THE REPUBLIC OF KENYA

COMPETENCY BASED CURRICULUM

FOR

BUILDING (MASONRY) TECHNOLOGY

LEVEL 4

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 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. 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 this Curriculum has been developed.

It is my conviction that this Curriculum will play a great role towards development of competent human resource for the Building and Construction sector.

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, emphasized the need to reform Curriculum development, assessment and certification. This called for a shift to CBET in order 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.

TVET Curriculum Development, Assessment and Certification Council (TVET CDACC) in conjunction with Building and Construction Sector Skills Advisory Committee (SSAC) have developed this Curriculum.

This Curriculum has been developed following the CBET framework policy; the CBETA Standards and guidelines provided by the TVET Authority and the Kenya National Qualification framework designed by the Kenya National Qualification Authority.

This Curriculum is designed and organized with an outline of learning outcomes; Suggested Methods of Instruction:, training/learning resources and methods of assessing the trainee's achievement. The Curriculum is competency-based and allows multiple entry and exit to the course.

I am grateful to the Council members, Council Secretariat, Building and Construction SSAC, expert workers and all those who participated in the development of this Curriculum.

CHAIRPERSON, TVET CDACC

ACKNOWLEDGEMENT

COUNCIL SECRETARY/CEO

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ABBREVIATIONS AND ACRONYMS

BRC   British Reinforcement Concrete

CAD   Computer Aided Design

CCTV   Closed-Circuit Television (Surveillance)

CDACC   Curriculum Development Assessment and Certification Council

ICT   Information Computer Technology

KCSE   Kenya Certificate of Secondary Education

KNQA   Kenya National Qualification Authority

OSHS   Occupational Safety and Health Standards

PPE   Personal Protective Equipment

PPR   Polypropylene Pipes

TVET   Technical and Vocational Education and Training

KEY TO UNIT CODE

CON/ CU /BUT/ BC/ 1/4 /A

Industry or sector

Curriculum

Occupation area

Type of competency

Competency number

Competency level

Control Version
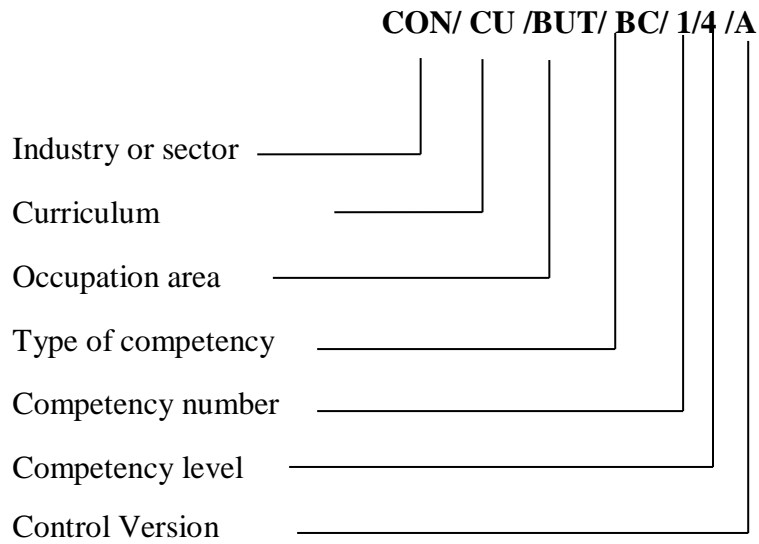
OVERVIEW

Description of the course

This course is designed to equip a trainee with competencies for masonry. The competencies include; performing site preliminary works, substructure works, superstructure works, building finishing and installing building services.

Basic Units of Learning:

Unit Code	Unit Title	Duration in Hours	Credit Factor
CON/CU/BUT/BC/01/4/A	Communication Skills	20	2
CON/CU/BUT/BC/02/4/A	Numeracy Skills	25	2.5
CON/CU/BUT/BC/03/4/A	Digital Literacy	35	3.5
CON/CU/BUT/BC/04/4/A	Entrepreneurial Skills	60	6
CON/CU/BUT/BC/05/4/A	Employability Skills	30	3
CON/CU/BUT/BC/06/4/A	Environmental Literacy	20	2
CON/CU/BUT/BC/07/4/A	Occupational Safety and Health Practices	20	2
TOTAL		**210**	**21**

Common Units of Learning:

Unit Code	Unit Title	Duration in Hours	Credit Factor
CON/CU/BUT/CC/01/4/A	Building Materials Science	20	2
CON/CU/BUT/CC/02/4/A	Workshop Technology Practices	70	7
CON/CU/BUT/CC/03/4/A	Building Temporary Works	40	4
	Industrial attachment	360	36
TOTAL		**490**	**49**

Core Units of Learning

Unit Code	Unit Title	Duration in Hours	Credit Factor
CON/CU/BT/CR/01/4/A	Site Preliminary Works	30	30
CON/CU/BT/CR/02/4/A	Substructure Works	140	14
CON/CU/BT/CR/03/4/A	Superstructure Works	140	14

CON/CU/BT/CR/04/4/A	Building Finishes	100	10
CON/CU/BT/CR/05/4/A	Installation of Building Services	70	70
Total Hours/Credits		**480**	**48**
GRAND TOTAL		**1180**	**118**

Entry Requirements

An individual entering this course should have any of the following minimum requirements:

Entry Requirements

A trainee entering this course should have any of the following minimum requirements:

a. Kenya Certificate of Secondary Education (KCSE)

Or

b. Building Artisan Level 3 certificate

Or

c. Equivalent qualifications as determined by Kenya National Qualifications Authority (KNQA)

Trainer qualification
A trainer for this course should have a higher qualification than the level of this course

Industrial attachment
A trainee will undertake industrial attachment of 360 hours.

