****

**REPUBLIC OF KENYA**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**SCAFFOLDING TECHNICIAN**

**LEVEL 6**

|  |  |
| --- | --- |
| TVET CDACC  P.O. BOX 15745-00100  NAIROBI | KABETE NATIONAL POLYTECHNIC  P.O BOX 29010-00625  NAIROBI |

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**Council Secretary/CEO**

**TVET Curriculum Development, Assessment and Certification Council**

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# FOREWORD

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

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

These reforms demand that Industry takes a leading role in Curriculum development to ensure the Curriculum addresses its competence needs. It is against this background that these Occupational Standards were developed for developing a competency-based Curriculum for Scaffolding Technology Level 6. These Occupational Standards will also be the basis for assessment of an individual for competence certification.

It is my conviction that these Occupational Standards will play a great role towards safety of workers in the 1` and development of competent human resource.

**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 and 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 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.

The TVET Curriculum Development, Assessment and Certification Council (TVET CDACC), in conjunction with Construction Sector Skills Advisory Committee (SSAC), Kabete National Polytechnic in partnership with National Construction Authority, Kenya Federation of Master Builders (KFMB) and Chamber of Skilled Craft Frankfurt Rhein Main (Germany) through the Kenya Initiative for Vocational Education and Training (KeVET) project have developed these Occupational Standards for Scaffolding Technicians. These standards will be the basis for development of competency-based Curriculum for Scaffolding Technology Level 6.

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

I am grateful to the Council Members, Council Secretariat, Construction SSAC, Kabete National Polytechnic, National Construction Authority, Kenya Federation of Master Builders, Chamber of Skilled Craft Frankfurt Rhein Main, expert workers and all those who participated in the development of these Occupational Standards.

**CHAIRPERSON, TVET CDACC**

# ACKNOWLEDGMENT

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

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

My gratitude and appreciation go to Kabete National Polytechnic, National Construction Authority, Kenya Federation of Master Builders and Chamber of Skilled Craft Frankfurt Rhein Main (Germany) for their immense contribution towards the development of these Standards. I also thank all the individuals and organizations who participated in the validation of these Standards.

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

**CHAIRPERSON**

**CONSTRUCTION SECTOR SKILLS ADVISORY COMMITTEE**

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# ABBREVIATIONS AND ACRONYMS

BC Basic Competency

CC Common Competency

CDACC Curriculum Development Assessment and Certification Council

CR Core Competency

EMCA Environmental Management and Co-ordination Act

ICT Information Communication Technology

NEMA National Environment Management Authority

OS Occupational Standards

OSH Occupation Safety and Health

OSHA Occupation Safety and Health Act

OSHS Occupational Safety and Health Standards

PPE Personal Protective Equipment

SSAC Sector Skills Advisory Committee

TVET Technical and Vocational Education and Training

# KEY TO UNIT CODE

**CON /OS /ST /BC /01/ 6A**

Industry or sector

Occupational Standards

Occupational area

Type of competency

Competency number

Competency level

Version

# OVERVIEW

Scaffolding Technician Level 6 qualification consists of competencies that an individual must achieve to design basic scaffolding systems, estimate and cost scaffolding works, manage safety compliance, source scaffolding contracts and implement scaffolding works. It also entails managing scaffolding site and firm as well as performing scaffolding trade project.

The units of competency for scaffolding technicians include the following:

**BASIC UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **UNIT CODE** | **UNIT TITLE** |
| CON/OS/ST/BC/01/6/A | Demonstrate communication skills |
| CON/OS/ST/BC/02/6/A | Demonstrate digital literacy |
| CON/OS/ST/BC/03/6/A | Demonstrate entrepreneurial skills |
| CON/OS/ST/BC/04/6/A | Demonstrate employability skills |
| CON/OS/ST/BC/05/6/A | Demonstrate environmental literacy |
| CON/OS/ST/BC/06/6/A | Demonstrate occupational safety and health practices |

**COMMON UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **UNIT CODE** | **UNIT TITLE** |
| CON/OS/ST/CC/01/6/A | Apply technical drawing skills |
| CON/OS/ST/CC/02/6/A | Apply engineering mathematics |
| CON/OS/ST/CC/03/6/A | Apply Scientific Principles |
| CON/OS/ST/CC/04/6/A | Perform Workshop Processes |

**CORE UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **UNIT CODE** | **UNIT TITLE** |
| CON/OS/ST/CR/01/6/A | Design basic scaffolding systems |
| CON/OS/ST/CR/02/6/A | Estimate and cost scaffolding works |
| CON/OS/ST/CR/03/6/A | Manage safety compliance |
| CON/OS/ST/CR/04/6/A | Source scaffolding contracts |
| CON/OS/ST/CR/05/6/A | Implement scaffolding works |
| CON/OS/ST/CR/06/6/A | Manage scaffolding site |
| CON/OS/ST/CR/07/6/A | Manage scaffolding firm |
| CON/OS/ST/CR/08/6/A | Perform trade project |

# BASIC UNITS OF COMPETENCY

## DEMONSTRATE COMMUNICATION SKILLS

**UNIT CODE:** CON/OS/ST/CC/01/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate communication skills. It involves meeting communication needs of clients and colleagues, developing communication strategies, establishing and maintaining communication pathways, conducting interviews, facilitating group discussion and representing the organization.

**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. Meet communication needs of clients and colleagues | 1. Specific communication needs of clients and colleagues are identified and met based on workplace requirements 2. Different communication approaches are identified and applied according to clients’ needs 3. Conflict is identified and addressed as per the standards of the organization |
| 1. Develop communication strategies | * 1. Strategies for effective internal and external dissemination of information are developed as per organization’s requirements   2. Special communication needs are considered in developing strategies according workplace procedures   3. ***Communication strategies*** are analyzed, evaluated and revised based the workplace needs |
| 1. Establish and maintain communication pathways | * 1. Pathways of communication are established as per organization policy   2. Pathways are maintained and reviewed according to organization procedures |
| 1. Promote use of communication strategies | * 1. Information is provided to all areas of the organization as per strategy requirements   2. Effective communication techniques are articulated and modeled according work requirements   3. Personnel are given guidance about adapting communication strategies as per organization procedures |
| 1. Conduct interview | 1. A range of appropriate communication strategies are employed in ***interview situations*** based on the workplace requirements 2. Records of interviews are made and maintained in accordance with organizational procedures 3. Effective questioning, listening and nonverbal communication techniques are used as per needs |
| 1. Facilitate group discussion | 1. Mechanisms to enhance ***effective group interaction*** are identified and implemented according to workplace requirements 2. Strategies to encourage group participation are identified and used as per organizations’ procedures 3. Meetings objectives and agenda are set and followed based on workplace requirements 4. Relevant information is provided and feedback obtained according to set protocols 5. Evaluation of group communication strategies is undertaken in accordance with workplace guidelines 6. Specific communication needs of individuals are identified and addressed as per individual needs |
| 1. Represent the organization | 1. 7Relevant presentation are researched and presented based on internal or external communication forums requirements 2. Presentation is delivered in a clear and sequential manner as per the predetermined time 3. Presentation is made as per appropriate media 4. Difference views are respected based on workplace procedures 5. Written communication is done as per organizational standards 6. Inquiries are responded according to organizational standard |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Communication strategies may include but not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrase * Clarification request * Translation * Restructuring * Approximation * Generalization |
| 1. Effective group interaction may include but not limited to: | * Identifying and evaluating what is occurring within an interaction in a non-judgmental way * Using active listening * Making decision about appropriate words, behaviour * Putting together response which is culturally appropriate * Expressing an individual perspective * Expressing own philosophy, ideology and background and exploring impact with relevance to communication |
| 1. Situations may include but not limited to: | * Establishing rapport * Eliciting facts and information * Facilitating resolution of issues * Developing action plans * Diffusing potentially difficult situations |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Active listening
* Interpretation
* Negotiation
* Writing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups
* Styles of group leadership
* Key elements of communications strategy

**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. Developed communication strategies to meet the organization requirements and applied in the workplace 2. Established and maintained communication pathways for effective communication in the workplace 3. Used communication strategies involving exchanges of complex oral information |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2. Materials relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Direct observation 2. Oral questioning 3. Written texts |
| 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. |

## DEMONSTRATE DIGITAL LITERACY

**UNIT CODE:** CON/OS/ST/CC/02/6/A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Identify appropriate computer software and hardware | * 1. Concepts of ICT are determined in accordance with computer equipment   2. Classifications of computers are determined in accordance with manufacturers specification   3. Appropriate computer software is identified according to manufacturer’s specification   4. Appropriate computer hardware is identified according to manufacturer’s specification   5. Functions and commands of operating system are determined in accordance with manufacturer’s specification |
| 1. Apply security measures to data, hardware, software in automated environment | * 1. ***Data security and privacy are classified*** in accordance with the prevailing technology   2. ***Security threats*** reidentified ***and control measures*** are applied in accordance with laws governing protection of ICT   3. Computer threats and crimes are detected in accordance to Information Management security guidelines   4. Protection against computer crimes is undertaken in accordance with laws governing protection of ICT |
| 1. Apply computer software in solving tasks | * 1. ***Word processing concepts*** are applied in resolving workplace tasks, report writing and documentation as per the job requirements   2. ***Word processing utilities*** are applied in accordance with workplace procedures   3. Worksheet layout is prepared in accordance with work procedures   4. Worksheet is built and data manipulated in the worksheet in accordance with workplace procedures   5. Continuous data manipulated on worksheet is undertaken in accordance with work requirements   6. Database design and manipulation is undertaken in accordance with office procedures   7. Data sorting, indexing, storage, retrieval and security is provided in accordance with workplace procedures |
| 1. Apply internet and email in communication at workplace | * 1. Electronic mail addresses are opened and applied in workplace communication in accordance with office policy   2. Office internet functions are defined and executed in accordance with office procedures   3. ***Network configuration*** is determined in accordance with office operations procedures   4. Official World Wide Web is installed and managed according to workplace procedures |
| 1. Apply Desktop publishing in official assignments | * 1. Desktop publishing functions and tools are identified in accordance with manufactures specifications   2. Desktop publishing tools are developed in accordance with work requirements   3. Desktop publishing tools are applied in accordance with workplace requirements   4. Typeset work is enhanced in accordance with workplace standards |
| 1. Prepare presentation packages | * 1. Types of presentation packages are identified in accordance with office requirements   2. Slides are created and formulated in accordance with workplace procedures   3. Slides are edited and run-in accordance with work procedures   4. Slides and handouts are printed according to work requirements |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Appropriate computer hardware may include but not limited to: | Collection of physical parts of a computer system such as:   * Computer case, monitor, keyboard, and mouse * All the parts inside the computer case, such as the hard disk drive, motherboard and video card |
| 1. Data security and privacy may include but not limited to: | * Confidentiality of data * Cloud computing * Integrity -but-curious data surfing |
| 1. Security and control measures may include but not limited to: | * Counter measures against cyber terrorism * Risk reduction * Cyber threat issues * Risk management * Pass-wording |
| 1. Security threats may include but not limited to: | * Cyber terrorism * Hacking |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical skills
* Interpretation
* Typing
* Communication
* Computing (applying fundamental operations such as addition, subtraction, division and multiplication)
* Using calculator
* Basic ICT skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Software concept
* Functions of computer software and hardware
* Data security and privacy
* Computer security threats and control measures
* Technology underlying cyber-attacks and networks
* Cyber terrorism
* Computer crimes
* Detection and protection of computer crimes
* Laws governing protection of ICT
* Word processing;
* Functions and concepts of word processing.
* Documents and tables creation and manipulations
* Mail merging
* Word processing utilities
* Spread sheets;
* Meaning, formulae, function and charts, uses and layout
* Data formulation, manipulation and application to cells
* Database;
* Database design, data manipulation, sorting, indexing, storage retrieval and security
* Desktop publishing;
* Designing and developing desktop publishing tools
* Manipulation of desktop publishing tools
* Enhancement of typeset work and printing documents
* Presentation Packages;
* Types of presentation Packages
* Creating, formulating, running, editing, printing and presenting slides and handouts
* Networking and Internet;
* Computer networking and internet.
* Electronic mail and world wide web
* Emerging trends and issues in ICT;
* Identify and integrate emerging trends and issues in ICT
* Challenges posed by emerging trends and issues

