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**MINISTRY OF EDUCATION**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**PLUMBER**

**LEVEL 4**

**PROGRAMME CODE: 0732 354 A**

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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 Kenya’s development blue print 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 and this resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of the TVET training. The policy document requires that training in TVET shall be competency based, curriculum development shall be industry led, certification shall be based on demonstration of competence and mode of delivery shall allow for multiple entry and exit in TVET programs.

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 Occupational Standard has been developed for the purpose of informing development of a competency-based carpenter and joiner level 3 Curriculum. This Occupational Standard will also form the basis for assessment of an individual for competency certification.

It is my conviction that this Occupational Standard will play a great role towards development of a competent human resource for the Construction Sector’s growth and sustainable development.

**CABINET SECRETARY**

**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, CAP 210A and the Sessional Paper No. 4 of 2016 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 labor force.

The industry in conjunction with national polytechnics and other national agencies have developed this Carpenter and Joiner Level 3 Occupational Standard. The Standard is designed and organized with clear performance criteria for each element of a unit of competency. It also outlines the required knowledge and skills for the performance of prescribed tasks as well as evidence guide for assessment purposes.

**PRINCIPAL SECRETARY**

# ABBREVIATIONS AND ACRONYMS

PPEs- PERSONAL PROTECTIVE EQUIPEMENTS.

CBET- COMPETENCE BASED EDUCATION TRAINING.

TVET- TECHNICAL VOCATIONAL EDUCATION TRAINING

ISCED- INTERNATIONAL STANDARDS CLASSIFICATION OF EDUCATION

POE- PORTIFOLIO OF EVIDENCE

PVC- POLY VINYL CHLORIDE

GI- GALVANIZED IRON

TVETA-TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING AUTHORITY

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# KEY TO UNIT CODE



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# OVERVIEW

Plumbing level 4 consists of competencies that an individual must have to be awarded full qualification on plumbing. It involves installing domestic water supply, installing sanitary appliances I, installing domestic drainage systems, installing water supply system for domestic buildings, installing rainwater harvesting for domestic buildings, installing drainage systems for domestic buildings, and installing sanitary appliances II

**Basic Units of Competency**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0417 251 04A | Apply workplace essential skills |

**Core Units of Competency**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0732 251 01A | Install water supply system I |
| 0732 251 02A | Install sanitary appliances I |
| 0732 251 03A | Install drainage systems I |
| 0732 351 05A | Install water supply system II |
| 0732 351 06A | Install rainwater harvesting system I |
| 0732 351 07A | Install drainage systems II |
| 0732 351 08A | Install sanitary appliances II |

# 

# BASIC UNITS OF COMPETENCY

## APPLY WORKPLACE ESSENTIAL SKILLS

**UNIT CODE:** 0417 251 04A

**UNIT DESCRIPTION**

This unit covers the competencies required to apply Workplace essential skills. It involves applying communication skills, promoting work ethical practices, and values, and applying entrepreneurial skills.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace function | **PERFORMANCE CRITERIA**  These assessable statements specify the required level of performance for each of the elements.  ***Bold and italicized terms*** ***are elaborated in the Range*** |
| --- | --- |
| 1. Apply Communication Skills | * 1. Specific communication methods are identified based on workplace requirements.   2. Identified ***communication methods*** are applied in accordance with workplace requirements.   3. Specific written communication strategies are identified based on workplace requirements.   4. Identified ***written communication methods*** are applied based on the workplace policy.   5. Non-verbal ***communication cues*** are identified in all areas as per workplace requirements.   6. Identified ***non-verbal communication cues are*** applied in all areas of the workplace requirements.   7. Pathways of ***oral communication*** are established as per workplace policy.   8. ***Group discussion techniques*** are applied based on workplace needs. |
| 1. Promote work ethical practices and values | 1. Personal management is demonstrated through self-awareness, self-esteem, emotional intelligence, stress management and assertiveness based on scope of work. 2. Policies and guidelines are observed as per the workplace requirements 3. Self-worth and professionalism is exercised in line with ***personal goals*** and organizational policies 4. Code of conduct is observed as per the workplace requirements 5. Teamwork is applied as per work place requirements 6. **Conflicts** are resolved between ***team*** members in line with organization policy. 7. ***Creative, innovative*** and practical solutions are developed based on the problem 8. ***Customer*** concerns and complaints are analyzed and resolved in line with the set organizational culture. |
| 1. Apply Entrepreneurial skills | 1. Personal finances are managed as per financial procedures and standards 2. Savings are managed as per financial procedures and standards 3. ***Sources of personal and business*** funds are identified as per financial procedures and standards 4. Investments are undertaken as per financial procedures and standards 5. ***Entrepreneurial roles and characteristics*** identified as per principles of Entrepreneurship 6. Salaried employment and self-employment are distinguished as per principles of entrepreneurship 7. ***Requirements for entry into self-employment*** are identified according to business procedures and standards 8. ***Regulatory requirements*** when starting a small business are identified as per business procedures and standards 9. Business planning is undertaken as per resource implications and regulatory framework |