Assessment
The course will be assessed at two levels: internally and externally. Internal assessment is continuous and is conducted by the trainer who is monitored by an accredited internal verifier while external assessment is the responsibility of TVET-CDACC.

Certification
On successful completion of a unit of learning, a trainee will be issued with a Certificate competency for one unit of competence and on successful completion of all units of competency a trainee will be awarded a National Certificate in Building Artisan (Masonry) - Level 4 qualification. These certificates will be issued by TVET CDACC in conjunction with a training provider.

BASIC UNITS OF LEARNING

COMMUNICATION SKILLS

UNIT CODE: CON/CU/BUT/BC/01/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Communication Skills

Duration of Unit: 20 Hours

Unit Description

This unit covers the competencies required demonstrate communication skills. It involves obtaining and conveying workplace information, completing relevant work-related documents, communicating information about workplace processes, leading workplace discussion and communicating workplace issues.

Summary of Learning Outcomes
1. Obtain and convey workplace information
2. Complete relevant work-related documents
3. Communicate information about workplace processes
4. Lead workplace discussions
5. Identify and communicate issues arising in the workplace

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Obtain and convey workplace information	• Communication process • Modes of communication • Medium of communication • Effective communication • Barriers to communication	• Interview • Third party reports

	• Flow of communication • Sources of information • Types of questions • Organizational policies • Workplace etiquette • Ethical work practices in handling communication	
2. Complete relevant work-related documents	• Types and purposes of workplace documents and forms • Methods used in filling forms and documents • Recording workplace data • Process of distributing workplace forms and documents • Report writing • Types of workplace reports	• Interview • Third party reports
3. Communicate information about workplace processes	• Communication process • Modes of communication • Medium of communication • Effective communication • Barriers to communication • Flow of communication • Sources of information • Organizational policies • Organization requirements for written and electronic communication methods • Report writing • Effective questioning techniques (clarifying and probing) • Workplace etiquette ❑ Ethical work practices in handling communication	• Interview • Portfolio

4. Lead workplace discussion	❑ Methods of discussion e.g.
	  • Coordination meetings
	  • Toolbox discussion
	  • Peer-to-peer discussion
	❑ Solicitation of response
		❑ Interview
		❑ Third party reports

5. Identify and communicate issues arising in the workplace	❑ Identification of problems and issues ❑ Organizing information on problems and issues ❑ Relating problems and issues ❑ Communication barriers affecting workplace discussions	❑ Interview ❑ Portfolio

Suggested Methods of Instruction
- Direct instruction
- Demonstration
- Practice assignment
- Discussion
- Role play
- Brainstorming

Recommended Resources
- Desktop computers/laptops
- Internet connection
- Projectors
- Telephone
- Report writing templates

NUMERACY SKILLS

UNIT CODE: CON/CU/BUT/BC/02/4/A

Relationship to Occupational Standards:

This unit addresses the Unit of Competency: Demonstrate Numeracy Skills

Duration of Unit: 25 hours

Unit Description

This unit covers the competencies required to demonstrate numeracy skills. It involves identifying and using whole numbers and simple fractions, decimals and percentages for work, identifying, measuring and estimating familiar quantities for work, reading and using familiar maps, plans and diagrams for work, identifying and describing common 2D and some 3D shapes for work, constructing simple tables and graphs for work using familiar data and identifying and interpreting information in familiar tables, graphs and charts for work.

Summary of Learning Outcomes

1. Identify and use whole numbers and simple fractions, decimals and percentages for work
2. Identify, measure and estimate familiar quantities for work
3. Read and use familiar maps, plans and diagrams for work
4. Identify and describe common 2D and some 3D shapes for work
5. Construct simple tables and graphs for work using familiar data
6. Identify and interpret information in familiar tables, graphs and charts for work

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify and use whole numbers	• Whole numbers • Simple fractions	• Written

and simple fractions, decimals and percentages for work	• Decimals • Percentages • Sizes • Problem solving methods • Calculations using the 4 operations • Recording and communicating numerical information	• Practice assignments
2. Identify, measure and estimate familiar quantities for work	• Measurement information • Units of measurement • Estimate familiar and simple amounts • Selection of appropriate measuring equipment • Calculate using familiar units of measurement • Check measurements and results against estimates • Using informal and some formal mathematical and general language • Record or report results	• Written • Practice assignments
3. Read and use familiar maps, plans and diagrams for work	• Maps, plans and diagrams • Locate items and places in familiar maps, plans and diagrams • Recognize common symbols and keys in familiar maps, plans and diagrams • Direction and location of objects, or route or places • Use of informal and some formal oral mathematical language and symbols	• Practical test • Written

