



TECHNICAL &
VOCATIONAL
EDUCATION &
TRAINING



National Competency Standard for Building Architecture

Qualifications Code: CON12S18V1



PREFACE

Technical and Vocational Education and Training (TVET) Authority was established with the vision to develop a TVET system in the Maldives that is demand driven, accessible, beneficiary financed and quality assured, to meet the needs of society for stability and economic growth, the needs of Enterprise for a skilled and reliable workforce, the need of young people for decent jobs and the needs of workers for continuous mastery of new technology.

TVET system in the Maldives flourished with the Employment Skills Training Project (ESTP) funded by ADB with the objective of increasing the number of Maldivians, actively participating in the labor force, employed and self-employed. The Project supported expansion of demand driven employment-oriented skills training in priority occupations and to improve the capacity to develop and deliver Competency Based Skill Training (CBST). The project supported delivery of CBST programs to satisfy employer demand-driven needs. The National Competency Standards (NCS) provide the base for this training. Currently CBST is offered for five key sectors in the Maldives: Tourism, Fisheries and Agriculture, Transport, Construction and the Social sectors. These sectors are included as priority sectors that play a vital role in the continued economic growth of the country.

The NCS are developed in consultation with Employment Sector Councils representing employers. They are designed using a consensus format endorsed by the Maldives Qualifications Authority (MQA) to maintain uniformity of approach and the consistency of content amongst occupations. This single format also simplifies benchmarking the NCS against relevant regional and international standards. NCS specify the standards of performance of a competent worker and the various contexts in which the work may take place. NCS also describes the knowledge, skills and attitudes required in a particular occupation. They provide explicit advice to assessors and employers regarding the knowledge, skills and attitudes to be demonstrated by the candidates seeking formal recognition for the competency acquired following training or through work experience. By sharing this information, all participants in the training process have the same understanding of the training required and the standard to be reached for certification. Certification also becomes portable and can be recognized by other employers and in other countries with similar standards. NCS are the foundation for the implementation of the TVET system in Maldives. They ensure that all skills, regardless of where or how they were developed can be assessed and recognized. They also form the foundation for certifying skills in the Maldives National Qualification Framework (MNQF).

CON23S17V1 is the first version of the NCS for Basic Building Architecture has been developed and endorsed in the year 2018. This standard includes one Qualification at Level 3 of Maldivian National Qualifications Framework.

KEY FOR CODING

Coding Competency Standards and Related Materials

DESCRIPTION	REPRESENTED BY
Industry Sector as per ESC (Three letters)	Construction Sector (CON) Fisheries and Agriculture Sector (FNA) Transport sector (TRN) Tourism Sector (TOU) Social Sector (SOC) Foundation (FOU)
Competency Standard	S
Occupation with in a industry Sector	Two digits 01-99
Unit	U
Common Competency	1
Core Competency	2
Optional/ Elective Competency	3
Assessment Resources Materials	A
Learning Resources Materials	L
Curricula	C
Qualification	Q1, Q2 etc
MNQF level of Qualification	L1, L2 etc
Version Number	V1, V2 etc
Year of endorsement of standard, qualification	By two digits Example- 07

1. Endorsement Application for Qualification 01		
2. NATIONAL CERTIFICATE III in Building Architecture		
3. Qualification code: CON12SQ1L318		Total Number of Credits: 60
4. Purpose of the qualification The holders of the level three qualifications will provides wide range of practical skills and supporting knowledge to develop the design to a level for regulatory application for building plan submission that comply to the requirements of local authorities, including understanding of building regulations, basic building construction and materials, environmental considerations and building services, translate the design into construction drawings with appropriate construction details and use established architectural drawing convention and work in a team and participate in the design process.		
5. Regulations for the qualification		National Certificate III in building architecture will be awarded to those who are competent in unit 1+2+3+3+4+5+6+7+8+9+10
6. Schedule of Units		
Unit Title	Unit Title	Code
1	Observe personal and workplace hygiene practices	CON12S1U01V1
2	Perform Computer Operations	CON12S1U02V1
3	Mathematics and Geometry	CON12S1U03V1
4	Architecture Drawing and Sketching	CON12S1U04V1
5	Measure and Draw a Floor Plan to Scale	CON12S1U05V1
6	Basic Building Planning Principles	CON12S1U06V1
7	Basic Auto CAD	CON12S1U07V1
8	Basic Architecture Symbol	CON12S1U08V1
9	Architectural Building Element	CON12S1U09V1
10	Apply legal requirements to building and construction projects	CON12S1U10V1
7. Accreditation requirements		The training provider should have construction architecture workplace or similar training facility to provide the trainees the hands-on experience related to this qualification
8. Recommended sequencing of units		As appearing under the section 06

UNITS DETAILS

Unit No.	Unit Title	Code	Level	No of credits
1	Observe personal and workplace hygiene practices	CON12S1U01V1	3	3
2	Perform Computer Operations	CON12S1U02V1	3	3
3	Mathematics and Geometry	CON12S1U03V1	3	5
4	Architecture Drawing and Sketching	CON12S1U04V1	3	10
5	Measure and Draw a Floor Plan to Scale	CON12S1U05V1	3	10
6	Basic Building Planning Principles	CON12S1U06V1	3	5
7	Basic Auto CAD	CON12S1U07V1	3	15
8	Basic Architecture Symbol	CON12S1U08V1	3	3
9	Architectural Building Element	CON12S1U09V1	3	3
10	Apply legal requirements to building and construction projects	CON12S1U10V1	3	3
7. Accreditation requirements		The training provider should have workplace or similar training facility to provide the trainees the hands-on experience related to this qualification		
8. Recommended sequencing of units		As appearing under the section 06		

Packaging of National Qualifications:

National Certificate III in Building Architecture will be awarded to those who are competent in units
1+2+3+4+5+6+7+8+9+10

Qualification Code: CON12SQ1L318

Description of a Building Architecture

Architecture is the art, science and business of building. An architect is trained and experienced not only in the design and construction of the built environment, but also in endeavors ranging from conceptual problem-solving to project management.