**RANGE**

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

| **Variable** | **Range** |
| --- | --- |
| 1. Written communication may include but not limited to: | * Memos * Letters * Notices * SMS |
| 1. Non-verbal strategies may include and not limited to: | * Posture * Gestures * Eye contact * Facial expressions * Dressing/Grooming |
| 1. Oral communication pathways may include and not limited to: | * Telephone calls * Face-to-face * Meetings * Interviews |
| 1. Group communication strategies may include but not limited to: | * Body language * Active listening * Concise language |
| 1. Conflicts include but are not limited to: | * Interpersonal Conflict. * Intrapersonal Conflict. * Intergroup Conflict. * Intragroup Conflict. |
| 1. Customer may include but not limited to: | * Loyal * Discount * Impulse * Need-based * Wandering |
| 1. Team may include but not limited to: | * Small workgroup * Staff in a section/department * Inter-agency Group * Virtual teams |
| 1. Creative and Innovation may include but are not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |
| 1. Sources of personal finance mayinclude but are not limited to: | * Salary/Wages * Investments * Savings * Inheritance * Government Benefits |
| 1. Sources of business finance mayinclude but not limited to: | * Equity Financing * Debt Financing, * Personal Savings/Investment * Retained Earnings * Grants and Subsidies * Crowdfunding * Supplier credit: * Leasing and Asset Financing: |
| 1. Characteristics of Entrepreneurs may include but are not limited to: | * Creative * Innovative * Planner * Risk-taker * Networker * Confident * Flexible * Persistent * Patient * Independent * Future-oriented * Goal oriented |
| 1. Requirements for entry into self-employment may include but not limited to | * Technical skills * Management skills * Entrepreneurial skills * Resources * Infrastructure |
| 1. Legal requirements when starting a small business may include but not limited to: | * Business Registration * Business Name Registration * Business Permits and Licenses * Tax Registration * Compliance with Employment Laws |

**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
* Interpretation
* Negotiation
* Writing
* Decision making
* Problem solving skills
* Team work
* Responsibility skills
* Critical thinking
* Organizational
* Negotiation
* Monitoring
* Creative/innovative thinking
* Adaptability
* Conflict management
* Emotional intelligence
* Leadership
* Critical thinking
* Networking
* Basic financial management skills
* Creativity
* Analytical
* Management
* Problem-solving
* Communication

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Effective verbal communication methods
* Simple effective questioning techniques
* Workplace etiquette
* Work planning
* Personal hygiene
* Accountability
* Workplace problems and how to deal with them
* Work values and ethics
* Company policies and procedures
* Company operations, procedures and standards
* Flexibility and adaptability
* Concept of time and leisure time
* Decision making
* Work planning
* Organizing work
* Gender and diversity mainstreaming
* Professional growth and development
* creativity
* Innovation
* problem-solving
* customer care
* mentoring and coaching.
* Emerging issues
* Decision making
* Competition
* Budgeting
* Investment
* Personal financial management
* Risk
* Time management
* Market and feasibility studies
* Relevant developments in other industries

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Effected written communication based on workplace requirements.   2. Exercised non-verbal communication as per workplace requirements.   3. Executed group discussion strategies as per workplace policy.   4. Promoted team work based on workplace requirements   5. Promoted work ethical practices and values as per work place requirements   6. Identified sources of personal and business finance as per financial procedures and standards   7. Undertook business planning as per resource implications and regulatory framework   8. Carried out mensuration as per the objects given   9. Was able to produce plain geometry drawings   10. Conducted freehand sketching of different types of geometric forms, tools, equipment, diagrams   11. Produced solid geometry drawings   12. Produced sketches of building sections   13. Produced sketches of building elevations |
| 1. Resource Implications | 1. Access to relevant workplace where assessment can take place 2. Materials, equipment and tools relevant to the proposed activity or tasks |
| 1. Methods of Assessment | 3.1 Written tests   * 1. Observation   2. Oral questioning   3. Portfolio of Evidence   4. Interview   5. Third party report |
| 1. Context of Assessment | Competency may be assessed   1. On the job 2. Off the job 3. During industrial attachment |
| 1. 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 COMPETENCY

## INSTALL WATER SUPPLY SYSTEM I

**UNIT CODE: 0732 251 01A**

**Unit Description**

This unit specifies the competencies required to install water supply system. It involves preparing pipe installation materials, performing domestic pipework and maintaining domestic pipework. It applies in the construction industry.

**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  ***Bold*** *and italicized terms are elaborated in the Range* |
| 1. Prepare and quantify pipe installation materials | 1. ***Safety measures*** are applied as per work requirement 2. ***Pipe installation materials*** are identified as per work requirement. 3. ***Pipes are prepared*** in accordance with manufacturer’s instructions. 4. ***Pipes installation materials*** are quantified as per work requirements. |
| 1. Sketch simple plumbing drawing and symbols | * 1. ***Working pipework drawings*** are identified as per work requirements.   2. Working pipework drawingsare interpretedas per work requirements.   3. ***Measurements and symbols*** of pipe work drawings are interpretedas per work requirements. |
| 1. Perform domestic pipework | * 1. ***Piping tools and equipment*** are assembled as per work requirement.   2. Pipe layout is set out based on working drawing   3. Pipes are mounted based on drawing specifications.   4. Storage and ***auxiliary fittings*** are mounted based on manufacturer’s installation.   5. ***Functionalit****y* ***tests*** are conducted as per work procedure   6. Housekeeping is performed as per work procedure. |
| 1. Maintain domestic pipework | * 1. Domestic pipework ***repair materials*** are identified as per job requirement.   2. Notice for maintenance operation are issued as per work procedure.   3. ***Tools and equipment*** are assembled as per work requirement   4. Pipework faults are repaired as per work requirement.   5. Housekeeping is conducted as per work requirement. |