4. Identify and describe common 2D and some 3D shapes for work	• Common 2D shapes and 3D shapes • Classification of common 2D shapes and designs • Description of Use informal and some formal language to describe common two-dimensional shapes and some common three-dimensional shapes • Construction of common 2D shapes • Match common 3D shapes to their 2D sketches or nets	• Written • Practical test
5. Construct simple tables and graphs for work using familiar data	• Types of graphs • Determination of data to be collected • Selection of data collection method • Collection of data • Determination of variables from the data collected • Order and collate data • Construct a table and enter data • Construct a graph using data from table • Check results • Report or discuss graph information related to work using informal and some formal mathematical and general language	• Written • Practical test
6. Identify and interpret information in familiar tables, graphs and charts for work	• Tables construction and labeling • i.e. title, headings, rows and columns	• Written • Practical test

		- Interpreting information and data in simple tables - Relaying information of relevant workplace tasks on/in a table - Identify familiar graphs and charts in familiar texts and contexts - Locate title, labels, axes, scale and key from familiar graphs and charts - Identify and interpret information and data in familiar graphs and charts - Relate information to relevant workplace tasks	

Suggested Methods of Instruction
- Instructor led facilitation of theory
- Practical demonstration of tasks by trainer
- Practice by trainees/ role play
- Discussion
- Observations and comments and corrections by trainers

Recommended Resources
- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- LCD projectors
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Projectors
- Writing boards

- Mathematical tables

DIGITAL LITERACY

UNIT CODE: CON/CU/BUT/BC/03/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Digital Literacy

Duration of Unit: 35 hours

Unit Description

This unit covers the competencies required to demonstrate digital literacy in a working environment. It entails identifying computer software and hardware, applying security measures to data, hardware, software, applying computer software in solving task sand applying internet and email in communication at workplace.

Summary of Learning Outcomes
1.   Identify computer software and hardware
2.   Apply security measures to data, hardware and software
3.   Apply computer software in solving tasks
4.   Apply internet and email in communication at workplace

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Identify computer hardware and software	❑ Meaning of a computer ❑ Functions of a computer ❑ Components of a computer ❑ Classification of computers	❑ Written tests ❑ Oral ❑ Observation
2. Apply security measures to data, hardware and software	❑ Data security and control ❑ Security threats and control measures ❑ Types of computer crimes	❑ Written tests ❑ Oral presentation ❑ Observation ❑ Projects

	❑ Detection and protection against computer crimes	
3. Apply computer software in solving tasks	❑ Operating system ❑ Word processing ❑ Spread sheets ❑ Data base	❑ Oral questioning ❑ Observation ❑ Project
4. Apply internet and email in communication at workplace	❑ Computer networks ❑ Uses of internet ❑ Electronic mail (e-mail) concept	❑ Oral questioning ❑ Observation ❑ Oral presentation ❑ Written report

Suggested Methods of Instruction
- Instructor led facilitation of theory
- Demonstration by trainer
- Practical assignment
- Viewing of related videos
- Project
- Group discussions

Recommended Resources
- Desktop computers
- Laptop computers
- Other digital devices
- Printers
- Storage devices
- Internet access
- Computer software

ENTREPRENEURIAL SKILLS

UNIT CODE: CON/CU/BUT/BC/04/4/A

Relationship to occupational standards

This unit addresses the Unit of Competency: Demonstrate Entrepreneurial Skills

Duration of unit: 60 hours

Unit description

This unit covers the competencies required for creating and maintaining small scale business, establishing small business customer base, managing and growing a micro/small-scale business.

Summary of Learning Outcomes
1. Create and maintain small scale business
2. Establish small scale business customer base
3. Manage small scale business
4. Grow/expand small scale business

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Create and maintain small scale business	- Starting a small business - Legal regulatory requirements in starting a small business - SWOT/ PESTEL analysis - Conducting market/industry survey - Generation and evaluation of business ideas - Matching competencies with business opportunities	- Individual/group assignments - projects - Written - Oral

	• Forms of business ownership	
	• Location of a small business	
	• Legal and regulatory requirement	
	• Resources required to start a small business	
	• Common terminologies in entrepreneurship	
	• Entrepreneurship in national development	
	• Self-employment	
	• Formal and informal employment	
	• Entrepreneurial culture	
	• Myths associated with entrepreneurship	
	• Types, characteristics, qualities & role of entrepreneurs	
	• History, development and importance of entrepreneurship	
	• Theories of entrepreneurship	
	• Quality assurance for small businesses	
	• Policies and procedures on occupational safety and health and environmental concerns	
2. Establish small scale business customer base	• Good staff/workers and customer relations • Marketing strategy • Identifying and maintain new customers and markets	• Individual/group assignments • projects • Written • Oral

