

**THE REPUBLIC OF KENYA**

**MINISTRY OF EDUCATION**

**NATIONAL OCCUPATIONAL STANDARDS**

**FOR**

**ARCHITECT**

**KNQF LEVEL: 6**

**OS PROGRAMME CODE:** **0732 554 A**

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**FOREWORD**

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

Reforms in the education sector are necessary for the achievement of Kenya Vision 2030 and meeting the provisions of the Constitution of Kenya 2010. The education sector had to be aligned to the Constitution and this resulted to the formulation of the Policy Framework for Reforming Education and Training (Sessional Paper No. 4 of 2016). A key feature of this policy is the radical change in the design and delivery of the TVET training. The policy document requires that training in TVET shall be competency based, curriculum development shall be industry led, certification shall be based on demonstration of competence and mode of delivery shall allow for multiple entry and exit in TVET programs.

These reforms demand that Industry takes a leading role in curriculum development to ensure the curriculum addresses its competence needs. It is against this background that this Occupational Standard has been developed for the purpose of informing development of a competency-based Highway Engineering technician Level 6 Curriculum. This Occupational Standard will also form the basis for assessment of an individual for competency certification.

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

**CABINET SECRETARY**

**PREFACE**

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

The Technical and Vocational Education and Training Act No.

29 of 2013 and the Sessional Paper No. 4 of 2016 on Reforming Education and Training in Kenya, emphasized the need toreform curriculum development, assessment and certification. This called for a shift to CBET to address the mismatch between skills acquired through training and skills needed by industry as well as increase the global competitiveness of Kenyan labour force.

The industry in conjunction with national polytechnics and other national agencies have developed this Highway Engineering technician Level 6 Occupational Standard. The Standard is designed and organized with clear performance criteria for each element of a unit of competency. It also outlines the required knowledge and skills for the performance of prescribed tasks as well as evidence guide for assessment purposes.

PRINCIPAL SECRETARY

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**ABBREVIATIONS AND ACRONYMS**

CBET Competency Based Education and Training

EMCA Environmental Management and Coordination Act

ICT Information Communication Technology

ISO International Organization for Standardization

OS Occupational Standard

OSH Occupational Safety and Health

PPE Personal Protective Equipment

TVET Technical and Vocational Education and Training

**KEY TO UNIT CODE**

**Sector / Industry**

**Sub Sector**

**Occupational Area**

**Version Control**

**Unit of Competence Number**

**ISCED level, Programme Orientation and Level of Completion**

xx

x

xxx

x

x

x

# OVERVIEW

The Architectural Technician Level 6 consists of competencies that a trainee must achieve to enable them to work in the Construction Sector. It entails designing architectural model, producing digital architectural model, producing physical architectural model, applying computer-aided design and drawing techniques, carrying out architectural landscaping, designing architectural interiors and managing construction project

**BASIC UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0611 551 08A | Apply Digital Literacy |
| 0031 541 04A | Apply communication skills |
| 0413 541 18A | Apply Entrepreneurial Skills |

**COMMON UNITS OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0731 551 07 A | Apply Mathematics for Architects I |
|  | Apply Mathematics for Architects II |
| 0731 551 12A | Apply Engineering Survey Principles |
| 0731 551 03A | Apply technical drawing techniques |
| 0732 551 15A | Apply Construction Materials Principles |
| 0731 551 17A | Apply Building construction technology principles |
| 0731 541 14A | Apply Structural Analysis Principles |
| 0731 551 02A | Apply Art and Architectural Language |
| 0731 551 11A | Apply History of Architecture Concepts |

**CORE UNIT OF COMPETENCY**

|  |  |
| --- | --- |
| **Unit Code** | **Unit Title** |
| 0731 551 20A | design architechtural project |
| 0731 551 05A | Produce digital architectural model |
| 0731 551 01A | Produce physical architectural model |
| 0731 551 06A | Apply computer-aided design drawing techniques |
| 0731 551 10A | Carry out architectural landscaping |
| 0731 551 13A | Design architectural interiors |
| 0731 551 16A | Manage construction project |

# BASIC UNITS OF COMPETENCY

**APPLY DIGITAL LITERACY**

**UNIT CODE: 0611 551 08 A**

**UNIT DESCRIPTION:**

This unit covers the competencies required to Demonstrate Digital Literacy. It involves operating computer devices, solving tasks using the Office suite, accessing online/offline data and information, performing online communication and collaboration, applying cyber security skills and performing jobs online. It also involves applying job entry techniques.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace functions | **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. Operate computer devices | * 1. C***omputer device*** usage is determined as per workplace requirements.   2. ***Computer hardware*** is identified according to job requirements   3. ***Computer software*** is identified according to workplace requirements   4. Computer devices are turned on or off as per the correct workplace procedure.   5. ***Mouse techniques*** are applied in solving tasks as per workplace requirements   6. Keyboardtechniques are applied in solving tasks as per workplace requirements   7. Computer files and folders are created and managed as per workplace requirements   8. ***Internet connection option***s are identified and applied in connecting computer devices to the Internet   9. ***External devices*** are identified and connected to the computer devices as per the job requirement |
| 1. Solve tasks using Office suite | * 1. ***Word processing concepts***are applied in solving workplace tasks as per job requirements   2. Worksheet data is entered and prepared in accordance with work procedures   3. Worksheet data is built and edited in accordance with workplace procedures   4. ***Data manipulation*** on a worksheet is undertaken in accordance with work requirements   5. Worksheets are saved and printed in accordance with job requirements   6. ***Electronic presentation concepts***are applied in solving workplace tasks as per job requirements |
| 1. Manage data and information | * 1. Office ***internet services*** are identified and applied in accordance with office procedures   2. ***Internet access applications*** are determined in accordance with office operation procedures   3. Internet search is performed as per job requirements   4. Online digital content is downloaded in accordance with workplace requirements   5. Digital content is identified and backed up in accordance with workplace procedures |
| 1. Perform online communication and collaboration | * 1. Netiquette principles are observed as per work requirements   2. Electronic mail communication is executed in accordance with workplace policy   3. Digital content copyright and licenses are identified and applied according to workplace policies and regulatory requirements   4. ***Online*** ***collaboration tools*** are applied in accordance with workplace policies and regulatory requirements |
| 1. Apply cybersecurity skills | * 1. ***Data protection*** and ***privacy*** is classified in accordance with workplace policies and regulatory requirements   2. ***Internet security threats*** are identified as per workplace policies and regulatory requirements   3. Computer threats and crimes are detected in accordance to Information Management security guidelines   4. ***Cyber security control measures*** are applied in accordance with workplace policies and regulatory requirements |
| 1. Perform online jobs | * 1. ***Online job platforms*** are identified as per the job requirements   2. Online accounts and profiles are created in accordance with the work requirements   3. Online jobs are identified according to the bidder’s skillset   4. Online digital identity is managed according to industry best practices   5. Online job bidding is done as per the specific job requirements   6. Online tasks are executed according to the job requirements   7. Personal online payment account is managed in accordance with financial regulations |
| 1. Apply job entry techniques | * 1. ***Job opportunities*** are sought based on competencies   2. A winning resume/CV is developed as per job advertisement   3. An application/cover letter is developed based on the job advertisement   4. ***certificates and testimonials*** are organized as per resume   5. ***Interview skills*** are demonstrated as per job advertisement |

**RANGE**

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

| **Variable** | **Range** |
| --- | --- |
| 1. Computer devices may include but are not limited to: | * Desktops * Laptops * Smartphones * Tablets * Smartwatches |
| 1. Computer hardware may include but are not limited to: | * The System Unit E.g. Motherboard, CPU, casing, * Input Devices e.g. Pointing, keying, scanning, voice/speech recognition, direct data capture devices. * Output Devices e.g. hardcopy output and softcopy output * Storage Devices e.g. main memory e.g. RAM, secondary storage (Solid state devices, Hard Drives, CDs & DVDs, Memory cards, Flash drives * Computer Ports e.g. HDMI, DVI, VGA, USB type C etc. |
| 1. Computer software may include but are not limited to: | * System software e.g. Operating System (Windows, Macintosh, Linux, Android, iOS) * Application Software e.g. Word Processors, Spreadsheets, Presentations etc * Utility Software e.g. Antivirus programs |
| 1. External devices may include but are not limited to: | * Printers * Projectors * Smart Boards * Speakers * External storage drives * Digital/Smart TVs |
| 1. Word processing concepts may include but are not limited to: | * Creating word documents * Editing word documents * Formatting word documents * Saving word documents * Printing word documents |
| 1. Mouse techniques may include but are not limited to: | * Clicking * Double-clicking * Right-clicking * Drag and drop |
| 1. Internet connection options may include but are not limited to: | * Mobile Networks/Data Plans * Wireless Hotspots * Cabled (Ethernet/Fiber) * Dial-Up * Satellite * ISDN (Integrated Services Digital Network) |
| 1. Data manipulation may include but are not limited to: | * Use of formulae * Use of functions * Sorting * Filtering * Visual representation using charts |
| 1. Electronic presentation concepts may include but are not limited to: | * Creating slides * Editing slides * Formatting slides * Applying slide effects and transitions * Creating and playing slideshows * Saving presentations * Printing slides and handouts |
| 1. Internet services may include but are not limited to: | * Communication Services * Information Retrieval Services * File Transfer * World Wide Web Services * Web Services * Directory Services * Automatic Network Address Configuration * NewsGroup * Ecommerce |
| 1. Internet access applications/software may include but are not limited to: | * Browsers * Email Apps * eCommerce Apps |
| 1. Online collaboration tools may include but are not limited to: | * Online Storage * Online productivity applications * Online meetings, * Online learning environments, * Online calendars * Social networks |
| 1. Data protection and privacy may include but not limited to: | * Confidentiality of data/information * Integrity of data/information * Availability of data/information |
| 1. Internet security threats may include but not limited to: | * Malware attacks * Social engineering attacks * Software supply chain attacks * Advanced persistent threats (APT) * Distributed denial of service (DDoS) * Man-in-the-middle attack (MitM) * Password attacks * IoT Attacks * [Phishing Attacks](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#phishing-attacks) * [Ransomware](https://onlinedegrees.sandiego.edu/top-cyber-security-threats/#ransomware) |
| 1. Security threats control measures may include but not limited to: | * Counter measures against cyber terrorism * Physical Controls * Technical/Logical Controls * Operational Controls |
| 1. Online job platforms may include but are not limited to: | * Remotask * Data annotation.tech * Cloudworker * Upwork * Oneforma * Appen |
| 1. Job opportunities may include but not limited to: | * Self employment * Service provision * product development * salaried employment |
| 1. Certificates and testimonialsmay include but not limited to: | * Academic credentials * Letters of previous employments/ services rendered * Letters of commendation * Certifications of participation * Awards |
| 1. Interview skills may include but not limited to: | * Listening skills * Grooming * Language command * Articulation of issues * Body language * Time management * Honesty * Generally knowledgeable in current affairs and technical area |

**REQUIRED KNOWLEDGE AND SKILLS**

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

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Computer Hardware and Software Concepts
* Computer Security Concepts (Data security and privacy)
* Cyber security threats and control measures
* Understanding Computer Crimes
* Detection and protection against computer crimes
* Laws governing protection of ICT in Kenya
* Digital Identity Management
* Netiquette Principles
* Fundamentals of Copyright and Licenses
* Word processing;

Functions and concepts of word processing;

Documents and tables creation and manipulations;

Document editing;

Document formatting;

Word processing utilities

* Spread sheets;

Meaning, types and importance of spreadsheets;

Components of spreadsheets;

Functions, formulae, and charts, uses and layout;

Data formulation, manipulation and application to cells;

Editing & formatting spreadsheets;

* Presentation Packages;

Types of presentation Packages.