**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.

|  |  |
| --- | --- |
| **Variables** | **Range** |
| 1. ***Safety measures*** may include but not limited to: | * Personal protective equipment (PPE) * Hardhat/ Helmet * Safety gloves * Dustcoat / overall * Safety shoes / boots * Safety goggles/ face mask * Handling tool and equipment. * Workplace behavior |
| 1. ***Pipe installation materials*** may include but not limited to: | * Various types of pipes * PPR-Polypropylene random pipes * HDPE-High density polyethylene pipes * Galvanized iron (G.I) pipes * Chlorinated polyvinyl chloride (CPVC) * Unplasticized polyvinyl chloride (UPVC) * Caulking supplies * Various types of pipe support * Sandpapers * Threading oil * Thread tape |
| 1. ***Pipe preparation*** may include but not limited to: | * Pipe bending * Cold bending * Heat bending * Pipe cutting * Pipe jointing * Pipe threading * Pipe welding |
| 1. ***Piping tools and equipment*** may include but not limited to: | * Pipe wrench * Pipe cutter * Hacksaw * Pipe threading machine * diestock * Pipe vice * Files * Screwdrivers * Drill with various sizes of bits * Mallet * Ballpein hammer * Cold chisel * PPR welding machine/ Heat Fusion * Pipe bender |
| 1. ***Pipework drawings*** may include but not limited to: | * Pictorials * Free hand sketches * Isometric drawings |
| 1. ***Auxiliary fittings*** may include but not limited to: | * + Tee   + Unions   + Elbows   + Adapters   + Nipples   + Valves * Tank connectors |
| 1. ***Functionality tests*** may include but not limited to: | * Water test * Air test |

**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 skills
* Problem solving skills
* Organizing skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Threading skills
* Fusion skills
* Bending skills
* Interpersonal Relationship skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Measurement
* Fusion
* Bending
* Mensuration
* Threading
* Testing

**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. Applied safety measures as per work requirement. 2. Identified pipe installation materials as per work requirement. 3. Prepared pipes as per the manufacturer’s instructions. 4. Assembled piping tools and equipment as per work requirement. 5. Set out pipe layout based on working drawing. 6. Mounted pipes based on drawing specifications. 7. Mounted auxiliary fittings as per manufacturer’s instructions. 8. Conducted functionality test as per work procedure. 9. Performed housekeeping as per work procedure. |
| 1. Resource Implications | The following resources must be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant work environment 3. Resources relevant to the proposed activities or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Practical   2. Project   3. Third party reports   4. Portfolio of evidence (POE)   5. Oral questioning   6. Written test |
| 1. Context of Assessment | Assessment may be done in a work place or a simulated work place. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector workplace and job role is recommended. |

## INSTALL SANITARY APPLIANCES I

**UNIT CODE: 0732 251 02A**

**Unit Description**

This unit specifies the competencies required to install sanitary appliances. It involves preparing materials for sanitary appliances, fixing sanitary appliances and maintaining sanitary appliances. It applies in the construction industry.

**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  ***Bold*** *and italicized terms are elaborated*  *in the Range* |
| 1. Prepare materials for sanitary appliances | 1. ***Safety measures*** are applied as per work requirement 2. ***Sanitary appliances installation materials*** are identified as per job requirement. 3. ***Sanitary appliances*** are selected based job requirement. 4. Sanitary appliances parts are assembled as per manufacturer’s manual. |
| 1. Sketch simple sanitary appliances drawings and symbols. | * 1. ***Working sanitary drawings*** are identified as per work requirements.   2. Working sanitary drawings are interpreted as per work requirements.   3. Measurements and symbols of sanitary drawings are interpretedas per work requirements. |
| 1. Fix sanitary appliances | * 1. ***Sanitary appliances installation tools and equipment*** are assembled as per work requirement.   2. Sanitary appliances setting out is performed based on working drawing.   3. Sanitary appliances are mounted based on working drawing.   4. ***Appliances*** ***functionality test*** is conducted as per work procedure. |
| 1. Maintain sanitary appliances | * 1. ***Sanitary appliances repair materials*** are assembled as per work requirement.   2. Notice for maintenance operation is issued as per work procedure.   3. ***Tools and equipment*** are assembled as per work requirement.   4. ***Sanitary appliances faults*** are repaired as per work requirement.   5. ***Housekeeping*** is performed as per work procedure. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variables** | **Range** |
| 1. ***Safety measures*** may include but not limited to: | * Personal protective equipment * Hardhat/ Helmet * Safety gloves * Dustcoat / overall * Safety shoes / boots * Safety goggles/ face mask * Handling tool and equipment. * Workplace behavior |
| 1. ***Sanitary appliances installation repair material***s may include but not limited to: | * Screws * Adhesives * Cement * Sand * Pipes * Traps * Caulking material |
| 1. ***Sanitary appliances*** may include but not limited to: | * Wash hand basin * Water closet * Bath tub * Urinal * Kitchen sink * Shower head |
| 1. ***Sanitary drawings:***   may include but not limited to: | * Pictorials * Free hand sketches * Isometric drawings |
| 1. ***Sanitary appliances installation tools and equipment*** may include but not limited to: | * Pipe wrench * Adjustable spanner * Pipe cutter * Hacksaw * Files * Screwdrivers * Drill with various sizes of bits * Mallet * Ball hammer * Electric cables * Masonry chisel * PPR machine / Heat Fusion * Trowel |
| 1. ***Sanitary appliances faults*** may include but not limited to: | * Leaking Faucet * Clogged Sink or Drain * Running Toilet * Low Water Pressure * Weak Flush or Clogged Toilet * Broken or Cracked Sink * Faulty Water Heater * Leak at Joints or Connections * Slow Draining Bathtub or Shower * Faulty Showerhead (leaking or low flow) * Overflowing Urinal * Bad odours from Drains * Corroded Pipes or Fittings * Non-functioning Bidet * Incorrectly Mounted Fixtures |
| 1. ***Housekeeping*** may include but not limited to: | * Care and maintenance * Storage |