Today, architects are engaged in the challenging historic task of creating new buildings or retrofitting existing structures in participating broadly in the concerns and affairs of society.

This concern may range from furniture design to city form and from community involvement and social change to development economics or technical research.

Today's architect may practice as an individual or in a small, medium or large firm; the architect may be either self-employed or salaried; the architect may work for an institution, a development company, or a large organization.

Likely functions for those who achieve this level of competency include:

- Building Architect
- Landscape Architect
- Building control officer/surveyor: job description

Competency Standard Development Process

The competencies were determined based on the analysis of the tasks expected to be performed by the Horticulture professional in the Maldives. The task analysis was based on the existing documents prepared among the experts in the industry and on the advice of the experts in the field of Architecture training in Maldives. Competency standards used for similar type of training in other countries were also examined

UNIT 01

UNIT TITLE	Observe personal and workplace hygiene practices				
DESCRIPTOR	<p>This unit covers the knowledge, skills and attitudes required to observe workplace hygiene procedures and maintaining of personal presentation and grooming standard.</p> <p>This unit deals with necessary skills and knowledge required for maintaining the hygiene of workers and the hygienic practices that should be applied while on the job.</p>				
CODE	CON12S1U01V1	LEVEL	3	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Observe grooming, hygiene and personal presentation standards	1.1. Grooming, hygiene and personal presentation practices maintained at high standards in line with industry norms and procedures 1.2. Adequate level of personal cleanliness observed throughout the work 1.3. Effects of poor personal hygiene understood and avoided in all practices
2. Follow hygiene procedures	2.1. Hygiene procedures followed in line with procedures and legal requirements 2.2. Hygiene standards maintained in line with procedures
3. Identify and avoid hygiene risks	3.1. Hygiene risks understood and avoided in line with general standards and guidelines

ASSESSMENT GUIDE

Form of assessment

- Assessment for the unit needs to be holistic and observed during assessment of other units of competency which forms the qualification.
- Any written or oral examinations may include questions related to hygiene, illness and personal grooming standard.

Assessment context

Assessment may be done in workplace or a simulated work environment.

Critical aspects

It is essential that competence is fully observed and there is ability to transfer competence to changing circumstances and to respond to unusual situations in the critical aspects of:

- Maintaining adequate level of all aspects of personal hygiene and cleanliness
- Following cleaning procedures for effective cleaning of work areas
- Immediately reporting any symptoms of illness
- Undertaking routine medical check-ups
- This unit may be assessed in conjunction with all and units which form part of the normal job role

Assessment conditions

- Theoretical assessment of this unit must be carried out in an examination room where proper examination rules are followed.
- Assessment of hygienic work practices must be constantly evaluated.

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none">• General knowledge of common terminologies used in hygiene including personal hygiene• Knowledge on general symptoms of different types of diseases• Detailed knowledge and importance of illness and injury reporting procedures	<ul style="list-style-type: none">• Ability to follow procedures and instructions• Competent to work according to relevant hygiene regulations and procedures• Competent to work to meet requirements for personnel hygiene and hygienic practices• Communication skills• Interpersonal skills

UNIT 02

UNIT TITLE	Perform computer operations				
DESCRIPTOR	This unit covers the knowledge, skills and attitudes and values needed to perform computer operations that include inputting, accessing, producing and transferring data using the appropriate hardware and software.				
CODE	CON12S1U02V1	LEVEL	3	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Input data into computer	<p>1.1. Data entered into the computer using appropriate program/application in accordance with company procedures</p> <p>1.2. Accuracy of information checked and information saved in accordance with standard operating procedures</p> <p>1.3. Input data stored in storage media according to requirements</p>
2. Access information using computer	<p>2.1. Correct program/application selected based on job requirement</p> <p>2.2. Program/application containing the information required accessed according to company procedures</p> <p>2.3. Desktop icons correctly selected, opened and closed for navigation purposes</p>

<p>3. Produce/output data using computer system</p>	<p>3.1. Entered/stored data processed using appropriate software commands</p> <p>3.2. Data printed out as required using computer hardware/peripheral devices in accordance with standard operating procedures</p> <p>3.3. Files and data transferred between compatible systems using computer software, hardware/ peripheral devices in accordance with standard operating procedures</p>
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RANGE STATEMENT

This unit covers computer hardware to include personal computers used independently or within networks, related peripherals, such as printers, scanners, keyboard and mouse, and storage media such as disk drives and other forms of storage. Software used must include but not limited to word processing, spreadsheets, database and billing software packages and Internet browsing software.

Tools, equipment and materials required may include:

- Storage device
- Different software and hardware
- Personal computers system
- Laptop computer
- Printers
- Scanner
- Keyboard
- Mouse
- Disk drive /CDs, DVDs, compressed storage device

ASSESSMENT GUIDE

Forms of assessment

The assessor may select two of the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

Assessment context

Assessment may be conducted out of the workplace preferably in a computer classroom

Critical aspects (for assessment)

Assessment must show that the candidate:

- Selected and used hardware components correctly and according to the task requirement
- Identified and explain the functions of both hardware and software used, their general features and capabilities
- Produced accurate and complete data in accordance with the requirements
- Used appropriate devices and procedures to transfer files/data accurately

Assessment conditions

Assessment may be conducted out of the work environment and may include assignments and projects.