Creating, formulating, running, editing, printing and presenting slides and handouts

* Networking and Internet;

Internet connectivity.

Browser and digital content management;

Managing data, information, and digital content

Electronic mail and World Wide Web

* Fundamentals of Online Working;

Online Profile Management;

e-Portfolio Management;

Online Jobs Bidding;

Online Payment Systems;

* Job entry techniques

Job searching sites

Interview preparation skills

Interview handling

**Required skills**

The individual needs to demonstrate the following skills:

* Active listening
* Keyboard Skills
* Mouse Skills
* Analytical skills
* Creativity
* Interpretation Skills
* Communication
* Spread sheet operations (applying fundamental operations such as addition, subtraction, division and multiplication)
* Computer Use Safety Skills
* Document Editing Skills
* Document Formatting Skills
* Document Printing Skills
* Netiquette Skills
* Internet Browsing Skills
* Problem Solving Skills
* Online Collaboration Skills
* Cyber security Skills
* CV writing
* grooming

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. 1. Critical aspects of competency | ***Assessment requires evidence that the candidate:***   * 1. Operated computer devices as per workplace policies and regulations   2. Solved tasks using the office suite as per workplace policies and regulations   3. Manage data and information as per workplace policies and regulations   4. Performed online communication and collaboration as per workplace policies and regulations   5. Applied cyber security skills in accordance with workplace policies and regulations   6. Executed online tasks according to the job requirements   7. Searched for job opportunity based on competencies   8. Prepared job requirement documentations based on job opportunity   9. Demonstrated interview skills based on the job opportunity. |
| 1. Resource implications | * 1. The following resources should be provided:   2. Appropriately simulated environment where assessment can take place   3. Access to relevant work environments where assessment can take place   4. Resources relevant to the proposed activities or task |
| 1. Methods of assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| 1. Context of assessment | Competency may be assessed:   * 1. Workplace or simulated workplace |
| 1. Guidance information for assessment | * 1. Holistic assessment with other units relevant to the industry sector and workplace job role is recommended |

**APPLY ENTREPRENEURIAL SKILLS**

**UNIT CODE : 0031 541 18A**

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate an understanding of entrepreneurship. It involves demonstrating an understanding of financial literacy, applying entrepreneurial concepts identifying entrepreneurship opportunities, applying business legal aspects, developing business innovative strategies, and developing business plans.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace function. | **PERFORMANCE CRITERIA**  These are assessable statements that specify the required level of performance for each of the elements  ***Bold and italicized terms are elaborated in Range*** |
| --- | --- |
| 1. Apply Financial Literacy Skills | 1. **Sources of personal and business** ***funds*** are identified as per financial procedures and standards 2. Personal finances are managed as per financial procedures and standards 3. Savings are managed as per financial procedures and standards 4. Debts are managed as per financial procedures and standards 5. Investments are undertaken as per financial procedures and standards 6. Insurance services are procured as per financial procedures and standards |
| 1. Apply entrepreneurial concept | * 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. Salaried employment and self-employment are distinguished as per principles of entrepreneurship   6. ***Requirements for entry into self-employment*** are identified according to business procedures and standards   7. Roles of an Entrepreneur in an enterprise are determined according to business procedures and standards   8. **Contributions of entrepreneurship** to National development are identified as per business procedures and standards |
| 1. Identify entrepreneurial opportunities | * 1. Business ideas are identified as per business procedures and standards   2. Factors to consider when evaluating business opportunity viability are explored based on business procedure and standards   3. Entrepreneurial opportunities are evaluated as per business procedures and standards   4. Business ideas and opportunities are generated as per business procedures and standards   5. Business life cycle is analysed as per business procedures and standards |
| 1. Apply business legal aspects | * 1. ***Forms of business ownership*** are identified as per legal procedures and practices   2. Business Registration and Licensing processes are identified as per legal procedures and practices   3. Types of Contracts and Agreements are analysed as per legal procedures and practices   4. Employment Laws are identified as per legal procedures and practices   5. Taxation laws are identified as per legal procedures and practices |
| 1. Innovate Business strategies | * 1. Business innovation strategies are determined by the organization standards   2. Creativity in business development is demonstrated in accordance with business standards   3. ***Innovative business standards***  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. 6. Develop Business Plan | * 1. Business idea is described as per business procedures and standards   2. Business description is developed as per business plan format   3. Marketing plan is developed as per business plan format   4. Organizational/Management plan is prepared in accordance with business plan format   5. Production/operation plan is prepared in accordance with business plan format   6. Financial plan is prepared in accordance with the business plan format   7. Executive summary is prepared in accordance with business plan format   8. Business plan is presented as per best practice   9. Business ideas are incubated as per institutional policy |

**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. Sources of personal funds mayinclude but not limited to: | * Salary/Wages * Investments * Savings * Inheritance * Government Benefits |
| 1. Sources of business finance mayinclude but not limited to: | * Equity Financing * Debt Financing, * Personal Savings/Investment * Retained Earnings * Grants and Subsidies * Crowdfunding * supplier Credit: * Leasing and Asset Financing: |
| 1. 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. Forms of businesses ownership may include but not limited to: | * Sole proprietorship * Partnership * Limited companies * Cooperatives |
| 1. Innovative business standards 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 standards
* 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 standards
* Market and feasibility studies
* Government and regulatory processes
* Local and international business environment
* Relevant developments in other industries
* Regional/ County business expansion standards

**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. Identified Sources of personal and business finance as per financial procedures and standards 3. Managed Personal finances as per financial procedures and standards 4. Made Investment decisions as per financial procedures and standards 5. Generated Business ideas and opportunities based on business procedure and standards 6. Analysed business life cycle based on business procedure and standards 7. Determined business innovative standards as per business principles 8. Developed and presented a business plan as per regulatory framework. |
| 1. Resource Implications | * 1. The following resources should be provided:   2. Access to relevant workplace where assessment can take place   3. Appropriately simulated environment where assessment can take place |
| 1. Methods of Assessment | * 1. Competency may be assessed through:   2. Written tests   3. Oral questions   4. Third party report   5. Interviews   6. Portfolio |
| 1. Context of Assessment | Competency may be assessed:   1. On-the-job 2. In a simulated work environment |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

**APPLY COMMUNICATION SKILLS**

**UNIT CODE: 0031 541 04A**

**UNIT DESCRIPTION**

This unit covers the competencies required to demonstrate communication skills. It involves applying communication channels, written, non-verbal, oral, and group communication skills.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  These describe the key outcomes that make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements that specify the required level of performance for each of the elements  ***Bold and italicized terms are elaborated in the Range*** |
| --- | --- |
| 1. Apply communication channels | 1. Specific communication channels are identified and applied based on workplace requirements 2. Challenges are identified and addressed as per the operational standards of the organization 3. Communication channels are evaluated to meet workplace needs |
| 1. Apply written communication skills | * 1. Types of written communication are identified and applied according to the workplace requirements   2. Written communication needs are identified and implemented according to workplace procedures   3. Written communication guidelines are analysed, evaluated, and revised based on workplace needs |
| 1. Apply non-verbal communication skills | * 1. Existing non-verbal communication techniques are identified based on organization policy   2. Existing non-verbal communication techniques are applied based on organization policy   3. Non-verbal communication techniques are articulated to enhance inclusivity according to workplace requirement   4. Non-verbal communication techniques are modelled to enhance inclusivity according to workplace requirement |
| 1. Apply oral communication skills | * 1. Types of oral communication are identified and established as per organization policy   2. Pathways of oral communication are identified and established as per organization policy   3. Pathways of oral communication are reviewed according to organization procedures.   4. Pathways of oral communication are maintained according to the organization standards. |
| 1. Apply group communication skills | * 1. Group communication strategies are appliedbased on the workplace needs   2. Groups are organized in accordance with workplace procedures   3. Effective questioning, listening and non-verbal communication techniques are used as per needs.   4. Group communication challenges are identified and addressed according to the workplace needs |

**RANGE**

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

| **Variable** | **Range** |
| --- | --- |
| 1. Communication strategies may include but are not limited to: | * Language switch * Comprehension check * Repetition * Asking confirmation * Paraphrasing * Clarification request * Translation * Restructuring * 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 are not limited to: | * Establishing rapport * Eliciting facts and information * Facilitating resolution of issues * Developing action plans |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Active listening
* Interpretation
* Negotiation
* Writing
* Oral skills
* Creative thinking
* Critical thinking
* Decision making
* Analytical
* Innovation
* Conflict skills
* Leadership
* Problem solving skills
* Management
* Organizational
* Teamwork

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Communication process
* Dynamics of groups
* Styles of group leadership
* Key elements of communications strategy
* Principles of effective communication
* Turn-taking techniques
* Conflict resolution techniques
* Work planning
* Work organization
* Company policies
* Company operations and procedure standards
* Fundamental rights at the workplace
* Personal hygiene
* Accountability
* Workplace problems and how to deal with them