**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. Identified and controlled security threats   2. Detected and protected computer crimes   3. Applied word processing in office tasks   4. Designed, prepared work sheet and applied data to the cells in accordance to workplace procedures   5. Opened electronic mail for office communication as per workplace procedure   6. Installed internet and World Wide Web for office tasks in accordance with office procedures   7. Integrated emerging issues in computer ICT applications   8. Applied laws governing protection of ICT |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace where assessment can take place   2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. 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. |

## DEMONSTRATE ENTREPRENEURIAL SKILLS

**UNIT CODE :**  CON/OS/ST/CC/03/6/A

**UNIT DESCRIPTION**

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

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT** | **PERFORMANCE CRITERIA** |
| 1. Demonstrate understanding of an Entrepreneur | 1. Entrepreneurs and Business persons are distinguished as per principles of entrepreneurship 2. ***Types of entrepreneurs*** are identified as per principles of entrepreneurship 3. Ways of becoming an Entrepreneur are identified as per principles of Entrepreneurship 4. ***Characteristics of Entrepreneurs*** are identified as per principles of Entrepreneurship 5. Factors affecting Entrepreneurship development are explored as per principles of Entrepreneurship |
| 1. Demonstrate understanding of Entrepreneurship and self-employment | 1. Entrepreneurship and self-employment are distinguished as per principles of entrepreneurship 2. Importance of self-employment is analysed based on business procedures and strategies 3. ***Requirements for entry into self-employment*** are identified according to business procedures and strategies 4. Role of an Entrepreneur in business is determined according to business procedures and strategies 5. Contributions of Entrepreneurs to National development are identified as per business procedures and strategies 6. Entrepreneurship culture in Kenya is explored as per business procedures and strategies 7. Born or made Entrepreneurs are distinguished as per entrepreneurial traits |
| 1. Identify Entrepreneurship opportunities | 1. Sources of business ideas are identified as per business procedures and strategies 2. Business ideas and opportunities are generated as per business procedures and strategies 3. Business life cycle is analysed as per business procedures and strategies 4. Legal aspects of business are identified as per procedures and strategies 5. Product demand is assessed as per market strategies 6. Types of ***business environment*** are identified and evaluated as per business procedures 7. Factors to consider when evaluating business environment are explored based on business procedure and strategies 8. Technology in business is incorporated as per best practice |
| 1. Create entrepreneurial awareness | 1. ***Forms of businesses*** are explored as per business procedures and strategies 2. Sources of business finance are identified as per business procedures and strategies 3. Factors in selecting source of business finance are identified as per business procedures and strategies 4. ***Governing policies*** on Small Scale Enterprises (SSEs) are determined as per business procedures and strategies 5. Problems of starting and operating SSEs are explored as per business procedures and strategies |
| 1. Apply entrepreneurial motivation | 1. ***Internal and external motivation*** factors are determined in accordance with motivational theories 2. Self-assessment is carried out as per entrepreneurial orientation 3. Effective communications are carried out in accordance with communication principles 4. Entrepreneurial motivation is applied as per motivational theories |
| 1. Develop innovative business strategies | 1. Business innovation strategies are determined in accordance with the organization strategies 2. Creativity in business development is demonstrated in accordance with business strategies 3. ***Innovative business strategies*** are developed as per business principles 4. Linkages with other entrepreneurs are created as per best practice 5. ICT is incorporated in business growth and development as per best practice |
| 1. Develop Business Plan | 1. Identified Business is described as per business procedures and strategies 2. Marketing plan is developed as per business plan format 3. Organizational/Management plan is prepared in accordance with business plan format 4. Production/operation plan in accordance with business plan format 5. Financial plan is prepared in accordance with the business plan format 6. Executive summary is prepared in accordance with business plan format 7. Business plan is presented as per best practice |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Types of entrepreneurs may include but not limited to: | * Innovators * Imitators * Craft * Opportunistic * Speculators |
| 1. Characteristics of Entrepreneurs may include but 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. Internal and external motivation may include but not limited to: | * Interest * Passion * Freedom * Prestige * Rewards * Punishment * Enabling environment * Government policies |
| 1. Business environment may include but not limited to: | * External * Internal * Intermediate |
| 1. Forms of businesses may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Governing policies may include but not limited to: | * Increasing scope for finance * Promoting cooperation between entrepreneurs and private sector * Reducing regulatory burden on entrepreneurs * Developing IT tools for entrepreneurs |
| 1. Innovative business strategies may include but not limited to: | * New products * New methods of production * New markets * New sources of supplies * Change in industrialization |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

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

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Decision making
* Business communication
* Change management
* Competition
* Risk
* Net working
* Time management
* Leadership
* Factors affecting entrepreneurship development
* Principles of Entrepreneurship
* Features and benefits of common operational practices, e. g., continuous improvement (kaizen), waste elimination,
* Conflict resolution
* Health, safety and environment (HSE) principles and requirements
* Customer care strategies
* Basic financial management
* Business strategic planning
* Impact of change on individuals, groups and industries
* Government and regulatory processes
* Local and international market trends
* Product promotion strategies
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion strategies

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | 1. Assessment requires evidence that the candidate: 2. Distinguished entrepreneurs and businesspersons correctly 3. Identified ways of becoming an entrepreneur appropriately 4. Explored factors affecting entrepreneurship development appropriately 5. Analysed importance of self-employment accurately 6. Identified requirements for entry into self-employment correctly 7. Identified sources of business ideas correctly 8. GeneratedBusiness ideas and opportunities correctly 9. Analysed business life cycle accurately 10. Identified legal aspects of business correctly 11. Assessed product demand accurately 12. Determined Internal and external motivation factors appropriately 13. Carried out communications effectively 14. Identified sources of business finance correctly 15. Determined Governing policy on small scale enterprise appropriately 16. Explored problems of starting and operating SSEs effectively 17. Developed Marketing, Organizational/Management, Production/Operation and Financial plans correctly 18. Prepared executive summary correctly 19. Determined business innovative strategies appropriately 20. Presented business plan effectively |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | 1. Written tests 2. Oral questions 3. Third party report 4. Interviews 5. Portfolio of Evidence |
| 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. |