**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 skills
* Organizing skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Threading skills
* Fusion skills
* Bending skills
* Quality of materials identification skills

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Conversion of units
* Measurement
* Fusion
* Bending
* Mensuration
* Types of cloaking materials
* Types of valves
* Types of appliances
* Types of traps
* Testing
* Special appliances and
* New technologies

**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. Applied safety measures as per work requirement. 2. Identified sanitary installation materials as per job requirement 3. Selected sanitary appliances based on job requirement. 4. Assembled sanitary appliances tools and equipment as per work requirement 5. Assembled sanitary appliance parts as per manufacturer’s manual. 6. Set out sanitary appliance layout based on working drawing 7. Mounted sanitary appliance based on working drawing. 8. Conducted functionality test as per work procedure. 9. Performed housekeeping as per work procedure. |
| 1. Resource Implications | The following resources must be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant work environment 3. Resources relevant to the proposed activities or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Practical   2. Project   3. Third party reports   4. Portfolio of evidence   5. Oral questioning   6. Written test |
| 1. Context of Assessment | Assessment may be done in a work place or a simulated work place. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector workplace and job role is recommended |

## INSTALL DRAINAGE SYSTEM I.

**UNIT CODE: 0732 251 03A**

**Unit Description**

This unit specifies the competencies required to install domestic drainage system. It involves Installing above ground drainage system, installing below ground drainage system, and maintaining drainage systems. It applies in the construction industry.

**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  ***Bold*** *and italicized terms are elaborated*  *in the Range* |
| 1. Install above ground drainage system | 1. ***Safety measures*** are applied as per work requirement. 2. ***Above ground drainage materials*** are prepared based on working drawing. 3. ***Drainage tools and equipment*** are assembled as per work requirement. 4. Drainage pipe layout is set out based on working drawing. 5. Drainage pipework is installed as per the layout. 6. Functionality test is performed as per work procedure. 7. Housekeeping is conducted as per work procedure. |
| 1. Install below ground drainage system | * 1. Safety measures are applied as per work requirement.   2. ***Below ground drainage materials*** are prepared based on working drawing.   3. ***Drainage tools and equipment*** are assembled as per work requirement.   4. Drainage trenches are prepared as per work requirement.   5. ***Drainage pipework is installed*** as per drainage system layout.   6. ***Drainage access points*** are constructed as per work procedure.   7. Functionality test is performed as per work procedure.   8. Housekeeping is conducted as per work procedure. |
| 1. Interpret simple domestic drainage system drawing | * 1. ***Working domestic drainage drawings*** are identified as per work requirements.   2. *Working domestic drainage drawings* are interpretedas per work requirements.   3. *Measurements and symbols* of domestic drainage drawings are interpretedas per work requirements. |
| 1. Maintain drainage systems | * 1. Domestic drainage repair materials are assembled as per job requirement.   2. Notice for maintenance operation is issued as per work procedure.   3. ***Drainage tools and equipment*** are assembled as per work requirement.   4. ***Drainage pipework faults*** are repaired as per work requirement.   5. Housekeeping is conducted as per work requirement. |

**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.

|  |  |
| --- | --- |
| **Variables** | **Range** |
| 1. ***Safety measures*** may include but not limited to: | * Personal protective equipment * Hardhat/ Helmet * Safety gloves * Dustcoat / overall * Safety shoes / boots * Safety goggles/ face mask * Handling tool and equipment. * Workplace behavior |
| 1. ***Above ground drainage materials*** may include but not limited to: | * Waste pipes * Pipe fittings * Clips * Screws * Nails * Wall plugs * Pipe adhesives |
| 1. ***Domestic drainage drawings;*** may include but not limited to: | * Pictorials * Free hand sketches * Isometric drawings |
| 1. ***Drainage tools and equipment*** may include but not limited to: | * Hacksaw * Trowel * Tape measure * Spirit level * Steel float * Wooden float * Drilling machine * Screw drivers * Power extension cable * Mason hammer * Builders square |
| 1. ***Drainage access points*** may include but not limited to: | * Inspection chambers * Man holes * Silt traps |
| 1. ***Drainage pipework faults*** may include but not limited to | * Blockage * Pipe burst * Leakages * Loss of trap seals |