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:   * 1. Identified and applied specific communication channels based on workplace requirements   2. Identified and applied specific written communication correspondence according to the workplace requirements.   3. Applied and developed non-verbal strategies to communicate in all areas of the workplace requirements.   4. Established pathways of oral communication as per workplace policy   5. Applied group communication strategies based on workplace needs. |
| 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.   3. Resources relevant to the proposed activity or tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   * 1. Observation   2. Oral assessment   3. Portfolio of evidence   4. Interviews   5. Third party report   6. Written assessment   7. Practical assessment   8. Projects |
| 1. Context of Assessment | Competency may be assessed:   * 1. On-the-job   2. In a simulated work environment |
| 1. 5. Guidance information for assessment | * 1. Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

# COMMON UNITS OF COMPETENCY

## APPLY MATHEMATICS FOR ARCHITECTS I

**UNIT CODE: 0731 551 07A**

**Unit Description**

This unit describes the competencies a technician requires to apply engineering mathematics. It involves applying algebra, applying trigonometry and hyperbolic functions, performing coordinate geometry, carrying out mensuration, applying vector theory and applying matrixes

**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 italicised terms are elaborated in the Range)*** | |
| --- | --- | --- | --- |
| 1. Apply algebra | | 1.1 Indices calculations are worked as per the law of indices  1.2 Logarithmscalculations are worked out as per the law of logarithm  1.3 ***Simultaneous equations*** are worked as per algebraic rules  ***1.4Quadratic equations*** are worked out as per the algebraic rules. | |
| 1. Apply trigonometry and hyperbolic functions | | 2.1 Right angled triangles are solved as per trigonometric ratios.  2.2Acute and obtuse angles triangles are solved as per trigonometric identities.  2.3Angles of elevation and depression calculations are worked out as per trigonometric ratios.  2.4Calculations are performed using hyperbolic functions  ***2***.5Trigonometric equations are worked out as per the trigonometric formulas  2.6Sin and cosine graphs are interpreted as per trigonometric rules. | |
| 1. Perform coordinates geometry | | 3.1Polar equations are calculated using coordinate geometry  3.2 Graphs of given polar equations are plotted using the Cartesian plane   * 1. ***Normal*** and ***tangents*** are worked out using coordinate geometry | |
| 1. Carry out mensuration | | ***4.1 Perimeter*** and ***areas*** of regular figures are worked out based on their shapes.  4.2 ***Areas*** of irregular figures are worked out based on their shapes.  ***4.3 Volume*** and ***surface area*** of solids are worked out based on their shapes. | |
| 1. Apply vector theory | | 5.1 Vectors and scalar quantities are obtained in two and three dimensions  5.2 Vector algebra calculations are worked out based on vector theory.  5.3 ***Gradient, Divergence and Curl are obtained.*** | |
| 1. Apply matrix | | * 1. Mathematical matrix operation are calculated as per the order of matrices.   2. Inverse of square matrices is worked out as per the order of matrices   3. Matrix simultaneous calculation are worked out as per the crammer’s rule methods. | |

**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** |
| --- | --- |
| Concept may include but is not limited to: | * Quadratic formula * Null factor law |
| 1. Perimeter and area may include but not limited to: | * Addition * Subtraction * Multiplication * Division |
| 1. Normal and tangent may include but not limited to: | * Sinh x * Cosh x * Cosec x * Cot x * Tanh x * Sech x |
| 1. Different methods may include but not limited to: | * Separation of variables * Linear equations * Homogenous equations |
| 1. Probability distributions may include but not limited to: | * Binomial distribution * Poisson distribution * Normal distribution |
| 1. Numerical methods may include but not limited to: | * Newton Raphson * Gregory Newton |

**REQUIRED KNOWLEDGE AND UNDERSTANDING**

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

**Required Skills**

The individual needs to demonstrate the following skills:

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

**Required Knowledge**

The individual needs to demonstrate knowledge and understanding of:

* Algebra
* Linear algebra
* Basic calculus
* Geometry
* Fundamental operations (addition, subtraction, division, multiplication)
* Calculating area and volume
* Types and purpose of measuring instruments
* Units of measurement and abbreviations
* Rounding techniques
* Types of fractions
* Types of tables and graphs
* Presentation of data in tables and graphs
* Vector operations
* Matrix operations

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Applied algebra   2. Applied trigonometry and hyperbolic functions   3. Applied coordinates geometry   4. Apply vector theory   5. Carried out mensuration   6. Applied matrix |
| 1. Resource implications | The following resources should be provided:   1. Mathematical tables 2. Whiteboards 3. Marker 4. Scientific calculator 5. Measuring equipment |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Demonstration 2. Oral questioning 3. Written examination |
| 1. Context of assessment | 1. Competency may be assessed individually or in group in the actual workplace or through simulated work environment |
| 1. Guidance information for assessment | 1. Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

## APPLY MATHEMATICS FOR ARCHITECTS II

**UNIT CODE:** 0731 551 20A

**Unit Description**

This unit describes the competencies a technician requires to apply engineering mathematics. It involves applying complex numbers, carrying out binomial expansion, applying calculus, applying power series, applying statistics, applying numerical methods, and solving ordinary differential equations.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| --- | --- |
| **ELEMENT**  This describes the key outcomes which make up workplace functions | **PERFORMANCE CRITERIA**  These are assessable statements specify the required level of performance for each element.  *Bold and italicised terms are elaborated in the range* |
| 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. 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. Apply Power Series | 1. Power series are obtained using Taylor’s Theorem 2. Power series are obtained using Maclaurin’s ‘s theorem |
| 1. Apply Statistics | 1. Identification, Collection and Organization of data is performed 2. Interpretation, analysis and presentation of data in appropriate format is performed 3. Mean, median, mode and Standard deviation are obtained from given data 4. Calculations are performed based on Laws of probability 5. Calculation involving probability distributions, mathematical expectation sampling distributions are performed 6. Sampling distribution methods are applied in data analysis 7. Calculations involving use of standard normal table, sampling distribution, T-distribution and Estimation are done 8. Confidence intervals are determined 9. Testing hypothesis using large samples and small samples are performed 10. Calculations involving Correlation and regression are done 11. Calculations involving rank correlation coefficient and equations of regression line are done |
| 1. Apply Numerical methods | 1. Roots of polynomials are obtained using iterative numerical methods 2. Interpolation and extrapolation are performed using numerical methods |
| 1. Solve Ordinary differential equations | 1. First order and second order differential equations are solved using the method of undetermined coefficients 2. First order and second order differential equations are solved from given boundary conditions |

**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** |
| --- | --- |
| Concept may include but is not limited to: | * Quadratic formula * Null factor law |
| 1. Perimeter and area may include but not limited to: | * Addition * Subtraction * Multiplication * Division |
| 1. Normal and tangent may include but not limited to: | * Sinh x * Cosh x * Cosec x * Cot x * Tanh x * Sech x |
| 1. Different methods may include but not limited to: | * Separation of variables * Linear equations * Homogenous equations |
| 1. Probability distributions may include but not limited to: | * Binomial distribution * Poisson distribution * Normal distribution |
| 1. Numerical methods may include but not limited to: | * Newton Raphson * Gregory Newton |

**REQUIRED KNOWLEDGE AND UNDERSTANDING**

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

**Required Skills**

The individual needs to demonstrate the following skills:

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

**Required Knowledge**

The individual needs to demonstrate knowledge and understanding of:

* Algebra
* Linear algebra
* Basic calculus
* Geometry
* Fundamental operations (addition, subtraction, division, multiplication)
* Calculating area and volume
* Types and purpose of measuring instruments
* Units of measurement and abbreviations
* Rounding techniques
* Types of fractions
* Types of tables and graphs
* Presentation of data in tables and graphs
* Vector operations
* Matrix operations

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of competency | Assessment requires evidence that the candidate:   * 1. Applied complex numbers   2. Applied coordinates geometry   3. Applied calculus   4. Solved ordinary differential equations   5. Applied power series   6. Applied statistics   7. Applied numerical methods |
| 1. Resource implications | The following resources should be provided:   1. Mathematical tables 2. Whiteboards 3. Marker 4. Scientific calculator 5. Measuring equipment |
| 1. Methods of assessment | Competency in this unit may be assessed through:   1. Demonstration 2. Oral questioning 3. Written examination |
| 1. Context of assessment | 1. Competency may be assessed individually or in group in the actual workplace or through simulated work environment |
| 1. Guidance information for assessment | 1. Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended |

## APPLY ENGINEERING SURVEY PRINCIPLES

**UNIT CODE: 0731 551 12A**

**UNIT DESCRIPTION:**

This unit covers the principles required by an architectural technician when applying engineering survey principles. These principles include applying survey linear measurement survey levelling, conducting surveying levelling, carrying out surveying earthworks, applying survey setting out works.

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| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply surveying linear measurements principles | * 1. ***Surveying linear measurements tools and equipment*** are assembled as per work requirements.   2. ***Surveying linear measurements principles*** are applied as per work requirements   3. ***Linear measurements*** *are documented*as per work requirements |
| 1. Conduct surveying levelling principles | 2*.*1 **Levelling *tools and equipment*** are assembled as per work requirements  2.**2** Surveying ***levelling principles*** are applied as per work requirements  2.3***levelling measurements*** *are documented*as per work requirements |
| 1. Carry out surveying earth works | * 1. ***Surveying earth works* tools and equipment** are assembled as per work requirements.   2. ***Earthworks*** are measured as per work requirements.   3. ***Earthworks*** are documented as per work requirements. |
| 1. Apply surveying setting out works | * 1. ***Surveying setting out tools and equipment*** are assembled as per work requirement.   2. ***Setting out works*** is carried out as per work requirements.   3. ***Setting out works*** is documented as per work requirements. |

**RANGE**

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

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| --- | --- |
| **Variable** | **Range** |
| 1. ***Linear surveying tools and equipment*** may include but not limited to: | * 1. Tape measure   2. Measuring wheel   3. Total station   4. Automatic level |
| 1. ***Linear surveying measurements*** may include but not limited to: | * 1. Tape measurement   2. Pacing measurement   3. Electronic distance measurement |
| 3. **Levelling *tools and equipment*** may include but not limited to: | * 1. Automatic level   2. Dumpy level   3. Levelling staff |
| 4. ***Levelling measurements*** may include but not limited to: | * 1. Horizontal   2. vertical |
| 5.***Surveying earth works* tools and equipment** may include but not limited to: | * 1. Surveying rods   2. Levelling instruments   3. Measuring tools |
| 1. ***Surveying Earthworks***may include but not limited to: | * 1. Cuts   2. Fills   3. Cut and fill |
| 1. ***Surveying setting out tools and equipment*** may include but not limited to: | * 1. Tape measure   2. Measuring wheel   3. Total station   4. Automatic level |
| 1. ***Surveying setting out works*** may include but not limited to: | * 1. Building setting out   2. Paths setting out   3. Vehicular parking |

**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 skills
* Analytical skills
* Surveying equipment operating skills
* Problem solving
* Communication skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

* Leveling knowledge
* Setting out
* Occupational Health and Safety
* Data interpretation

**EVIDENCE GUIDE**

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

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| --- | --- |
| 1. Critical aspect of competency | Assessment requires evidence that the candidate:   * 1. Documented linear measurements as per work requirements   2. Documented levelling measurements as per work requirement   3. Documented Surveying earthworks per work requirement   4. Carried out surveying setting out works as per work requirement.   5. Documented surveying setting out works as per work requirement |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. 3. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY CONSTRUCTION MATERIALS PRINCIPLES

**UNIT CODE: 0731 551 15A**

**UNIT DESCRIPTION:**

This unit cover the principles required by an architectural technician in applying construction materials principles. These principles include applying; construction walling units, construction timber and timber products, construction clay products, construction metal products, construction plastics and Rubber products, construction paints and varnishes, construction glass and construction concrete.

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| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply construction walling units | * 1. ***Construction walling materials*** are identified as per work requirement.   2. ***Construction walling materials*** are assembled as per work requirement.   3. ***Walling*** is constructed as per work requirement. |
| 1. Apply construction timber and timber products | * 1. ***Construction timber products*** are identified as per work requirement.   2. ***Construction timber products*** are assembled as per work requirement.   3. ***Construction timber products*** are prepared as per work requirement.   4. ***Timber building elements*** are constructed as per work requirement |
| 1. Apply construction clay products. | ***3.1Construction clay products*** are identified as per work requirement.   * 1. ***clay products*** are assembled as per work requirement.   2. ***clay products*** are fixed as per work requirement |
| 1. Apply construction metal products. | ***4.1 Construction metal products*** are identified as per work requirement.  ***4.2 metal products*** are assembled as per work requirement.   * 1. ***metal products*** are fixed as per work requirement |
| 1. Apply construction plastics and rubber products. | 5.1 plastics and Rubber ***products*** are identified as per work requirement.  ***4.2*** plastics and Rubber ***products*** are assembled as per work requirement.   * 1. ***metal products*** are fixed as per work requirement |
| 1. Apply construction paints | 6.1 paints ***products*** are identified as per work requirement.  6.2paints ***products*** are assembled as per work requirement.   * 1. paints are applied as per work requirement |
| 1. Apply construction glass | 7.1 construction glass ***products*** are identified as per work requirement.  7.2 construction glass ***products*** are assembled as per work requirement.  7.3 glass elements are fixed as per work requirement |
| 1. Apply construction concrete | 8.1 construction concrete ***products*** are identified as per work requirement.   * 1. Construction concrete ***products*** are assembled as per work requirement.   2. concrete products are installed as per work requirement |

**RANGE**

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

|  |  |
| --- | --- |
| Variable | Range |
| 1. ***Construction walling units*** may include but not limited to: | * 1. Building stones   2. Concrete blocks   3. Soil stabilized blocks   4. EPS   5. Prefabricate walling units |
| 1. ***Construction walling units’ properties*** may include but not limited to: | * 1. Texture   2. Colour   3. Density   4. Strength   5. Fire resistance   6. Sound insulation |
| 1. ***Timber conversion*** may include but not limited to: | * 1. Quarter sawing   2. Through and through |
| 1. ***Clay products*** may include but not limited to: | * 1. Bricks   2. Roofing tiles   3. External work elements |
| 1. ***Metal products properties*** may include but not limited to: | * 1. Texture   2. Colour   3. Density   4. Strength   5. Fire resistance   6. Sound insulation |
| 1. ***Plastics and rubber products*** ***properties*** may include but not limited to: | * 1. Durability   2. Lightweight   3. Chemical resistance   4. Density   5. Strength   6. Fire resistance   7. Sound insulation |
| 1. ***Plastics and rubber products*** may include but not limited to: | * 1. PVC pipes   2. Polythene sheeting   3. Acrylic sheets   4. Rubber roofing materials   5. Rubber expansion joints |
| 1. ***Paints and varnishes properties*** may include but not limited to: | * 1. Adhesion   2. Colour   3. Durability   4. Opacity   5. Drying time |
| 1. ***Paints and varnishes products*** may include but not limited to: | * 1. primer coat   2. base coat   3. finish coat |
| 1. ***Glass properties*** may include but not limited to: | * 1. Durability   2. Lightweight   3. Chemical resistance   4. Density   5. Strength   6. Fire resistance   7. Sound insulation |
| 1. ***Glass product*** may include but not limited to: | * 1. Float glass   2. Tinted glass   3. Reflective glass   4. Tempered glass   5. Patterned glass |
| 1. ***Concrete properties*** may include but not limited to: | * 1. Durability   2. Lightweight   3. Chemical resistance   4. Density   5. Strength   6. Fire resistance   7. Sound insulation |
| 1. ***Concrete products*** may include but not limited to: | * 1. Externa works elements   2. Precast concrete products   3. Insitu-concrete products |

**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:

1. Measuring skills
2. Analytical skills
3. Communication skills
4. Problem solving skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

1. Construction processes
2. Sustainability
3. Occupational Health and Safety
4. Material selection
5. Construction codes and standards
6. Quality control

**EVIDENCE GUIDE**

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

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| --- | --- |
| 1. Critical aspect of competency | Assessment requires evidence that the candidate:   * 1. Walling is constructed as per work requirement.   2. Construction timber products are prepared as per work requirement.   3. Timber building elements are constructed as per work requirement   4. Clay products are fixed as per work requirement   5. Metal products are fixed as per work requirement   6. Metal products are fixed as per work requirement   7. Paints are applied as per work requirement   8. 7.3 glass elements are fixed as per work requirement   9. Concrete products are installed as per work requirement |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY BUILDING WORKS MEASUREMENTS PRINCIPLES

**UNIT CODE:** 0731 551 /18/A

**UNIT DESCRIPTION:**

This unit covers the principles required by an architectural technician in applying building works measurement principles. These principles include applying substructure works taking off principles, applying superstructure works taking off principles applying construction external work taking off principles and applying building works estimating and costing principles.

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| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply substructure works taking off principles | 1. ***Substructure elements*** are documented as per work requirement. 2. Substructure elements quantitiesare quantified as per work requirement. 3. Substructure elements quantitiesare booked as per work requirement. |
| 1. Apply superstructure works taking off principles. | 1. ***Superstructure elements*** are documented as per work requirement. 2. Superstructure elements quantitiesare quantified as per work requirement. 3. Superstructure elements quantitiesare booked as per work requirement. |
| 1. Apply construction external work taking off principles | 1. ***External works elements*** are documented as per work requirement. 2. External works elements quantitiesare quantified as per work requirement. 3. External works elements quantitiesare booked as per work requirement. |
| 1. Apply building works Estimating and costing principles | * 1. ***Construction preliminary work*** unit rate build up is carried out as per work requirement.   2. ***Substructure work*** unit rate build up is carried out as per work requirement.   3. ***Superstructure work*** unit rate build up is carried out as per work requirement.   4. ***External work*** unit rate build up is carried out as per work requirement.   5. Bill of quantities is prepared as per work 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.Substructure elements*** may include but not limited to: | * 1. Trench excavation   2. Reducing level   3. Foundation strip   4. Foundation walling   5. Hard core fill   6. Floor bed |
| ***2.Superstructure elements*** may include but not limited to: | * 1. Walling units   2. Doors   3. Windows   4. Roof work   5. Fittings and fixtures   6. Finishes |
| ***3. External works elements*** may include but not limited to: | * 1. Landscaping works   2. Rendering works   3. Drainage works |
| ***4. Construction preliminary work*** may include but not limited to: | * 1. Access roads   2. Site clearance   3. Demolition work |
| ***5. Substructure works estimating and costing*** may include but not limited to: | * 1. Excavation works   2. Walling works   3. Concreting works   4. Hard-core fill   5. Blinding |
| ***6. Superstructure works estimating and costing*** may include but not limited to: | * 1. Superstructure walling   2. Doors and windows   3. Roofing   4. Finishes |
| ***7. Construction external work estimating and costing*** may include but not limited to: | * 1. Landscaping works   2. Drainage works   3. Paving works |

**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:

1. Drafting skills
2. Technical drawing skills
3. Sketching skills
4. Analytical skills
5. Construction drawings interpretation skills
6. Cost estimation
7. Communication skills
8. Management skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

1. Mathematical knowledge
2. General building construction knowledge
3. Occupational Health and Safety
4. Construction materials
5. Building codes and standards
6. Unit measurement systems
7. Measurement tools

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspect of competency | Assessment requires evidence that the candidate:   * 1. Substructure elements quantities are quantified as per work requirement.   2. Substructure elements quantities are booked as per work requirement.   3. Superstructure elements quantities are quantified as per work requirement.   4. Superstructure elements quantities are booked as per work requirement.   5. External works elements quantities are quantified as per work requirement. |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY STRUCTURAL ANALYSIS PRINCIPLES

**UNIT CODE: 0732 551 14A**

**UNIT DESCRIPTION:**

This unit cover the principles required by an architectural technician in applying structural analysis principles. These principles include applying principles on; shear force and bending moment structural analysis, beam and frames structural analysis and construction structural design principles.