## DEMONSTRATE EMPLOYABILITY SKILLS

**UNIT CODE:** CON/OS/ST/CC/04/6/A

**UNIT DESCRIPTON**

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

**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. Conduct self-management | 1. Personal vision, mission and goals are formulated based on potential and in relation to organization objectives 2. Emotional intelligence is demonstrated as per workplace requirements. 3. Individual performance is evaluated and monitored according to the agreed targets. 4. Assertiveness is developed and maintained based on the requirements of the job. 5. Accountability and responsibility for own actions are demonstrated based on workplace instructions. 6. Self-esteem and a positive self-image are developed and maintained based on values. 7. Time management, attendance and punctuality are observed as per the organization policy. 8. Goals are managed as per the organization’s objective 9. Self-strengths and weaknesses are identified based on personal objectives |
| 1. Demonstrate interpersonal communication | 1. Writing skills are demonstrated as per communication policy 2. Negotiation and persuasion skills are demonstrated as per communication policy 3. Internal and external stakeholders’ needs are identified and interpreted as per the communication policy 4. Communication networks are established based on workplace policy 5. Information is shared as per communication policy |
| 1. Demonstrate critical safe work habits | * 1. Stress is managed in accordance with workplace policy.   2. Punctuality and time consciousness is demonstrated in line with workplace policy.   3. Personal objectives are integrated with organization goals based on organization’s strategic plan.   4. ***Resources*** are utilized in accordance with workplace policy.   5. Work priorities are set in accordance to workplace goals and objectives.   6. Leisure time is recognized and utilized in line with personal objectives.   7. ***Drugs and substances of abuse*** are identified and avoided based on workplace policy.   8. HIV and AIDS prevention awareness is demonstrated in line with workplace policy.   9. Safety consciousness is demonstrated in the workplace based on organization safety policy.   10. ***Emerging issues*** are identified and dealt with in accordance with organization policy. |
| 1. Lead a workplace team | 1. Performance targets for the ***team*** are set based on organization’s objectives 2. Duties are assigned in accordance with the organization policy. 3. ***Forms of communication*** in a team are established according to organization’s policy. 4. Team performance is evaluated based on set targets as per workplace policy. 5. Conflicts are resolved between team members in line with organization policy. 6. Gender related issues are identified and mainstreamed in accordance workplace policy. 7. Human rights and fundamental freedoms are identified and respected as Constitution of Kenya 2010. 8. Healthy relationships are developed and maintained in line with workplace. |
| 1. Plan and organize work | 1. Work plans are prepared based on activities and budget. 2. Assigned tasks are interpreted and expectations identified as per the workplace instructions. 3. Task occupational safety and health requirements are identified and observed regulations. 4. Work resources are identified, mobilized, allocated and utilized based on organization work plans. 5. Work activities are monitored and evaluated in line with work plans and workplace policy. 6. Work plans are reviewed based on target and available resources. |
| 1. Maintain professional growth and development | * 1. Personal training needs are identified and assessed in line with the requirements of the job.   2. ***Training and career opportunities*** are identified and utilized based on job requirements.   3. Resources for training are mobilized and allocated based organizations and individual skills needs.   4. Licensees and certifications relevant to job and career are obtained and renewed as per policy.   5. Work priorities and personal commitments are balanced and managed based on requirements of the job and personal objectives.   6. Recognitions are sought as proof of career advancement in line with professional requirements. |
| 1. Demonstrate workplace learning | * 1. Learning opportunities are sought and managed based on job requirement and organization policy.   2. Improvement in performance is demonstrated based on courses attended.   3. Application of learning is demonstrated in both technical and non-technical aspects based on requirements of the job   4. Time and effort is invested in learning new skills based on job requirements   5. Initiative is taken to create more effective and efficient processes and procedures in line with workplace policy.   6. New systems are developed and maintained in accordance with the requirements of the job.   7. Awareness of personal role in workplace ***innovation*** is demonstrated based on requirements of the job. |
| 1. Demonstrate problem solving skills | * 1. Creative, innovative and practical solutions are developed based on the problem   2. Independence and initiative in identifying and solving problems is demonstrated based on requirements of the job.   3. Team problems are solved as per the workplace guidelines   4. Problem solving strategies are applied as per the workplace guidelines   5. Problems are analyzed and assumptions tested as per the context of data and circumstances |
| 1. Manage ethical performance | * 1. Policies and guidelines are observed as per the workplace requirements   2. Self-worth and professionalism is exercised in line with personal goals and organizational policies   3. Code of conduct is observed as per the workplace requirements   4. Integrity is demonstrated as per legal requirement |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Drug and substance abuse may include but not limited to: | Commonly abused   * Alcohol * Tobacco * Miraa * Over-the-counter drugs * Cocaine * Bhang * Glue |
| 1. Feedback may include but not limited to: | * Verbal * Written * Informal * Formal |
| 1. Relationships may include but not limited to: | * Man/Woman * Trainer/trainee * Employee/employer * Client/service provider * Husband/wife * Boy/girl * Parent/child * Sibling relationships |
| 1. Forms of communication may include but not limited to: | * Written * Visual * Verbal * Non verbal * Formal and informal |
| 1. Team may include but not limited to: | * Small work group * Staff in a section/department * Inter-agency group |
| 1. Personal growth may include but not limited to: | * Growth in the job * Career mobility * Gains and exposure the job gives * Net workings * Benefits that accrue to the individual as a result of noteworthy performance |
| 1. Personal objectives may include but not limited to: | * Long term * Short term * Broad * Specific |
| 1. Trainings and career opportunities may includes but not limited to | 1. Participation in training programs 2. Serving as Resource Persons in conferences and workshops |
| 1. Resource may include may but not limited to: | * Human * Financial * Technology |
| 1. Innovation may include but not limited to: | * New ideas * Original ideas * Different ideas * Methods/procedures * Processes * New tools |
| 1. Emerging issues may include but not limited to: | * Terrorism * Social media * National cohesion * Open offices |
| 1. Range of media for learning may include but not limited to: | * Mentoring * peer support and networking * IT and courses |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Interpersonal
* Communication
* Critical thinking
* Organizational
* Negotiation
* Monitoring
* Evaluation
* Record keeping
* Problem solving
* Decision Making
* Resource utilization
* Resource mobilization

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Work values and ethics
* Company policies
* Company operations, procedures and standards
* Occupational Health and safety procedures
* Fundamental rights at work
* Workplace communication
* Concept of time
* Time management
* Decision making
* Types of resources
* Work planning
* Organizing work
* Monitoring and evaluation
* Record keeping
* Gender mainstreaming
* HIV and AIDS
* Drug and substance abuse
* Professional growth and development
* Technology in the workplace
* Innovation
* Emerging issues

**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. Conducted self-management   2. Demonstrated interpersonal communication   3. Demonstrated critical safe work habits   4. Demonstrated the ability to lead a workplace team   5. Planned and organized work   6. Maintained professional growth and development   7. Demonstrated workplace learning   8. Demonstrated problem solving skills   9. Demonstrated the ability to manage performance ethically |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. 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. |

## DEMONSTRATE ENVIRONMENTAL LITERACY

**UNIT CODE:** CON/OS/ST/CC/05/6/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to demonstrate environmental literacy. It involves, controlling environmental hazard and environmental pollution, demonstrating sustainable resource use, evaluating current practices in relation to resource usage, identifying environmental legislations/conventions for environmental concerns, implementing specific environmental programs, monitoring activities on environmental protection/Programs , analyzing resource use and developing resource conservation plans

**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. Control environmental hazard | 1. Storage methods for environmentally hazardous materials are strictly followed according to environmental regulations and OSHS. 2. Disposal methods of hazardous wastes are followed according to environmental regulations and OSHS. 3. ***PPE*** is used according to OSHS. |
| 1. Control environmental Pollution | * 1. Environmental pollution ***control measures*** are implemented in accordance with international protocols.   2. Procedures for solid waste management are observed according Environmental Management and Coordination Act 1999   3. Methods for minimizing noise pollution is complied with based on Noise and Excessive Vibration Pollution and Control Regulations, 2009 |
| 1. Demonstrate sustainable resource use | * 1. Methods for minimizing wastage are complied with based on organizational waste management guide   2. Waste management procedures are employed following principles of 3Rs (Reduce, Reuse, Recycle)   3. Methods for economizing and reducing resource consumption are practiced as per the Constitution of Kenya 2010 Article 69 . |
| 1. Evaluate current practices in relation to resource usage | * 1. Information on resource efficiency systems and procedures are collected and provided as per work groups/sector   2. Current resource usage is measured and recorded as per work group   3. Current purchasing strategies are analyzed and recorded according to industry procedures.   4. Current work processes to access information and data is analyzed following enterprise protocol. |
| 1. Identify environmental legislations/conventions for environmental concerns | 1. Environmental legislations/conventions and local ordinances are identified according to the different environmental aspects/impact 2. Industrial standard/environmental practices are described according to the different environmental concerns |
| 1. Implement specific environmental programs | 1. Programs/Activities are identified according to organizations policies and guidelines. 2. Individual roles/responsibilities are determined and performed based on the activities identified. 3. Problems/constraints encountered are resolved in accordance with organizations’ policies and guidelines 4. Stakeholders are consulted based on company guidelines |
| 1. Monitor activities on Environmental protection/Programs | 1. Activities are periodically monitored and Evaluated according to the objectives of the environmental program 2. Feedback from stakeholders are gathered and considered in Proposing enhancements to the program based on consultations 3. Data gathered are analyzed based on Evaluation requirements 4. Recommendations are submitted based on the findings 5. Management support systems are set/established to sustain and enhance the program 6. Environmental incidents are monitored and reported to 7. concerned/proper authorities |
| 1. Analyze resource use | 1. All resource consuming processes are Identified as per the organizational work plan 2. Quantity and nature of resource consumed is determined based on processes 3. Resource flow is analyzed as per different parts of the process. 4. Wastes are classified according to NEMA regulations on waste management. |
| 1. Develop resource Conservation plans | 9.1. Efficiency of use/conversion of resources is determined according to industry protocol.  9.2. Causes of low efficiency of use of resources are Determined based on industry protocol.  9.3. Plans for increasing the efficiency of resource use are developed based on findings. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. PPE may include but not limited to | * + Mask   + Gloves   + Goggles   + Safety hat   + Overall * Hearing protector |
| 1. Control measures may include but not limited to | * Methods for minimizing or stopping spread and ingestion of airborne particles * Methods for minimizing or stopping spread and ingestion of gases and fumes * Methods for minimizing or stopping spread and ingestion of liquid wastes |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Measuring
* Recording
* Analytical
* Monitoring
* Communication
* Writing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* PPEs
* Environmental regulations
* OSHS
* Pollution
* Waste management
* Principle of 3Rs
* Types of resources
* Techniques in measuring current usage of resources
* Environmental hazards
* Regulatory requirements

**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. Controlled environmental hazard   2. Controlled environmental pollution   3. Demonstrated sustainable resource use   4. Evaluated current practices in relation to resource usage   5. Demonstrated knowledge of environmental legislations and local ordinances according to the different environmental issues /concerns.   6. Described industrial standard environmental practices according to the different environmental issues/concerns.   7. Resolved problems/ constraints encountered based on management standard procedures   8. Implemented and monitored environmental practices on a periodic basis as per company guidelines   9. Recommended solutions for the improvement of the program   10. Monitored and reported to proper authorities any environmental incidents |
| 1. Resource Implications | The following resources should be provided:   * 1. Workplace with storage facilities   2. Tools, materials and equipment relevant to the tasks (e.g. Cleaning tools, cleaning materials, trash bags)   3. PPE, manuals and references   4. Legislation, policies, procedures, protocols and local ordinances relating to environmental protection   5. Case studies/scenarios relating to environmental Protection |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral questioning   3. Written test   4. Portfolio of Evidence   5. Interview   6. 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. |

## DEMONSTRATE OCCUPATIONAL SAFETY AND HEALTH PRACTICES

**UNIT CODE:** CON/OS/ST/CC/06/6/A

**UNIT DESCRIPTION**

This unit specifies the competencies required to demonstrate occupational health and safety practices. It involves identifying workplace hazards and risks, identifying and implementing appropriate control measures to hazards and risks and implementing OSH programs, procedures and policies/guidelines.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Identify workplace hazards and risk | 1.1 ***Hazards*** in the workplace are identified ***based their indicators***  1.2 Risks and hazards are evaluated based on legal requirements.  1.3 ***OSH concerns*** raised by workers are addressed as per legal requirements. |
| 1. Control OSH hazards | 2.1 Hazard prevention ***and control measures*** are implemented as per legal requirement.  2.2 Risk assessment is conductedand a risk matrix developed based on likely impact.  2.3 ***Contingency measures***, including ***emergency procedures*** during workplace ***incidents and emergencies*** are recognized and established in accordance with organization procedures. |
| 1. Implement OSH programs | 3.1 Company OSH program are identified, evaluated and reviewed based on legal requirements.  3.2 Company OSH programs are implemented as per legal requirements.  3.3 Workers are capacity built on OSH standards and procedures as per legal requirements  3.4 ***OSH-related records*** are maintained as per legal requirements. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Hazards may include but not limited to: | * Physical hazards – impact, illumination, pressure, noise, * vibration, extreme temperature, radiation * Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects * Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors * Ergonomics * Psychological factors – over exertion/ excessive force,   awkward/static positions, fatigue, direct pressure,   * varying metabolic cycles * Physiological factors – monotony, personal relationship, work out cycle * Safety hazards (unsafe workplace condition) –confined space, excavations, falling objects, gas leaks, electrical, poor storage of materials and waste, spillage, waste and debris * Unsafe workers’ act (Smoking in off-limited areas, Substance and alcohol abuse at work) |
| 1. Indicators may include but not limited to: | * Increased of incidents of accidents, injuries * Increased occurrence of sickness or health complaints/ symptoms * Common complaints of workers related to OSH * High absenteeism for work-related reasons |
| 1. OSH concerns may include but not limited to: | * Workers’ experience/observance on presence of work hazards * Unsafe/unhealthy administrative arrangements (prolonged work hours, no break time, constant overtime, scheduling of tasks) * Reasons for compliance/non-compliance to use of PPEs or other OSH procedures/policies/guidelines |
| 1. Safety gears /PPE (Personal Protective Equipment) may include but not limited to: | * 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 |
| 1. Appropriate risk controls   may include but not limited to: | * Appropriate risk controls in order of impact are as follows: * Eliminate the hazard altogether (i.e., get rid of the dangerous machine) * Isolate the hazard from anyone who could be harmed (i.e., keep the machine in a closed room and operate it remotely; barricade an unsafe area off) * Substitute the hazard with a safer alternative (i.e., replace the machine with a safer one) * Use administrative controls to reduce the risk (i.e., train workers how to use equipment safely; train workers about the risks of harassment; issue signage) * Use engineering controls to reduce the risk (i.e., attach guards to the machine to protect users) * Use personal protective equipment (i.e., wear * gloves and goggles when using the machine) |
| 1. Contingency measures may include but not limited to: | * Evacuation * Isolation * Decontamination * (Calling designed) emergency personnel |
| 1. Incidents and emergencies may include but not limited to: | * Chemical spills * Equipment/vehicle accidents * Explosion * Fire * Gas leak * Injury to personnel * Structural collapse * Toxic and/or flammable vapors emission. |
| 1. OSH-related Records may include but not limited to: | * Medical/Health records * Incident/accident reports * Sickness notifications/sick leave application * OSH-related trainings obtained |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

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

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* General OSH Principles
* Occupational hazards/risks recognition
* OSH organizations providing services on OSH evaluation and/or work environment measurements (WEM)
* National OSH regulations; company OSH policies and protocols
* Systematic gathering of OSH issues and concerns
* General OSH principles
* National OSH regulations
* Company OSH and recording protocols, procedures and policies/guidelines
* Training and/or counseling methodologies and strategies

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   1. Identified hazards in the workplace based their indicators 2. Evaluated workplace hazards based on legal requirements. 3. Addressed OSH concerns raised by workers as per legal requirements. 4. Implemented hazard prevention and control measures as per legal requirement. 5. Conducted risk assessment as per legal requirement. 6. Developed risk matrix based on likely impact. 7. Recognized and established contingency measures in accordance with organization procedures. 8. Identified, evaluated and reviewed company OSH program based on legal requirements. 9. Implemented company OSH programs as per legal requirements. 10. Capacity built workers on OSH standards and procedures as per legal requirements 11. Maintained OSH-related records as per legal requirements. |
| 1. Resource Implications | The following resources should be provided:   1. Access to relevant workplace where assessment can take place 2. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Observation 2. Oral questioning 3. Written test 4. Portfolio of Evidence 5. Interview 6. 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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# COMMON UNITS OF COMPETENCY

## APPLY TECHNICAL DRAWING SKILLS

**UNIT CODE:** CON/OS/ST/CC/01/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to technical drawing skills. It involves competencies for selecting, using and maintaining drawing equipment and materials. It also involves producing plane geometry drawings, solid geometry drawings, pictorial and orthographic drawings of components, assembly drawings and application of Computer Aided Design packages.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT** | **PERFORMANCE CRITERIA**  ***(Bold and italicized terms are elaborated in the Range)*** |
| --- | --- |
| 1. Use and maintain drawing equipment and materials | 1.1 Terms and concepts in Technical drawing are identified and defined.  ***1.2 Drawing equipment*** are identified and gathered according to task requirements.  1.3***Drawing materials*** are identified and gathered according to task requirements.  1.4 Drawing equipment are used and maintained as per manufacturer’s instructions.  1.5 Drawing materials are used as per workplace procedures.  1.6 Waste materials are disposed in accordance with workplace procedures and ***environmental legislations.***  1.7 ***Personal Protective Equipment*** is used according to occupational safety and health regulations.  1.8 Workshop safety rules and regulations are observed as per safety codes. |
| 1. Produce plane geometry drawings | * 1. Different types of lines used in drawing and their meanings are identified according to standard drawing conventions.   2. Different types of ***geometric forms*** are constructed according to standard drawing conventions.   3. Different types of angles are constructed according to principles of trigonometry.   4. Different types of angles are measured using appropriate measuring tools.   5. Angles are bisected according to standard drawing conventions. |
| 1. Produce solid geometry drawings | * 1. Sketches and drawings of patterns are interpreted according to standard conventions.   2. Patterns are developed in accordance with standard conventions. |
| 1. Produce pictorial and orthographic drawings of components | * 1. Different symbols and abbreviations are identified and their meaning interpreted according to standard drawing conventions.   2. Isometric sketches and drawings of components are interpreted and produced in accordance with the standard conventions of isometric drawings.   3. First and third angle orthographic sketches and drawings of components are interpreted and produced in accordance with the standard conventions of orthographic drawings.   4. Freehand sketching of different types of geometric forms, tools, equipment, diagrams and components is conducted based on instructions. |
| 1. Produce assembly drawings | * 1. Orthographic views are exploded according to standard conventions of orthographic drawings.   2. Pictorial views are exploded according to standard conventions of orthographic drawings.   3. Part lists are identified according to part to be produced.   4. Produced drawing is hatched according to standard conventions of drawings. |
| 1. Apply Computer Aided Design (CAD) packages in drawing | * 1. CAD packages are selected according to task requirements   2. CAD packages are applied in production of scaffolding drawings and designs. |

**RANGE**

| **Variable** | **Range** |
| --- | --- |
| 1. Drawing equipment may include but is not limited to: | * Drawing boards * T-square * Set squares * Drawing set * Computers with CAD packages |
| 1. Drawing materials may include but is not limited to: | * Drawing papers * Pencils * Erasers * Masking tapes * Paper clips |
| 1. Environmental legislations may include but is not limited to: | * EMCA 1999 * NEMA Regulations * Public health act Cap 242 |
| 1. Personal Protective Equipment may include but is not limited to: | * Dust coats * Closed leather shoes * Goggles for CAD/CAM |
| 1. Geometric forms may include but is not limited to: | * Circles * Triangles * Rectangles * Parallelogram * Polygons * Pyramids * Conic sections * Prisms * Loci |
| 1. Standard drawing conventions may include but is not limited to: | * Anatomy of engineering drawing (title block, coordinate grid system, revision block, notes and legends) * Drawing scale (paper size and drawing symbols) * International drawing standards |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills**

The individual needs to demonstrate the following skills:

* Critical thinking
* Drawing
* ICT
* Interpretation
* Analytical
* Communication
* Interpersonal
* Sketching

**Required knowledge**

The individual needs to demonstrate knowledge of:

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

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Applied andadhered to safety procedures.   2. Cared and maintained drawing equipment appropriately.   3. Interpreted assembly and lay out diagrams correctly.   4. Applied appropriate technical drawing standards, used proper tools and equipment for a given task.   5. Produced sketches and drawings appropriately.   6. Applied CAD packages appropriately. |
| 1. Resource Implications | Resources the same as that of workplace are advised to be applied.   * 1. Drawing room   2. Drawing equipment and materials   3. Computers   4. CAD packages |
| 1. Methods of Assessment | C Competency may be assessed through:   * 1. Written tests   2. Oral questions   3. Interview   4. Observation   5. portfolio   6. 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. |

## APPLY ENGINEERING MATHEMATICS

**UNIT CODE:** CON/OS/ST/CC/02/6/A

**UNIT DESCRIPTION:**

This unit describes the competencies required to apply engineering mathematics. It involves applying: algebra, trigonometry and hyperbolic functions, complex numbers, co-ordinate geometry and carry out binomial expansion. It also entails calculus, solving ordinary differential equations, carry out mensuration, power series, statistics, numerical methods, vector theory and matrices.

This standard 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. Apply Algebra | * 1. Calculations involving Indices are performed as per the concept   2. Calculations involving Logarithms are performed as per the concept   3. Scientific calculator is used in solving mathematical problems in line with manufacturer’s manual   4. Simultaneous equations are performed as per the rules   5. Quadratic equations are calculated as per the concept |
| * 1. Apply Trigonometry and hyperbolic functions | * 1. Calculations are performed using trigonometric rules   2. Calculations are performed using hyperbolic functions |
| * 1. Apply complex numbers | * 1. Complex numbers are represented using Argand diagrams   2. Operations involving complex numbers are performed   3. Calculations involving complex numbers are performed using De Moivre’s theorem |
| * 1. Apply Coordinate Geometry | * 1. Polar equations are calculated using coordinate geometry   2. Graphs of given polar equations are drawn using the Cartesian plane   3. Normal and tangents are determined using coordinate geometry |
| * 1. Carry out Binomial Expansion | * 1. Roots of numbers are determined using binomial theorem   2. Errors of small changes are determined using binomial theorem |
| * 1. Apply Calculus | * 1. Derivatives of functions are determined using Differentiation   2. Derivatives of hyperbolic functions are determined using Differentiation   3. Derivatives of inverse trigonometric functions are determined using Differentiation   4. Rate of change and small change are determined using Differentiation.   5. Calculation involving stationery points of functions of two variables are performed using differentiation.   6. Integrals of algebraic functions are determined using integration   7. Integrals of trigonometric functions are determined using integration   8. Integrals of logarithmic functions are determined using integration   9. Integrals of hyperbolic and inverse functions are determined using integration |
| * 1. Solve Ordinary differential equations | * 1. First order and second order differential equations are solved using the method of undetermined coefficients   7.2 First order and second order differential equations are solved from given boundary conditions |
| * 1. Carry out Mensuration | * 1. Perimeter and areas of figures are obtained   2. Volume and of Surface area of solids are obtained   3. Area of irregular figures are obtained   4. Areas and volumes are obtained using Pappus theorem |
| * 1. Apply Power Series | * 1. Power series are obtained using Taylor’s Theorem   2. Power series are obtained using McLaurin’s ‘s theorem |
| * 1. Apply Statistics | * 1. Mean, median ,mode and Standard deviation are obtained from given data   2. Calculations are performed based on Laws of probability   3. Calculation involving *probability distributions* , mathematical expectation sampling distributions are performed   4. Sampling distribution methods are applied in data analysis   5. Calculations involving use of standard normal table, sampling distribution, T-distribution and Estimation are done   6. Confidence intervals are determined |
| * 1. Apply Numerical methods | * 1. Roots of polynomials are obtained using iterative *numerical methods*   2. Interpolation and extrapolation are performed using numerical methods |
| * 1. Apply Vector theory | * 1. Vectors and scalar quantities are obtained in two and three dimensions   2. *Operations* on vectors are performed   3. Position of vectors is obtained   4. Resolution of vectors is done |
| * 1. Apply Matrix | * 1. Determinant and inverse of 3x3 matrix are obtained   2. Solutions of simultaneous equations are obtained   3. Calculation involving Eigen values and Eigen vectors are performed |