**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:

* Problem-solving skills
* Communication skills
* Interpersonal relationship skills
* Organizing skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Bending skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Conversion of units
* Levelling
* Drainage materials
* Drainage tools and equipment
* Joining and jointing
* Mensuration
* Drainage systems
* Faults in drainage system
* Functionality test

**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. Applied safety measures as per work requirement. 2. Prepared drainage materials as per working drawing 3. Assembled drainage tools and equipment as per work requirement 4. Set out pipe layout based on working drawing 5. Installed above ground drainage system as per the layout 6. Installed below ground drainage system as per the layout 7. Tested drainage systems as per work procedure 8. Conducted housekeeping on work requirement |
| 1. Resource Implications | The following resources must be provided:   1. Appropriately simulated environment where assessment can take place 2. Access to relevant work environment 3. Resources relevant to the proposed activities or tasks |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Practical   2. Project   3. Third party reports   4. Portfolio of evidence   5. Oral questions   6. Written test |
| 1. Context of Assessment | Assessment may be done in a work place or a simulated work place. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector workplace and job role is recommended |

## INSTALL WATER SUPPLY SYSTEM II

**UNIT CODE:** 0732 351 05A

**UNIT DESCRIPTION**

This unit specifies the competencies required to install water supply system. It involves preparing water supply system schematic drawings, costing water supply materials, installing water supply pipework, installing water storage tanks and maintaining water supply systems.

**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.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Prepare water supply system schematic drawing | 1. ***Personal Protective Equipment*** are donned as per work requirement 2. Water supply system ***working drawings*** are selected based on task. 3. Water supply system measurements are converted based on the drawing scale. 4. Water Supply system symbols are identified based on standard practices. 5. Isometric pipework drawings are sketched based on design. |
| 1. Cost water supply materials | 1. Water supply system ***materials and supplies*** are selected based on design specifications. 2. Water supply system materials schedule is prepared as per working drawing 3. Water supply system materials are quantified based on Standard Methods of Measurements. 4. Water supply system materials and supplies cost estimate is prepared based on market rate. |
| 1. Install water storage tank. | * 1. Personal Protective Equipment are donned as per work requirement   2. Location of storage tank is determined based on working drawing.   3. Tank connection positions are set out based on manufacturer’s guidelines and building codes.   4. Water Supply pipes are cut based on working drawing and job requirements   5. Water supply pipes are bent based on type of pipe, working drawing and job requirement.   6. Water supply pipe joints are prepared in accordance with manufacturer’s instructions.   7. Pipefittings and control valves are installed as per the job requirement.   8. Water storage tanks are mounted based on job requirements and manufacturer’s instructions.   9. Housekeeping is conducted as per workplace procedure |

**RANGE**

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

|  |  |
| --- | --- |
| **Variables** | **Range** |
| * + - 1. ***Personal Protective Equipment*** may include but not limited to: | * Helmet * Gloves * Dustcoat /overall * Safety boots * Face mask * Safety googles * Ear muffs * Nose mask |
| * + - 1. ***Working drawings*** may include but not limited to: | * Pictorial * Line drawing * Freehand sketching * Scale drawings |
| * + - 1. ***Materials and supplies*** may include but not limited to | * Pipes * Fittings * Jointing paste * Adhesives * Hemp * PTFE * Welding rods |
| * + - 1. ***Pipework tools and equipment*** may include but not limited to: | * Pipe wrench * Pipe cutter * Hacksaw * Pipe Threading Equipment * Files * Screwdrivers * Portable drilling machine * Tape measure * Hammer * Masonry chisel * PPR machine * Pipe bender |
| * + - 1. ***Water supply pipes*** may include but not limited to: | * PPR * PVC * CPVC * GI * UPVC * PEX * HDPE |
| * + - 1. ***Water supply Pipe joints*** may include but not limited to: | * Screwed * Brazed * Soldered * Welded * Flanged |
| * + - 1. ***Water supply pipe fittings and control valves*** may include but not limited to: | * Union * Tee * Sockets * Elbow * Bends * Nipples * Gate valve * Globe valve * Stop cock * Ball cock |
| * + - 1. ***Water supply functionality tests*** may include but not limited to: | * Water test * Air test |
| * + - 1. ***Tank connection positions*** may include but not limited to: | * Inlet * Outlet * Overflow * Washout |
| * + - 1. ***Building codes*** may include but not limited to: | * British Standard Code 6700/ 8558 * International Plumbing Code * Kenya Building Code * BS 10 * BS 970 |
| * + - 1. ***Water storage tanks*** may include but not limited to: | * Plastic tanks * Steel tanks * Concrete tanks * Masonry tanks * Fibre glass |
| * + - 1. ***Faults*** ***in plumbing systems*** may include but not limited to: | * Leakages * Air lock * Water hammer * Blockages |

R**EQUIRED 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:

* Interpersonal skills
* Communication skills
* Sketching skills
* Interpretation skills
* Problem-solving skills
* Critical thinking skills
* Organizing skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Threading skills
* Pipe bending skills
* Pipe jointing skills
* Interpersonal Relationship skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Interpretation of symbols
* Conversion of units
* Types of pipes
* Types of scales
* Types of drawings
* Materials and supplies
* Piping tools and equipment
* Jointing of pipes
* Bending methods
* Mensuration
* Piping systems
* Faults in pipe work
* Water supply system functionality tests
* Water sources
* Types of valves
* New technologies
* Costing
* Estimation
* Storage systems

**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. Donned PPEs as per work requirement 2. Sketched isometric pipework drawings based on the drawing design 3. Prepared water supply system material schedule as per the working drawing 4. Selected pipework tools and equipment as per work requirement 5. Marked water supply pipe layout based on schematic drawing. 6. Cut water supply pipes as per the isometric pipe layout 7. Jointed and installed water supply pipes, fittings and control valves in accordance with the manufacturer’s instructions and job requirement 8. Conducted installed water supply functionality tests as per work procedure 9. Set out tank connection positions as per manufactures instructions. 10. Cut and bent water supply pipes as per job requirement 11. Mounted water supply storage tanks based on manufactures instructions 12. Repaired water supply faults based on job requirement 13. Conducted housekeeping as per workplace procedure |
| 2. | Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant work environments.   3. Resources relevant to the proposed activities or task. |
| 3. | Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical   2. Projects   3. Poe evaluation   4. Third party reports   5. Written tests |
| 4. | Context of Assessment | The competency may be assessed in a workplace or a simulated workplace |
| 5. | Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## INSTALL RAINWATER HARVESTING SYSTEM I

**UNIT CODE: 0732 351 06A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to install rainwater harvesting system. It involves preparing rainwater harvesting schematic drawing, costing rainwater harvesting system materials & supplies, fabricating rainwater goods, installing rain water goods, testing rainwater system and maintaining rain water harvesting system..

**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.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Prepare rainwater harvesting schematic drawing | 1. ***Personal Protective Equipment*** are donned as per work requirement 2. Rainwater harvesting system ***working drawings*** are selected based on task. 3. Drawing instruments are selected based on drawing requirements 4. Rainwater harvesting system measurements are converted based on the drawing scale. 5. Rainwater harvesting system symbols are identified based on standard practices. 6. Rainwater harvesting system is sketched based on design |
| 1. Cost Rainwater harvesting system materials & supplies | 1. ***Rainwater harvesting system materials and supplies*** are selected based on working drawing specifications. 2. Rainwater harvesting system materials schedule is prepared based on working drawing. 3. Rainwater harvesting system materials are quantified based on standard methods of measurements 4. Rainwater harvesting system materials and supplies cost estimate is prepared based on market rate. |
| 1. Fabricate rainwater goods | 1. Personal Protective Equipment are donned as per work requirement 2. ***Rainwater goods tools and equipment*** are selected based on the job requirements. 3. ***Rainwater goods*** materials are selected based on the job requirements 4. Rainwater goods are fabricated based on drawing and as per standard work procedure. 5. Housekeeping is conducted as per workplace procedure |
| 1. Install rain water goods | 1. Personal Protective Equipment are donned as per work requirement 2. Water harvesting methods are identified based on the working drawing 3. Rainwater goods are identified based on the working drawing. 4. Rainwater goods installation tools and equipment are selected based on task. 5. Rainwater goods are set out based on job requirement and building codes 6. Rainwater goods are installed based on working drawing. 7. Housekeeping is conducted as per workplace procedure |
| 1. Test rainwater system | 1. Personal Protective Equipment are donned as per work requirement 2. Water tests is conducted based on job requirements 3. ***Rainwater*** ***system faults*** are corrected based on work requirements. 4. Housekeeping is conducted based on workplace procedure |
| 1. Maintain rain water harvesting system | * 1. Personal Protective Equipment are donned as per work requirement   2. Faults in rainwater harvesting system are detected based on Functionality   3. Rainwater harvesting system tools and equipment are selected based on task   4. Faults in rainwater harvesting system are repaired based on original status   5. Maintained rainwater system is tested as per the original status   6. Housekeeping is conducted as per workplace procedure |

**RANGE**

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

|  |  |
| --- | --- |
| **Variables** | **Range** |
| 1. ***Personal Protective Equipment*** may include but not limited to: | * Helmet * Gloves * Dustcoat/overall * Safety boots * Safety harness * Safety goggles |
| 1. ***Working drawings*** may include but not limited to: | * Pictorial * Line drawing * Freehand sketching * Scale drawings |
| 1. ***Rainwater harvesting materials and supplies*** may include and not limited to: | * Galvanised iron plain sheet * Copper plain sheet * Aluminium plain sheet * Silicon * Paint * Nails * Screws * Rivets * Solder * Soldering flux |
| 1. ***Rainwater harvesting tools and equipment*** may include but not limited to: | * Hacksaw * Screwdrivers * Portable drilling machine * Mallet * Hammer * Plumb bob * Tape measure * Chalk line * Rope level * Spirit level * Silicon gun * Builders square * Soldering gun |
| 1. ***Rainwater goods*** may include but not limited to: | * Down pipes * Gutters * Brackets * Hopper head * Rainwater shoe * Bends * Inside corner * Outside corner * Gutter dropper |
| 1. ***Rainwater system faults*** may include but not limited to: | * Water podding * Water leakage * System blockage |