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| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply shear force and bending moments structural analysis principles | 1.1 ***types of supports*** are applied as per work requirement  1.2 Support reaction on beams and frames are calculated as per work requirement  1.3 Shear force and bending moment drawings are prepared as per work requirement |
| 1. Apply beam and frames structural analysis principles | 2.1 ***Forces on beams*** are applied as per work requirement  2.2 Forces on beams and frames are calculated as per work requirement  2.3 Force moment drawings are prepared as per work requirement |
| 1. Apply construction structural design principles | 3.1 ***Types of stresses*** are identified as per work requirement  3.2 ***Compression stresses*** are calculated as per work requirement  3.3 Nature of compression members is defined as per work 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. Types of supports*** may include but not limited to: | * 1. Fixed support   2. Simply supported   3. Hinged support   4. Roller support |
| ***2. Construction structural elements characteristics*** may include but not limited to: | * 1. Strength   2. Stiffness   3. Durability   4. Elasticity   5. Fire resistance |
| ***3. Construction structural elements*** may include but not limited to: | * 1. Beams   2. Columns   3. Foundations   4. Slabs   5. Walls   6. Roof trusses   7. Bracing systems |

**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:

1. Drafting skills
2. Technical drawing skills
3. Sketching skills
4. Analytical skills
5. Construction drawings interpretation skills
6. Communication skills
7. Management skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

1. Mathematical knowledge
2. General building construction knowledge
3. Occupational Health and Safety
4. Construction materials
5. Building codes and standards
6. Unit measurement systems
7. Measurement tools

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY ART AND ARCHITECTURAL LANGUAGE PRINCIPLES

**UNIT CODE: 0731 551 02A**

**UNIT DESCRIPTION:**

This unit covers the principles required by an architectural technician in applying art and architectural language. These principles include applying architectural design fundamentals, producing architectural thematic expressions, applying anthropometric and ergonomics concepts, applying freehand drawing techniques and applying architectural drawings techniques

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| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply architectural design fundamentals principles | 1. Architectural design fundamental principles are identified as per work requirement. 2. Architectural design principles are applied as per work requirement. 3. Artistic forms are produced as per work requirement. |
| 1. Produce architectural thematic expressions | * 1. ***Architectural thematic expression tools and equipment*** are assembled as per work requirement.   2. ***Architectural thematic expression materials*** are assembled as per work requirement   3. ***Architectural thematic expression*** are produced as per work requirement. |
| 1. Apply anthropometric and ergonomics concepts | * 1. ***Architectural anthropometric and ergonomics tools and equipment*** are assembled as per work requirement.   2. ***Architectural anthropometric and ergonomics materials*** are assembled as per work requirement   3. ***Architectural anthropometric and ergonomics*** are applied as per work requirement. |
| 1. Apply freehand drawing techniques | * 1. ***Architectural freehand drawing tools and equipment*** are assembled as per work requirement.   2. ***Architectural freehand drawing materials*** are assembled as per work requirement   3. ***Architectural freehand drawing*** are prepared as per work requirement. |
| 1. Apply technical drawing techniques | * 1. ***Technical drawing tools and equipment*** are assembled as per work requirement.   2. ***Technical drawing materials*** are assembled as per work requirement   3. ***Technical drawing techniques*** are performed as per work requirement. |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| ***1. Architectural design Elements and principles*** may include but not limited to: | **Elements**   * + Form   + Line   + Shape   + Texture   + Value   + Volume   + Space   **Principles**   * + Contrast   + Balance   + Emphasis   + Proportions |
| ***2. Artistic forms*** may include but not limited to: | * + Painting   + Sculpture   + Literature   + Cinema   + Theatre   + Music |
| 4. ***Architectural thematic expression tools and equipment*** may include but not limited to: | * + NT cutter   + Drawing board   + T square   + Set squares   + Templates |
| 5. ***Architectural thematic expression materials*** may include but not limited to: | * + Water colour papers   + A series papers   + Embossed papers   + Water colour paints   + Oil colour paints   + Coloured pencils   + B series pencils |
| ***6.Architectural thematic expression*** may include but not limited to: | * + Balance   + Serenity   + Mystery   + Proportion   + Movement |
| ***7.Architectural anthropometric and ergonomics materials*** may include but not limited to: | * + Water colour papers   + A series papers   + Water colour paints   + Oil colour paints   + Coloured pencils   + B series pencils |
| 1. ***Architectural anthropometric and ergonomics*** may include but not limited to: | * + Body measurements   + Population density   + Clearance and reaches   + Workstation design   + Human computer interaction   + Circulation spaces |
| 1. ***Architectural freehand drawing tools and equipment*** may include but not limited to: | * + NT cutter   + Drawing board   + T square   + Set squares   + Templates |
| 1. ***Technical drawing tools and equipment*** may include but not limited to: | * + NT cutter   + Drawing board   + T square   + Set squares   + Templates |
| 1. ***Technical drawing materials*** may include but not limited to: | * + A series papers   + HB series pencils |
| 1. ***Technical drawing techniques*** may include but not limited to: | * + Plane geometry   + Solid geometry |

**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:

* + - 1. Drafting skills
      2. Technical drawing skills
      3. Sketching skills
      4. Analytical skills
      5. Spatial awareness
      6. Communication skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

1. Art and Architectural language
2. Evolution of architecture
3. Occupational Health and Safety
4. Architectural elements awareness
5. Arts historical knowledge
6. Architectural styles knowledge
7. Rendering and visualization

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspect of competency | Assessment requires evidence that the candidate:   * 1. Applied architectural design fundamental principles as per work requirement.   2. Produced architectural thematic expression as per work requirement.   3. Prepared architectural figurative expressions as per work requirement.   4. Applied architectural anthropometric and ergonomics as per work requirement.   5. Prepared architectural freehand drawing as per work requirement. |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY HISTORY OF ARCHITECTURE CONCEPTS

**UNIT CODE: 0731 551 11A**

**UNIT DESCRIPTION:**

This unit covers the principles required by an architectural technician in applying the history of architecture concepts. These principles include applying; architectural contextual meaning concepts, ancient cultures architectural languages, architectural Industrial Revolution concepts, architectural modern movement principles, traditional architecture concepts n and architectural Postmodern concepts.

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply architectural contextual concepts. | 1. ***Architectural contextual concepts*** are identified as per work requirement. 2. Architectural contextual concepts are documented as per work requirement. 3. Architectural designs are developed as per contextual concepts. |
| 1. Apply ancient cultures architectural languages | 1. ***Ancient Architectural built forms*** are identified as per work requirement. 2. Ancient architectural formsare documented as per work requirement. 3. Architectural designs are developed as per ancient architectural built forms. |
| 1. Apply architectural Industrial revolution concept. | 1. Modern movement principles are identified as per work requirements 2. Modern movement principles are documented as per work requirements 3. Architectural designs are developed as per Modern movement principles. |
| 1. Apply architectural modern movement principles. | 1. Postmodern architectural concepts are identified as per work requirements 2. Postmodern architectural concepts are documented as per work requirements 3. Architectural designs are developed as per postmodern concepts. |
| 1. Apply architectural Postmodern concepts. | 6.1Traditional architectural concepts are identified as per work requirements  6.2 Traditional architectural concepts are documented as per work requirements  6.3Architectural designs are developed as per traditional architectural concepts. |
| 1. Apply Traditional architecture concepts. | Identify Traditional architectural concepts  Document Traditional architectural concepts  Develop Architectural design |

**RANGE**

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

|  |  |
| --- | --- |
| Variable | Range |
| ***1. Architectural contextual concepts*** may include but not limited to: | * + Cultural   + Sociological   + Environmental   + Economic   + Technological |
| ***2.Ancient Architectural built forms*** may include but not limited to: | * + Egyptian   + Greek   + Romans   + Gothic   + Renaissance   + Romanesque   + Baroque |
| ***3. industrial revolution materials*** may include but not limited to: | * 1. Steel   2. Glass   3. Ornamentation   4. Concrete |

**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:

1. Drafting skills
2. Sketching skills
3. Analytical skills
4. Communication skills
5. Problem solving skills
6. Visual analysis skills
7. Research skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

1. General building construction knowledge
2. Occupational Health and Safety
3. Architectural styles
4. Architectural movements
5. Building materials and techniques
6. Architectural icons

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1.Critical aspect of competency | Assessment requires evidence that the candidate:   * 1. Architectural designs are developed as per contextual concepts.   2. Architectural designs are developed as per ancient architectural built forms.   3. Architectural designs are developed as per industrial revolution concepts.   4. Architectural designs are developed as per Modern movement principles   5. Architectural designs are developed as per postmodern concepts.   6. Architectural designs are developed as per traditional architectural concepts. |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. 3. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY BUILDING CONSTRUCTION TECHNOLOGY PRINCIPLES

**UNIT CODE: 0731 551 17A**

**UNIT DESCRIPTION:**

This unit covers the principles required by an architectural technician when applying construction technology principles. These principles include applying principles on; construction site preliminary work, construction substructure work, construction superstructure work, construction finishes work, and construction external work

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance of each of the elements  *Italicized* terms are elaborated in the Range of Variables |
| 1. Apply construction site preliminary work principles | 1.1 ***site investigation*** is carried out as per work procedures  1.2 ***site clearance*** is carried out as per work procedures  1.3 ***site soil tests*** is carried out as per work procedures |
| 2.Apply construction substructure work principles | 2.1 site levelling is carried out as per work requirements  2.2 setting out is carried out as per work requirements  2.3 ***foundation types*** are excavated as per work requirements  2.4 ***ground floors*** are installed as per work requirement |
| 3.Apply Construction superstructure work principles | 3.1 ***building walling types*** are identified as per work requirement  3.2 ***building openings*** are installed as per work requirement  3.3 3.4 ***building concreting works*** are carried out as per work requirement  3.5 ***Roof construction elements*** are installed as per work requirement |
| 4.Apply construction finishes work principles | 4.1 ***construction walling finishes*** are installed as per work requirement  4.2 ***construction floor finishes*** are installed as per work requirements  4.3 ***roof coverings and finishes*** are installed as per work requirement |
| 5Apply construction external work principles | 5.1 ***construction drainage works*** is carried out as per work requirements  5.2 ***vehicular parking*** is constructed as per work requirement  5.3 ***construction fencing*** is carried out as per work requirement |

**RANGE**

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

|  |  |
| --- | --- |
| **Variable** | **Range** |
| ***1. Site investigation*** may include but not limited to: | * + Site reconnaissance   + Geotechnical investigation   + Environmental assessment   + Utility investigation |
| ***2. Site clearance*** may include but not limited to: | * + Vegetation removal   + Demolition   + Debris removal |
| ***3. Site soil tests*** may include but not limited to: | * + Boring   + Soil sampling   + Soil classification   + Laboratory testing * Particle size analysis * Atterberg limits * Moisture content * Permeability test * Compaction test * Shear strength test |
| ***4. Foundation types*** may include but not limited to: | * + Strip foundation   + Stepped foundation   + Pad foundation   + Pile foundation |
| ***5. Ground floors*** may include but not limited to: | * + Concrete slab   + Timber floors   + Beam and block floors   + Raised access floor   + Hollow port slab   + Raft slab |
| ***6. Building walling types*** may include but not limited to: | * + Load bearing walls   + Non load bearing walls |
| ***7. Building openings*** may include but not limited to: | * + Doors   + Windows   + Arches |
| ***8. Building concreting works*** may include but not limited to: | * + Foundation strip   + Beams   + Slabs   + Columns   + Retaining walls |
| ***9. Roof construction elements*** may include but not limited to: | * + Timber element sections   + Steel sections   + Roofing covering |
| ***10. Construction walling finishes*** may include but not limited to: | * + Plastering   + Rendering |
| ***11. Construction floor finishes*** may include but not limited to: | * + Screed   + Tilling   + Epoxy |
| ***12. Roof coverings and finishes*** may include but not limited to: | **Coverings**   * + GCI sheets   + Clay tiles   + Wood shingles   + Slate   + Synthetic finishes   + Green roofs   **Finishes**   * + Fascia   + Ceiling   + Eaves |
| ***13. Construction drainage works*** may include but not limited to: | * + Surface drains   + Sub surface drains   + Culverts   + Grading and sloping   + French drains   + Inspection chamber   + Bio digester   + Septic tank   + Cess pool |
| ***14. Vehicular parking*** may include but not limited to: | * + Parking spaces   + Types of parking   + Driveways and entrances   + Signage and markings   + Lighting   + Kerbs and wheel stops   + Pedestrian walkways   + Bicycles parking |
| ***15. Construction fencing*** may include but not limited to: | * + Fencing panels   + Support posts   + Base plates   + Bracings   + Gates and access points |

**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:

1. Drafting skills
2. Sketching skills
3. Analytical skills
4. Communication skills
5. Problem solving skills
6. Visual analysis skills
7. Research skills

**Required Knowledge:**

The individual needs to demonstrate knowledge of:

1. General building construction knowledge
2. Occupational Health and Safety
3. Architectural styles
4. Architectural movements
5. Building materials and techniques
6. Architectural icons

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1.Critical aspect of competency | Assessment requires evidence that the candidate:   * 1. site investigation is carried out as per work procedures   2. site clearance is carried out as per work procedures   3. site soil tests is carried out as per work procedure   4. site levelling is carried out as per work requirements   5. setting out is carried out as per work requirements   6. foundation types are excavated as per work requirements   7. ground floors are installed as per work requirement   8. building openings are installed as per work requirement   9. Roof construction elements are installed as per work requirement   10. construction walling finishes are installed as per work requirement   11. construction floor finishes are installed as per work requirements   12. roof coverings and finishes are installed as per work requirement   13. vehicular parking is constructed as per work requirement   14. construction fencing is carried out as per work requirement |
| 1. Resource Implications | The following resources should be provided:   * 1. Access to relevant workplace or appropriately simulated environment where assessment can take place   2. Resources appropriate for performance of assessment tasks |
| 1. 3. Methods of Assessment | Competency in this unit may be assessed through:   1. Practical 2. Project 3. Third party report 4. Portfolio of evidence 5. Written tests 6. Oral questioning |
| 1. Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 1. Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## APPLY TECHNICAL DRAWING TECHNIQUES

**UNIT CODE: 0731 551 03A**

**UNIT DESCRIPTION**

This unit covers the competencies required to prepare and interpret technical drawings. It involves competencies to producing plain geometry drawings, producing solid geometry drawings, producing pictorial and orthographic drawings.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  **These describe the key outcomes which make up workplace function.** | **PERFORMANCE CRITERIA**  **These are assessable statements which specify the required level of performance for each element.**  ***(Bold and italicised terms are elaborated in the Range)*** |
| --- | --- |
| 1. Produce plane geometry drawings | * 1. ***Drawing lines*** are drafted as per ASME conventional drawing standards.   2. Lines and circles are divided into number of parts as per work requirement.   3. ***Plane geometric forms*** are constructed as per ASME standard drawing conventions   4. Angles are constructed as per principles of trigonometry   5. Angles are bisected as per work requirements.   6. Scales are constructed as per ASME standard drawing conventions. |
| 1. Produce solid geometry drawings | * 1. ***Solid geometric forms*** are drafted as per as per work requirements.   2. ***Solid geometric forms*** are truncated are drawn as per work requirements.   3. Auxiliary projection of solid geometric forms are developed as per work requirement.   4. Surface development ***for Solid geometric forms*** are drawn as per work requirements.   5. ***Solid geometric forms*** are modelled as per work requirements |
| 1. Produce orthographic drawings | * 1. Freehand Orthographic projection drawings are produced as per the standard conventions   2. Scaled Orthographic projection drawings are produced as per the standard conventions   3. Orthographic elevations are dimensioned as per standard conventions |
| 1. Produce Pictorial drawings | * 1. Isometric drawings produced as per standard conventions   2. Oblique drawings are produced as per standard conventions   3. Perspective drawings are interpreted and produced as per standard conventions |

**RANGE**

| **Variable** | **Range** |
| --- | --- |
| 1. ***Drawing equipment*** includes but not limited to: | * Drawing boards * T and set squares * drawing sets * computers with CAD packages |
| 1. ***Drawing materials*** includes but not limited to: | * Drawing papers * Pencils * Erasers * masking tapes * paper clips |
| 1. ***Personal Protective Equipment*** includes but not limited to: | * Dust coats * closed leather shoes |
| 1. ***Geometric forms*** include but not limited to: | * Circles * Triangles * Rectangles * Parallelogram * Polygons * Pyramids * conic sections * prisms * loci |
| 1. ***Conventional*** ***Standard*** include but 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
* Interpretation
* Drawing equipment handling
* Analysis and synthesis
* Communication
* Inter personal

**Required knowledge**

The individual needs to demonstrate knowledge of:

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

EVIDENCE GUIDE

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

|  |  |
| --- | --- |
| 1. Critical Aspects of Competency | Assessment requires evidence that the candidate:   * 1. Applied and adhered to safety procedures   2. Cared and maintained drawing equipment   3. Interpreted circuit, assembly and lay out diagrams   4. Applied appropriate technical standards, used proper tools and equipment for a given task   5. Produced sketches and drawings   6. Applied CAD packages in production of drawings |
| 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 | Competency may be assessed through:   * 1. Practical tests   2. Observation |
| 1. Context of Assessment | Competency may be assessed individually in the actual workplace or a simulated work place setting |
| 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

## APPLY COMPUTER AIDED DESIGN DRAWING TECHNIQUES

**UNIT CODE: 0731 551 06A**

**UNIT DESCRIPTION**

This unit covers the competencies required to produce computer-aided drawings. It involves competencies to draft computer aided building floor plan, draft computer aided building elevation drawing, draft computer aided building section drawing, produce computer aided building details.

**ELEMENTS AND PERFORMANCE CRITERIA**

| **ELEMENT**  **These describe the key outcomes which make up workplace function.** | **PERFORMANCE CRITERIA**  **These are assessable statements which specify the required level of performance for each element.**  ***(Bold and italicised terms are elaborated in the Range)*** |
| --- | --- |
| 1. Draft computer aided building floor plan drawing | * 1. ***Drafting Software*** is identified as per work requirement.   2. Floor Plan settings are adjusted as per work requirements.   3. Floor plan layout is detailed as per work requirement. |
| 1. Draft computer aided building elevation drawing | * 1. Elevation settings are adjusted as per work requirements.   2. Sight of elevation is established as per work requirements.   3. Elevation drawing is rendered as per proposed material schedule.   4. Elevation drawing is detailed as per proposed material schedule. |
| 1. Draft Computer aided building section drawing | * 1. Section settings are adjusted as per work requirements.   2. Line of section is established as per work requirements.   3. Section drawing is rendered as per proposed material schedule.   4. Section drawing is detailed as per proposed material schedule. |
| 1. Produce computer aided building details | * 1. **Building detail part** is identified as per work requirements.   2. Building detail is drafted as per work requirement.   3. Detail drawing is annotated as per proposed material schedule. |

**RANGE**

| **Variable** | **Range** |
| --- | --- |
| 1. ***Drafting Software*** includes but not limited to: | * Autocad * Revit * Archicad |
| 1. ***Building detail part*** includes but not limited to: | * Windows * Doors * Staircase * Cabinets * Foundation * Balustrade * Ceiling * Planters * Trusses * Coping |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required skills**

The individual needs to demonstrate the following skills:

* Communication skills
* Analytical skills
* Evaluation skills
* Management skills
* Problem solving skills
* Time management
* Numeracy skills
* Digital literacy skills
* Creativity skills
* Design skills
* Drawing and sketching skills
* Spatial awareness
* Critical thinking

**Required knowledge**

The individual needs to demonstrate knowledge of:

* Quality control
* Interpretation of drawings
* Design principles
* Building codes and regulations
* Collaboration and team work
* Building system integration
* Construction technology
* Site analysis
* Environmental design
* Basic principles of structural analysis
* Computer aided design
* Client relationship management

## DESIGN ARCHITECTURAL PROJECT

**UNIT CODE:  0731 551 20A**

**UNIT DESCRIPTION**

This unit covers the competencies required by an Architectural technician to design an architectural project. It includes; preparing an architectural project brief, conducting an architectural site analysis, carrying out an architectural project literature review, conducting an architectural project case study, conducting an architectural project activity study and producing architectural project design drawings.

