drawings are presented to the architect</p> <p>8.2 Detailed landscape drawings are presented to the architect.</p>
<p>9. Apply CADD in architectural work</p>	<p>9.1 Sketch is drafted using design software</p> <p>9.2 Sketch is detailed to produce presentation drawing</p> <p>9.3 Presentation drawing is detailed to produce working drawing</p> <p>9.4 Detail drawing is produced using design software</p> <p>9.5 Detail drawing is plotted on a tracing paper</p> <p>9.6 Detail drawing is produced on blueprint</p> <p>9.7 Building Information Management Systems are applied as per workplace procedures</p>

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.

Variable	Range
1. Fittings may include but is not limited to:	<ul style="list-style-type: none">• Wash hand basins• Bathtubs• Water closet• Sinks
2. Furniture may include but is not limited to:	<ul style="list-style-type: none">• Chairs• Tables• Wardrobes
3. Design changes may include but is not limited to:	<ul style="list-style-type: none">• Alterations• Additions
4. Detailed site plan may include but is not limited to:	<ul style="list-style-type: none">• Building location• Sewer and storm water drainage• Plot coverage

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:

- Designing
- Scheduling
- Sketching
- Drafting
- Modelling
- Creativity
- Estimation skills
- Observation skills
- Planning and organizing
- Analytical skills

Required knowledge

The individual needs to demonstrate knowledge of:

- Design software

- Design scales
- Anthropometrics and ergonomics
- Environmental regulations
- Architect's data
- Building standards and regulations
- Building codes
- Statutory regulations
- Safety precautions and regulations
-
- Research
- Photography
- Thermal insulation
- Mathematics
- Acoustics

EVIDENCE GUIDE

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

1. Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Produced schematic drawings</p> <p>1.2 Prepared presentation drawings</p> <p>1.3 Prepared working drawings</p> <p>1.4 Prepared details drawings</p> <p>1.5 Applied CADD in architectural drawings</p>
2. Resource Implications	<p>The following resources should be provided:</p> <p>2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place</p> <p>2.2 Materials relevant to the proposed activity or tasks</p>
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <p>3.1 Direct Observation</p> <p>3.2 Oral Questioning</p> <p>3.3 Portfolios</p> <p>3.4 Projects</p> <p>3.5 Written tests</p>
4. Context of Assessment	<p>Competency may be assessed</p> <p>4.1 On job</p> <p>4.2 Off job</p> <p>4.3 During Industrial Attachment</p>
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

PRODUCE ARCHITECTURAL PERSPECTIVES

UNIT CODE: CON/OS/ARC/CR/02/5/A

UNIT DESCRIPTION

This unit describes the competencies required to prepare freehand internal perspectives, prepare freehand external perspectives, produce pictorial views, apply CAD in preparing perspectives and produce walkthrough videos

ELEMENTS 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 italicized terms are elaborated in the Range.</i>
1. Prepare freehand internal perspectives	1.1 Internal <i>Perspective drawing</i> is designed 1.2 <i>Details</i> are incorporated in the perspective 1.3 Distance is indicated by aerial perspective.
2. Prepare freehand external perspectives	2.1 External perspective drawing is designed based on the number of vanishing points 2.2 Distance is indicated by aerial perspective
3. Produce pictorial views	3.1 The plan is drawn on a skewed or rotated 45-degree grid which keeps the original orthogonal geometry of the plan. 3.2 The verticals are projected vertically on the page 3.3 All lines are drawn to scale so that relationships between elements are accurate.
4. Produce walkthrough videos	4.1 Cameras are set as per the rooms or external space 4.2 Walkthroughs are generated 4.3 Sound is incorporated in the video
5. Apply CAD in preparing perspectives	5.1 Images/ Computer Generated <i>Renderings</i> are generated by a computer using three-dimensional modeling software or other computer software for presentation purposes 5.2 Lighting and materials are approximated using computer software. 5.3 Renderings are created for presentation, marketing and design analysis purposes. 5.4 Building design and its visual aspects are experimented.

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.

Variable	Range
1. Perspective drawing may include but is not limited to:	<ul style="list-style-type: none">• Two-point perspective• Three-point perspective
2. Details may include but is not limited to:	<ul style="list-style-type: none">• Furniture and fittings• Colour• Finishes
3. Renderings may include but is not limited to:	<ul style="list-style-type: none">• Internal• External

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:

- Design skills
- Planning and organizing
- Detailing
- Presentation skills
- Artistic skills
- ICT skills
- Creativity skills

Required knowledge

The individual needs to demonstrate knowledge of:

- Art and design
- Perspectives
- Perspective software in CAD
- Walkthroughs
- Video development
- Digital media

EVIDENCE GUIDE

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

1. Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Prepared internal perspectives 1.2 Prepared external perspectives 1.3 Produced walkthrough videos 1.4 Applied CAD in preparing perspectives
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2 Materials relevant to the proposed activity or tasks
3. Methods of Assessment	<p>Competency in this unit may be assessed through:</p> <ul style="list-style-type: none"> 2.1 Direct Observation 2.2 Oral questioning 2.3 Portfolios
4. Context of Assessment	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On job 4.2 Off job 4.3 During Industrial Attachment
5. Guidance information for assessment	<p>Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended.</p>

PRODUCE ARCHITECTURAL MODELS

UNIT CODE: CON/OS/ARC/CR/03/5/A

UNIT DESCRIPTION

This unit describes the competencies required to produce schematic, digital and physical models

ELEMENTS 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 italicized terms are elaborated in the Range.</i>
1. Produce schematic/sketch models	1.1 A rough sketch is acquired from the architect 1.2 A design is formulated based on the rough sketch 1.3 A model is prepared as per the sketch
2. Produce physical model	2.1 Tools, materials and equipment are identified, gathered and used as per workplace procedures 2.2 The scaled plans are printed 2.3 Physical model is constructed as per the design 2.4 A detailed model is constructed as per the detailed design
3. Produce digital models	3.1 Presentation drawings are produced 3.2 Presentation drawings are rendered using CAD software

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.

Variable	Range
1. Design may include but is not limited to:	<ul style="list-style-type: none"> • Approximated floor plans • Simple elevations • Quick 3D views • Conceptual rough sections
2. Physical model may include but is not limited to:	<ul style="list-style-type: none"> • site models • concept models • interior (demountable) models
3. detailed model may include	<ul style="list-style-type: none"> • stairs

but is not limited to:	<ul style="list-style-type: none"> • door • window • roof
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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:

- Modelling
- Design skills
- Creativity skills
- Interpretation of drawings
- Precision skills
- Measuring skills
- Artistic skills
- ICT skills

Required knowledge

The individual needs to demonstrate knowledge of:

- Art and design
- Visualization
- Architectural modelling
- Architectural design
- Digital design software
- Measurements and scales

EVIDENCE GUIDE

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

1. Critical aspects of Competency	<p>Assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Produced sketch model 1.2 Produced physical models 1.3 Produced digital models
2. Resource Implications	<p>The following resources should be provided:</p> <ul style="list-style-type: none"> 3.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 3.2 Materials relevant to the proposed activity or tasks

3.Methods of Assessment	Competency in this unit may be assessed through: 3.1 Direct Observation 3.2 Oral questioning 3.3 Portfolios
4. Context of Assessment	Competency may be assessed 4.1 On job 4.2 Off job 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.

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INSTALL BUILDING FINISHES AND FITTINGS

UNIT CODE: CON/OS/ARC/CR/04/5/A

UNIT DESCRIPTION

This unit describes the competencies required to apply wall finishes, install doors, windows and openings, fix floor finishes, apply paint, and install furniture, fittings and ceilings

ELEMENTS 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 italicized terms are elaborated in the Range.</i>
1. Apply wall finishes	1.1 <i>Wall finishes</i> are identified as per the client's need. 1.2 Wall finish application specification is determined as per design
2. Install doors windows openings	2.1 Opening schedules and design are prepared 2.2 Marking of layout is carried out 2.3 Frame is fixed in the opening 2.4 Doors /windows are installed as per <i>material</i> and instructions 2.5 <i>Accessories</i> are installed on doors and windows
3. Fix floor and surface finishes	3.1 PPEs are identified, gathered and used as per SOPs 3.2 Floor finish is identified and designed as per clients need 3.3 Floor surface is <i>prepared</i> 3.4 <i>Floor finish</i> is applied as per specifications
4. Apply paint	4.1 Base surfaces are prepared prior to painting 4.2 Paint mix and varnish is prepared using various constituents as per specification and desired finish 4.3 Paint is applied to produce a paint film of uniform thickness as per requirements 4.4 Correction/remedial action of common painting defects is carried out. 4.5 Paint is left to dry.
5. Install furniture and fittings	5.1 <i>Furniture and fittings</i> are assembled 5.2 Furniture and fittings are <i>fixed</i> on the wall or floor based on the purpose.
6. Install ceilings	6.1 <i>Type of ceiling</i> is identified and designed as per clients need 6.2 Ceiling location is inspected for obstructions or problems that need to be fixed. 6.3 Levelling is conducted on the ceiling location 6.4 Ceiling is fixed as per the design 6.5 Ceiling fixtures are placed.

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.

Variable	Range
1. Wall finishes may include but not limited to:	<ul style="list-style-type: none">• Paint• Tiles• Acoustics• Paddings• Cladding
2. Accessories may include but not limited to:	<ul style="list-style-type: none">• Hinges• Knobs• Locks• Stay
3. Floor finish may include but not limited to:	<ul style="list-style-type: none">• Tiles• Carpets• Terrazzo• Cement screed
4. Type of ceiling may include but not limited to:	<ul style="list-style-type: none">• Gypsum• Acoustic• Timber• PVC
5. Material may include but not limited to:	<ul style="list-style-type: none">• wooden• PVC• Metal
6. Prepared may include but not limited to:	<ul style="list-style-type: none">• Patch• level any damaged or uneven areas• free of wax, soap scum, and grease.• Remove any moldings, trim, or appliances• Clean• holes or blemishes have been repaired and smoothed over• sandpaper
7. Furniture and fittings may include but not limited to::	<ul style="list-style-type: none">• Cabinets• Counter tops
8. Fixed may include but not limited to:	<ul style="list-style-type: none">• Nailed• Glued

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:

- Designing
- Planning and organizing
- Precision skills
- Measuring
- Assembling fittings
- Installing fittings and furniture
- Workmanship

Required knowledge

The individual needs to demonstrate knowledge of:

- Construction methods
- Joinery and fittings
- Types of house finishes
- Fittings and furniture
- Paints
- Floor types.
- Wall types
- Doors, windows and opening types
- Installation of finishes

EVIDENCE GUIDE

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

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Installed wall finishes 1.2 Installed doors and windows 1.3 Installed floor finishes 1.4 Installed furniture and fittings 1.5 Applied paint 1.6 Installed ceilings
2. Resource Implications	The following resources should be provided: 3.1 Access to relevant workplace or appropriately simulated environment where assessment can take place 3.2 Materials relevant to the proposed activity or tasks
3. Methods of	Competency in this unit may be assessed through:

Assessment	<ul style="list-style-type: none"> 3.1 Direct Observation 3.2 Oral Questioning 3.3 Portfolios 3.4 Projects 3.5 Written tests
4. Context of Assessment	<p>Competency may be assessed</p> <ul style="list-style-type: none"> 4.1 On Job 4.2 Off Job 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.

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