**RANGE**

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

|  |  |
| --- | --- |
| Variable | Range |
| 1. Operations may include but not limited to: | * + Addition   + Subtraction |
| 1. Hyperbolic functions may include but not limited to: | * + Sinh x   + Cosh x   + Cosec x   + Coth x   + Tanh x   + Sech x |
| 1. Probability Distributions may include but not limited to: | * + Binomial   + Poisson   + Normal |
| 1. Numerical Methods may include but not limited to: | * + Newton Raphson   + Gregory Newton |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Communication
* Logical thinking
* Problem solving
* Drawing
* Sketching
* Interpersonal
* Organization

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Mensuration
* Vector operations
* Matrix operations
* Calculus
* Statistics
* Ordinary differential equations
* Power series
* Complex numbers
* Algebra
* Trigonometry and hyperbolic functions
* Coordinate Geometry
* Binomial Expansion
* Numerical methods

**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 algebra correctly. 2. Applied Trigonometry and hyperbolic functions correctly. 3. Applied complex numbers correctly. 4. Applied Calculus correctly. 5. Solved Ordinary differential equations correctly. 6. Carried out mensuration correctly. 7. Applied Power Series correctly. 8. Applied Vector theory correctly. 9. Applied Matrix correctly. 10. Applied Numerical methods correctly. 11. Applied statistics correctly. 12. Applied binomial expansion correctly. 13. Applied co-ordinate geometry correctly. |
| 1. 2. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Measuring equipment   3. Materials relevant to the proposed activity or tasks |
| * 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Written tests 2. Observation 3. Oral Questioning 4. Interview |
| 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. |

## APPLY SCIENTIFIC PRINCIPLES

**UNIT CODE:** CON/OS/ST/CC/03/6/A

**UNIT DESCRIPTION**

This unit describes the competencies required to apply scientific principles in scaffolding. It involves applying concepts of science, resolution of forces, determining effects of various loads on scaffolding systems and analysing properties of materials.

**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. Apply science concepts | 1.1 Units of measurement are explored  1.2 Standard International Units are applied in measurements.  1.3 Basic concepts of density and pressure are explored.  1.4 Basic concepts of work, power and energy are explored.  1.5 Basic concept of motion is explored.  1.6 Basic concept of moments is explored. |
| 1. Resolve forces | 1. Forces are defined as per reference. 2. Theorems are stated and explained. 3. Forces are resolved as per theorems. 4. Resultant forces are determined as per the methods. |
| 1. Determine effects of loads in scaffolding systems. | 1. ***Types of forces*** are identified. 2. Equilibrium of forces and plane framework are calculated. 3. Loads are determined as per instruction. 4. Loads are analyzed as per instruction. |
| 1. Analyse properties of materials | 1. ***Mechanical properties and stress*** are identified in accordance with standard. 2. Mechanical properties of materials are tested as per procedure. 3. Direct, shear and torsion stresses are calculated as per formula. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Principles of science may include but not limited: | * + Newton’s laws of motion   + Law of conservation of momentum   + Law of conservation of energy   + Archimedes’ principle   + Triangle of forces theorem   + Parallelogram of forces law   + Polygon of forces theorem   + Principle of moments   + Bow’s notation |
| 1. Calculations may include but not limited: | * + Mechanical advantage   + Velocity ratio   + Efficiency   + Torque   + Power/Energy   + Work   + Velocity and acceleration   + Stress and strain |
| 1. Types of forces may include but not limited: | * + Friction   + Centrifugal   + Centripetal   + Gravitational   + Inertia   + Shear |
| 1. Properties of materials may include but not limited: | * + Elasticity   + Tensile strength   + Young modulus   + Brittleness   + Compressive strength   + Shear strength   + Plasticity   + Modulus of rigidity |
| 1. Parameters may include but not limited: | * + Density   + Temperature   + Pressure |

**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:

* Use of basic scaffold equipment
* Perform various unit conversions of quantities
* Basic scaffold systems design
* Logical thinking
* Problem solving
* Drawing
* Using different measuring tools

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Newton’s laws of motion
* Levers and pulleys
* Laws of conservation of energy
* Laws of friction
* Types of forces
* Calculation of pressure and density
* Loading
* Mechanical advantage and efficiency calculations
* Properties of materials
* SI units of mechanical energy.
* Mechanical calculation of power, energy, work done, torque and safety factor
* Units of measurement, conversions and abbreviations

**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. Identified and converted units of measurement correctly. 2. Calculated density and pressure correctly. 3. Determined and applied work , power and energy appropriately. 4. Determined type and principles of motion correctly. 5. Determined and calculated moments correctly. 6. Resolved forces correctly. 7. Determined loading correctly. 8. Determined stress and strain of materials correctly. 9. Tested mechanical properties of materials correctly. 10. Calculated direct, shear and torsion stresses correctly. |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Measuring tools and equipment   3. Sample materials to be tested |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral Questioning   3. Interview   4. Written tests   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. |

## PERFORM WORKSHOP PROCESSES

**UNIT CODE:** CON/OS/ST/CC/04/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to perform workshop processes. It involves applying workshop safety practices, using of workshop tools and equipment, demonstrating the use of scaffold components and members, preparation for scaffold site materials and supplies. It also entails preparation of scaffold site, storage of scaffold materials and supplies, maintaining scaffold components and tools.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT** | **PERFORMANCE CRITERIA**  ***(Bold and italicised terms are elaborated in the Range)*** |
| --- | --- |
| 1. Apply workshop safety practices | 1. ***Personal Protective Equipment (***PPEs) are used as per instruction and legal requirement. 2. Workshop rules are followed as per workshop policy. 3. ***Scaffolding Tools and equipment*** are used as per manufacturer’s manual. 4. First Aid procedures are adhered to as per legal requirements. |
| 1. Use workshop tools and equipment | * 1. Workshop tools and equipment are identified based on purpose.   2. Tools and equipment are used as per manufacturer’s manuals.   3. Workshop tools and equipment are handled as per manufacturer’s manuals.   4. Workshop tools and equipment are maintained as per manufacturer’s manuals.   5. Scaffolding equipment are calibrated based on manufacturer’s specifications and legal requirements. |
| 1. Demonstrate use of scaffold components and members | * 1. ***Scaffold components and members*** are identified based on type.   2. Use of scaffold components and members is demonstrated based on type and purpose. |
| 1. Prepare scaffold site materials and supplies | * 1. List of required tools and equipment is prepared based on purpose.   2. List of required ***material and supplies*** is prepared based on purpose.   3. Materials and supplies are sorted and checked based on present condition. |
| 1. Prepare scaffold site | * 1. Site is surveyed based on scope of work.   2. Site is cleared based on its condition.   3. Site is levelled based on its condition. |
| 1. Store scaffold materials and supplies | * 1. Temporary storage area is created based on scope of work.   2. Scaffold members and components are sorted based on type.   3. Scaffold members and components are inspected based on condition.   4. Scaffold members and components are stored based on type. |
| 1. Maintain scaffold components and members | * 1. Scaffold members and components are sorted based on their present condition.   2. Unserviceable components and members are removed and replaced based on their condition.   3. Serviceable components and members are maintained based on condition. |

**RANGE**

| **Variable** | **Range** |
| --- | --- |
| 1. Personal Protective Equipment may include but is not limited to: | * Harnesses * Safety boots * Hand gloves * Helmet/hard hat * Reflective jacket * Goggles * Safety vest |
| 1. Scaffolding Tools and equipment may include but is not limited to: | Tools:   * + Hammer   + Spirit levels   + Spanner   + Plumb bob   + Pliers   + Measuring tape   Equipment/supplies:   * + Portable drill   + Mason line and pegs   + Anchor tester   + Electrical and optical |
| 1. Scaffold members may include but not limited to: | * Ladder * Platform * Girder * Toe boards * Stairways * Sheeting |
| 1. Scaffold components may include but not limited to: | * Coupler * Ledger * Standards * Transoms * Braces * Boards * Base plate * Anchorage |
| 1. Materials and supplies may include but is not limited to: | * Ropes * Nails * Timber plunks * Poles * Safety net * Tarpaulin * Wire |

**REQUIRED KNOWLEDGE AND SKILLS**

The individual needs to demonstrate ability to:

**Required Skills:**

* Communications
* ICT
* Time management
* Analytical
* Problem solving
* Decision making
* First aid
* Report writing

**Required Knowledge**:

The individual needs to demonstrate knowledge and understanding of:

* Legal framework related to safety
* Health and safety in the safety in the workshop
* Waste management
* Inspection
* Reconnaissance
* Hazard and risk management
* Maintenance of scaffold components and members
* Use of scaffold components and members
* Scaffold materials and supplies
* Identification and sorting of scaffold components and members

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | **Assessment requires evidence that the candidate:**   1. Used PPEs correctly. 2. Adhered to safety rules and regulations appropriately. 3. Used tools and equipments correctly. 4. Applied first aid procedures correctly. 5. Identifiedworkshop tools, and equipment correctly. 6. Used tools and equipments correctly. 7. Handled workshop tools and equipment appropriately. 8. Maintained workshop tools and equipment appropriately. 9. Calibrated scaffolding equipment appropriately. 10. Identified scaffold components and members correctly. 11. Demonstrated use of scaffold components and members correctly. 12. Prepared list of required tools, equipment, materials and supplies correctly. 13. Sorted and checked tools and equipment appropriately. 14. Surveyed, cleared and levelled site appropriately 15. Created temporary storage area appropriately. 16. Sorted scaffold members and components adequately. 17. Inspected scaffold components and members adequately. 18. Stored scaffold components and members correctly. 19. Removed and replaced unserviceable components and members appropriately. 20. Maintained serviceable components and members appropriately. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated assessment environment where assessment can take place 2. Access to relevant assessment environment 3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | **Competency may be assessed through:**   * 1. Written test   2. Observation   3. Interview   4. 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. |

# 

# CORE UNITS OF COMPETENCY

## DESIGN BASIC SCAFFOLDING SYSTEMS

**UNIT CODE:** CON/OS/ST/CR/01/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to design basic scaffolding system. It involves evaluating scaffolding site, interpreting project working drawings, determining scaffold loading and developing scaffold drawings.