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicised terms are elaborated in the Range*** |
| 1.     Prepare architectural project brief. | 1.1  ***Client architectural requirements*** are documented as per work requirement.  1.2  Project cost and estimatesare documented as per work requirement.  1.3  ***Regulatory requirements*** are documented as per work requirement. |
| 2.     Conduct architectural site analysis. | 2.1  ***Site analysis tools and equipment*** are assembled as per work requirement  2.2  Site data collectionis carried out as per work requirement.  2.3  Site analysisis carried out as per work requirement.  2.4  Site analysis documentationare prepared as per work requirement. |
| 3.     Carry out architectural project literature review. | 3.1  Architectural project historical background analysis is carried out as per work requirement.  3.2  Architectural Technological and innovation parameters are documented as per work requirement.  3.3  Architectural project material useis documented as per work requirement.  3.4  Architectural project design parametersare documented as per work requirement. |
| 4.     Conduct architectural project case study. | 4.1  Case study analysis tools and equipment are assembled as per work requirement  4.2  Case study parameters analysisis carried out as per work requirement.  4.3  Case study analysis drawingsare prepared as per work requirement. |
| 5.     Conduct architectural project activity study. | 5.1  Spatial ergonomicsis carried out as per work requirement.  5.2  Spatial activity study is carried out as per work requirement.  5.3  Activity study schedule is prepared as per workplace procedure. |
| 6.     Produce architectural project design drawings. | 6.1  ***Architectural project drawing tools and equipment*** are assembled as per work requirement.  6.2  ***Architectural project drawing*** is prepared as per work requirement.  6.3  Architectural Drawing isgenerated as per workplace procedure. |

**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.***     ***Client architectural requirements*** may include but not limited to: | ·   Ownership documents  ·   Site size  .Project type  · |
| 2.     ***Regulatory requirements*** may include but not limited to: | ·   NCA  ·   NEMA  ·   COUNTY GOVERNMENTS  · |
| ***3.*** ***Site analysis tools and equipment*** may include but not limited to: | ·   Tape measure  ·   Notebooks  ·   Camera  .    Laser distance measure  .     Safety gear  · |
| ***4.***   ***Architectural project drawing tools and equipment***  may include but not limited to: | ·   Design software  .      Drafting equipments |
| ***5. Architectural project drawing*** may include but not limited to: | .Schematic drawings  .Working drawings  .Detail drawings |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills:**

The individual needs to demonstrate the following skills:

* .              Communication skills
  + - Analytical skills
    - Evaluation skills
    - Management skills-
    - Problem solving skills
    - Time management
    - Data collection
    - Numeracy skills
    - Digital literacy skills
    - Creativity skills
    - Research skills
    - Entrepreneurial skills
    - Design skills
    - Drawing and sketching skills
    - Spatial awareness
    - Critical thinking
    - Adaptability skills

**Required Knowledge:**

The individual needs to demonstrate knowledge of:

* + - ·       Report writing
    - ·       Quality control
    - Interpretation of drawings
    - ·       Design principles
    - ·       Architectural history
    - ·       Building codes and regulations
    - ·       Collaboration and team work
    - ·       Building system integration
    - ·       Construction technology
    - ·       Site analysis
    - ·       Environmental design
    - ·       Basic principles of structural analysis
    - ·       Computer aided design
    - ·       Continuing education
    - ·       Client relationship management

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1.     Critical aspects of Competency | Assessment requires evidence that the candidate:   1.1 Documented client architectural requirements based on work requirement.  1.2 Analyzed site parameters based on work requirement.  1.3 Documented architectural project design parameters based on work requirement.  1.4 Carried out spatial ergonomics based on work requirement.  1.5 Carried out spatial activity study based on work requirement.  1.6 Carried out case study parameters analysis based on work requirement.  1.7 Prepared architectural project drawing based on work requirement.  1.8 Carried out drawings plotting based on work requirement.    1.9 Generated architectural drawing printouts based on workplace procedure. |
| 2.     Resource Implications | The following resources should be provided:  2.1 Access to relevant workplace or appropriately simulated environment where assessment can take place   2.2 Resources appropriate for performance of assessment tasks |
| 3.     Methods of Assessment | Competency in this unit may be assessed through:  3.1        Practical  3.2        Project  3.3        Third party report  3.4        Portfolio of evidence  3.5        Written tests     3.6    Oral questioning |
| 4.     Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5.     Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## PRODUCE DIGITAL ARCHITECTURAL MODEL

**UNIT CODE:  0731 551 05A**

**UNIT DESCRIPTION**

This unit covers the competencies required by an Architectural technician to produce a digital architectural model. It includes; producing exterior renders, producing interior render, and Producing project animation.

**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.  Produce exterior render. | 1.1 Architectural ***rendering tools and equipment*** are assembled as per work requirement.  1.2 Architectural rendering drawingsare prepared as per work requirement.  1.3 Exterior 3D models are prepared as per work requirement.  1.4 Architectural rendering printoutsare generated as per workplace procedure. |
| 2. Produce interior render. | 2.1 Modelling ***tools and materials*** are assembled as per work requirement.  2.2 Modelling component scheduleis prepared as per work requirement.  2.3 Architectural physical modelling is carried out as per work procedure. |
| 3.Produce project animation. | ***3.1*** Architectural ***animation software*** is identified as per work requirement.  ***3.2*** Architectural model is selected as per work requirement.  3.3 Project ***finishes*** are identified as per work requirement.  3.4 Landscaping elements are identified as per project requirements.  3.5 Project animation is generated as project requirements. |

**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** |
| ***5.***     ***Architectural rendering tools and equipment*** may include but not limited to: | * Archicad * Revit * Sketch- up * Twin motion * Lumion * D5 render * Blender * Artlantis |
| 6.     ***Modelling tools and materials*** may include but not limited to: | * Twin motion * Lumion * D5 render * Blender * Artlantis |
| 7.     ***Architectural animation software*** may include but not limited to: | * Twin motion * Lumion * D5 render * Blender * Artlantis |
| ***8. Project finishes*** may include but not limited to: | * Cladding materials * Floor finishes * Paving material * Roof finishes * paints |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication skills
* Analytical skills
* Evaluation skills
* Problem solving skills
* Time management
* Numeracy skills
* Digital literacy skills
* Creativity skills
* Research skills
* Design skills
* Drawing and sketching skills
* Spatial awareness
* Critical thinking
* Adaptability skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Interpretation of drawings
* Design principles
* Architectural history
* Building codes and regulations
* Collaboration and team work
* Building system integration
* Construction technology
* Site analysis
* Environmental design
* Computer aided design
* Continuing education
* Client relationship management

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**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1.     Critical aspects of Competency | Assessment requires evidence that the candidate:  1.1 |
| 2.     Resource Implications | The following resources should be provided:  2.1  Appropriately simulated environment where assessment can take place.  2.2  Access to relevant assessment environment.  2.3  Resources relevant to the proposed assessment activity or tasks. |
| 3.     Methods of Assessment | Competency in this unit may be assessed through:  3.1  Practical  3.2  Project  3.3  Third party report  3.4  Portfolio of evidence  3.5  Written test  3.6  Oral questioning |
| 4.     Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5.     Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## PRODUCE PHYSICAL ARCHITECTURAL MODEL

**UNIT CODE:  0731 551 01A**

**UNIT DESCRIPTION**

This unit covers the competencies required by an Architectural technician to produce physical architectural model. It includes; Producing conceptual model, Producing Presentation model and Producing site model.

**ELEMENTS AND PERFORMANCE CRITERIA**

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| --- | --- |
| **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.Produce conceptual model | 1. ***Conceptual modelling tools, equipment and materials*** are assembled as per work requirements. 2. Conceptual modelling materials are cut as per work requirements. 3. Conceptual model is assembled as per work requirement. |
| 2.Produce  Presentation model | ***2.1***  ***Presentation modelling tools, equipment and materials*** are assembled as per work requirements.  ***2.2***  Presentation modelling materials are cut as per work requirements.  ***2.3***   Presentation model is generated as per work requirement. |
| 3.Produce site model | * 1. ***Site modelling tools, equipment and materials*** are assembled as per work requirements.   2. ***Contextual site map is acquired as per work requirements.***   3. ***Site modelling materials are cut as per work requirements.***   4. ***Site model is generated as per work 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.***     ***Conceptual modelling tools, equipment and materials*** may include but not limited to: | * razor * .Scapel * . Scissors * .Scale Rule * .Manilla paper * .Adhesive   · |
| 2.     ***Presentation modelling tools, equipment and materials*** may include but not limited to: | * . razor * .Scapel * . Scissors * .Scale Rule * .Manilla paper * .Adhesive |
| 3.     ***Site modelling tools, equipment and materials*** may include but not limited to: | * . razor * .Scapel * . Scissors * .Scale Rule * .Manilla paper * .Adhesive |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* ·   Communication skills
* ·   Analytical skills
* ·   Evaluation skills
* ·   Management skills
* ·   Problem solving skills
* ·   Time management
* ·    Numeracy skills
* ·   Digital literacy skills
* ·   Creativity skills
* ·   Research skills
* ·   Entrepreneurial skills
* ·   Design skills
* ·   Drawing and sketching skills
* ·   Spatial awareness
* ·   Critical thinking
* ·   Adaptability skills

Required Knowledge:

The individual needs to demonstrate knowledge of:

* ·       Report writing
* ·       Quality control
* ·       Interpretation of drawings
* ·       Design principles
* ·       Architectural history
* ·       Building codes and regulations
* ·       Collaboration and team work
* ·       Building system integration
* ·       Construction technology
* ·       Site analysis
* ·       Environmental design
* ·       Basic principles of structural analysis
* ·       Computer aided design
* ·       Continuing education
* ·       Client relationship management

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**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:  1.1  Carried out architectural physical modelling based on work requirements.  1.2Generated architectural walkthrough model based    on work requirement. |
| 2. Resource Implications | The following resources should be provided:  2.1  Access to relevant workplace or appropriately simulated environment where assessment can take place  2.2 Resources appropriate for performance of assessment tasks |
| 3. Methods of Assessment | Competency in this unit may be assessed through:  3.1   Practical  3.2   Project  3.3   Third party report  3.4   Portfolio of evidence  3.5   Written tests  3.6  Oral questioning |
| 4.     Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5.     Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## CARRY OUT ARCHITECTURAL LANDSCAPING

**UNIT CODE:  0731 551 10A**

**UNIT DESCRIPTION**

This unit covers the competencies an Architectural technician requires to carry out architectural landscaping. It includes; designing architectural landscaping layouts, preparing architectural landscaping elements schedule, preparing architectural landscaping sites, and installing architectural landscaping elements