**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:

* Interpersonal skills
* Communication skills
* Sketching skills
* Interpretation skills
* Problem-solving skills
* Critical thinking skills
* Organizing skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Fabrication skills
* Interpersonal Relationship skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Interpretation of symbols
* Conversion of units
* Materials and supplies
* Rainwater goods tools and equipment
* Methods of jointing
* Forming
* Riveting
* Levelling
* Soldering
* Mensuration
* Faults in rainwater goods

**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. Donned PPEs as per work requirement 2. Sketched rainwater harvesting system based on design 3. Prepared rainwater harvesting system material schedule as per the working drawing 4. Estimated rainwater harvesting system materials and supplies cost based on market rate. 5. Selected rainwater harvesting system tools and equipment based on job requirements 6. Marked rainwater harvesting system layout as per layout drawing. 7. Fabricated rainwater goods based on working drawing and as per standard work procedure 8. Selected rainwater goods based on working drawing. 9. Installed rainwater harvesting system as per the design. 10. Performed water test as per work procedure. 11. Repaired rainwater harvesting system faults based on functionality 12. Conducted housekeeping as per workplace procedure |
|  | 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant work environments.   3. Resources relevant to the proposed activities or task. |
|  | 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical   2. Projects   3. Poe evaluation   4. Third party reports   5. Written tests |
|  | 1. Context of Assessment | The competency may be assessed in a workplace or a simulated workplace |
|  | 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## INSTALL DRAINAGE SYSTEMS II

**UNIT CODE:** **0732 351 07A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to install drainage system. It involves preparing drainage system schematic drawing, costing drainage materials, setting out drainage system, installing drainage system, testing drainage system and maintaining drainage system.

**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.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Prepare drainage system schematic drawing | * 1. ***Personal Protective Equipment*** are donned as per work requirement   2. Drainage system ***working drawings*** are selected based on work requirement.   3. ***Drawing instruments*** are selected based on drawing requirements   4. Drainage system measurements are converted based on the drawing scale.   5. Drainage system symbols are identified based on standard practices   6. Drainage system is sketched based on working drawing |
| 1. Cost drainage materials | 1. ***Drainage Materials and supplies*** are identified based on working drawing specifications. 2. Drainage materials schedule are prepared based on best practice. 3. Drainage materials are quantified based on design. 4. Drainage materials and supplies cost estimate is determined based on market rate. |
| 1. Set out Drainage system. | * 1. Personal Protective Equipment are donned as per work requirement   2. Drainage system setting out tools and equipment are selected based on the job requirement   3. Drainage System measurements are transferred to the building elements based on working drawings |
| 1. Test drainage system | * 1. Personal Protective Equipment are donned as per work requirements   2. ***Functionality tests*** for drainage systems are performed as per work requirement.   3. ***Drainage system faults*** are corrected based on functionality   4. ***Housekeeping*** is conducted based on workplace procedure |

**RANGE**

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

|  |  |
| --- | --- |
| **Variables** | **Range** |
| 1. ***Personal Protective Equipment*** may include but not limited to | * Helmet * Gloves * Dustcoat/ overall * Safety boots * Nose mask |
| 1. ***Working drawings*** may include but not limited to: | * Pictorial * Line drawing * Freehand sketching * Scale drawings * Elevations * Plans |
| 1. ***Drawing instrument*** may include but not limited to: | * Set squires * T square * Protractor * Dividers * Compass |
| 1. ***Drainage materials and Supplies*** may include but not limited to | * Pipe fittings * Caulking materials * Pipes supports * Clay pipes * UPVC pipes * Cast iron pipes * Concrete pipes |
|  |  |
| 1. ***Drainage tools and equipment*** may include but not limited to | * Measuring tools * Levelling equipment * Mason trowels * Mason square * Spirit level * Boning rods * Floats * Mallet * Hammer * Masonry chisel * Strap wrench * De-clogging wire * De-clogging machine * Toilet plunger |
| 1. ***Functionality tests*** may include but not limited to | * Smoke test * Water test * Air test * Pressure test * Dye test * Mirror test * Ball test |
| 1. ***Faults in drainage system*** may include but not limited to | * Leakages * Blockages |
| 1. ***Housekeeping*** may include but not limited to | * Protecting existing work environment * Clearing work area as per work procedure * Keeping work area tidy |

**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:

* Interpersonal skills
* Communication skills
* Sketching skills
* Interpretation skills
* Problem-solving skills
* Critical thinking skills
* Jointing skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Bending skills
* Masonry skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Interpretation of symbols
* Organisation
* Conversion of units
* Levelling
* Drainage materials and supplies
* Drainage tools and equipment
* Types of pipes
* Jointing
* Mensuration
* Drainage systems
* Faults in drainage system
* Functionality tests