Special notes for assessment

During the assessment the trainees shall:

- Carry out all the tasks according to the industry and organizational policies and procedures
- Meet the performance criteria of all competence
- Demonstrate accepted level of performance determined by the assessors

Resources required for assessment

Computer hardware with peripherals and appropriate software

UNIT- 03

UNIT TITLE	Mathematics and Geometry				
DESCRIPTOR	The design of a building relies on a clear understanding of shapes, lines and angles, which is why mathematics is an essential part of earning an architectural degree. To become a well-rounded and successful architect, you'll be required to take four primary areas of math study. Each of these core concepts will teach you the skills you need to design a building, but more importantly, to design a building that can be constructed properly by following that design.				
CODE	CON12S1U03V1	LEVEL	3	CREDIT	5

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Obtain measurements	1.1. Select and apply appropriate industry methods of measurement. 1.2. Obtain measurements by physical measurement or from plans or other documentation to required degree of accuracy 1.3. Confirm measurements, including areas and volumes, and record correctly
2. Perform calculations	2.1. Select appropriate calculation factors and use correct methods for achieving required result 2.2. Apply calculations to basic estimating activities related to residential building 2.3. Calculate material quantities for the project correctly using appropriate factors 2.4. Check, confirm and record results.
3. Calculations and Units	3.1. Take measurements in give measurements must be given in terms of specific units 3.2. Use International System of Units 3.3. Use appropriate conversion factor 3.4. Round off numbers and in the process, which

	<p>creates more random bias thereby producing a more representative mean value from a set of data</p> <p>is to round to the nearest even digit</p> <p>3.5.</p>
4. Geometrical construction	<p>4.1. Consider the three principal geometric patterns in architectural design which include:</p> <ul style="list-style-type: none"> - Circle - Square - Triangle <p>4.2. Construct a 90-degree angle</p> <p>4.3. Construct a 60-degree angle</p> <p>4.4. Construct a 30-degree angle</p> <p>4.5. Construct a 45-degree angle</p>
5. Initial feasibility success calculation	<p>5.1. Gross Area: total footprint area. Includes walls and projections</p> <p>5.2. Net area: available area that can be occupied. does not include walls, projections or surface areas that do not form part of the floor surface</p> <p>5.3. Carry out the simple math (width x length = floor area) to calculate the net and gross areas</p>
5. Cost estimation	<p>6.1. Calculate the actual cost of the actual quantity of each individual material with installation costs added to arrive at a detailed calculation for the entire design.</p> <p>6.2. Consider the measurements such as building type, size, location and building height in estimating the cost of the design.</p>
6. Material Analysis	<p>6.1. Determine what materials are being used</p> <p>6.2. Determine the cost of the materials being used.</p> <p>6.3. Take decisions of construction materials versus costs</p>

Range statement

- Select and apply appropriate industry methods of measurement.
- Obtain measurements by physical measurement or from plans or other documentation to required degree of accuracy
- Confirm measurements, including areas and volumes, and record correctly

- Select appropriate calculation factors and use correct methods for achieving required result
- Apply calculations to basic estimating activities related to residential building
- Calculate material quantities for the project correctly using appropriate factors
- Check, confirm and record results.

Tools, equipment and materials required may include:

- Calculator
- Measuring equipment

Assessment guide

Form of assessment

The assessor may use the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

- Any written or oral examinations must include questions related to Handling hazardous substances in work place.

Assessment context

- Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of safe working practices. The assessment environment should not disadvantage the candidate.

Critical aspects

It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to:

- Select and apply appropriate industry methods of measurement
- Confirm measurements, including areas and volumes, and record correctly
- Apply calculations to basic estimating activities related to residential building
- Calculate material quantities for the project correctly using appropriate factors

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
A basic understanding of:	Ability to:

<ul style="list-style-type: none"> - basic calculators - scale rulers - basic arithmetic rules and geometric principles - company procedures - residential building terminology - measuring, calculating, geometry and determination of quantities - processes for use and care of measuring equipment. 	<ul style="list-style-type: none"> - read and interpret drawings and specifications - write measurements, calculations and quantities - demonstrate numeracy skills to apply measurements, - calculations and geometry - work with others to action tasks relate to people.
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UNIT- 04

UNIT TITLE	Architecture drawing and sketching				
DESCRIPTOR	Building architects needs to translate the design into construction drawings with appropriate construction details and use established architectural drawing convention. In this unit it will describe skills and knowledge required from simple diagrams to show relationships between spaces and activities to complete detailed working drawings showing every last detail, and from which contractors and sub-contractors will estimate the cost of the work and subsequently construct it.				
CODE	CON12S1U04V1	LEVEL	3	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Drawing Materials and Equipment	<p>1.1. Pencils HB pencil for line drawing, B and 2B pencil for rendering. 0.5 mm Pacers or sharpened clutch pencils. Range of good quality colored pencils.</p> <p>1.2. Pens Fine 0.4 mm Artline black markers or Artline Faxblac. Good for drawing base or ground lines.</p> <p>1.3. Erasers Soft, good quality erasers. • When worn the edges can be cut to sharp and used to create reflective highlights in a rendered drawing.</p> <p>1.4. Sharpeners Handheld reservoir manual sharpeners for individual use. • Electric sharpeners or battery operated are great for a large class room</p> <p>1.5. Abrasive paper Used to get a fine point to a lead.</p>

	<p>1.6. Scale rules Either flat or tri-sided with scales 1:5/50, 1:10/100, 1:20/200, 1:25/1:250.</p> <p>1.7. Templates Circle. • Furniture scale 1:50 and 1:100. Good for doing multiples of tables and chairs, planning layouts for restaurants.</p> <p>1.8. Compass Drawing circles and arches.</p> <p>1.9. Set square • 45 and 30/60</p> <p>1.10. T-square Preferably acrylic and timber T-squares. T-squares with timber edges tend to chip</p> <p>1.11. Masking tape 20 mm wide in a roll.</p> <p>1.12. Drawing board Not necessary as you can easily use a table top and a T-square. • Good if you want to leave a drawing on a board and come back to it. Boards larger than A3 in size. • Parallel rule boards come with stands to slope the board and are easily packed away.</p> <p>1.13. Papers Bond: A4 or A3 photocopy paper • Cartridge • Tracing paper: good for many things, easily photocopied</p>
2. Sketching	2.1. Take control: Position your hand at the end of the pencil to gain more control and precision. This also produces darker markings. On the other hand, positioning your hand further up the pencil makes you less in control, producing lighter markings.