	• Product/ service promotions • Products / services diversification • SWOT / PESTEL analysis • Conducting a business survey • Generating Business ideas • Business opportunities	
3. Manage small scale business	• Organization of a small business • Small business' business plan • Marketing for small businesses • Managing finances for small business • Production/ operation process for goods/services • Small business records management • Book keeping and auditing for small businesses • Business support services • Small business resources mobilization and utilization • Basic business social responsibility • Management of small business • Word processing concepts in small business management • Computer application software	• Oral • Individual/group assignments • projects • Written

	• Monitoring and controlling business operations	
4. Grow/expand small scale business	• Methods of growing small business • Resources for growing small business • Small business growth plan • Computer software in business development • ICT and business growth	• Individual/group assignments • projects • Written

Suggested Methods of Instruction
- Instructor led facilitation of theory
- Demonstration by trainer
- Practice by trainee
- Role play
- Case study

Recommended Resources
- Case studies for small businesses
- Business plan templates
- Lap top/ desk top computer
- Internet
- Telephone
- Writing materials

EMPLOYABILITY SKILLS

UNIT CODE: …./CU/../BC/05/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Employability Skills

Duration of Unit: 30 hours

Unit Description

This unit covers competencies required to demonstrate employability skills. It involves conducting self-management, demonstrating critical safe work habits, demonstrating workplace learning and workplace ethics.

Summary of Learning Outcomes
1. Conduct self-management
2. Demonstrate critical safe work habits
3. Demonstrate workplace learning
4. Demonstrate workplace ethics

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Conduct self-management	❑ Self-awareness ❑ Formulating personal vision, mission and goals ❑ Strategies for overcoming life challenges ❑ Emotional intelligence ❑ Assertiveness ❑ Expressing personal thoughts, feelings and beliefs	❑ Written tests ❑ Oral questioning ❑ Portfolio of evidence ❑ Third party report

	• Developing and maintaining high self-esteem • Developing and maintaining positive self-image ❑ Articulating ideas and aspirations ❑ Accountability and responsibility ❑ Good work habits ❑ Self-awareness ❑ Self-development ❑ Financial literacy ❑ Healthy lifestyle practices	
2. Demonstrate critical safe work habits	❑ Stress and stress management ❑ Punctuality and time consciousness ❑ Interpersonal communication ❑ Sharing information ❑ Leisure ❑ Integrating personal objectives into organizational objectives ❑ Resources utilization ❑ Setting work priorities ❑ HIV and AIDS ❑ Drug and substance abuse ❑ Handling emerging issues	❑ Written tests ❑ Oral questioning ❑ Portfolio of evidence ❑ Third party report
3. Demonstrate workplace learning	❑ Personal training needs identification and assessment ❑ Managing own learning ❑ Contributing to the learning community at the workplace ❑ Cultural aspects of work ❑ Variety of learning context ❑ Application of learning ❑ Safe use of technology ❑ Identifying opportunities ❑ Workplace innovation ❑ Performance improvement ❑ Handling emerging issues ❑ Future trends and concerns in learning	❑ Written tests ❑ Oral questioning ❑ Portfolio of evidence ❑ Third party report

4. Demonstrate workplace ethics	❑ Meaning of ethics ❑ Ethical perspectives ❑ Principles of ethics ❑ Values and beliefs ❑ Ethical standards ❑ Organization code of ethics ❑ Common ethical dilemmas ❑ Organization culture ❑ Corruption, bribery and conflict of interest ❑ Privacy and data protection ❑ Diversity, harassment and mutual respect ❑ Financial responsibility/accountability ❑ Etiquette ❑ Personal and professional integrity ❑ Commitment to jurisdictional laws ❑ Emerging issues in ethics	❑ Written tests ❑ Oral questioning ❑ Portfolio of evidence ❑ Third party report

Suggested Methods of Instruction
- Simulation/Role play
- Group Discussion
- Presentations
- Q&A
- Case studies
- Assignments

Recommended Resources
- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- Radio sets
- TV sets

- LCD projectors

ENVIRONMENTAL LITERACY

UNIT CODE:CON/CU/BUT/BC/06/4/A

Relationship to Occupational Standards

This unit addresses the Unit of Competency: Demonstrate Environmental Literacy

Duration of Unit: 20 hours

Unit Description

This unit specifies the competencies required to demonstrate environmental literacy. It involves controlling environmental hazard, controlling environmental pollution, demonstrating sustainable resource use and evaluating current practices in relation to resource usage.

Summary of Learning Outcomes
1. Control environmental hazard
2. Control environmental pollution
3. Demonstrate sustainable use of resources
4. Evaluate current practices in relation to resource usage

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Control environmental hazard	❑ Purposes and content of Environmental Management and Coordination Act 1999 ❑ Purposes and content of Solid Waste Act ❑ Storage methods for environmentally hazardous materials	❑ Written tests ❑ Oral questions ❑ Observation of work procedures

		□ Disposal methods of hazardous wastes □ Types and uses of PPE in line with environmental regulations □ Occupational Safety and Health Standards (OSHS)	
2.	Control environmental Pollution	□ Types of pollution □ Environmental pollution control measures □ Types of solid wastes □ Procedures for solid waste management □ Different types of noise pollution □ Methods for minimizing noise pollution	□ Written tests □ Oral questions □ Observation of work procedures □ Role play
3.	Demonstrate sustainable resource use	□ Types of resources □ Techniques in measuring current usage of resources □ Calculating current usage of resources □ Methods for minimizing wastage □ Waste management procedures □ Principles of 3Rs (Reduce, Reuse, Recycle) □ Methods for economizing or reducing resource consumption	□ Written tests □ Oral questions □ Observation of work procedures
4.	Evaluate current practices in relation to resource usage	□ Collection of information on environmental and resource efficiency systems and procedures, □ Measurement and recording of current resource usage □ Analysis and recording of current purchasing strategies.	□ Written tests □ Oral questions □ Observation of work procedures

	❑ Analysis of current work processes to access information and data ❑ Identification of areas for improvement	
5. Identify Environmental legislations/conventions for environmental concerns	❑ Environmental issues/concerns ❑ Environmental legislations /conventions and local ordinances ❑ Industrial standard /environmental practices ❑ International Environmental Protocols (Montreal, Kyoto) ❑ Features of an environmental strategy	❑ Written tests ❑ Oral questions ❑ Observation of work procedures

Suggested Methods of Instruction
- Instructor led facilitation of theory
- Practical demonstration of tasks by trainer
- Practice by trainees/ role play
- Discussion
- Observations and comments and corrections by trainers

Recommended Resources
- Computers
- Stationery
- Charts
- Video clips
- Audio tapes
- Radio sets
- TV sets
- LCD projectors
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE)

OCCUPATIONAL SAFETY AND HEALTH PRACTICES

UNIT CODE: CON/CU/BUT/BC/01/7/A

Relationship to Occupational Standards

This unit addresses the unit of competency: Demonstrate Occupational Safety and Health Practices

Duration of Unit: 20 hours

Unit Description

This unit specifies the competencies required to practice safety and health and comply with OSH requirements relevant to work. It involves adhering to workplace procedures for hazards and risk prevention and participating in arrangements for workplace safety and health maintenance.

Summary of Learning Outcomes
1. Adhere to workplace procedures for hazards and risk prevention
2. Participate in arrangements for workplace safety and health maintenance

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Adhere to workplace procedures for hazards and risk prevention	❑ Arrangement of work area and items in accordance with Company housekeeping procedures ❑ Adherence to work standards and procedures ❑ Application of preventive and control measures, including use of safety gears/PPE	❑ Oral questions ❑ Written tests ❑ Portfolio of evidence ❑ Third party report

	Study and apply standards and procedures for incidents and emergencies.	
2. Participate in arrangements for workplace safety and health maintenance	□ Participating in orientations on OSH requirements/regulations of tasks □ Providing feedback on health, safety, and security concerns to appropriate personnel as required in a sufficiently detailed manner □ Practice workplace procedures for reporting hazards, incidents, injuries and sickness □ OSH requirements/ regulations and workplace safety and hazard control procedures are reviewed, and compliance reported to appropriate personnel □ Identification of needed OSH-related trainings are proposed to appropriate personnel	□ Oral questions □ Written tests □ Portfolio of evidence □ Third party report

Suggested Methods of Instruction
- Assigments
- Discussion
- Q&A
- Role play
- Viewing of related videos

Recommended Resources
- Computers
- Stationery
- Charts
- Video clips
- Audio tapes

- Radio sets
- TV sets
- LCD projectors
- Standard operating and/or other workplace procedures manuals
- Specific job procedures manuals
- Machine/equipment manufacturer's specifications and instructions
- Personal Protective Equipment (PPE) e.g.
  - Mask
  - Face mask/shield
  - Safety bootsn
  - Safety harness
  - 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

COMMON UNITS OF LEARNING

BUILDING MATERIALS SCIENCE

UNIT CODE: CON/CU/BUT/CC/01/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Apply Building Materials Science

DURATION OF UNIT: 20 Hours

UNIT DESCRIPTION

This unit describes the competence in applying building materials science. It involves identifying properties of construction materials, using construction materials appropriately, and handling construction materials safely.

SUMMARY OF LEARNING OUTCOMES

1. Identify properties of construction materials
2. Use construction materials appropriately
3. Handle construction materials safely

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Identify properties of construction materials	• Physical properties of construction materials • Chemical properties of construction materials • Mechanical properties of construction materials	• Written assignments • Written Tests
2. Use construction materials appropriately	• Construction methods and processes • Appropriate use of construction materials, tools and equipment	• Practical projects • Practical Tests • Oral questioning • Observation of work procedures
3. Handle construction materials safely	• Identification of construction materials • User safety in handling construction materials • Construction materials handling and storage	• Practical projects • Practical Tests • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Field trips
- Trainee group discussions

Recommended Resources

Tools and equipment

- Hand tools
- Machine tools

Materials and supplies

- Construction materials
- Stationery
- Manufacturer's catalogues

Personal protective equipment (PPEs)
- Safety boots
- Goggles
- Gas masks
- Helmets
- Gloves
- Dust coats
- First aid kit
- Ear muffs
- Dust masks
- Overalls

WORKSHOP TECHNOLOGY PRACTICES

UNIT CODE: CON/CU/BUT/CC/02/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Apply Workshop Technology Practices

DURATION OF UNIT: 70 Hours

UNIT DESCRIPTION

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

SUMMARY OF LEARNING OUTCOMES

1. Perform masonry tasks
2. Perform plumbing tasks
3. Perform carpentry tasks

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Perform masonry tasks	• Masonry workshop safety requirements • Masonry hand tools • Masonry machine tools • Maintenance of masonry tools • Use of masonry tools	• Practical projects • Practical Tests • Oral questioning • Observation of work procedures
2. Perform plumbing tasks	• Plumbing workshop safety requirements • Plumbing hand tools • Plumbing machine tools • Maintenance of plumbing tools • Use of plumbing tools	• Practical projects • Practical Tests • Oral questioning • Observation of work procedures
3. Perform carpentry tasks	• Carpentry workshop safety requirements • Carpentry hand tools • Carpentry machine tools • Maintenance of carpentry tools	• Practical projects • Practical Tests • Oral questioning • Observation of work procedures

	• Use of carpentry tools	

Suggested Methods of Instruction:

- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Field trips
- Trainee group discussions

Recommended Resources

Tools and equipment

- Masons trowel
- Wood float
- Cold chisels
- Masons square
- Spade
- Shovel
- Plumb bob
- Concrete mixer
- Block cutter
- Vibrator
- Pneumatic hammer
- Compactors
- Bench shears
- Anvil
- Pipe wrench
- Pliers
- Bending machine
- Welding
- Sheet metal holding machine
- Portable power drill
- Saws
- Planes
- Hammer
- Carpenter square

- Marking gauges
- Hand drill
- Screw drivers
- Circular saw
- Thicknesser
- Portable sander
- Close cut saw
- Portable drill machine
- Screw driver
- Pliers
- Long nose
- Side cutter
- Draw in wire
- Arc welding shields
- Leather gloves
- Chipping hammers
- Welding goggles
- Tongs
- Hand vices
- Pliers
- Centrifugal
- Submersible
- Reciprocating pump
- Hand pumps
- Hand grinder

Materials and supplies

- Lumber
- PPR pipes
- PVC pipes
- GI pipes
- Pipe fittings
- Cement
- Sand
- Lime
- Sheet metal
- Steel plates

- Plumbing appliances
- Fuel
- Grease
- Oil
- Filters

Personal protective equipment (PPEs)

- Helmets
- Gloves
- Safety goggles
- Safety boots
- Overalls
- Dust masks
- Gas masks
- Dust coats

BUILDING TEMPORARY WORKS

UNIT CODE: CON/CU/BUT/CC/03/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Perform building temporary works

DURATION OF UNIT: 40 hours

UNIT DESCRIPTION

This Unit describes the competencies required to perform building temporary works. It involves constructing and dismantling trench timbering, constructing and dismantling building formwork/shuttering, erecting and dismantling building scaffolding, and erecting and dismantling building shores.

SUMMARY OF LEARNING OUTCOMES
1. Construct and dismantle trench timbering
2. Construct and dismantle building formwork/shuttering
3. Erect and dismantle building scaffolding
4. Erect and dismantle building shores

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Construct and dismantle trench timbering	• Personal protective equipment • Soil types • Trench timbering materials and tools • Trench timbering methods • Trench timbering dismantling	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
2. Construct and dismantle building formwork/shuttering	• Personal protective equipment • Types of formwork • Formwork materials • Formwork oiling	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning

		• Formwork measurements and dimensions • Formwork construction/installation • Formwork dismantling	• Observation of work procedures
3.	Erect and dismantle building scaffolding	• Types of scaffolds • Assembling and dismantling of scaffolds • Personal protective equipment • Cleanup of site	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
4.	Erect and dismantle building shores	• Personal protective equipment • Types of shores • Shoring materials • Shores connection methods • Shoring construction and erection • Shoring dismantling	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

Tools and equipment
- Hammer
- Handsaw
- Shoring equipment
- Survey instruments
- Spanners

- Spirit level
- Plumb bob

Materials and supplies
- Field notebook
- Nails
- Bolts and nuts
- Timber poles
- Metal poles
- Metal plates
- Moulding oil

Personal protective equipment (PPEs)
- Overall
- Helmet
- Safety boots
- Masks
- Gloves
- First aid kit
- Reflectors
- Safety goggles

CORE UNITS OF LEARNING

SITE PRELIMINARY WORKS

UNIT CODE: CON/CU/BUT/CR/01/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Perform Site Preliminary Works

DURATION OF UNIT: 30 hours

UNIT DESCRIPTION

This Unit describes the competencies required to perform site preliminary works. It involves clearing building site, hoarding/screening the site, and demolishing unwanted structures.

SUMMARY OF LEARNING OUTCOMES
1. Clear building site
2. Hoard/screen the building site
3. Demolish unwanted structures

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Clear and level building site	• Building site conditions • Building and health safety regulations • Disposal of debris • Methods of clearing and levelling building site	• Written assignments • Written Tests • Practical projects • Oral questioning • Observation of work procedures
2. Hoard/screen the building site	• Hoarding/screening materials • Site hoarding/fencing • Hoarding tools • Building safety regulations	• Written assignments • Written Tests • Practical projects • Oral questioning • Observation of work procedures
3. Basic demolition of unwanted structures	• Hazardous materials removal • Methods of basic demolition	• Written assignments • Written Tests

	• Safety consideration during demolition • Disposal of demolished materials	• Practical projects • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Project / research
- Group discussions

Recommended resources

Tools and equipment
- Measuring and drawing tools
- Site clearing tools and equipment
- Computers/internet
- Masonry/building tools and equipment
- Surveying tools and equipment /instrument
- Soil testing instruments/equipment
- Site levelling tools and equipment

Materials and supplies
- Site survey maps
- Hoarding materials
- Demolition material
- Building codes / regulations
- Sand
- Ballast
- Cement
- Damp proofing materials
- Anti-termite
- Reinforcement/reinforcing bar
- Dewatering equipment

Personal protective equipment (PPEs)
- Dust coat
- First aid kits
- Overalls

- Gum boots
- Safety goggles
- Helmets
- Gloves

UNIT CODE: CON/CU/BUT/CR/02/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: perform substructure works

DURATION OF UNIT: 140 hours

UNIT DESCRIPTION

This unit describes the competences required to perform substructure work. It involves setting out the building, excavating foundation, laying building foundation, erecting foundation walls, and constructing solid ground floor.

SUMMARY OF LEARNING OUTCOMES
1. Set out the building
2. Excavate building foundation
3. Lay building foundation
4. Erect foundation walls
5. Construct solid ground floor

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Set out the building	• Site investigation/surveying • Building drawings and interpretation • Construction dimensions • Setting out tools and equipment • Setting out procedure • Profile boards • Building codes	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
2. Excavate building foundation	• Excavation methods • Soil analysis • Timbering • Dewatering methods	• Written assignments • Written Tests • Practical projects • Oral questioning • Observation of work procedures

3. Lay building foundation	• Types of foundations • Working drawings • Setting foundation levels • Foundation blinding • Assembly of foundation formwork • Foundation reinforcement • Architectural layout • Concrete placement	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
4. Erect foundation walls	• Building codes • Working drawing • Foundation walling • Levelling • Mortar/ concrete technology • Damp proof membrane	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
5. Construct solid ground floor	• Levelling of floor base • Construction materials • Termite control • Damp proof membrane • Formwork • Concrete technology • Floor reinforcement	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Project
- Group discussions

Recommended Resources

Tools and equipment
- Measuring and drawing tools
- Computers/internet
- Masonry/building tools and equipment

Materials and supplies

- Building Codes
- Sand
- Ballast
- Cement
- Damp proofing materials
- Anti-termite
- Reinforcement/reinforcing bar
- Dewatering equipment
- Blinding material

Personal protective equipment (PPEs)
- Dust coat
- First aid kits
- Overalls
- Gum boots
- Safety goggles
- Helmets
- Gloves

SUPERSTRUCTURE WORKS

UNIT CODE: CON/CU/BUT/CR/03/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Perform superstructure works

DURATION OF UNIT: 140 hours

UNIT DESCRIPTION

This Unit describes the competencies required to perform superstructure works. It involves setting out and constructing superstructure columns, setting out and erecting superstructure walling, setting and constructing superstructure beams and setting and erecting building roofs

SUMMARY OF LEARNING OUTCOMES
1. Set out and construct superstructure columns
2. Set out and erect superstructure walling
3. Set and construct superstructure beams
4. Set and erect building roof

Learning Outcomes, Content And Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Set out and construct superstructure columns	• Structural elements • Reinforcement steel • Formwork • Concrete materials • Concrete mix design • Concrete placement and compaction methods	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
2. Set out and erect superstructure walling	• Wall dimensions • Structure openings • Mortar materials and mixing • Wall screeding • Damp proofing • Bonding methods • Codes of practice	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning

	• Wall construction	• Observation of work procedures
	• Occupational safety and health standards	
	• Environment act and by laws	
3. Set and construct superstructure beams	• Beam formwork • Formwork props • Reinforcement steel • Concrete placement and compaction methods	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
4. Set and erect building roof	• Types of roofs • Truss construction and installation • Roof material installation method	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

Tools and equipment
- Builders square
- Builders line
- Plumb bob
- Poker vibrator
- Tape measure
- Hammer
- Nails
- Spade

- Trowel
- Concrete mixer
- Float
- Brush
- Spirit level
- Wheelbarrow

Materials and supplies
- Cement
- Water
- Sand
- Ballast
- Timber
- Damp proof materials
- Hessian cloth
- Reinforcement bars
- Steel
- Hoop iron
- BRC
- Masonry units
- Iron sheets
- Warning signs

Personal protective equipment (PPEs)
- Overall
- Helmet
- Safety boots
- Masks
- Gloves
- First aid kit
- Reflectors
- Safety goggles

BUILDING FINISHES

UNIT CODE: CON/CU/BUT/CR/04/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Perform building finishes

DURATION OF UNIT: 100 hours

UNIT DESCRIPTION

This unit describes the competences required to perform building finishes. It entails installing door and window frames, applying floor finishes, applying building facings, applying wall finishes, carrying out pointing and jointing, performing rough casting.

SUMMARY OF LEARNING OUTCOMES
1. Install doors and windows Frames
2. Apply floor finishes
3. Apply building facings
4. Apply wall finishes
5. Carry out pointing and jointing
6. Perform building rough casting
7. Paint building surfaces

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Install doors and windows frames	• Door and window installation tools and equipment • Types of doors and windows • Opening preparation • Door and window installation	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
2. Apply floor finishes	• Types of floor finishes • Floor finishing tools & equipment • Background preparation. • Floor finishing	• Written assignments • Written Tests • Practical projects • Practical Tests

				Oral questioning
				• Observation of work procedures
3. Apply building facings	• Facing materials, tools and equipment • Preparation of facing materials • Preparation of facing background • Fixing of facings • Building code			• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
4. Apply wall finishes	• Wall mastering materials, tools and equipment • Preparation of wall surfaces • Application of wall master • Protection of wall mastered surface • Lining materials, tools and equipment • Background preparation. • Fixing of linings • Cladding materials, tools and equipment • Background preparation • Application of claddings • Plastering tools and equipment. • Plastering materials • Background preparation • Mixing ratios/mortar making • Application of plaster			• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
5. Carry out pointing and jointing	• Pointing and jointing materials, tools and equipment • Preparation of materials • Background preparation • Pointing and jointing			• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning

		• Observation of work procedures
6. Perform building rough casting	• Rough casting materials, tools and equipment • Preparation of materials • Background preparation • Application of rough cast	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
7. Paint building surfaces	• Painting materials • Painting tools & equipment • Preparation of painting surface • Application of paint • Protection of painted surface	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

Tools and equipment
- Spade
- Wheelbarrows
- Painting brushes
- Trowel
- Spririt level
- Screw driver
- Hammer
- Plumb bob
- Wooden float

- Steel float
- Head pans

Materials and supplies
- Cement
- Water
- Bricks
- Wooden blocks
- Tiles
- Lining boards
- Lime
- Doors
- Windows

Personal protective equipment (PPEs)
- Gum boots
- Helmets
- Gloves
- Dust coats
- First aid kits

INSTALLATION OF BUILDING SERVICES

UNIT CODE: CON/CU/BUT/CR/05/4

RELATIONSHIP TO OCCUPATIONAL STANDARDS

This unit addresses the unit of competency: Install building services

DURATION OF UNIT: 70 hours

UNIT DESCRIPTION

This Unit describes the competencies required to install building services. It involves installing water supply systems, Sanitary appliances, drainage systems and electrical conduit building and fittings.

SUMMARY OF LEARNING OUTCOMES
1. Install water supply systems
2. Install sanitary appliances
3. Install drainage systems
4. Install electrical conduit, tubing and fittings

Learning Outcomes, Content and Suggested Assessment Methods

Learning outcome	Content	Suggested assessment methods
1. Install water supply systems	• Water supply system drawings • Plumbing materials • Types of pipes • Plumbing tools and equipment • Pipe connection sockets • Pipe bending and cutting • Pipe alignment • Pipe threading • Plumbing layout • Safety and health standards	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
2. Install sanitary appliances	• Types of sanitary appliances • Plumbing tools and equipment	• Written assignments • Written Tests • Practical projects

	Installation procedures for sanitary appliances • Waste disposal act	• Practical Tests • Oral questioning • Observation of work procedures
3. Install drainage systems	• Drainage system drawings • Drainage materials • Collection chamber types • Collection chamber construction • Types of drainage systems • Drainage system installation • Drainage pipes • Drainage system testing • Waste disposal act	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures
4. Install electrical conduit, tubing and fittings	• Types of electrical conduit, tubing and fittings • Electrical conduit tools and equipment • Electrical drawings • Electrical codes • Electrical conduit, tubing and fittings installation	• Written assignments • Written Tests • Practical projects • Practical Tests • Oral questioning • Observation of work procedures

Suggested Methods of Instruction:
- Demonstration by trainer
- Practical work by trainee
- Demonstration videos
- Projects
- Group discussions

Recommended Resources

Tools and equipment
- Concrete mixer
- Trowel
- Plumb bomb
- Spirit levels
- Pipe wrench

- Pliers
- Hacksaw
- Welding machine
- Tester
- Hammer
- Pipe bending equipment

Materials and supplies
- Cement
- Water
- Sand
- Ballast
- Timber
- Damp proof materials
- Hessian cloth
- Reinforcement bars
- Steel
- Hoop iron
- BRC
- Masonry units
- Nails
- Pipes
- Pipe fittings
- Gutters
- Rainwater drop pipe
- Manhole covers
- Sockets
- Conduit
- Tubing

Personal protective equipment (PPEs)
- Overall
- Helmet
- Safety boots
- Masks
- Gloves
- First aid kit
- Reflectors

- Safety goggles