This standard 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 termsare elaborated in the Range*** |
| 1. Evaluate scaffolding site | 1. ***Site accessibility is assessed based on purpose of scaffold.*** 2. ***Risk assessment is conducted based on site condition.*** 3. ***Stability*** of scaffolding surface is assessed based on site condition. |
| 1. Interpret project working drawings | 1. ***Type of structure*** is determined based on design. 2. ***Type of scaffold*** to erect is determined based on purpose. 3. ***Position of scaffold*** is determined based on accessibility. 4. ***Nature and scope of work*** is determined based on the design. 5. Risk involved is pre-determined based on nature and scope of work. |
| 1. Determine scaffold loading | 1. Scaffolding area is measured based on project working drawings. 2. ***Types of loading*** are assessed based on purpose and position. 3. Scaffold anchorage and fixed points are determined based on nature and scope of work. 4. Loading is determined based on type of scaffold and forces involved. |
| 1. Develop scaffold drawings | 1. Scaffold area is measured based on scope and nature of work. 2. Scaffold sketches are developed based on purpose of scaffold. 3. Detailed working scaffold drawings are developed based on the scaffold sketches. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Type of structure may include but not limited to: | * Platform * Building * Bridge * Billboards |
| 1. Type of scaffold may include but not limited to: | * Suspended * Cantilever/hanging * Single * Double * Trestle/moveable * Sloping platform * Vessel * Birds cage * Hug |
| 1. Position of scaffold may include but not limited to: | * Elevation * Roof * Soffit * Confined * Lift |
| 1. Nature and scope of work may include but not limited to: | * Suspended * Access * Working |
| 1. Risks involved may include but not limited to: | * Open excavations * Work at heights * Overhead power lines * Confined spaces * Contaminated lands * Excessive vehicle movements * Traffic management systems * Fire risks |
| 1. Types of loading may include but not limited to: | * Dead * Live/Imposed * Wind * Dynamic/moveable |

**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
* Numeracy
* Analytical
* ICT
* Drawing
* Modelling
* Sketching

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Technical drawing
* Use of symbols
* Metric system of measurement
* Imperial system of measurement
* Computer aided design (CAD)
* Basic measurements
* Types of loads
* Types of forces
* Load capacities
* Loading analysis
* Types of working drawings
* Types of scaffolds
* Risk assessment
* Types of soils
* Bearing capacity of soils
* Nature of surface
* Characteristics of materials
* Handling of materials

**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. Assessed site accessibility correctly. 2. Conducted risk assessment adequately. 3. Assessed stability of scaffolding surface correctly. 4. Determined type of structure correctly. 5. Determined type of scaffold to erect correctly. 6. Determined anchorage and fixed points of scaffold appropriately. 7. Determined the nature and scope of work correctly. 8. Pre-determined the risk involved correctly. 9. Measured scaffolding area accurately. 10. Assessed types of loading correctly. 11. Determined scaffold loading correctly. 12. Developed scaffold sketches appropriately. 13. Developed basic detailed working scaffold accurately. 14. Demonstrated understanding of technical knowledge of scaffolding and basic knowledge of construction. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated assessment environment where assessment can take place 2. Access to relevant assessment environment 3. Resources relevant to the proposed assessment activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## ESTIMATE AND COST SCAFFOLDING WORKS

**UNIT CODE:** CON/OS/ST/CR/02/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to estimate and cost scaffolding works. It involves measuring scaffold area, quantifying scaffold members, quantifying scaffolding resources, building-up scaffold unit rate and developing bills of quantities.

This standard 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 termsare elaborated in the Range*** |
| 1. Measure scaffold area | 1. ***Measurement tools*** are identified based on nature and scope of work. 2. Scaffold area is measured based on nature and scope of work. |
| 1. Quantify scaffold members | 1. ***Scaffold members*** are identified based on type of scaffold. 2. ***Scaffold components*** are counted based on the scaffold sketch and manufacturer’s manual. |
| 1. Quantify scaffolding resources | 1. Scaffold staying period is estimated based on scope and nature of work. 2. Human resources requirement is estimated based on nature and scope of work. |
| 1. Build-up scaffold unit rate | 1. Unit rates are determined based on the standard method of measurement. 2. ***Preliminary costs*** are determined based on build-up unit rate. |
| 1. Develop bill of quantities | 1. ***Provisional sum*** of scaffold works is determined based on build-up unit rate and nature of work. 2. ***Fixed costs*** are determined based on current rates. 3. Total cost of scaffold work is determined based on calculation. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Measuring tools may include but not limited to: | * Manual * Measuring tape * Spirit level * Plumb bob * Electronic and optical * Theodolite * Dumpy level |
| 1. Scaffold systems may include but not limited to: | * Tube and couplers * Modular/ Quick stage * Framed * Timber |
| 1. Scaffold members may include but not limited to: | Tube and couplers   * Standards * Ledgers * Base plates * Based jack * Sole plate * Braces * Transom   Modular/ Quick stage   * Standards * Ledgers * Base plates * Based jack * Sole plate * Braces * Transom   Timber   * Ropes * Nails * Standards * Ledgers * Sole plate * Braces |
| 1. Scaffold components may include but not limited to: | * Toe boards * Coupler * Ladder * Platform * Girder |
| 1. Preliminary costs may include but not limited to: | * Logistics * Storage * Insurance * Human resource * Security * Services |
| 1. Fixed costs may include but not limited to: | * Rent * Tax * Salaries for staff * Vehicles * Services * Insurance |
| 1. Variable costs may include but not limited to: | * Labour * Materials * Contingencies |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Measuring
* Analytical
* Interpretation
* Computation
* Interpersonal
* Geometric imagination

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Building up unit rates
* Taking off measurements
* Measuring tools
* Preparation of Bills of Quantity
* Basic numeracy
* Types of costs
* Geometry
* Scaffold systems
* Scaffold members and components

**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 require evidence that the candidate:   1. Identified measurement tools correctly. 2. Measured scaffold area accurately. 3. Identified scaffold members correctly. 4. Counted scaffold components accurately. 5. Estimated scaffold staying period appropriately. 6. Estimated human resources requirement appropriately. 7. Determined unit rates correctly. 8. Determined preliminary costs of scaffold works appropriately. 9. Determined provisional sum of scaffold works appropriately. 10. Determined fixed costs appropriately. 11. Determined total cost of scaffold work accurately. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant assessment environment. 3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE SAFETY COMPLIANCE

**UNIT CODE:** CON/OS/ST/CR/03/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to manage safety compliance. It involves developing site safety plans, implementing site safety plans, handling site hazards and incidents. It also entails applying safety codes, rules and regulations and maintaining site safety records.

This standard 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 termsare elaborated in the Range*** |
| 1. Develop site safety plans | 1. Risk assessment is conducted based on nature of work and site condition. 2. ***Accidents and hazards*** reporting and handling procedures are developed based on presenting condition. 3. ***Emergency procedures***are developed based on type and site condition. 4. ***Safety resources*** are identified and secured based on nature of work and site condition. |
| 1. Implement site safety plans | 1. Safety compliance resources are mobilized based on the site safety plan. 2. ***Site personnel*** are trained based on site safety plan. |
| 1. Handle site hazards and incidents | 1. Site ***safety incidents*** are handled based on safety plan. 2. Site ***safety hazards*** are handled based on safety plan. 3. Site ***safety mitigation measures*** are applied based on-site safety plan |
| 1. Apply safety codes, rules and regulations | 1. ***Safety codes*** are identified based on legal requirements. 2. Safety codes are applied based on legal requirements and industry best practice. 3. Site rules and regulations are observed as per site safety plan. |
| 1. Maintain site safety records | 1. Worker’s health records are obtained and maintained based on clinical reports. 2. Incident’s investigation reports are prepared based on findings. 3. Site safety inventories are prepared and maintained based on current status. 4. Site safety reports are prepared based on occurrences. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Site hazards may include but not limited to: | * Surface instability * Inadequate structural integrity of the material * Absence of scaffold components and members * Un-plumbness and un-levelness of members * Negligence and human error * Presence of power cable * Unqualified workers * Lack of supervision |
| 1. Site accidents may include but not limited to: | * Falls * Electric shock * Snake bite * Attack by insects (bees, termites) * Fire out break * Injury * Collapsing of scaffold |
| 1. Emergency procedures may include but not limited to: | * First aid procedures * Evacuation procedures * Firefighting procedures * Safety instructions |
| 1. Safety resources may include but not limited to: | * First aid kit * Fire extinguishers * Trained first aiders * Emergency telephone numbers * PPEs * Fire assembly points * Emergency procedures * Safety plans |
| 1. Safety codes may include but not limited to: | * Occupational safety and health regulations * Public health regulations * NEMA regulations * EMCA regulations * Site regulations |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Analytical
* Interpersonal
* Report writing
* Communication
* First aid
* Organization
* Management

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Risk assessment
* General site safety
* Development of a site safety plan
* Emergency response
* Safety management resources
* Resource mobilization, allocation and utilization
* Safety training
* Site safety hazards
* Investigation of site incidents
* Safety codes and regulations
* Safety compliance
* Site rules and regulations
* Record keeping
* Safety inventory
* Report writing

**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. Conducted risk assessment adequately. 2. Developed accidents and hazards reporting and handling procedures correctly. 3. Developed emergency procedures correctly. 4. Identified and secured adequate resources for safety management. 5. Mobilized adequate safety compliance resources. 6. Trained site personnel effectively. 7. Handled site safety incidents correctly. 8. Handled site safety hazards appropriately. 9. Applied site safety mitigation measures correctly. 10. Identified site safety codes correctly. 11. Applied Safety codes appropriately. 12. Adhered site rules and regulations diligently. 13. Maintained workers health records accurately. 14. Prepared incidents investigation reports correctly. 15. Maintained site safety inventories correctly. 16. Prepared site safety reports adequately. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant assessment environment. 3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## SOURCE SCAFFOLDING CONTRACTS

**UNIT CODE:** CON/OS/ST/CR/04/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to source scaffolding contracts. It involves responding to expression of interest for scaffolding contracts, developing scaffolding contract documents and negotiating scaffolding contracts.

This standard 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. Respond to Expression of Interest | 1. Client’s instructions are obtained based on organization’s policy. 2. Client’s instructions are registered as per organization’s policy. 3. Client’s instructions are evaluated and interpreted as per legal requirements and contractors’ codes. 4. Site reconnaissance is conducted as per client’s instruction. 5. Scaffold site is measured based on scope and nature of work. 6. Sketches or drawings are prepared based on site measurements. 7. Estimate and cost the contract based on the sketches or drawings. 8. Expression of interest document is developed based on client’s instructions. |
| 1. Develop contract proposals | 1. Scaffolding firm is registered as per legal requirements. 2. ***Statutory licences and permits*** identified and acquired based on legal requirements. 3. Scaffold firm profile is prepared based on best practice. 4. ***Contract documents*** are obtained and interpreted based on nature and scope of work. 5. ***Preliminary Bill of Quantities*** are prepared based on scaffolding sketches, basic designs, manuals and ***working drawings*** for the project. 6. Scaffold units rates are built-up based on type of scaffold. 7. Contract technical and financial proposals are developed based on the Bill of Quantities. 8. Bidding is done based on legal requirements. |
| 1. Negotiate scaffold contract | 1. Letter of contract award is obtained as per client’s instruction. 2. Letter of contract acceptance is written and submitted as per client’s instructions. 3. Contract document are signed as per legal requirements. 4. Scaffold project is negotiated based on Terms of Reference. 5. ***Modes and terms*** of payment are negotiated based on best industry practice. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Statutory licences and permits may include but not limited to: | * Directorate of Safety and Health permit * Business permit * National Construction Authority practice certificate and licences * Business registration certificate * Tax compliance certificate |
| 1. Modes and terms may include but not limited to: | * One off payment * Interim payment |

**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:

* Negotiation
* Communication
* Analytical
* Entrepreneurial
* Interpretation
* Interpersonal
* Critical thinking
* Problem solving
* Drawing

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Types of contracts
* Estimation and costing
* Drawings/sketches
* Build up unit rates
* Bidding methods
* Legal framework
* Contract documents
* Preparation of proposals
* Negotiation
* Modes and terms of payments

**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. Registered scaffolding firm appropriately. 2. Identified and acquired appropriate statutory licences and permits. 3. Prepared scaffold firm profile adequately. 4. Sourced contracts appropriately. 5. Prepared preliminary BOQs correctly. 6. Identified construction projects appropriately. 7. Identified and approached contractors appropriately. 8. Obtained and interpreted contract documents accurately. 9. Built-up scaffold units rates accurately. 10. Developed scaffolding bill of quantities accurately. 11. Bided appropriately. 12. Prepared and submitted scaffold project technical and financial proposals appropriately. 13. Negotiated scaffold project sufficiently. 14. Negotiated modes and terms favourably. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant assessment environment. 3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## IMPLEMENT SCAFFOLDING WORKS

**UNIT CODE:** CON/OS/ST/CR/05/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to implement scaffolding works. It involves mobilization of scaffolding project resources, organizing project working teams and erecting scaffolds. It also entails dismantling scaffolds and managing contract emerging issues.

This standard 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. Mobilize scaffolding project resources | 1. ***Scaffolding resources*** are identified based on scaffold design. 2. Scaffolding resources are mobilised based on nature and scope of work. 3. Resources are allocated based on activities. 4. Scaffolding resources are utilised based on scaffolding activities. 5. Utilization of resources is controlled based on scaffold design and scope of work. |
| 1. Organize project working teams | 1. Responsibility is delegated to team leaders based on their competency. 2. ***Scaffolding tasks*** are assigned based on competency and scope of work. 3. ***Scaffolding working team*** is identified based on their competency and size of the project. |
| 1. Erect scaffolds | 1. ***Scaffolding tools, equipment and PPEs*** are identified and used based on nature, scope of work and industry best practice. 2. Scaffolding surface is prepared based on its nature. 3. Scaffold measurements are taken based on its design. 4. Scaffold is set up based on design. 5. Scaffold is assembled based on working drawing. 6. Scaffold integrity is checked based on standard practice. 7. Scaffold is modified based on the purpose and integrity. 8. Scaffold performance is monitored based staying period. |
| 1. Dismantle scaffolds | 1. Scaffolding tools, equipment and PPEs are identified and used based on nature, scope of work and industry best practice. 2. Scaffold components’ temporary storage area is identified based on availability of space. 3. Scaffold dismantling is done based on industry best practice. 4. ***Scaffold components*** are sorted and removed from site based on type. |
| 1. Manage contract emerging issues | 1. ***Contract emerging issues*** are identified based on present condition. 2. Contract emerging issues are handled based on their nature and impact. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Scaffolding resources may include but not limited to: | * Financial * Human * Material and supplies * Tools, equipment and machine * Instructional manuals |
| 1. Scaffolding tasks may include but not limited to: | * Mobilisation   + Identification and selection   + Inspection and allocation * Transportation * Storage * Inspection * Surface preparation * Setting up of scaffolding   + Measurement * Erecting * Integrity inspection * Maintenance and servicing * Dismantling * Storage * Transportation * Inspection * Component’s maintenance and servicing * Final storage * Report writing |
| 1. Scaffolding working team may include but not limited to: | * Project manager * Site manager * Site engineer * Site supervisor * Site foreman * Scaffolder * Labour * Store keeper * Security team |
| 1. Scaffolding tools, equipment and PPEs may include but not limited to: | Tools:   * Ball pein hammer * Spanner * Measuring tape * Spirit level * Plumb bob * Screw driver   Equipment:   * Electronic and optical * Drilling machine portable * Power dowel machine   PPEs:   * Harness * Safety boots * Helmets * Gloves * Safety goggles * Tools belt * Overalls |
| 1. Scaffold components may include but not limited to: | * Toe boards * Coupler * Ladder * Platform * Girder |
| 1. Contract emerging issues may include but not limited to: | * Modification * Collapsing of scaffold * Taxes * Legal regulations * Scaffold materials * Theft and vandalism * Change in variables and fixed cost * Stoppage of the contract |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Interpersonal
* Analytical
* Delegation
* Erecting
* Dismantling
* Organisational
* Report writing
* Critical thinking
* Problem solving
* Negotiation
* Interpretation
* Drawing
* Management

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Concepts and terms in scaffolding
* Welfare and safety of construction workers
* Erecting of scaffolds
* Types and systems of scaffolding
* Dismantling of scaffolds
* Scaffold systems
* Integrity of scaffolds
* Scaffolding resources
* Scope and nature of projects that need scaffolding
* Scaffold components
* Contract management
* Contract emerging issues

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. Identified scaffolding resources appropriately. 2. Mobilised adequate resources for scaffolding. 3. Allocated resources appropriately. 4. Utilised scaffolding resources appropriately. 5. Controlled utilization of scaffolding resources effectively. 6. Delegated responsibility appropriately 7. Assigned scaffolding tasks appropriately. 8. Identified working teams appropriately. 9. Identified and used scaffolding tools, equipment and PPEs correctly. 10. Prepared scaffolding surface correctly. 11. Took scaffold measurements accurately. 12. Set up scaffold correctly. 13. Assembled scaffold correctly. 14. Checked scaffold integrity correctly. 15. Modified scaffold appropriately. 16. Monitored scaffold performance adequately. 17. Identified and used scaffolding tools, equipment and PPEs correctly. 18. Identified suitable scaffold components’ temporary storage area. 19. Dismantled scaffold correctly. 20. Sorted and removed scaffold components from site correctly. 21. Identified contract emerging issues appropriately. 22. Handled contract emerging issues correctly. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant assessment environment. 3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE SCAFFOLDING SITE

**UNIT CODE:** CON/OS/ST/CR/06/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to manage a scaffolding site. It involves developing site layout, setting up scaffolding site, developing and placing site signage, developing work execution schedules and controlling site activities.

This standard 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. Develop site layout | 1. Site reconnaissance is conducted based on site location plan. 2. Site reconnaissance report is prepared based on findings. 3. ***Position of the scaffold*** is determined based on nature and scope of work. 4. Site layout is designed and developed based on site reconnaissance report. |
| 1. Set up scaffolding site | 1. Construction permit is secured from regulatory authorities. 2. Site is barricaded depending on nature of work. 3. Scaffold site is set up based on site layout. |
| 1. Develop and place site signage | 1. Areas of signage are identified based on-site activities and hazards. 2. ***Site signages*** are developed based on the nature of the work. 3. Site signages are positioned based on activities and hazards. |
| 1. Develop work execution schedules | 1. Scaffolding work plan is developed based on scope of work. 2. ***Scaffolding resources*** are identified and mobilized based on the work plan. 3. ***Scaffolding activities*** are identified based on the work plan. 4. Resources are allocated based on scaffolding activities. 5. Work execution schedules are developed based on activities. |
| 1. Control site activities | 1. ***Site control mechanisms*** are developed and implemented based on activities. 2. Monitoring and evaluation plan is developed and implemented based on work plan. 3. ***Site records*** are developed and maintained based on-site activities. 4. Site activities are co-ordinated based on scope of work. 5. Site activities are controlled based on code of practise and work schedules. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Position of the scaffold may include but not limited to: | * Soffit /bridge * Facade * Roofing * Open excavations * Ramp * Tower * Vessel * Confined spaces * Cantilevered |
| 1. Site signages may include but not limited to: | * Informative * Warning * Prohibitive |
| 1. Scaffolding resources may include but not limited to: | * Financial * Human * Material and supplies * Tools, equipment and machine * Instructional manuals |
| 1. Scaffolding activities may include but not limited to: | * Mobilisation   + Identification and selection   + Inspection and allocation * Transportation * Storage * Inspection * Surface preparation * Sketching * Setting up of scaffolding * Erecting * Integrity inspection * Maintenance and servicing * Dismantling * Storage * Transportation * Inspection * Component’s maintenance and servicing * Final storage * Report writing |
| 1. Site control mechanisms may include but not limited to: | * Designated paths * Frisking * Working programmes * Stores issues vouchers * Wage bills * Attendance registers * Work ticket * Security * Fencing * Productivity * Integrity checks |
| 1. Site records may include but not limited to: | * Stores issue records * Attendance registers * Delivery books * Reports * Inventories * Manuals * Permits * Worker’s health records * Licences * Certificates * Contract documents * Insurance records |

**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
* Organization
* Interpretation
* Drawing
* Analytical
* Measuring
* Computation
* Management
* Problem solving
* Critical thinking

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Construction management
* Code of practise
* Staff welfare
* Working programmes
* Monitoring and evaluation
* Record management
* Waste management
* Stores management
* Signage
* Regulatory authorities
* Statutory requirements
* Site organization
* Site investigation
* Technical drawing
* Computer Aided Design

**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. Conducted site reconnaissance adequately. 2. Prepared site reconnaissance report appropriately. 3. Determined position of the scaffold appropriately. 4. Designed and developed site layout correctly. 5. Secured appropriate construction permits. 6. Barricaded scaffolding site appropriately. 7. Set up scaffold site correctly. 8. Identified areas of signage correctly. 9. Developed site signages appropriately. 10. Positioned site signages correctly. 11. Developed scaffolding work plan adequately. 12. Identified and mobilized scaffolding resources correctly. 13. Identified scaffolding activities correctly. 14. Allocated scaffolding resources correctly. 15. Developed appropriate work execution schedules. 16. Developed effective site control mechanisms. 17. Developed monitoring and evaluation plan correctly. 18. Developed and maintained site records appropriately. 19. Co-ordinated site activities effectively. 20. Controlled site activities effectively. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant assessment environment. 3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE SCAFFOLDING FIRM

**UNIT CODE:** CON/OS/ST/CR/07/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to manage scaffolding firm. It involves planning, organizing, staffing, directing and controlling scaffolding firm activities.