	<p>2.2. Diversify your lines: try to use a variety of lines by shifting from thick to thin lines and from light to dark shades. This can be challenging at the beginning, but you can master it by practicing using different pencil grades (from 3H to 6B) and with holding the pencil at different angles.</p> <p>2.3. Add some texture: When using watercolors, you can add a grainy touch to your drawings. So do not add water over the whole sketch so you can have a lively look.</p> <p>2.4. Avoid being too symmetrical: add some simple changes, but keep the general lines symmetrical to give your drawing an interesting look.</p> <p>2.5. Stay clear of smudging: Put an extra sheet of paper under your hand when you are shading to avoid un-required smudges. Also, begin shading from left to right, if you are right-handed, and shade from right to left if you are left-handed.</p>
<p>3. Draw floor plan</p>	<p>3.1. Choose an area.</p> <p>3.2. Determine the area to be drawn. If the building already exists, decide how much (a room, a floor, or the entire building) of it to draw. If the building does not yet exist, brainstorm designs based on the size and shape of the location on which to build.</p> <p>3.3. Take measurements. If the building exists, measure the walls, doors, and pertinent furniture so that the floor plan will be accurate.</p> <p>3.4. If the layout is being created for an entirely new area, be sure that the total area will fit where it is to be built. It is advisable to examine buildings built</p>

	<p>in similar areas to use as an estimate for this floor plan.</p> <p>3.5. Draw walls. Add walls for each room of the building, taking care to draw them to scale.</p>
	<p>3.6. Add architectural features. Begin adding features to the space by including the unchangeable things, like the doors and windows, as well as the refrigerator, dishwasher, dryer, and other important appliances that must be placed in a specific location.</p> <p>3.7. Add furniture. Add furniture if the floor plan calls for it</p>

	<p>3.8. Ideal room layout. Make sure bedrooms are far from entertaining spaces.</p> <p>3.9. Bathrooms shouldn't face common entertainment spaces like dining rooms or living rooms. Most people will like if the kitchen opens to the dining or living rooms so whoever is cooking can still interact with guests or keep an eye on the kids playing</p> <p>3.10. Size matters. Whenever designing any room or hallway, think about how many people will be in that space at one time. Do they have room to move around? Is there room for furniture to accommodate all the planned activities?</p> <p>3.11. Fits your priorities and lifestyle. If entertaining is important, make sure there's a good flow from the kitchen to an outside space and living room.</p> <p>3.12. When measuring existing spaces, lay your measuring tape flat on the floor and measure room dimensions in several places, especially where furniture will be a tight fit. Don't assume your walls are parallel.</p> <p>3.13. When planning an office, first determine whether the occupant's back will be toward the door.</p> <p>3.14. Leave enough empty space in front of filing cabinets to fully extend the drawer, plus at least 18 additional inches if the drawers will be accessed by a person standing in front of them.</p> <p>3.15. Allow adequate working space at desks or cubicles. The distance from the working side of a desk to the nearest wall or furniture should be at least 42 inches (and most people find 54 or 60 inches more comfortable).</p> <p>3.16. Don't line all the furniture up along the walls. Break up spaces by placing pieces out in the room.</p>
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	Setting rugs, sofas, or other furniture at angles can help avoid an overly rigid feel.
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Range statement

- Drawing and sketching equipment
- Sketching guideline: positioning hand, diversifying lines, avoiding being too symmetrical and staying clear of smudging
- Draw floor plan with details
- Taking measurements to draw the floor plan
- Room layout and planning an office layout
- Important things to consider before drawing such as
 - adequate working space at desks or cubicles
 - empty space in front of filing cabinets,
 - measuring existing spaces
 - Size and how many people will fit the room
 - bedrooms are far from entertaining spaces.
 - Bathrooms shouldn't face common entertainment spaces like dining rooms or living rooms

Tools, equipment and materials required may include:

- Drawing materials and equipment

Assessment guide

Form of assessment

The assessor may use the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

Assessment context

- Assessment of this unit must be completed on the job or in a simulated work environment. The

assessment environment should not disadvantage the candidate.

- Competency needs to be holistic and must be demonstrated in a suitable horticulture workplace condition.

Critical aspects

It is essential that competence is demonstrated in the knowledge and skills defined in this unit.

These may include the ability to:

- Take measurements and sketch
- Draw floor plan with detail
- Room and office layout

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
A basic working knowledge of: <ul style="list-style-type: none">- Sketching which include taking control, diversifying lines, add some texture and stay clear of smudging- Taking measurements / measure the walls, doors, and pertinent furniture so that the floor plan will be accurate.	The ability to: <ul style="list-style-type: none">- Ability to use drawing materials and equipment appropriately- Sketch drawings and draw floor plan- Determine the area to be drawn and ability decide how much (a room, a floor, or the entire building) of it to draw

UNIT- 05

UNIT TITLE	Measure and Draw a Floor Plan to Scale				
DESCRIPTOR	<p>An accurate floor plan drawing is a necessity whether you're planning a home remodel, commercial space build-out, or just need dimensions for arranging furniture placement.</p> <p>This unit will build competency in measuring and drawing a floor plan to scale.</p>				
CODE	CON12S1U05V1	LEVEL	3	CREDIT	10