**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 italicised terms are elaborated in the Range*** |
| 1.     Design architectural landscaping layout | 1. Client landscaping requirements are documented as per work requirement. 2. Landscaping cost and timelines are estimated as per work requirement. 3. Landscaping design is carried out as per work requirement. |
| 2.     Prepare architectural landscaping elements schedule | 2.1  ***Landscaping planting elements*** are quantified as per work requirement.  2.2  ***Hardscaping elements*** are quantified as per work requirement.  2.3  Planting and Hardscaping elementsare specified as per work requirement. |
| 3. Prepare architectural landscaping site | 3.1  ***Tools and equipment*** are assembled as per work requirement.  3.2  Rocks and boulders are removed as per work requirement.  3.3  Site vegetation is removed as per work requirement.  3.4  Ploughingis carried out as per work requirement.  3.5  Manure applicationis carried out as per work requirements.  3.6  Excavation   is carried out according to work requirements |
| 4.     Install  architectural  landscaping elements | 4.1  ***Landscaping planting elements*** are assembled as per work requirement.  4.2  ***Hardscaping elements*** are assembled as per work requirement.  4.3  Setting out is carried out as per work requirement.  4.4  Planting and hardscaping elements are installed as per work 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.***     ***Landscaping planting elements*** may include but not limited to: | * Flowers * Shrubs * Trees * grass |
| 2.     ***Hardscaping elements*** may include but not limited to: | * Water features * concrete pavings * Stone pavings * Garden lightings * Moulds * Sculptures |
| 3.     ***Tools and equipment*** may include but not limited to: | * Pangas * Jembes * Shovels * Plows * Husks * Rakes * Wheelbarrows * machetes |
| ***4. Landscaping planting elements,*** may include but not limited to: | * Flowers * Shrubs * Trees * grass |
| ***5. Hardscaping elements*** ay include but not limited to: | * Water features * concrete pavings * Stone pavings * Garden lightings * Moulds * Sculptures |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication skills
* ·   Analytical skills
* ·   Evaluation skills
* ·   Management skills
* ·   Problem solving skills
* ·   Time management
* ·    Numeracy skills
* ·   Digital literacy skills
* ·   Creativity skills
* ·   Research skills
* ·   Entrepreneurial skills
* ·   Design skills
* ·   Drawing and sketching skills
* ·   Spatial awareness
* ·   Critical thinking
* ·   Adaptability skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* ·       Report writing
* ·       Quality control
* ·       Interpretation of drawings
* ·       Design principles
* ·       Architectural history
* ·       Building codes and regulations
* ·       Collaboration and team work
* ·       Building system integration
* ·       Construction technology
* ·       Site analysis
* ·       Environmental design
* ·       Computer aided design
* ·       Client relationship management

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**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:    1.1  Documented client landscaping requirements based on work requirements.  1.2  Carried out landscaping design based on work requirements.  1.3  Specified planting and hardscaping elements based on work requirement.  1.4  Assembled landscaping planting elements based on work requirements.  1.5  Assembled hardscaping elements based on work requirements.  1.6  Carried out setting out based on work requirements.  1.7Installed planting and hardscaping elements based on work requirements. |
| 2. Resource Implications | The following resources should be provided:    2.1  Access to relevant workplace or appropriately simulated environment where assessment can take place  2.2  Access to relevant assessment environment.  2.3  Resources relevant to the proposed assessment activity or tasks. |
| 3. Methods of Assessment | Competency in this unit may be assessed through:  3.1   Practical  3.2   Project  3.3   Third party report  3.4   Portfolio of evidence  3.5   Written tests  3.6 Oral questioning |
| 4.     Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5.     Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## DESIGN ARCHITECTURAL INTERIORS

**UNIT CODE:  0731 551 13A**

**UNIT DESCRIPTION**

This unit covers the competencies an Architectural technician requires to design architectural interiors. It includes; Preparing architectural interior design drawings, preparing architectural interior fittings schedule, preparing architectural interior material schedule, and inspecting architectural interior works design conformance

**ELEMENTS AND PERFORMANCE CRITERIA**

|  |  |
| --- | --- |
| **ELEMENT**  These describe the key outcomes which make up workplace function | **PERFORMANCE CRITERIA**  These are assessable statements which specify the required level of performance for each of the elements.  ***Bold and italicized terms are elaborated in the Range*** |
| 1. Prepare architectural interior design drawings | 1.1  ***Client interior design requirements*** are documented as per work requirement.  1.2  ***Furniture layout drawing*** is preparedas per work requirement.  1.3  ***Interior perspective drawings*** are preparedas per work requirement. |
| 2. Prepare architectural interior fittings schedule | 2.1  ***Interior Fittings and fixtures*** are quantified as per work requirement.  2.2  ***Interior fittings and fixtures sizes*** are specified as per work requirement.  2.3  ***Fitting and fixtures*** are specified as per work requirement. |
| 3.Prepare architectural interior material schedule | 3.1  Spatial conceptualization is carried out as per work requirement.  3.2  Materials coverage areais quantified as per workplace procedure.  3.3  Materials specificationis carried out as per work requirement. |
| 4. Inspect architectural interior works design conformance. | 4.1  Interior works concept conformanceis checked as per work requirement.  4.2  Interior works material conformance is checked as per work specifications.  4.3  Interior works quality standards are checked as per work specifications. |

**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.***      ***Client interior design requirements*** may include but not limited to: | . Notebook   .Pen  . Tape measure  .Camera |
| 2.     ***Interior Fittings and fixtures*** may include but not limited to: | . Lighting   .Paint  . Floor finishes  .Cladding  .Ceiling  .Furnitures  . |
| 3.     ***Fitting and fixtures*** may include but not limited to: | . Lighting   .Paint  . Floor finishes  .Cladding  .Ceiling  .Furnitures |

**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:

**Required skills:**

* ·Communication skills
* Analytical skills
* Evaluation skills
* Problem solving skills
* Time management
* Digital literacy skills
* Creativity skills
* Research skills
* Design skills
* Drawing and sketching skills
* Spatial awareness
* Critical thinking
* Adaptability skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

 Report writing

* Quality control
* Interpretation of drawings
* Design principles
* Architectural history
* Collaboration and team work
* Building system integration
* Construction technology
* Site analysis
* Environmental design
* Computer aided design
* Client relationship management

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**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:  1.1  Documented client interior design requirements based on work requirement.  1.2  Prepared furniture layout drawing based on work requirement.  1.3  Quantified interior fittings and fixtures based on work requirement.  1.4  Specified interior fittings and fixtures sizes based on work requirement.  1.5  Carried out spatial conceptualization based on work requirement.  1.6  Carried out materials specification based on work requirement.  1.7  Checked interior works concept conformance based on work requirement.  1.8  Checked interior works material conformance based on work requirement.  1.9 Checked interior works quality standards based on work requirement. |
| 2. Resource Implications | The following resources should be provided:  2.1  Appropriately simulated environment where assessment can take place.  2.2  Access to relevant assessment environment.  2.3  Resources relevant to the proposed assessment activity or tasks. |
| 3. Methods of Assessment | Competency in this unit may be assessed through:  3.1  Practical  3.2  Project  3.3  Third party report  3.4  Portfolio of evidence  3.5  Written test  3.6  Oral questioning |
| 4.     Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5.     Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |

## MANAGE CONSTRUCTION PROJECT

**UNIT CODE:  0732 551 16A**

**UNIT DESCRIPTION:**

This unit covers the competencies an Architectural technician requires to manage a construction project. It includes; Organizing a construction site, managing the site construction team, procuring building materials, Supervising the construction process, implementing site safety measures, and Preparing project progress reports

**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.  Organise construction site | 1.1 Site hoarding is carried out as per the site boundaries.  1.2 Site ***activities*** are designated per the site layout.  1.3 Site ***utilities*** are installed as per work requirements. |
| 2.  Manage site construction team | 2.1 Team members are recruited as per works requirements.  2.1 Tasks are assigned to team members as per works requirements.  2.2 Project site workers records are kept as per daily activities.  2.3 Project ***teams*** are guided to deliver on specific works as per work requirements.  2.4 Remuneration ***schedules*** are prepared as per work requirement. |
| 3.   Procure building materials. | 3.1 Building materials are identified as per work requirements.  3.2 Building ***material samples*** are acquired as per work specifications.  3.3 Building ***materials*** are inspected as per work specifications. |
| 4.   Supervise construction process | 4.1  ***Construction activities*** to be undertaken are identified as per work specifications.  4.2  Construction tasks are executed as described in the work schedule.  4.3  Construction activities approvals are requested for as per work requirements. |
| 5.   Implement site safety measures | 5.1  ***Personal protective equipments*** are provided as per safety requirements.  5.2  Safety signs are erected as per safety requirements.  5.3  Hazardous areas are enclosed as per safety requirements. |
| 6.   Prepare project progress report | 6.1  Project progress data is collected according to daily activities.  6.2  Project progress report is prepared as per progress milestone.  6.3  Project progress report is presented as per inspected timelines. |

**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.***     ***Building material samples*** may include but not limited to: | Steel sections  Aggregates  Finishes  Concrete  Fittings |
| 2.   ***Building materials*** may include but not limited to: | Steel sections   Aggregates  Finishes  Concrete  Fittings  Stones  Timber |
| 3.     ***Construction activities*** may include but not limited to: | Excavations   Backfilling  Site clearing  Installations  Landscaping |
| 4.  ***Personal protective equipment may*** include but not limited to: | Safety boot  Helmets   Reflectors  PPEs  Body belts |

**REQUIRED SKILLS AND KNOWLEDGE**

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

**Required Skills**

The individual needs to demonstrate the following skills:

* Communication skills
* Analytical skills
* Evaluation skills
* Management skills
* Problem solving skills
* Time management
* Data collection
* Numeracy skills
* Digital literacy skills
* Creativity skills
* Research skills
* Entrepreneurial skills
* Design skills
* Drawing and sketching skills
* Spatial awareness
* Critical thinking
* Adaptability skills

**Required Knowledge**

The individual needs to demonstrate knowledge of:

* Report writing
* Quality control
* Interpretation of drawings
* Design principles
* Architectural history
* Building codes and regulations
* Collaboration and team work
* Building system integration
* Construction technology
* Site analysis
* Environmental design
* Basic principles of structural analysis
* Computer aided design
* Client relationship management

**EVIDENCE GUIDE**

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

|  |  |
| --- | --- |
| 1. Critical aspects of Competency | Assessment requires evidence that the candidate:  1.1     Confirmed site boundaries for hoarding  1.2 Employed workers and assigned duties as per work requirements.  1.3 Identified construction materials and samples for procurement based on site requirements.  1.4 installed utilities as per site layout  1.5 Carried out all aspects of construction process as required.  1.6 Employed safety measures as required.  1.7 Prepared project progress report. |
| 2. Resource Implications | The following resources should be provided:  2.1  Appropriately simulated environment where assessment can take place.  2.2  Access to relevant assessment environment.  2.3  Resources relevant to the proposed assessment activity or tasks. |
| 3. Methods of Assessment | Competency in this unit may be assessed through:  3.1  Practical  3.2  Project  3.3  Third party report  3.4  Portfolio of evidence  3.5  Written test  3.6  Oral questioning |
| 4.     Context of Assessment | This competency may be assessed in a workplace or in a simulated workplace. |
| 5.     Guidance information for assessment | Holistic assessment with other units relevant to the industry sector, workplace and job role is recommended. |