This standard 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 termsare elaborated in the Range*** |
| 1. Plan scaffolding firm activities | 1. Market research is conducted as per scientific research methods. 2. ***Scaffolding firm objectives*** are set based on market needs. 3. Scaffolding firm strategic plan is developed based on organizational objectives 4. ***Scaffolding firmoperational resources*** are identified based on organizational objectives. 5. Scaffolding firm budget estimates are prepared based on proposed activities or anticipated incomes. 6. ***Scaffolding firm inventory*** is managed based on procurement policy. 7. ***Scaffolding firm activities/tasks*** are identified based on organization objectives. 8. ***Scaffolding firm human resource*** needs are identified based on activities. 9. ***Scaffolding firm risks*** are identified based on magnitude of impact. |
| 1. Organize scaffolding firm activities | 1. Scaffolding firm organization structure is designed based on activities or tasks. 2. Resources are allocated based on organization structure and tasks to be undertaken. 3. Scaffolding firm inventory is procured and commissioned based on activities to be undertaken. 4. ***Scaffolding firm policies*** are formulated based on legal requirements and regulations. |
| 1. Staff the scaffolding firm | 1. ***Scaffolding firm staff*** recruitment, selection and placement is done based on strategic plan as per human resource policies. 2. Scaffolding firm staff is up-skilled based on competency gap analysis report. 3. Scaffolding firm staff is remunerated/compensated based on labour laws and human resource policies. 4. Scaffolding firm employee relations are built based on human resource policies. 5. Scaffolding firm staff grievances are managed based on human resource policy. 6. Scaffolding firm staff performance is managed based on set targets. 7. Scaffolding firm staff diversity is managed based on legal requirement. |
| 1. Direct scaffolding firm activities | 1. Leadership is provided based on standard procedure. 2. Scaffolding firm communication is managed as per workplace policy. 3. Staff motivation is conducted as per workplace policy. |
| 1. Control scaffolding firm activities | 1. ***Internal processes/ control systems*** are put in place as per workplace policy. 2. ***Performance variances*** are analysed and managed based on target. 3. Scaffolding firm activities are monitored and evaluated based on set target. 4. Scaffolding firm risks are managed based on magnitude of impact and workplace policies. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Scaffolding firm operational resources may include but not limited to: | * Financial * Human * Material and supplies * Tools, equipment and machine * Instructional manuals |
| 1. Scaffolding firm inventory may include but not limited to: | * Stores issue records * Attendance registers * Delivery books * Reports * Manuals * Permits * Worker’s health records * Licences * Certificates * Contract documents * Insurance records |
| 1. Scaffolding firm activities may include but not limited to: | * Mobilisation   + Identification and selection   + Inspection and allocation * Transportation * Storage * Inspection * Surface preparation * Setting up of scaffolding   + Measurement * Erecting * Integrity inspection * Maintenance and servicing * Dismantling * Storage * Transportation * Inspection * Component’s maintenance and servicing * Final storage * Report writing |
| 1. Scaffolding firm risks may include but not limited to: | * Surface instability * Inadequate structural integrity of the material * Absence of scaffold components and members * Un-plumbness and un-levelness of members * Negligence and human error * Presence of power cable * Unqualified workers * Lack of supervision |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Interpersonal
* Critical thinking
* Problem solving
* Interpretation
* Analytical
* Computation
* Management
* Budgeting

**Required Knowledge**

* The individual needs to demonstrate knowledge of:
* Principles of management
* Human resource management
* Organization development
* Financial management
* Legal and regulatory framework

**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. Conducted market research adequately. 2. Set scaffolding firm objectives appropriately. 3. Developed effective scaffolding firm strategic plan. 4. Identified scaffolding firm operational resources correctly. 5. Prepared scaffolding firm budget estimates correctly. 6. Managed Scaffolding firm inventory effectively. 7. Identified Scaffolding firm activities/tasks correctly. 8. Identified Scaffolding firm human resource needs correctly. 9. Identified Scaffolding firm risks correctly. 10. Designed Scaffolding firm organization structure appropriately. 11. Allocated Resources appropriately. 12. Procured scaffolding firm inventory appropriately. 13. Formulated effective scaffolding firm policies. 14. Recruitment, selection and placement scaffolding firm staff correctly. 15. Up-skilled Scaffolding firm staff appropriately. 16. Compensated scaffolding firm staff appropriately. 17. Built scaffolding firm employee relations effectively. 18. Managed scaffolding firm staff grievances appropriately. 19. Managed Scaffolding firm staff performance appropriately. 20. Managed Scaffolding firm staff diversity appropriately 21. Provided effective Leadership. 22. Managed scaffolding firm communication effectively. 23. Conducted staff motivation appropriately. 24. Put in place effective Internal processes/ control. 25. Analyzed and managed Performance variances effectively. 26. Monitored and evaluated Scaffolding firm effectively. 27. Managed Scaffolding firm risks effectively. |
| 1. Resource Implications | The following resources should be provided:   * 1. Appropriately simulated environment where assessment can take place.   2. Access to relevant assessment environment.   3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Oral questioning   2. Written tests   3. Interviews   4. Observation   5. Portfolio   6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   * 1. On-the-job   2. Off-the-job   3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## PERFORM TRADE PROJECT

**UNIT CODE:** CON/OS/ST/CR/08/6/A

**UNIT DESCRIPTION**

This unit covers the competencies required to perform trade project. It involves conducting feasibility study, developing project proposal, estimating and costing the project and implementing the project.

This standard 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. Conduct project feasibility study | 1. Project is interpreted based on the provided instructions. 2. Scaffold project is identified based on the provided instructions. 3. Reconnaissance survey is conducted based on scaffold project site. 4. ***Type of scaffold*** is identified based on the reconnaissance survey report. 5. Scaffold project sketches are developed based on the reconnaissance survey report. 6. Measurement of scaffold project surface is conducted based on scope of work. 7. Site layout is developed based on scaffold sketches. |
| 1. Develop scaffold project proposal | 1. ***Project proposal components*** are identified based on best practice. 2. ***Scaffold loadings*** are determined based on scaffold working drawings. 3. Scaffold design is developed based on the sketches. 4. Scaffold project proposal document is written based on nature and scope of work. 5. Working drawings are developed based on manufacturer’s manual and scaffold sketches. |
| 1. Estimate and cost of scaffold project | 1. ***Scaffold members*** are identified based on type of scaffold. 2. ***Scaffold components*** are counted based on the scaffold sketch. 3. Scaffold staying period is estimated based on scope and nature of work. 4. Human resources requirement is estimated based on nature and scope of work. 5. Unit rates are determined based on the standard method of measurement. 6. ***Preliminary costs*** are determined based on build-up unit rate. 7. Provisional sums of scaffold works is determined based on build-up unit rate 8. ***Fixed costs*** are determined based on current rates. 9. Total cost of scaffold work is determined based on calculation. |
| 1. Implement scaffold project | 1. ***Scaffolding resources*** are identified, mobilised and allocated based on nature and scope of work. 2. Programme of activities is developed based on nature and scope of work. 3. Scaffold project is implemented based on design. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| 1. Types of scaffold may include but not limited to: | * Suspended * Cantilever/hanging * Single * Double * Trestle/moveable * Sloping platform * Vessel * Birds cage * Hug |
| 1. Project proposal components may include but not limited to: | * Title * Abstract * Statement of work * Budget * Work plan * Methodology * Conclusions * Recommendations |
| 1. Scaffold loadings may include but not limited to: | * Dead * Live * Imposed * Wind * Dynamic |
| 1. Scaffold members may include but not limited to: | * Ladder * Platform * Girder * Toe boards * Stairways * Sheeting |
| 1. Scaffold components may include but not limited to: | * Coupler * Ledger * Standards * Transoms * Braces * Boards * Base plate * Anchorage |
| 1. Preliminary costs may include but not limited to: | * Logistics * Storage * Insurance * Human resource * Security * Services |
| 1. Fixed costs may include but not limited to: | * Rent * Tax * Salaries for staff * Vehicles * Services * Insurance |
| 1. Scaffolding resources may include but not limited to: | * Financial * Human * Material and supplies * Tools, equipment and machine * Instructional manuals |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication
* Interpersonal
* Critical thinking
* Problem solving
* Interpretation
* Analytical
* Organisation
* Designing
* Drawing
* sketching
* Computation

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Forces
* Loadings
* Project writing
* Site reconnaissance
* Taking off
* Estimation and costing
* Building -up unites rate
* Technical drawing
* Scaffold design
* Research methods

**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. Interpreted project correctly. 2. Identified appropriate scaffold project. 3. Conducted reconnaissance survey adequately. 4. Identified type of scaffold correctly. 5. Developed scaffold project sketches appropriately. 6. Conducted measurement of scaffold project surface accurately. 7. Developed Site layout correctly. 8. Identified project proposal components correctly. 9. Determined scaffold loadings accurately. 10. Developed effective Scaffold design. 11. Wrote Scaffold project proposal document correctly. 12. Developed scaffold working drawings correctly. 13. Identified scaffold members correctly. 14. Counted scaffold components accurately. 15. Estimated Scaffold staying period correctly. 16. Estimated Human resources requirement correctly. 17. Determined Unit rates accurately. 18. Determined preliminary costs accurately. 19. Determined provisional sums of scaffold works accurately 20. Determined fixed costs accurately. 21. Determined total cost of scaffold work accurately. 22. Identified, mobilised and allocated scaffolding resources appropriately. 23. Developed effective Programme of activities. 24. Implemented Scaffold project effectively. |
| 1. Resource Implications | The following resources should be provided:   1. Appropriately simulated environment where assessment can take place. 2. Access to relevant assessment environment. 3. Resources relevant to the proposed assessment activity or tasks. |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Oral questioning 2. Written tests 3. Interviews 4. Observation 5. Portfolio 6. Third party reports |
| 1. Context of Assessment | Competency may be assessed   1. On-the-job 2. Off-the-job 3. Workplace |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

END