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Accuracy	<p>1.1. Determine the level of accuracy required</p> <ul style="list-style-type: none"> - measure the approximate size of the building and show the general interior layout - Measure within the nearest 1/4 or even 1/2 foot of outside walls is probably sufficient - planning an interior remodel, such as a kitchen, measure to the nearest 1/4 inch. .
2. Perimeter	<p>2.1. Start by measuring the perimeter</p> <p>2.2. make a rough outline of the dimensions, for a good visual starting point</p> <p>2.3. Measure the longest wall first. Do this by running your tape measure along the baseboard from one corner to the other.</p> <p>2.4. Run the tape along the top of the baseboard so you get a full wall-to-wall dimension. If this is impractical, run it along the floor and make an adjustment for the width of the baseboards.</p> <p>2.5. For outside walls, simply go from one corner of the building to the other.</p>
3. Doors and Windows	3.1. Measure doors and windows

	<p>3.2. From the nearest corner, measure the distance to the door opening and note this on your drawing</p> <p>3.3. Ignore casings or trim.</p> <p>3.4. Measure the width of the door. Note the direction that the door swings</p> <p>3.5. Measure windows from frame edge to frame edge, without the casings or trim.</p> <p>3.6. measure the height of windows and their distances from the floor and ceiling.</p> <p>3.7. use the back of the page as a door/window schedule.</p>
<p>4. Other features</p>	<p>4.1. Measure other features</p> <p>4.2. cabinets, built-in bookshelves, and any other features should be measured and added to the plan next</p> <p>4.3. If the plan includes multiple rooms, make sure to account for the interior and exterior walls. Typical residential construction uses 6" exterior and 4" interior walls.</p> <p>4.4. Measure and locate electrical switches and outlets, thermostats, circuit boxes, radiators, heating and air conditioning registers, and any other elements on your diagram.</p>
<p>5. Elevation drawing</p>	<p>5.1. A floor plan is an overhead view of a space. An elevation is a ground-level view of a wall. If you need elevation drawings, you'll want to do these on separate sheets of paper.</p> <p>5.2. Measure each wall from floor to ceiling, and use the wall-to-wall measurements</p> <p>5.3. Draw the perimeter of the wall. Label it</p> <p>5.4. Draw in all of the doors, windows, cabinets, switches, etc. on each wall elevation</p> <p>5.5. Once all the measurements are taken make a rough</p>

	sketch of the floor plan on paper
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Range statement

- Measure the approximate size of the building and show the general interior layout with accuracy
- Measure the perimeter
- Take measurements of doors and windows
- Measure and locate electrical switches and outlets, thermostats, circuit boxes,
- Measurement for elevation drawing

Tools, equipment and materials required may include:

- Measuring equipment
- Drawing and sketching equipment

Assessment guide

Form of assessment

The assessor may use the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

Assessment context

- Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of safe working practices. The assessment environment should not disadvantage the candidate.

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
A basic working knowledge of: - Taking accurate measurement	The ability to:

<ul style="list-style-type: none">- Taking perimeter measurements- Taking measurement of doors, windows, cabinets and other features- Taking measurements for elevation drawing	<ul style="list-style-type: none">- Diagrams to show relationships between spaces and activities to complete detailed working drawings showing every last detail- Write up specifications which, with the working drawings, define the building.
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UNIT- 06

UNIT TITLE	Basic Building Planning Principles				
DESCRIPTOR	Landscape and Architectural designs must be integrated with all project design disciplines in order to optimize building performance and aesthetics. Prior to initiating any schematic design, the Architect must perform a series of coordination meetings with all project design disciplines/consultants to explore performance and functional objectives that could impact building orientation, massing, space adjacencies, material selections, and assemblies				
CODE	CON12S1U06V1	LEVEL	3	CREDIT	5

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Integrated Design	<p>1.1. Designs must be integrated with all project design disciplines in order to optimize building performance and aesthetics.</p> <p>1.2. Perform a series of coordination meetings with all project design disciplines/consultants to explore performance and functional objectives that could impact building orientation, massing, space adjacencies, material selections, and assemblies</p>
2. Performance Measures and Functional Objectives.	<p>2.1. Ensure the design supports quality-based performance measures for customer satisfaction, energy consumption, and reduced operations and maintenance.</p> <p>2.2. Identify all functional expectations and establish alternative features that support attainment</p>

	2.3. apply those architectural elements that optimize building performance and functional capabilities
3. Basic Configurations and Core Placement	3.1. Consider the depth of the occupiable space established by the core and exterior walls
4. Placement of Core Elements and Distances	<p>4.1. In buildings with large floor plates, not all core elements need to be placed at each core location</p> <p>4.2. Passenger Elevators should be grouped in banks of at least two for efficiency. Elevator groups of four or more should be separated into two banks opposite each other for maximum efficiency in passenger loading and minimum hall call notification for accessibility under requirements of UFAS/ADA. Travel distances from a given office or workstation to an elevator should not exceed 61 000 mm (200 feet).</p>

Range statement

- Design disciplines/consultants to explore performance and functional objectives that could impact building orientation, massing, space adjacencies, material selections, and assemblies.
- Take measures in designing building for customer satisfaction, energy consumption, and reduced operations and maintenance
- Consider the depth of the occupiable space established by the core and exterior

Assessment guide

Form of assessment

- Assessment for the unit needs to be holistic and must be observed through real or simulated workplace

activities.

Assessment context

Assessment may be done in workplace or a simulated work environment.

Critical aspects

Assessment conditions

- Theoretical assessment of this unit must be carried out in an examination room where proper examination rules are followed.

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
<ul style="list-style-type: none">• General knowledge of quality-based performance measures for customer satisfaction, energy consumption, and reduced operations and maintenance.• General knowledge of grouping Passenger Elevators for efficiency.• General knowledge of travel distances from a given office or workstation to an elevator	<ul style="list-style-type: none">• Ability to design disciplines in order to optimize building performance and aesthetics• Ability to coordinate meetings with all project design disciplines/consultants• identify all functional expectations and establish alternative features that support attainment for customer satisfaction, energy consumption, and reduced operations and maintenance.• To plan building design considering the environmental factors such as vegetation and historic building

UNIT- 07

UNIT TITLE	Basic Auto CAD				
DESCRIPTOR	The actual drawing up of plans is done on computers these days, as are simulations, artistic renderings, and much of the rest of the visual output of the field. You will need to develop agility with various architectural drafting software.				
CODE	CON12S1U07V1	LEVEL	3	CREDIT	15

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Basics	<p>1.1. Basic AutoCAD controls</p> <ul style="list-style-type: none"> - Start Drawing button to begin a new drawing - enter commands directly in the Command window instead of using the ribbon, toolbars, and menus. - conform to industry or company standards by specifying settings for text, dimensions, line types, and several other features - Create own drawing template - decide what the length of one unit represents—an inch, a foot, a centimeter, a kilometer, or some other unit of length. - decide what unit of length that you want to use, the UNITS command lets you control several unit display settings including the following: <ul style="list-style-type: none"> - Format (or Type). For example, a decimal length of 6.5 can be set to display as a fractional length of 6-1/2 instead. - Precision. For example, a decimal length of 6.5 can be set to display as 6.50, 6.500, or 6.5000.
2. Precision	2.1. Polar Tracking

	<ul style="list-style-type: none"> - Specify a point, such as when you create a line, you can use polar tracking to guide the movement of your cursor in certain directions. <p>2.2. Locking angles. Lock to a single, specified angle and specify a distance along that angle.</p> <p>2.3. Object snaps. Snap to precise locations on existing objects, such as an endpoint of a polyline, the midpoint of a line, or the center point of a circle.</p> <p>2.4. Grid snaps. Snap to increments in a rectangular grid.</p> <p>2.5. Coordinate entry. Specify a location by its Cartesian or polar coordinates, either absolute or relative.</p>
3. Geometry	<p>3.1. Create basic geometric objects such as lines, circles, and hatched areas.</p> <p>3.2. Use coordinator system and grid display</p> <p>3.3. Use line as construction aids. Lines can serve as reference and construction geometry such as</p> <ul style="list-style-type: none"> - Property line setbacks - The mirror line of a symmetrical mechanical part - Clearance lines to avoid interferences - Traversal path lines <p>3.4. Use polylines and rectangles</p> <p>3.5. Use the PLINE command to create open or closed polylines for</p> <ul style="list-style-type: none"> - Geometry that needs to have fixed-width segments - Continuous paths for which you need to know the total length - Contour lines for topographic maps and isobaric data - Wiring diagrams and traces on printed circuit boards

	<ul style="list-style-type: none"> - Process and piping diagrams
4. Layers	<p>4.1. Organize drawing by assigning objects to layers</p> <p>4.2. Using layers:</p> <ul style="list-style-type: none"> - Associate objects by their function or location - Display or hide all related objects in a single operation - Enforce line type, color, and other property standards for each layer <p>4.3. Resist the temptation to create everything on one layer. Layers are the most important organizing feature available in AutoCAD drawings.</p> <p>4.4. For complex drawings, consider a more elaborate layer naming standard. For example, layer names could begin with 3 digits followed by a naming code that accommodates multiple floors in a building, project numbers, sets of survey and property data, and so on.</p> <p>4.5. establish or to conform to a company-wide layer standard.</p> <p>4.6. With a layer standard, drawing organization will be more logical, consistent, compatible, and maintainable over time and across departments. Layer standards are essential for team projects.</p>
5. Properties	<p>5.1. Assign properties such as color and line type to individual objects, or as default properties assigned to layers.</p> <p>5.2. Perform editing operations such as erase, move, and trim on the objects in a drawing.</p> <p>5.3. Select a large number of objects. Instead of selecting each object individually, you can select the objects in an area by clicking an empty location</p>

6. Blocks and layouts	6.1. Insert symbols and details into your drawings from commercial online sources or from your own designs. <ul style="list-style-type: none"> - Insert block - Create a block definition 6.2. Familiarize with four methods of scaling <ul style="list-style-type: none"> - The original method - The layout method - The annotative method - The trans-spatial method
7. Modeling 3D objects	7.1. Use 3 different types of 3D modelling <ul style="list-style-type: none"> - 3D solid - 3D surface - 3D mesh 7.2. Convert surfaces and meshes to 3D solids 7.3. Convert 2D objects to 3D objects 7.4. Create and modify meshes 7.5. Create and modify surfaces

Range statement

- Review the basic AutoCAD controls.
- Pan and zoom in a drawing, and control the order of overlapping object
- Create basic geometric objects such as lines, circles, and hatched areas.
- Ensure the precision required for your models.
- Organize your drawing by assigning objects to layers.
- assign properties such as color and line type to individual objects, or as default properties assigned to layers.
- Perform editing operations such as erase, move, and trim on the objects in a drawing.
- Insert symbols and details into your drawings from commercial online sources or from your own designs.
- Display one or more scaled views of your design on a standard-size drawing sheet called a layout.
- Create notes, labels, bubbles, and callouts. Save and restore style settings by name.
- Create several types of dimensions and save dimension settings by name.
- Output a drawing layout to a printer, a plotter, or a file. Save and restore the printer

settings for each layout.

- Use and apply four methods of scaling
- 2D modeling and 3D modeling

Tools, equipment and materials required may include:

- AutoCAD software installed
- Architectural CAD file of building you wish to clean up/convert
- Existing standardized floor plan CAD file

Assessment guide

Form of assessment

The assessor may use the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

8. Any written or oral examinations must include questions related to Handling hazardous substances in work place.

Assessment context

- Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of safe working practices. The assessment environment should not disadvantage the candidate.

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
A basic working knowledge of: <ul style="list-style-type: none">- Knowledge of making AutoCAD commands using computer	The ability to: <ul style="list-style-type: none">- Perfectly make use of the LINE command in AutoCAD, and acquire the mastery of this command.- Create circles in AutoCAD using the CIRCLE command and master the UCS command.- Work with the POLAR TRACKING Mode- Play with the POLYGON command in AutoCAD. Creating Circumscribed around a circle and inscribed in a circle polygon with different number of sides.- Able to do 2D and 3D modeling

UNIT- 08

UNIT TITLE	Basic Architecture symbols				
DESCRIPTOR	This unit will describe the basic architecture symbols that architects must be using in architecture designing and drawing				
CODE	CON12S1Uo8V1	LEVEL	3	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Architectural symbol	1.1. Dimension line 1.2. Extension line 1.3. Wall surface line 1.4. North direction ine 1.5. Column line grid 1.6. Partition type 1.7. Window type 1.8. Door type 1.9. Room number 1.10. Ceiling height 1.11. Elevation marker
2. Plumbing piping	2.1. Cold water 2.2. Hot water 2.3. Chilled drinking water supply 2.4. Fire line 2.5. Gas 2.6. Vaccum
5. Plumbing fixture symbols	3.1. Dishwasher 3.2. Laundry trays

<p>6. Material indication symbols</p>	<p>6.1. Wood 6.2. Brick 6.3. Stone 6.4. Concrete 6.5. Concrete block 6.6. Earth 6.7. Glass 6.8. Insulation 6.9. Plaster 6.10. Structural steel 6.11. Tile 6.12. Porous fill 6.13. Plywood</p>
<p>5. Landscape symbols</p>	<p>5.1. Building Window Door Paving Wall Stone wall Stes</p>
<p>9. Window and door symbols</p>	<p>9.1. Double hung windows 9.2. Casement windows 9.3. Slider 9.4. Exterior code 9.5. Interior door 9.6. Bifold door</p>

Range statement

Symbols such as:

- Building materials
- Doors and Windows
- Plumbing piping
- Landscape symbols

Tools, equipment and materials required may include:

- AutoCAD software installed
- Architectural CAD file of building you wish to clean up/convert
- Existing standardized floor plan CAD file

Assessment guide

Form of assessment

The assessor may use the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
A basic working knowledge of: <ul style="list-style-type: none">- Different architectural symbols and their use	The ability to: <ul style="list-style-type: none">- Use basic architectural symbols in drawing and designing- Modelling building models using Auto CAD an use appropriate symbol.

UNIT- 09

UNIT TITLE	Architectural Building Elements				
DESCRIPTOR	The term "materials" refers to all the physical substances that are assembled to create the interior and exterior of a building. Today most buildings are constructed from a multitude of materials, each with very specific functional demands and complex assembly requirements. For instance, an exterior wall assembly contains materials that keep the rain and wind out, thermally insulate the inhabitants from exterior temperatures, structurally support the building and the associated enclosure system, and provide desired interior and exterior finishes. These decisions should be based on a number of carefully considered issues as described below, including symbolism, appropriateness, physical properties, and technique				
CODE	CON12S1U09V1	LEVEL	3	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. selecting appropriate materials and assemblies.	<p>1.1.Select material compatible with climatic, cultural and aesthetic condition</p> <p>1.2.Select applicable material depending to occupancy and size of building, including durability, structural and fire protection requirement.</p> <p>1.3.Analyze environmental impact of obtaining raw materials, processing and fabricating building materials, transportation impact and recycle issues such as</p> <ul style="list-style-type: none"> - How was it processed or fabricated? - How long will it last? How will it eventually be disposed of? - How will this material impact the environment while in place? - How can the use of a particular material minimize construction waste?
2. Physical properties	2.1.Strength: Material strength quantifies resistance to compression, tension, and other types of loading on a given material. For instance, masonry performs most effectively as a load-bearing or compressive material,

	<p>while steel is a more suitable choice for greater spanning and tensile requirements.</p> <p>2.2.Mass and thickness: After an initial material selection is made, the dimensional thickness of each material must be based on requirements for durability, strength, and aesthetic considerations.</p> <p>2.3.Physical and visual density: Often a particular tactile density is desired, ranging from heaviness to lightness in degrees of opacity, translucency, or transparency.</p> <p>2.4.Texture: Many materials may be finished to different textures, either during off-site production or while finishing materials on-site</p> <p>2.5.Color: Selection of a building color palette must consider the surrounding context, as well exterior and interior light qualities under which the colors will be viewed. The cool diffused light of Seattle will render colors quite differently than the hot clear light of Phoenix. Colors may be light absorptive or light reflective, warm or cool, while the palette may be monochromatic or polychromatic.</p> <p>2.6.PATTERN: Material patterning must be designed at two scales: the individual elements themselves, such as bricks or glass panes, and the composition of these elements into larger assemblies. For example, at the individual element scale the inherent patterning of wood grain or stone marbling must be considered</p> <p>2.7.WEATHERING: The passing of time has an immense</p>
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	<p>impact on the appearance and life span of building materials. Thus, future weathering must be carefully considered during material selection, building detailing, and construction.</p>
<p>3. Work in a team</p>	<p>3.1. Allocated tasks are identified and completed within defined time-lines.</p> <p>3.2. Assistance is actively sought by approaching other team members when difficulties arise.</p> <p>3.3. Feedback provided by others in the working groups is acknowledged.</p> <p>3.4. Appropriate lines of communication with supervisors and peers are demonstrated according to enterprise policy.</p> <p>3.5. Support and tolerance are offered and provided to colleagues.</p> <p>3.6. Participation in team problem solving activities is demonstrated.</p>
<p>4. Meet, greet and direct clients and customers</p>	<p>4.1. Client is greeted in line with enterprise policy.</p> <p>4.2. Questioning and active listening is used to elicit client needs.</p> <p>4.3. Clients with special needs are referred or redirected as required.</p> <p>4.4. A positive attitude is maintained in interacting with clients and customers.</p> <p>4.5. Personal and cultural differences are taken into account when dealing with clients.</p> <p>4.6. Telephone is answered promptly, calls re-directed to appropriate person or messages recorded according to</p>

	enterprise policy.
5. Maintain personal presentation	5.1. Personal dress is maintained in line with enterprise policy. 5.2. Personal grooming and hygiene reflect enterprise policy.

Range statement

- Select materials compatible with specific regional and local cultural and aesthetic conditions.
- Select applicable materials to the building size, durability and structure to protect health, safety and welfare
- Consider long term ecological footprint of material production when selecting material
- Consider physical properties in selecting materials such as strength, mass and thickness, physical and visual density, texture and color

Tools, equipment and materials required may include:

- Building materials

Assessment guide

Form of assessment

The assessor may use the following assessment methods to objectively assess the candidate:

- Observation
- Questioning
- Practical demonstration

Assessment context

- Assessment of this unit must be completed on the job or in a simulated work environment which reflects a range of safe working practices. The assessment environment should not disadvantage the candidate.

UNDERPINNING KNOWLEDGE AND SKILLS

Underpinning Knowledge	Underpinning Skills
A basic knowledge of; <ul style="list-style-type: none"> • How climate affect building materials • Environmental impact of obtaining raw materials • Physical properties of different materials 	An ability to <ul style="list-style-type: none"> • Select material in accordance to: <ul style="list-style-type: none"> - Climate - Environmentally friendly - Physical property

UNIT 10

UNIT TITLE	Apply legal requirements to building and construction projects				
DESCRIPTOR	This unit of competency specifies the outcomes required to apply legal requirements to building and construction projects. Application of legal requirements includes the capacity to ensure compliance with all contractual requirements. A thorough knowledge of the application of current legal and regulatory requirements is essential.				
CODE	CON12S1U10V1	LEVEL	3	CREDIT	3

ELEMENTS OF COMPETENCIES	PERFORMANCE CRITERIA
1. Apply the laws relating to builder licensing or registration.	1.1. Licensing or registration legislation is researched and identified. 1.2. Classifications for builders, supervisors and managers are applied.
2. Apply OHS legislation and provisions on site.	2.1. Main provisions of OHS legislation and regulations are researched and identified and local legislative requirements are met. 2.2. Regulations and codes applicable to on-site construction are identified, applied and monitored. 2.3. Site safety signage requirements are identified and applied.
3. Apply the codes, Acts, regulations and standards relevant to construction.	3.1. Current codes, Acts, regulations and standards applicable to a particular building and construction project are researched. 3.2. Construction process is carried out in accordance with codes, Acts, regulations and standards concerning construction, insurance,

	sustainability, environmental matters and appropriate by-laws.
4. Apply dispute resolution processes.	<p>4.1. Organisational dispute resolution processes are applied.</p> <p>4.2. Customer complaints are dealt with according to company policy.</p> <p>4.3. Disputes are documented and outcomes recorded and maintained.</p>

RANGE STATEMENT

1. Government laws
2. OHS legislation
3. Codes, Acts, regulations and standards
4. Insurance cover

ASSESSMENT GUIDE

This unit of competency could be assessed by the preparation of a portfolio of the legislative requirements for residential and commercial building and construction project case study.

The unit of competency can be assessed in the workplace or a close simulation of the workplace environment, provided that simulated or project-based assessment techniques fully replicate construction workplace conditions, materials, activities, responsibilities and procedures.

Critical aspects for assessment

A person who demonstrates competency in this unit must be able to provide evidence of the ability to:

understand appropriate registration, licensing or compliance requirements

meet appropriate business registration requirements

identify and specify requirements for compliance with:

5. OHS legislation
6. legislation pertaining to financial transactions, including payment of wages and subcontractor and supplier invoices
7. relevant building and construction codes, Acts, regulations and standards

8. sustainability and environmental legislation
9. industrial relations laws
10. legal obligations of contractual agreements.

Assessment context

This competency is to be assessed using standard and authorised work practices, safety requirements and environmental constraints.

Assessment of essential underpinning knowledge will usually be conducted in an off-site context.

Resource implications for assessment include:

documentation that should normally be available in either a building or construction office

relevant codes, standards and government regulations

office equipment, including calculators, photocopiers and telephone systems

technical reference library with current publications on measurement, design, building

construction and manufacturer's product literature

a suitable work area appropriate to the construction process.

Assessment method

Assessment methods must:

include direct observation of tasks in real or simulated work conditions, with questioning to

confirm the ability to consistently identify and correctly interpret the essential underpinning knowledge required for practical application

reinforce the integration of employability skills with workplace tasks and job roles

confirm a reasonable inference that competency is not only verified under the particular

assessment circumstance, but is able to be transferred to other circumstances and environments.

Validity and sufficiency of evidence requires that:

competency will need to be demonstrated over a period of time reflecting the scope of the role and practical requirements of the workplace

UNDERPINNING KNOWLEDGE AND SKILLS

UNDERPINNING KNOWLEDGE	UNDERPINNING SKILLS
<ul style="list-style-type: none"> • Building and construction industry contracts • OHS frameworks and obligations • Risk management processes and practices and the planning required to develop plans • Building and construction codes, standards and government regulations • Workplace safety requirements. 	<ul style="list-style-type: none"> • Ability to research, access and interpret complex documents • Communication skills to: • Communicate with local or regulatory authorities on matters relating to site conditions or approvals and to negotiate on matters concerning industrial relations by telephone, or face to face • Written skills to communicate by memo, letter, facsimile or email with subcontractors, staff, clients and regulatory authorities • Interpersonal skills relevant to the supervision and monitoring of work processes • Numeracy skills to apply calculations.