**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 Donned PPE as per work requirement  1.2 Sketched drainage system based on the working drawing  1.3 Prepared drainage system material schedule as per the working drawing  1.4 Estimated drainage system materials and supplies cost based on market rate.  1.5 Selected drainage tools and equipment based on job requirements  1.6 Marked drainage system pipe layout as per the schematic drawing.  1.7 Measured, marked and cut drainage pipes as per the working drawing   * 1. Jointed and installed drainage pipes and fittings in accordance with the manufacturer’s instructions and job requirements   2. Performed drainage functionality tests as per work procedure.   3. Conducted drainage functionality tests as per work procedure   4. Detected and repaired drainage system faults based on functionality   5. Conducted housekeeping as per workplace procedure. |
|  | 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant work environments.   3. Resources relevant to the proposed activities or task. |
|  | 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical   2. Projects   3. Poe evaluation   4. Third party reports   5. Written tests |
|  | 1. Context of Assessment | The competency may be assessed in a workplace or a simulated workplace |
|  | 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## INSTALL SANITARY APPLIANCES II

**UNIT CODE:** **0732 351 08A**

**UNIT DESCRIPTION**

This unit specifies the competencies required to install sanitary appliances. It involves preparing sanitary appliances layout schematic drawing, costing sanitary appliances, fixing sanitary appliances and testing installed sanitary appliances.

**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.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Prepare sanitary appliances layout schematic drawing | 1. ***Personal Protective Equipment*** are done as per requirement 2. ***Sanitary appliance*** working drawings are selected based on task. 3. Sanitary appliance ***drawing instruments*** are selected based on drawing requirements 4. Sanitary appliance measurements are converted based on the drawing scale. 5. Sanitary appliances symbols are identified based on technical drawing standards 6. Sanitary appliance installation layout is sketched based on design. |
| 1. Cost sanitary appliances | 1. ***Sanitary appliance materials and supplies*** are selected based on working drawing specifications. 2. Sanitary appliance material schedule is prepared based on design specification 3. Sanitary appliance materials are quantified based on standard methods of measurements. 4. Sanitary appliance materials and supplies cost estimate is determined based on market rate. |
| 1. Fix sanitary appliances. | * 1. Personal Protective Equipment are donned as per work requirement.   2. ***Sanitary appliances installation tools and equipment*** are selected based on job requirement.   3. Sanitary appliances materials and supplies are selected based on working drawing.   4. Sanitary appliances are handled based on manufacturer’s instructions   5. Sanitary appliances are fixed as per the working drawing.   6. Fauts are detected as per work requirements   7. Sanitary appliances are commissioned as per workplace requirements.   8. Housekeepingis conducted based on workplace procedure |

**RANGE**

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

|  |  |
| --- | --- |
| **Variables** | **Range** |
| 1. ***Personal Protective Equipment*** may include but not limited to: | * Helmet * Gloves * Dustcoat /overall * Safety boots * Face mask * Safety googles * Ear muffs |
| 1. ***Sanitary appliances*** may include but not limited to: | * Wash hand basin * Water closet * Bath tub * Urinal * Bidet * Kitchen sink * Jacuzzi * Shower head * Cisterns * Instant Showers * Shower tray |
| 1. ***Drawing instrument*** may include but not limited to: | * Set squires * T square * Protractor * Dividers * Compass |
| 1. ***Sanitary appliances installation tools and equipment*** may include but not limited to: | * Pipe wrench * Hacksaw * Bench Vice * Files * Screwdrivers * Portable drilling machine * hammer * Mason chisel * Basin spanner * Adjustable spanner * Spirit level * Tape measure * Silicon gun * Heat gun * Trowel |
| 1. ***Sanitary appliances materials and supplies*** may include but not limited to: | * Screws * dowels * Cement * Sand * Pipes * Traps * PTFE tape * Hemp * Jointing paste * Fittings |
| 1. ***Faults in installed sanitary appliances*** may include but not limited to: | * Leakages * Blockages |

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical skills
* Drawing skills
* Problem-solving skills
* Critical thinking skills
* Measuring skills
* Numeracy skills
* Cutting skills
* Assembling skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Properties of materials
* Drawing interpretation
* Entrepreneurial
* Interpretation of symbols
* Organisation
* Conversion of units
* Levelling
* Sanitary appliances
* Sanitary appliance tools and equipment
* Sanitary appliances installation
* Mensuration
* Faults in sanitary appliances
* Functionality tests

**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. Donned PPE in line with work requirement 2. Converted measurements based on working drawing 3. Sketched sanitary appliances installation layout based on design 4. Prepared sanitary appliances material schedule based on design specifications. 5. Estimated sanitary appliances materials and supplies cost based on market rate. 6. Selected sanitary appliances installation tools and equipment based on job requirements. 7. Handled sanitary appliances as per manufacturer’s instructions. 8. Fixed sanitary appliances as per working drawing. 9. Conducted sanitary appliances functionality test based on work requirement 10. Repaired installed sanitary appliances faults as per work procedure. 11. Conducted housekeeping as per workplace procedure |
|  | 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant work environments.   3. Resources relevant to the proposed activities or task. |
|  | 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Practical   2. Projects   3. Poe evaluation   4. Third party reports   5. Written tests |
|  | 1. Context of Assessment | The competency may be assessed in a workplace or a simulated workplace |
|  | 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |